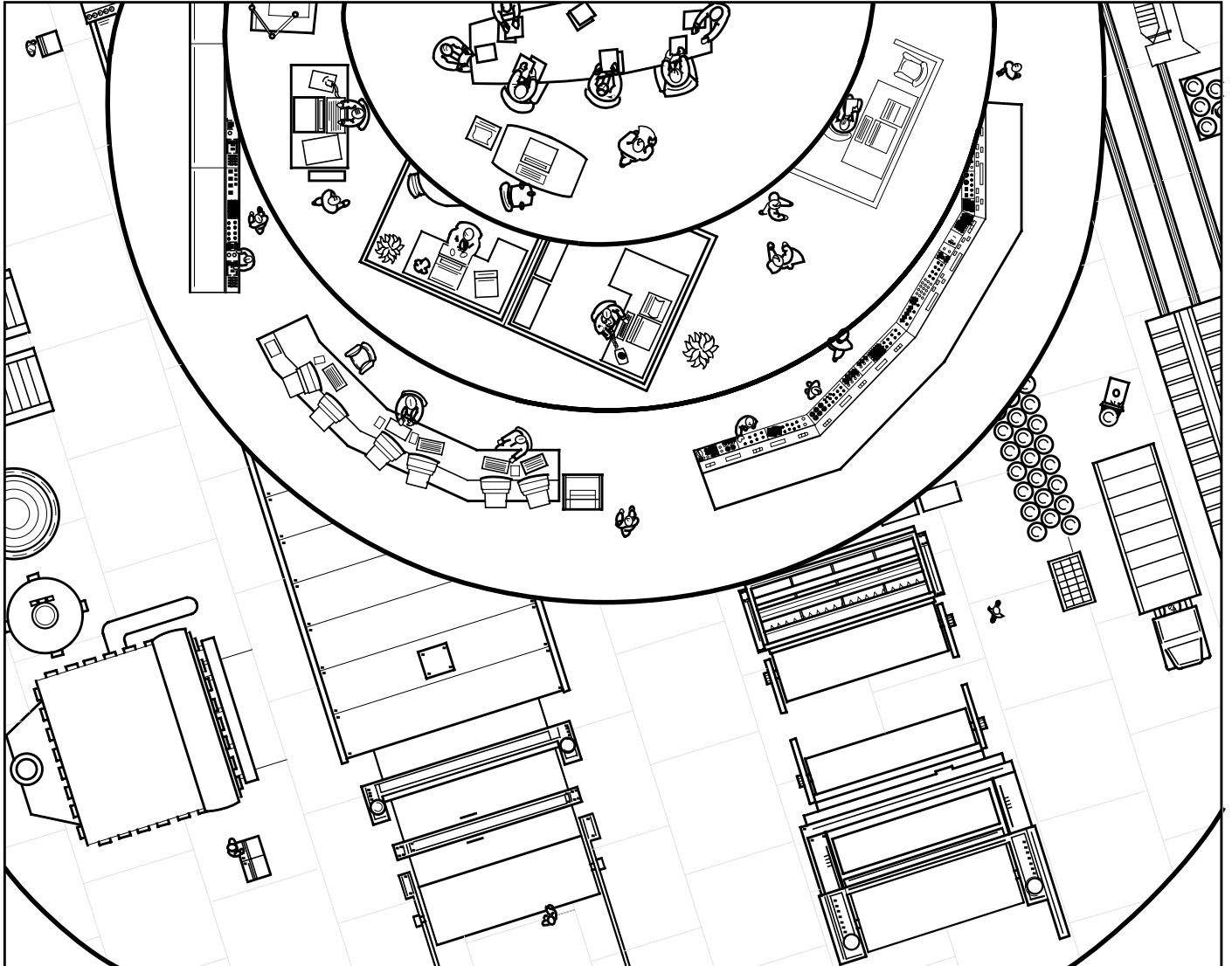


For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Smart Platform™ 1200 Installation and Maintenance Manual



ABB

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

PROPRIETARY DATA

This document contains proprietary data of ABB Industrial Systems Inc.
No disclosure, reproduction, or use of any part thereof may be made
except by written permission.

Publishing Staff:

Writers: Kay Brown, Bob Gongaware, Bill Houston, Robert Macchia, Pamela Murray

Artists: Melinda Hoyle, Kathleen Poirier

Contributors: Keith Carson, Jack Dukes, Mort Jensen, Al Luckman, Donald Stephens

© 1992, 1993, 1996, 1997, 1998 by ABB Industrial Systems Inc.

™ Smart Platform, OptiPak, and ACE are trademarks of ABB Industrial Systems Inc.

™ DESQview is a trademark of QUARTERDECK OFFICE SYSTEMS.

® Teflon is a trademark of I.E. duPont de Nemours.

® Registered trademark and service mark of ABB Industrial Systems Inc.

July 1998

101764-003

Version J

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Document Version History

Smart Platform™ 1200 Installation and Maintenance Manual

Version Level	Effective Date	Sections Changed by Revision	Sections Added by Revision	Sections Deleted by Revision
A	September 1992	Original Release		
B	January 1993	Entire Manual		
C	May 1993	63		
D	September 1993	43		
E	October 1993	Replacement Parts for the ASPC Section, page 213 and page 217		
F	November 1993	Entire Manual		
G	May 1996	Entire Manual		
H	September 1996	Setup Checklists, 104 Standardize Limits, 131-32	Default Compensations for IR Moisture, Microwave, and Ash Sensors, 153	
I	June 1997	“Platform Software Setup Checklist” on page 70 “Basic Tuning” on page 83 “General Information” on page 141 “Acceptable Range for Standardize Limits” on page 149 “Control Panel Description” on page 170 “Control Panel Functions” on page 173 “Replacement Parts for the ASPC” on page 230	“Ash Sensor” on page 133	
J	July 1998	Entire Manual		

Blank Page

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Preface

The audience for the *Smart Platform 1200 Installation and Maintenance Manual, 101764-003*, is the person(s) who initially sets up and maintains the Smart Platform 1200. The purpose of this manual is to provide for installation, setup, and maintenance of the Smart Platform 1200.

While limited information is included, the user is expected to be somewhat familiar with operations related to the Service Workstation and Health Reports. Additional background is available in the documents listed below.

The following are recommended for maintenance of the Smart Platform 1200:

- *Liquid Cooling Unit Reference Manual, 101333-003*
- *AccuRay Smart Platform System Software Manual, 101760-xxx*
- *AccuRay Smart Platform Troubleshooting Procedures Manual, 101761-001*
- *Radiation Safety Manual (for customers), 019406-001*
- Specific sensor manuals

Blank Page

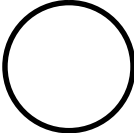
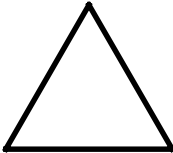

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Caution and Warning Symbols

General Safety Forms and Colors

Geometric Form and Meaning

Geometric Form	Meaning
	Prohibition or mandatory action
	Warning
	Information (including instructions)

General Meaning of Safety Colors

Safety color	Meaning or Objective	Example of Use
Red	Stop Prohibition	Stop signs Emergency stops Prohibition signs
	This color is also used for fire-prevention and fire-fighting equipment and its location	
Blue ¹	Mandatory action	Obligation to wear personal protective equipment
Yellow	Caution, risk of danger	Indications of dangers, (fire, explosion, radiation, toxic hazards, etc.) Warning for steps, low passages, obstacles ²
Green	Safe condition	Escape routes Emergency Exits Emergency showers First-aid and rescue stations

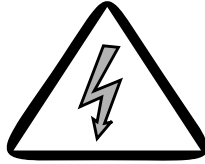
1. Blue is considered a safety color only if used in a circular shape.
2. Fluorescent orange-red may be used in place of safety yellow except on safety signs. This color is very conspicuous, especially in conditions of poor natural lighting.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Definition of Cautions and Warning Symbols

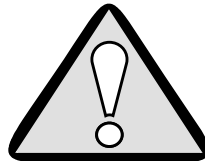
The following symbols represent warnings and cautions which you may find on the product or in product documentation.



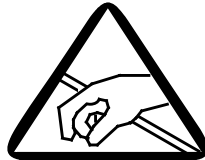
This symbol warns of dangerous voltage. This symbol is used if there is a danger of a harmful or fatal shock.



This is a radiation warning and is used when ionizing rays are present. Where a lamp is used to indicate the presence of ionizing radiation it is red.



This is a general warning symbol and is to be used if there is no other more specific symbol available.



This symbol warns of potential electrostatic sensitive devices. It is used as a reminder to observe all electrostatic discharge control procedures.



This symbol warns of a potential crushing hazard. For example, if the motor controller is not properly adjusted to stall, it may be possible for someone to be crushed between the head package and the end column.



This symbol warns of a potential hand or finger entrapment hazard.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.



This symbol warns that equipment may automatically start-up.

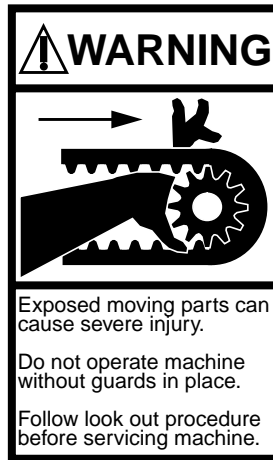
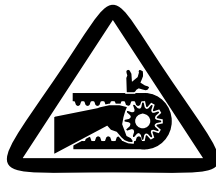


MOTOR ONLY

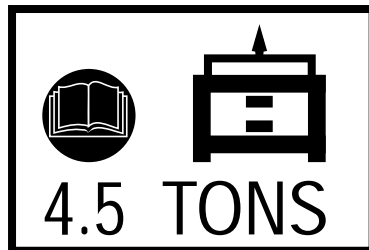
This symbol is a reminder that the motor must be locked off before performing any action where unexpected movement of the head package or any of the associated drive elements would pose a hazard. Note that the motor lock-out switch removes power from only the motor controller and motor. It does NOT remove all power from the SP.



This symbol is a reminder that it is mandatory to read and understand the supporting manual before proceeding. Additional necessary information is in the manual.



See WARNING text.



This symbol indicates the maximum weight of an SP1200 and refers to this manual for more information. See Chapter 3, "Hardware Installation".

Blank Page

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table of Contents

Preface	i
Caution and Warning Symbols	iii
List of Figures	xiii
1 Product Overview.....	1
Smart Platform 1200 Options.....	3
Sensor Options.....	3
Scanner Options.....	3
AccuRay Smart Processing Center (ASPC) Backplane Identification	4
Introduction	4
Identifying Different Backplanes	4
Slot Assignments	5
Print Books	6
12 Volt Fuses.....	6
Mechanical Structure.....	7
Way System.....	8
Drive System	9
Electrical and Cable Systems	10
Service Workstation.....	12
Service Tools.....	13
2 Radiological Safety	15
Safety Features	16
Handling the Source	18
Installation of the Source	19
Individual Responsibility	20
3 Hardware Installation.....	23
Unpacking Instructions	24
Checklist.....	24
Handling Instructions	25
Dimensions and Weight	27
Space Requirements	27
Safety	28
Personnel	28
Machine	29
Installation Requirements	30
Environmental Data.....	30
Electrical Supply and Grounding Requirements	30
Cabling	31
Equipment Location	32

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

3 Hardware Installation (Continued)	
Liquid Cooling Unit Setup	34
Pedestal Installation and Alignment	35
Installation Guidelines	35
Alignment of the Customer Pedestals	36
Attaching the Platform to the Pedestals	38
Platform Alignment	43
Carriage Alignment	45
Pass Angle Adjustment	46
Process Direction Alignment.....	49
Air Gap Alignment	52
Verify Air Gap	53
Scan Direction Alignment	54
4 Utility Service Installation	57
Air Purge	58
Air and Water Supply	59
Electrical Hook-Up	61
SP1200 Power Up Procedure	63
Starting Up the Software	67
5 Platform Tuning	69
Platform Software Setup Checklist	70
Motor Drive Setup (ABB ACS-100)	72
General Description.....	72
Control Panel Functions	72
Motor Drive Parameters	73
Panel Operations.....	75
Motor Controller Setup (Fincor and Lovejoy)	79
Procedure	79
Basic Tuning	83
Procedure	83
Head Position Setup	91
Notes about LHEOS and LFEOS (Scanning Measurement Limits)	94
Procedure for Determining Position Values	95
Head Package Dimensions Setup	96
Definition of Head Package Dimensions	96
Determining and Entering the Head Dimensions	99
Automatic Edge-of-Sheet	102
Setup Guidelines.....	103
Entering AEOS Setup Parameters	104
Motion Restriction Sensitivity	106
Changing the Motion Restriction Sensitivity	107
Standardize Off-Sheet Delay Setup	108

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

5 Platform Tuning (Continued)	
Setup Procedure.....	108
Operation Overview	109
Other Host Setup Procedures	110
6 Measurement Setup	111
Setup Checklists	112
Basis Weight Sensor Setup.....	112
IR Moisture Sensor Setup.....	112
OptiPak Sensor Setup	113
Ash Sensor Setup.....	113
Gloss Sensor Setup	113
Apparent Density Setup.....	114
Caliper Sensor Setup	114
Sheet Temperature Sensor Setup.....	114
Smoothness Sensor Setup.....	115
Microwave Sensor Setup.....	115
Smart Color Sensor Setup	115
IR CoatWeight Sensor Setup.....	115
Operation of the Sensor Health Pages.....	116
Temperature Controller Setup	
for Basis Weight, Ash, and Caliper Sensors	118
Smart Ash and Smart Basis Weight	120
Temperature Controller Tuning Parameters	122
Using the Optional Temperature Controller Utility	123
Setup of Customer Units	124
Ream Size	124
Apparent Density.....	125
Changing Caliper Output Units.....	125
Ash Units Setup.....	126
Enter Calibration Head Constants	127
Basis Weight Sensor.....	127
Air Column Measurement	
(Smart Basis Weight Sensor Only)	129
IR Moisture Sensor.....	131
Ash Sensor.....	133
Sheet Temperature Sensor.....	135
Gloss Sensor	136
Gloss Sensor Head Constant Tuning	137
Caliper Sensor	139
Microwave Moisture Sensor.....	140
Standardize Limits	141
Procedure for Changing Standardize Limits	141
General Information	141

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

6 Measurement Setup (Continued)	
Changing the Standardize Mode of the FCP Standardize Request	145
Controlling the Type of Standardize for a Specific Sensor	146
Smart Basis Weight Sensors	147
Caliper Sensor	148
Acceptable Range for Standardize Limits	149
Verification	155
Background	155
Phase I – Initial Static Verification	155
Phase II – Process Measurement Verification	155
Phase III – Continuing Certification	155
Implementation of the Sensor Verification Program	156
Air Temperature Compensation for Basis Weight	157
Verification of Setup and Stability	157
Fine Tuning ATC with dBWDT	159
Air Profile Compensation for Basis Weight, Gloss, and Caliper	161
Air Profile Data Collection	161
At the Service Workstation	162
At the Host Computer	162
Enabling Air Profile Compensation	163
Air Profile Compensation for OptiPak	164
Setup	164
Data Collection	165
Using the Data	165
Digital Input Invert Adjustment for the Smoothness Sensor	166
Default Compensations for IR Moisture, Microwave, and Ash Sensors	167
Calibrate Sample - Minimum Time Data Accumulation	168
7 Control Panel Operation	169
Control Panel Description	170
Smart Platform Modes of Operation	171
Remote/On-Sheet	171
Remote/Off-Sheet	171
Local	171
Local/Head Split	172
Control Panel Functions	173
Head Split Switches	177
8 Startup Options	179
Manual Startup	180
Automatic Startup	181
Service Workstation Software Startup	182

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

9 Maintenance Procedures	183
Smart Platform Maintenance Log	184
Inspecting the Incoming Power	186
Inspecting the Drive System	187
Drive Belt Tension Measurement.....	188
Drive Belt Tension and Tip Adjustment	189
Drive Motor Belt Inspection.....	190
Drive Motor Adjustment	190
Seal Belt Tension Inspection	191
Seal Belt Tension Adjustment	192
Head Separation and Limit Switch Inspection	193
Wheel Inspection	195
Platform Alignment Inspection	196
Air Purge Filter Inspection	197
Purge Blower Replacement Process.....	197
Cleaning the Air Purge Filter	198
Inspecting the Compressed Air Filters	199
Cleaning the Compressed Air Filter	199
Inspecting the Water Filter	200
Power and Temperature Checks	201
DC Voltage Level Checks	202
Cabinet Environmental Checks	202
10 Replacement Procedures	203
Drive Motor Belt	204
Carriage Drive Belt	206
Idler Pulley	208
Carriage Wheel	209
Seal Belt	210
Split Rollers	213
Flex Cable	215
Electric Chassis	218
Electric Chassis Replacement Procedure	218
Flex Power Cable Retrofit Kit.....	220
Flex Cable Replacements	220
Motor Drive Replacement (ABB ACS-100)	222
Drive Motor Controller (Fincor and Lovejoy)	223
Pressure Switch	225
Encoder	226
Replacement Parts List	227
Replacement Parts for the ASPC	230

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

11 Troubleshooting	237
Alarm Messages	238
Electronics Health Report.....	238
Voltage Level Out of Limits.....	239
Frame Health Report	240
LED Interpretation	242
Power Supply LEDs	242
ECF and ECS LEDs	243
MPRC LEDs.....	244
Power Down and DC Power Analysis	246
Diagnostic Card Operation	249
Diagnostics Performed at the Sensor.....	250
Diagnostic Cards	252
Troubleshooting Start-Up Messages	261
Appendix A: Service Workstation Activities	269
Service Workstation Setup	270
Software.....	270
Hardware	270
Displaying Reports	271
Standardize Report	271
Sample Check Report	272
Calibrate Sample Report.....	273
Utilities	274
The inspect Utility	274
The gstore Utility.....	275
Identifying Sensor Configuration	277
Determining Software Release Levels	278
Preparing On-Site Documentation	279
Index	281

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

List of Figures

Figure.....	Page
Figure 1-1 System Overview	2
Figure 1-2 Platform Cross Section	7
Figure 1-3 Carriage System	8
Figure 1-4 Drive System	9
Figure 1-5 Electrical Component Locations	10
Figure 2-1 Shutter Status Lights on the Lower Carriage and the End Column	17
Figure 2-2 Types of Safety Labels Used on Shipping Containers	18
Figure 2-3 Safety Labels	20
Figure 2-4 Safety Label for the X-ray Sensor	21
Figure 2-5 Measurement Beam	22
Figure 3-1 Smart Platform on Shipping Dollies	24
Figure 3-2 Rigging Recommendations	26
Figure 3-3 Liquid Cooling Unit Setup	34
Figure 3-4 Alignment of the Mounting Pedestals	36
Figure 3-5 Platform to Pedestal Installation – Drive Side	38
Figure 3-6 Platform to Pedestal Installation – Idler Side	39
Figure 3-7 Preliminary Alignment Setup	40
Figure 3-8 Jackscrew Orientation	41
Figure 3-9 Verifying Platform Alignment	43
Figure 3-10 Head Alignment Conditions	45
Figure 3-11 Pass Angle Adjustment	46
Figure 3-12 Simulating the Process Pass Line	47
Figure 3-13 Process Direction Alignment Points	49
Figure 3-14 Upper Head Carriage	50
Figure 3-15 Air Gap Alignment Points	51
Figure 3-16 Air Gap Measurement Tool	53
Figure 3-17 Scan Direction Optimum Alignment Point	54
Figure 3-18 Scan Direction Adjustment	55
Figure 3-19 Manual Alignment Setup	56
Figure 4-1 Purge Air Duct Attachment	58
Figure 4-2 Air and Water Hookup	60
Figure 4-3 Standard Cable Configuration	62
Figure 4-4 Circuit Breakers	63

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Figure.....	Page
Figure 5-1 Menu Tree	71
Figure 5-2 MDPanel	72
Figure 5-3 Manual Servo Calibration Screen in ft.	80
Figure 5-4 Location of the Motor Controller in the Smart Platform End Column	81
Figure 5-5 Adjustments to the Motor Controller	82
Figure 5-6 Head Position Calibration – Initial Display (Example)	84
Figure 5-7 Head Position Calibration Measurement	85
Figure 5-8 Head Position Calibration Screen	86
Figure 5-9 Head Position Calibration Summary Display	87
Figure 5-10 Automatic Motor Controller Tuning Screen	89
Figure 5-11 Motor Controller Servo Calibration Summary	90
Figure 5-12 Smart Platform Positions at the Host Computer	93
Figure 5-13 Limits for Multiple Frame Installations	94
Figure 5-14 Frame Health Report with Scanner Setup Panel	95
Figure 5-15 Location of Head Package Measurements	98
Figure 5-16 Head Setup Using the Frame Health Report	101
Figure 5-17 Automatic Edge-of-Sheet Position Measurements	103
Figure 5-18 AEOS Setup on the Frame Health Report	105
Figure 5-19 Setting Up Motion Sensitivity with the Frame Health Report	107
Figure 6-1 Example of the Health Overview Page	116
Figure 6-2 Example of Basis Weight Health Page 2 of 2 for Heater Setup	119
Figure 6-3 Example of the Caliper Health Report	126
Figure 6-4 Basis Weight Sensor Health Report Showing Calibration Constants	128
Figure 6-5 Air Column Measurement Health Report	129
Figure 6-6 IR Moisture Health Report Showing Calibration Constants	131
Figure 6-7 Ash Sensor Health Report	134
Figure 6-8 Sheet Temperature Sensor Health Report Showing Calibration Constants	135
Figure 6-9 Example of Gloss Sensor Calibration Report	136
Figure 6-10 Caliper Health Report Showing Calibration Constants	139
Figure 6-11 Standardize Mode Selection	143
Figure 6-12 Basis Weight Health Report Showing Standardize Limits	147
Figure 6-13 Caliper Sensor Health Report Showing Standardize Limits	148
Figure 6-14 Heat Source for Fine Tuning dBWdT	159

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Figure.....	Page
Figure 7-1 The Smart Platform Control Panel	170
Figure 7-2 Locations of the Head Split Switches	177
Figure 9-1 SP1200 Lockout Switch	187
Figure 9-2 Drive Belt Measurement and Adjustment	189
Figure 9-3 Drive Motor Belt Check and Adjustment	190
Figure 9-4 Seal Belt Tension Checks	191
Figure 9-5 Seal Belt Adjustment	192
Figure 9-6 Head Separation Check	194
Figure 9-7 Electronics Health Page Report	201
Figure 10-1 Drive Motor Belt	204
Figure 10-2 Clutch Assembly Details	205
Figure 10-3 Carriage Drive Belt	207
Figure 10-4 Idler Pulley	208
Figure 10-5 Carriage Wheel	209
Figure 10-6 Seal Belt Clamp	210
Figure 10-7 Seal Belt	211
Figure 10-8 Seal Belt Tension Checks	212
Figure 10-9 Seal Belt Tension Adjustments	213
Figure 10-10 Split Roller Assembly	214
Figure 10-11 Seal Belt Tension Checks	214
Figure 10-12 Carriage Assembly (Top View)	215
Figure 10-13 Cable Suspension	216
Figure 10-14 Carriage Assembly	219
Figure 10-15 Side View of Proper Cable Dress for SP1200	221
Figure 10-16 SP1200 Motor Drive Assembly	222
Figure 10-17 Drive Motor Controller	224
Figure 10-18 Pressure Switch	225
Figure 10-19 Drive End Column Parts	229
Figure 10-20 SP Electronics Cabinet (086345-004 Backplane Version)	232
Figure 10-21 SP Electronics Cabinet (086345-003 Backplane Version)	233
Figure 10-22 Location of SMI and BRAM Boards	234
Figure 10-23 Location of OSPS2 and EC24V	235
Figure 11-1 Subsystem Temperature Report	247
Figure 11-2 Historical Trend Report for Microcontroller DC Voltages	248
Figure 11-3 Test Board Hookup	249
Figure 11-4 Basis Weight Source Module	251

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Figure.....	Page
Figure 11-5 Basis Weight Detector Module	251
Figure 11-6 Sample Diagnostic Card: Top Power	253
Figure 11-7 Sample Diagnostic Card: Bottom Power	254
Figure 11-8 Sample Diagnostic Card: Top Signal	255
Figure 11-9 Sample Diagnostic Card: Bottom Signal Sensor	256
Figure 11-10 Sample Diagnostic Card: Backplane Power	257
Figure 11-11 Sample Diagnostics Card: Bottom Auxiliary Power	258
Figure 11-12 Sample Diagnostics Card: Detector Module	259
Figure 11-13 Sample Diagnostics Card: Source Module	260
Figure A-1 Debug Port on the Smart Platform (-003 Backplane shown)	270
Figure A-2 Example of Standardize Report	271
Figure A-3 Example of Sample Check Report	272
Figure A-4 Example of Calibrate Sample Report	273
Figure A-5 gstore Menu Screen	275

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

1

Product Overview

The Smart Platform 1200 is a full size (maximum of 12 meters long), high-performance platform for medium-to-giant size paper machines with up to 10.2 meters (402 in) of trim. The platform can carry up to seven sensors at a $\pm 25^\circ$ pass angle (optionally at a $\pm 45^\circ$ pass angle). It has on-board electronics for local sensor and platform signal processing. This chapter discusses the Smart Platform hardware. [Figure 1-1 on page 2](#) shows a typical Smart Platform 1200 based measurement system.

This chapter contains the following major sections:

Section.....	Page
Smart Platform 1200 Options	3
AccuRay Smart Processing Center (ASPC) Backplane Identification	4
Mechanical Structure	7
Drive System	9
Electrical and Cable Systems	10
Service Workstation	12
Service Tools	13

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

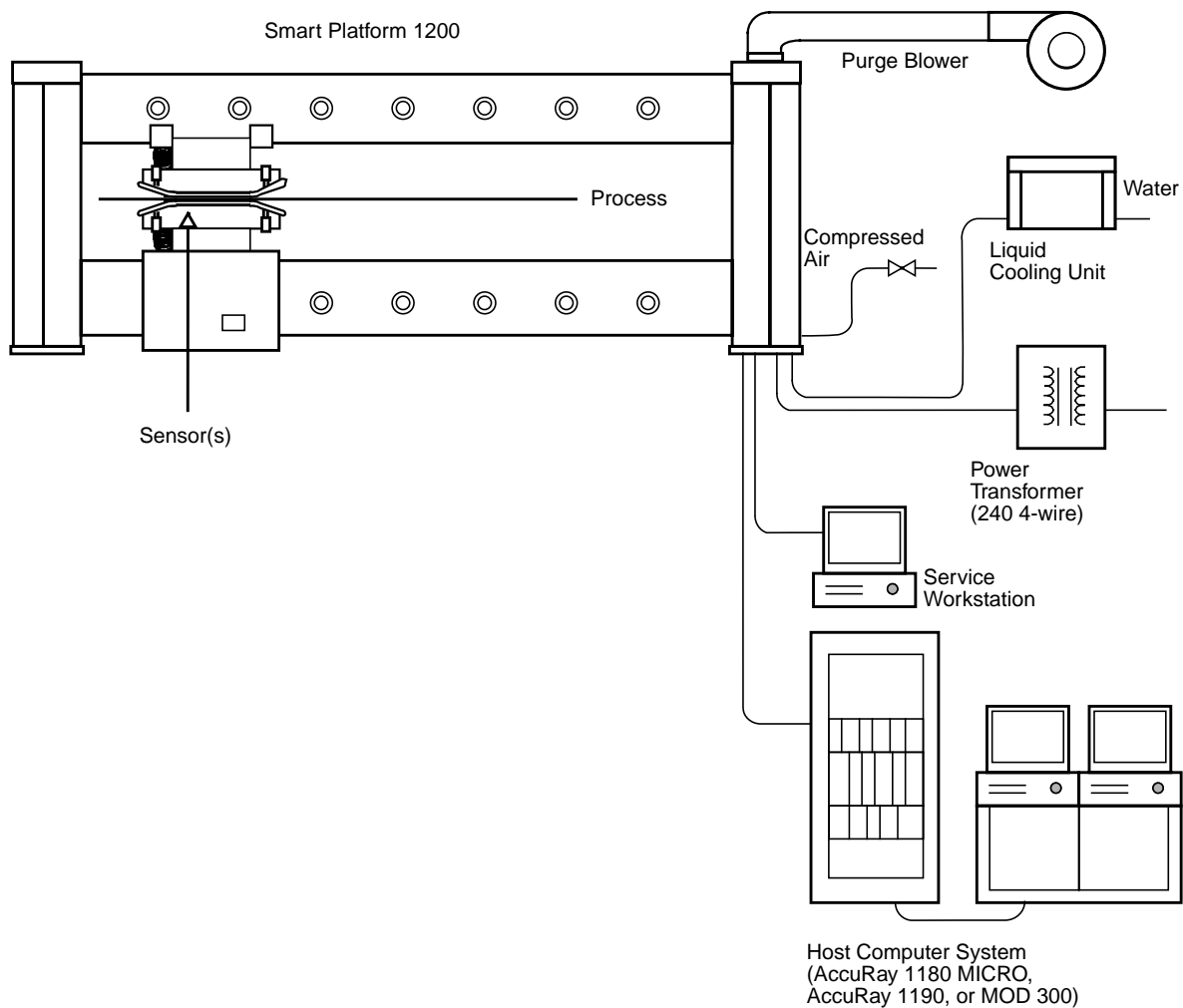


Figure 1-1 System Overview

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Smart Platform 1200 Options

The Smart Platform 1200 can be configured with the following options listed below.

Sensor Options

The following sensors can be mounted on the Smart Platform 1200.

- Basis Weight
- Infrared Moisture
- Caliper
- Ash
- OptiPak™
- Gloss
- Temperature
- Microwave Moisture
- Edge-of-Sheet
- Smoothness
- Color
- Smart ReflectionPlus CoatWeight

Scanner Options

The following options are also available for the Smart Platform 1200.

- High temperature scanner insulation kit
- Remote electronics
- Remote control panel
- Extended end columns/extended pass angle

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

AccuRay Smart Processing Center (ASPC) Backplane Identification

Introduction

With the introduction of the Smart Color sensor and the ReflectionPlus CoatWeight sensor, it became necessary to introduce a new ASPC backplane, Part Number 086345-004. Previous updates to the ASPC backplane were all backward compatible so there is little distinction between Part Numbers 086345-001, 086345-002, or 086345-003. The latest backplane, however, is not backward compatible. It is important to be able to tell which backplane your scanner has. Associated with the new backplane are new functional drawings, sensor cables, and jumper plugs. External wiring for things like sheet break and chiller flow switches are also different. Make sure you are using the correct documentation associated with the particular version of backplane in your SP1200.

Identifying Different Backplanes

The most positive identification of which backplane your system uses is to locate and read the part number tag on the PWA. The location of this tag on the 086345-004 backplane is above the programming plug, P1. Unfortunately, on some of the older backplanes it is on the bottom; sometimes concealed by the heat exchanger and plumbing.

The most obvious differences in the appearances of 086345-004 backplanes with respect to earlier versions are changes in the types of connectors (see examples of Backplanes 086345-003 and -004 in [Figure 10-20 on page 232](#) and [Figure 10-21 on page 233](#)).

- J8, J9, and J10 are 14-position connectors. On the earlier backplanes the connections for sheet break, reel turn-up, chiller flow switches, etc. (J8, J9, J10, J11, and J12) were all 10-position connectors.
- J11 is a new nine-position connector for wiring IR Sola transformers (replacing J20 and J21); and there is not J12, J20, or J21.
- The signal programming plugs P3, P4, and P5 were changed to 64 position from position plugs.
- The “AC IN” plug, J25 was changed to a nine-position plug from a four-position plug.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Slot Assignments

These are the typical slot assignments for Part Number 086345-004 backplane:

Slot	I.D.	Function
0	ECPSR	ECPSR
1	MPRC	MPRC
2	0x1F	ECF
3	0x21	Basis Weight
4	0x02	HemiPlus IR
5	0x03	Caliper
6	0x04	OptiPak OR Top Reflection IR
7	0x25	Dual Gloss OR Top Reflection IR
8	0x26	Ash OR Bottom Reflection IR
9	0x27	BW HAW & Microwave & Temperature & Smoothness OR Specials

These are the typical slot assignments for Backplane Part Numbers 086345-001, 086345-002, and 086345-003:

Slot	I.D.	Function
0	ECPSR	ECPSR
1	MPRC	MPRC
2	0x1F	ECF
3	0x01	Basis Weight
4	0x22	HemiPlus OR Top Reflection IR OR Bottom Reflection IR
5	0x23	Caliper
6	0x24	OptiPak
7	0x05	Dual Gloss
8	0x06	Ash
9	0x27	Color & Microwave & Temperature OR BW HAW & Microwave & Temperature & Smoothness OR Specials

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Print Books

Because of the wiring and program jumper changes, there are two separate SP1200 print books. The print books associated with the different backplanes are:

Backplane	Print Book
086345-004	101765-006
086345-003	101765-004
086345-002	101765-004
086345-001	101765-004

± 12 Volt Fuses

There are some very specific requirements in the National Electric Code (NEC) Article 725 having to do with cable types for power-limited circuits. To increase the selection of allowable cable types, fuses were added to the +12 Volt and -12 Volt circuits on Backplane Part Number 086345-004 for sheet break, reel turn-up, chiller flow switches, etc. They are 5 amp fuses located between J8 and J9.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Mechanical Structure

The platform beams are constructed of custom pressed, steel box beams. The cross section is shown in [Figure 1-2](#).

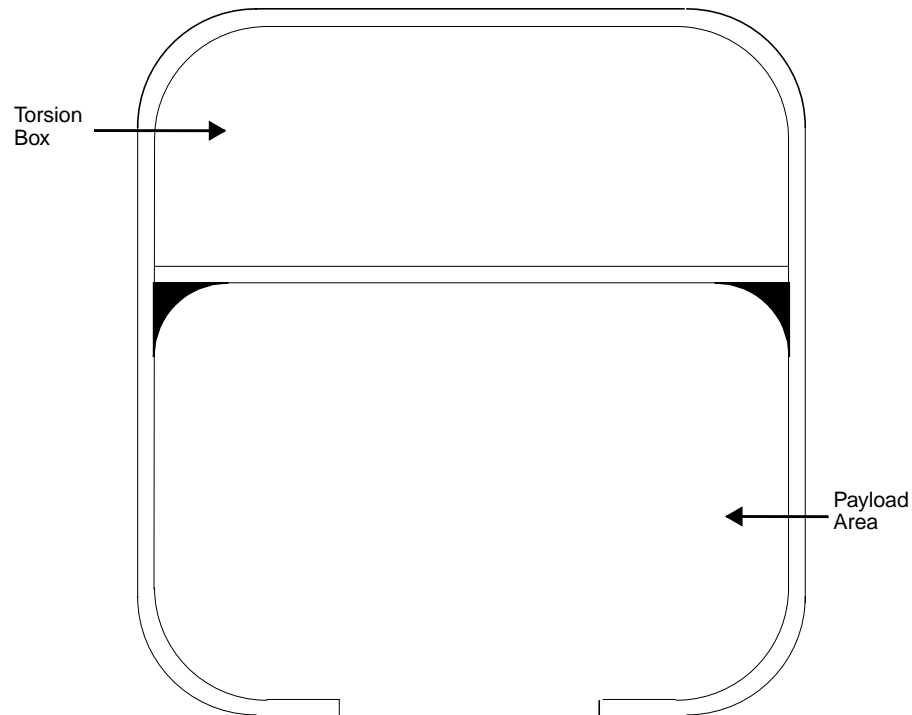


Figure 1-2 Platform Cross Section

The end columns are also made of steel box sections. The Smart Platform is welded together in a rigid “O”. The end columns house on-platform electronics and a drive system.

For longitudinal expansion, there is a Teflon® glide pad mounted under one end column. The other end column is fixed.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Way System

The upper and lower sensors are carried across the web by means of a two-way system with four wheels on each carriage. The principle of operation is shown below.

NOTE: The encoder and drive shaft have been removed for clarity.

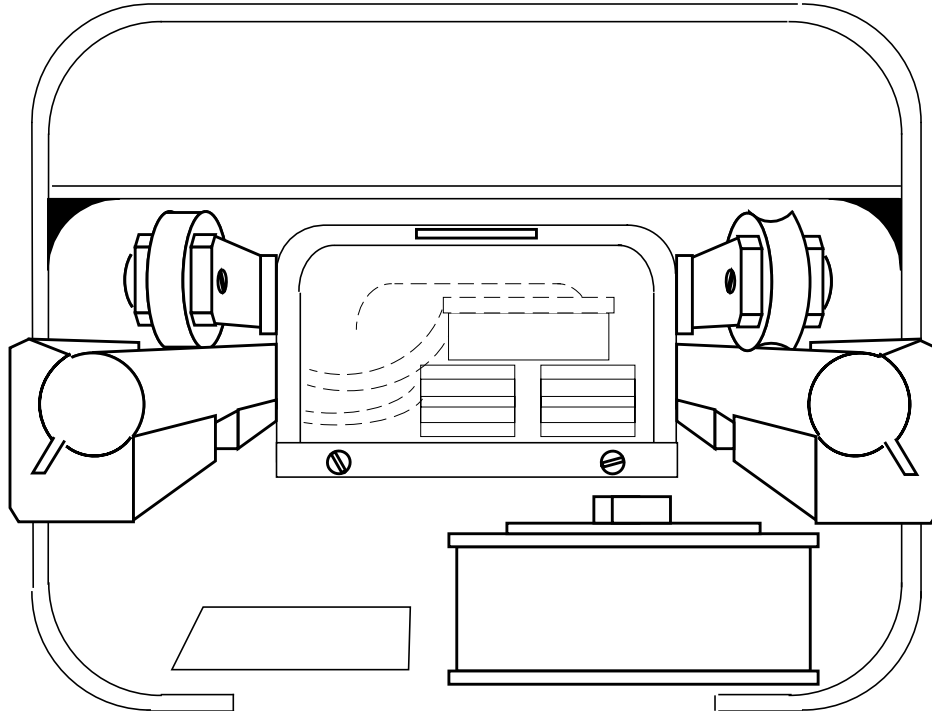


Figure 1-3 Carriage System

The weight of the carriage is carried on the side way bars which provide precision of motion. The horizontal guidance is provided by contoured wheels.

The carriage wheels are made from a hard, carbon fiber and Teflon reinforced polymer. The bearings are permanently lubricated ball bearings.

The way bars are permanently laser aligned at the factory and locked by high strength fasteners. The side way mounting bolts are covered by self-locking plastic push buttons.

Note: The way bar alignment is never to be adjusted in the field.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Drive System

The upper and lower carriages are traversed across the web by the drive system. The principle of operation is shown below.

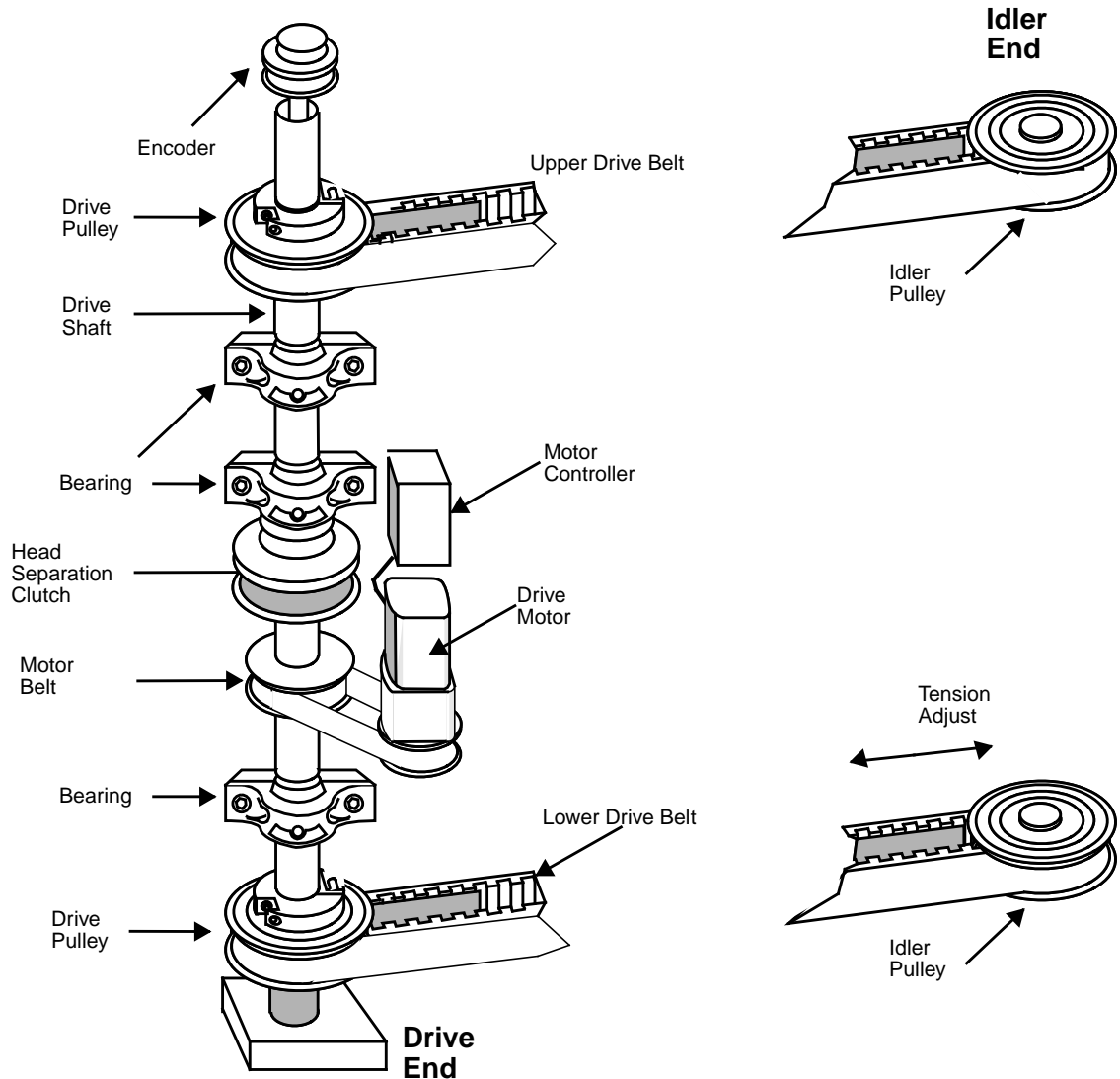


Figure 1-4 Drive System

The drive motor is a three-phase, variable frequency AC gear motor. The motor controller supplies the drive wave forms.

The drive belts are 2 in (50 mm) wide and made of steel-reinforced polyurethane. A pneumatic, self-aligning head separation clutch at the middle of the drive shaft allows for head separation.

The encoder gives a positioning pulse train consisting of A and B quadrature pulses and an index pulse. The software counts pulses to establish the head position. A home limit switch is used to reset the counters and establish position reference.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Electrical and Cable Systems

The major electrical components and their locations are shown below. The electrical component descriptions are given in [Table 1-1 on page 11](#).

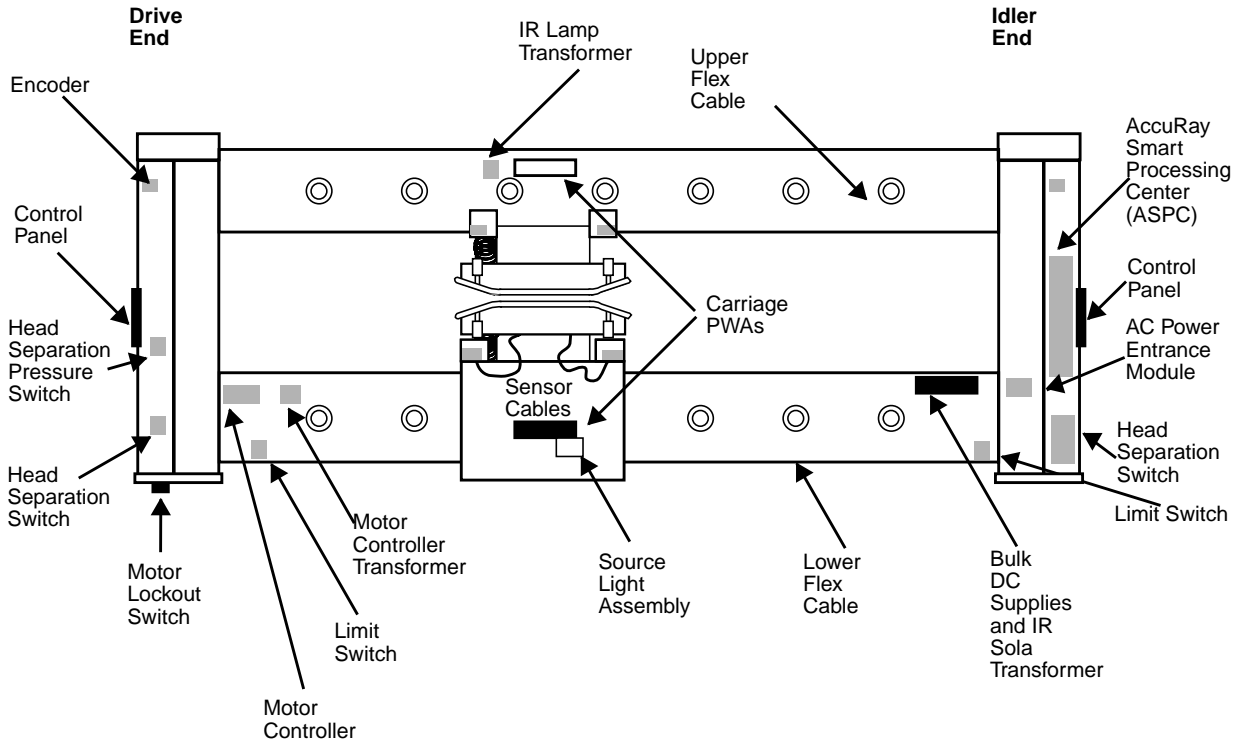


Figure 1-5 Electrical Component Locations

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 1-1 Electrical Components

Item	Description
AC Power Entrance Module	Contains circuit breakers, filters, and the outlet and termination for incoming AC power
Bulk DC Supplies	Delivers bulk DC voltages for the AccuRay Smart Processing Center, sensors, and accessories
AccuRay Smart Processing Center (ASPC)	Contains all of the smart electronic modules for platform and sensor processing, connector systems for most of the cables, and an environmental control system
Control Panels	Allows for operation of the platform and display status via LEDs
Limit Switch	Used to stop head travel and to reset the encoder counter
Encoder	Located on the drive shaft; gives head position feedback to the system
Motor Controller	Delivers three-phase power to the drive motor; incoming AC power is isolated via the motor controller transformer
Head Separation Pressure Switch	Located at the drive clutch assembly; it senses the head separation to take safety action during head split
Head Separation Switch	Located on both end columns to activate head separation clutch
Motor Lockout Switch	Allows for positive lockout of power to the drive motor for safety during maintenance operations
IR Sola Transformer	Delivers stabilized AC power to the IR source head and lamp transformer
IR Lamp Transformer	Provides for lamp power at the carriage
Carriage Connector Boards	Distribute the power and signal functions from the flex cables to the sensors
Flex Cables	With signal ribbon cable, power ribbon cable and flex hoses connect moving carriages to end column
Sensor Cables	Connect sensors to carriage connector boards

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Service Workstation

The Service Workstation is used for local interaction with the AccuRay Smart Processing Center (ASPC). The Service Workstation can be any 386 or higher compatible PC or lap top computer with the proper software load. For software setup information, see the appropriate *AccuRay Smart Platform System Software Manual, 101760-xxx*. The ABB MasterAid® 220 can serve as a workstation for both the AccuRay 1190™ system and the Smart Platform.

Communication with the workstation is established via a serial port on the ASPC. The workstation can be remoted to a computer room or used near the platform. The connection can use RS232 for short distances or a 20MA current loop for remote use. A current loop adapter is required at the Service Workstation to convert RS232 to a current loop.

The Service Workstation provides a set of tools that are used for monitoring, tuning, and diagnostics of the electronics and sensors on the platform.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Service Tools

Service tools include:

- A belt tension gauge is used to set the tension in the drive belts.
- A gap setting tool is used to verify the alignment of the upper and lower heads.
- A test panel is used to access platform and sensor signals at diagnostic outlets.

Blank Page

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

2

Radiological Safety

This chapter is about radiological safety and the Smart Platform. The information in this chapter is meant to be an overview and not a substitute for training and authorization.

This chapter contains the following major sections:

Section.....	Page
Safety Features	16
Handling the Source	18
Installation of the Source	19
Individual Responsibility	20

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Safety Features

The radioactive material used in the nucleonic sensors is hermetically sealed in a high integrity metal capsule to form a sealed source. Each sealed source is manufactured to exacting specifications and is subjected to rigorous quality control procedures.

The sealed source in the nucleonic sensor and the X-ray tube in the X-ray sensor are shielded because they are encased in metallic source holders and are equipped with spring-loaded, fail-safe shutter mechanisms. The shutters are designed to remain closed except during operation. During operation, the system applies power to overcome the spring of the shutter mechanisms. The shutters close automatically if power to the Smart Platform is turned off or interrupted.

When power is applied, the status of the shutters (open or closed) is indicated by the red and green shutter lights on the Smart Platform. A red light means one or more shutters are open and there may be a radiation beam in the measuring gap. A green light, at the control panel on the end column, means all the shutters are fully closed. Refer to [Figure 2-1 on page 17](#) for a representation of the combined shutter and status lights on the end column. The shutter status lights for each individual shutter mechanism are located on the lower head carriage. Refer to [Figure 2-1](#) for the locations of the shutter status lights. The Ash High-Voltage status light (yellow) indicates that the X-ray tube is energized when the light is illuminated.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

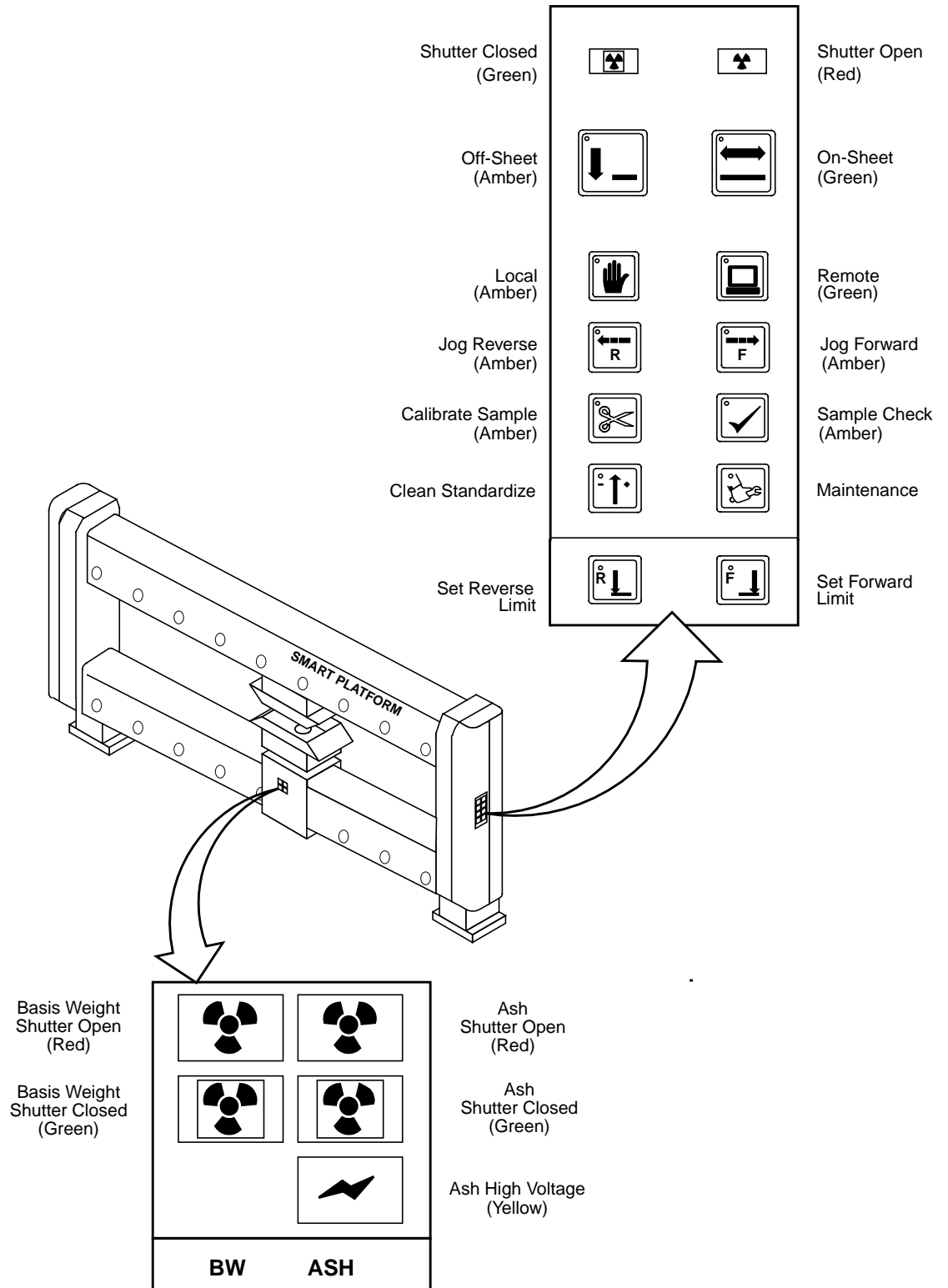


Figure 2-1 Shutter Status Lights on the Lower Carriage and the End Column

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

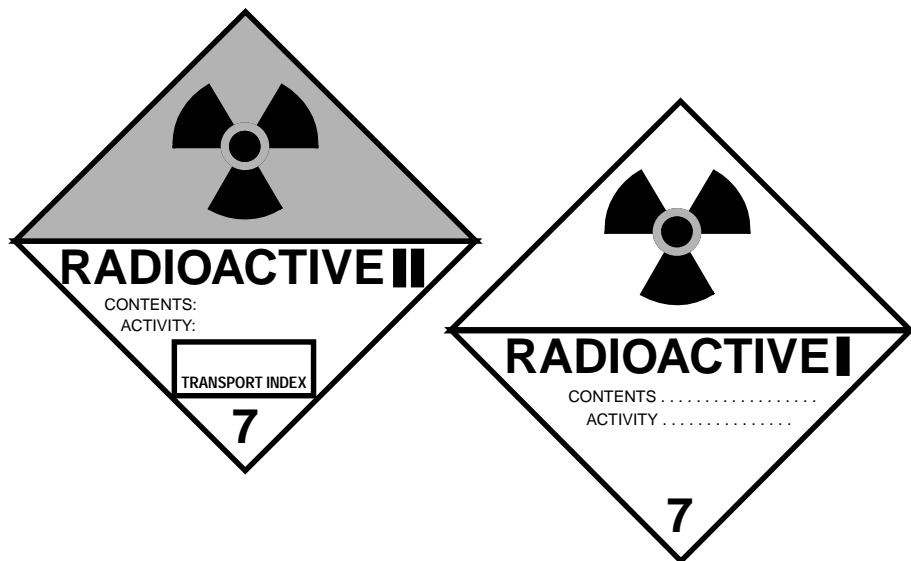
Handling the Source

Only persons specifically trained in radiological safety and specifically authorized by their controlling, regulatory agency may handle, install, or service the radiation source, the radiation source containment, or the radiation source shielding.

Nuclear sources for the sensors are shipped to the site in a separate container which is clearly marked with the International Radioactive Hazardous Materials shipping label and marking statement. Refer to [Figure 2-2](#) for a description of the labeling and markings.

Upon receipt, the shipping container is to be placed in secure storage by an authorized person, who is on-site and responsible for radiological safety.

The nuclear source is to remain unopened and in secure storage until a trained and authorized person removes it for installation into the sensor.



**RADIOACTIVE MATERIAL, N.O.S.
UN 2982, USA DOT 7A TYPE A**

**RADIOACTIVE MATERIAL,
SPECIAL FORM, N.O.S.,
UN 2974, USA DOT 7A TYPE A**

Figure 2-2 Types of Safety Labels Used on Shipping Containers

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Installation of the Source

Installation of the radiation source may take place only after power has been turned on to the Smart Platform and operation of all the radiological safety features has been verified.

Only persons specifically trained in radiological safety and specifically authorized by their controlling regulatory agency may handle, install, or service the radiation source, the radiation source containment, or the radiation source shielding.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Individual Responsibility

All personnel are responsible for adhering to the radiological safety cautions and procedures indicated on the labels and in the manuals that are part of the AccuRay® 1190™ Paper Machine Measurement and Control System. Refer to [Figure 2-3](#) and [Figure 2-4 on page 21](#) for examples of the safety labels.

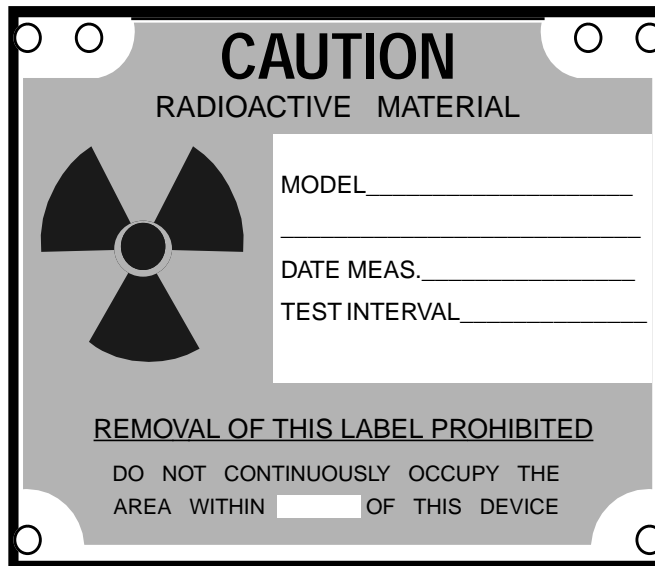


Figure 2-3 Safety Labels

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

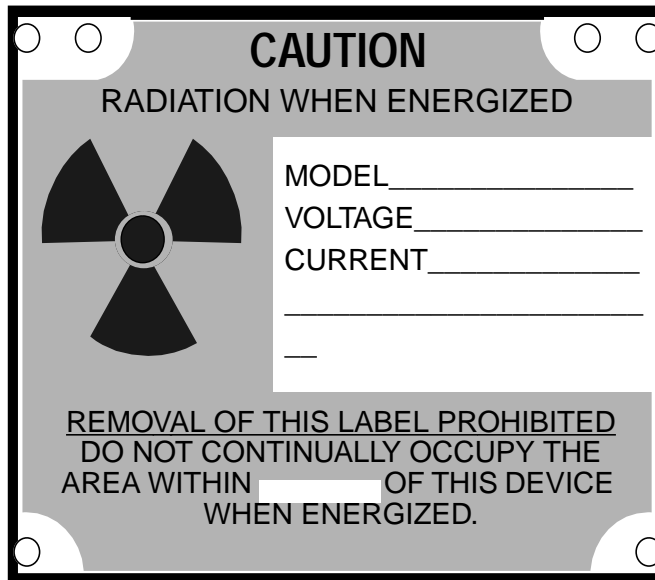
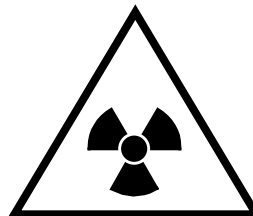


Figure 2-4 Safety Label for the X-ray Sensor

Individual responsibility also includes the following precautions:

- Pre-planning work activities to keep radiation exposure to a minimum.
- Determining that the sensor shutters are closed by looking at the status lights before beginning work near the sensor carriage.



Never put any part of the human body in the sensor measuring gap when the shutter is open. Refer to [Figure 2-5 on page 22](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

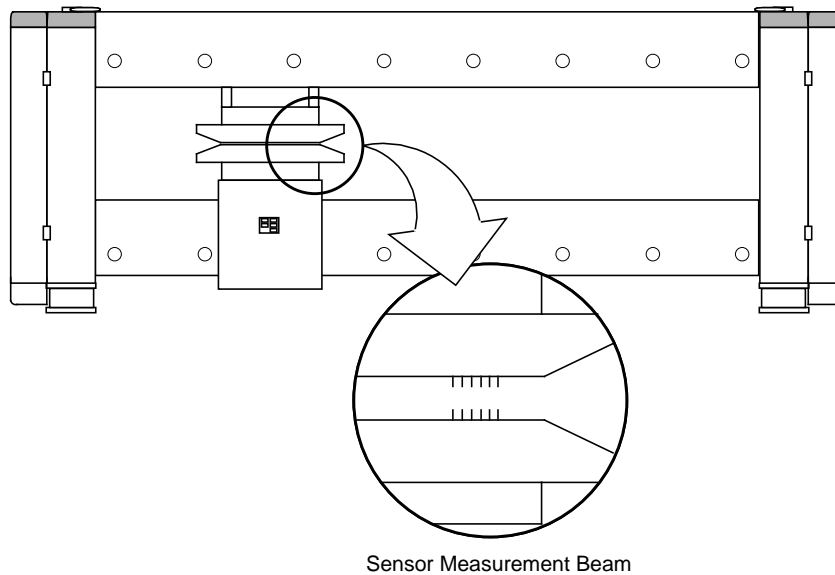


Figure 2-5 Measurement Beam

- Maintaining the safety labels and safety features.
- Not using a sensor until the safety features are functioning properly.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

3

Hardware Installation

Hardware Installation guides you from the arrival of the Smart Platform on-site to alignment of the head package assembly.

This chapter contains the following major sections:

Section.....	Page
Unpacking Instructions	24
Handling Instructions	25
Safety	28
Installation Requirements	30
Liquid Cooling Unit Setup	34
Pedestal Installation and Alignment	35
Attaching the Platform to the Pedestals	38
Platform Alignment	43
Carriage Alignment	45
Pass Angle Adjustment	46
Verify Air Gap	53
Scan Direction Alignment	54

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Unpacking Instructions

The Smart Platform is carefully packed for shipment. The platform arrives on dollies so that you are able to move it directly into position in the mill. Refer to [Figure 3-1](#). Depending on the location of the mill, some Smart Platforms will arrive with the dollies bolted to a skid. For those shipments, unpacking instructions are posted inside the crate.

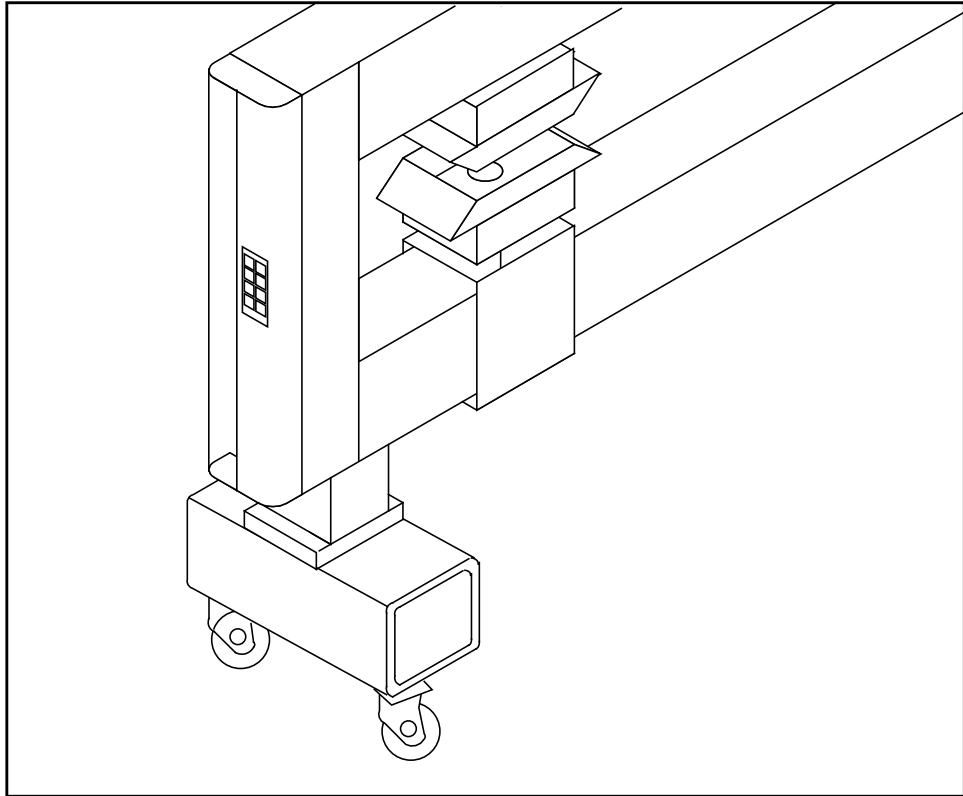


Figure 3-1 Smart Platform on Shipping Dollies

Various components and cables are removed and packed separately for shipment. The Smart Platform comes with a bill of lading.

Use the checklist below during the unpacking process.

Checklist

- Inspect the platform and components for dents, scratches, and damaged parts.
- Verify that the delivered components match the bill of lading.
- If there is minor damage, make a note of the damage on the bill of lading. Photograph the damage, when possible.
- If there is major damage, immediately notify the ABB shipping department in Columbus, Ohio or Dundalk, Ireland.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Handling Instructions

The Smart Platform arrives on dollies so that it can be maneuvered into place at the mill. Use caution when rolling the platform on an uneven floor to keep from getting the wheels stuck in a hole. If you need to lift the platform, see [Figure 3-2 on page 26](#) and make certain that you observe the following guidelines:

- Attach any rigging used to the two lifting eyes on top of the platform.
- Lifting forces must be spread over 75% of the platform.
- Do not lift from one point.
- Use a crane or hoist to move the platform (a dual pulley house crane is preferred to prevent weight distribution problems).
- Make certain that the platform is not subjected to bending and twisting forces.
- Do not bump or drop the platform.
- Secure the platform from movement while it is being stored.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

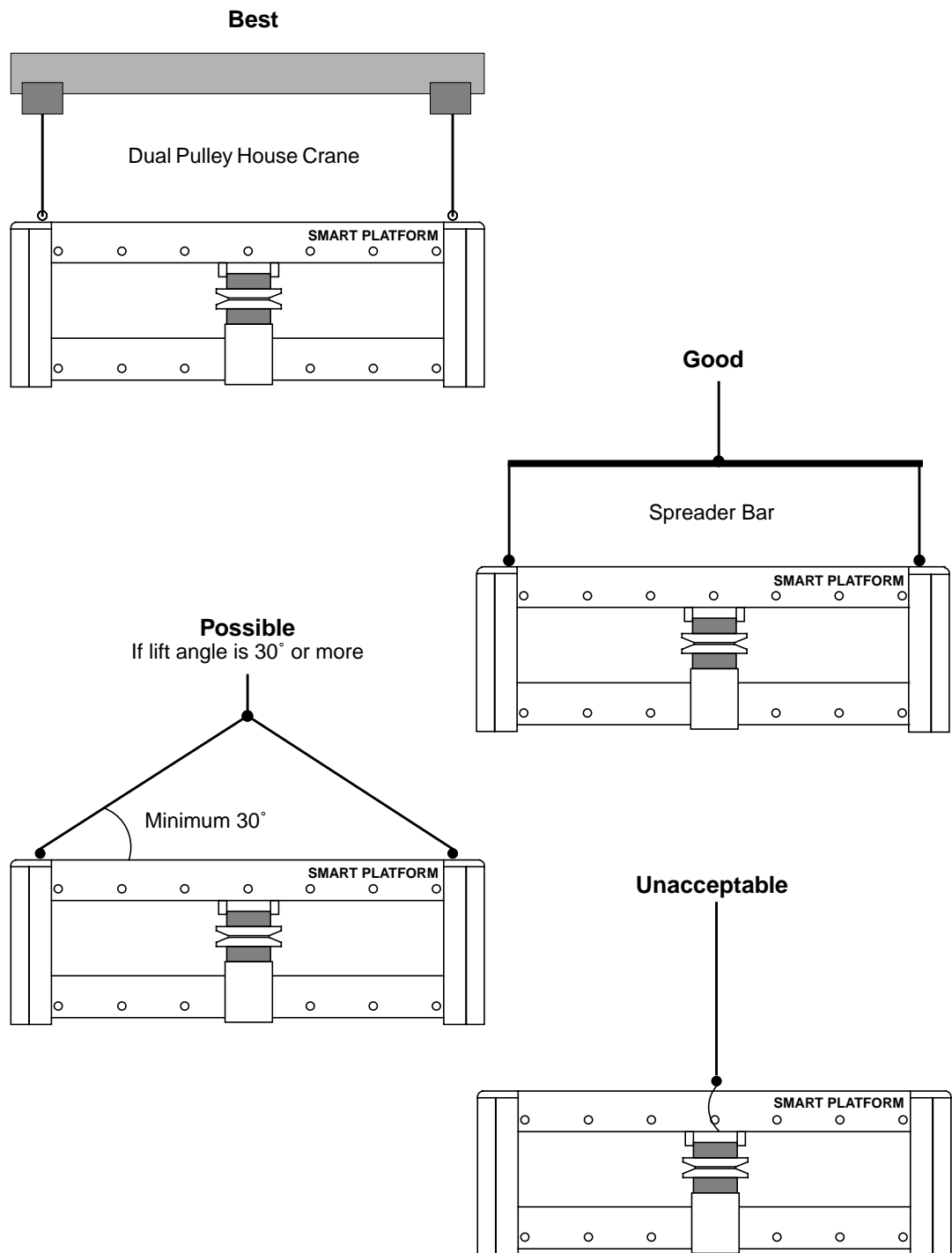


Figure 3-2 Rigging Recommendations

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Dimensions and Weight

The Smart Platform 1200 is supplied in standard lengths between the pedestal center lines as indicated in [Table 3-1](#). Weights include sensors and dollies.

Table 3-1 Dimensions and Weight

Dash Number	Standard Length for Hole Centers		Maximum Trim		Weight	
	(mm)	(in)	(mm)	(in)	(kg)	(lb.)
004	4000	157.5	2235	97.9	1659	3661
005	5000	196.9	3235	127.4	1925	4248
006	6000	236.2	4235	166.7	2191	4710
007	7000	275.6	5235	206.1	2457	5243
008	8000	315.0	6235	245.5	2723	6011
009	9000	354.3	7235	284.8	2989	6597
010	10000	393.7	8235	324.2	3255	7184
011	11000	433.1	9235	363.6	3521	7773
012	12000	472.4	10235	403.0	4787	8358

Space Requirements

Installation requirements are dependent upon the facilities and space available at the site location. Refer to the general installation plans made prior to installation of the Smart Platform.

The customer-supplied platform supports must be flat and unobstructed. Allow sufficient access space around the support for cables to be connected and disconnected.

It is advisable to drill necessary cable holes through the concrete floor before the pedestals are mounted. A single hole of approximately 3 in. (75 mm) in diameter and located near the idler end is sufficient. A similar hole can be used for the liquid cooling unit. See [Figure 3-3 on page 34](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

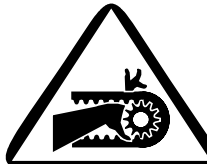
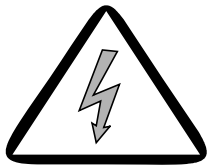
Safety

The Smart Platform 1200 has been designed to comply with ABB and worldwide standards including the following:

- *ABB PA Electrical Safety Directive, 3BDU000002*
- *ABB PA Machinery Requirements and Policy, 3BUS000159*
- *ABB PA Field Installation Considerations for Design of Electronics, 3BSE000161*
- *ABB PA EMC Requirements and Policy, 3BSE000200*

The following personnel and machine safety rules should be followed when installing and operating the Smart Platform 1200.

Personnel



Symbols appearing on the equipment warn personnel of potential hazards. Symbols for dangerous voltage warning, radiation warning, crushing hazard warning, hand entrapment hazard warning, moving machinery warning, and a warning that equipment may automatically start up are shown on the left. Refer to the explanations in the Caution and Warning Symbols section at the beginning of this manual.

All people working on the SP1200 system must know the location of the main power supply switch to the system and how to operate it.

Service on the SP1200 system is to be performed only by qualified, trained personnel. Hazardous voltages exist inside the AccuRay Smart Processing Center (ASPC) and in the SP beam.

Work with care when supply voltage is applied in the SP system. The voltage in the ASPC and the SP beam can cause injury and can even be fatal.

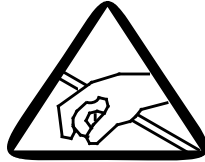
For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Machine

Avoid discharges of static electricity by grounding both yourself and tools before handling circuit boards and other parts of the equipment.

Use the grounded wristband installed in the cubicle when handling parts of the system.



Always store circuit boards in approved anti-static bags when not installed in the system rack.

Always switch off the voltage before extracting or inserting a board.

Switch off voltage to the system and withdraw all boards at least 2 cm before electrical welding is performed near the SP1200.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Installation Requirements

Environmental Data

Table 3-2 lists some of the standard parts of the Smart Platform 1200 system and the maximum ambient temperatures in which they were designed to be used.

Table 3-2 Environmental Data for the SP1200

Part	°F	°C	Rel. Hum.
SP1200	175	80	95% non-condensing
Remote ASPC Junction Box (Optional)	120	50	90% non-condensing
SPDC	120	60	95% non-condensing
Purge Blower	120	60	80% non-condensing
Liquid Cooling Unit (LCU)	110	43	95% non-condensing

If the temperature around the idle end column is above 50°C, then the ASPC severe environment option which moves the ASPC into a Remote Junction Box like enclosure is required.

Electrical Supply and Grounding Requirements

Supply

The signal-processing electronics in the Smart Platform 1200 is chassis-grounded and all suppression of external signal noise uses the chassis as a reference ground. If this requirement is not satisfied, the SP1200 system may be sensitive to high frequency interference from unsuppressed relays, contactors, and the discharge of static electricity.

The main power supply to the SP1200 must be from the same power supply as the host system. If there must be a deviation, then the two supplies must be bonded to the same ground (single point earth reference).

Grounding

- The electrical connections of the reference ground are to be effective and permanent.
- The cable shields are to be connected to the chassis with a short lead of less than 10 cm (0.5 inch).
- The introduction of an extra grounding system such as an instrument ground is absolutely forbidden. The system is to be grounded with a copper lead to the distribution box (single point earth reference).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Smart Platform Distribution Center (SPDC)

The main power supply to the SP1200 must be from the same power supply as the host system. If there must be a deviation, then the two supplies must be bonded to the same ground (single point earth reference).

A neutral to ground bond must exist on the secondary side of the Smart Platform Distribution Center (SPDC). This bond must be only in the SPDC.

The SPDC is 10KVA and can handle the largest SP1200 system including the purge blower and Liquid Cooling Unit. Even if your installation does not consume that much power, the input wiring, fusing, and disconnect should still be sized for the full 10 KVA.

Allowable input voltages to the transformer are:

- Rated Input Voltage: 240, 230, 220, 208, or 200 volts \pm 10%
- Rated Frequency: 50 or 60 Hertz (Hz) \pm 1%
- Rated Current: 41.7 amps @ 240 VAC

The secondary is always wired as 120/240 volts alternating current (VAC).

Cabling

The *National Fire Protection Association (NFPA), Publication No. 70* “The National Electric Code (NEC)”, Article 725 states that Class 1, Class 2, and Class 3 Remote-control, signaling, and power-limited circuits acknowledges alternative requirements for circuits characterized by usage and electrical power limitation. It specifies less stringent requirements than those for general wiring elsewhere in the code.

The SP1200 utilizes \pm 12 volts with adequate isolation to be safe without further protective measures, even in wet environments. However, due to the amperage available, it does not qualify as power-limited. Any of the circuits with direct ties to the \pm 12 volt power supplies qualify as “Class 1 Remote-Control and Signaling Circuits” as defined by NEC Article 725-11b and as such, require insulation suitable for 600 volts.

The serial communications circuits satisfy the “inherently limited” clause in Article 725-31 and may be wired using the Class 2 (or Class 3) rules. The cables provided by ABB for these circuits are dual rated CL3/PLTC with 300 volt insulation.

NEC Article 725-52a(2) prohibits conductors of Class 2 or Class 3 circuits from being “placed in any cable, cable tray, compartment, enclosure, outlet box, raceway, or similar fitting with conductors of electric light, power, Class 1, and non power-limited fire protective signaling circuits”, except where conductors of the different circuits are separated by a barrier.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Cable requirements are as follows:

Cable Use	Cable Type	Max. Run
Comm Link from ASPC to Host (customer supplied black box required)	20mA	1000 ft.
Comm Link from ASPC to SWS	RS232 / 20 mA	15 ft./1000 ft.
Operator Panel to ASPC	connectorized	75 ft. (standard length)

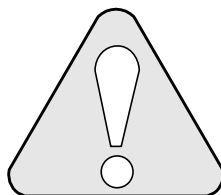
Equipment Location

The location of the ASPC, the SPDC, the operator panel, and the blower will be site specific. Refer to the System Specifications prepared prior to your installation for details on where each component will be installed.

ASPC Location

The ASPC is designed to be securely mounted to the wall in the paper mill facility. Refer to *Drawing DC-D-130181-001* for details on the weight and hole pattern required for mounting the ASPC. For information on termination, refer to the appropriate wire list.

A connection terminal block for the supply voltages is located behind the cover over the main circuit breakers. The phase conductors of the main 120/240 VAC terminate directly to the main breaker; neutral and ground to the adjacent terminals.



The European service power and the system 120/240 must be bonded to the same ground.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Smart Platform Power Distribution Center (SPDC)

The Smart Platform Power Distribution Center (SPDC) is designed to be securely mounted to the wall in the paper mill facility.

Operator Control Panel Location

Refer to *Drawing DC-D-121599-001* for information on the location and mounting requirements for the operator panel.

Blower Location

Refer to your blower specific drawings for information on its location and mounting requirements.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Liquid Cooling Unit Setup

Setup procedures for the liquid cooling unit are available in the *AccuRay 1190 Liquid Cooling Unit Reference Manual, 101333-003*.

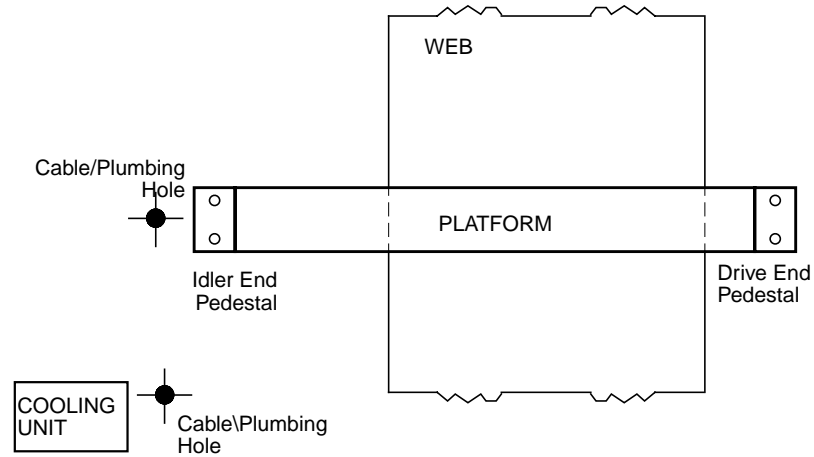


Figure 3-3 Liquid Cooling Unit Setup

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Pedestal Installation and Alignment

The ultimate objective of the pedestal installation and alignment procedure is to ensure a precise dimensional relationship between the source heads, the detector heads, and the process. This objective can be achieved by following the guidelines and procedures in this section.

Installation Guidelines

Observe the following guidelines when installing the Smart Platform.

- The pedestals must be stable in the machine direction and cross-machine direction.
- The pedestals must be level in the machine and cross-machine direction.
- The pedestal center lines must be perpendicular to the machine direction and to the sole plate.
- The top surfaces of the pedestals must be in the same horizontal plane.
- The top surfaces of the pedestals must be at the prescribed distance from the sheet pass line through the center of the Smart Platform.
- The height of the platform and the angle of the sensor heads may have to be adjusted to compensate for the process angle.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Alignment of the Customer Pedestals

Refer to [Figure 3-4](#) while aligning the pedestals.

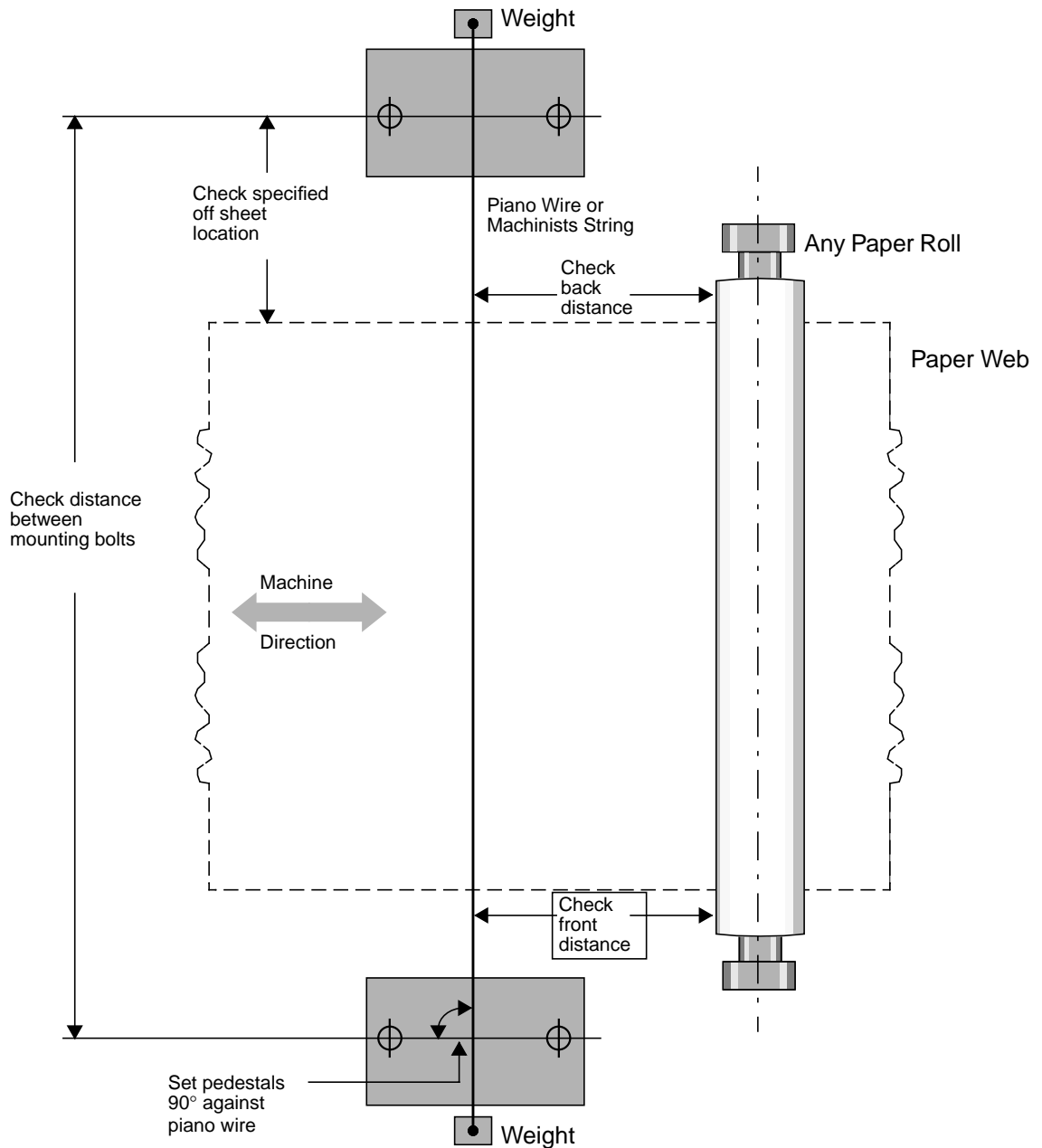


Figure 3-4 Alignment of the Mounting Pedestals

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

1. Scribe a center line on each pedestal exactly halfway between the mounting bolt pattern and perpendicular to the machine direction.
2. Stretch a length of piano wire, (0.012 in./0.3 mm) in diameter, (or thin, strong, machinist's string) between the two mounting pedestals.
3. Attach a weight to each end of the wire (approximately 10 lb./5 kg). The wire should pass over the scribe lines on the pedestal's top surface.
4. Adjust both mounting pedestals by gently tapping their sides with a hammer until the piano wire passes directly over the scribe lines for both pedestals.
5. Visually determine that the wire and the scribe lines coincide within 0.04 in./1 mm along a 8 in./200 mm length on each pedestal.
6. Make certain the distance between the pedestals and off sheet location (center line to center line) corresponds to the dimensions on the site specific engineering drawings.
7. Determine that the top surfaces of the two pedestals are at the same elevation.
If the pedestals must be leveled, then recheck the alignment of the scribe lines after completing the leveling.
8. Determine that the piano wire is parallel to the adjacent process rolls within 0.08 in./2 mm by measuring the back and front distances of the roll to the piano wire with vertical plumb lines.

The mounting pedestals are now aligned.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Attaching the Platform to the Pedestals

This section describes the attachment of the Smart Platform to the pedestals.

1. Transport the Smart Platform on its shipping dollies or skids to the installation site.
2. Remove the end column doors to avoid damaging them during placement.
3. Coat the entire top surface of both pedestals with a corrosion preventive compound.
4. Install shims. Refer to [Figure 3-5](#) and [Figure 3-6](#) on page 39.

Install the 0.5 in. (13 mm) plate at the idler end. Install the 0.375 in. (10 mm) plate and the 0.25 in. (3 mm) Teflon® pad at the drive end.

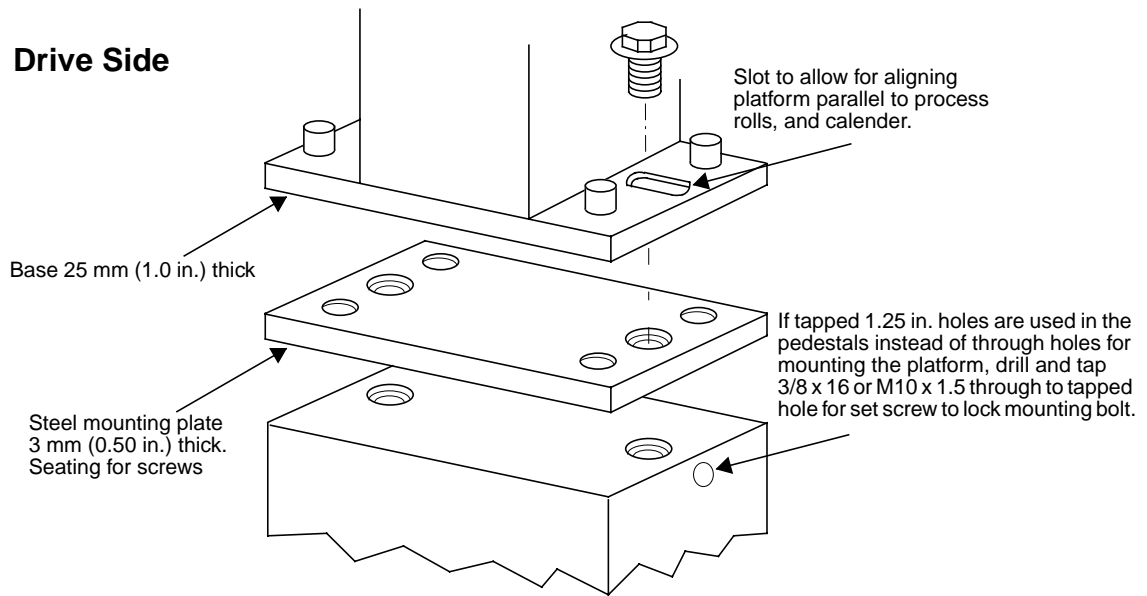


Figure 3-5 Platform to Pedestal Installation – Drive Side

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

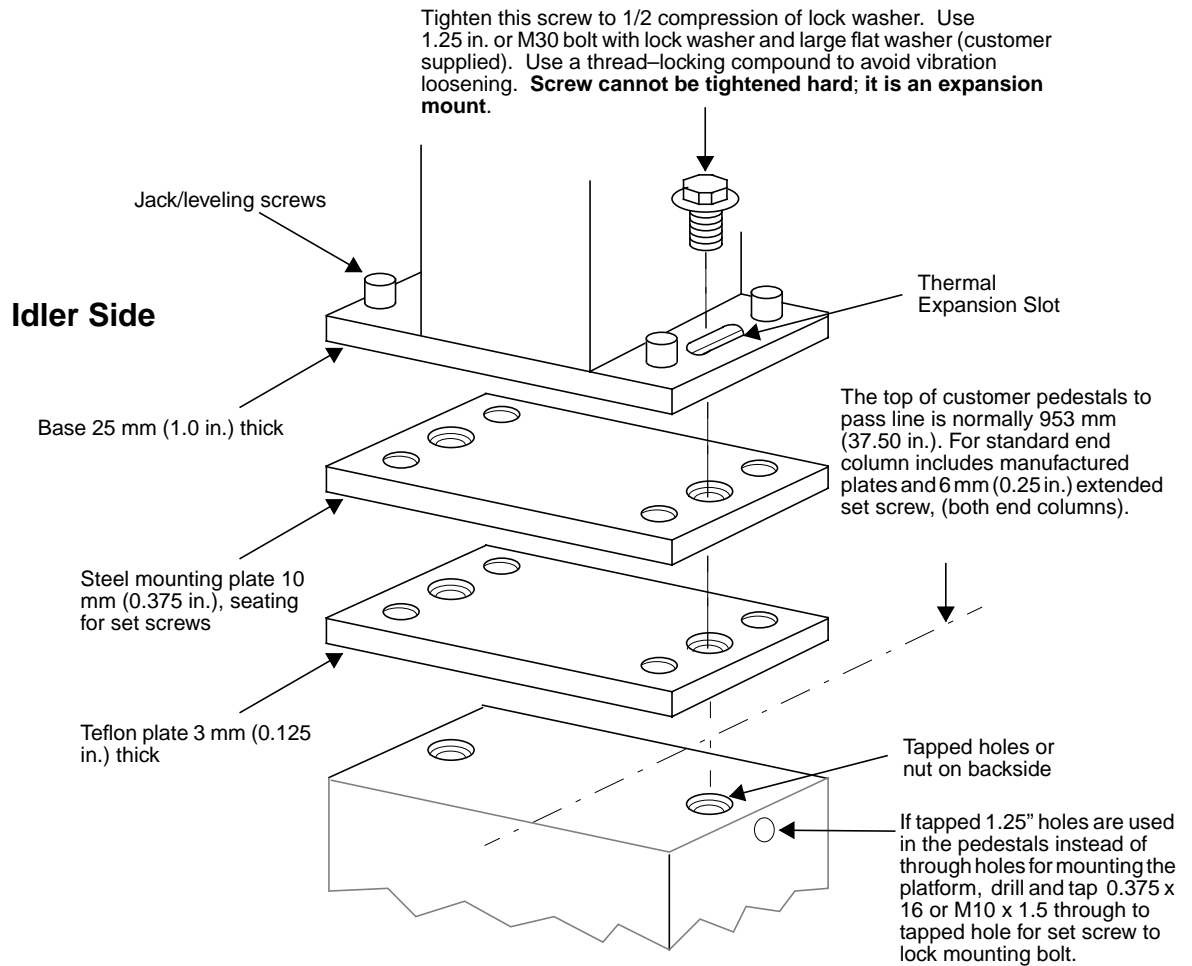


Figure 3-6 Platform to Pedestal Installation – Idler Side

5. Make certain that the mounting surfaces on the bottom of the platform are clean and smooth.
6. Coat the entire surface on the bottom of the platform with a corrosion preventive compound.
7. Thread two parallel lengths of wire over the rolls onto which the process is to be guided. Refer to [Figure 3-7 on page 40](#).

These wires should be placed in the positions that are representative of the outside edges of the process sheet.

8. Suspend a weight of approximately 5 lb. (3 kg) from each end of the wire.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

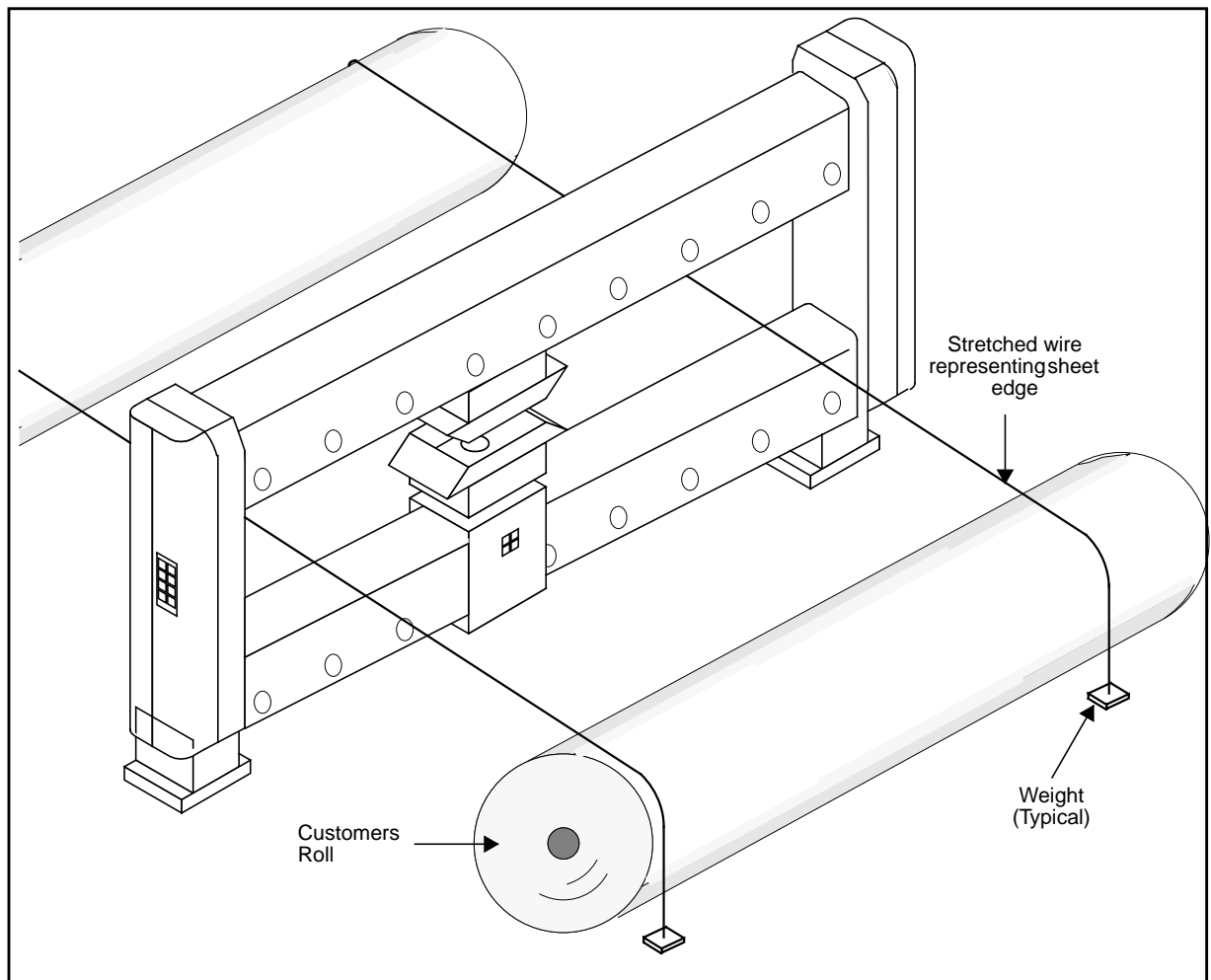


Figure 3-7 Preliminary Alignment Setup

9. Check the dimension from the customer pedestals to the process being simulated by the wires. Make sure that this dimension corresponds to the dimension on the Smart Platform specification drawings. These drawings are customized for each installation site.
10. Temporarily remove the two parallel lengths of wire to allow placement of the Smart Platform.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

11. Install eight jackscrews in the platform mounting bases.

Refer to [Figure 3-8](#).

The four front (inner most) jackscrews should protrude 0.125 to 0.25 in. (3 to 6 mm) below the mounting surface, and the remaining jackscrews should be flush with the mounting surface.

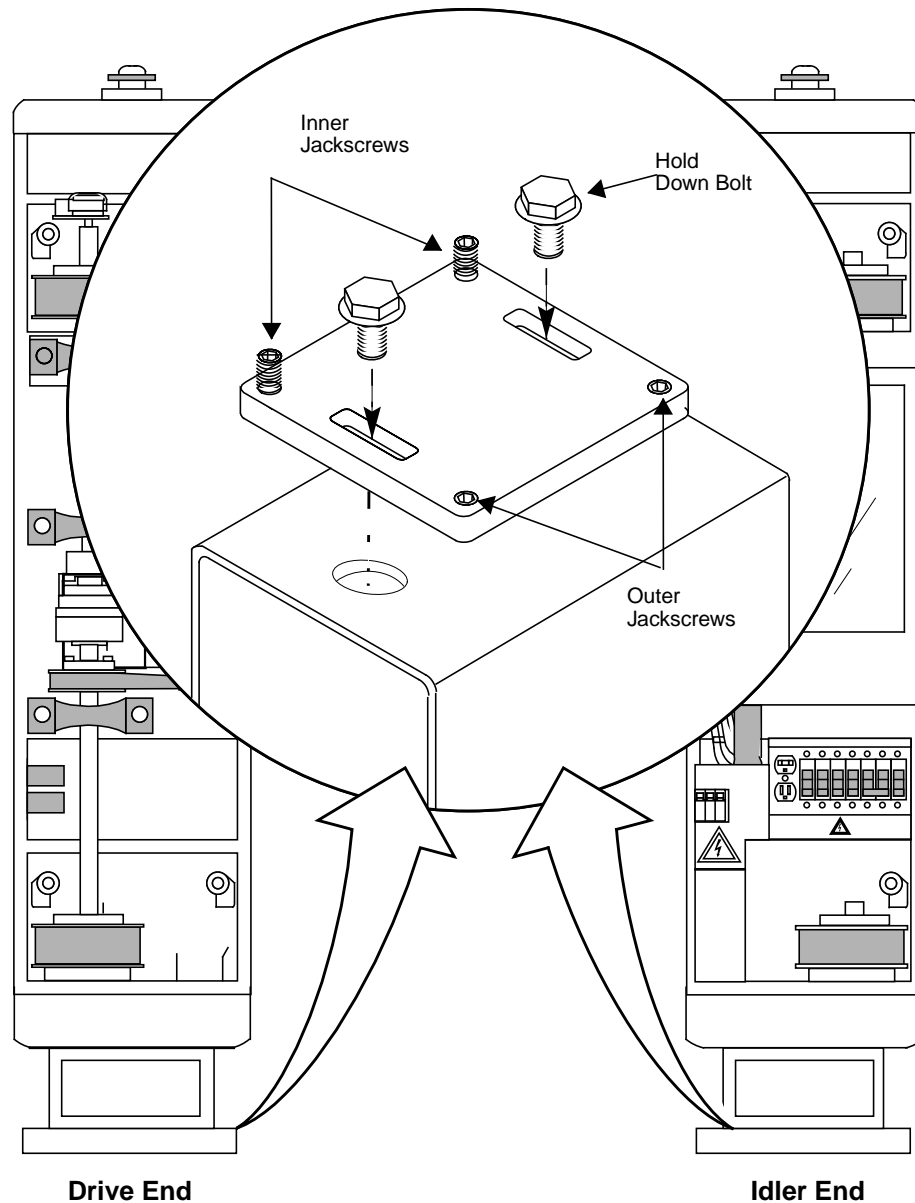


Figure 3-8 Jackscrew Orientation

12. Connect a heavy duty cable or chain through the two large lifting lugs located on the top beam of the Smart Platform.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

13. Using the lifting device, secure it to the cable or chains connected to the lifting lugs.
14. Carefully lift the Smart Platform from the transporting skid or dolly and position it on the customer pedestals so that the platform and the support structure mounting holes are aligned.

The mounting holes center-to-center dimension should be within 3 mm (0.125 in.) of the dimension noted on the dimensional outline drawing. The dimensional drawing is site specific.
15. Install four customer-provided hold-down mounting bolts, leaving them loose enough for Smart Platform alignment later.

The platform is now in position.
16. Rethread the two parallel lengths of wire over the rolls onto which the process is guided. Refer to [Figure 3-7 on page 40](#).
17. Verify that the wire locations represent the outside edges of the process sheet.
18. Separate the head assembly.
19. Manually move the lower carriage assembly close to the wire at one end of the platform.
20. Adjust the jackscrews in the base of the applicable column to position the Beta source detector window 0.25 in. (6 mm) below the wire. See [Figure 3-5 on page 38](#) and [Figure 3-6 on page 39](#).
21. Move the carriage assembly to the other end of the Smart Platform.
22. Adjust the front jackscrews to position the wire in the center of the source detector air gap.
23. At the drive end of the platform, compress the lock washer approximately half-way.
24. At the idler end of the platform, tighten the screws securely.
25. Verify that there is approximately equal travel remaining in each direction in the slotted holes in the drive end pedestal.

This completes the preliminary installation of the Smart Platform.

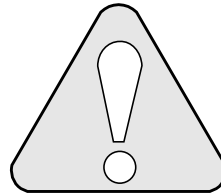
For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Platform Alignment

To accomplish alignment of the Smart Platform, proceed as follows:

1. Place a machinist's level on the leveling blocks located on the inner side of each end column. See [Figure 3-9](#).



Do not make any adjustments to the alignment block. The adjustment block is factory adjusted. Any adjustment will render the block unusable.

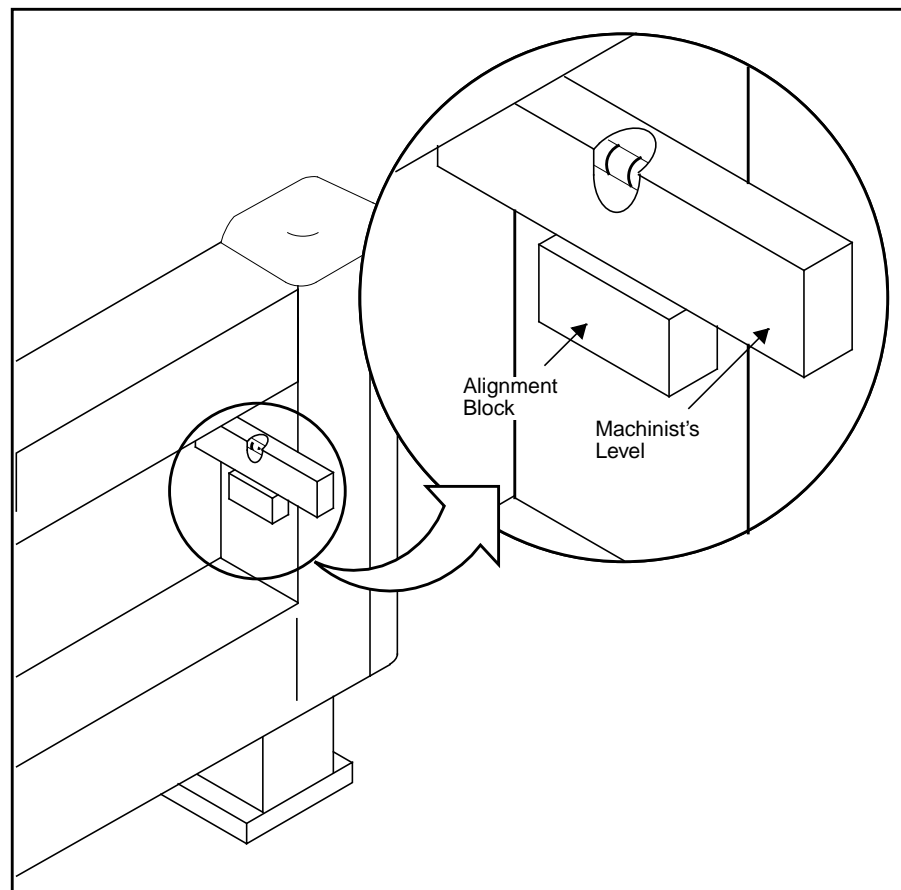


Figure 3-9 Verifying Platform Alignment

2. Loosen the hold-down mounting bolts.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

3. Adjust the inner jackscrews on the end column to zero the level at one column, and repeat for the column at the other end of the platform.

Maintain the same orientation of the machinist's level at both ends of the platform.

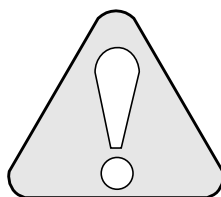
4. Check the position of the wire in the air gap to assure that the pass line angle is unchanged. Should the angle appear to have changed, repeat Step 3.

5. Adjust the outside jackscrews down against the mounting support.

The adjusted jackscrews should be snug, but they should not lift the platform off the front (inner most) jackscrews which are already precisely set.

6. Place the machinist level on the leveling blocks to monitor the final settings and to make certain no changes in leveling occur.

7. When all four jackscrews at one of the columns are adjusted satisfactorily, tighten the hold-down mounting bolts to secure the Smart Platform to the support structure.



Do not over stress the mounting bolts.

8. Repeat Steps 1. through 7. for the other column.

9. Remove the wires.

This completes the Smart Platform alignment.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Carriage Alignment

The mechanical alignment (relative positioning) of the sensor's upper and lower heads is critical in maintaining proper measurement characteristics. Both the static (off-sheet) and the dynamic (scanning) alignments must be correct. Static and dynamic alignment conditions (see [Figure 3-10](#)) which should be considered for the sensor heads include the following alignments and adjustments:

- Pass Angle Adjustment (see [“Pass Angle Adjustment”](#) on page 46.)
- Process Direction (Lateral Alignment)
- Air Gap Dimension (Vertical Spacing)
- Scan Direction (Horizontal Alignment)

These alignment and adjustment procedures are in the following sections.

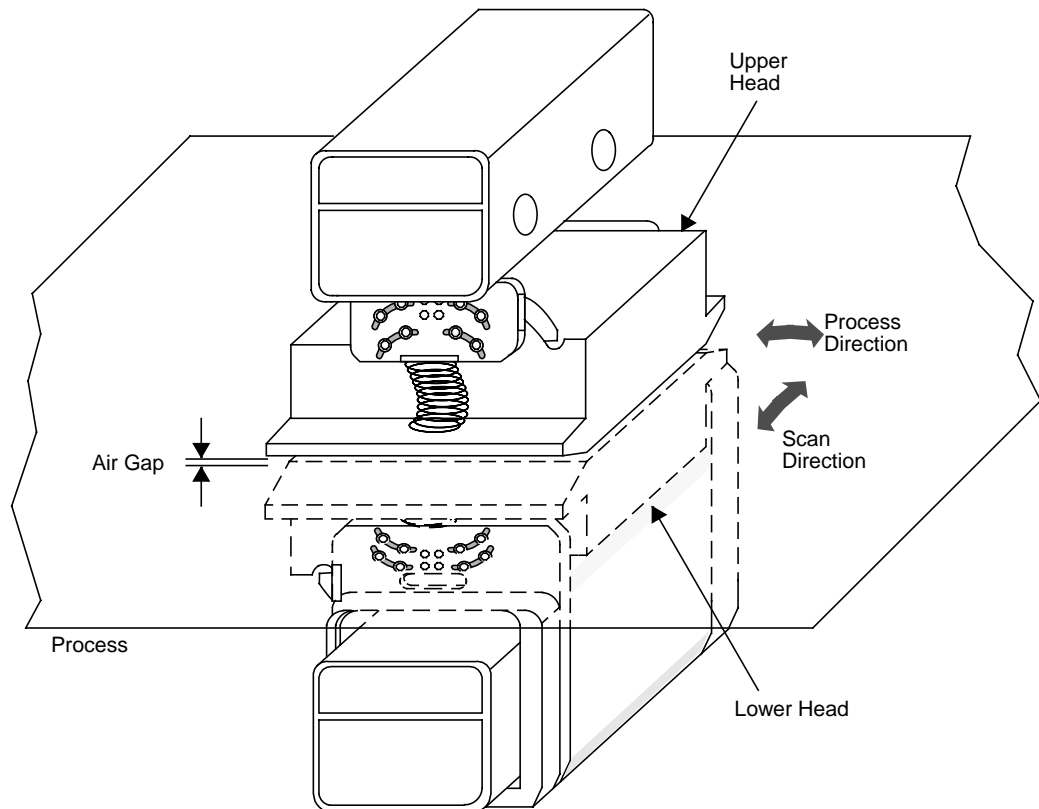


Figure 3-10 Head Alignment Conditions

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Pass Angle Adjustment

This procedure describes how to make adjustments to the pass angle. To insure proper alignment of the sensor carriage assembly, you will perform a process direction alignment and an air gap alignment at the same time. Refer to [Figure 3-11](#).

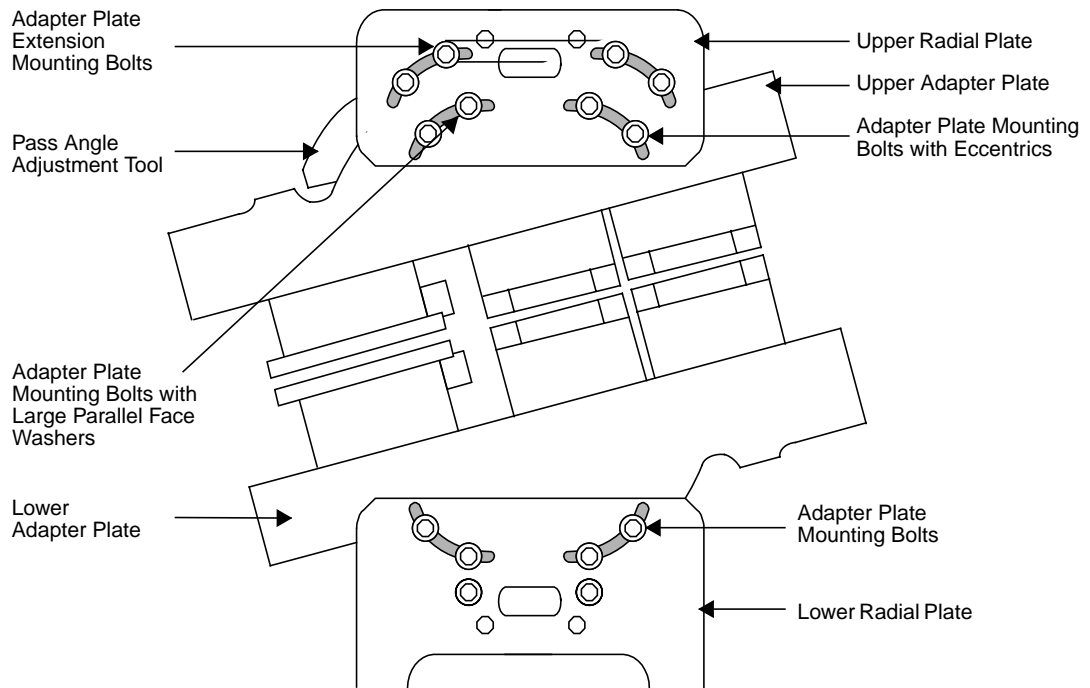


Figure 3-11 Pass Angle Adjustment

Note: Whenever a pass angle change is made, no matter how slight, be sure to follow the procedure below.

1. Move the sensor head package to the off-sheet position.
2. Place the platform in local by pressing the LOCAL push button on the control panel.
3. Turn off the power to the platform.
4. Activate the head separation switch located at either end of the Smart Platform in the service outlet box.
Deactivating the clutch trips a switch which also causes the platform to enter the local mode.
5. Manually separate the heads.
6. Remove the lower carriage electrical enclosures on both sides of the carriage. See [Figure 3-11](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

- Using a 13 mm socket or wrench, loosen the four locking M8 bolts (lower adapter plate mounting bolts) in the curved slots on each side of the bottom carriage.
- Thread two parallel lengths of wire over the rolls onto which the process is being guided. See [Figure 3-12](#).

These wires should be placed in the positions that are representative of the outside edges of the process sheet.

- Suspend a weight of approximately 5 lb. (3 kg) from each end of the wire.

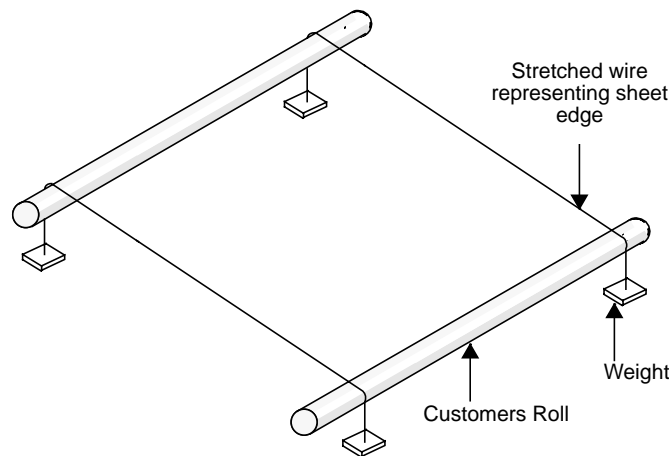


Figure 3-12 Simulating the Process Pass Line

- Rotate the lower head to the desired pass angle.
- Tighten the four locking M8 bolts (lower adapter plate mounting bolts) on each side of the bottom carriage. See [Figure 3-11 on page 46](#).

Note: Prior to removing the electrical covers on the upper carriage assembly, wipe them of any accumulated dirt or moisture to avoid damaging exposed components.

- Remove the top cover and electrical enclosures from each side of the upper head. See [Figure 3-11](#).

Note: Lift the carriage seal sled manually to allow free removal or insertion of the electrical enclosure.

- Loosen upper adapter plate mounting bolts with parallel face washers and remove the mounting bolts with eccentrics. See [Figure 3-11](#).
- Loosen the adapter plate extension mounting bolts. See [Figure 3-11](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

15. Adjust the four vertical adjustment screws so that the weight of the upper carriage rests on the bolts of the upper adapter plate.

This is done so that when you adjust the air gap between the upper and lower sensor heads you have enough slack to move the upper head vertically.

16. Rotate the upper head package to approximate pass angle and move the upper head package directly over the lower head package.
17. Rotate the upper head package to match the lower head package angle closely by visual inspection.
18. Tighten the upper adapter plate extension mounting bolts. See [Figure 3-11 on page 46](#).

Note: When aligning the head packages, all reference points will be located on the Basis Weight sensor plate. If a Basis Weight sensor is not present, use the Ash sensor for the alignment reference. If neither Basis Weight or Ash sensors are present, use the Basis Weight/Ash sensor blank base plate.

19. Align the upper and lower base plates of the Basis Weight sensor using the procedure for Process Direction Alignment below.
20. Continue with the [“Air Gap Alignment” on page 52..](#)
21. Finally, verify the [“Scan Direction Alignment” on page 54..](#)

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Process Direction Alignment

Note: When aligning the head packages, reference points will be located on the Basis Weight sensor plate. If a Basis Weight sensor is not present, use the Ash sensor for the alignment reference. If neither the Basis Weight or Ash sensors are present, use the Basis Weight/Ash sensors blank base plate. If a Smart Caliper GT is present, one reference point will be located on the caliper sensor.

1. Use a machinist straight edge (or the back side of the air gap tool (Part Number 128624-001)) to make certain that the upper and lower heads are parallel. They should be flush within ± 0.005 in. (0.127 mm). See [Figure 3-13](#).

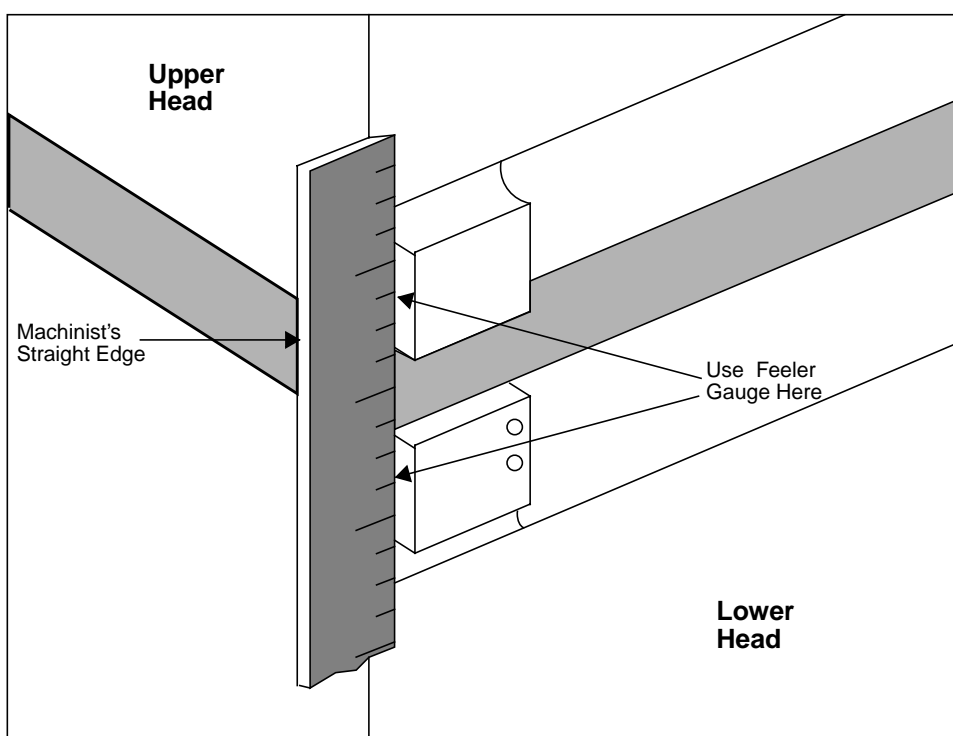
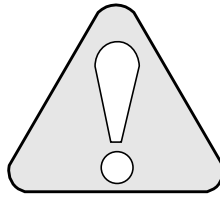


Figure 3-13 Process Direction Alignment Points

2. Place the straight edge against the machined surface on the upper and lower base plates of the Basis Weight sensor. If the plates are perpendicular to the straight edge, they are parallel to each other.
3. Align the upper head to the lower head using the horizontal adjustment bolts on the adapter plate extension. See [Figure 3-14 on page 50](#).
4. Turn the horizontal adjustment bolts clockwise to move the upper head towards you; counterclockwise to move the upper head away from you.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.



Do not force the horizontal adjustment bolts if binding is felt. Instead, loosen both bolts before resuming alignment.

The horizontal adjustment bolts have to be adjusted with respect to each other to avoid binding the upper head carriage. For example, every half-turn of one horizontal adjustment bolt necessitates a half-turn to the other.

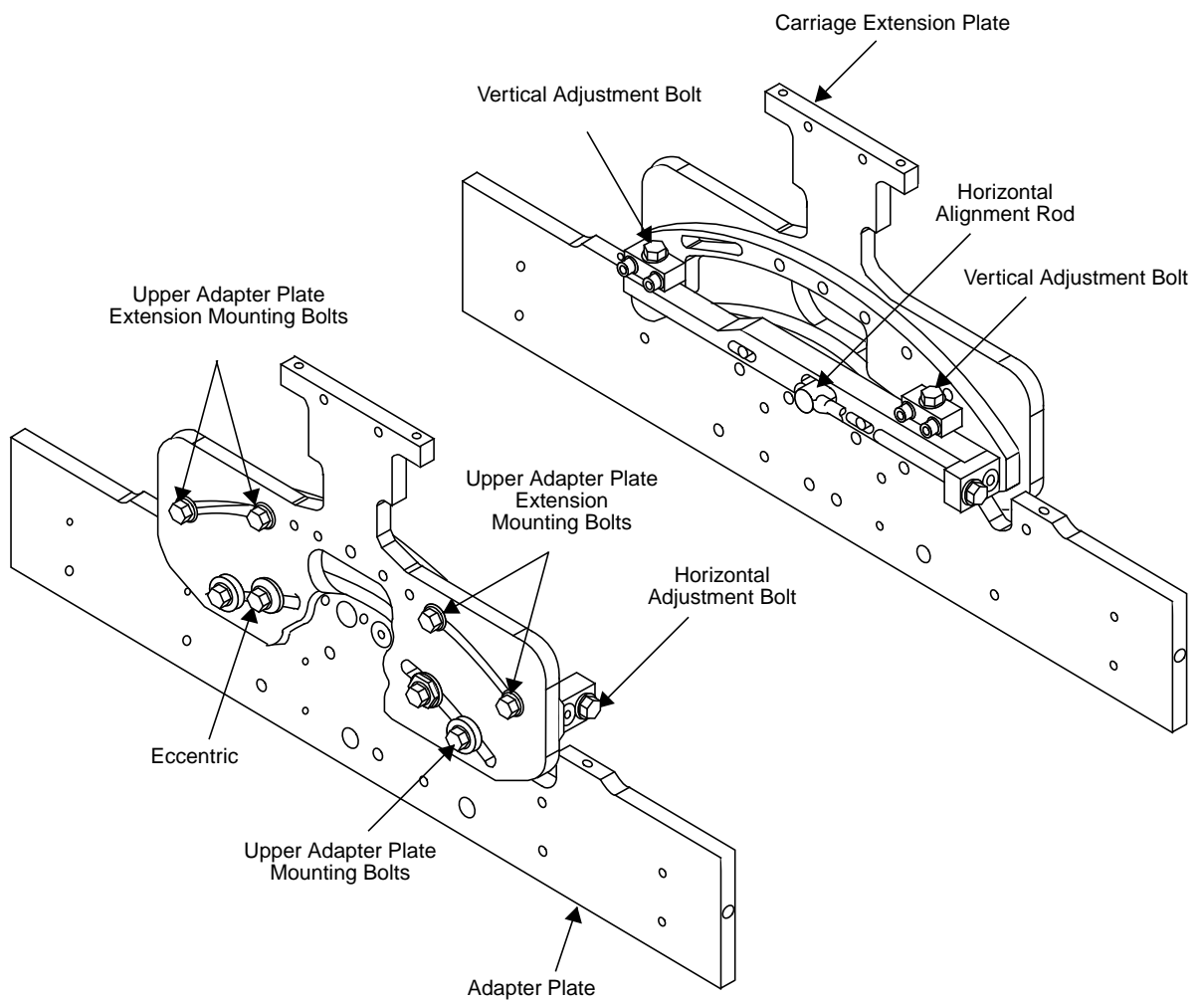


Figure 3-14 Upper Head Carriage

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

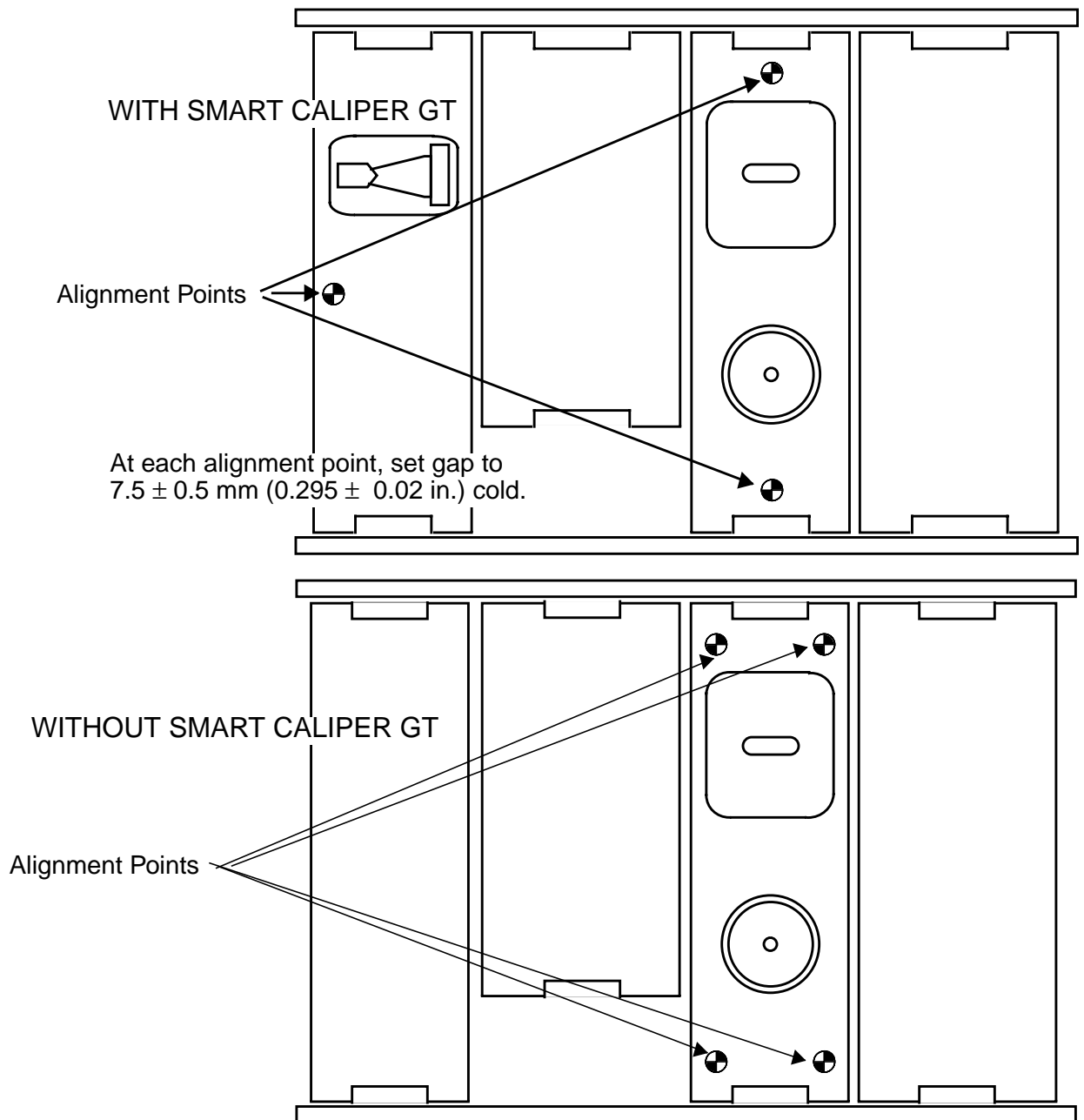


Figure 3-15 Air Gap Alignment Points

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Air Gap Alignment

Refer to [Figure 3-14 on page 50](#) and [Figure 3-15 on page 51](#) while performing the air gap alignment procedure.

1. Use the vertical adjustment bolt to achieve a 7.5 ± 0.5 mm (0.295 ± 0.02 in.) cold air gap between the base plates along the on-sheet end of the sensors and at the points designated in [Figure 3-15](#). For every half turn of a vertical adjustment bolt, do a half turn to its opposite adjustment bolt. Across the sensor window, check the distance using the air gap tool provided with the platform. If bolts seem to bind at any time, adjust the opposite side air gap before proceeding.

Note: You need to protect the carriage assembly from damage from mechanical forces by not positioning the vertical adjustment bolts such that the weight of the carriage is supported on three bolts instead of four as this may twist the carriage. Also, never rest the upper head package weight on the lower head package by leaving the air gap tool between the sensors.

2. Adjust the off-sheet side air gap to 7.5 ± 0.5 mm (0.295 ± 0.02 in.) cold.
3. Continue to adjust the vertical adjustment bolts until the specified air gap is achieved.
4. After acceptable air gap is set, make certain the sensor is still aligned in the process direction. Refer to the [“Process Direction Alignment” on page 49](#).
5. Tighten the bolts which have large parallel face washers onto the upper adapter plate.
6. Replace bolts with eccentrics.
7. Rotate the eccentrics on the adapter plate extension so that they bear the weight of the upper head assembly.
8. Tighten the bolts that hold the eccentrics in place.
9. To insure that the top electrical covers will fit, the alignment mechanism should be centered over the adapter plates.
 - a. Loosen adapter plate extension mounting bolts.
 - b. Use the horizontal alignment bolt to center the alignment mechanism over the adapter plates.
 - c. Center the horizontal alignment rod in its slot.
 - d. Tighten the extension mounting bolts.
10. Tighten the bolts on the adapter plate, both sides.
11. Replace the electrical covers.

This completes the Air Gap Alignment Procedure.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Verify Air Gap

Sensor calibration is performed at the factory prior to equipment shipment to meet the specific requirements of the sensor's on line use. The optimum air gap dimension is specified in the Calibration Report.

To perform measurement of the air gap dimension, proceed as follows:

1. Insert the Gap Measurement Tool, part number 128624-001 and measure the gap size at the specified alignment points of the Basis Weight sensor and Smart Caliper GT (if present). See [Figure 3-15 on page 51](#) and [Figure 3-16](#).

Air gap specifications are shown in [Figure 3-15](#).

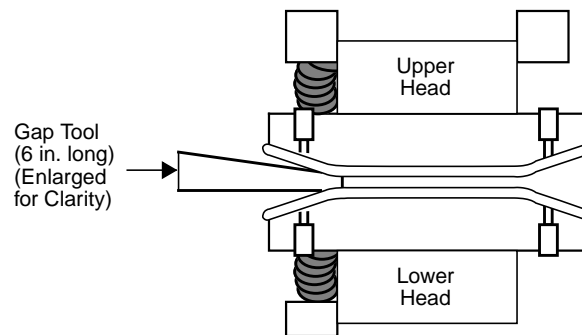


Figure 3-16 Air Gap Measurement Tool

2. Compare the measurements to the Calibration Report.
3. If the air gap dimension is not within tolerance, perform “[Air Gap Alignment](#)” on [page 52](#).

Note: The air gap and process direction alignment changes are interdependent. It may be necessary to repeat the “[Process Direction Alignment](#)” on [page 49](#).

4. Realign the sensor heads.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Scan Direction Alignment

The scan direction alignment is checked both close to the drive end column and close to the idler end column on the scanner.

Alignment at the drive end is set by drive pulley phase adjustment. Alignment at the idler end is controlled by belt tension.

The scan direction alignment procedure is as follows:

1. Jog the sensor heads near the drive end column.
2. Apply a straight edge and feeler gauge to the machined surface on the upper and lower sensor heads. Refer to [Figure 3-17](#).

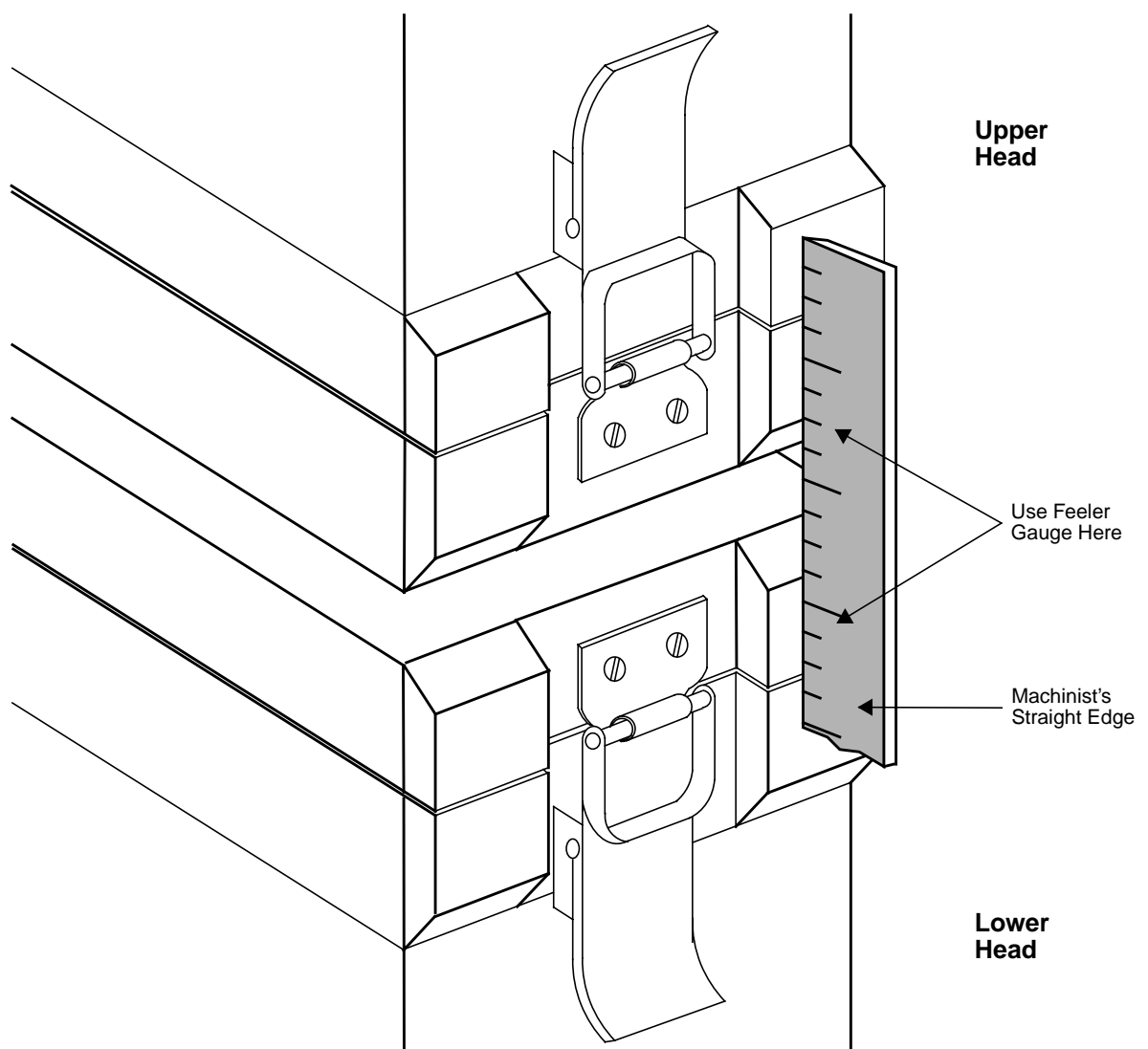


Figure 3-17 Scan Direction Optimum Alignment Point

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

The machined ears should be flush within ± 0.005 in. If they are not:

- a. Loosen the upper drive belt pulley locking screws.
 - b. Adjust set screws for phasing of the pulley until the heads are parallel.
 - c. Tighten the screws when finished.
3. Jog the heads near the idler end column.
 4. Apply a straight edge and feeler gauge to the machined surface on the upper and lower heads.
 5. If they are not aligned in the scan direction within ± 0.010 in., adjust belt tension in the upper or lower belts by means of the idler bracket adjustment screws.

See [Figure 3-18](#).

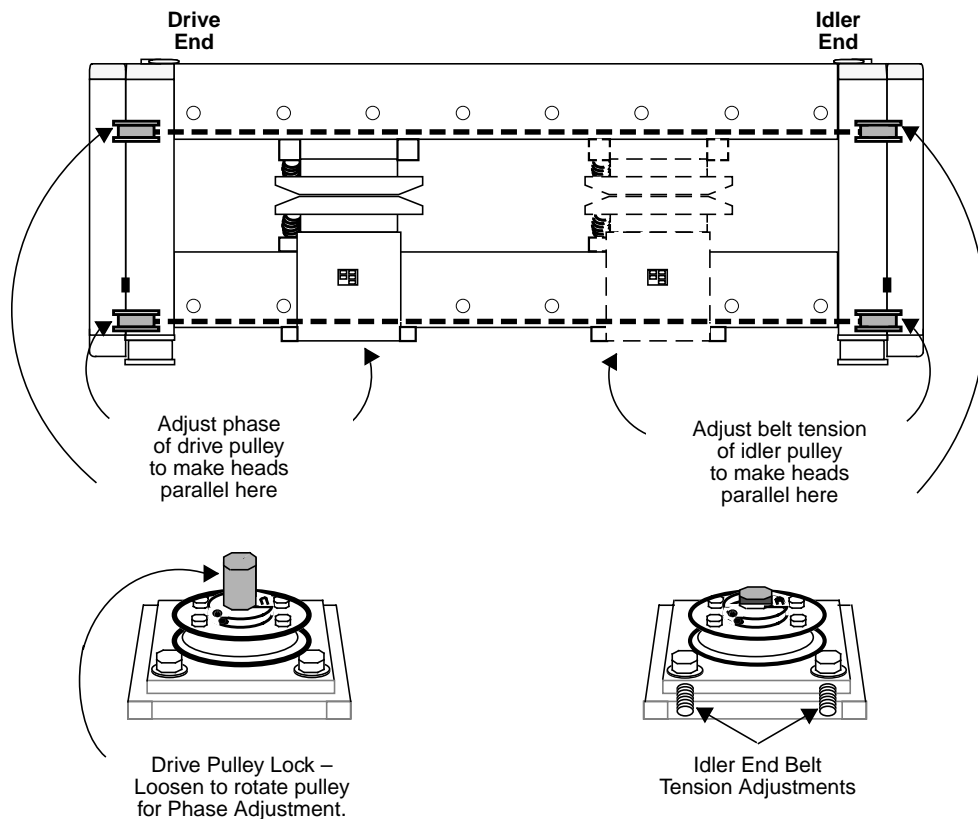


Figure 3-18 Scan Direction Adjustment

6. Use the belt tensiometer (Part Number 122146-004) to check the belt tension. The range is specified on the tensiometer.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Note: The belt may be installed in such a way that the upper and lower heads are off by more than one tooth on the belts. This can be corrected by inserting a short strip of thin sheet metal or hard plastic between the belt and drive pulley and allows for manual alignment to the next tooth. Refer to [Figure 3-19](#).

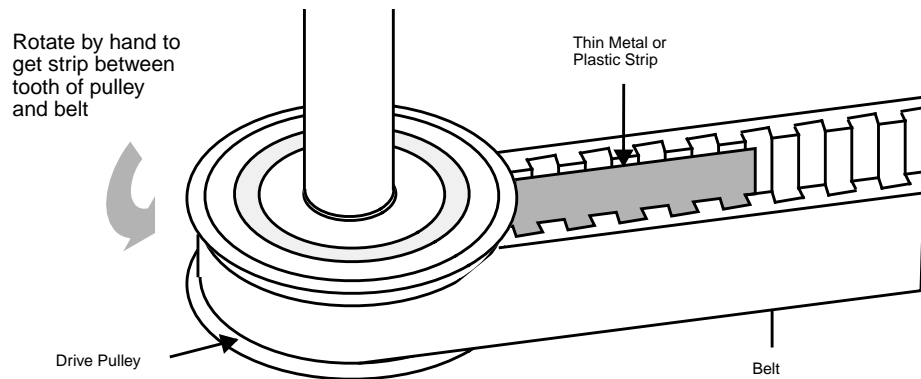


Figure 3-19 Manual Alignment Setup

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

4

Utility Service Installation

This chapter contains the following major sections:

Section.....	Page
Air Purge	58
Air and Water Supply	59
Electrical Hook-Up	61
SP1200 Power Up Procedure	63
Starting Up the Software	67

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Air Purge

The Smart Platform 1200 is air purged to assure reliable operation in a paper mill environment. The purge air duct is attached to the idler end column either directly or with a flexible air hose. If a flexible air hose is used, the flexible portion of the hose should be less than 10 ft. (3 m) to avoid a drop in pressure. Refer to [Figure 4-1](#).

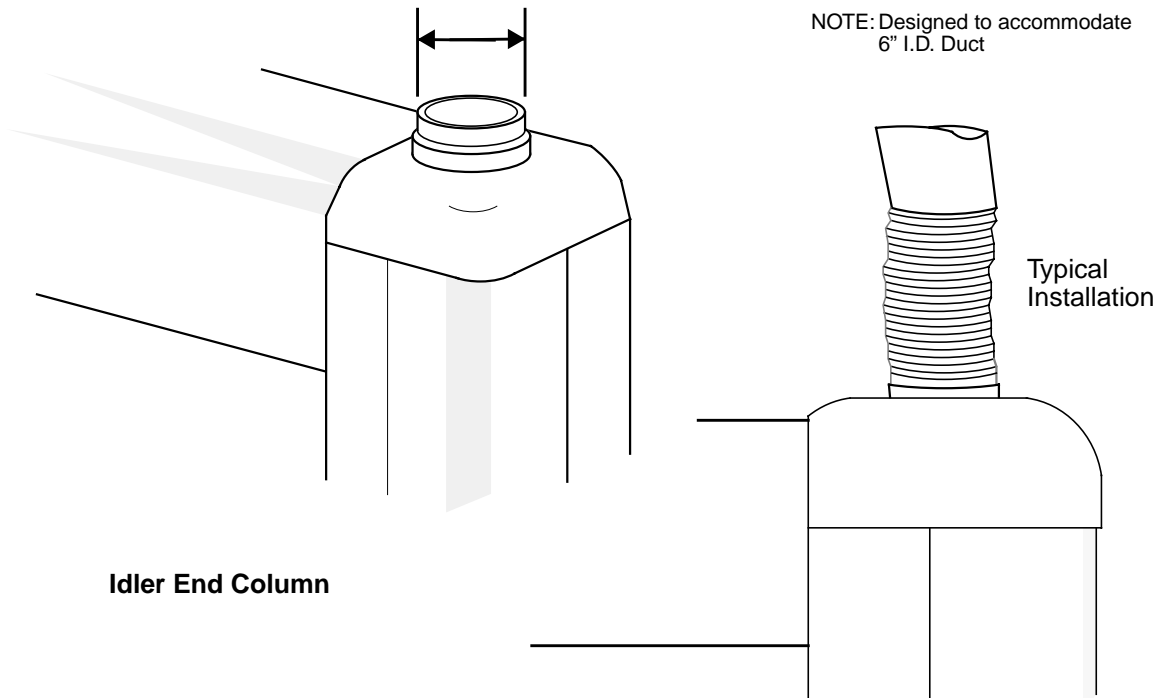


Figure 4-1 Purge Air Duct Attachment

Note: Do not allow the weight of a heavy metal air duct to rest on the plastic top cap. Off load the duct by means of bracing to the machine foundation or use a flex ducting.

The source of air for air purge can be supplied by either the DC motor cooling air or the ABB purge blower. Clean DC motor cooling air has the advantage of no special air filter maintenance and is generally preferred when available. If the DC motor cooling air is used, an adjustable damper is needed to reduce the air flow and avoid excessive system pressure loss (especially when the doors are opened).

For installation of the ABB purge blower, refer to the instructions which are supplied on the illustration drawings.

Normal applications should operate with the platform fully sealed. For high temperature applications, a continuous air flow must be supplied through the scanner beams to the drive end.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Air and Water Supply

Sensors require clean, oil free, dry compressed air for operation. The pressure at the platform air inlet ports must be at least 4.4 bar (65 psi) and a maximum of 5.4 bar (80 psi). The air flow depends upon the sensor configuration and the adjustment of the manifold valves (the range is typically 0.37 m³/min (13 scfm) to 0.6 m³/min (21 scfm). Refer to the appropriate sensor manuals for further information.

The SP1200 clutch has a separate air regulator. Approximately 30 to 40 psi is required to operate the clutch.

The liquid cooling unit provides a closed loop water circulation system to the electronics on the platform and IR sensors. The liquid cooling unit requires secondary heat exchange, a water supply of less than 80°F (27°C), and a flow of typically less than 5 liters/min (1.5 gpm). [Figure 4-2 on page 60](#) illustrates a typical hook-up.

During installation make sure that the liquid cooling unit is filled according to instructions and that the air supply is on before proceeding with the electrical power up.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

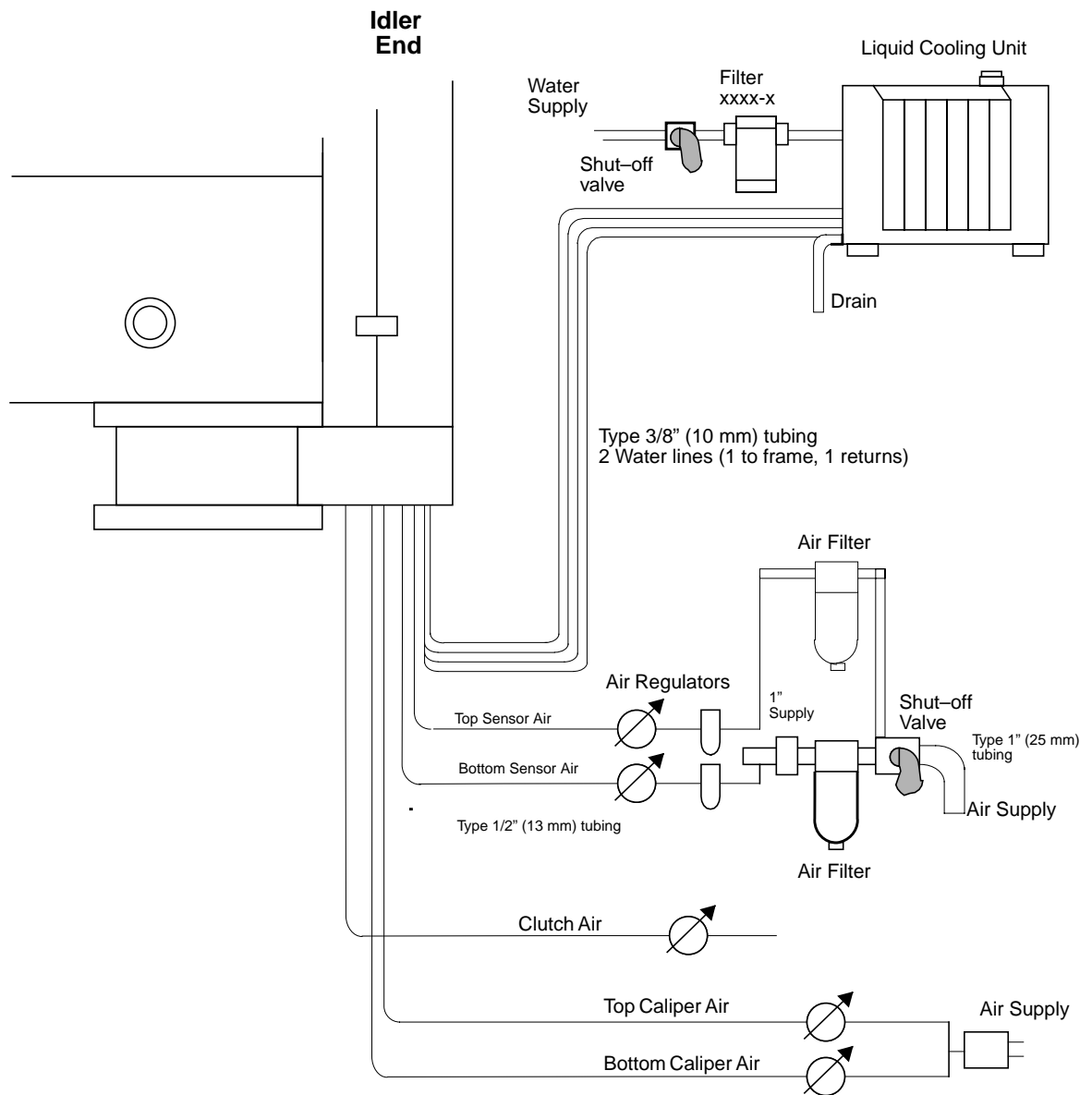


Figure 4-2 Air and Water Hookup

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Electrical Hook-Up

Cabling to a Smart Platform is minimal. All that is normally required for hook-up are the AC power, serial communication loops to the host system and Service Workstation, sheet break detector, Liquid Cooling Unit (LCU) flow switch (es), and reel turn-up detector. Other auxiliary equipment (for example, microwave or smoothness processors), depending upon the configuration, may also require cables to the AccuRay Smart Processing Center (ASPC).

For details of the TCP-IP Ethernet connection to the 086444-001 MPRC, see ABB Functional Drawing 086424-201. This drawing outlines the details of the required 132573-001 “Y” cable which plugs into J6 “HOST” connector on the ASPC backplane. It also shows the redundant Ethernet port which exits the electronics enclosure through an aluminum shield grounding block attached to the front door of the ASPC. This redundant Ethernet port is normally not present. A Fiberoptic Transceiver (ABB 102204-001) is required to meet CE Mark Radio Frequency emissions and susceptibility requirements. Using twisted pair or coaxial Ethernet transceivers is not certified to meet CE Mark. The suggested fiberoptic cable is ABB 102205-001 with 102206-001 “ST” connectors. These “ST” connectors require special tooling such as the ABB 102206-100 tool kit.

The platform is connected to customer power via the Smart Platform Power Distribution Center (SPDC). The SPDC also provides the power for the purge blower, Liquid Cooling Unit (LCU), and various auxiliary equipment. The SPDC is an integral part of the SP electrical design and is required to meet electromagnetic compliance (EMC) specifications and standards. See [Figure 4-3](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

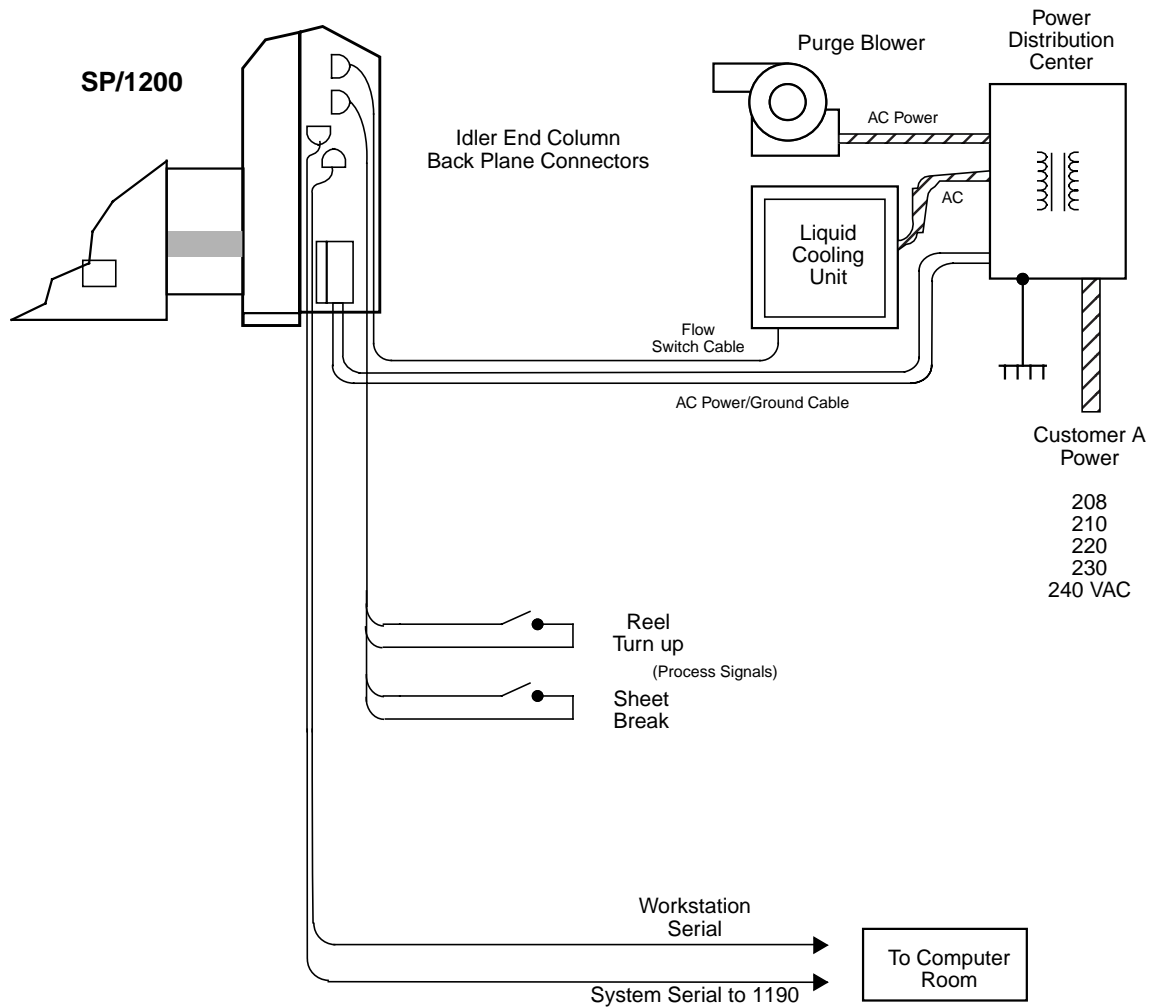


Figure 4-3 Standard Cable Configuration

The main supply to the SP is to be from the same supply as the host system. If there must be a deviation, then the two supplies must be banded to the same ground (single point earth reference). The introduction of an extra grounding system such as an instrument ground is absolutely forbidden.

A neutral to ground bond must exist on the secondary side of the SPDC. This bond must be in the SPDC and only in the SPDC.

The SPDC is 10 KVA to handle the largest SP system. Your particular installation will probably not actually consume that much power. The input wiring, fusing, and disconnect should, however, still be sized for the full 10 KVA.

Allowable input voltages to the SPDC are:

- Rated Input Voltage: 240, 230, 220, 208, or 200 volts \pm 10%
- Rated Frequency: 50 or 60 Hz \pm 1%

The secondary is always wired as 120/240.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

SP1200 Power Up Procedure

The following power up sequence is required to ensure no wiring errors or malfunctioning equipment cause a failure that could jeopardize a successful installation.

1. Verify power is tagged off and locked out at the Motor Control Center (MCC).
2. Verify all SPDC SP1200 circuit breakers are turned off (see [Figure 4-4](#)).

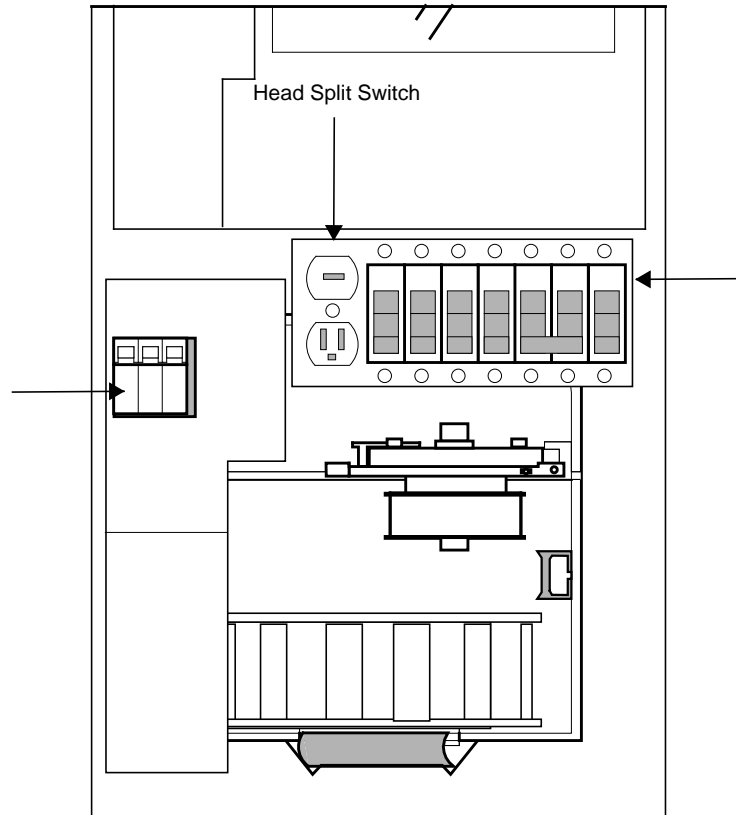
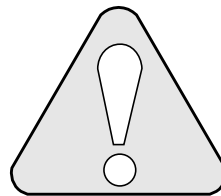


Figure 4-4 Circuit Breakers

3. Remove all debris from the installation work and vacuum the enclosure. Verify no tools or assembly material were left in the equipment.



The neutral to ground bond is extremely important. If it is not correct, the electronic filter in the ASPC may be destroyed when power is applied.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

4. Verify there is a neutral to ground bond at the SPDC, and ONLY at the transformer. Ensure that the primary and secondary are correctly terminated.
5. Verify all of the ASPC cabling is correctly terminated.
6. Unplug the Host and Service Workstation from the ASPC. Unplug all other external I/O cables (Sheet-Break, Reel Turn-up, chiller flow switches, etc.).
7. Remove the lock-out on the MCC and turn on the power to the SPDC. Measure the primary voltages (phase to phase, phases to neutral, and phases to ground) to verify proper power, grounding, and tap selection.
8. Turn on the Primary main circuit breaker and measure the secondary voltages (phase to phase, phases to neutral, and phases to ground). The output must be 240 VAC \pm 10% phase to phase; and 120 VAC \pm 10% each phase to neutral and each phase to ground.
9. Turn on the secondary circuit breakers and securely fasten all transformer covers.
10. Measure the input voltages on the line side of the SP1200 main breaker. The SP1200 input must be 240 VAC +10%, -14% phase to phase; and 120 VAC +10%, -14% each phase to neutral and each phase to ground.
11. Switch on the SP1200 main breaker and the Service breaker. Check for 120 VAC at the service outlet.
12. Switch on the DC breaker and check the \pm 12 Volts on the I/O connectors on the backplane. Refer to the appropriate SP1200 positioning functional drawing. Verify that the LEDs are operating correctly. See [Table 4-1 on page 65](#) and [Table 4-2 on page 65](#).
13. Switch off the main breaker.
14. Securely fasten the power entrance cover.
15. Plug in the Service Workstation, power, comm, and Air Pressure Transducer cables.
16. Switch on all the appropriate branch circuit breakers before switching on the main breaker. This is to allow the heater power-on sequencing in the software to minimize the heater turn on surge currents. The system is now ready for software loading and setup.

The following tables explain what the various LEDs are on the ECPSR and MPRC.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 4-1 ECPSR LEDs

LEDs	Description
DC IN	This LED refers to the 24 VDC power supply for the ASPC. When this LED is lit, the power supply is on but may not be within acceptable tolerance.
DISABLE	This LED refers to a remote disable input to the ECPSR. When the LED is lit, the -12 VDC are out of spec and the ECPSR is disabled.
+15 V -15 V +5 V	These LEDs refer to the presence of their respective voltages within the ASPC. When these LEDs are lit, the respective voltages are within acceptable tolerances.

Table 4-2 086349-002 MPRC LEDs

LEDs	Description
ERROR (red)	This LED indicates status of local diagnostics; it is under software control on a reset. If the LED stays on after reset, replace the MPRC. If the LED is flashing, check the service console. If the LED is off and the RUN light is flashing, conditions are normal. If the LEDs are not lit, check to make certain there is power to the board.
RUN (green)	This LED is driven by the data strobe and indicates the level of 68332 external bus activity. The intensity of the LED varies from dim to bright depending upon bus activity.
RX TERMINAL	When the LED is lit or flashing, there is a physical connection to the terminal. When the LED is not lit, the physical connection to the terminal is broken.
RX HOST	When the LED is lit or flashing, there is a physical connection to the host. When the LED is not lit, the physical connection to the host is broken.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 4-3 MPRC 086444-001 LED Interpretation

LEDs	Description
ERROR (red)	<p>This LED indicates status of local diagnostics; it is under software control on a reset.</p> <p>If the LED stays on after reset, replace the MPRC.</p> <p>If the LED is flashing, check the service console.</p> <p>If the LED is off and the RUN light is flashing, conditions are normal.</p> <p>If the LEDs are not lit, check to make certain there is power to the board.</p>
RUN (green)	<p>This LED is driven by “Transfer in Progress” and indicates the level of 68040 external bus activity.</p> <p>The intensity of the LED varies from dim to bright depending upon bus activity.</p>
NET TX_B (green)	When lit, the Ethernet port on J2 (Port B) is transmitting data.
NET TX_A (green)	When lit, the Ethernet port on the ASPC Host Connector (Port A) is transmitting data.
RTS 0 (green)	HDLC Port 0 is transmitting to the sensor microcontrollers.
RTS 1 (green)	When lit, HDLC Port 1 is transmitting to the sensor microcontrollers.
RTS 2 (green)	When lit, HDLC Port 2 is transmitting (unused in Smart Platform).
RTS 3 (green)	When lit, HDLC Port 3 is transmitting (unused in Smart Platform).
RX TERMINAL (green)	<p>When the LED is lit or flashing, there is a physical connection to the terminal.</p> <p>When the LED is not lit, the physical connection to the terminal is broken.</p>
RX HOST (green)	<p>When the LED is lit or flashing, there is a physical connection to the host.</p> <p>When the LED is not lit, the physical connection to the host is broken.</p>

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Starting Up the Software

The Service Workstation allows for direct interaction with the Smart Platform to allow for initial software loading, tuning of the scanner and sensors, diagnostics, and monitoring. In order to proceed with platform or sensor setup, the Service Workstation and the Smart Platform software must be activated. Once the Smart Platform software is loaded in the BRAM of the end column boards, the content has battery backup for several days, and the platform software can be repeatedly restarted by means of the RESET button on MPRC, by the power down and power up cycle, or by Service Workstation commands.

For the initial configuration and software loading of the Service Workstation and the Smart Platform, please refer to the appropriate *AccuRay Smart Platform System Software Manual, 101760-xxx*.

For subsequent start up, please refer to “Startup Options” on page 179.

Note: It is possible to run the Smart Platform software independent of the Host. All procedures, except where specifically noted, can be executed by local commands using the control panel and Service Workstation.

Blank Page

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

5

Platform Tuning

Chapter 5 describes the activities required to set up and tune the scanning control for the Smart Platform.

This chapter contains the following major sections:

Section.....	Page
Platform Software Setup Checklist	70
Motor Drive Setup (ABB ACS-100)	72
Motor Controller Setup (Fincor and Lovejoy)	79
Basic Tuning	83
Head Position Setup	91
Head Package Dimensions Setup	96
Automatic Edge-of-Sheet	102
Motion Restriction Sensitivity	106
Changing the Motion Restriction Sensitivity	107
Standardize Off-Sheet Delay Setup	108
Other Host Setup Procedures	110

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Platform Software Setup Checklist

Smart Platform software setup ensures efficient movement of the Smart Platform head package and the correct positioning of the head package on the process sheet. This checklist is a recommended sequence of steps to correctly set up the Smart Platform.

- Use the Electronics Health Report to make certain there are no safety interrupts which might impede the setup process.
- Check for alarms while tuning the frame.
- Set up the motor controller ([page 79](#)).
- Perform basic Smart Platform tuning—head position calibration and automatic motor control tuning ([page 83](#)).
- Set up the Smart Platform position values ([page 91](#)). If required, set up select positions in the host computer.
- Restart the communications between the Host computer and the Smart Platform (required to download Host head positions to the Smart Platform).
- Head Package Dimension Setup ([page 96](#)).
- Set up the Auto Edge-of-Sheet (AEOS) detectors, if configured on the Smart Platform ([page 102](#)).
- Set up the head motion restriction sensitivity if required by the installation site ([page 107](#)).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

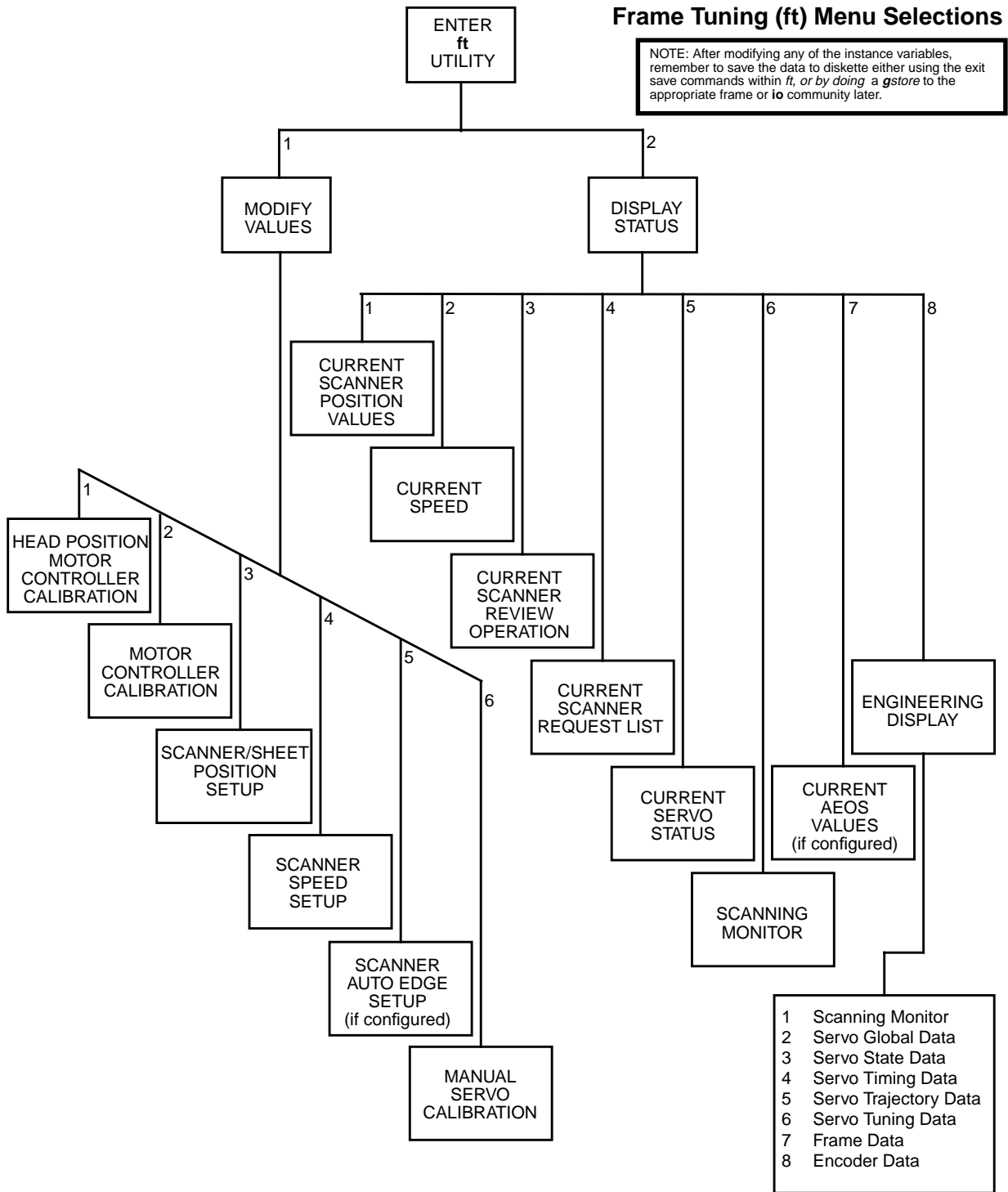


Figure 5-1 Menu Tree

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Motor Drive Setup (ABB ACS-100)

General Description

The direction and speed of the AC motor which moves the sensor head package is managed by a motor drive. It determines how much torque to apply as the head package traverses the frame.

The ABB ACS-100 Motor Drive (part number 133853-001) is the replacement for both the Fincor and Lovejoy motor controllers. It uses a removable digital control panel (MDPanel) to set the various tuning parameters. Motor drive assemblies shipped from Columbus, Ohio, arrive preprogrammed with the standard Smart Platform setup. These settings should provide proper performance for all scanners except Smart U-Frames. For Smart U-Frames, the values for Parameters 202 and 306 must be entered manually. Should any tuning parameters change, it will be necessary to rerun the Motor Drive Tuning routine (ft) in the software.

Control Panel Functions

The MDPanel is the only access to the Motor Drive provided for setup and diagnostics. It can be detached from the motor drive, but should only be removed when the motor drive is in REMOTE mode. The MDPanel can also be used to copy parameters from one motor controller to others. See “[Downloading Parameters](#)” on page 76.

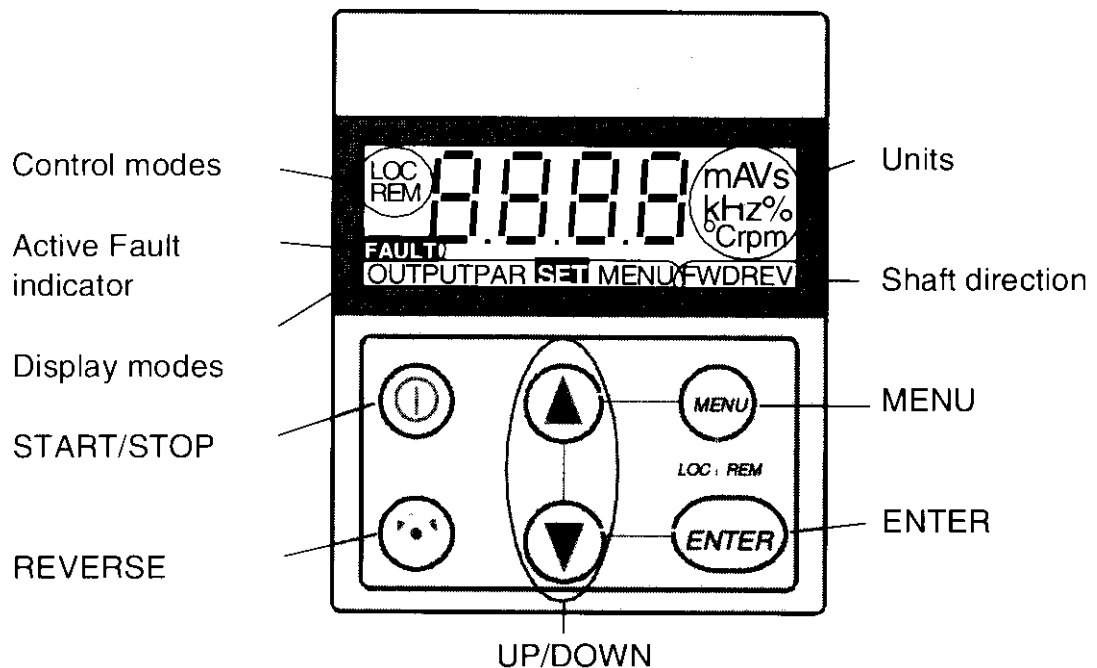


Figure 5-2 MDPanel

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

The push buttons, on the MDPanel, are used to navigate around a menu to give access to the various tuning parameters. These parameters are organized into five groups, 01 through 05. See [Table 5-1 on page 74](#). Each group has three or more subgroups. With the exception of the Smart U-Frame, all scanners should be able to operate with ABB SP Default parameter values. These defaults have been stored in the MDPanel to facilitate ease of setup.

The push buttons used in this application are:

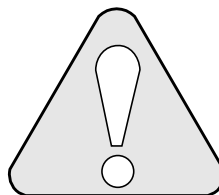
- MENU
- ENTER
- UP/DN arrows

The two buttons to the left are not used. The LCD displays menu selections, parameter values, and fault conditions. Appropriate parameter units are displayed along with the values.

Coded alarms which appear on the display can be decoded using [Table 5-2 on page 78](#).

Motor Drive Parameters

The motor drive that is shipped with the frame will be programmed with the correct tuning parameters. If the drive is replaced, the values should be checked against the appropriate default values.



Failure to use the correct values will result in improper frame operation, burn the windings of the motor, or produce excessive torque.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Code	Name	Controller Vendor Default Values	Smart Platform Default Values	Smart U-Frame Values
Group 01: ACTUAL VALUES AND STATUS				
101	f_{ref}	(Info Only)	(Info Only)	(Info Only)
102	Last Fault	(Info Only)	(Info Only)	(Info Only)
103	Version	(Info Only)	(Info Only)	(Info Only)
Group 02: MOTOR VALUES AND LIMITS				
201	U_{nom}	230 V	230 V	230 V
202	f_{nom}	50 Hz	155 Hz	95 Hz
203	I_{nom}	2.2 Amp	1.1 Amp	1.1 Amp
204	Nom Speed	1440 rpm	1800 rpm	1800 rpm
205	I_{max}	3.3 Amp	2.5 Amp	2.5 Amp
206	f_{max}	50 Hz	120 Hz	120 Hz
207	f_{min}	0 Hz	0 Hz	0 Hz
208	Dir Lock	1	1	1
209	Motor Noise	0	0	0
Group 03: DRIVE CONTROL				
301	Stop	1	1	1
302	Ramp	0	0	0
303	Acc	5.0 sec	1.0 sec	1.0 sec
304	Dec	5.0 sec	0.5 sec	0.5 sec
305	U/f Ratio	1	1	1
306	IR Comp	10 VAC	5 VAC	6 VAC
307	DC Inj Time	0.0 sec	0.0 sec	0.0 sec
308	UC_{max} Control	1	1	1
Group 04: INPUT/OUTPUT				
401	AI min	0%	0%	0%
402	AI max	100%	100%	100%
403	Ref min	0 Hz	0 Hz	0 Hz
404	Ref max	50 Hz	120 Hz	120 Hz
405	DI Config	1	1	1
406	Const speed	5 Hz	5 Hz	5 Hz
Group 05: SUPERVISION				
501	AI Fault	0	1	1
502	f_{lim}	35 Hz	0	0
503	Param Lock	1	1	1

Note: Motor Drive assemblies shipped from Columbus, Ohio arrive preprogrammed with the standard Smart Platform setup. For Smart U-Frames, the values for Codes 202 and 306 must be entered manually.

Table 5-1 Motor Drive Parameters

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Panel Operations

The panel display defaults to the Code 101 display of output frequency. Subsequent pressing of the UP/DN arrow push buttons will alternate the display between the output frequency and output current.

Moving Around the Menu

1. Press the MENU push button to show the menu group level of the last observed parameter value.
2. Press the DN arrow push button to get to lower menu groups. It is a rotating display buffer; so you will eventually get to where you want, even if you pick the wrong direction.
3. When you get to the group you want, press ENTER to move into the subgroup. The same rules apply within the subgroup.
4. At the desired subgroup, press ENTER to view the parameter value. Press and release quickly, and the value only displays for a moment. Press it for a few seconds, and the value will stay on the display.
5. Press MENU to get back to the submenu display.

[Table 5-1 on page 74](#) shows the available menu selections.

LOCAL/REMOTE

The power-up default mode for the Motor Drive is REMOTE. All values can be observed in REMOTE. However, values can only be changed when the Drive is in LOCAL mode.

1. To put the Motor Drive in LOCAL, simultaneously press the MENU and ENTER push buttons. Note that the LCD shows the new mode.
2. To go back to REMOTE, simultaneously press the MENU and ENTER push buttons again.

Setting a Parameter Value

1. Go to the desired parameter menu location (see [Table 5-1 on page 74](#)).
2. Set the MDPanel to show LOCAL mode.
3. Press the ENTER push button until SET is displayed.
4. Use the UP/DN arrow push buttons to adjust the parameter to the desired value. When the value is changed, the SET display will blink.
5. Return the MDPanel to REMOTE operations when done.

For ABB Employee Use Only

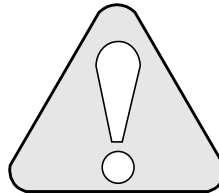
Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Downloading Parameters

This operation should only be used to program a new Motor Drive using an MDPanel which already contains the desired parameter values.

Note: Make sure the MDPanel shows the LOCAL mode.

1. Press the MENU push button to get to the group display.



Do not execute the “-Fd-” menu selection. It will change the Motor Controller to the ABB Drives factory settings, not the settings established for ABB scanners.

2. Press the UP arrow push buttons until the display shows “-dL-”.
3. Press and hold the ENTER push button until the display starts to blink. When the operation is complete, the display will revert back to the power-up display of output frequency (Hz).
4. Return the control panel to REMOTE operation when done.

For ABB Employee Use Only

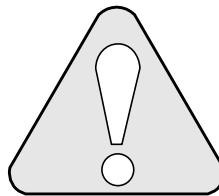
Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Uploading Parameters

This operation is used to prepare a new Motor Drive Panel unit with default parameters from a Motor Drive that is known to have the correct operational parameters installed.

Note: Make sure:

1. The configuration switch (S1) on the motor controller is at zero (0).
 2. The MDPanel is showing LOCAL mode.
1. Press the MENU push button to get to the group display.
 2. Press the UP arrow push button until the display shows “-UL-”.



Do not execute the “-Fd-” menu selection. It will change the Motor Drive to the ABB Drives factory settings, not the settings established for the Smart Platforms.

3. Press and hold the ENTER push button until the display starts to blink. When the operation is complete, the display will revert back to the power-up display of output frequency (Hz).
4. Return the MDPanel to REMOTE operation when done.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Alarms and Fault Reporting

Code	Description
CF 0 - CF 9	Position of configuration switch S1. Certain parameters can be modified only when S1=0.
AL 1	Parameter upload/download failed.
AL 2	Operation not allowed while start is active.
AL 3	Operation not allowed in remote or local control.
AL 4	REVERSE button disabled. Parameter 208 (Dir Lock) is active.
AL 5	Panel START button disabled. DI configuration is three-wire and D12 is open.
AL 6	Operation not allowed. Parameter 503 (Param Lock) is active.
AL 10	Overcurrent controller active.
AL 11	Overvoltage controller active.
AL 12	Undervoltage controller active.
AL 13	Reserved. Contact supplier.
AL 14	Reverse command attempted in remote control (REM), while parameter 208 (Dir Lock) is active.
AL 15 - AL 16	Reserved. Contact supplier.
FL 1	Overcurrent: <ul style="list-style-type: none"> • Possible mechanical problem. • Acceleration and/or Deceleration times may be too small.
FL 2	DC overvoltage: <ul style="list-style-type: none"> • Input voltage too high. • Deceleration time may be too small.
FL 3	ACS 100 overtemperature: <ul style="list-style-type: none"> • Ambient temperature too high. • Severe overload.
FL 4	Fault current: output earth fault or short circuit
FL 5	Output overload.
FL 6	DC undervoltage.
FL 7	Analog input fault. See parameter 501.
FL 8	Motor overtemperature. See parameter 502.
FL 9	Panel disconnected from drive in local control. NOTE: If FL9 is active when the power is turned off, the ACS 100 will start in remote control (REM) when the power is turned back on.
FL 10	Parameters inconsistent. Check that Al min (f_{min}) is not greater than Al max (f_{max}).
FL 11*	DC bus ripple too large. Check supply.
FL 12	Reserved. Contact supplier.
FL 13 - FL 19*	Hardware error. Contact supplier.
Full display blinking	Serial link failure. Bad connection between the control panel and the ACS 100.

Note: Faults (*) with a red blinking LED are reset by turning the power off and on. Other faults are reset by pressing the START/STOP button.

Table 5-2 Motor Drive Alarms and Faults

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Motor Controller Setup (Fincor and Lovejoy)

The direction and speed of the AC motor which drives the Smart Platform, is managed by the motor controller, located in the end column of the Smart Platform. The motor controller determines how much torque to apply when the head package encounters resistance.

At initial power-up, before head position calibration or tuning, the Smart Platform will move at 50 percent of its maximum speed whenever the JOG push buttons are pressed. The maximum speed is determined by the FMAX adjustment on the motor controller and this speed is used when moving off-sheet from a position out on the scanner.

The motor controller will also affect the perceived tuning of the Smart Platform. The actual velocity of the head package movement has a non-linear relationship with the output request of the Smart Platform due to the dynamics of the motor controller. Any changes to the motor controller adjustment will require retuning of the software.

The procedure to correctly set up the motor controller requires you to manually adjust the motor controller and alter instance variables in the Smart Platform software using the **ft** utility.

Procedure

1. At the Service Workstation, run the **ft** utility by typing **ft** at the \$\$ prompt. The screen shown in [Figure 5-3 on page 80](#) will help you find your way through the menu selections.
2. In the **ft** main menu, select MODIFY Values, selection 1.
3. Select Manual Servo Calibration, selection 6, from the MODIFY Values menu. The Manual Servo Calibration screen is shown in [Figure 5-3](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

```

***  MANUAL SERVO CALIBRATION  ***

Variable Name          Description                      Current Value
1: Accel               Nominal acceleration.           40.59
2: vmin               Minimum speed necessary to move head.  3.85
   activeVmin          Current minimum speed value in use.  3.85
3: vmax               Maximum allowed speed.          40.55
4: vdb                Velocity deadband for DDC control.   1.00
5: Kp                 DDC proportional gain term.       0.250
6: Ki                 DDC integral gain term.          0.010
7: ddcExcessiveErrorPct Excessive error percent for DDC control. 25.00
8: ddcRestrictedMotionPct Restricted motion percent for DDC control. 50.00
9: vminTune           Vmin self-tuning algorithm active.  OFF
10: vminFilterFactor  Exp. filter factor for vmin self-tuning. 0.33
11: MCSlope           Motor controller slope.           0.09
12: MCoffset          Motor controller offset.          18
13: MCjogCommand      DAC output for joggng the frame.    128
14: MCFastTuneDAC     Motor controller tuning FAST DAC output. 190
15: MCSlowTuneDAC     Motor controller tuning SLOW DAC output. 80
16: xdb               Position deadband for HOMING control. 0.95

TO MODIFY A VARIABLE ENTER ITS NUMBER NOW
(r to redisplay, q to quit, Q to exit):

```

Figure 5-3 Manual Servo Calibration Screen in ft.

4. Set the value for **MCjogCommand** to 128.
5. Mark two positions on the frame which are 150 cm (60 in.) apart.
6. Use the JOG push buttons to move the head between the marked positions, adjusting FMAX on the motor controller until the time to traverse the positions is between six and 10 seconds.

For long frames (greater than 8 meters), the faster time may be required to successfully accomplish frame tuning.

7. Jog the head, adjust V/F so that the head can be manually stopped as it traverses without undue effort. Note that this is being done at the jog speed which is roughly 15 cm/sec (6 in./sec).

Higher scan speeds will require more force to stop and lower scan speeds will require less force.

8. Manually force the head carriage to move from a stopped position.
9. Adjust the BOOST potentiometer so that significant force is required to make it move.
10. Ensure that the motor does not heat up when in the off-sheet position (too much boost can cause a stopped motor to overheat).

11. Exit the **ft** utility, type **q** and press RETURN when requested to save the variables changed in this procedure to the current **.ini** files.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

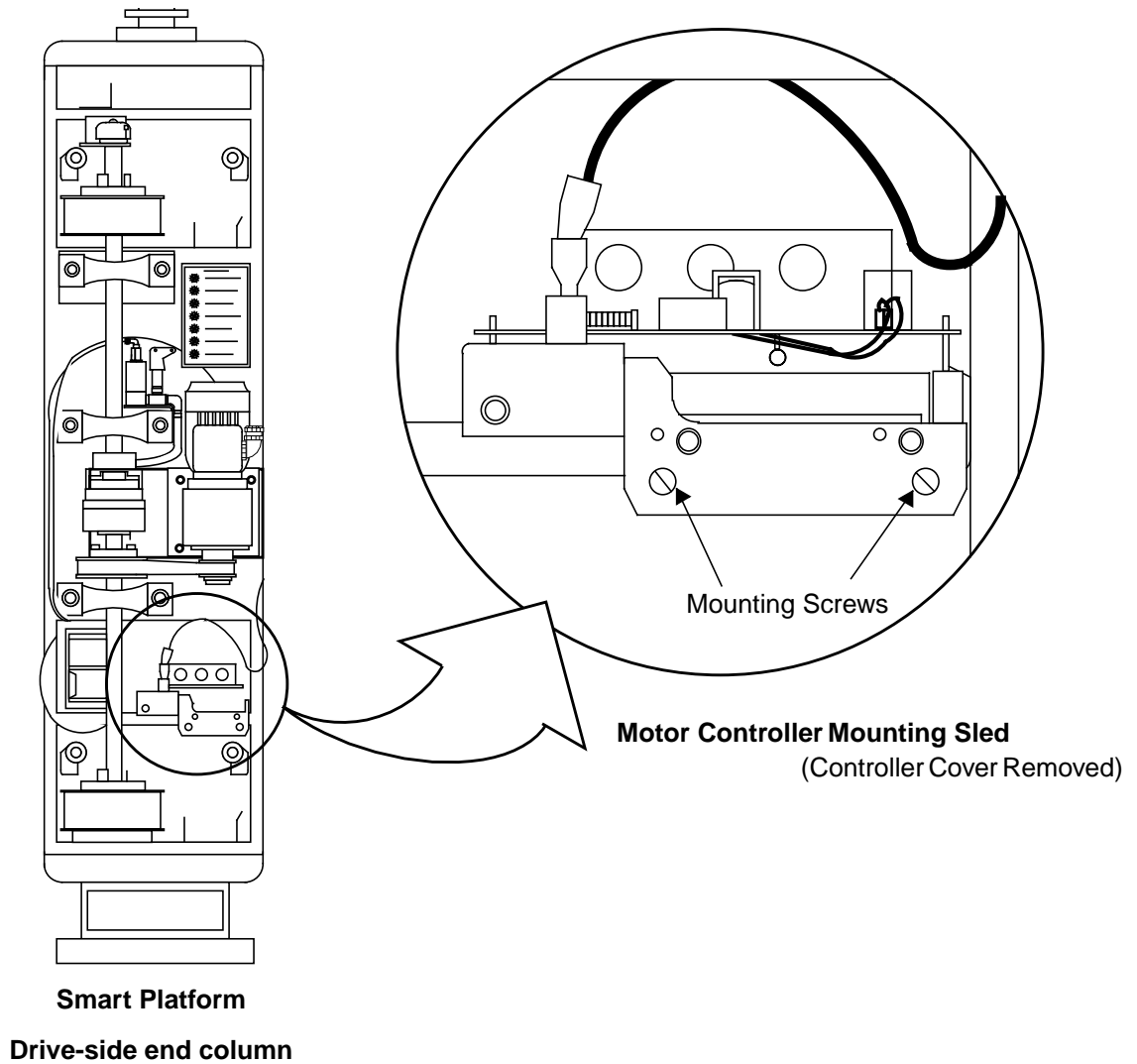
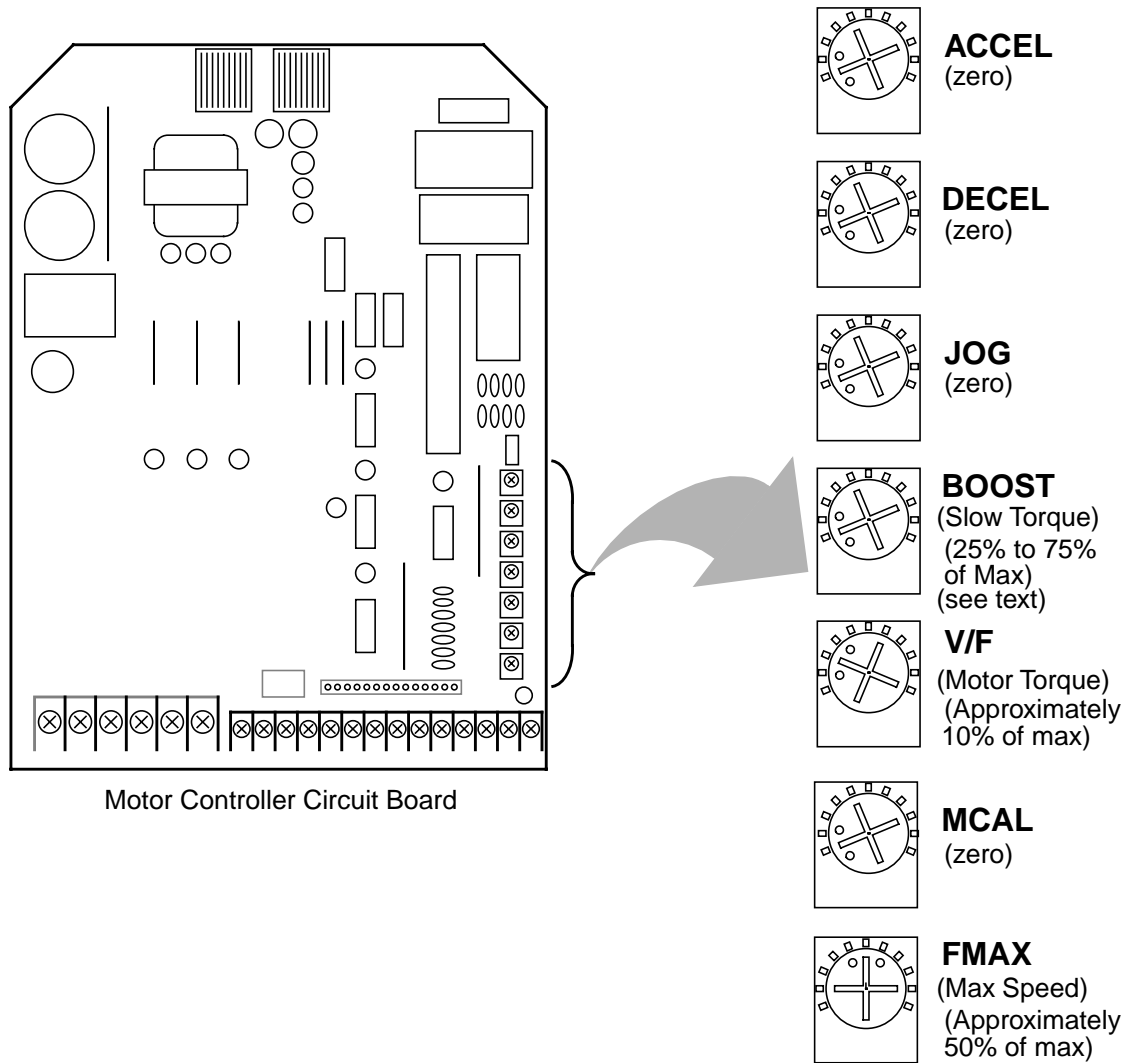


Figure 5-4 Location of the Motor Controller in the Smart Platform End Column

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.



Motor Controller Circuit Board

Figure 5-5 Adjustments to the Motor Controller

For ABB Employee Use Only

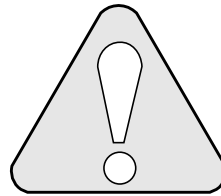
Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Basic Tuning

The basic tuning portion of Smart Platform Setup will calibrate the position encoder and tune the controlling software (servo object) for the Smart Platform drive motor. Head position calibration will be achieved by entering a position measurement into the **ft** utility at the Service Workstation. The calibration utility will determine the measured position on the Smart Platform.

The servo tuning is an automated routine that measures the response of the Smart Platform to a series of velocity targets initiated by the controlling software. The servo software object is then calibrated to the response of the motor controller setup. The response is affected by the tuning of the motor controller hardware, so the Motor Controller Setup procedure must be performed before basic tuning.

This procedure requires you to jog the Smart Platform head package and take one dimension measurement on the Smart Platform and enter it at the Service Workstation. The automated master controller motor controller tuning portion of this procedure will move the head package to several positions on the Smart Platform.



Before proceeding with this phase, make certain the Far Limit Switch has been mechanically adjusted to prevent the head package from hitting an obstruction, such as the machine ropes.

Procedure

1. At the Service Workstation, start the **ft** utility, by typing **ft** at the \$\$ prompt.
2. In the **ft** main menu, select MODIFY Values, selection 1.
3. Select Head Position and Motor Controller Calibration, selection 1, from the MODIFY Values menu.

The **ft** utility will display the current tuning values as shown in [Figure 5-6 on page 84](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

```
*** HEAD POSITION CALIBRATION ***

The CURRENT head position slope is : 0.010000
The CURRENT head position offset is : 1.725000
The CURRENT scanner home travel limit is: 17.625000
The CURRENT scanner far travel limit is:293.075000

This frame has auto edge of sheet (AEOS):
  The HOME edge detector offset is: 35.000000
  The FAR edge detector offset is: 19.500000

Please enter the frame type or q to quit;
  1 for 700;
  2 for 1200 or Dual Rail U-Frame;
  3 for Single Rail U-Frame;

Please enter the customer units for head position (1 = cm; 2 = inch; q to quit);2
```

Step 4

Figure 5-6 Head Position Calibration – Initial Display (Example)

4. Enter the frame type. For example, enter “2” for the SP1200, Reflection Scanner, or Smart Dual Rail U-Frame. Enter a “1” for the SP700. Enter a “3” for the Smart Single Rail U-Frame.
5. After selecting frame type 1200, choose the units to be used for the head position calibration, as shown in [Figure 5-6](#).
Select 1 for centimeters, or select 2 for inches.

Note: Initially, the Smart Platform is configured with the customer units defined as centimeters. If it is necessary to change the customer units to inches, all of the Smart Platform dimension variables must be converted to inches.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

- When requested by **ft**, use the JOG push buttons to move the Smart Platform head package to the home limit switch.

The home side limit switch is activated when the scanning head will not jog further in the home end column direction.

- Measure the distance from the home end column to the edge of the carriage wrap-around assembly as shown in [Figure 5-7](#).

Record the measurement in the customer units chosen in Step 4.

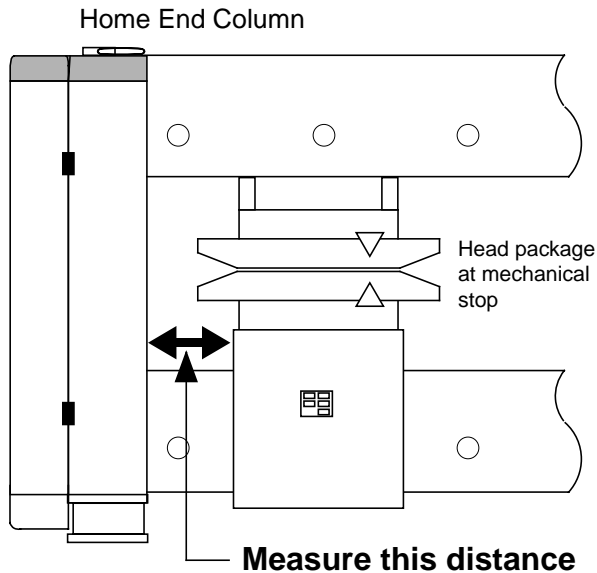


Figure 5-7 Head Position Calibration Measurement

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

- When requested by the **ft** utility, enter the measurement taken in Step 7, as shown in [Figure 5-8](#).

The utility will display the computed value for the distance between the end column and the measurement window center line, based on the measurement entered. If the values do not seem reasonable, repeat this step.

```
Jog the frame to the HOME limit switch;
PUSH the head against the mechanical stop and
measure the wraparound carriage distance;
Enter the customer units value of this position => 5.25      Step 7

NOTE: The following measurements are with respect to the head center line
The MEASURED home travel limit is      : 17.625000 units
                                           : 1600.000000 counts
The DESIRED home travel limit is      : 17.625000 units
Do you wish to repeat the HOME limit setup? (y or n):n
```

Figure 5-8 Head Position Calibration Screen

- The utility will ask whether you want to use automatic (a) or manual (m) determination of the far limit switch position. The preferred method is manual. In manual, you should first force the head into the far mechanical stop position after reaching the limit switch, then, press RETURN. The utility will display the measured value, in customer units, of the current position of the head package, shown in [Figure 5-8](#). If acceptable, press return. If the value does not seem reasonable, repeat this step. If automatic, jog the Smart Platform head package to the far limit switch, using the JOG push buttons. When the head package has reached the limit switch, wait one second and then return the head to the home end and place in remote.
- The utility provides the option of establishing a process centerline point. The utility will then ask if you want to use the machine centerline to determine setup. For all but aseptic applications, you should answer no (n). The process centerline setup enables the system to establish reasonable scan limits and speed apart from further setup and control by a host computer. A “no” (n) answer advances you to the next step. A “yes” answer (y) answer asks you to jog the head to the position on the platform which represents the centerline of the process. Then, press the RETURN key. In either case, a final summary of the head position calibration procedure will be displayed as shown in [Figure 5-9 on page 87](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

11. To save the head position calibration values determined in this procedure, press RETURN when prompted by the utility as shown in Figure 5-9. There is a separate prompt for **io.ini**, **frame.ini**, and **appl.ini**.

The new calibration values will be saved to the current **.ini** file so that they will be available when the Smart Platform is restarted.

Since the head position calibration tuning has been changed, it is necessary to reload the Host computer head positions with the Smart Platform, by using the **PMMRLD** command.

```
The NEW head position slope is : 0.010000
The new head position offset is: 1.625000
Scanner's home travel limit has been changed to 17.625000 units.
Scanner's far travel limit has been changed to 293.145000 units.
Scanner's maximum speed has been changed to 15.891772 units.
Scanner's on-sheet speed has been changed to 5.959414 units.
PmmFrame has been recalibrated to new max limits.
Servo's minimum speed (vmin) has been changed to 0.720715 units.
Servo's maximum speed (vmax) has been changed to 15.891712 units.
Servo's maximum acceleration (Accel) has been changed to 4.592000 units.
Servo's position deadband (xdb) has been changed to 0.639990 units.
EdgeDetector's directional hysteresis has been set to: 0.160000 units.
```

```
Enter new file path name OR
(ret) to save to "/ss01/clm/frame.ini" OR
"q" to quit.
=>
Frame graph was successfully saved to file "/ss01/clm/frame.ini".
```

```
Enter new path name OR
(ret) to save to "/ss01/clm/io.ini" OR
"q" to quit.
=>
Enter the new file path name OR
<ret> to save to "/ss01/clm/appl.ini" OR
"q" to quit.
=>
```

Step 10

```
NOTE: Successful completion of head position calibration
requires (re)calibration of the Motor Controller;
This function will be performed next...
```

Figure 5-9 Head Position Calibration Summary Display

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Note: Make sure the head is near but not on the Home Limit Switch prior to Step 12.

12. Press RETURN to continue or press **a** to abort.

If return is selected the system will respond with the message

```
***      AUTOMATIC SERVO CALIBRATION      ***
```

13. The system will display the following message:

Motor controller tuning will cross the sheet edges, do you wish to continue? (y or n) (If a sheet break is present this step will be skipped.)

Note: If the head crossing the sheet edge will create a problem, abort the procedure. Wait until there is a sheet break before proceeding.

14. Place Frame Control in Remote and press RETURN to continue.

The Motor Controller Tuning screen will be displayed, as shown in the example in [Figure 5-10 on page 89](#).

The scanning carriage will move in the off-sheet direction and search for its home position. It will then begin a series of movements across the Smart Platform, taking velocity and distance measurements at certain times. After appropriately 30 seconds, the utility will finish the motor controller calibration. You can terminate the Automatic Controller Tuning at any time by typing “**a**” at the keyboard, or placing the Smart Platform in LOCAL control at the control panel.

Note: On scanners less than 2.5 meters long, it may be necessary to reduce the SLOW and FAST JOG DAC outputs to keep the head from tripping the far travel limit switch during the motor controller tuning.

15. When motor controller tuning is complete, the utility will display a banner across the middle of the display. The display prompts you to accept the tuning results, “**y**” or “**n**”. Answer “**y**” unless the new slope and offset values seem incorrect. A summary of the new motor controller calibration values is shown in [Figure 5-11 on page 90](#).

16. In order to fully implement the head position calibration procedure, it will be necessary to restart the Smart Platform as a final step. To do this, exit the *ft* utility and type **reset** at the \$\$ prompt.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

17. Establish a correct minimum velocity.

Because of the action by the servo to keep increasing the output until there is movement, it is not likely that there will be situations where the head will actually stall. **activeVmin** is only changed if the **vminTune** flag is set. Making sure that the system has established a reasonable **activeVmin** before turning off the **vminTune** flag is important because it allows the servo HOMING action to proceed quicker if a more correct starting point is used. Once a reasonable **activeVmin** has been established, the value should be written into the **vmin** field and saved using the *gstore* utility. This will establish the correct **activeVmin** at the next system restart.

```

Carriage return to continue or "a" to abort...
          "a" to Abort [ MOTOR CONTROLLER TUNING ]
          DAC      Event  Forward  Forward  Reverse  Reverse
          Output  Duration Time Of  Position Time Of  Position
Start          80      5.000 12093.015 12339
Accelerate Slow 80      1.000
Slow Sample One 80      1.000 12095.016 [1] 13677      0.000 [5]      0
Slow Sample Two 80      12.000      0.000 [2]      0      0.000 [6]      0
Accelerate Fast 190     1.000
Fast Sample One 190     1.000      0.000 [3]      0      0.000 [7]      0
Fast Sample Two 190     4.500      0.000 [4]      0      0.000 [8]      0
TurnAround      190     1.000
Fast Stop        190     1.000      Old Slope 0.087  New Slope 0.000
Decelerate Slow 80      1.000      Old Offset 18    New Offset
-----|-----|-----|-----|-----|-----|
H O h----->-----f-----|F
Tuning State      CRUISING_SLOW_FORWARD_TO_SAMPLE_TWO      Timer 3.000
Current:          Time 12098.016 Position 15720 FORWARD DAC 80
Initialization:   Time 12087.619 Position 9017 Elapsed Time 10.397
Motion Threshold Time 99.900 Counts 100
Motion:           Timer 10.400 Detected FALSE
Positions:        H = 3430 O = 9057 h = 12078 f = 42291 F = 54725
Limits:          Reverse FALSE Forward FALSE
    
```

Figure 5-10 Automatic Motor Controller Tuning Screen

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

18. To use the motor controller calibration values determined in this procedure, press RETURN when prompted by the utility, as shown in Figure 5-11. The new calibration values will be saved to the current **.ini** file so that they will be available when the Smart Platform is restarted.

The **ft** utility will return to the MODIFY Values menu.

```
***      AUTOMATIC SERVO CALIBRATION      ***
The following servo tuning changes are being implemented:
Motor controller slope of  0.139 is being changed to  0.139
Motor controller offset of   10 is being changed to   11
Servo minimum speed of     0.721 is being changed to  0.989
Servo maximum speed of    15.892 is being changed to  15.801
Scanner maximum speed of   15.982 is being changed to  15.801

Enter new file path name OR
(ret) to save to "/ss01/clm/frame.ini" OR
"q" to quit.
=>
Frame graph was successfully saved to file "/ss01/clm/frame.ini"
Carriage return to continue...
```

Step 13

Figure 5-11 Motor Controller Servo Calibration Summary

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Head Position Setup

This section defines specific head position locations. See [Figure 5-12 on page 93](#). The position variables are listed below.

Garage Position (OFF)

The Garage Position is the position on the Smart Platform, next to the process, where maintenance is performed. The entered distance should be the smallest of the Host positions, as measured from the home end column.

If personal safety and service access needs dictate, it is possible to place the off-sheet position adjacent to the far column end of the platform. In this case, leave the standardize position at the home end if possible and note that when going on-sheet, the heads will traverse the entire platform length from the far end to the home end in order to start its scan.

Standardize Position (STDZ)

The Standardize Position is the position where sensor standardization occurs. This position typically is the same as the off sheet position and should never be close enough to the sheet edge so that the far edge detector sees the sheet edge. The entered distance should be less than the value for the Minimum Home EOS Position. Normally the off-sheet and standardize positions are identical because this allows the automatic check sample sequence to be extended after standardize without moving the head to a new position and enhances accuracy.

Minimum Home Measure Position (LHEOS)

This position defines the home position of the maximum scan width, and the minimum limit for the Current Home Scan Limit. The Smart Platform will never scan outside of the minimum measure position. This value should be greater than those for the Garage Position and the Standardize Position. This position is called the Home Measure Limit.

Current Home Scan Position (KHEOS)

This position is the current home side scan limit for the present sheet width. This value will never be less than the Minimum Home Measure Position. This position is called the Home Scan Limit.

Default Single Point Position (SPPOS)

This is the default single-point measurement position, when the Smart Platform is placed in the single-point mode. The entered value must be between the Current Home Scan Position and Current Far Scan Position.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Current Far Scan Position (KFEOS)

This position is the current far side scan limit for the present sheet width. This value will never be greater than Maximum Far Measure Position. This position is called the Far Scan Limit.

Maximum Far Measure Position (LFEOS)

This position defines the far position of maximum scan width, and the maximum limit for Current Far Scan Limit. The Smart Platform never scans outside of the Maximum Measure Position. This position is called the Far Measure Limit.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

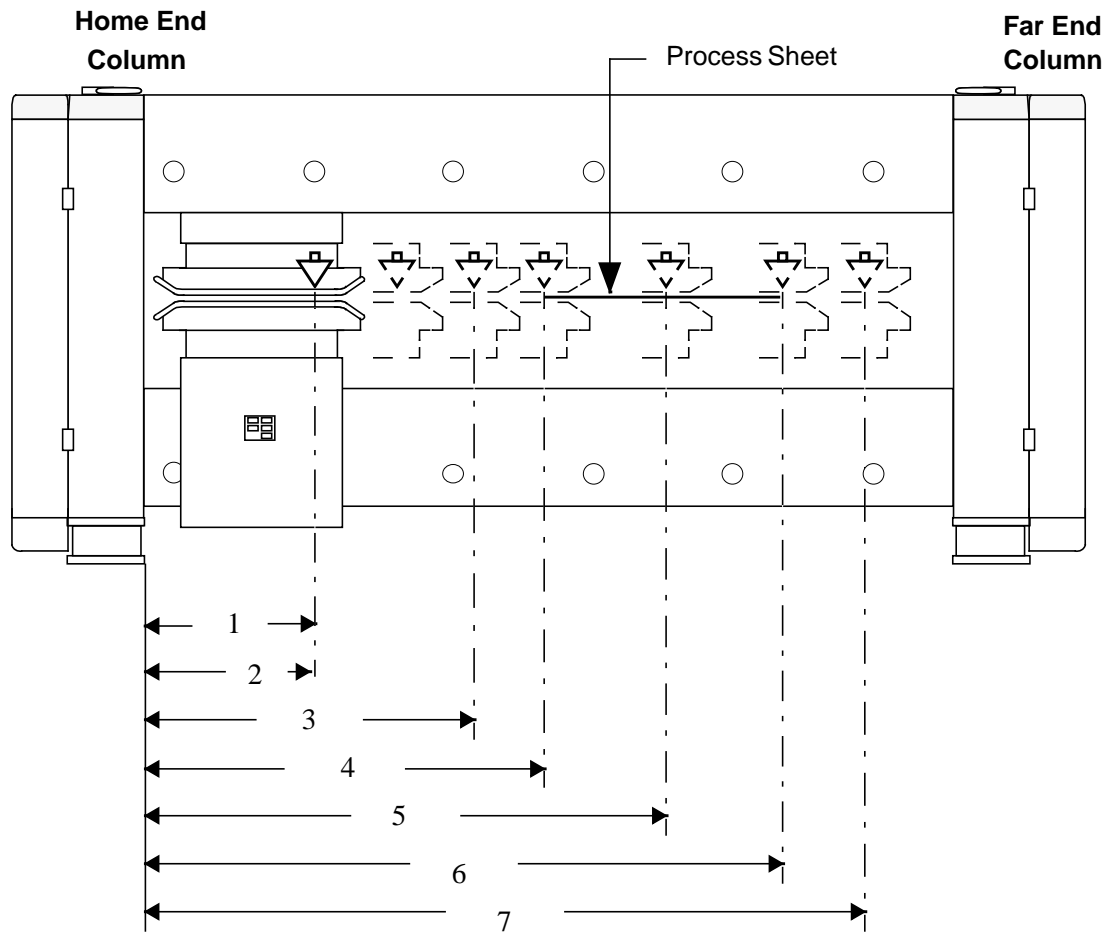


Figure 5-12 Smart Platform Positions at the Host Computer

- | | |
|----------------------------------|---------|
| 1. Garage Position | (OFF) |
| 2. Standardize Position | (STDZ) |
| 3. Minimum Home Measure Position | (LHEOS) |
| 4. Current Home Scan Position | (KHEOS) |
| 5. Default Single Point Position | (SPPOS) |
| 6. Current Far Scan Position | (KFEOS) |
| 7. Maximum Far Measure Position | (LFEOS) |

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Notes about LHEOS and LFEOS (Scanning Measurement Limits)

The variables LHEOS and LFEOS define the sheet's measure limits at the maximum possible trim positions of the process. This then defines the farthest positions which the measurement heads can achieve during scanning operations. As a result these variables define the width and location of all system databoxes.

On multi-frame applications, all frames must be identically aligned with respect to the physical process. Since sheet shrinkage is a very nonlinear function, it is not recommended that any attempt be made to compensate for shrinkage by misaligning the frames. Proper compensation for sheet shrinkage can only be accomplished via algorithmic means. See [Figure 5-13](#).

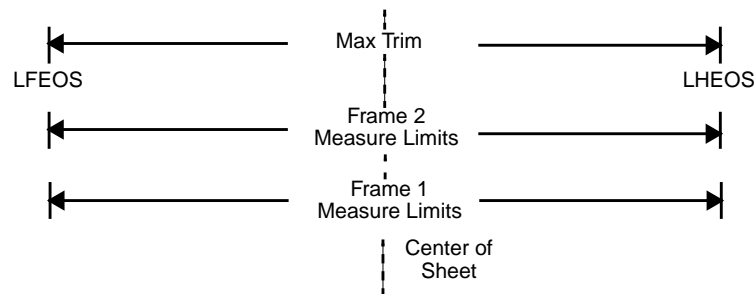


Figure 5-13 Limits for Multiple Frame Installations

Procedure for LHEOS and LFEOS

1. Determine the physical center line of the **process** relative to the Headbox at each frame location. Note that the center line of the rolls in any area of the machine may not be the center line of the process.
2. The maximum trim locations should be determined by measuring equal distances from the center line determined above to each edge of the possible sheet run.
3. JOG or otherwise move the head package until the center line of the sensing windows is directly aligned with each of the maximum trim locations determined above. Permanently mark the frames to identify the maximum trim locations. These marks will make it easier to check or set up these locations during maintenance operations.
4. Record the head position while the head package is at each of the marked locations. Enter the recorded position into LHEOS and LFEOS, as specified for your system.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Procedure for Determining Position Values

Mark the locations of the machine center line, the Minimum Home Measure Position, and the Maximum Far Measure Position on the Smart Platform for future reference.

Note: If you have trouble using the Jog push buttons on the Smart Platform control panel because the system is too responsive, slow down the jog speed using the Frame Health Page Report.

1. Select the Frame Health Report. If necessary, refer to [“Operation of the Sensor Health Pages”](#) on page 116.
2. Use the JOG push buttons on the Smart Platform end column to move the head package to the desired position.
3. Record the current head position as displayed on the Health Report.
4. Repeat Steps 2 and 3 for each of the fixed frame positions.
5. Enter values in customer units in the appropriate data fields of the Health Report.
6. Remember to do a *gstore* to make changes permanent.

Frame Health Report

ABB Process Automation	FWS170.009 RELEASED	01-31-96 11:44:27
SP Release:	SP280.2	Page 1 of 1
Frame Ctrl From:	WORKSTATION	Safety Intr: Reset
Head Command:	OFFSHEET	Safety Alarms: No
Frame Type: SP 1200	Active Alarms: NO	

<table style="width: 100%; border-collapse: collapse;"> <tr><td>Max Speed</td><td>CU/SEC</td><td>11.81</td></tr> <tr><td>On Sheet Speed</td><td>CU/SEC</td><td>5.21</td></tr> <tr><td>Scan Speed</td><td>CU/SEC</td><td>3.23</td></tr> <tr><td>On Sheet Time</td><td>SEC</td><td>50</td></tr> <tr><td>Off Sheet Time</td><td>SEC</td><td>120</td></tr> </table>	Max Speed	CU/SEC	11.81	On Sheet Speed	CU/SEC	5.21	Scan Speed	CU/SEC	3.23	On Sheet Time	SEC	50	Off Sheet Time	SEC	120	<p style="text-align: center; margin: 0;">SCANNER SETUP</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>** Home Travel Limit</td><td>CU</td><td>20.38</td></tr> <tr><td>Garage Position</td><td>CU</td><td>26.40</td></tr> <tr><td>Stdz Position</td><td>CU</td><td>26.40</td></tr> <tr><td>Home Measure Limit</td><td>CU</td><td>38.79</td></tr> <tr><td>Home Manual Scan Limit</td><td>CU</td><td>49.70</td></tr> <tr><td>Far Manual Scan Limit</td><td>CU</td><td>247.43</td></tr> <tr><td>Far Measure Limit</td><td>CU</td><td>258.67</td></tr> <tr><td>** Far Travel Limit</td><td>CU</td><td>284.88</td></tr> </table>	** Home Travel Limit	CU	20.38	Garage Position	CU	26.40	Stdz Position	CU	26.40	Home Measure Limit	CU	38.79	Home Manual Scan Limit	CU	49.70	Far Manual Scan Limit	CU	247.43	Far Measure Limit	CU	258.67	** Far Travel Limit	CU	284.88
Max Speed	CU/SEC	11.81																																						
On Sheet Speed	CU/SEC	5.21																																						
Scan Speed	CU/SEC	3.23																																						
On Sheet Time	SEC	50																																						
Off Sheet Time	SEC	120																																						
** Home Travel Limit	CU	20.38																																						
Garage Position	CU	26.40																																						
Stdz Position	CU	26.40																																						
Home Measure Limit	CU	38.79																																						
Home Manual Scan Limit	CU	49.70																																						
Far Manual Scan Limit	CU	247.43																																						
Far Measure Limit	CU	258.67																																						
** Far Travel Limit	CU	284.88																																						

** ENTRY NOT PERMITTED

F
r
a
m
e

Sheet Break	FALSE
Motor Overload	FALSE
Beam Air Flow Alarm	FALSE
Chiller 1	FLOWING
Chiller 2	FLOWING
Heads Split	NO
BW Shutter	CLOSED
Ash Shutter	NOT CLOSED

C
o
m
p
u
t
e
r

Motor Ctrl Output DAC	0
MC Direction	FORWARD
MC Run/Stop	RUN

Power Shelf Temp	°C	24.00
Motor Ctrl Temp	°C	22.59

E
n
c
o
d
e
r

S
Y
N
C
H
R
O
N
I
Z
E
D

Head Position	CU	26.33
Position Error	CU	0.35
Servo Veloc	CU/SEC	0.00
Avg DDC Corr		1.00
Home Scan Limit	CU	49.70
Far Scan Limit	CU	247.43
InTransit		NO
Mtr Ctrl Slp		0.139
Mtr Ctrl Off	CU/SEC	13
Min Velocity	CU/SEC	1.170

ESC
EXIT

F1
HELP

F2
ALARM

F3
DATA

F4

F5

F6
SETUP

F7
STDZ

F8
SMPCK

F9
CALIB

F10
PRTSC

PGUP
PRVPG

PGDN
NXTPG

Figure 5-14 Frame Health Report with Scanner Setup Panel

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Head Package Dimensions Setup

The sensor head package dimensions are used to control the orientation of the window over the sheet as the head moves through its various sequences. The variables used for this purposes can be manipulated to accomplish a variety of head behavior patterns as the head moves from off-sheet to a scanning condition. This section contains information about the locations of these variables and a procedure for determining their values. The head package dimensional variables are defined below. Two basic equations deal with bringing the head on-sheet, depending whether auto edge of sheet is turned on or not:

Auto Edge of Sheet Turned Off:

Prepare to measure position = homeScanLimit + homeHeadClearance – homeWindowClearance + curlDist + positioningSafetyFactor

Auto Edge of Sheet Turned On:

Prepare to measure position = homeEOS + homeHeadClearance + curlDist + positioningSafetyFactor

Definition of Head Package Dimensions

Table 5-1 Head Package Dimensions

homeHeadClearance	This variable represents the distance between the home-side edge of the sensor head package and the measurement center line. Its value will depend on how far beyond the home edge of the sheet the head must come before starting the Prepare To Measure activity. In any event, it must always be larger than the homeWindowClearance .
farHeadClearance	This variable represents the distance between the far-side edge of the sensor head package and the measurement center line. The variable only comes into play when the head must enter the prepare to measure position from the far side of the scanner. In that case, it will have the same function as the homeHeadClearance . When it is used, it must be larger than the farWindowClearance .
homeWindowClearance	This variable represents the distance, on the home-side of the head package, from the measurement center line to the edge of the largest sensor window in the head package. The window radii will range from approximately 0.5 in. for a Smart Ash sensor to 2.5 in. for a HemiPlus sensor (see Figure 5-15).

(continued on next page)

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 5-1 (continued)

farWindowClearance	This variable represents the distance, on the far-side of the head package, from the measurement center line to the edge of the largest sensor window in the head. The window radii will range from approximately 0.5 in. for a Smart Ash sensor to 2.5 in. for a HemiPlus sensor (see Figure 5-15).
curlDist	This variable represents the additional distance that the heads will travel when first coming on-sheet to the prepare-to-measure position to assure that sheet contacting sensors, such as caliper, are fully on-sheet before making contact. The heads will then back up to the Current Home EOS Position to start scanning. If desired, the entire prepare-to-measure positioning can be accomplished with the homeHeadClearance dimension, leaving the curlDist at its default value of 0.1 units.
positioningSafetyFactor	This variable represents the additional distance that the heads will travel when first coming on-sheet to the prepare-to-measure position to assure that sheet contacting sensors, such as caliper, are fully on-sheet before making contact. The head will then back up to the current homeScanLimit to start scanning. If desired, the entire prepare-to-measure positioning can be accomplished with the homeHeadClearance dimension, leaving the curlDist at its default value of 0.1 units.

The locations of these positions on a Smart Platform sensor head package are shown in [Figure 5-15 on page 98](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

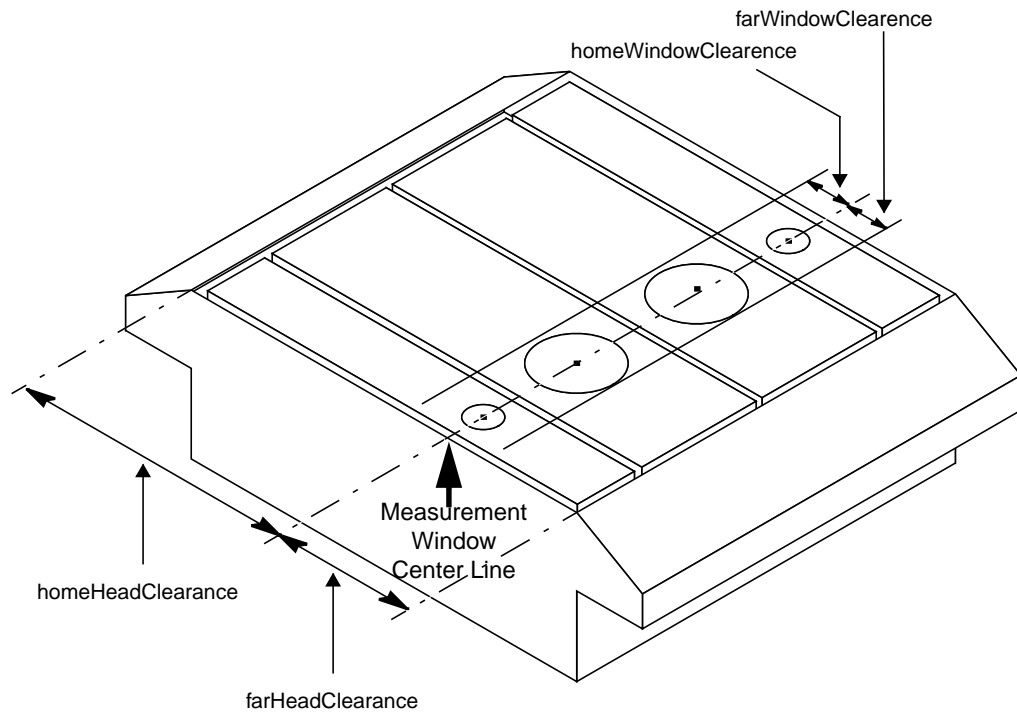


Figure 5-15 Location of Head Package Measurements

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Determining and Entering the Head Dimensions

Refer to [Table 5-2 on page 100](#) and [Figure 5-16 on page 101](#).

1. Split the sensor heads, using one of the head split switches. Head split switches are located in the drive end and idler end columns.
2. Measure and record the **homeHeadClearance** and the **farHeadClearance** (in customer units) from the Smart Platform head package.
3. Enter the values for **homeHeadClearance** and **farHeadClearance** into the Frame Health Report. Refer to [Figure 5-16](#).

homeHeadClearance and **farHeadClearance** assist the servo in making sure the head is sufficiently inside the sheet before measuring. These dimensions can be adjusted instead of **curlDist** to suit a desired head position during Prepare to Measure operations.

4. Determine the values for **farWindowClearance** and **homeWindowClearance** from [Figure 5-15 on page 98](#). [Table 5-2 on page 100](#) gives typical measurement area diameters for each sensor.
5. Divide the value for the largest sensor beam diameter by 2 to get the **farWindowClearance** and **homeWindowClearance**.
6. Enter the resultant number into the HEAD SETUP section of the Frame Health Report. Refer to [Figure 5-16](#).
7. Exit the Health Report program.
8. Use the **gstore** procedure to save the changes made on the Frame Health Report.

Note: The diameters given in [Table 5-2](#), define the nominal dimensions of the various sensor measurement beams. Each sensor has its own unique tolerance characteristics as the beam encroaches over a sheet edge. These characteristics will govern, in part, how close the measurement centerline may be brought to the sheet edge. For example, a GT Caliper probe may not go beyond the edge. On the other hand, a HemiPlus IR beam can be as much as halfway over the edge. Check each sensor's technical manual for that sensor's tolerance.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 5-2 Sensor Window Diameters

Sensor Type	Sensor Model	Measurement Beam Diameter	
		in.	cm
Basis Weight	TLK-5	2.1	5.33
	TLK-8	2.1	5.33
	TLK-9	2.1	5.33
	TLS-1	2.5	6.35
	TLP-1	1.0	2.54
	STLK*	0.59	1.5
	STLP*	0.59	1.5
IR Moisture	MIR-212	2.5	6.35
	DIR-212	2.125	5.40
Microwave Moisture	any	--	--
Ash	TLXR	1.0	2.54
	STLXR	0.59	1.5
Caliper	any	2.0	5.08
Gloss	any	--	--
OptiPak	any	--	--
Smoothness	any	--	--

*Cross Machine Direction Only

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Frame Health Report

ABB Process Automation FWS170.009 RELEASED 01-31-96 08:45:39

INTEGRATION LOAD DEVEL-1 REEL	SP Release: SP280.2 Frame Ctrl From: END COLUMN Head Command: OFFSHEET	Page 1 of 1 Safety Intr: RESET System Alarms: NO
--	---	---

Frame Type: SP 1200 **Active Alarms** NO

<p style="text-align: center;">HEAD SETUP</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Curl Distance</td><td>CU</td><td>0.10</td></tr> <tr><td>Home Head Clearance</td><td>CU</td><td>2.70</td></tr> <tr><td>Far Head Clearance</td><td>CU</td><td>2.70</td></tr> <tr><td>Home Window Clearance</td><td>CU</td><td>2.60</td></tr> <tr><td>Far Window Clearance</td><td>CU</td><td>2.60</td></tr> </table>	Curl Distance	CU	0.10	Home Head Clearance	CU	2.70	Far Head Clearance	CU	2.70	Home Window Clearance	CU	2.60	Far Window Clearance	CU	2.60	<p style="text-align: center;">AUTO EDGE OF SHEET</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>AEOS State</td><td>ON</td></tr> <tr><td>** Home Det Offset</td><td>CU 16.83</td></tr> <tr><td>** Far Det Offset</td><td>CU 10.75</td></tr> <tr><td>EOS Deadband</td><td>CU 2.00</td></tr> <tr><td>Max Edge Change</td><td>CU 100.00</td></tr> <tr><td>Home Edge Track</td><td>CU 2.00</td></tr> <tr><td>Far Edge Track</td><td>CU 2.00</td></tr> </table>	AEOS State	ON	** Home Det Offset	CU 16.83	** Far Det Offset	CU 10.75	EOS Deadband	CU 2.00	Max Edge Change	CU 100.00	Home Edge Track	CU 2.00	Far Edge Track	CU 2.00
Curl Distance	CU	0.10																												
Home Head Clearance	CU	2.70																												
Far Head Clearance	CU	2.70																												
Home Window Clearance	CU	2.60																												
Far Window Clearance	CU	2.60																												
AEOS State	ON																													
** Home Det Offset	CU 16.83																													
** Far Det Offset	CU 10.75																													
EOS Deadband	CU 2.00																													
Max Edge Change	CU 100.00																													
Home Edge Track	CU 2.00																													
Far Edge Track	CU 2.00																													

****IF CHANGED, RESET FRAME MICROCONTROLLER**

**F
r
a
m
e**

Sheet Break	FALSE
Motor Overload	FALSE
Beam Air Flow Alarm	FALSE
Chiller 1	FLOWING
Chiller 2	FLOWING
Heads Split	NO
BW Shutter	CLOSED
Ash Shutter	CLOSED

**C
o
m
p
u
t
e
r**

Power Shelf Temp	C °	26.83
Motor Ctrl Temp	°C	25.44
Encoder	SYNCHRONIZED	
Head Position	CU	29.92
Position Error	CU	-0.39
Servo Veloc	CU/SEC	0.00
Avg DDC Corr		1.00
Home Scan Limit	CU	85.00
Home EOS	CU	57.89
Far EOS	CU	236.82
Far Scan Limit	CU	230.23
InTransit		NO
Mtr Ctrl Slp		0.170
Mtr Ctrl Off	CU/SEC	22
Min Velocity	CU/SEC	1.616

Esc	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	PGUP	PGDN
EXIT	HELP	ALARM	DATA			SETUP	STDZ	SMPCK	CALIB	PRTSC	PRVPG	NXTPG

Figure 5-16 Head Setup Using the Frame Health Report

Press the F6 key until the desired setup panel appears on the Health Report.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Automatic Edge-of-Sheet

The Automatic Edge-of-Sheet (AEOS) option available on the Smart Platform allows the sensor head package to closely track the edge of the process sheet, and to respond to changes in the width of the process sheet. AEOS is made possible by mounting an infrared detector on the home and far edges of the head package.

This section contains guidelines for the setup of AEOS and a procedure for entering the values in the Smart Platform.

The variables necessary for set up of AEOS are described below.

maxEdgeChange	This variable represents the maximum amount the sheet edge position is allowed to change before interpreting the edge change as a sheet break. All edge changes which are within this value, but greater than EOSDeadband are considered valid and sent to the Host computer.
EOSDeadband	This variable represents the distance the sheet edge is allowed to wander before a valid edge change to the Host is triggered.
homeEdgeTrack	This variable represents the target distance from the home edge of the window in the head package to the home edge of the sheet. See note on page 99 .
farEdgeTrack	This variable is the target distance from the far edge of the window in the head package to the far edge of the sheet. See note on page 99 .
homeDetectorOffset	This variable is the distance from the measurement window center line to the center of the home edge sheet detector.
farDetectorOffset	This variable is the distance from the measurement window center line to the center of the far edge sheet detector.
allowSecondEdgeErrMsg	This variable is designed to allow or disallow an error message in “pe” when the far edge detector sees a threading rope which is close to the far sheet edge. If the flag is set to a 1 , then the system will report that it has found a new edge. If the flag is set to a 0 , its normal default value, the system will assume the new edge was a threading rope and ignore the occurrence. If the system performance requires that the far edge detector see the threading ropes in order to get close to the sheet edge, this flag should be set to 0.
allowEdgeOutsideLimits	This variable is used to permit the ignoring of false home edge detection while the head is coming on-sheet. This situation may occur on a Smart Platform Reflection Scanner when there is a piece of the paper machine structure which can be seen by the edge detectors while coming on-sheet. For this to be effective, the actual edge of the sheet must be at a distance from the interfering structure that is at least the separation between the two edge detectors. This flag is defaulted to a 1 , which will make the head acknowledge the false edge, and if it is outside the homeMeasureLimit , will position the window centerline so that it is just inside the homeMeasureLimit . By making the flag a 0, the detectors will ignore the false edge and proceed to the predefined prepare to measure position.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

These measurement relationships are shown in [Figure 5-17 on page 103](#).

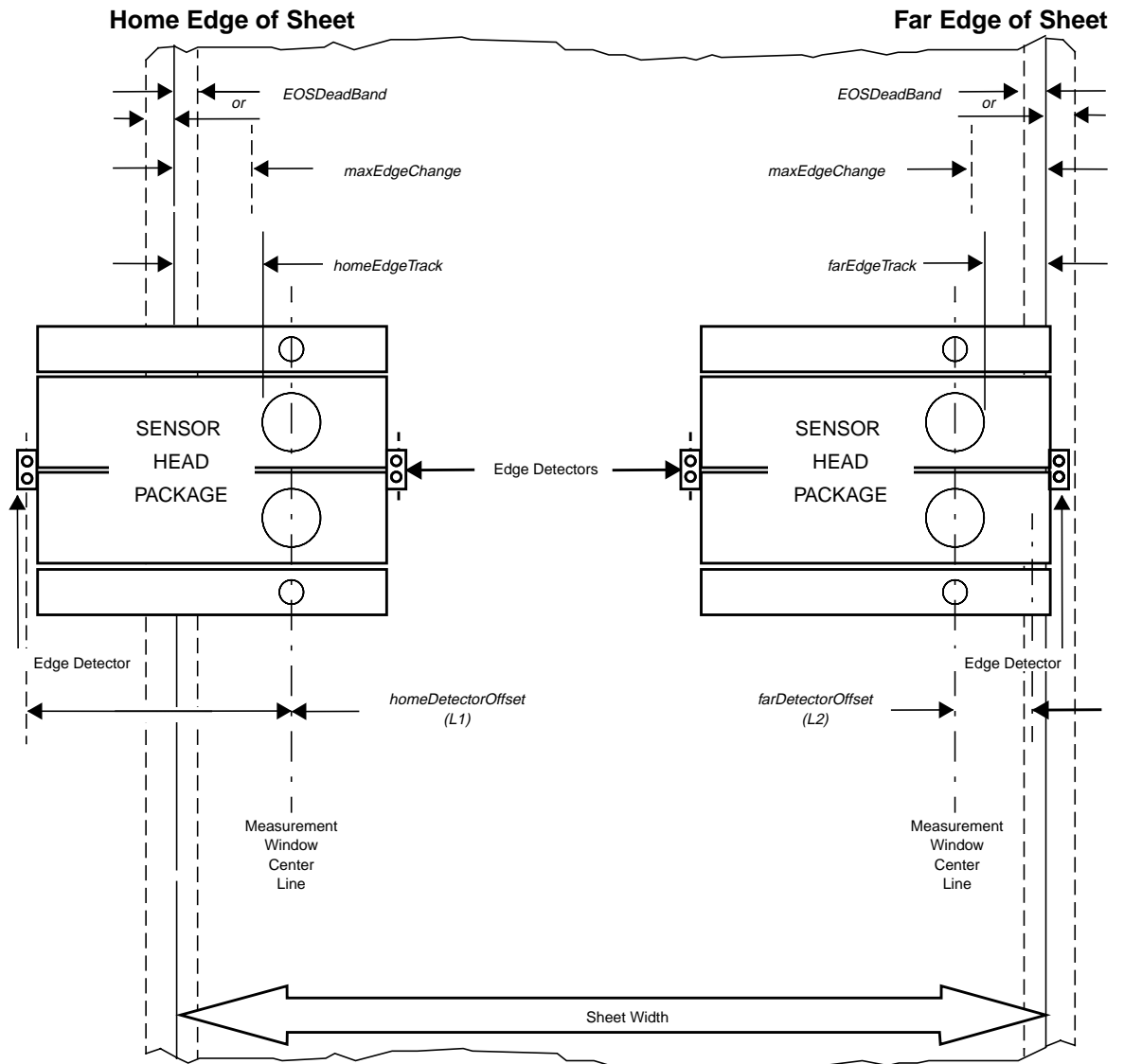


Figure 5-17 Automatic Edge-of-Sheet Position Measurements

Setup Guidelines

When the Smart Platform scans near an edge, the scan limits will change only if the projected new scan limit will be outside the **EOSDeadband** value of the current scan limit.

It is important that all of the setup parameters be entered in the same customer units.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Do not make either **homeEdgeTrackingDistance** or **farEdgeTrackingDistance** smaller than the value for **xdb** located on the Frame Health page, setup panel number 3. If either of these tracking variables is made too small, the Smart Platform may position part of the window off the sheet edge, resulting in an increase in the dwell time at the edges. As the **EOSDeadband** is made smaller, the Smart Platform will report a larger number of scan limit changes.

The relationship between the calculated scan limits and the detected edges is as follows:

$$\text{homeScanLimit} = \text{homeEOS} + \text{farWindowClearance} + \text{farEdgeTrackingDistance} + \text{EOSDeadband}$$

$$\text{farScanLimit} = \text{farEOS} - \text{farWindowClearance} - \text{farEdgeTrackingDistance} - \text{EOSDeadband}$$

The tracking distance variables should be set such that the scan limit positions allow the edge detectors to see the sheet edge. If the tracking distance is larger than the detector offset value, the head will not move smoothly at the sheet edge. In general, the tracking distances should meet the following inequality:

$$(\text{Detector Offset} - \text{Window Clearance}) > (\text{Tracking Distance} + \text{EOSDeadband} + \text{xdb})$$

Entering AEOS Setup Parameters

Based on the previous guidelines, the following procedure will show how to enter the AEOS setup values into the Smart Platform, using the **ft** utility.

The values for **homeDetectorOffset** and **farDetectorOffset** can be measured on the head package. The other values must be based on the desired performance of the AEOS feature.

Procedure

1. At the Service Workstation, access the Frame Health Report. Refer to [Figure 5-18 on page 105](#).

2. Enter values, in customer units, for the following variables:

AEOS State

Home Det Offset

Far Det Offset

EOS Deadband

Max Edge Change

Home Edge Track

Far Edge Track

3. Reset the microcontroller to activate the changed offsets.

Use the command: **uc_reset -f 0x1f**

4. After about 30 seconds, put the platform in remote mode to synchronize the encoder.

5. Put the platform in the on-sheet mode to resume normal operation.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Frame Health Report

ABB Process Automation **FWS170.009 RELEASED** **01-31-96** **08:45:39**

INTEGRATION LOAD DEVEL-1 REEL	SP Release: SP280.2 Frame Ctrl From: END COLUMN Head Command: OFFSHEET	Page 1 of 1 Safety Intr: RESET System Alarms: NO
--	---	---

Frame Type: SP 1200 **Active Alarms:** NO

HEAD SETUP	AUTO EDGE OF SHEET
Curl Distance CU 0.10 Home Head Clearance CU 2.70 ** Far Head Clearance CU 2.70 ** Home Window Clearance CU 2.60 Far Window Clearance CU 2.60	AEOS State ON Home Det Offset CU 16.83 Far Det Offset CU 10.75 EOS Deadband CU 2.00 Max Edge Change CU 100.00 Home Edge Track CU 2.00 Far Edge Track CU 2.00

**IF CHANGED, RESET FRAME MICROCONTROLLER

Sheet Break	FALSE
Motor Overload	FALSE
Beam Air Flow Alarm	FALSE
Chiller 1	FLOWING
Chiller 2	FLOWING
Heads Split	NO
BW Shutter	CLOSED
Ash Shutter	CLOSED

...

Power Shelf Temp	C ° 26.83
Motor Ctrl Temp	°C 25.44
Encoder	SYNCHRONIZED
Head Position	CU 29.92
Position Error	CU -0.39
Servo Veloc	CU/SEC 0.00
Avg DDC Corr	1.00
Home Scan Limit	CU 85.00
Home EOS	CU 57.89
Far EOS	CU 236.82
Far Scan Limit	CU 230.23
InTransit	NO
Mtr Ctrl Slp	0.170
Mtr Ctrl Off	CU/SEC 22
Min Velocity	CU/SEC 1.616

F
r
a
m
e

Motor Ctrl Output DAC	0
MC Direction	REVERSE
MC RUN/STOP	RUN

C
o
m
p
u
t
e
r

Esc	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	PGUP	PGDN
EXIT	HELP	ALARM	DATA			SETUP	STDZ	SMPCK	CALIB	PRTSC	PRVPG	NXTPG

Figure 5-18 AEOS Setup on the Frame Health Report

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Motion Restriction Sensitivity

The Smart Platform can be set up to respond with varying degrees of sensitivity to conditions which prevent or impede movement of the head package.

When the restriction exceeds the defined sensitivity, all drive output ceases and sensor shutters are closed until corrective action can be taken to clear the condition. An error message is also sent to the Host computer to notify it of the condition.

The desired sensitivity will depend on the setup of the motor controller and the site requirements for stopping the head package when an obstruction is met.

Obtaining the correct sensitivity is a matter of adjusting two parameters:

ddcExcessiveErrorPercent, which has an inverse relationship to sensitivity, and **ddcMotionRestrictionPercent**, which has a direct relationship to sensitivity. [Table 5-3](#) lists the sensitivity parameters and examples of values to reach desired sensitivities. Any value between 0 and 100 may be used. Experimentation will determine the best values for the site.

Table 5-3 Example of Motion Restriction Sensitivity Values

	Desired Sensitivity			
	low	medium	high	default
ddcExcessiveErrorPercent	95	90	80	100
ddcMotionRestrictionPercent	5	20	50	0

Note: Motor drive response to restrictions is also influenced by the motor controller pot adjustment for torque. High settings of the boost and V/F adjustments will alter the values given in Figure 5-19 on page 107.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Changing the Motion Restriction Sensitivity

Choose the desired sensitivity from [Table 5-3 on page 106](#). The values can be entered by using the Frame Health Report. Refer to [Figure 5-19](#).

Frame Health Report

ABB Process Automation FWS170.009 RELEASED 01-31-96 11:45:48

SP Release: SP280.2

Frame Ctrl From: WORKSTATION

Head Command: OFFSHEET

Page 1 of 1

Safety Intr: RESET

System Alarms:NO

Frame Type: SP 1200

Active AlarmsNO

SERVO SETUP

Acceleration	CU/SEC	3.4732	DDC Proportional Gain	0.25
Position Deadband	CU	0.3000	DDC Integral Gain	0.01
Minimum Velocity	CU/SEC	1.1696	DDC Excessive Error	% 100.00
Maximum Velocity	CU/SEC	15.6761	DDC Restricted Motion	% 0.00
MC Jog Command	DAC	128	DDC Vmin Self-tuning	ON
MC Slow Tune Speed	DAC	80		
MC Fast Tune Speed	DAC	190		

F r a m e

Sheet Break	FALSE
Motor Overload	FALSE
Beam Air Flow Alarm	FALSE
Chiller 1	FLOWING
Chiller 2	FLOWING
Heads Split	NO
BW Shutter	CLOSED
Ash Shutter	NOT CLOSED

C o m p u t e r

Power Shelf Temp	C °	26.83
Motor Ctrl Temp	°C	25.44
Encoder	SYNCHRONIZED	
Head Position	CU	29.92
Position Error	CU	-0.39
Servo Veloc	CU/SEC	0.00
Avg DDC Corr		1.00
Home Scan Limit	CU	85.00
Home EOS	CU	57.89
Far EOS	CU	236.82
Far Scan Limit	CU	230.23
InTransit		NO
Mtr Ctrl Slp		0.170
Mtr Ctrl Off	CU/SEC	22
Min Velocity	CU/SEC	1.616

Motor Ctrl Output DAC	0
MC Direction	FORWARD
MC RUN/STOP	RUN

Esc EXIT	F1 HELP	F2 ALARM	F3 DATA	F4	F5	F6 SETUP	F7 STDZ	F8 SMPCK	F9 CALIB	F10 PRTSC	PGUP PRVPG	PGDN NXTPG
-------------	------------	-------------	------------	----	----	-------------	------------	-------------	-------------	--------------	---------------	---------------

Figure 5-19 Setting Up Motion Sensitivity with the Frame Health Report

Press the F6 key until the desired setup panel appears on the Health Report.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Standardize Off-Sheet Delay Setup

At times there are large temperature differences between the off-sheet position and where the head package is over the process. These temperature differences can cause measurement problems if the head has been off-sheet long enough to cool. Under this situation, it is not appropriate to initiate a standardize before going back on-sheet, as this will introduce errors to the measurement due to standardizing with a cooled sensor package. To overcome this potential error, release SP280.2 introduces a feature which will delay the standardize if the head has been off-sheet for more than a specified amount of time. In this case, the head will forego any scheduled standardize until such time as a prescribed time on-sheet has been accomplished. During this time delay, the measurements will be valid provided there was an initial good standardize.

There are four instance variables located in the **scanner01** object associated with this feature. Two are setup variables, **offSheetTime** and **onSheetTime**; while the other two, **stdzRequested** and **stdzDelayRequired**, are status flags used to identify the current status of any standardize delay. The default condition for **offSheetTime** and **onSheetTime** is a 0. This will turn off the feature. Any non-zero positive value (time in seconds) in these two variables will activate the feature. The values used will necessarily be site and installation specific, depending on the temperature environment surrounding each frame. Experiment to determine the correct off- and on-sheet delay times.

This feature is primarily beneficial for the Caliper and OptiPak sensors and on Off-Machine Coaters where standardize should be delayed after machine startup. Other sensors may also benefit where on and off-sheet temperature differences are considered large. Unless large temperature differences are present, turn off the feature if a Caliper or OptiPak sensor is not present in the configuration. However, if it is on, it will control the standardize of all sensors in the system.

Setup Procedure

1. Activate the *inspect* utility.
2. Enter the desired off-sheet time in seconds:
scanner01 -> offSheetTime = xxxx (0 = off)
3. Enter the desired on-sheet time in seconds:
scanner01 -> onSheetTime = yyyy
4. Exit the *inspect* utility by typing: **:q**
5. Save the changes to the frame community using the *gstore* utility.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Operation Overview

When the head is moved off-sheet, a timer is started. When the time accumulation equals that of the **offSheetTime** value, the system will set the **stdzDelayRequired flag**. If a DIRT standardize request then comes from the host, the standardize request will be so noted in the **stdzRequested** flag, but the actual standardize procedure will be delayed until on-sheet has been requested and the head has been over the sheet for at least **onSheetTime** seconds. Note that a single point request will start the on-sheet timer, but that standardize will not occur until the mode changes back to scan or off-sheet.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Other Host Setup Procedures

The Host computer has several other important parameters that must be entered to assure proper operation of the measurements system including the following:

- Scanning time, typically takes 15-30 seconds
- Number of profile points, typically takes 100-600
- Standardize interval, typically takes 30-120 minutes
- Product code slopes, offset, compensations, and IR 4-filter flag
- Composite profile filter factor
- Requests for report printing
- Trend graphing of measurement and standardize results

Please refer to the appropriate system manuals for details.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

6

Measurement Setup

Measurement setup consists of a set of procedures that involve both the sensor and the Smart Platform. Specific sensors have additional hardware setup procedures that are located in the specific sensor manuals. Refer to the Setup Checklists for the setup procedures sequence for each sensor.

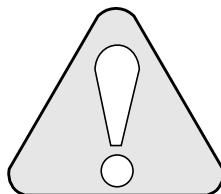
This chapter contains the following major sections:

Section.....	Page
Setup Checklists	112
Operation of the Sensor Health Pages	116
Temperature Controller Setup for Basis Weight, Ash, and Caliper Sensors .	118
Setup of Customer Units	124
Enter Calibration Head Constants	127
Standardize Limits	141
Verification	155
Air Temperature Compensation for Basis Weight	157
Air Profile Compensation for Basis Weight, Gloss, and Caliper	161
Air Profile Compensation for OptiPak	164
Digital Input Invert Adjustment for the Smoothness Sensor	166
Default Compensations for IR Moisture, Microwave, and Ash Sensors	167
Calibrate Sample - Minimum Time Data Accumulation	168

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Setup Checklists



Newer sensor manuals may address all of these sensor setup activities in more detail. Always review your sensor manual for information which may supersede the contents referred to here.

Basis Weight Sensor Setup

Newer sensor manuals may address all of these sensor setup activities in more detail. Always review your sensor manuals for information which may supersede the contents referred to in this chapter.

Table 6-1 Basis Weight Sensor Setup

Procedure	Refer To
Align the Sensor Heads	page 45
Set up the Temperature/Air Flow	page 118
Enter the Head Constants	page 127
Set the Standardize Limits	page 141
Verify the Sensor Function	page 155
Setup for Correct Ream Size	page 124
Air Temperature Compensation	page 157
Air Profile Compensation	page 161

IR Moisture Sensor Setup

Table 6-2 IR Moisture Sensor Setup

Procedure	Refer To
Align the Sensor Heads	AccuRay 1190 HemiPlus Moisture Sensor manual, 101766-003
Set up Cooling Unit	page 59
Adjust the Air Wipes	AccuRay 1190 HemiPlus Moisture Sensor manual, 101766-003
Enter the Head Constants	page 127
Set the Standardize Limits	page 141
Verify the Sensor Function	page 155
Setup Default Compensation	page 167

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

OptiPak Sensor Setup

Table 6-3 OptiPak Sensor Setup

Procedure	Refer To
Align the Sensor Heads	<i>AccuRay 1190 OptiPak Sensor manual, 101766-007</i>
Air Pressure Verification	<i>AccuRay 1190 OptiPak Sensor manual, 101766-007</i>
Calibration of the Head Constants	
Set the Standardize Limits	
Verify the Sensor Function	
Set up the Air Profile Compensation	

Ash Sensor Setup

Table 6-4 Ash Sensor Setup

Procedure	Refer To
Align the Sensor Heads	page 45
Set up the Temperature /Air Flow	page 118
Verify Source High Voltage Supply Power-up and Adjustment	For STLXR3, refer to <i>Smart Ash Sensor Manual, Part Number 101766-015</i> For TLXR3, refer to <i>1190 2-Component and 3-Component Ash Sensors Manual, Part Number 101766-006</i>
Enter the Head Constants	page 124
Set the Standardize Limits	page 141
Verify the Sensor Function	page 155
Setup Default Compensation	page 167

Gloss Sensor Setup

Table 6-5 Gloss Sensor Setup

Procedure	Refer To
Align the Sensor Heads	<i>AccuRay 1190 Gloss Sensor Manual 101766-008</i>
Adjust the Air Wipes	
Filter Regulator Assembly	
Air Supply Quality Verification	
Enter the Head Constants	page 127
Set the Standardize Limits	page 141
Verify the Sensor Function	page 155
Set up the Air Profile Compensation	page 161

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Apparent Density Setup

Table 6-6 Apparent Density Setup

Procedure	Refer To
Set up for Correct Density Units	page 114

Caliper Sensor Setup

Table 6-7 Caliper Sensor Setup

Procedure	Refer To
Power Checks	
Caliper Filter Regulator Assembly	<i>Contacting Caliper Sensor Manual, 101766-005</i> <i>Caliper Sensor Technical Manual with FirstSight Technology, 101045-001</i>
Air pressure Verification	
Align the Sensor Heads	<i>Non-Contacting Caliper Sensor Manual, 101800-001</i>
Set Up the Temperature Controller	page 118
Enter the Head Constants	page 139
Set the Standardize Limits	page 141
Verify the Sensor Function	page 155
Set Up the Air Profile Compensation	page 161
Set Up for Correct Units (Mils/ Microns)	page 125

Sheet Temperature Sensor Setup

Table 6-8 Sheet Temperature Sensor Setup

Procedure	Refer To
Align the Sensor Heads	<i>Sheet Temperature Sensor Reference Manual, 101766-010</i>
Air Purge	
Power Checks	
Calibrate and Enter the Head Constants	
Set the Standardize Limits	
Verify the Sensor Function	

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Smoothness Sensor Setup

Table 6-9 Smoothness Sensor Setup

Procedure	Refer To
Alignment of Sensor Heads	
Set Up the Cooling Unit	<i>AccuRay 1190 Liquid Cooling Unit Reference Manual, 101333-003</i>
External Electronics Setup	
Nitrogen System Setup	
Digital Input Invert Adjustment	page 166
Performance Verification	

Microwave Sensor Setup

Table 6-10 Microwave Sensor Setup

Procedure	Refer To
Alignment of Sensor Heads	<i>Microwave Moisture Sensor Manual, 101766-004</i>
Enter the Head Constants	page 140
Calibrate Temperature Compensation	
Verify Sensor Function	<i>Microwave Moisture Sensor Manual, 101766-004</i>
Setup Default Compensation	page 167

Smart Color Sensor Setup

Table 6-11 Smart Color Sensor Setup

Procedure	Refer To
Alignment of Sensor Heads	Refer to the <i>Smart Color Sensor Support Manual, 101797-001</i> .
Enter the Head Constants	
Set Standardize Limits	
Verify Sensor Function	

IR CoatWeight Sensor Setup

Table 6-12 IR CoatWeight Sensor Setup

Procedure	Refer To
Alignment of Sensor Heads	Refer to the <i>Smart ReflectionPlus CoatWeight Sensor Manual, 103029-001</i> .
Enter the Head Constants	
Set up Cooling Unit	
Set Standardize Limits	
Verify Sensor Function	

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Operation of the Sensor Health Pages

1. Press the F7 key to open the Health Page window from the DESQview™ window showing the AVOS (\$\$) prompt..

The first page to appear after the startup data is the Overview page (see [Figure 6-1](#)). The Overview page shows the Smart Platform status of each sensor, the Frame Control Panel (FCP) status, and the scanner graphic with numeric positions. Each sensor in the status display shows a key identifier in brackets. This is the key stroke which will give access to the sensor specific Health Pages.

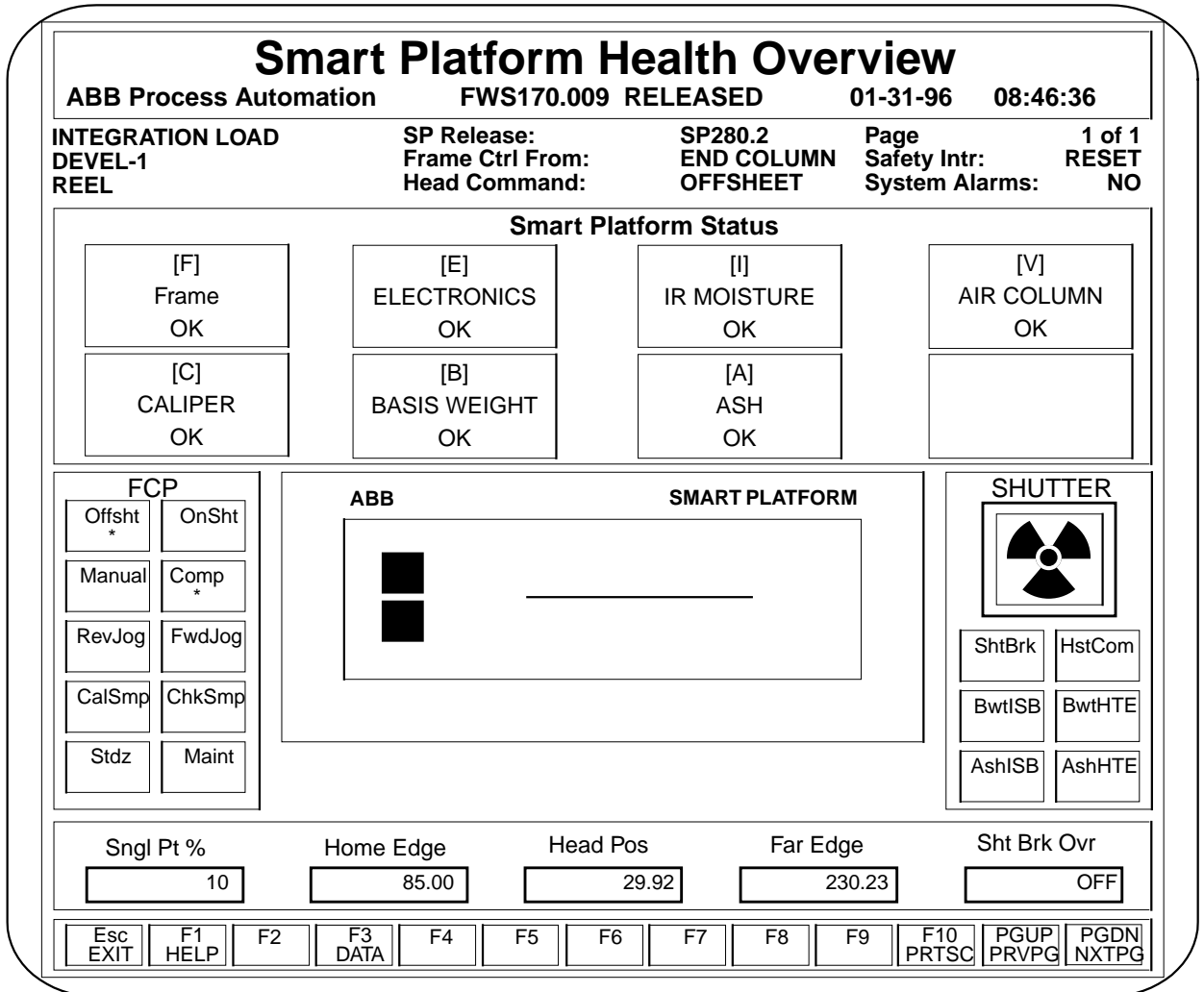


Figure 6-1 Example of the Health Overview Page

On each page, the TAB key will initially make the cursor visible. Subsequent pressing of the TAB key will move the cursor to each sub-panel where selections can be made.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

In the setup panel of each subsystem page, the TAB key will initially make the cursor visible. Subsequent pressing of the TAB key will cycle the cursor between the various subsections of each page.

Within the interactive subsection areas of each page, the arrow keys move the cursor according to the following rules:

- Left and right arrows move the cursor horizontally within each setup panel, highlighting each entry area on that line.
 - The up and down arrows move the cursor to other lines within the selected page.
2. To change numerical data, enter the new value and press RETURN. For other entries, the space bar will toggle through the selection options. Press RETURN when a desired selection appears.
 3. To select a panel, use the F6 through F9 keys which correspond to SETUP, STDZ, SMPCK, and CALIB.

The SETUP selection provides one or more panels in sequence which may be used to enter tuning constants, standardize limits, and other setup parameters associated with the selected sensor.

The STDZ selection provides pending and current Standardize Reports sequentially in the lower right-hand corner of the page.

The CALIB selection provides the Calibrate Sample Report in the lower right-hand corner of the page.

The SMPCK selection provides the Sample Check Report in the lower right-hand corner of the page.

The PGUP/PRVPG and PGDN/NXTPG keys allow the selection of other sensor pages which may be available. Not all sensors have multiple pages.

4. To return to the Overview Page, press the ESC key. New subsystem reports can be selected without going back to the Overview Page.
5. To exit the Health Page Report, press the ESC key while on the Overview Page. Additional prompts will appear to determine the desire to leave in the workstation mode. Confirm the desire to exit and do a *gstore* if data has been changed.

The F1 HELP key on the Overview Page gives more detailed information on the Health Report operation.

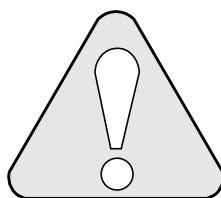
For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Temperature Controller Setup for Basis Weight, Ash, and Caliper Sensors

Temperature control maintains the measurement area environment for critical internal components and controls the temperature of the external air column (CAP). Standard operating conditions include mill air temperature environments that vary between 10°C and 85°C and sheet temperature up to 148°C. The environment for internal components and the temperature of the external air column are controlled by the microcontrollers in the AccuRay Smart Processing Center (ASPC). The software control has an accuracy of $\pm 2^\circ\text{C}$ and will maintain the set point within a precision of 0.5°C. Controller set up is done at the Service Workstation using the Caliper, Ash, and Basis Weight Health Pages. See [Figure 6-2 on page 119](#) for an example of the Basis Weight Health Page (the Ash Health Page is similar). For instructions on how to use the health pages, see the section entitled “[Operation of the Sensor Health Pages](#)” on page 116. Do not change the kp, ki, or kd constants without consulting a specialist.

Temperature controller tuning parameters are determined by the nature of the thermistor type and the immediate heating environment involved. Use the Caliper, Ash, and Basis Weight Health Pages (see “[Operation of the Sensor Health Pages](#)” on page 116) to make the appropriate entries.



Temperature target should be between 45° C and 65° C (never above 65° C) or electronics damage may occur. Set temperature about 10° to 20° cooler than the temperature four inches from the sheet.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

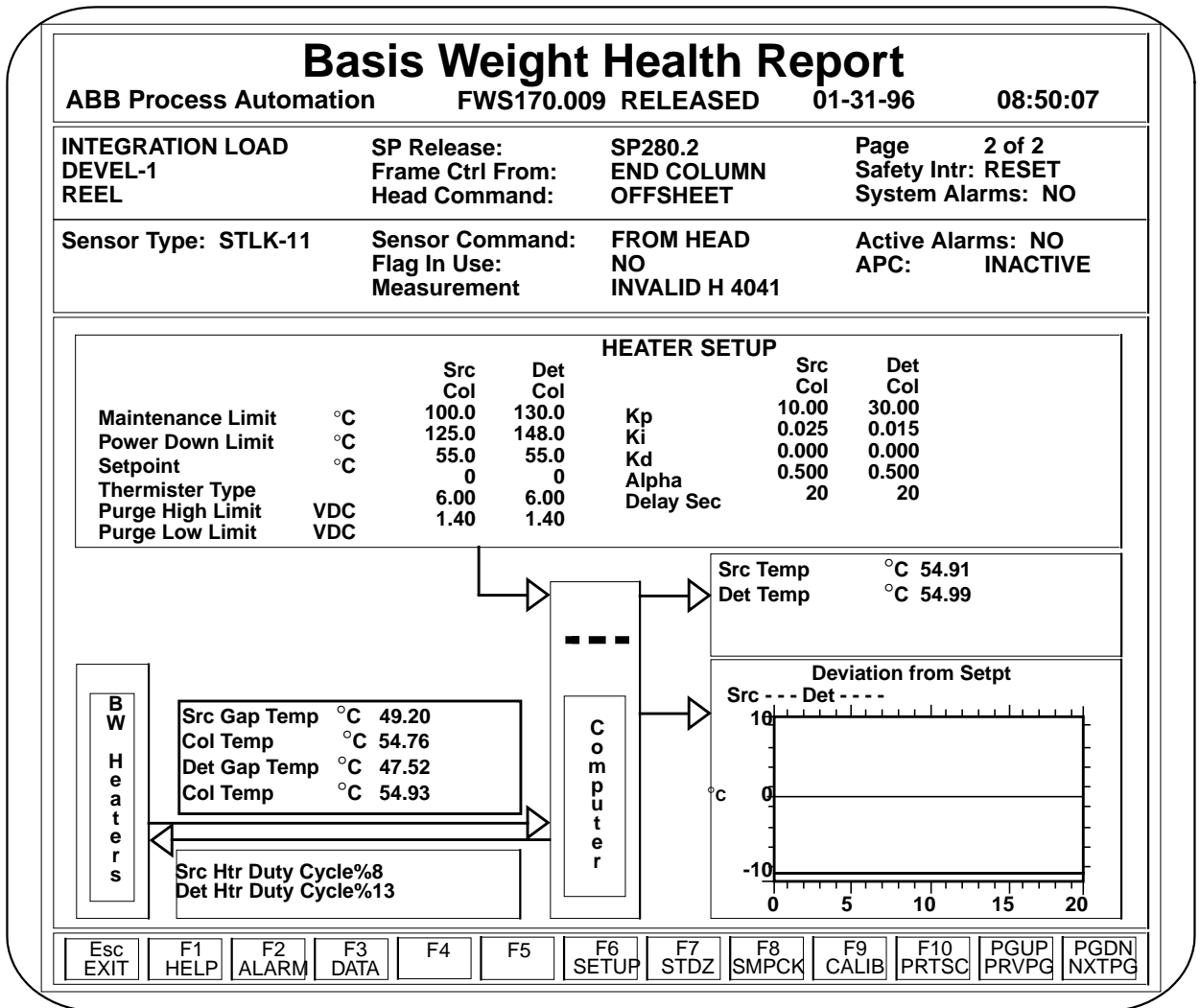


Figure 6-2 Example of Basis Weight Health Page 2 of 2 for Heater Setup

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Smart Ash and Smart Basis Weight

Temperature controller setup consists of setting control set points and adjusting the air flow. The set point for both the source and detector module should be the same (see [Table 6-14 on page 122](#)). The air flow should be adjusted for 4 - 4.5 scfm air flow for each module.

1. Be sure that the Ash and Basis Weight sensor modules are cold and have been off-sheet and powered down so that the heads start off cool.
2. Turn Off the air flow to each module. The valves are located on the air manifold on the back of the basis weight source and detector modules. Valves should be marked.
3. Set the temperature set point for each module.

Note: This adjustment must be made before the source controller begins to operate. If additional time is required, move the source set point to a higher temperature. Be sure not to leave the controller at this higher temperature.

4. Adjust the source air flow while observing the source heater current at the Service Workstation. Adjust flow for 2.2 amperes, this should correlate to about 4.0 scfm. The on time duty cycle must be at 100.
5. Repeat Step 4 for the detector module flow and detector heater current.
6. Reset the temperature set points for the desired operating point as directed in [Table 6-14](#).

Note: A hot process requires higher set points. For basis weight and ash, the CAP air system will provide both heating and cooling capabilities, different from previous designs.

7. If ambient conditions are greater than 85°C, then air flow to each module must be increased. If an air flow of 8.5 scfm is reached at about 3.5 amperes, refer to [Table 6-13 on page 121](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 6-13 Flow Versus Current with the Heater Fully On

PTC Heater Character at 30°C Input Air	
Amperes	scfm
1.4	2.2
1.8	3.7
2.6	5.7
3.6	8.7
3.7	9.8
Flow \approx Amps * 2.8 - 1.8	

8. Jog the head package to the coldest location, probably off-sheet, for at least one hour. Verify that the source and detector heater duty cycle is less than 90%. See [Figure 6-2 on page 119](#) for detector heater and source heater duty cycles.
9. Locate the head package in the hottest location for one hour. Verify that the source and detector heater duty cycle is greater than 5%.
10. If Steps 8 or 9 fail, then repeat Steps 4 and 6 to obtain reasonable operation. Increasing air flow or control set point will increase duty cycle; lowering air flow or control set point will reduce the duty cycle.

Note: When the sensors are cold, allow 20 minutes before control begins to operate. One hour is required before the sensors are stable enough for measurement or before duty cycle evaluation.

The Basis Weight detector sensor has a longer thermal time constant. It will take longer for it to come into control.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Temperature Controller Tuning Parameters

Refer to [Table 6-14](#).

* Set to a nominally estimated sheet temperature

** Set to 5° C less than the head heater set point

*** Set to 10° C less than the head heater set point

Table 6-14 Temperature Controller Tuning Parameters

Temperature Controller	Set Point	Therm Type	Delay	Gain (Kp)	Ki	Kd	Filter (alpha)	Cont No.
BW source head (TLK/TLP)	*	0	20	18.000	0.003	0	0.500	0
BW detect head (TLK/TLP)	*	0	20	15.000	0.002	0	0.500	1
BW detect head (TLS)	*	1	20	15.000	0.003	0	0.500	1
BW source CAP	**	0	200	18.000	0.003	0	0.500	0
BW detect CAP	**	0	200	18.000	0.003	0	0.500	1
BW source HAW	***	0	20	15.000	0.006	0	0.500	0
BW detect HAW	***	0	20	5.000	0.003	0	0.500	1
BW source head (STLK-11, STLP-3)	*	0	20	10.000	0.025	0	0.500	0
BW detect head (STLK-11, STLP-3)	*	0	20	30.000	0.015	0	0.500	1
Ash source head (old)	*	0	0	24.000	0.002	0	0.500	0
Ash source head (STLXR)	*	0	80	10.000	0.025	0	0.500	0
Ash detect head (STLXR)	*	0	80	25.000	0.01	0	0.500	1
Caliper probe	*	1	60	2.0	0.04	0	0.500	0

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Using the Optional Temperature Controller Utility

1. At the \$\$ prompt, Type:

uc_heat n

(where n = 1 for BW head heaters)

6 for Ash head heaters

34 for IR head heaters

35 for Caliper probe

36 for HAW/CAP

39 for BW HAW/CAP heaters

2. When enter menu comes up, select 2 to change heater setup data.

```
Current Microcontroller number is 0x1
Enter 1 to display heater data
      2 to change heater setup data
      3 to monitor one controller
      4 to change microcontroller number
      5 to quit this utility: 1
```

3. When asked, select the desired controller number. The utility requests inputs in the following order (xxx indicates the current value):

Enter temperature target scaled by 10 (or <cr> for xxx):

Are further changes needed for this heater controller? (y or n):

(answer n if just want to set target)

Thermister type 0 for 5k, 1 for 100k (<cr> for xxx):

Startup delay in seconds (<cr> for xxx):

Controller gain (K) scaled by 1000 (<cr> for xxx):

Integration constant (Bi) scaled by 1000 (<cr> for xxx):

Derivative constant (Nd) scaled by 1000 (<cr> for xxx):

Noise filter constant (alpha) scaled by 1000 (<cr> for xxx):

4. At the conclusion, the utility will respond with the line:

Enter heater controller number (0 - 3), 4 to send, or 5 to abort:

Either select a new controller on that same ECS board, send the new data to the ECS board, or abort the process.

If all the microcontroller within the ECS board have been changed during the session, the data will automatically be sent down without requesting it manually.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Setup of Customer Units

Ream Size

The ream size conversion factor converts the internal computation of basis weight from grams per square meter (gsm) to customer units of pounds per ream. If customer units are to be gsm, the conversion factor is 1.0. Consult the Calibration Report for the correct value and enter it into the software variable name **reamSize**. Ream size is, by default, controlled from the Smart Platform Basis Weight Health Page. It is possible to have the Host Computer determine the Ream Size by changing a flag called **hostDefaultReamSize** in the **betaSensor01** object using the inspect utility. If this flag is set to a “1”, the ream size will be determined by what the host sends down at a grade change or a PMMRLD command. If it is a “0”, the default condition, then the Health Page controls it exclusively. It is still possible to temporarily change it from the Health Page as shown below, however, care must be taken to return it to its original value when done. This feature is only available on Software Release 280.2 or later, and it will only function if the host has been modified to use it.

Changing Ream Size

1. Access the Basis Weight Health Report from the Service Workstation. Refer to [Figure 6-2 on page 119](#).
2. Press the TAB key to cycle the cursor to the setup panel. Use the arrow keys to position the cursor on the Ream Size entry.
3. Change the ream size by changing the Ream Size value on the setup panel of the Basis Weight Health Report.
4. Changes to ream size are immediately displayed in the Measurement Results panel of the Basis Weight Health Report.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Apparent Density

Apparent density is a computation of basis weight divided by caliper. It is presented on the Host computer display in LMR units. This is weight per Mil–Ream. The default units in the software are metric, or grams per micron–square meter. This is controlled by an instance variable called **customerUnitsConversionFactor** in the **pmmApDens01** object. For metric systems, the value is 1.0. For English systems, the value will depend upon the ream size and is governed by the following algorithm:

$$\text{customerUnitsConversionFactor} = 0.0052 * \text{reamSize}$$

Using the above algorithm, the computed value for **customerUnitsConversionFactor** should be entered into the system using the **inspect** utility and typing the following at the I>:

```
0[pmmAppDensity01 customerUnitsConversionFactor:x.x]
```

and then stored on the diskette to the PMM community by using the **gstore** utility. To make the change effective without restarting the system, simply initiate a small edge change. The recalculation of the **customerUnitsConversionFactor** is included in the edge change adjustment activity.

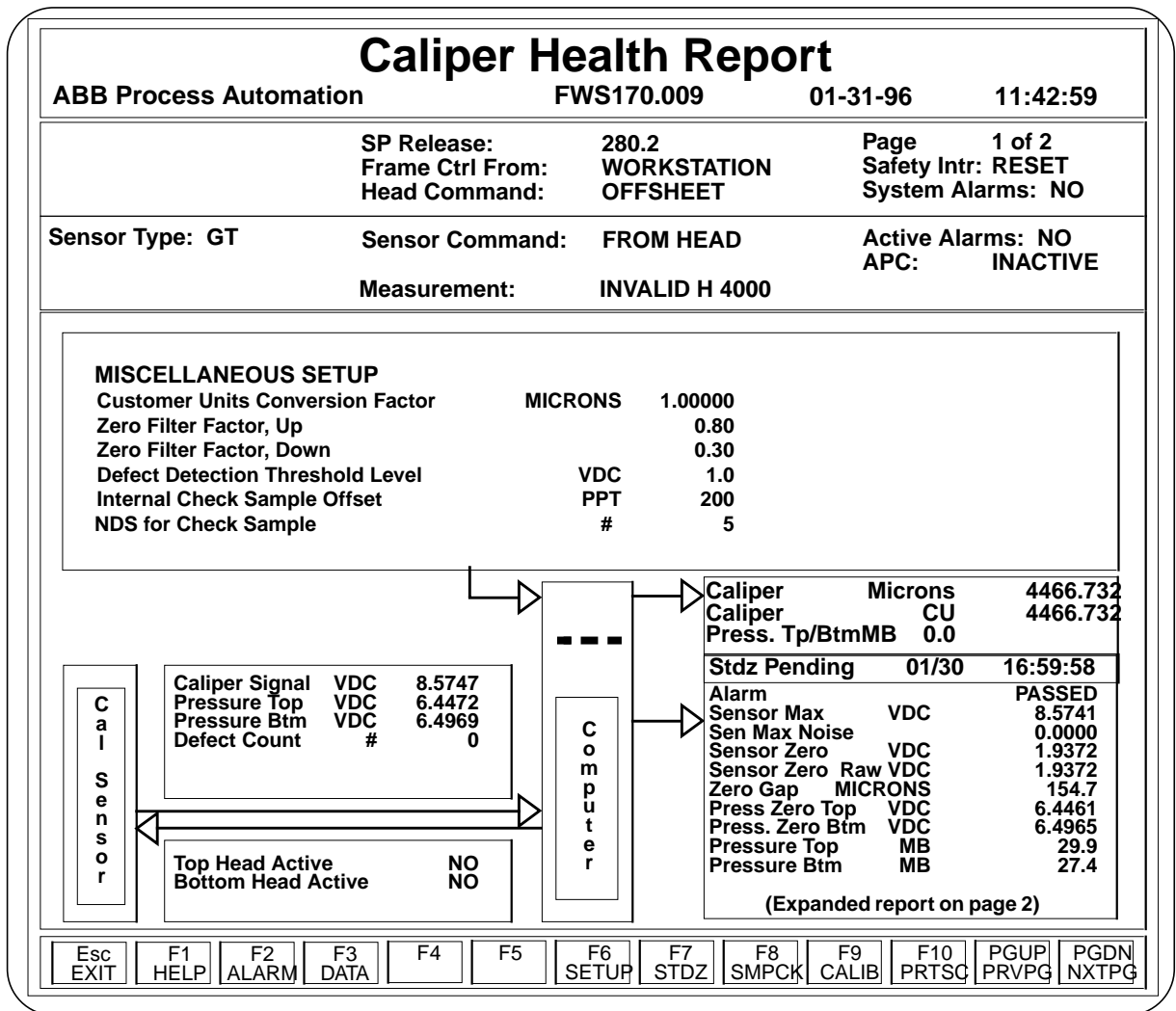
Changing Caliper Output Units

To change the output units for the Caliper sensor, access the Miscellaneous Setup panel on the Caliper Health Report. Refer to [Figure 6-3 on page 126](#).

1. Press the F6 key to bring up the desired setup page.
2. Place the cursor on the units designation and press the SPACE BAR at the terminal to toggle through the selections of units.
3. Press the RETURN key when the desired units appear.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.



For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Enter Calibration Head Constants

Calibration head constants have to be entered into the Smart Platform software. The values for these constants can be found on reports for the Basis Weight (includes Air Column), and Ash sensors or tags for the IR Moisture and Caliper sensors. For the OptiPak and Gloss sensor, values are entered through an interactive **genrpt** program that allow the software to calibrate the constants it needs on line.

Basis Weight Sensor

The Basis Weight sensor head constants are K0, K1, K2, K3, WCC, and AM. These constants may be different for every sensor. They may need to be changed if certain components in the sensor geometry are repaired or replaced. Change sensor constants using the Basis Weight Health Page, [Figure 6-4 on page 128](#). See [“Operation of the Sensor Health Pages” on page 116](#), for instructions for using the Health Pages.

The Basis Weight sensor calibration constants consist of one or two sets of constants. [Table 6-15](#) lists the head constants for the Basis Weight sensor, which are different for each sensor manufactured.

[Table 6-16 on page 128](#) lists the optional constants for the Air Temperature Compensation (ATC) which are determined by the sensor model number.

Table 6-15 Basis Weight Calibration Constants

Head Constant	Value – betaSensor01 (Enter values from the Calibration Report)
K0	
K1	
K2	
K3	
WCC (Smart Basis Weight only)	
AM (Smart Basis Weight only)	

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

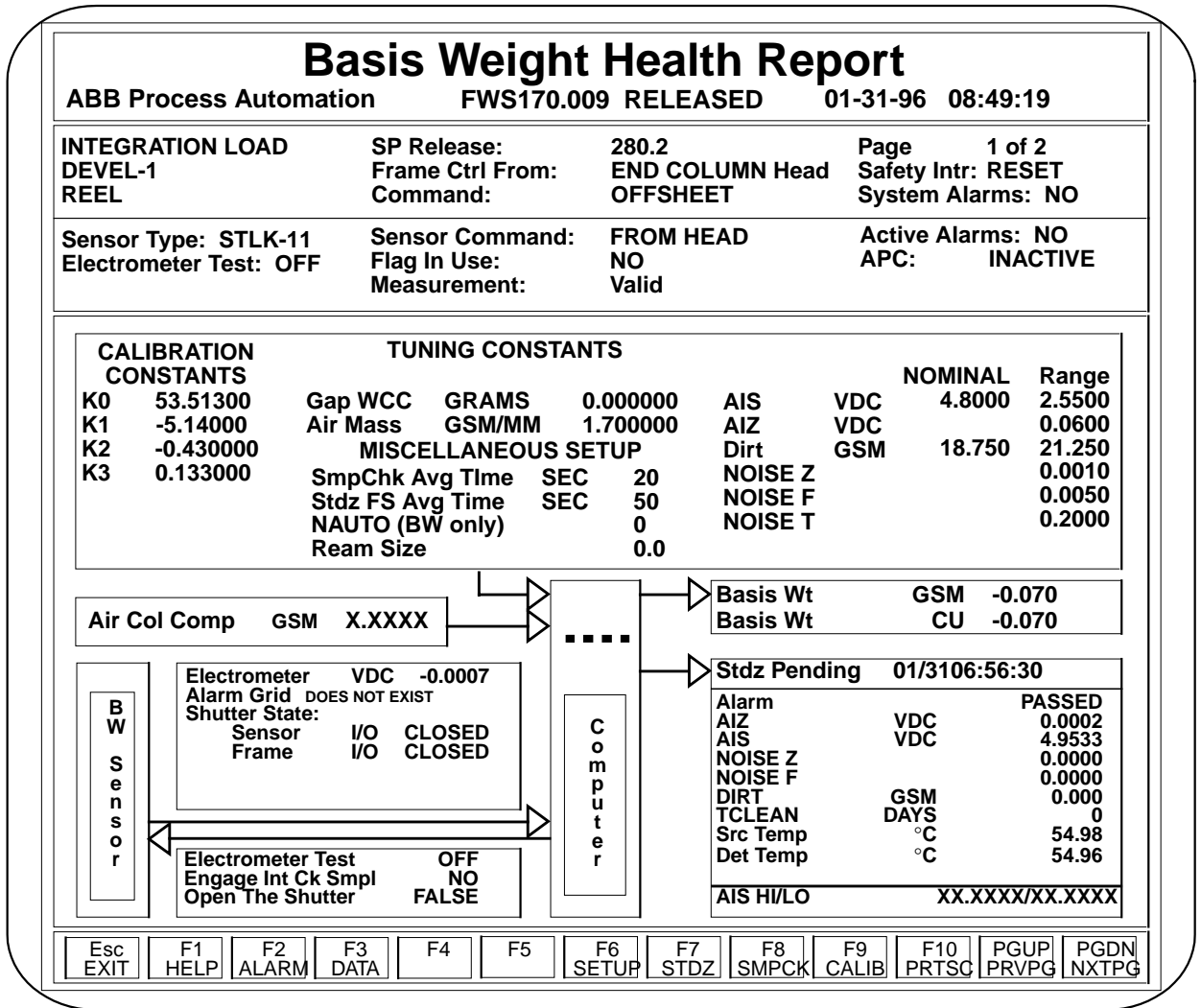


Figure 6-4 Basis Weight Sensor Health Report Showing Calibration Constants

Table 6-16 Basis Weight Sensor ATC Calibration Constants

ATC Constant	Basis Weight Sensor Model			
	TLK-5	TLK-8	TLK-9	TLP-1
KT0	0.0	0.09765	0.1758	0.0
KT1	0.5859	0.09375	0.2148	0.1953
KT2	-0.3477	0.2813	0.0	0.1953
KT3	0.0	0.0	0.0	0.0
dBWdT	-0.1	-0.1	-0.1	-0.1

Enter the calibration head constants into the Smart Platform software through the Basis Weight Health report.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Air Column Measurement (Smart Basis Weight Sensor Only)

Air column measurement constants are changed using the Air Column Sensor Health Report in a manner similar to the way Basis Weight sensor constants are changed (see [Figure 6-4 on page 128](#) and [Figure 6-5](#)). There are five air column measurement sensor constants, KZ0, KZ1, KZ2, KZ3, and gap offset (see [Table 6-17 on page 130](#)). These constants are shown as K0, K1, K2, and K3 on the screen.

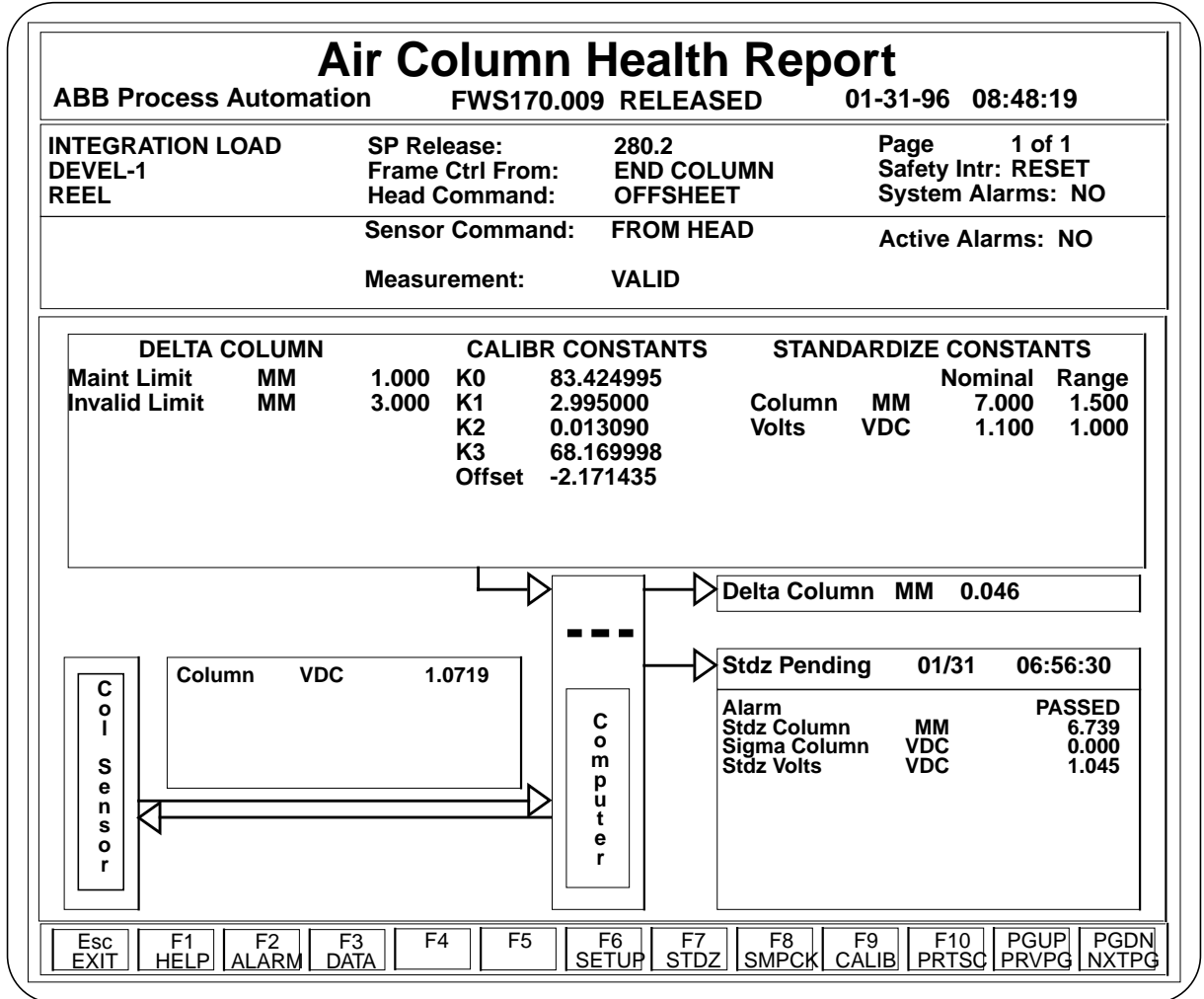


Figure 6-5 Air Column Measurement Health Report

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 6-17 Air Column Measurement Constants

Head Constant	Value (Enter values from the Calibration Report)
KZ0	
KZ1	
KZ2	
KZ3	
gap offset	

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

IR Moisture Sensor

Calibration head constants are found on the calibration tags on each IR sensor. To enter those values into the Smart Platform software, follow the instructions in “Operation of the Sensor Health Pages” on page 116. The head constants are listed in Table 6-18 on page 132.

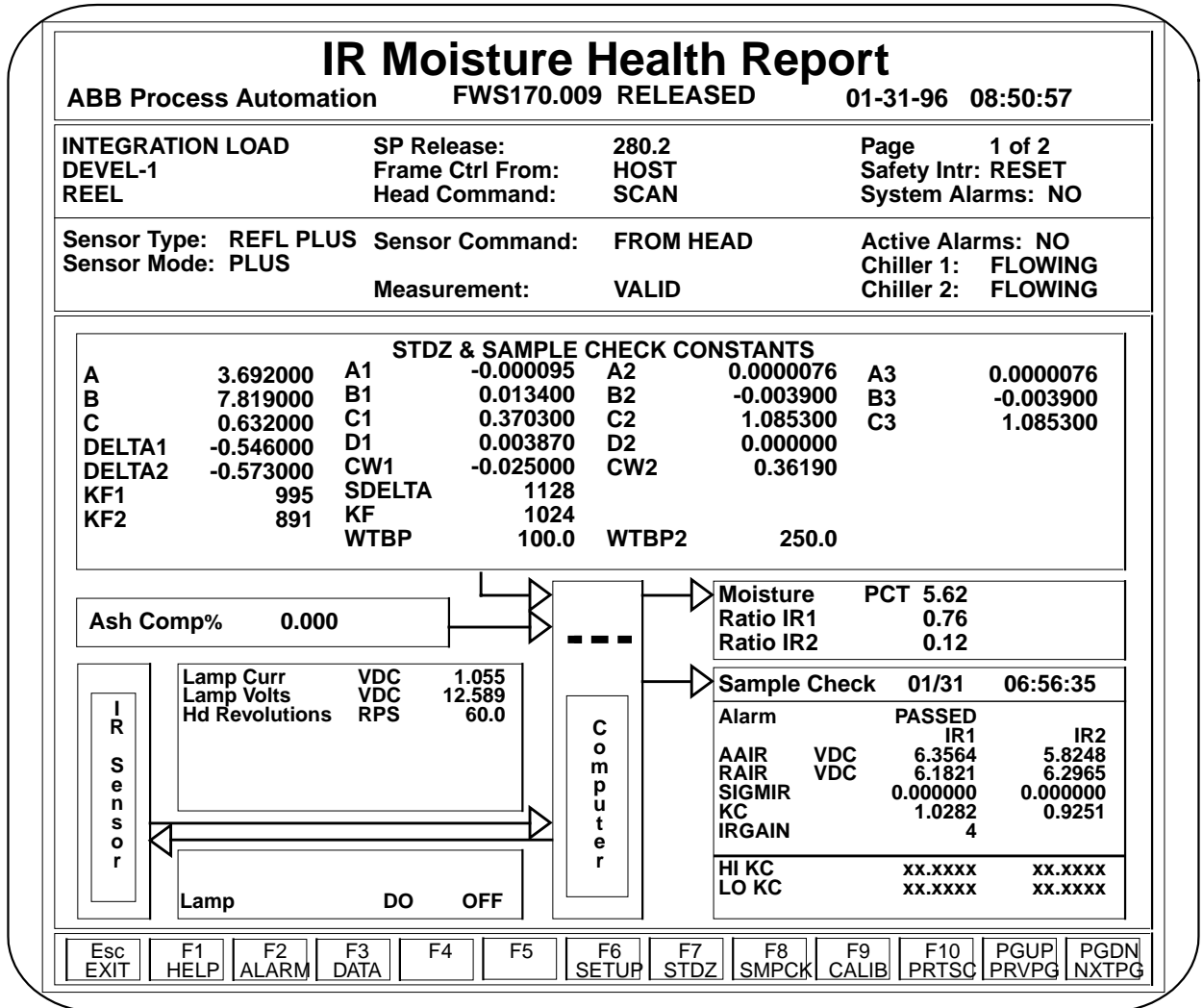


Figure 6-6 IR Moisture Health Report Showing Calibration Constants

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 6-18 Head Constants

Nameplate Name	Value to Enter
A1	
A2	
CW	
B1	
B2	
WTBP	
SDELTA or DELTA	
A	
B	
C	
DELTA1	
DELTA2	
KF1 of KF	
KF2	
A1	
B1	
C1	
D1	
CW1	
A2	
B2	
C2	
D2	
CW2	
A3	
B3	
C3	
WTBP1	
WTBP2	

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Ash Sensor

The Ash sensor uses seven unique head constants for a flag-in operation and another unique seven constants for a flag-out operation. If the sensor is a Smart Ash, then there are an additional two head constants required. These are listed in Table 6-19. The 14 values for flag-in/flag-out operation are found in the Ash Calibration Report. The two additional constants for Smart Ash operation are found in the calibration report for the Smart Basis Weight, under the Air Column data.

Head constants from the calibration report can be entered into the system using the Ash Sensor Health page, [Figure 6-7 on page 134](#). The second setup panel is selected by pressing the F6 function key. See [“Operation of the Sensor Health Pages” on page 116](#), for instructions on using the Health Pages. [Table 6-19](#) lists the head constants for the Ash sensor.

Table 6-19 Ash Sensor Head Constants

Head Constant	Flag-In	Flag-Out
BW Corr Factor (A2)		
Corr Offset (B2)		
Mo Corr Factor (C2)		
K0		
K1		
K2		
K3		
Gap WCC (Smart Ash Only)		
Air Mass (Smart Ash Only)		

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Ash Health Report

ABB Process Automation		05-26-92	11:00:35
-------------------------------	--	-----------------	-----------------

Workstation Mode Test 1 1	SP Release: Frame Ctrl From: Head Command:	SP210.5 END COLUMN OFFSHEET	Page Safety Intr: System Alarms:	1 of 2 RESET NEW
--	--	-----------------------------------	--	------------------------

Sensor Type: S3-C	Sensor Command: Flag In Use: Measurement	FROM HEAD NO INVALID H 4846	Active Alarms: APC:	NO ACTIVE
-------------------	--	-----------------------------------	------------------------	--------------

CALIBRATION CONSTANTS			FULL SCALE STANDARDIZE LIMITS		
	Flag In	Flag Out		Flag In	Flag Out
BW Corr Factor (A2)	28.79000	28.18000	Nominal	5.1000	6.0000
Corr Offset (B2)	-33.03000	-33.14000	Range	1.0000	1.0000
Mo Corr Factor (C2)	0.011330	0.10940	Noise Range	0.5000	0.5000
K0	49.56200	53.51300			
K1	-5.02000	-5.14000			
K2	-0.350000	-0.430000			
K3	0.138000	0.133000			

<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Basis Wt Comp</td> <td style="width: 10%;">GSM</td> <td style="width: 20%;">150.00</td> </tr> <tr> <td>Moisture Comp</td> <td>%</td> <td>7.00</td> </tr> <tr> <td>Air Col Comp</td> <td>GSM</td> <td>X.XXX</td> </tr> </table>	Basis Wt Comp	GSM	150.00	Moisture Comp	%	7.00	Air Col Comp	GSM	X.XXX	<div style="border: 1px solid black; padding: 2px;">▶</div>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Ash Wt</td> <td style="width: 10%;">GSM</td> <td style="width: 20%;">0.000</td> </tr> </table>	Ash Wt	GSM	0.000
Basis Wt Comp	GSM	150.00												
Moisture Comp	%	7.00												
Air Col Comp	GSM	X.XXX												
Ash Wt	GSM	0.000												

<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: center;">A s h</td> <td style="width: 10%;">Electrometer</td> <td style="width: 10%;">VDC</td> <td style="width: 10%;">0.0229</td> </tr> <tr> <td></td> <td>Hi Volt Mon</td> <td>VDC</td> <td>5.4174</td> </tr> <tr> <td></td> <td>Anode I Mon</td> <td>VDC</td> <td>0.6152</td> </tr> <tr> <td></td> <td colspan="3">Shutter State:</td> </tr> <tr> <td></td> <td>Sensor</td> <td>DI</td> <td>CLOSED</td> </tr> <tr> <td></td> <td>Frame</td> <td>DI</td> <td>CLOSED</td> </tr> </table>	A s h	Electrometer	VDC	0.0229		Hi Volt Mon	VDC	5.4174		Anode I Mon	VDC	0.6152		Shutter State:				Sensor	DI	CLOSED		Frame	DI	CLOSED	<div style="border: 1px solid black; padding: 2px;">▶</div>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="3">Stdz Current MM/DD HH:MM:SS</td> </tr> <tr> <td colspan="3">Alarm PASSED</td> </tr> <tr> <td>AIZ</td> <td>VDC</td> <td>0.0000</td> </tr> <tr> <td>NOISE Z</td> <td>VDC</td> <td>0.0000</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">Flag In Flag Out</td> </tr> <tr> <td>AIS</td> <td>VDC</td> <td>5.1000 6.0000</td> </tr> <tr> <td>Noise F</td> <td>VDC</td> <td>0.0000 0.0000</td> </tr> <tr> <td>Src Tmp</td> <td>°C</td> <td>0.00 0.00</td> </tr> <tr> <td>Det Tmp</td> <td>°C</td> <td>0.00 0.00</td> </tr> <tr> <td>HV Mon</td> <td>VDC</td> <td>0.0000 0.0000</td> </tr> </table>	Stdz Current MM/DD HH:MM:SS			Alarm PASSED			AIZ	VDC	0.0000	NOISE Z	VDC	0.0000			Flag In Flag Out	AIS	VDC	5.1000 6.0000	Noise F	VDC	0.0000 0.0000	Src Tmp	°C	0.00 0.00	Det Tmp	°C	0.00 0.00	HV Mon	VDC	0.0000 0.0000
A s h	Electrometer	VDC	0.0229																																																					
	Hi Volt Mon	VDC	5.4174																																																					
	Anode I Mon	VDC	0.6152																																																					
	Shutter State:																																																							
	Sensor	DI	CLOSED																																																					
	Frame	DI	CLOSED																																																					
Stdz Current MM/DD HH:MM:SS																																																								
Alarm PASSED																																																								
AIZ	VDC	0.0000																																																						
NOISE Z	VDC	0.0000																																																						
		Flag In Flag Out																																																						
AIS	VDC	5.1000 6.0000																																																						
Noise F	VDC	0.0000 0.0000																																																						
Src Tmp	°C	0.00 0.00																																																						
Det Tmp	°C	0.00 0.00																																																						
HV Mon	VDC	0.0000 0.0000																																																						

<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: center;">S e n s o r</td> <td style="width: 10%;">Electrometer Test</td> <td style="width: 10%;">DO</td> <td style="width: 10%;">OFF</td> </tr> <tr> <td></td> <td>Flag</td> <td>DO</td> <td>OUT</td> </tr> <tr> <td></td> <td>Open The Shutter</td> <td>DO</td> <td>FALSE</td> </tr> </table>	S e n s o r	Electrometer Test	DO	OFF		Flag	DO	OUT		Open The Shutter	DO	FALSE	<div style="border: 1px solid black; padding: 2px;">▶</div>	
S e n s o r	Electrometer Test	DO	OFF											
	Flag	DO	OUT											
	Open The Shutter	DO	FALSE											

Esc EXIT	F1 HELP	F2 ALARM	F3 DATA	F4	F5	F6 SETUP	F7 STDZ	F8 SMPCK	F9 CALIB	F10 PRTSC	PGUP PRVPG	PGDN NXTPG
-------------	------------	-------------	------------	----	----	-------------	------------	-------------	-------------	--------------	---------------	---------------

TUNING CONSTANTS			MISCELLANEOUS SETUP	
Ignition Factor		1.000	NAUTO	0
Gap WCC	GRAMS	0.000000		
Air Mass	GSM/MM	1.500000		

Figure 6-7 Ash Sensor Health Report

134

Measurement Setup

101764-003

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Sheet Temperature Sensor

Use the Sheet Temperature Health Pages to change the calibration constants (see “Operation of the Sensor Health Pages” on page 116.) Figure 6-8 shows an example of the Sheet Temperature Health Report.

For instructions on calibrating the Sheet Temperature sensor, see the *AccuRay 1190 Sheet Temperature Sensor Reference Manual, 101766-010*.

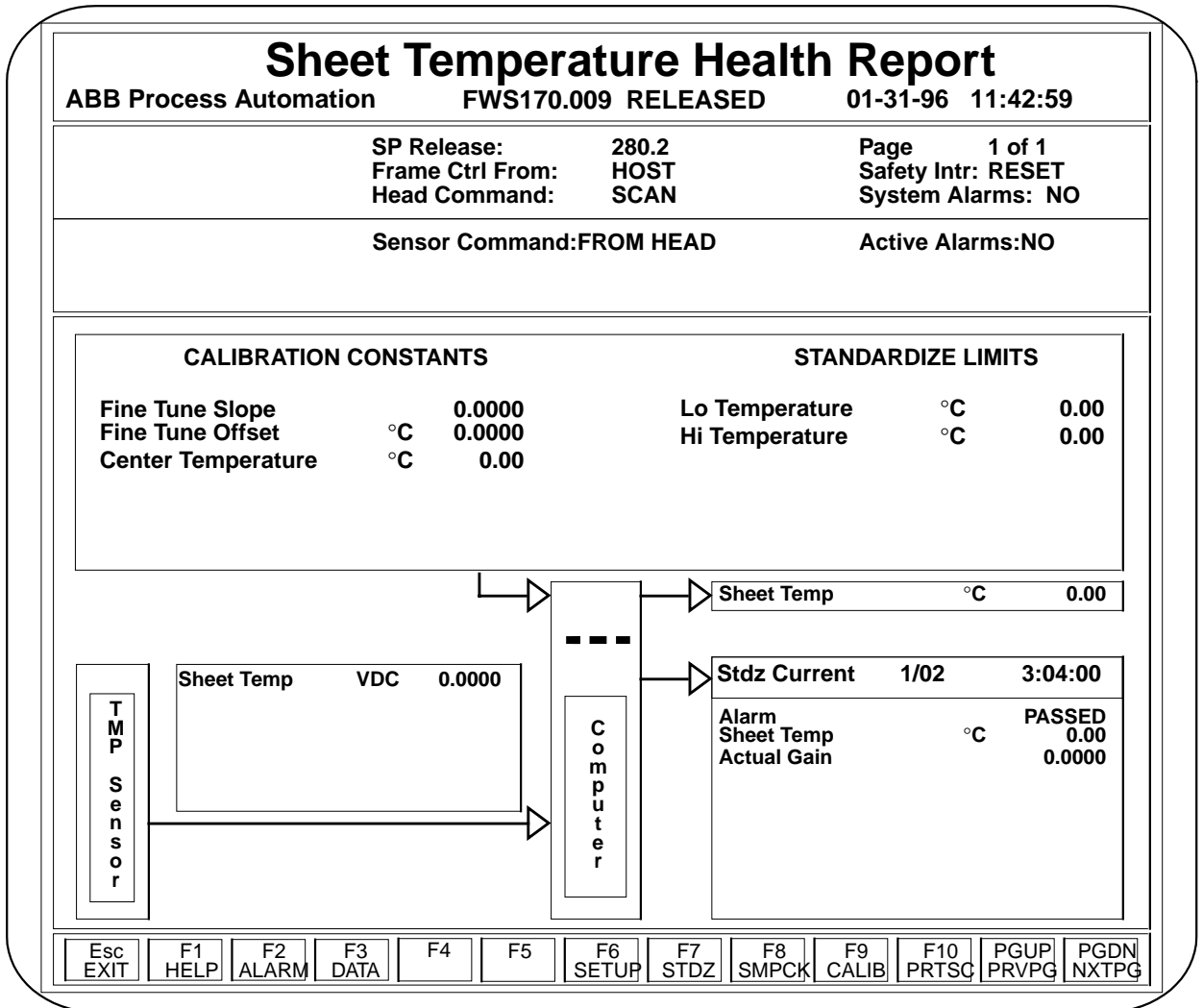


Figure 6-8 Sheet Temperature Sensor Health Report Showing Calibration Constants

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Gloss Sensor

Table 6-20 identifies the variable names of the two head constants for the Gloss sensor. Enter the values you read from the sensor head nameplate into the specified instance variable column and store them in the frame community using the **gstore** utility.

Table 6-20 Head Constants for the Gloss Sensor

NamePlate Name	Instance Variable Name	Value
GL1HC1	headConstant1	
GL2HC2	headConstant2	

1. At the \$\$ prompt type **genrpt**.

The current calibration head constants, giving variable name and current value, will be displayed on the console. The bottom portion will be an interactive question about changing, redisplaying, or recalculating the current values. See Figure 6-9.

```

GENERAL SENSOR REPORT TUNING UTILITY; rev date 8 Sep. 1989.

Enter the name of the sensor you wish to view.
TopGlossSensor01
Do you wish to view Standardize variables or Calibration constants? (s or c)
c
GLOSS SENSOR CALIBRATION CONSTANTS TUNING UTILITY; rev. date 27 Mar., 1990.

Current Calibration Constants

Variable Name      Current Value
1: headConstant1  26.00000
2: headConstant2  0.000000

Enter 1 to change head constants
    2 to re-display head constants
    3 to calculate new head constants
    q to exit

Do you wish to view another sensors report? (y or n) n
    
```

Figure 6-9 Example of Gloss Sensor Calibration Report

2. If a current value is to be changed, enter a **1** and continue to the next step. If you wish to redisplay the constants, enter a **2** and observe the screen refresh. If you wish to calculate new constants, enter a **3** and follow the interactive instructions. If no changes are to be made, answer **q** and skip to Step 6.
3. If **1** is selected, the console will then ask which variable is to be changed. Enter the variable number. If **3** is selected, go to the Gloss Sensor Head Constant Tuning Procedure below..

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

4. The console will then confirm the variable name and wait for the new value to be entered.
5. The console will ask again if a variable is to be changed. If yes, answer **y** and go back to Step 3. If no, answer **n** and continue.
6. The console will give instructions regarding the selection of another report if desired. If no, answer **n** and the utility will exit to the AVOS shell (\$\$). If yes, answer **y** and the utility will restart as if **genrpt** had just been entered.

Gloss Sensor Head Constant Tuning

The gloss head constants are adjusted so that the sensor will correlate to the laboratory measurements. Since the instruments used in the lab will read slightly different from one to another, the head constants determined in Columbus are attached to the sensor, but are marked as approximate numbers.

The following interactive procedure is to be used to fine tune the sensor response to the customer's lab. It uses two lab sample readings which are entered by the user, and the results of the sample check readings on the same two samples. The recalibration routine is selected interactively using **genrpt**. After running the routine, and there are no errors, the newly computed head constants are stored in memory. The user must save the new values to RAM disk in the frame community by using the **gstore** utility.

Note: This procedure involves a series of interactive steps including work at the console and performing sample checks. Before starting, read through the entire procedure making sure that all resources and time are available to complete the procedure without interruption.

1. Ensure that the laboratory instrument is calibrated with the calibration standards that come with it.
2. Read the Gloss sensor's check samples on the laboratory device, noting the proper measurement area and direction of measurement. Take several readings and calculate the average.
3. Allow the Gloss sensor to thermally stabilize for at least two hours. Clean the windows and standardize.
4. Place the Gloss sensor in sample check mode 1 from the Host computer.
5. Activate **genrpt** for the Gloss sensor and select recalibration by entering a **3**.
6. Enter the average Lab 1 sample value at the prompt.
7. Run a sample check on the same sample used for Lab 1.
8. Enter the average Lab 2 sample value at the prompt.
9. Run a sample check on the same sample used for Lab 2.
10. The new head constant values will be reported. If there are no errors, the user will be instructed to write the values to diskette using the **gstore** utility.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

11. Exit the sample check mode when completed.

Error Conditions

- The absolute value of the difference between the two lab values (Lab 2 – Lab 1) is less than or equal to 15.
- Calculated head constant GL1HC1 is less than 5 or greater than 50.
- Calculated head constant GL1HC2 is less than -15 or greater than 15.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Caliper Sensor

Use the Caliper Health Pages to change the calibration constants (see “Operation of the Sensor Health Pages” on page 116). Figure 6-10 shows an example of the Caliper Health Report. Caliper calibration constants for your caliper sensor may be different. See the appropriate caliper sensor manual and your calibration report.

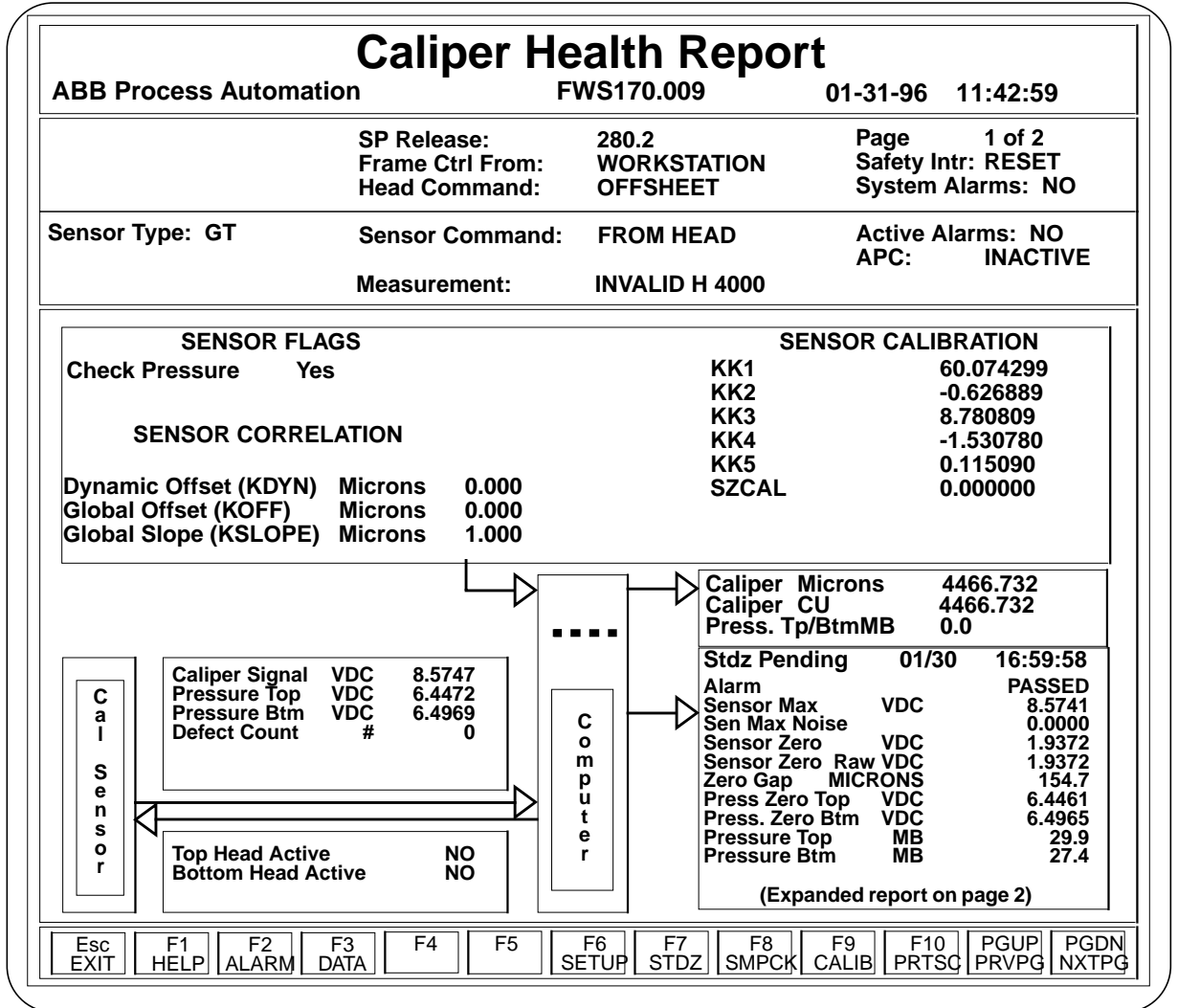


Figure 6-10 Caliper Health Report Showing Calibration Constants

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Microwave Moisture Sensor

The Calibration Head Constants are found in the Sensor Calibration Report supplied with the sensor. The entries are summarized in [Table 6-21](#) given below. Enter them into the system using the Health Reporting System.

Table 6-21 Microwave Moisture Calibration Constants

Head Constant	Value
Wt Slope Factor	
Target Moisture	
Sensor Slope	
Target Voltage	
Target Weight	
Temp Corr Coeff	
Target Temp	
Moisture Breakpoint	
Temp Correction Factor	
Temp Correction Exponent	

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Standardize Limits

Procedure for Changing Standardize Limits

Refer to “[Operation of the Sensor Health Pages](#)” on page 116 for instructions on how to enter data. Standardize limits are entered via the setup panel on each sensor report.

General Information

There are a number of options and scenarios available which control how the standardize feature is to be operated. These are:

- Time interval between standardizes
- The selection of CLEAN or DIRTY standardize modes
- Standardize delay after long off-sheet periods
- Reporting of "internal" check sample during standardize

Time Interval Between Standardizes

The time interval between standardizes is generally controlled by the host computer, except for AccuRay Direct systems. A minimum time interval should be 30 minutes. On AccuRay Direct systems, the interval is controlled by an instance variable called *stdzPeriod*, located in each of the sensor objects present in the system. If any of the sensors have a non-zero value in this variable, that value will be used to establish the standardize interval. For AccuRay Direct systems interfacing with a foreign DCS (not Smart CD to an 1180M), only one sensor needs to have an interval defined since one serves all. On AccuRay Direct systems, the default time within each sensor is set to 60 minutes. For AccuRay Direct connected to an 1180M via the Smart CD interface, the value for the *stdzPeriod* in each sensor should be set to zero if the interval being scheduled by the host is greater than 60 minutes. If it is less, then no change is required since the most frequent interval prevails.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

The Selection of CLEAN or DIRTY Standardize Modes

CLEAN and DIRTY standardizes are selectable from the host computer (1190 and 1180M) and can be either manually requested or defined at the time of automatic standardizes. Of all the sensors available in the system, only Basis Weight, GT Caliper, and OptiPak (FOB) have any sensitivity to what mode of standardize has been selected. It is possible to have one of these sensors responding to a DIRTY standardize request while the others are held to doing only CLEAN standardizes. As an example, in a system with both Basis Weight and GT Caliper, it may be desirable to have the Basis Weight sensor only doing CLEAN standardizes while the GT Caliper must be doing DIRTY standardizes due to the environmental aspects of the paper machine. In this case, the host would be set up to request DIRTY standardizes while the Basis Weight sensor on the Smart Platform is set up to do a CLEAN standardize every time a DIRTY one is requested. In all cases after a system reset, regardless of how the various CLEAN/DIRTY flags are set, the system will force a CLEAN standardize on all sensors which require one. The CLEAN request will continue until all of those sensors have passed their initial standardize.

[Figure 6-11 on page 143](#) describes the standardize CLEAN/DIRTY mode selection that takes place when a standardize is requested from either the Host, the Health Pages (HP), or the Frame Control Panel (FCP). To summarize the three situations, whenever DIRT standardizes occur and are accepted by the sensors; the OptiPak sensor can be set up to basically ignore standardize requests, the Basis Weight sensor will take into account the effect on beam absorption when dust accumulates on the window, and the GT Caliper sensor will filter the sensor zero (SZERO) results for GT Caliper to adjust for the effects caused by dust on the probes.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

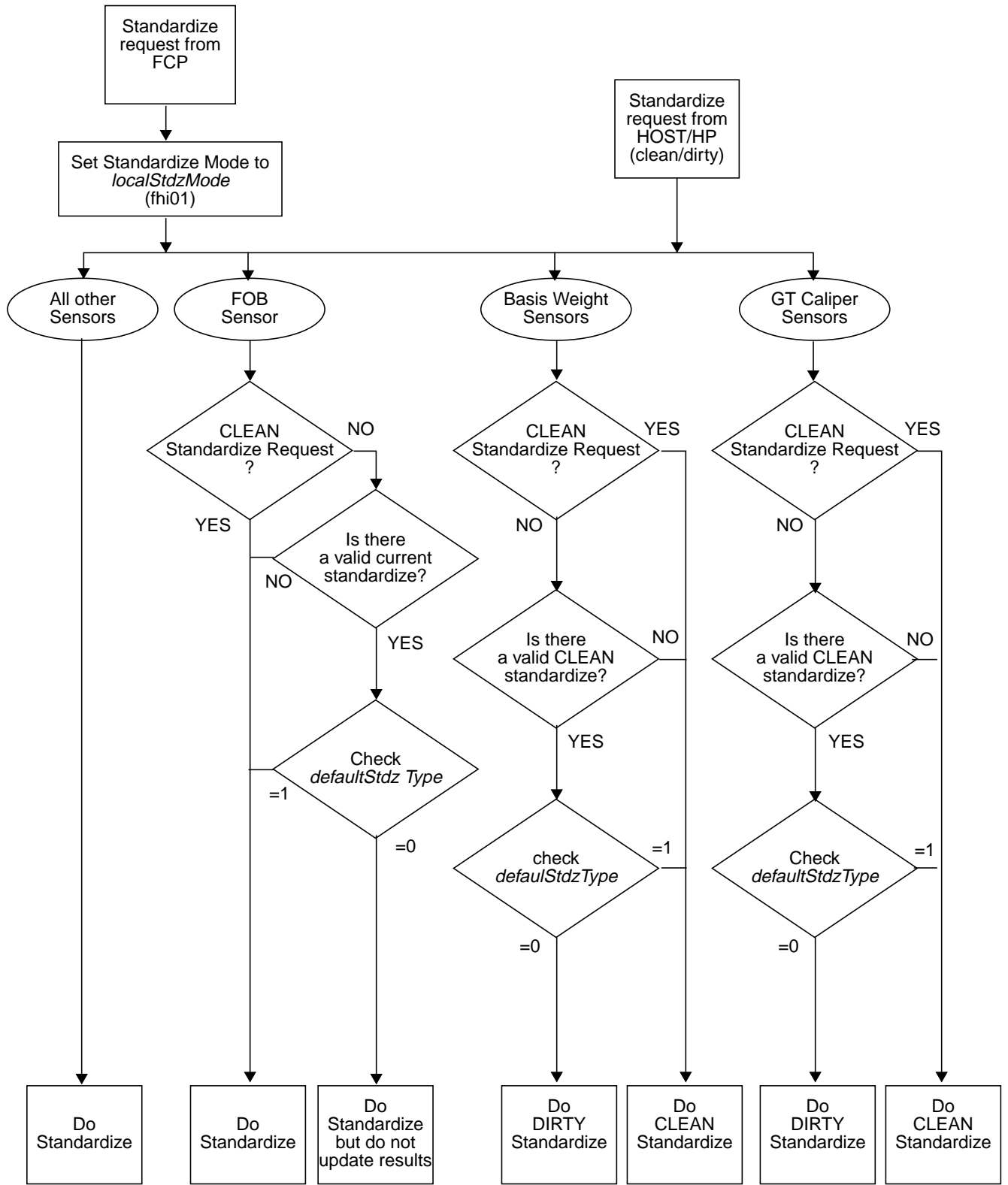


Figure 6-11 Standardize Mode Selection

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Standardize initiated from the Frame Control Panel (FCP) is either CLEAN or DIRTY depending on the state of the instance variable *localStdzMode* in the object *fhi01*. The default setting for this variable is DIRTY. This can be changed to be CLEAN by changing the value from a "0" to a "1" (if this change is to be retained after a system reset, the "fhi" graph needs to be saved with the "gstore" utility). A reset is NOT needed to make the change active.

In any CLEAN standardize request, an automatic internal check sample for those sensors so equipped, is executed.

Note: Three sensor categories require a "good" CLEAN standardize before they can be made operational after a restart. These are the OptiPak (FOB), Caliper sensor, and ALL Basis Weight sensors. After a restart, and regardless of which kind of standardize is being requested from the host, Frame Control Panel, or Health Pages, a CLEAN standardize will be scheduled for these sensors until the initial standardize is passed. The individual sensor manuals should be consulted to see the effect of a CLEAN or DIRTY standardize selection.

Standardize Delay After Long Off-Sheet Periods

There is a "delayed standardize feature" which allows the system to delay a DIRTY standardize request until the head has scanned for a specified amount of time, after the head has been off-sheet for a specified amount of time. This feature is desired where a lot of dust is present in the air and this dust settles on the GT Caliper probes while off-sheet for an extended time. In that case, the head is desired to scan (to rub the dust off the probes) before doing a standardize. This delayed standardize feature is also desirable for all the other sensors in that it assures a correct standardize after the sensors have been reconditioned to the sheet after long idle periods. Not allowing the sensors to recondition before standardizing can cause measurement inaccuracies if the head has been off-sheet long enough to cool. During this time delay, the measurements will be valid provided there was an initial good standardize.

There are four instance variables associated with this feature. Two are setup variables accessible on the Frame Health Page, *offSheetTime* and *onSheetTime*, while the other two, *stdzRequested* and *stdzDelayRequired*, both located in the **scanner01** object, are status flags used to identify the current status of any standardize delay. The *stdzDelayRequired* will indicate a 1 if the off-sheet position has been active for more than the *offSheetTime*. The *stdzRequested* instance variable will indicate if a new request from the host or Health Pages has been received after the *onSheetTime* has expired. A value of 0, the current default value for *offSheetTime* and *onSheetTime*, will turn off the feature. The recommended starting value for the off-sheet timer should be 10 minutes (600 seconds), and for the on-sheet timer, 6 minutes (360 seconds). Experiment to determine the most appropriate off and on sheet delay times for each site. This feature is bypassed when a local standardize is requested from the FCP or if a CLEAN standardize has been requested from the host or Health Pages.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Reporting of "Internal" Check Sample During Standardize

Several sensors have an internal check sample which is monitored at a CLEAN standardize request. The internal check sample can be also monitored at selected DIRTY standardize intervals. The sensors involved are Smart Basis Weight, Smart Ash, GT Caliper, Color, and IR Coat Weight. There is a instance variable called NAUTO for each of these sensors. If it is set to 0, no internal check sample will take place during a DIRTY standardize request. If it is a positive number, then the number will define the standardize interval between internal check samples done at DIRTY standardizes. If the number is set to a negative value, then the internal check sample will place it at the beginning and again at the end of the standardize sequence.

Health Page Standardize Reports

The standardize report available on the health report has two presentations:

- Pending
- Current

The Pending Report is the last standardize results, either passed or failed, that was executed. The Current Report is the last passed standardize and is the one the sensor would be currently using while scanning or in single point. If the Pending Standardize Report shows failure, the sensor will still be able to show a measurement on the Health Report, however, the data to the host will be marked invalid. Selection of the Pending/Current Report is done using the function key F7.

Changing the Standardize Mode of the FCP Standardize Request

The default standardize mode requested from the FCP is DIRTY. This can be changed to be CLEAN by changing and saving the mode flag in the FCP data base. A reset is NOT needed to make the mode flag change active. Note that regardless of the setting of the mode flag, a CLEAN standardize will always be performed after a reset.

To change the mode flag, proceed as follows:

1. Activate the *inspect* utility.
2. Change the mode flag by typing:

```
I> fhi01->localStdzMode=x
```

where x= 0 for DIRTY
1 for CLEAN

3. Exit the *inspect* utility by typing: :q
4. Save the change to the **frame community** using the **gstore** utility.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Controlling the Type of Standardize for a Specific Sensor

With Software Release 280.1, the system now has the ability of specifying for each sensor, what type of standardize is to be performed when a DIRT standardize is requested from the Host. Most sensors do not perform differently for either a CLEAN or DIRT standardize, but for those that do, it may be desirable at times to always have a CLEAN standardize even when a DIRT standardize is requested.

The sensors in question which can sense the difference are the weight and caliper sensors. Another sensor which now joins this group, is the OptiPak sensor. With this feature turned on for the OptiPak, the sensor will ignore collecting new standardize data at a DIRT standardize request. The only time the OptiPak sensor will actually establish new standardize data is when a CLEAN one is selected.

The instance variable **defaultStdzType**, located in each sensor object, determines what type of standardize the sensor will perform whenever a DIRT standardize has been requested by either the host or the workstation. The selection code used to determine whether it is a CLEAN or DIRT standardize, is “1” for CLEAN and “0” for DIRT. Therefore, if the **defaultStdzType** is set to a “1”, the sensor will do a CLEAN standardize as requested, except of course the OptiPak sensor which will not standardize at all. CLEAN standardizes are always responded to by the sensors as requested. the default value of the **defaultStdzType** for all sensors except for OptiPak is a “0”. The value for OptiPak is defaulted to a “1”.

It should be noted that no capability in the standardize process has been lost. What this means is more flexibility as to what type of standardize is done when a DIRT standardize has been requested.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Smart Basis Weight Sensors

Internal check sample may be automatically initiated at a dirty standardize. It will be forced at each clean standardize. The variable **NAUTO**, available through the **inspect** utility or the Basis Weight Health Report, determines the frequency of internal check sample relative to dirty standardize. If set to zero, there will be no automatic internal check sample. If set to an integer (n) greater than 0, then an automatic internal check sample will be run every (n) dirty standardize.

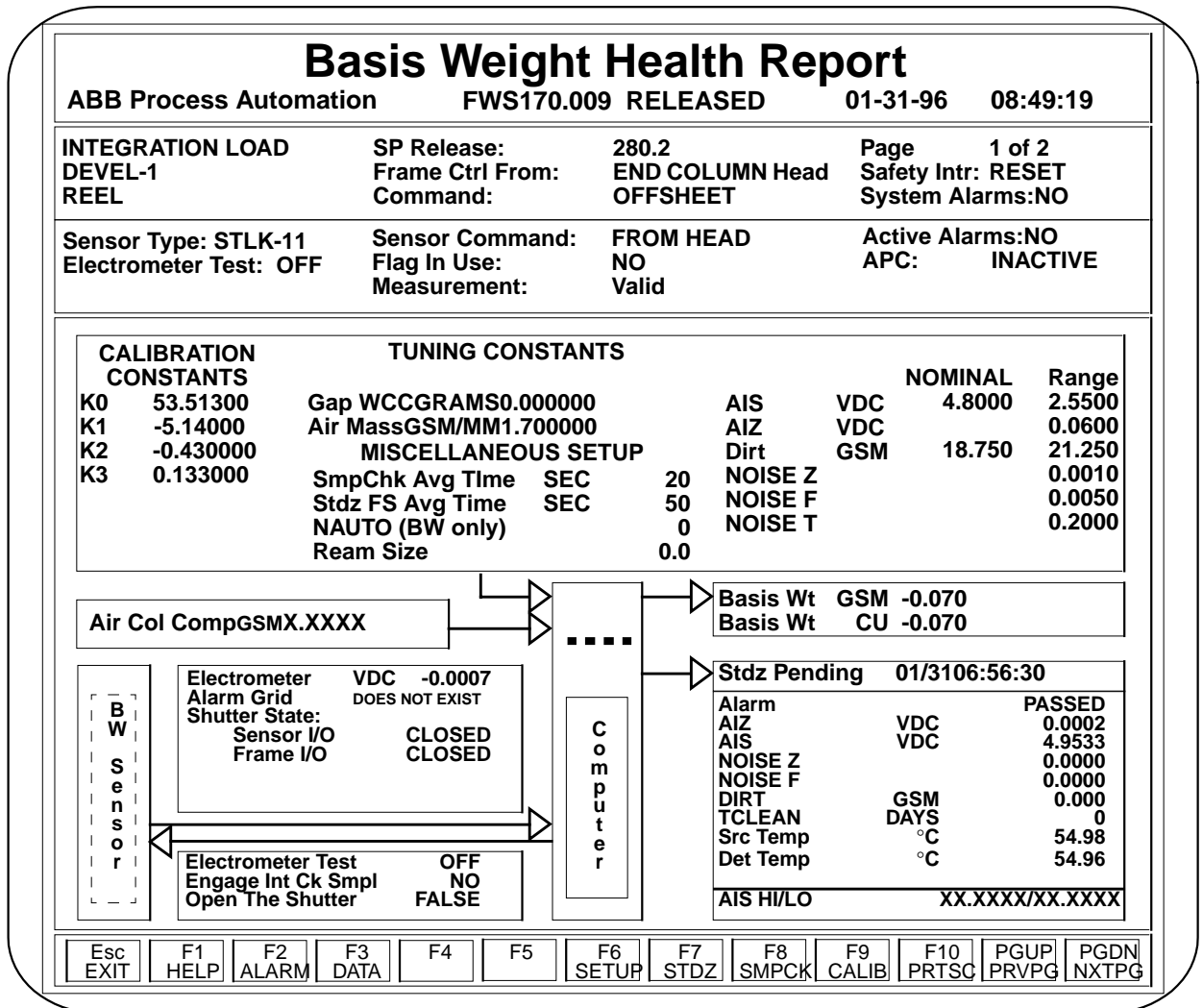


Figure 6-12 Basis Weight Health Report Showing Standardize Limits

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Caliper Sensor

The Caliper sensor is unique in that only the nominal values may be set by the user. Ranges, both for failure and maintenance, are calculated internally. The failure range is calculated every time the nominals are changed. The maintenance range is calculated only when a clean standardize has been selected.

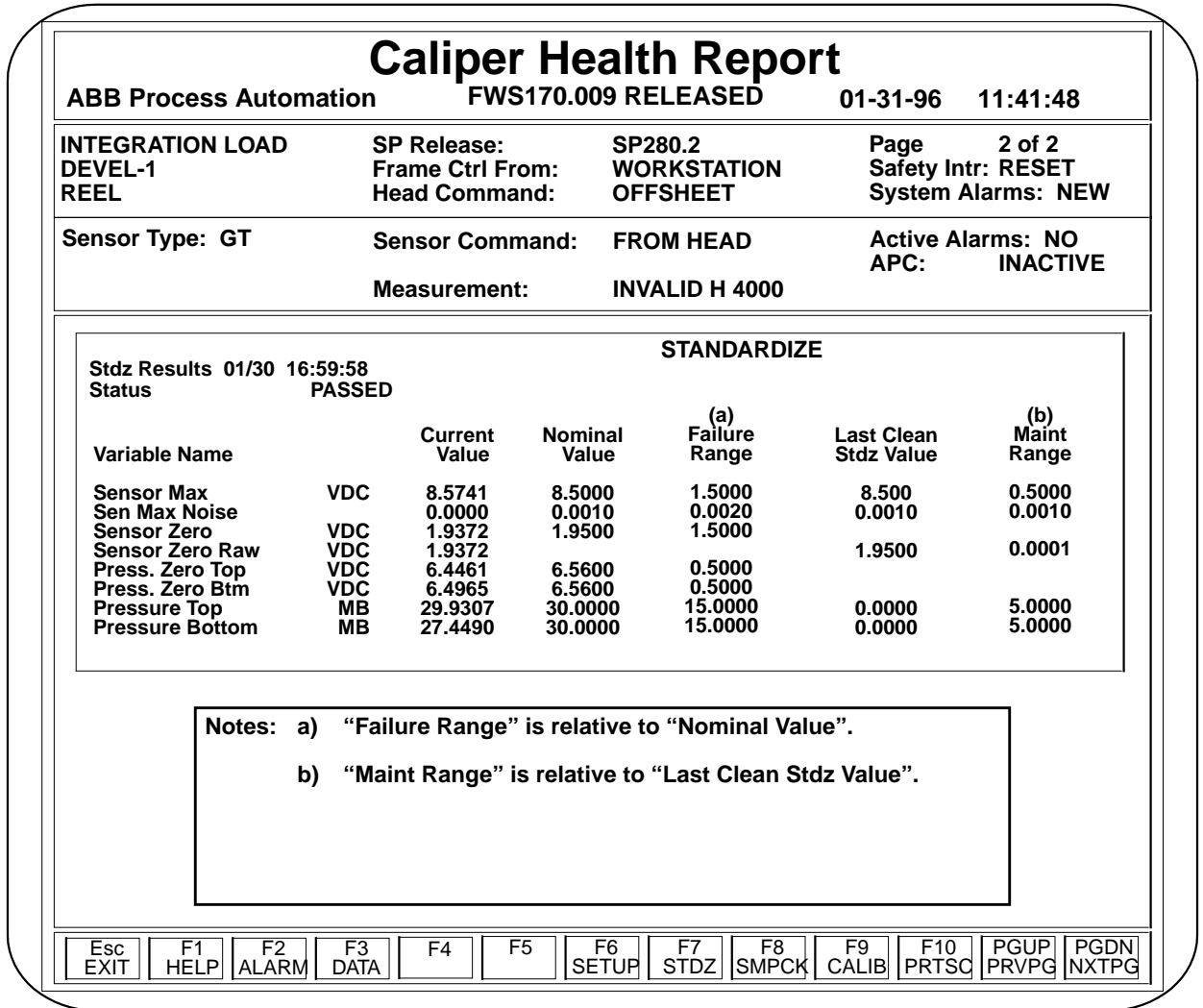


Figure 6-13 Caliper Sensor Health Report Showing Standardize Limits

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Acceptable Range for Standardize Limits

Refer to the following tables for the acceptable range of standardize limits for each of the sensors. See [Table 6-22](#), [Table 6-23](#), [Table 6-24](#), [Table 6-25](#), and [Table 6-27](#).

Table 6-22 Range for Basis Weight Sensor Standardize Limits

Host Report Name	Variable Name	Function	Acceptable Values
AIZ	AIZ Nominal	Expected voltage with shutter closed	0.0 VDC
	AIZ Range	Plus and minus limits for zeroScaleNominal	0.1 VDC
SIGMAZ	Noise Z	Standard deviation of the source closed signal	<0.00001 VDC ²
AIS	AIS Nominal	Expected voltage output of the electrometer with nothing in the gap	3.0-9.0 VDC
	AIS Range	Plus and minus limits for fullScaleNominal	0.5 VDC
SIGMAB	Noise F	Standard deviation of the electrometer output signal with nothing in the gap.	<0.4 VDC ²
DIRT	DIRT Nominal	One half of the allowed dirt accumulation permitted for the sensor in gsm	TLK/STLK - 18.5 GSM ± 21.25 TLP/STLP - 4.5 GSM ± 5.5 TLS - 45 GSM ± 5.5
	DIRT Range	Equal to the dirtNominal entry	

Note: You have to observe source decay, which will reduce the AIS value by 3.4% per month for STLP and 0.7% per month for STLK sensors.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

IR Moisture Sensor

Table 6-23 Range for IR Sensor Standardize Limits

Host Computer Reporting Name	Variable Name In IR Health Report	Description	Acceptable Range
AAIR	AAIR	Standardize air gap reading for the absorption signal on transmission-type sensors.	6.5 VDC \pm 2.5
RAIR	RAIR	Standardize air gap reading for the reference signal on transmission-type sensors.	6.5 VDC \pm 2.5
AFLAG	AFLAG	Standardize flag reading for the absorption signal on reflection-type sensors.	5.7 \pm 0.7
RFLAG	RFLAG	Standardize flag reading for the reference signal on reflection-type sensors.	5.7 \pm 0.7 VDC
KC	KC	Standardize ratio A/R	1.0 \pm 0.2 KC should not drift more than 0.01 units from standardize to standardize; drift could indicate dirt or condensation on the windows.
SIGMIR	SIGMIR	This is one standard deviation of noise. It is reported in percent of noise of the A/R ratio.	0.00005 \pm 0.00005 Values outside of this range indicates head or cabling problems.
IRGAIN	IRGAIN	Preamplifier gain required to achieve the RAIR reading; applies only to transmission-type sensors	HemiPlus and Lt Hemi - 4 \pm 3 Hvy Hemi - 11 \pm 3 If the gain changes, it is an indication of dirt buildup, changes in the chiller, problems with the detector, or lamp problems.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

OptiPak Sensor

Table 6-24 Range for OptiPak Standardize Limits

Host Computer Reporting Name	Variable Name In OptiPak Health Report	Variable Description	Acceptable Range
Full Scale Volts	FULL	Maximum output voltage of each OptiPak component with nothing in the gap. NOTE: Due to lamp brightness decay, the signal strength may lose up to 15% in each year of operation.	Formation: 0.105 ± 0.025 VDC Opacity 5.0 - 9.5 VDC Brightness: 1.0 - 4.5 VDC
Zero Volt	ZERO	Minimum output voltage of the Brightness and Opacity sensors with the source turned off.	0.125 ± 0.025 VDC
Vacuum Volts	Vacuum	The vacuum signal with no process in the gap.	7.5 ± 0.146 VDC

Ash Sensor

Table 6-25 Range for Ash Sensor Standardize Limits

Host Computer Reporting Name	Variable Name In Ash Health Report	Variable Description	Acceptable Range
AIZ	Zero	Voltage with the electrometer clamped.	0.0 ± 1.0 VDC
SIGMAZ	Zero Noise	Standard deviation of the clamped electrometer signal.	<0.001 VDC
AISOUT	Nominal Flag Out	Voltage output of the electrometer with nothing in the gap.	7.3 ± 1.9 VDC
SIGMAGO	Noise Range - Flag Out	Standard deviation of the electrometer output signal with nothing in the gap.	TBD
AISIN	Nominal Flag In	Voltage output of the electrometer with nothing in the gap.	(45% to 85% of AISOUT) ± 1.0 VDC (See note below)
SIGMAGI	Noise Range - Flag In	Standard deviation of the electrometer output signal with nothing in the gap.	TBD

Note: After determining what the AISOUT value is, make sure that the AISIN value falls to within the 45% to 85% range of AISOUT. Determine the percentage by calculation. Set nominal for AISIN so that it is the correct percentage of AISOUT.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Caliper Sensor

Table 6-26 Range for Caliper Sensor Standardize Limits (Continued on next page)

Host Computer Reporting Name	Variable Name In Caliper Health Report	Variable Description	Acceptable Range
SMAX	Sensor Max	Expected output voltage of the proximeter switch with the heads unclamped	Air Brng Cal: 7.5-9.0 VDC GT Caliper: 8.25 VDC ± 1.0
SNOISE	Sen Max Noise	Standard deviation of the maximum sensor signal noise in mv	< 10 mv
SZERO	Sensor Zero	Expected voltage of the proximeter output with nothing in the gap and the heads clamped. On GT Caliper, this value is filtered by the "Sensor Zero Filter Factor Up/Down"	Air Brng Cal: 3.0-4.0 VDC Cont Cal (Al foot): 5.5-7.0 VDC Cont Cal (Ti foot): 3.5-5.0 VDC GT Cal - 2.25 ± 1.0 VDC
	Sensor Zero Raw	The unfiltered value of the GT Caliper signal with the probe closed. It is usually determined from the GT Caliper calibration report. On GT Calipers calibration reports without this variable, it can be determined by cleaning the probes and doing a CLEAN standardize. The value to use will be the resulting measured Sensor Zero.	GT Cal - 2.25 ± 1.0 VDC
	Pressure Zero Pressure Zero Top (GT) Pressure Zero Bot (GT)	This is the output signal of the pressure transducer when there is no pressure being applied to the probe.	GT Cal - 5.0 VDC - 7.0 VDC Other Calipers - 7.0 VDC - 9.0 VDC

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 6-26 (Continued)

Host Computer Reporting Name	Variable Name In Caliper Health Report	Variable Description	Acceptable Range
	Pressure Top Pressure Bottom	Pressure at top and bottom heads of GT Caliper, with air solenoids engaged, in millibars.	12.5 - 50 mb
PRESSURE	Contact Press	Pressure transducer voltage difference in volts (globalPressure - PressureZero)	Air Brng Cal: 1.2-2.0 VDC Cont Cal 0.2 - 0.3 VDC
DSAIRB (air bearing sensor only)	Air Brng Pressure	Air bearing voltage difference in volts (airBearingStats - sensorZero)	Air Brng Cal: 0.7-0.9 VDC Cont Cal: 0 VDC
ABNOIS (air bearing sensor only)	Air Brng Press Noise	Air bearing noise in mv	< 5 mv
VACREF (air bearing sensor only)	Vacuum Signal	Vacuum signal voltage in volts	Air Brng Cal: 6.8-7.8 VDC Cont Cal: NA

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Gloss Sensor

Table 6-27 Standardize Limits for the Gloss Sensor

Host Computer Reporting Name	Variable Name In Gloss Health Report	Variable Description	Acceptable Range
stdzAdjNominal		Nominal value for limit checking the maximum signal output on air. It should be about 1.7 VDC.	1.71 VDC
stdzAdjRange		Range limit of the maximum signal output on air. It should be set to 1 VDC.	± 1 VDC
stdzZeroOffset-Nominal		Nominal value for limit checking the minimum signal output with the measurement clamp. It should be about 0.06 VDC.	0.26 VDC
stdzZeroOffset-Range		Range limit of the minimum signal output with the measurement clamped. It should be set to 0.1 VDC.	±.11 VDC
stdzVacuumNominal		Nominal value for limit checking the head pressure associated with the vacuum. It should be about 7.5 VDC. Note that increasing pressure decreases the voltage.	7.5 VDC
stdzVacuumRange		Range limit of the head pressure associated with the vacuum. It should be set to 1.5 VDC.	± 1.5 VDC

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Verification

Background

Sensor verification is the process of determining if the measurement signals from the sensor are being processed into correct measurement values at the Host. This can be done in an uncomplicated manner by using standard check samples and comparing the results of on line measurements to those known values.

If you have trouble verifying sensor performance, then you would want to use a more vigorous methodology to examine sensor performance.

Initial verification of sensor performance can be accomplished using the Service Workstation and the sensor Health Pages. Initial verification of the Moisture and the Ash sensors cannot be done independent of the Host because setup specific compensation factors must be set up at the Host. For long-term verification for sensor performance, refer to the sensor verification procedures in your Host documentation.

It is important to organize the sensor verification process into distinctive phases with a different set of procedures and goals for each phase.

Phase I – Initial Static Verification

The purpose of this activity is to verify that the Smart Platform and its associated sensors have been properly installed and adjusted and that all calibration constants are correctly entered. During this phase, the measurement system is also tested for stability and repeatability, to assure that it is ready to start the on-line measurement. Typically, this program takes one day.

Phase II – Process Measurement Verification

This phase of the program has the goal of verifying on-line measurement during dynamic conditions to the customer laboratory standards, on some of the key grades of paper being run in the process. This phase is usually 1-4 weeks.

Phase III – Continuing Certification

The purpose of this phase is to assure that long-term measurement performance is stable, and to alert about any potential problems before any degradation can happen in measurement quality. This phase is organized to give a reliable long-term performance record to the system by means of simple, periodic checks, and record keeping. By definition, this phase lasts for the life of the system.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Implementation of the Sensor Verification Program

A major portion of Phase I can be implemented using only the Service Workstation and the Smart Platform.

Activities include:

- Reading of all of the check samples
- Recording standardize stability
- Recording check sample repeatability
- Recording internal check sample readings
- Verifying calibrate sample function operation
- Scanning on air gap and on samples to verify static profiles (requires Host system)
- Generation of Phase I verification results report.

Phase II and Phase III are implemented using mostly the Host computer reporting and graphing packages.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Air Temperature Compensation for Basis Weight

Air Temperature Compensation (ATC) corrects the basis weight measurement for changes in air density due to temperature changes in the measurement column. ATC measures the temperature at clean window standardize and then corrects the basis weight measurement for deviations from the last clean standardize value at each measurement.

Note: ATC should not operate while using the air gap conditioner (AGC). Tune ATC with AGC turned off.

The temperature measurement is the weighted sum of four signals derived from thermistors in four locations: Source head, Detector head, Air gap above the sheet, Air gap below the sheet.

Tuning ATC involves:

- Verifying the measurement stability of the beta sensor
- Tuning ATC based upon its response to an artificially induced temperature gradient

Verification of Setup and Stability

1. Access the **inspect** utility at the Service Workstation.
2. At the **I>** prompt type:
BetaSensor01->tempCompFlagExists=1
3. Save the change using the **gstore** utility.
4. Restart the system to complete the enabling process.
5. Use the Basis Weight Health Report to check the default values for **temperatureCoefficients** coldstart file and compare them to the values in [Table 6-28](#) for your specific sensor type. Update the coefficient array if it does not match the values in the table. The default for **dBWdT** is shown in the table. If it is different from that reported on the Health Page, then a previous adjustment has been made. Do not change it at this time.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 6-28 Default Sensor Temperature Coefficients

Variable	TLK5	TLK8	TLK9	TLP1
temperatureCoefficients 1	0.0	0.09765	0.1758	0.0
temperatureCoefficients 2	0.5859	0.09375	0.2148	0.1953
temperatureCoefficients 3	-0.3477	0.2813	0.0	0.1953
temperatureCoefficients 4	0.0	0.0	0.0	0.0
dBWdT	-0.1	-0.1	-0.1	-0.1

6. Adjust the air pressure to the air wipes up to 35 psig (pounds per square inch gauge).
7. Place the system in Sample Check Mode to verify off-sheet stability.
8. Move the sensor to the off-sheet position and let it stabilize for 10 minutes.
9. Clean the sensor windows and then perform a clean standardize.
10. Perform several sample checks without a sample in the air gap. Check the values of **PPT** and **STANDARD WT** on the Sample Check Report.
 - The specification for **STANDARD WT** is 0.0 ± 0.2 gram.
 - The specification for **PPT** at clean standardize is 1000 ± 0.5 .

If the values for **STANDARD WT** and **PPT** do not meet these specifications, there is a basic problem with the basis weight measurement such as:

- Broken or dirty window on the beta sensor
- Incorrect head constants
- Air Wipes are not set up properly

These conditions will have to be corrected before fine tuning ATC.

11. Take the system out of the sample check mode and turn on ATC by setting the variable **BetaSensor0x->tempCompFlag** to 1.
12. Perform a clean standardize immediately after ATC is turned on.
13. Let the measurement heads scan over the process for approximately 30 minutes.
14. Move the heads to the off-sheet position. Perform several more sample check measurements on air.
15. Compare the check sample readings before and after the air wipes are turned on. The basis weight measurement from the check sample readings, before and after the air wipes are turned on, should not vary by more than 0.2 G/M^2 .

If the basis weight measurement does not meet this specification, then fine tune it by adjusting **dBWDT**. Refer to the procedure on [page 159](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Fine Tuning ATC with dBWDT

Fine tuning ATC involves monitoring the measurement response to an artificially induced temperature gradient. For this procedure you will need two people and a 800–1200 Watt heat gun. Using a larger heat source will damage the sensor heads. Begin with the head package in the off-sheet position without a sample in the gap.

1. Position the heating device in the machine direction at the front of the sensor package, exactly in line with the windows and parallel with the surface. Hold the heat source steady and 12 - 18 inches away from the sensor. See [Figure 6-14](#).

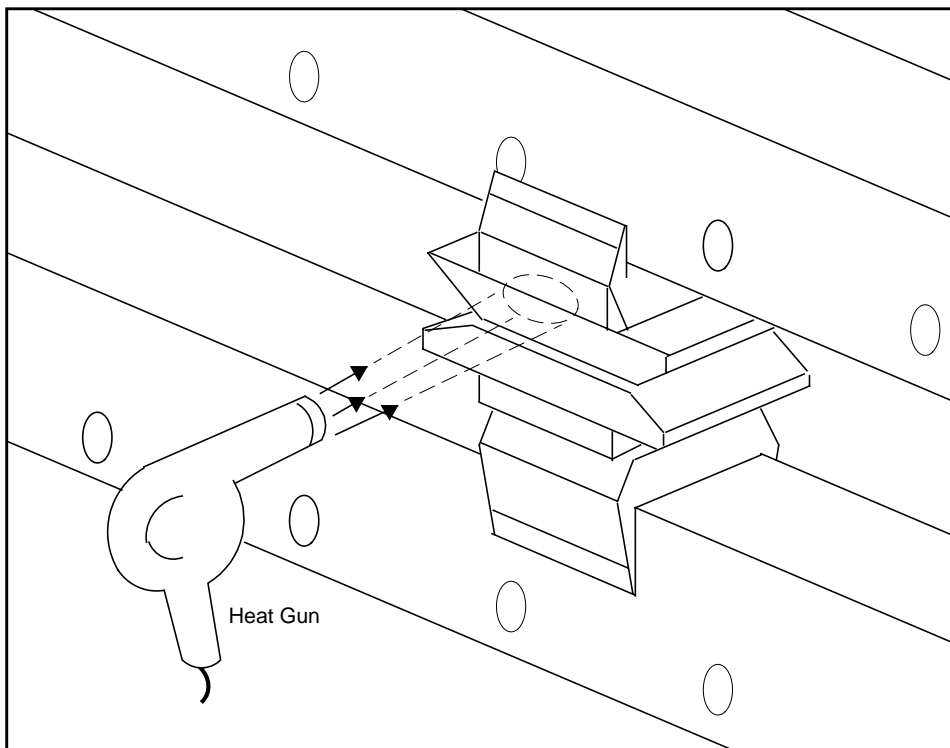


Figure 6-14 Heat Source for Fine Tuning dBWdT

2. Turn on the heat source and let the temperature stabilize for one minute.
3. Perform several sample checks with the heat source on.
4. Average the values of the **STANDARD WT** from the sample checks.

The value of **STANDARD WT**, after heating the sensor, should be $0 \pm 0.2 \text{ G/M}^2$. The value of **PPT**, after heating the sensor, should be 1002 to 1005 units. This range indicates a reasonable temperature change. If the **PPT** value is greater than 1005 units, reduce the heat.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

5. Adjust the value of **dBWdT** using the following guidelines:
 - If the **STANDARD WT** value is zero, leave **dBWdT** as is.
 - If the **STANDARD WT** value is greater than +0.2, decrease the magnitude of **dBWdT**.
 - If the **STANDARD WT** value is less than - 0.2, increase the magnitude of **dBWdT**.

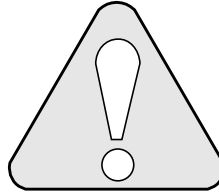
Note: The range of **dBWdT** is -20 to 0. A more negative value of **dBWdT** means more temperature compensation. A less negative value of **dBWdT** means less temperature compensation.

6. Enter the new **dBWdT** and repeat the sample checks with the heat source On.
The **STANDARD WT** should be 0.00 ± 0.2 .
If the ATC operation does not meet specifications, check the thermistor operation.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Air Profile Compensation for Basis Weight, Gloss, and Caliper



Perform the procedure only under the direction of a measurement specialist.

Note: If you are planning to perform Air Profile Compensation for the OptiPak sensor, you can set up the OptiPak sensor at the same as Basis Weight, Gloss, or Caliper. Refer to the procedure [“Air Profile Compensation for Basis Weight, Gloss, and Caliper”](#) on page 161.

Air profile compensation (APC) allows for any mechanical misalignments of the platform without degrading the measurement performance. APC allows the sensor heads to traverse the entire platform length, including off-sheet and standardize position, without any process in the gap. During APC operation, the system gathers deflection measurement data. This data can be used to smooth out any errors in the measurement due to platform irregularities.

To use APC, first collect an air profile by setting a software flag and using Host computer commands to begin air profile collection.

The system generates the air profile by scanning the widest sheet trim without a process in the gap. The maximum trim limits (**homeMeasureLimit** and **farMeasureLimit**) define the scanning limits while performing APC. To collect enough information, the sensors must make at least five complete scans (forward and reverse). When the scanning is complete, the sensors will move to the off-sheet position. The scan limits are reset to the last known scan limits (**homeScanLimit** and **farScanLimit**).

The number of forward and reverse scans set up for APC is defined by the Host as 10.

Air Profile Data Collection

Note: There must be an active sheet break to perform this function.

1. Disable the auto edge-of-sheet feature, if it is present and active.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

At the Service Workstation

1. Turn the APC existence flag on by using the **inspect** utility in the Smart Platform subsystem as follows:

At the I> prompt type:

betaSensor01->airProfileCompExists=1 (for basis weight)

caliperSensor01->airProfileCompExists = 1 (for caliper)

topGlossSensor01->airProfileCompExists=1 (for top gloss)

bottomGlossSensor01->airProfileCompExists=1 (for bottom gloss)

2. For the Gloss sensor, insert a sample of the most common grade into the sensor. The air to the air bearing sheet guides must be turned Off and the sample must be stretched very tightly without any ripples in the gap.

At the Host Computer

1. Enable APC through the Host computer.

The operator can abort the APC composite mode by selecting mode zero. The system will alert the operator that enough data may not exist to perform APC.

2. Activate Scan at the Host computer.

The sheet-break override also activates and the sheet-break override alarm results. When APC is complete, the sensors move to the off-sheet position.

3. Push the ON-SHEET push button at the platform.
4. Push the STDZ (standardize) button at the Host operator station. Wait for the system to standardize.
5. Let the scanner go through at least five complete forward and reverse scans or let it exit by itself.
6. Activate OFF-SHEET at the Host computer.
7. Exit the air profile collection mode.
8. Return the auto edge-of-sheet feature to the usual mode.
9. Change to the **airProfile** directory
cd/ss01/airProfiles
10. Type: **Is -l**
to list the contents of the directory. The directory should reflect the current date, indicating that the data was successfully written to the file. Each sensor will have a separate file of from 1,000 to 2,000 bytes in the **airProfile** directory.
11. Remove the paper from the Gloss sensor gap.
12. Save the existence flag to the scanner community diskette using the **gstore** utility.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Enabling Air Profile Compensation

1. Turn APC on by using the **inspect** utility as follows:

At the I> prompt type:

betaSensor01 -> airProfileCompOn=1

CaliperSensor01 -> airProfileCompOn = 1

topGlossSensor01 -> airProfileCompOn=1

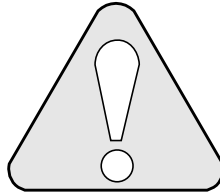
bottomGlossSensor01 - > airProfileCompOn=1

2. If this is to be the normal mode of operation, save the flag on diskette by using the **gstore** utility.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Air Profile Compensation for OptiPak



Perform the procedure only under the direction of a measurement specialist.

Setup

Air Profile Compensation for OptiPak is only run for opacity and brightness.

At the Service Workstation

1. Use the Health Reports to view the values of the standardize limits for OptiPak.
2. Record the nominal values. You will need to re-enter them later.
3. Place a sample of the process that simulates the typical process in the gap of the OptiPak before requesting a standardize.

Leave the paper in the gap while running Air Profile Compensation.

4. Request a standardize.
5. Enter the new standardize nominal values into **genrpt** or the OptiPak Health Report so that the OptiPak sensor will pass standardize.
6. Perform another standardize.
7. Turn On the APC existence flags using the **inspect** utility.

At the I> prompt type:

OpacityAir ProfileCompExists=1

BrightnessAir ProfileCompExists=1

At the Host Computer

1. Enter the Air Profile Compensation Initial Air Mode.
2. Request the Scan mode.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Data Collection

At the Platform

1. Push the ON SHEET push button at the platform. The head will start to scan from the home measure limit to the far measure limit.

Note: The number of scans that occur during data collection are defined by the Host as 10.

At the Host Computer

2. Exit the Air Profile Compensation Mode at the Host computer.

At the Service Workstation

3. Change to the airProfile directory

cd/ss01/airProfiles

4. Type: **ls -l**

to list the contents of the directory. The directory should reflect the current date, indicating that the data was successfully written to the file.

Each sensor will have a separate file of from 1000 to 2000 bytes in the **airProfile** directory.

5. Remove the paper from the OptiPak sensor gap, restore the nominal standardize limits in the Health Report, and request a standardize.
6. Save the changes using the **gstore** procedure.

The Air Profile Compensation Setup procedure is now complete.

Using the Data

At the Service Workstation

1. Turn the Air Profile Compensation On by using the **inspect** utility as follows:

After the I> prompt type:

OpacityAirProfileCompOn=1

BrightnessAirProfileCompOn=1

2. Save the changes using the **gstore** utility.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Digital Input Invert Adjustment for the Smoothness Sensor

The first Smoothness sensor on the Smart Platform (smoothness Sensor A01) must have the two digital inputs for temperature alarm and validity, inverted before being processed by the MPRC software. To do this, proceed as follows:

1. Activate the **dim** utility.
2. Select the digital inputs for the **ucGeneral** board.
3. Invert bit 0 by pressing **i**, then **0**, then <return> twice.

Observe that the Invert bit gets set and that the value changes to a 1.

4. Repeat step 3 for bit 1.
5. Press **q** and respond affirmatively when asked if the mask changes are to be used.
6. Press **q** repeatedly until \$\$ prompt returns. Do a **gstore** to the **io** community to save the information.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Default Compensations for IR Moisture, Microwave, and Ash Sensors

IR Moisture, Microwave, and Ash sensors are dependent sensors requiring compensation from other process parameters. The requirements for each sensor are as follows:

Table 6-29 Default Compensation Requirements

Dependent Sensor	Compensation Required
IR Moisture Sensor	Basis Weight (in 2-Filter mode) Ash (in HemiPlus mode)
Microwave Sensor	Basis Weight Sheet Temperature (optional)
Ash Sensor	Basis Weight Moisture

Each of these sensors must have their compensating input values established within the Host Computer Grade File for each customer grade, even if the sensor has been configured to use the internal (measured) value for its compensation. This is so that, if the internal (measured) value becomes unavailable for one reason or another, there will be a reasonable compensation signal available for the dependent sensor coming from the Grade File. Refer to the Host computer documentation for details on setting up the respective Grade Files.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Calibrate Sample - Minimum Time Data Accumulation

The Calibrate Sample function provides a real-time report of the active measurement performance of all the operational sensors on the Smart Platform. The data collection operates in parallel with the normal measurement processing taking place so that there is no interference with data being delivered to the host computer system. The Calibrate Sample procedure is available any time the measurement head is on-sheet and measuring.

There are two methods of operation:

- Holding the Calibrate Sample push button down for the duration of the data collection. The Calibrate Sample push button is the “scissors” push button located on the Frame Control Panel. You can hold down the push button for as long as desired, with no upper limit.
- Press and release the Calibrate Sample push button and allow the internal timer to dictate the duration of the data collection.

The default time in the *inspect* utility shows up as a 0, which the system converts to a minimum time of five seconds. To make this time longer, follow the steps below:

1. Activate the *inspect* utility.
2. Check the current minimum Calibrate Sample time by typing:
fhi01 → calSampMinTime
If a 0 or less than 5, the minimum time will be five seconds.
3. Enter in the desired minimum sample time:
fhi01 → calSampMinTime=xx
Where: **xx** is any time greater than five seconds.
4. Verify the change by placing the head on-sheet and measuring. Then, press and release the Calibrate Sample push button. The push button LED should remain lit for the time just entered in Step 4 plus a five-second settle time.
5. Save the change by performing a *gstore* to the Frame Human Interface Community (fhi01).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

7

Control Panel Operation

The basic operations of the Smart Platform are managed by the control panel. This chapter describes the operations that can be performed using the control panel.

This chapter contains the following major sections:

Section	Page
Control Panel Description	170
Smart Platform Modes of Operation	171
Control Panel Functions	173
Head Split Switches	177

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Control Panel Description

The control panel consists of a covered key pad with 12 keys and two sensor shutter indicator lights. A control panel is located on each end column of the Smart Platform. Refer to the control panel in [Figure 7-1](#).

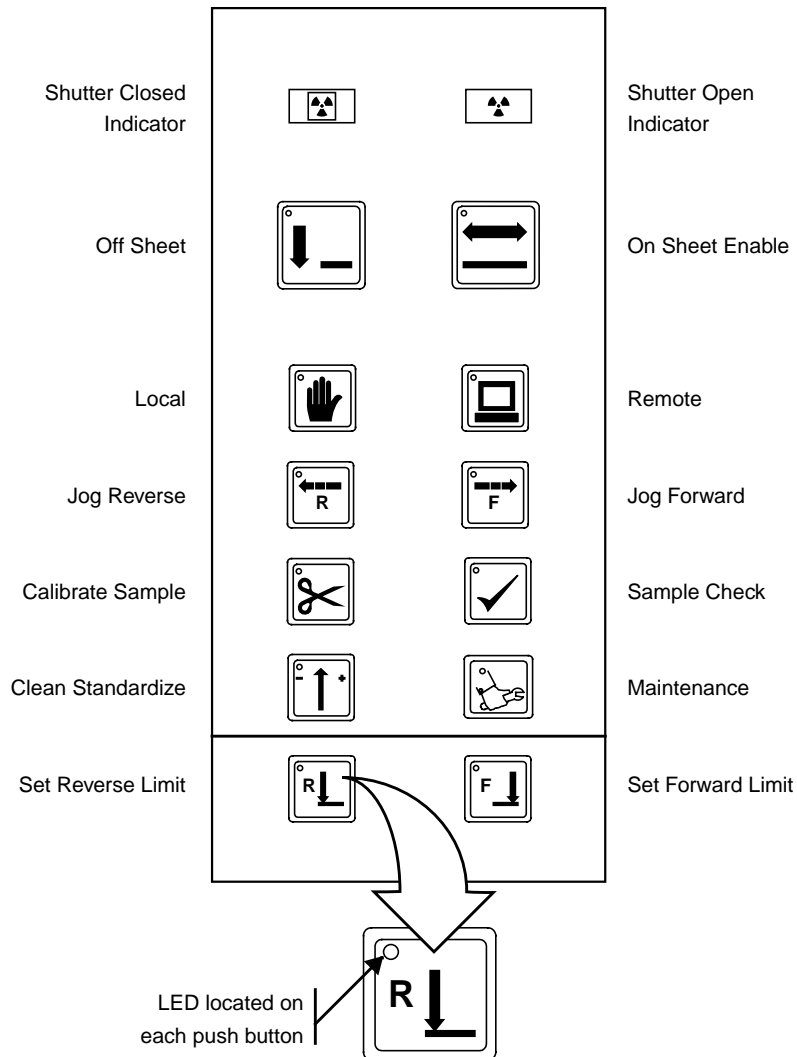


Figure 7-1 The Smart Platform Control Panel

When a control panel push button has been pressed, the request is acknowledged by a small LED located in the upper left corner of the button, as shown in [Figure 7-1](#). For some control panel push buttons, the LED will remain on while the push button is being pressed or while a function is being performed. For other control panel push buttons, the LED will remain on until another push button has been pressed, placing the Smart Platform in another mode.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Smart Platform Modes of Operation

The control panel has four modes of operation that allow different levels of Host computer control. The control panel's modes of operation are described below.

Remote/On-Sheet

In the Remote/On Sheet mode, the Host computer has total control of the Smart Platform. The Host computer is able to request the Smart Platform to measure, standardize, or other remote operations.

While the Smart Platform is in the Remote/On Sheet mode, the REMOTE and ON SHEET push button LEDs are on.

Remote/Off-Sheet

In the Remote/Off-Sheet mode, the Smart Platform is still communicating with the Host computer system, but it will refuse any Host requests to measure or standardize, but permits sample check.

While the Smart Platform is in the Remote/Off-Sheet mode, the REMOTE and OFF SHEET push button LEDs are on, and the sensor head package is in the off-sheet position on the Smart Platform.

When a sheet break is detected on the paper machine, the sensor shutters close, the sensor head package moves to the off-sheet position, and the Smart Platform enters the Remote/Off-Sheet mode automatically. Head tracking errors, inherent sheet break, and AEOS errors will also cause the platform to automatically enter the Remote/Off-Sheet mode.

The Smart Platform must be in the Remote/Off-Sheet mode to perform sensor sample checks. While in the Remote/Off-Sheet mode, the STANDARDIZE push button on the Smart Platform control panel is enabled, but any standardize results will be reported through the Service Workstation, not the Host computer.

Local

In the Local mode, all communications with the Host computer are disabled. The sensor shutters will not open and the Smart Platform will not scan.

When the Smart Platform is in the local mode, the LOCAL push button LED is on and the On Sheet and Off-Sheet LEDs are off.

The Local mode enables the control panel JOG and SET SCAN LIMIT push buttons.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Local/Head Split

In Local/Head Split mode, all communications with the Host computer are disabled, and the Smart Platform drive mechanism is disengaged.

The Smart Platform enters Local/Head Split mode when the drive clutch is disengaged by a head split switch, located in each of the Smart Platform end columns. The Smart Platform also enters this mode when the air supply to the drive clutch drops below the correct pressure.

Since the drive mechanism is disabled in local/head split mode, the sensor head package can only be positioned by hand.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Control Panel Functions

The functions of each of the control panel push buttons is described below.



Off-Sheet

If the Smart Platform is in remote, pressing the OFF SHEET push button places the Smart Platform in Remote/Off-Sheet mode.

If the OFF SHEET push button is pressed while the Smart Platform is scanning or standardizing, the sensor shutters close and the head package moves to the off-sheet position.



On-Sheet

If the Smart Platform is in remote, pressing the ON SHEET push button places the Smart Platform in Remote/On Sheet mode. When the ON SHEET LED is lit, it permits the Host to direct the head to standardize or measure.



Local

Pressing the LOCAL push button places the Smart Platform in Local mode.

If the Local push button is pressed while the Smart Platform is scanning or standardizing, the sensor shutters close and the head package remains in place.



Remote

Pressing the REMOTE push button places the Smart Platform in Remote/Off-Sheet mode, if the Smart Platform is currently in Local mode.



Jog

The JOG push buttons are used to position the sensor head package manually, anywhere between the mechanical limit switches of the Smart Platform. The FORWARD JOG push button (**F**) moves the head package towards the far side end column. The REVERSE JOG push button (**R**) moves the head package toward the home end column.

The JOG push buttons only function when the Smart Platform is in Local mode.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.



Calibrate Sample (Sample Cut)

While the CALIBRATE SAMPLE push button is pressed, the Smart Platform begins a special accumulation of measurement single point or profile data. When the push button is released, this data is forwarded to the Host computer where a Calibrate Sample report is printed.

The CALIBRATE SAMPLE push button LED is on while the measurement data is being accumulated, and while the data is being sent to the Host computer.

The CALIBRATE SAMPLE push button functions only when the Smart Platform is measuring in the Remote/On Sheet mode and the sensor is in the measurement mode, either scanning or in single point.



Sample Check

The SAMPLE CHECK push button requests the sensors to take a sample check measurement. The push button LED is on while the measurement is being taken.

The SAMPLE CHECK push button operates only if the Smart Platform is in the Remote/Off-Sheet mode. No report will be sent unless the Sample Check mode is enabled at the Host computer. However, a local report is available through the Sensor Health Report.



Standardize

Pressing the STANDARDIZE push button requests the sensors to perform a standardize. The standardize will be either CLEAN or DIRTY depending on the setting of the *localStdzType* instance variable in the **fhi01** object. The push button LED is lit during the standardize cycle. If any of the sensors fail the standardize, the LED flashed until the sensors all pass standardize. Standardize reports are available through the HOST display, or through the HEALTH PAGES at the Service Workstation.

The sensors will do a CLEAN or DIRT standardize depending on the state of the defaultStdzType flag associated with each sensor object. If the flag is a “0”, the standardize will be a DIRT one. If the flag is a “1”, then the standardize will be a CLEAN one. The only sensors affected by a CLEAN or DIRT request are Basis Weight, Caliper, and OptiPak. For the other sensors, this discussion is irrelevant. They will do their normal standardize no matter what the flags are set to.

It is possible to temporarily change the Control Panel default standardize mode from DIRT to CLEAN by setting the **localStdzMode** flag in the fhi01 object object to a “1”. This assignment is set back to DIRT (“0”) automatically at the next restart.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.



Self Test

The Self Test push button serves as a lamp test for the LEDs on the panel, as well as being able to initiate a check on the positioning subsystem operation when the scanner is in the LOCAL mode. In all scanner modes except LOCAL, when the Self Test push button is pushed, the various LEDs on the panel will sequentially light up momentarily to indicate their condition. This test has no impact on what other functions the scanner is performing at the time.

When the scanner is in LOCAL, the function of the Self Test push button changes to include a check on the positioning subsystem. Under the LOCAL condition, the initial push of the button will start the usual LED lighting cycle, but when released, the OFF SHEET LED will extinguish and the scanner will attempt to resynchronize the encoder. The following sequence will take place.

- unsynchronizes the encoder
- moves the head package to the home limit switch
- resynchronizes the encoder
- moves the head package to the off-sheet position

Note: The test can be started with the head located anywhere along the frame. When the test starts the head will move toward the home limit switch at a high slew rate. If there is a need to stop the head at any time during this transition, simply press the LOCAL push button once more, stopping the head. This will terminate the self-test request.

The actual check being performed in this test, is to verify that the encoder count at the point of the head coming off the limit switch, matches the count when the encoder was initially synchronized. Any error in this will result in the push button LED flashing. In this case, run the test again to clear the alarm and check the Encoder Diagnostic screen in the ft utility to see the details of the encoder's history. It is possible that the test failure may only be the result of the system having lost some counts during an earlier scan. In that case, the Encoder Diagnostic screen should be visited periodically to make sure that the condition is not a chronic one. Some things which can cause failure are:

- Scanning too fast (can lose encoder counts)
- Defective encoder
- Defective encoder mounting (slipping)
- Defective cabling from encoder to the ECF board
- Defective ECF board

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.



Scan Limit Set

The LIMIT SET push buttons set the measured sheet edge limits for Smart Platforms without auto edge-of-sheet (AEOS) or when AEOS is disabled.

The FORWARD LIMIT button (**F**) sets the limit near the drive (far) end column of the Smart Platform. The REVERSE LIMIT button (**R**) sets the limit near the idler (home) end column.

The LIMIT SET push buttons are enabled only when the Smart Platform is in Local mode.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Head Split Switches

To gain access to the sensors mounted in the Smart Platform head package, a head split switch is located in each end column, as shown in Figure 7-2. The switch, when activated, disengages the motor drive clutch and allows the top and bottom sensor heads to be separated.

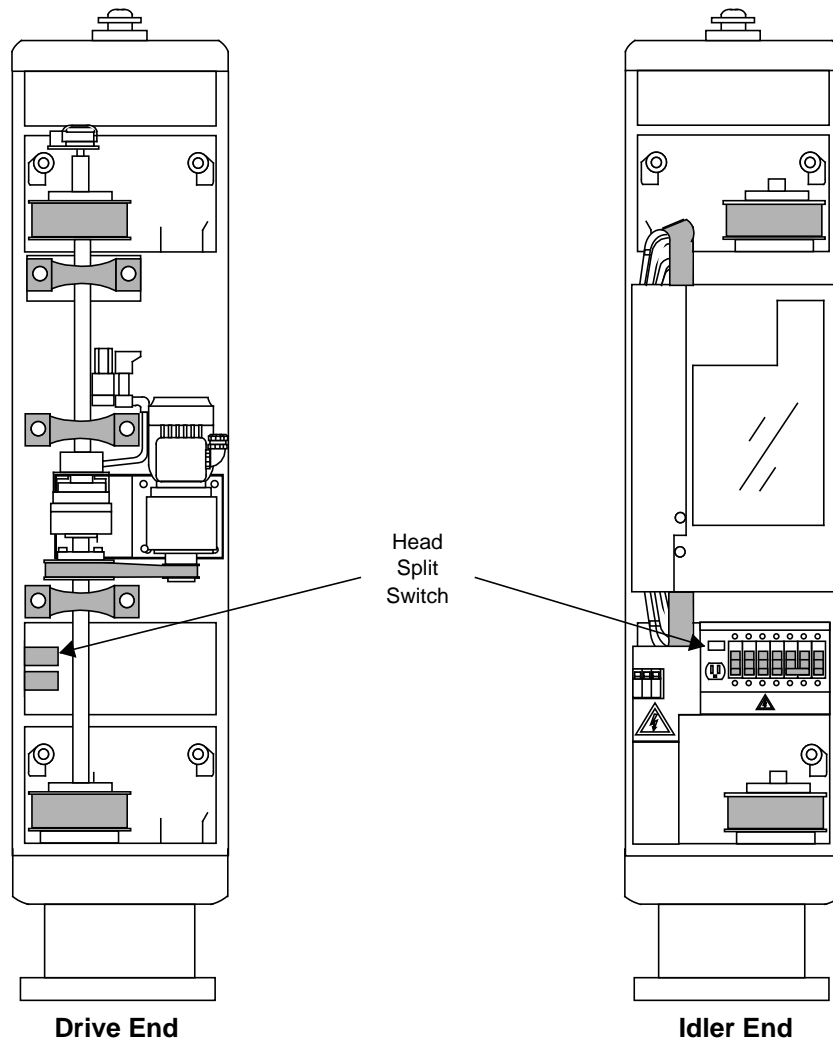
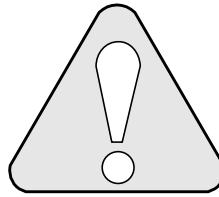


Figure 7-2 Locations of the Head Split Switches

When the sensor heads are split, the Smart Platform is placed in Local mode, and the sensor heads can only be moved by hand.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.



Make certain the sensor heads are properly aligned before re-engaging the clutch. Aligning the sensor heads is mandatory to assure the radiation beam is directed to its proper target.

In Local/Head Split mode, all communications with the Host computer are disabled, and the Smart Platform drive mechanism is disengaged.

The Smart Platform enters Local/Head Split mode when the drive clutch is disengaged.

Make sure the sensor heads can be separated by manually moving the bottom head. Since the drive mechanism is disabled in Local/Head Split mode, the bottom sensor head package can only be positioned by hand.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

8

Startup Options

There are two startup options available to the user, one requires manual intervention after the reset is initiated, and the other is automatic in that the startup sequence will proceed automatically after a power reset or a manual reset request. It is recommended that the switch be left in the automatic startup position. The manual position is used primarily for troubleshooting activities.

This chapter contains the following major sections:

Section.....	Page
Manual Startup	180
Automatic Startup	181
Service Workstation Software Startup	182

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Manual Startup

The following procedure involves manual intervention via the console keyboard after reset has been initiated. It also enables reporting of conditions resulting in an OFFLINE DEBUG status of the software.

1. Place the START MODE switch on the MPRC front panel to the STOP/DEBUG position (down).
2. Either press the RESET switch on the MPRC front panel, or type **reset** on the console keyboard (Smart Platform window open).
3. For non-Ethernet MPRC Boards (086349-002):

When the console responds with OFFLINE DEBUG, enter a **g** {CR}.

For Ethernet MPRC Boards (086444-001):

When the console responds with OFFLINE DEBUG, place the START MODE switch back to the center position, then enter a **g** {CR}.

4. The system will proceed with the startup and loading activity after about a 15-second delay for diagnostic checks.
5. In less than a minute, the console should display the startup completion banner which gives the download instructions from the Host computer. Execute the **PMMRLD** command directed by the Host computer.
6. The Host computer download activity will result in three messages:

pmmFrame01: HOST TO AMS DOWNLOAD IN PROGRESS.

pmmFrame01: HOST TO AMS DOWNLOAD COMPLETED.

pmmFrame01: HOST COMMUNICATIONS ESTABLISHED.

If the download activity is not started, the console will eventually respond with:

pmmFrame01: HOST COMMUNICATIONS TIMEOUT.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Automatic Startup

This method of startup will automatically restart the Smart Platform MPRC board in the case of a power reset or a manual reset request.

1. Place the START MODE switch on the MPRC front panel to the Short Diag position (middle).
2. Either press the RESET switch on the MPRC front panel, or type **reset** on the console keyboard (Smart Platform window open).
3. The system will proceed with the startup and loading activity after about a 15-second delay for diagnostic checks.
4. In less than a minute, the console should display the startup completion banner which gives the download instructions from the Host computer. Execute the **PMMRLD** command as directed by the Host computer.
5. The Host computer download activity will result in three messages:

pmmFrame01: HOST TO AMS DOWNLOAD IN PROGRESS.

pmmFrame01: HOST TO AMS DOWNLOAD COMPLETED.

pmmFrame01: HOST COMMUNICATIONS ESTABLISHED.

If download activity is not started, the console will eventually respond with:

pmmFrame01: HOST COMMUNICATIONS TIMEOUT.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Service Workstation Software Startup

1. Connect the Service Workstation serial port to the Smart Platform 1200.
2. Load up the software ACE2/GONZO and HEALTH diskettes into the Service Workstation per instructions in the *Smart Platform System Software Manual, 101760-00x*.
3. Select the Smart Platform “HEALTH/ACE2 TERMINAL” window to get the AVOS window.
4. Press return to display the \$\$ prompt.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

9

Maintenance Procedures

This chapter contains the following major sections:

Section.....	Page
Smart Platform Maintenance Log	184
Inspecting the Incoming Power	186
Inspecting the Drive System	187
Wheel Inspection	195
Platform Alignment Inspection	196
Air Purge Filter Inspection	197
Inspecting the Compressed Air Filters	199
Inspecting the Water Filter	200
Power and Temperature Checks	201

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Smart Platform Maintenance Log

(Initial Maintenance)

START DATE: _____

MAINTENANCE ITEM	SCHEDULE (WEEKS)											
	1	2	3	4	5	6	7	8	9	10	11	12
DRIVE CHECKS												
1. Check upper/lower drive belts with tensiometer. ①												
2. No evidence of wear or cracks in belts												
3. Motor Drive Belt Tension (Tight enough to eliminate possibility of the belt derailing)												
4. Upper/lower Seal Belt Tension (uniform seal provided and no gaps in seal exist) ②												
5. Head Separation Clutch Operation												
WHEEL CHECKS												
1. Upper/lower Carriage Wheels												
2. Upper/lower Seal Belt Roller Assembly												
ALIGNMENT CHECKS												
1. Air Profile Check ③												
2. Scan Direction Alignment												
UTILITY CHECKS												
1. Air Purge Filter												
2. Compressed Air Filters												
3. Water Filter												

- ① Check upon replacement and at three weeks after replacement.
- ② Check upon replacement and at one week after replacement.
- ③ Check at four week intervals when the process is not running.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

SMART PLATFORM MAINTENANCE LOG (Subsequent Maintenance Log)

START DATE: _____

MAINTENANCE ITEM	SCHEDULE (MONTHS)											
	1	2	3	4	5	6	7	8	9	10	11	12
DRIVE CHECKS												
1. a. Check upper/lower drive belts with tensiometer. b. Check pulleys for lubrication c. Check belt tracking on page 188 . ①												
2. No evidence of wear or cracks in belts												
3. Motor Drive Belt Tension (Belt should deflect .12 - .25 in. (3.0 – 6.3 mm) with finger pressure)												
4. Upper/lower Seal Belt Tension (uniform seal provided and no gaps in seal exist) . See page 191 . ②												
5. Head Separation Clutch Operation/lubrication. See page 193 .												
WHEEL CHECKS												
1. Upper/lower Carriage Wheels												
2. Upper/lower Seal Belt Roller Assembly												
ALIGNMENT CHECKS												
1. Air Profile Check ③												
2. Scan Direction Alignment												
UTILITY CHECKS												
1. Air Purge Filter. See page 197 . ④												
2. Compressed Air Filters. See page 199 . ④												
3. Water Filter. See page 200 . ④												

- ① Check upon replacement and at three weeks after replacement.
- ② Check upon replacement and at one week after replacement.
- ③ Check at one month intervals when the process is not running.
- ④ Schedule for maintenance depends upon installation circumstances and mill conditions.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Inspecting the Incoming Power

The following procedure provides direction on checking the incoming power used for the Smart Platform.

Verify the presence of incoming power at the idler end column. The power for the Smart Platform comes through a transformer. The voltage to the transformer must be of a nominal level (200, 208, 220, 230, or 240 volts) to connect to one of the taps on the primary. The long-term variations from the nominal voltage must not exceed $\pm 10\%$.

Example: A 240 volt primary voltage must not average less than 198 VAC or greater than 242 VAC for longer than one second.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Inspecting the Drive System

The drive system consists of several belts that must be checked periodically for proper tension and damage or defects. Complete the following procedures to perform the drive checks.



MOTOR ONLY

When performing any maintenance operation in the carriages, always lock out the drive motor power using the lock-out switch at the drive end column. Refer to [Figure 9-1](#).

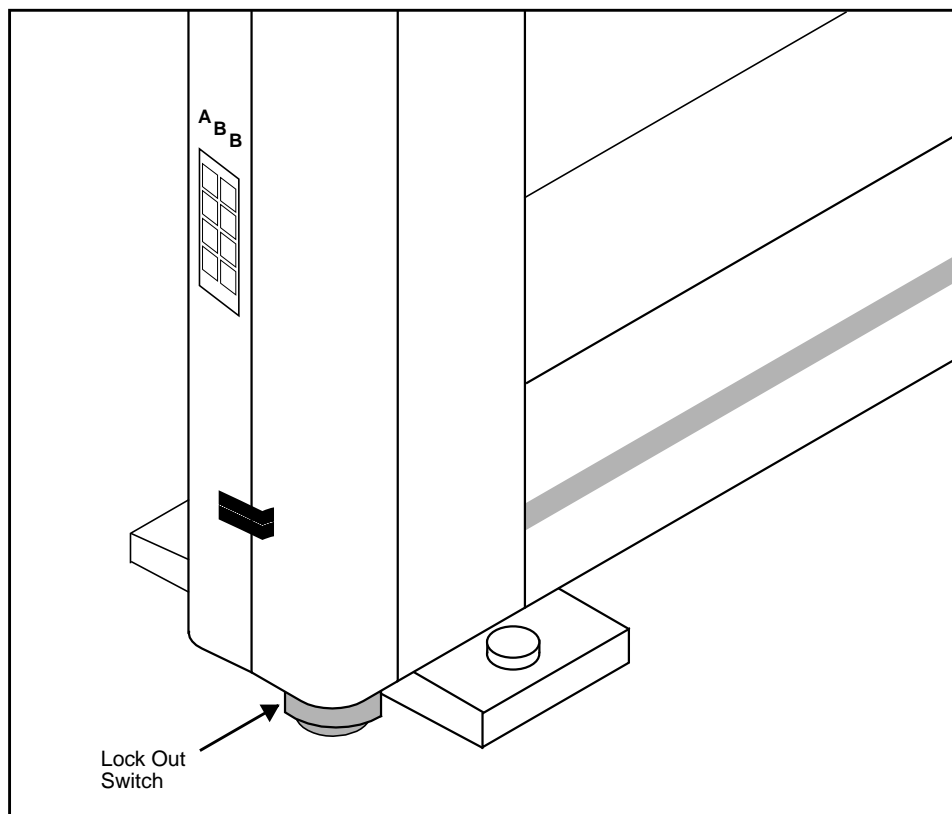


Figure 9-1 SP1200 Lockout Switch

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Drive Belt Tension Measurement

Inspect the tension of the upper and lower drive belts. They should be the same. Perform the belt tension check as follows:

1. Squeeze the handle of the tension gauge and place it on the drive belt at the idler end of the Smart Platform.

The gauge must be applied to the portion of the carriage drive belt that traverses the Smart Platform.

2. Release the handle and read the tension indication on the gauge. The tension should be in the range specified on the gauge.
3. If the tension is outside of that range, adjust the idler pulley tension adjustment screws until the tension is proper.
4. Tighten the adjustment lock when finished.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Drive Belt Tension and Tip Adjustment

Refer to [Figure 9-2](#).

Observe the idler pulleys on the Smart Platform while the sensor heads are scanning. If the drive belt climbs up or down on the idler pulley, adjust the pulley tip by completing the following steps:

1. Loosen the tip adjustment lock.
2. Tighten the tip adjustment if the belt tracks to the upper edge of the pulley.
3. Loosen the tip adjustment if the belt tracks to the lower edge of the pulley.
4. Observe the idler pulleys while the sensor heads are scanning. If the drive belt climbs up or down on the idler pulley, repeat Step 2 or 3.
5. Tighten the tip adjustment lock.

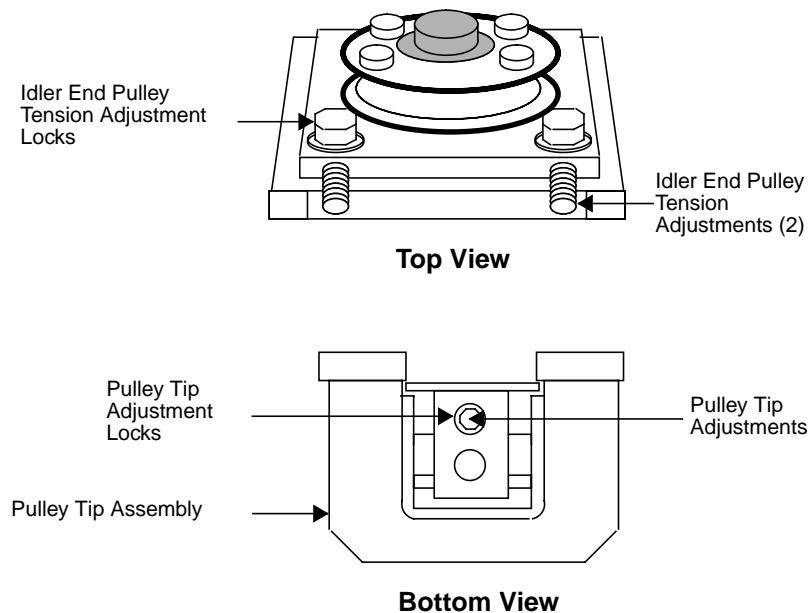


Figure 9-2 Drive Belt Measurement and Adjustment

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Drive Motor Belt Inspection

Refer to [Figure 9-3](#).

1. Inspect the upper and lower drive belts for evidence of wear or damage.
2. If either the upper or lower drive belt exhibits serious cracks, replace both drive belts. Replacing both belts will prevent uneven wear of the belts. Cracks may indicate a future failure of the drive belt.
3. Inspect the tension of the drive motor belt by pressing it with your finger. If a deflection greater than 0.25 in. (6 mm) occurs, adjust the drive motor position.

Drive Motor Adjustment

1. Loosen the four drive motor/gear box mount adjustment bolts.
2. Slide the assembly away from the drive shaft to tighten the belt.
3. Tighten the assembly while keeping tension on the belt. The assembly should remain parallel to the drive shaft at all times.
4. Inspect the drive motor belt for evidence of wear and cracks.
5. Replace belts that have evidence of wear or cracks.

Note: A spare belt can be attached to the shaft with tie wraps or heavy-duty tape to make future service easier.

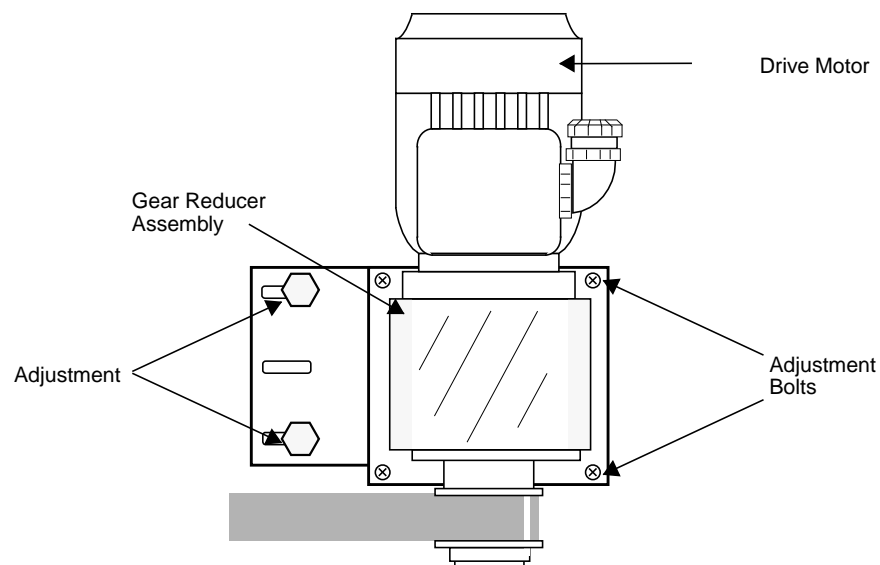


Figure 9-3 Drive Motor Belt Check and Adjustment

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Seal Belt Tension Inspection

Inspect the seal belts. The seal belts must have enough tension so that a seal is present along the length of the platform but not too much so that the carriage seal belt roller is deflected up causing a break in the cable seal. Refer to [Figure 9-4](#). The tension on the seal belts must be even on each side of the belt. If this is not the case, the carriage seal belt roller will be deflected up on one end.

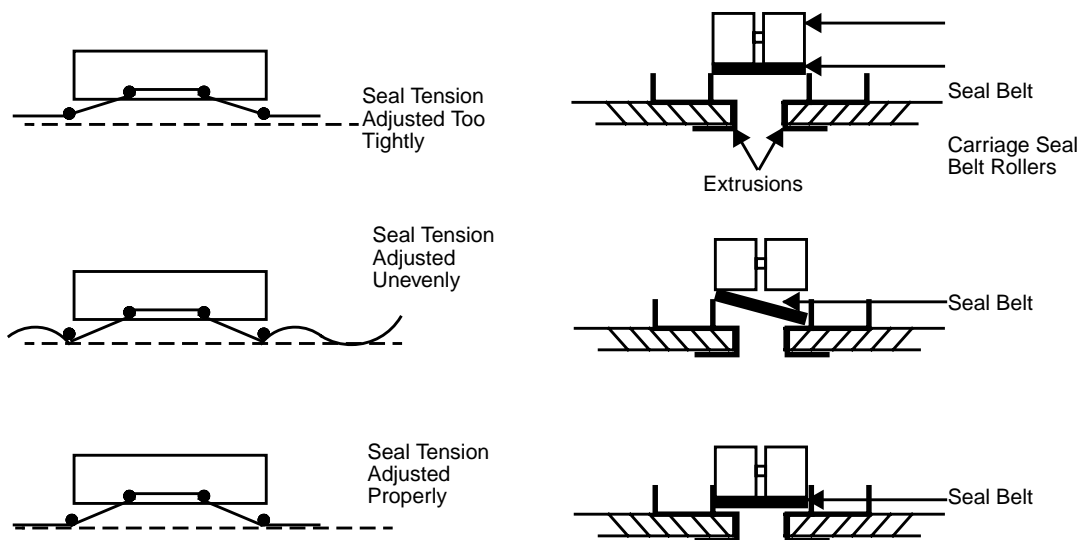


Figure 9-4 Seal Belt Tension Checks

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Seal Belt Tension Adjustment

Refer to [Figure 9-5](#).

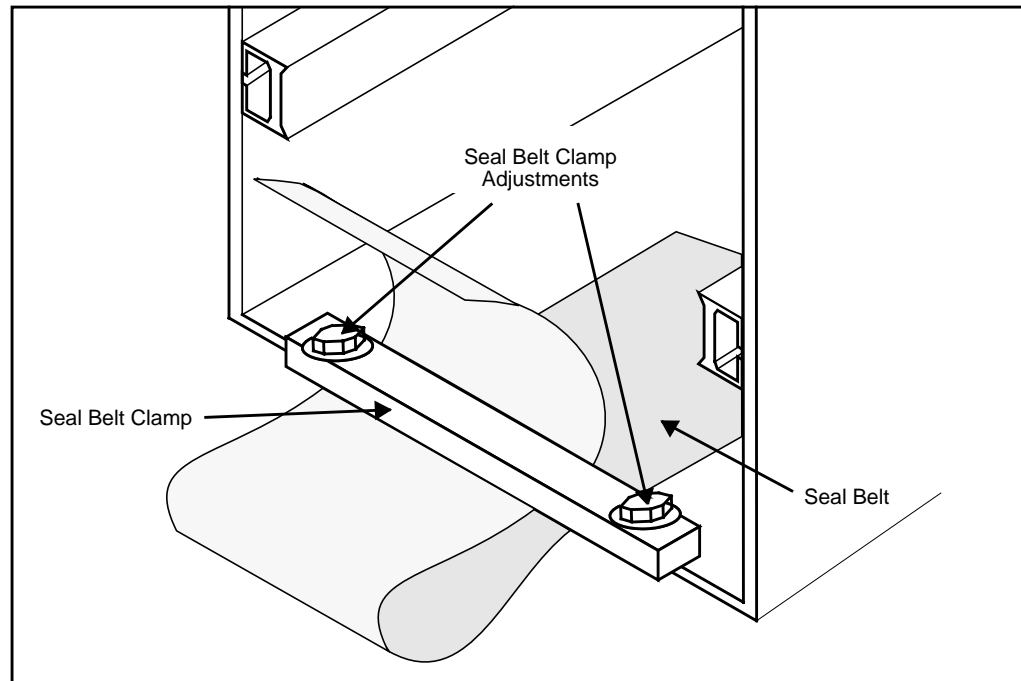


Figure 9-5 Seal Belt Adjustment

1. Inspect the seal belts for evidence of wear or cracks. Replace belts that have evidence of wear or cracks.
2. Inspect the seal belt rollers for evidence of cracks or wear.
3. Inspect the spring tension on the seal belt rollers. The roller assembly should exert some downward force when manually lifted. If this does not happen, the roller assembly should be replaced.

If the seal belt tension is uneven, adjust the tension of the seal belt as follows:

1. Loosen the seal belt clamp adjustment corresponding to the side that is elevated by a slight amount.
2. Tighten the clamp when finished.

If the belt tension is too tight at both sides:

1. Loosen the seal belt clamp adjustments and pull the seal belt evenly in the cross-machine direction to result in a uniform decrease in tension.
2. Tighten the clamps when finished.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

If the belt tension is too loose:

1. Loosen the seal belt clamp and pull the seal belt through the clamp in the cross-machine direction evenly to result in a uniform increase in tension.
2. Tighten the clamp when finished.

Head Separation and Limit Switch Inspection

Refer to [Figure 9-6 on page 194](#). Verify the operation of the head separation clutch by completing the following:

1. Move the sensor head package to the off-sheet position.
2. Place the platform in Local by pressing the LOCAL push button on the control panel.
3. Verify that the shutter closes on the Basis Weight and Ash sensors.
4. Activate the head separation switch located at either end of the Smart Platform in the service outlet box.
5. Make sure the sensor heads can be separated by manually moving the bottom head.
6. Move the sensor heads back as close as possible to their original position.
7. Deactivate the head separation switch by returning it to its normal position.
8. Manually position the sensor heads to make sure the air clutch has been properly seated and locks when the proper position is reached.
9. Return to the normal system operation.
10. Manually jog the sensor package to the drive and idler ends slowing the rate of travel as they reach the end of the platform.
11. Verify that the drive motor stops when the limit switch is tripped.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

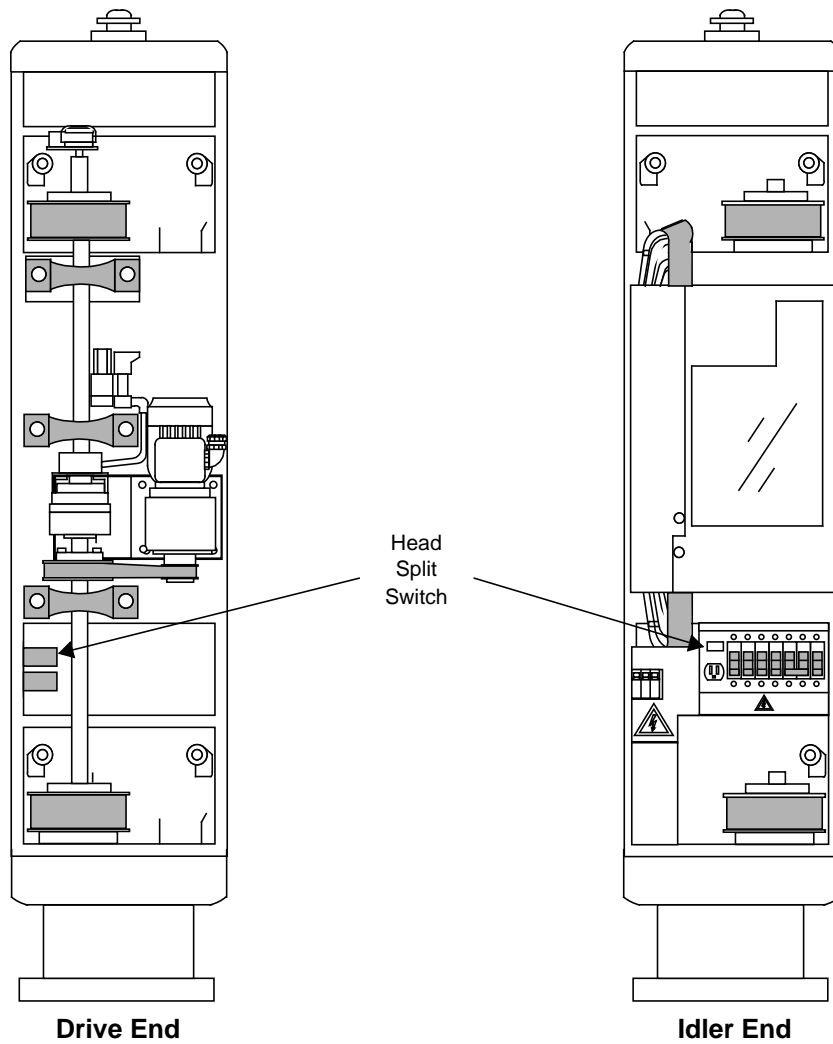


Figure 9-6 Head Separation Check

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Wheel Inspection

The carriage wheels should be checked periodically for wear or damage in the material. Complete the following steps to check the carriage wheels:

1. Put the Smart Platform in Local mode.
2. Jog the sensor package to the drive end of the Smart Platform so that the carriage wheels are visible at that end.
3. Check for proper wheel and way bar contact.
4. Jog the sensor package slightly to inspect portions of the wheel that are hidden by the carriage.
5. Replace carriage wheels that exhibit wear or damage.
6. Jog the sensor package to the idler end of the Smart Platform so that the carriage wheels are visible at that end.
7. Check for proper wheel and way bar contact.
8. Jog the sensor package slightly to inspect portions of the wheel that are hidden by the carriage.
9. Replace wheel assemblies that exhibit wear or damage.



MOTOR ONLY

When performing maintenance operations to the carriage or platform, always lock out the drive motor power on the lock-out switch at the drive end column.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Platform Alignment Inspection

The alignment inspection recommended for the Smart Platform consists of running an air profile at four-week intervals during a time when the process is not running. Complete the following to perform an air profile:

1. Scan the sensor package with at least ten scans without the process in the gap. The composite profile weighting factor should be set up for 10 scans.
2. Select and observe the Basis Weight profile on the video monitor.
3. Compare the profile to the profile taken at installation. They should not differ more than 0.1 grams per square meter (g/m^2). Consult your measurement specialist if the profiles differ more than this amount.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Air Purge Filter Inspection

The Smart Platform requires a constant flow of filtered air to keep the electronics and mechanisms at a safe temperature and to prevent contaminants from entering the sealed platform.

If the platform is utilizing DC motor cooling air from the mill air system, there are no extra filters needed.

If the platform is using the ABB supplied high capacity purge blower (Part Number 101495-006, the filters need to be cleaned periodically to maintain good air flow. The frequency of cleaning the filters depends upon mill conditions. The presence of good air flow is easily detected by opening the doors on the idler side of the Smart Platform.

The high capacity purge blower is intended to provide better SP Frame reliability under all environmental conditions. The circuit breaker is rated at 15.0A for the high capacity purge blower. The high capacity purge blower draws between 5 and 9 AMPs at 230 VAC during normal operation. The highest current will be observed when the damper is fully open.

Purge Blower Replacement Process

Note: Purge blowers used before October 1995 used a low capacity purge blower, Part Number 101495-003. This item is no longer being used. A high capacity purge blower, Part Number 101495-006 is now being shipped and replaces the low capacity purge blower.

If the low capacity purge blower fails, you will need to order the high capacity blower assembly. The following assemblies are available for specific application requirements:

- 123595-008 Purge Blower Assembly without cabinet and with High Capacity Purge Blower
- 127323-011 Blower Assembly without cabinet and with High Capacity Purge Blower
- 127323-012 Blower Assembly with stainless steel cabinet and High Capacity Purge Blower

Note: Some earlier shipments of the high capacity purge blower contained the wrong circuit breaker. If you replaced the low capacity purge blower with the high capacity purge blower, check the circuit breaker for the correct rating. If you are experiencing startup or run trips, check the circuit breaker rating. If incorrect, order the correct rating, 15.0 A, ABB Part Number 014847-108.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Cleaning the Air Purge Filter

Cleaning the Air Purge Filter depends on the paper dust levels. If there is a high level of dust, the filter should be checked and cleaned at least once a day. If there are lesser amounts of paper dust, then the interval should be a minimum of every other day.

If the Air Purge Filter requires frequent cleaning, you might consider relocation of the blower to a cleaner environment. Failure to check and clean the filter will cause premature failure of the purge blower motor and frame down time.

1. Turn off power to the purge blower using the switch on the blower.
2. Turn off the power at the power distribution center.
3. Remove the cylindrical fiber filter.
4. Blow compressed air into the inside of the filter to clean it. If the metal screen filter is also dirty, clean it the same way.
5. Replace the filter. Restart the blower.

Note: Keep the Smart Platform well sealed and the doors fully closed at all times, except during maintenance. Positive air flow is required for reliable operation.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Inspecting the Compressed Air Filters

The Smart Platform requires good quality compressed air. Air pressure to the platform must never be below 4.5 bar (65 psi). Contaminants are filtered through the incoming air filters. The frequency with which the compressed air filters are changed depends upon the amount of contaminants in the mill air supply and the type of filter used. Inspect the filter once a week for the first three weeks to gauge the frequency that the filter needs to be cleaned.

Cleaning the Compressed Air Filter

1. Press the OFF SHEET push button on the control panel.
2. Turn off the main AC circuit breaker at the Smart Platform idler side power entrance module.
3. Turn off the main air valve.
4. Replace or clean the filter.
5. Turn on the main air valve.
6. Turn on power to the platform. Wait five minutes for stabilization, then perform a standardize.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Inspecting the Water Filter

The maintenance schedule for the water filter will depend upon the amount of contamination in the cooling water supply. Inspect the filter once a week for the first three weeks to gauge the frequency that the filter needs to be cleaned. Follow the procedure below for maintenance to the water filter.

1. To perform maintenance that will take two hours or more, turn Off the main AC circuit breaker.
2. When maintenance will be less than two hours, keep the Liquid Cooling Unit (LCU) pump running and the platform scanning, while temporarily shutting down the mill water supply for filter replacement.

The replacement procedure for the water filter will depend upon what type of unit was purchased.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Power and Temperature Checks

Prepare weekly reports on the system power and board temperatures. Use the Electronics Health Pages to print out the last 20 occasions of DC power levels and cabinet temperatures. Refer to [Figure 9-7](#) for an example of the Electronics Health Page. Keep the weekly reports in a log for future reference.

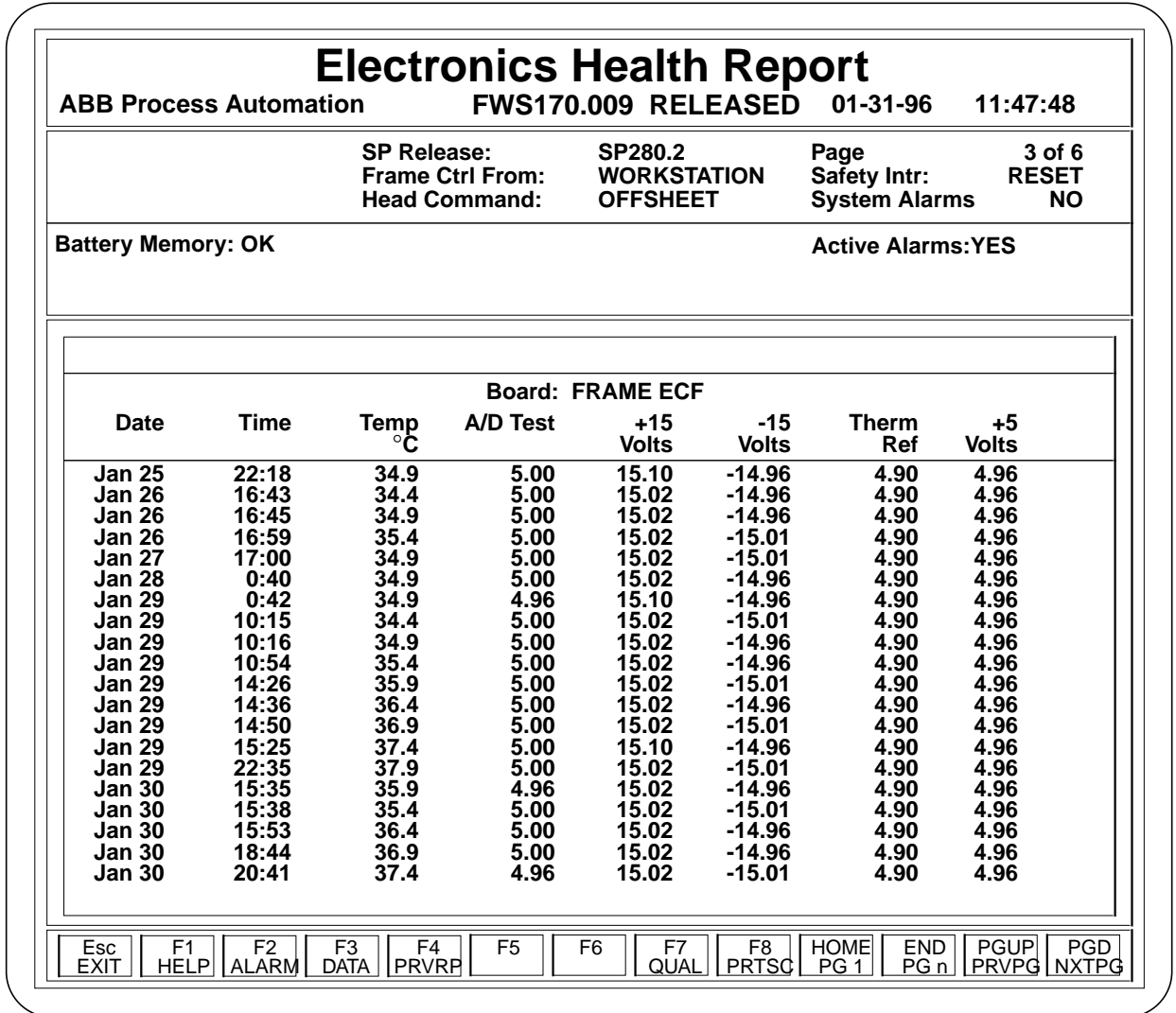


Figure 9-7 Electronics Health Page Report

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

DC Voltage Level Checks

Check the five DC voltage levels. Perform this check at least once a month using the Electronics Health Page. The Electronics Health Page reports the number of times each day that the DC voltages exceeded their tolerance limits. The limits are checked on the hour, each hour of the day. The limits for each voltage are as follows:

± 12 volt supply	- 11.41 - 12.64 VDC
+ 5 volt and +5 volt supply	- 4.76 - 5.29 VDC
+ 10 volt supply	- 9.94 - 10.12 VDC

Cabinet Environmental Checks

Check the cabinet environmental temperature at each microcontroller board. Perform this check at least once a week using the Electronics Health Page. The report represents the maximum temperature of each shift for each day. The limits are checked on the hour, each hour of the day.

Examine the report for excessive cyclical variations or heating trends. It may be possible to correlate performance problems with heat problems.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

10

Replacement Procedures

This chapter contains the following major sections:

Section.....	Page
Drive Motor Belt	204
Carriage Drive Belt	206
Idler Pulley	208
Carriage Wheel	209
Seal Belt	210
Split Rollers	213
Flex Cable	215
Electric Chassis	218
Motor Drive Replacement (ABB ACS-100)	222
Drive Motor Controller (Fincor and Lovejoy)	223
Pressure Switch	225
Encoder	226
Replacement Parts List	227
Replacement Parts for the ASPC	230

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Drive Motor Belt

Use these procedures to replace the drive motor belt. Refer to [Figure 10-1](#) and [Figure 10-2](#) on page 205.

1. Turn off the power to the drive motor.
2. Loosen the tension on the drive motor belt by completing the following:
 - a. Loosen the four drive motor mount adjustment bolts.
 - b. Slide the assembly towards the drive shaft and take the belt off of the motor pulley.

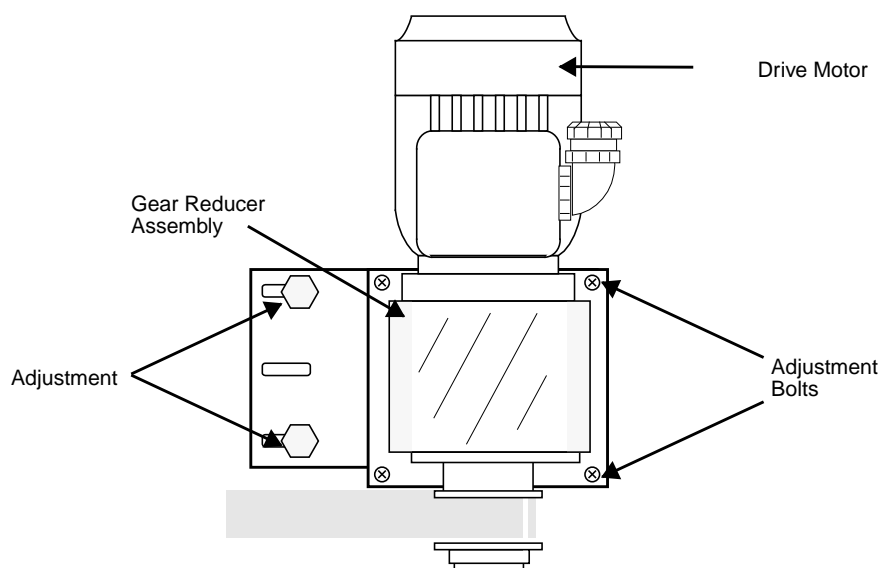


Figure 10-1 Drive Motor Belt

3. Disengage the air clutch by using the head separation switch so that the two drive shafts can move independently.
4. Remove the two metric Allen screws that hold the collar to the shaft.
5. Remove the three SAE bolts on the mating collar.
6. Remove the collar which exposes a two-inch gap between the upper and lower drive shafts to allow removal of the drive motor belt.
7. Replace the drive motor belt.
8. Adjust the tension and tighten the drive position adjustment locks.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

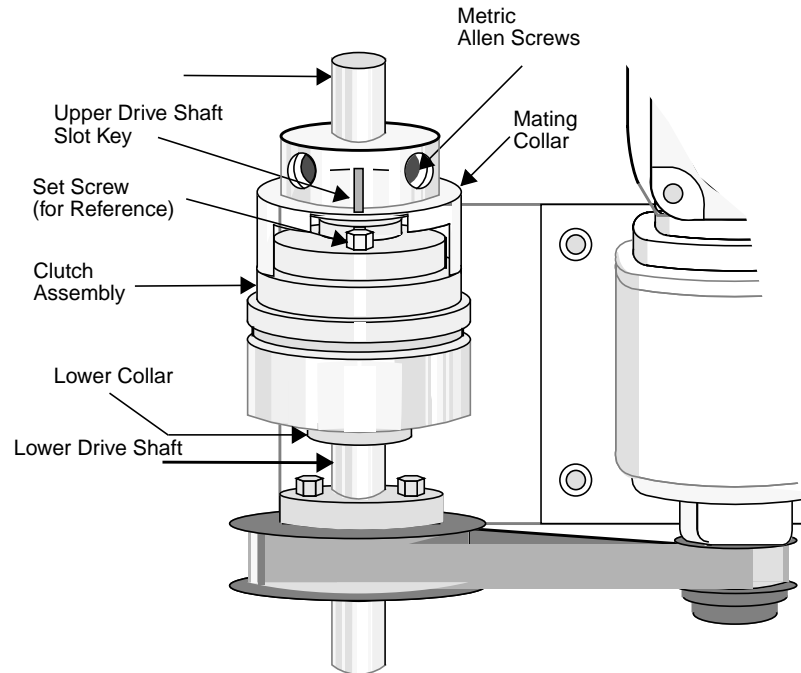


Figure 10-2 Clutch Assembly Details

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Carriage Drive Belt

Use these procedures to replace the carriage drive belt. Once this procedure is completed, perform a scan direction alignment to make certain that the sensor heads are tracking each other. Refer to [Figure 10-3 on page 207](#). The carriage alignment in the drive direction may need to be reset. To check the alignment, complete the [“Scan Direction Alignment” on page 54](#).

Note: When replacing a failed belt, it is required that both top and bottom belts be replaced as a matched set. Replacing both belts at the same time maintains sensor alignment by eliminating variation between belts due to wear. In an emergency situation, it is acceptable to defer replacement of the second belt until the first scheduled maintenance shutdown.

$$\text{Belt Length} = 2 \times \text{center - to - center} + 8.75 \text{ in}$$

Equation 10-1 Carriage Drive Belt Equation

1. Disengage the air clutch so that the heads can be separated.
2. Turn off the power to the drive motor.
3. Move the head carriage with the defective belt to the Smart Platform idler end column.
4. Release the belt tension by loosening the idler pulley at the Smart Platform idler end column.
5. Remove the end of the drive belt which is attached to the idler end of the carriage assembly.
6. Attach the new belt with strong tape to one end of the old belt which was removed in the previous step.
7. Go to the drive end of the Smart Platform and pull the new drive belt through the structure.
8. Attach the other end of the new belt to the idler end of the carriage assembly.
9. Move the head carriage to the Smart Platform drive end, and at the same time, pull the new belt along with it.
10. Disconnect the two belts attached in Step 6 and discard the old belt.
11. Cut the new belt to a length such that when it is attached to the carriage assembly, the tension can be adequately adjusted using the idler tension adjustments.
12. Attach the remaining loose end of the new belt to the drive end of the carriage assembly.
13. Move the head with the new drive belt, center them, and engage the air clutch.
14. Tighten the new belt to 125 ± 25 pounds.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

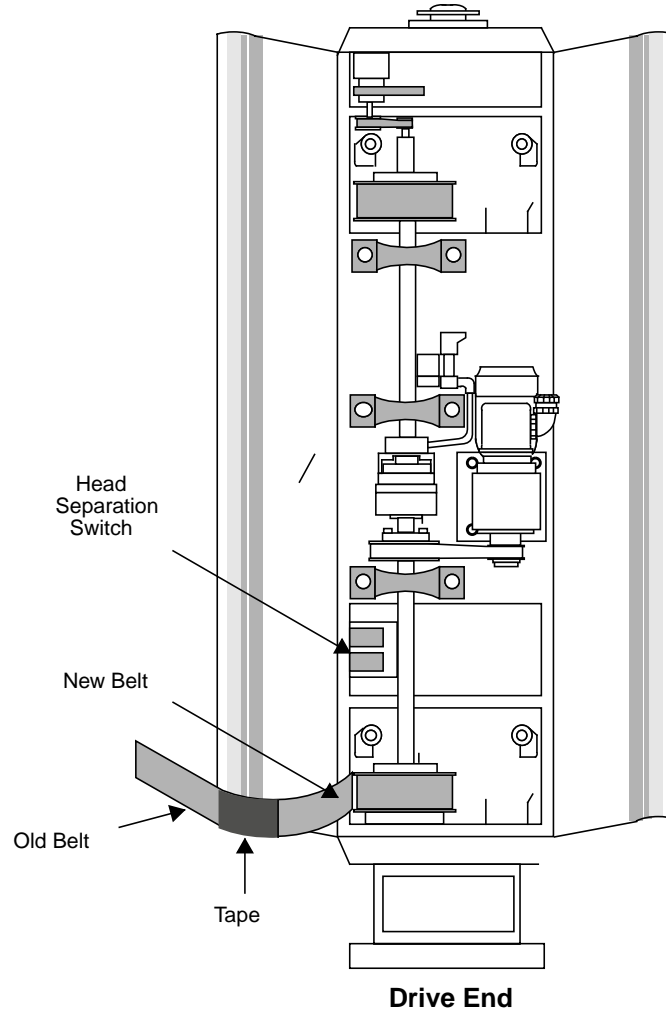


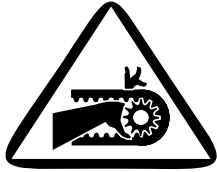
Figure 10-3 Carriage Drive Belt

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Idler Pulley

Use these procedures to replace the idler pulley. Refer to [Figure 10-4](#).



Exercise care when working with toothed belt and toothed gear equipment. Do not wear ties or loose clothing while working near equipment.

1. Turn Off the power to the drive motor.
2. Loosen the idler tension adjustment locks and loosen idler pulley.
3. Remove the shaft on the pulley shaft that secures the pulley and lift the pulley off from the shaft.
4. Replace pulley assembly.
5. Adjust tension by adjusting the idler tension adjustments.
6. Perform the Scanning Direction Alignment Procedure in Chapter 3, [page 54](#).

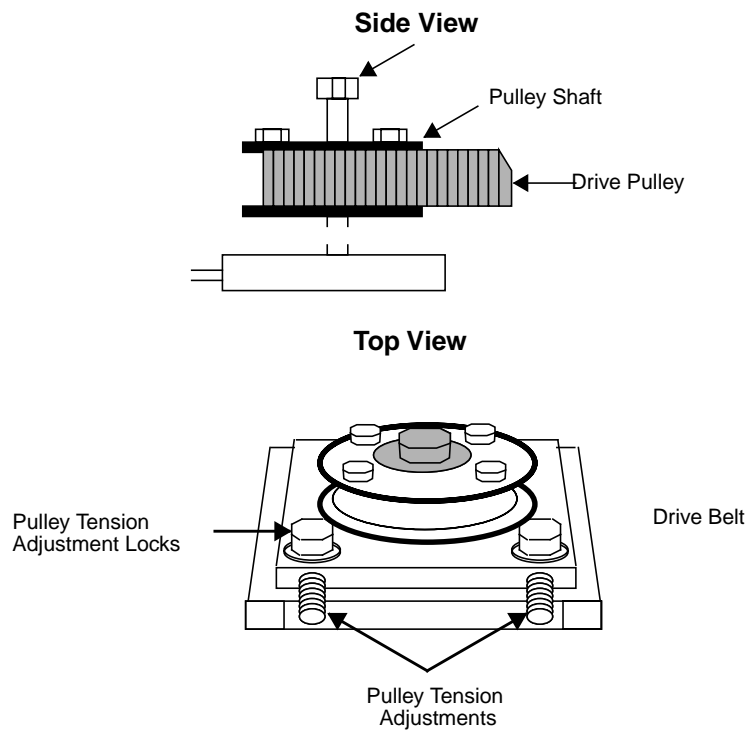


Figure 10-4 Idler Pulley

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Carriage Wheel

Use these procedures to replace the carriage wheel. Refer to [Figure 10-5](#).

1. Move carriage assembly to either the idler end or the drive end of the platform depending upon which wheels need replaced.
2. Remove both of the bolts which are holding the carriage wheel to the assembly.
3. Remove the wheel from the axle.
4. Replace the wheel and secure the two bolts which attaches the wheel to the carriage assembly.

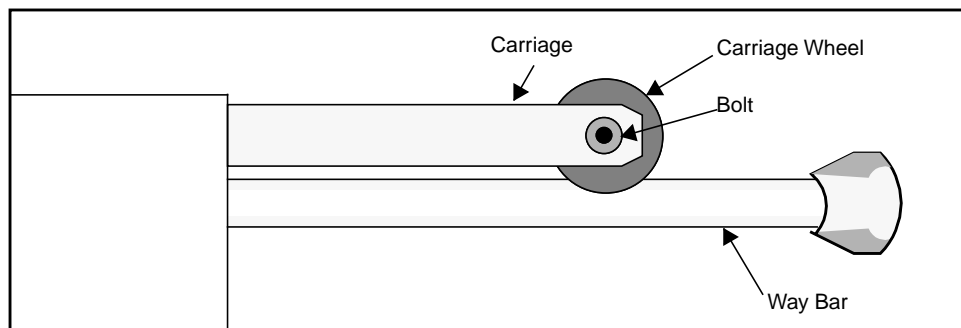


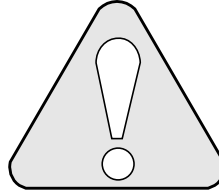
Figure 10-5 Carriage Wheel

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Seal Belt

Use these procedures to replace the Seal Belt. Refer to [Figure 10-6](#), [Figure 10-7](#) on page 211, and [Figure 10-8](#) on page 212.



The Smart Platform design allows replacement of this item while the customer's process is running. Exercise caution to ensure that the seal belt is kept clear of the process while being removed and replaced.

1. Loosen the seal belt clamp at the drive end.

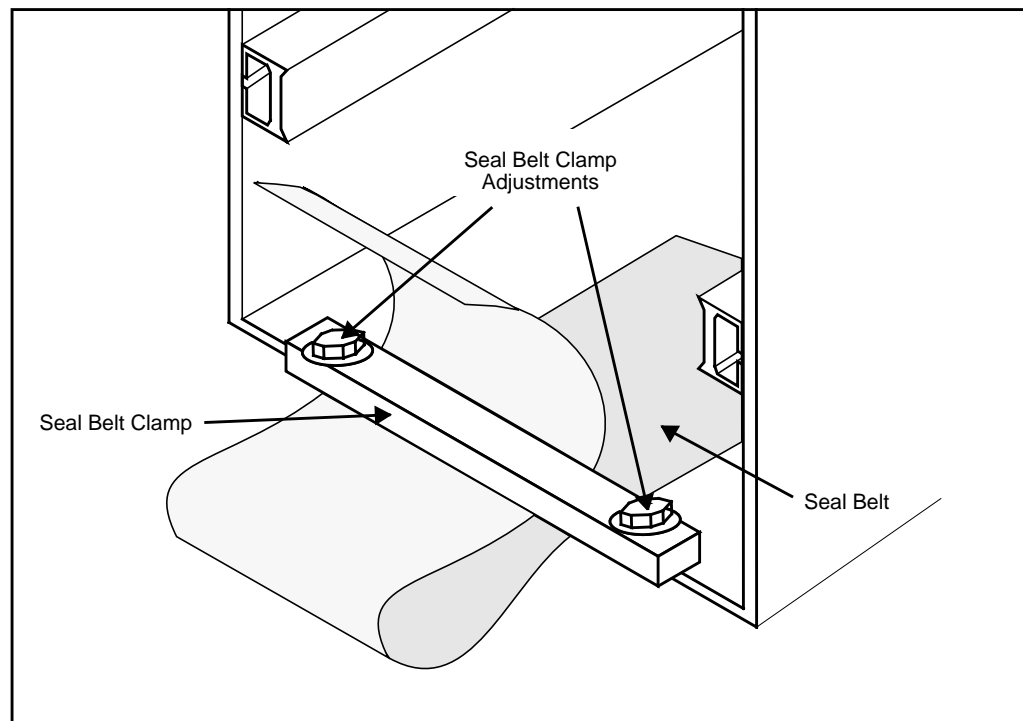


Figure 10-6 Seal Belt Clamp

2. Loosen the seal belt clamp at the Smart Platform idler end.
3. Pull the seal belt through the Smart Platform idler end.
4. Jog sensor heads to the Smart Platform idler end.
5. Turn off power to the drive motor.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

6. Thread the seal belt into position at the idler end under the seal belt roller and guide through the carriage assembly.

Note: It is extremely important to note that the seal belt should be centered between the extrusions otherwise the belt may rub the side of the extrusions while the sensor heads are scanning. This condition could result in unsteady scanning and premature wear of the seal belt.

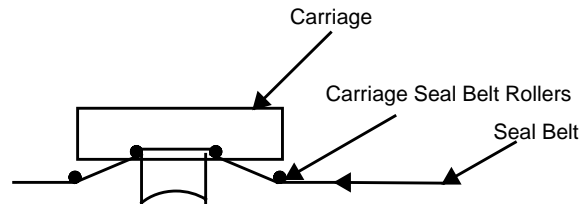


Figure 10-7 Seal Belt

7. Secure belt at the drive end of the carriage with tape.
8. Turn on the power to the Smart Platform long enough to jog the sensor heads to the drive end platform while maintaining enough tension to ensure that the seal belt does not contact the customer process.
9. Secure the belt at the drive end by threading through the seal belt clamp and tightening the clamp.
10. Pull seal belt from idler end of the platform to remove any slack in the seal belt.
11. Turn on power to the Smart Platform long enough to jog sensor heads to the idler end carefully taking up slack in the seal belt.
12. Adjust tension such that the seal belt lays flat in the tray without any deflections in the seal belt roller assembly.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

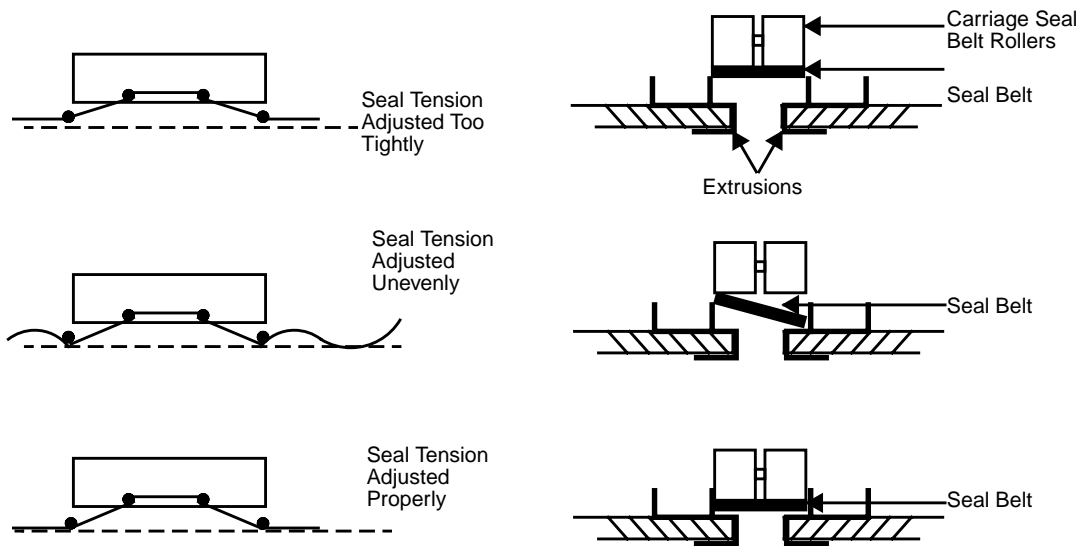


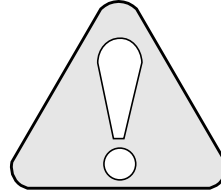
Figure 10-8 Seal Belt Tension Checks

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Split Rollers

Use these procedures to replace one of the split rollers. Refer to [Figure 10-9](#), [Figure 10-10](#) on page 214, and [Figure 10-11](#) on page 214.



The Smart Platform design allows replacement of this item while the customer's process is running. Exercise caution to ensure that the seal belt is kept clear of the process while being removed and replaced.

1. Jog the sensor heads to the end column that provides access to the split roller that needs replaced.
2. Turn off the power to the drive motor.
3. Loosen the seal belt clamp and relieve tension from the split roller assembly.

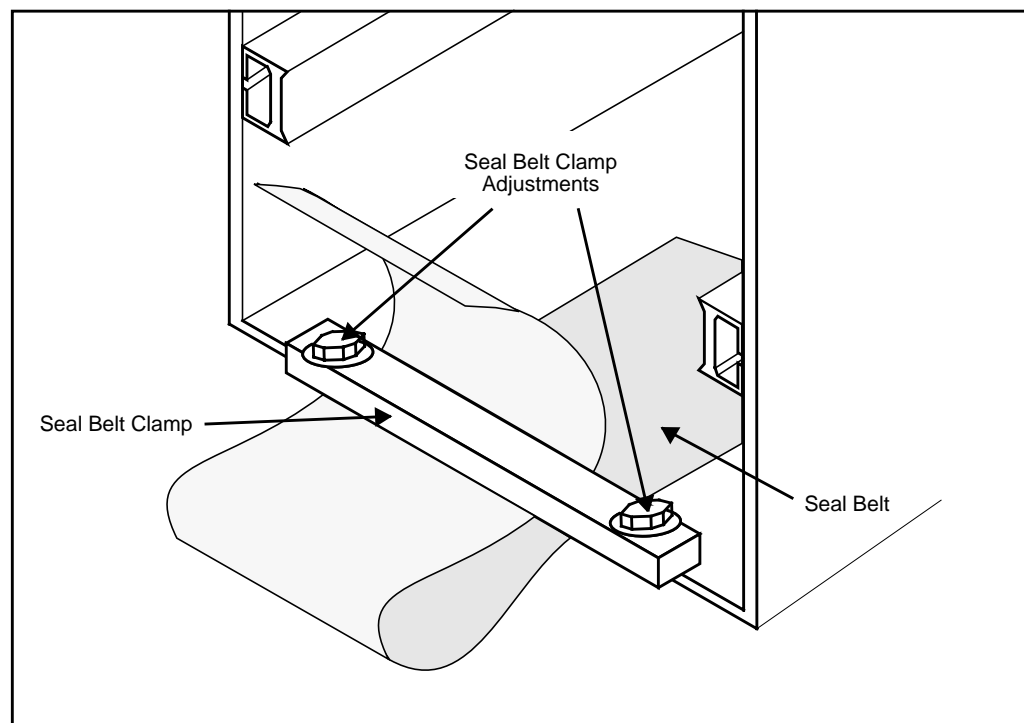


Figure 10-9 Seal Belt Tension Adjustments

4. Remove the bolt securing the damaged split roller assembly.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

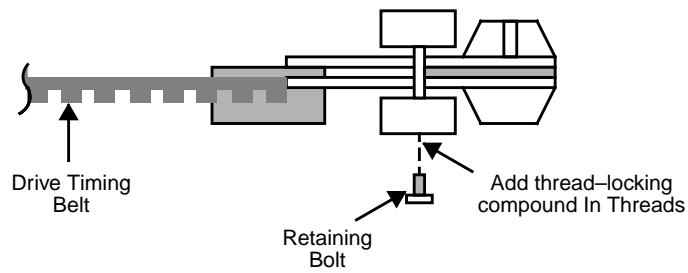


Figure 10-10 Split Roller Assembly

5. Remove the split roller.
6. Install the new split roller.
7. Add thread-locking compound to the threads of the bolt that secures the split roller. Reinstall it.
8. Pull the seal belt through the seal belt clamp to remove any slack in the seal belt.
9. Adjust tension such that the seal belt lays flat in the tray without any deflections in the seal belt roller assembly.

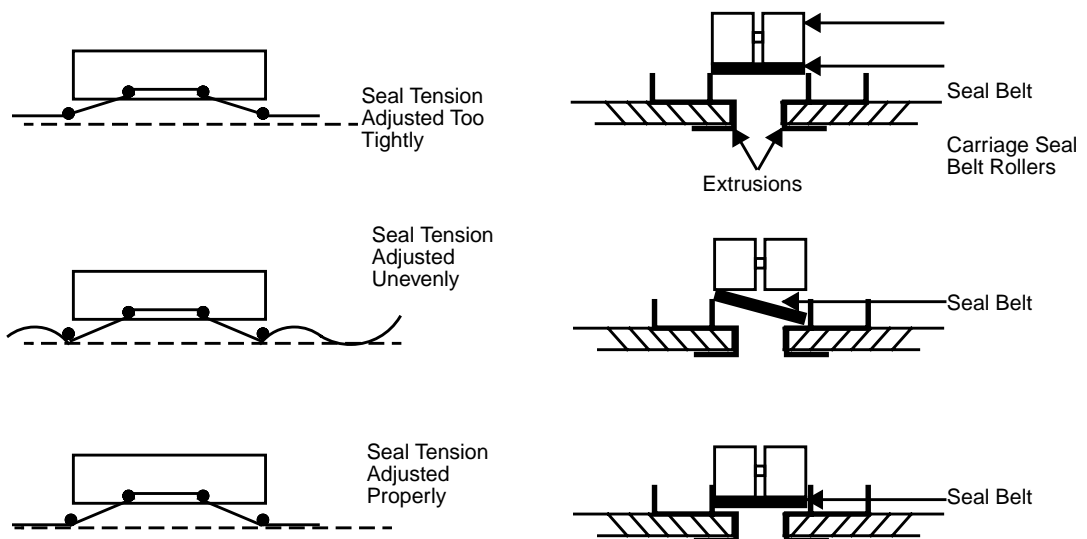


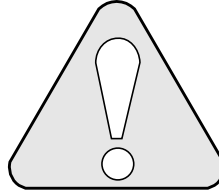
Figure 10-11 Seal Belt Tension Checks

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Flex Cable

Complete the following steps to replace the cable suspension. Refer to [Figure 10-12](#) and [Figure 10-13](#) on page 216.

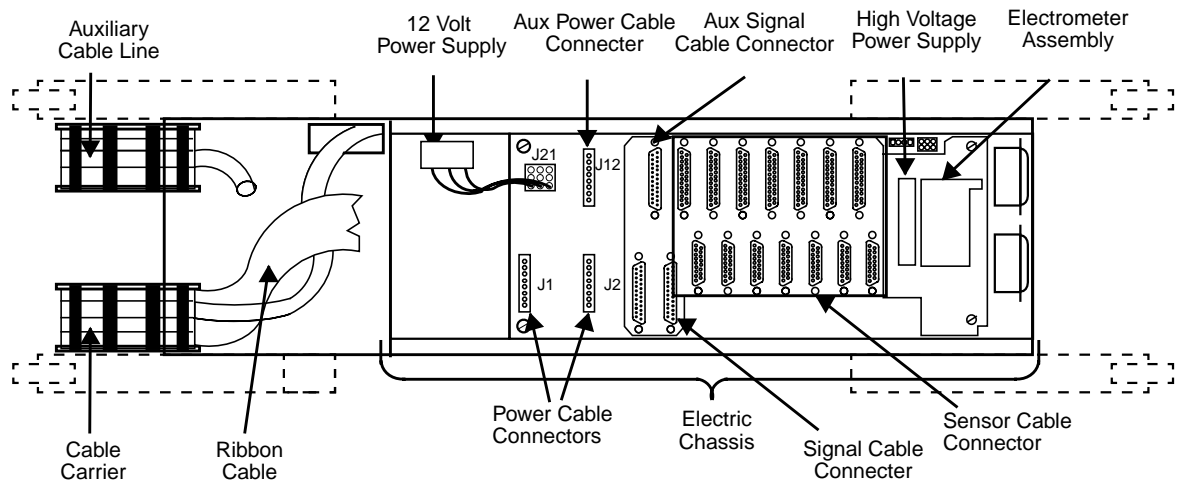


The Smart Platform design allows replacement of this item while the customer's process is running. Exercise caution to ensure that the flex cable is kept clear of the process while being removed and replaced.

$$\text{Flex Cable Length} = \text{center - to - center} + 120 \text{ in.}$$

Equation 10-3 Flex Cable Length Equation

1. Put the platform in local mode and jog the head to the idler end column.
2. Pull out the carriage PC board, and disconnect the signal and power cable connectors. At the carriage end only, cut off the connectors from the signal and power cables.



Upper Assembly Top View

Figure 10-12 Carriage Assembly (Top View)

Note: It may become necessary to cut the utility lines on the manifold at the Smart Platform idler end. The utility line is long enough to take up the slack. However, this should not be done too many times. Make sure the ribbon cable connectors are flat. This will make removal easier.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

3. Disconnect power and signal cables from the idler end column PC board.
4. Jog the head to the drive end.
5. At the drive end, remove cable carrier mounting bracket.
6. Roll cable carrier back and pull power and signal cables from carriage.
7. At the idler end column, remove cable carrier retaining bolt.
8. Pull cable carrier out just enough so that it lays flat at the drive end.
9. At the drive end, with both cables out of the carriage, tape the old cable to the new cable using a high-strength tape. For example, use strapping or shipping tape.

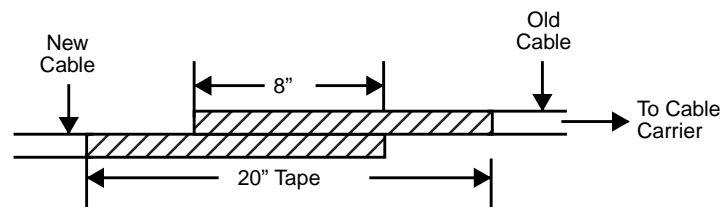


Figure 10-13 Cable Suspension

10. While one person at the drive end guides the new cable through the cable carrier, another person at the idler end column pulls the new cable through the platform. Once the cable is all the way through, leave enough excess cable at the idler end column to allow for a cable dress back into the idler end PC board.

Keep the cable carrier, ribbon cables, and utility lines clean. Dust and dirt will cause premature wear of the cables.

Note: Replacement of the complete assembly, ribbon cables, or utility lines can be accomplished at this time. If replacing the ribbon cable assembly, measure the length of cable exposed at each end and terminate new cable at the same length.

11. At the drive end, leave 60 inches of excess cable from the end of the cable carrier and cut the cable.
12. Terminate the signal cable according to Engineering Drawings 121974-003 and 121974-004.

Note: Do not reuse signal cable connectors. They must be replaced each time a new signal cable is installed.

13. Terminate power cable according to Engineering Drawings 121974-003, and 121974-004.
14. Feed cables back at the same time through the trough leading to the carriage and reinstall the cable carrier mounting bracket.

For ABB Employee Use Only

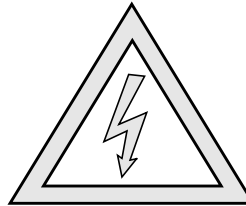
Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

15. At the idler end column, reinstall the cable carrier retaining bolt and cut the new power cable to the length needed to dress into the end column PC board. Install the connector according to Engineering Drawings 121974-003 and 121974-004.
16. Reconnect the power and signal cables to the idler end column PC board.
17. Jog the head to the idler end column, pull out the carriage PC board and reconnect the power and signal cables.
18. Push the carriage PC board back into place.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Electric Chassis



There have been several reported occurrences of the MP power flex cable being plugged in wrong. A typical error puts 120 VAC where the ± 15 VDC is supposed to be. If the system is powered up with the power cable plugged in wrong, catastrophic failure of sensors is likely.

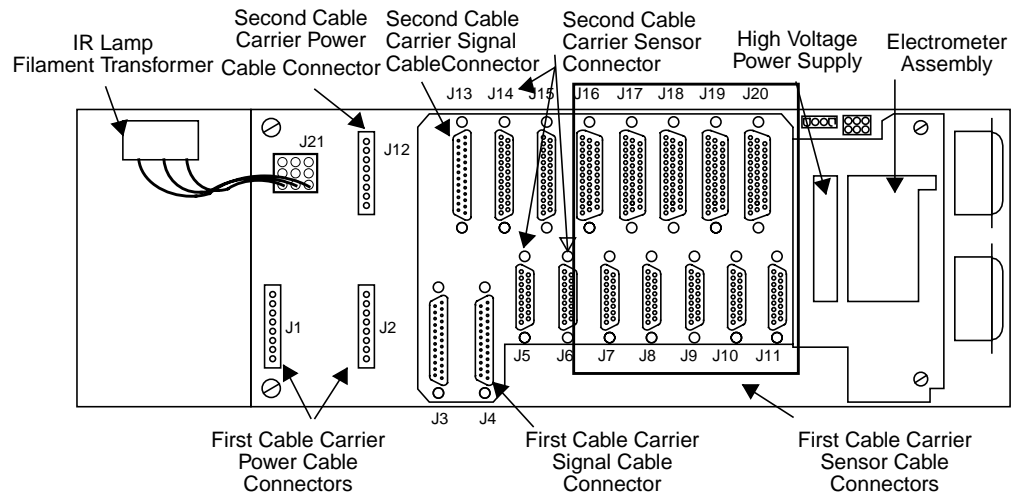
Electric Chassis Replacement Procedure

Complete the following procedure to replace the electric chassis in the upper or lower carriage. Refer to [Figure 10-14 on page 219](#).

1. Jog sensor heads to the Smart Platform idler end.
2. Turn Off power to the Smart Platform.
3. Remove the carriage end cover, then pull out the electric chassis.
4. Remove the cable connectors for the sensor interconnection.
5. Remove the ribbon cable connectors for the cable suspension from the carriage electric chassis.
6. Replace ribbon cable connectors for the cable suspension.
7. Replace the cable connectors for the sensor interconnection.
8. Slide the replacement electric chassis in place.
9. Replace the carriage end cover.
10. Turn On power to the Smart Platform.

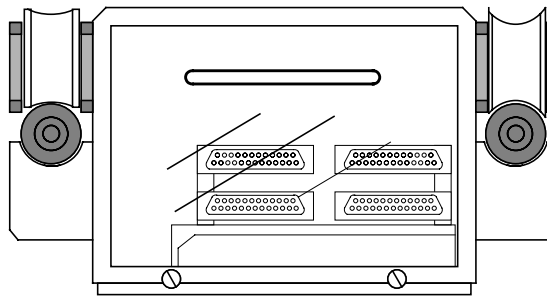
For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

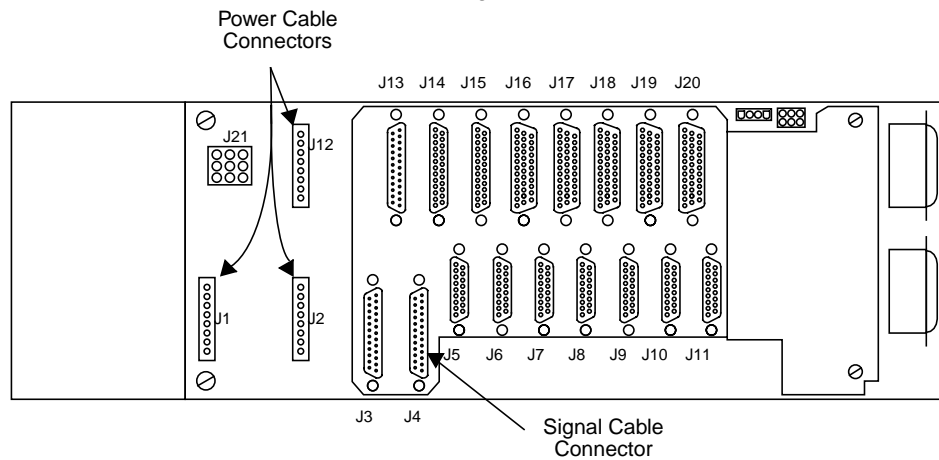


Upper Assembly Top View

NOTE: Static Box is not shown



Idler End View



Lower Assembly Top View

Figure 10-14 Carriage Assembly

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Flex Power Cable Retrofit Kit

The Flex Power Cable Retrofit Kit (Part Number GK-130618-001), significantly mistake proofs against plugging the power cable connectors in wrong.

The kit includes the following:

- Two 9-pin connectors (Part Number 101929-609)
- Two keying caps (Part Number 101929-901)
- Drawing Number DI-130618-000

One kit is enough to do one scanner (top and bottom) or two reflection scanners. The second flex cable (used for ash only) does not use two connectors so it does not need any rework.

Note: Changing the connectors will not prevent damage if the connectors are not installed on the cable correctly. The verification procedures on the instruction drawing are still required when replacing cables. However, once the cable is correctly made, use of this kit should prevent the connectors from being plugged in wrong.

Flex Cable Replacements

The correct procedure requires you to verify that the cables are correctly installed before repowering any sensors. There are two relatively simple ways to do this:

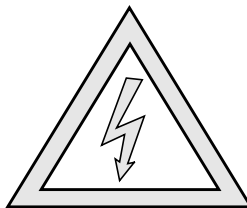
- After plugging the system back together, before repowering the frame, use two diagnostic cards and do continuity checks between the end column diagnostic plug and the carriage diagnostic plug.
- Unplug all of the sensor cables, electrometer, chamber supply, and IR transformer so you can power up the frame without danger of destroying your sensors. Check the supply voltages on the diagnostic plug (s) at the carriage before plugging anything back together. Again, refer to your test card inserts.

Doing both checks is recommended to make sure all of the wires are in the right place and there are not any catastrophic failures.

[Figure 10-15 on page 221](#) shows the proper cable dress in a Smart Platform 1200. Note that the longer side of the power cable plugs into the back connector (towards the drive end of the carriage board). The short side of the power cable plugs into the front connector (closer to the “idler” end). That is done to help from the cable loop so you can slide the carriage board assembly out.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.



Unfortunately, when the carriage board is pulled all the way out, the cable looks backwards if you forget about that loop. If you do not remember the loop, and plug the cable in the way it probably looks like you should, you just did it wrong.

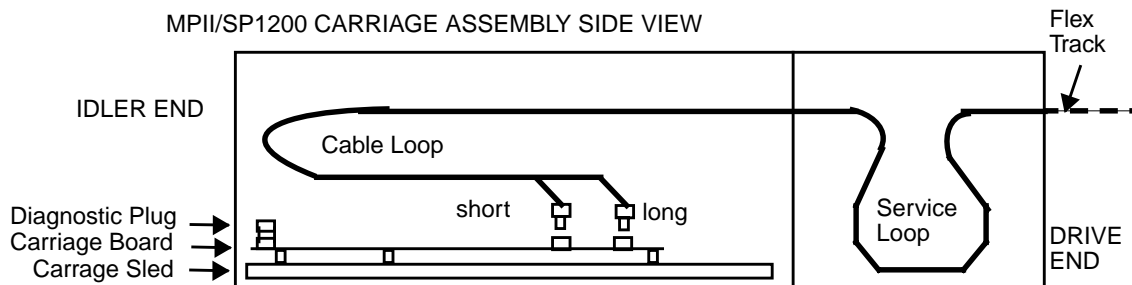


Figure 10-15 Side View of Proper Cable Dress for SP1200

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Motor Drive Replacement (ABB ACS-100)

Complete the following procedure to replace the Motor Drive. Refer to [Figure 10-16](#).



Exercise care when working with toothed belt and toothed gear equipment. Do not wear ties or loose clothing while working near equipment.

1. Turn Off power to the Motor Drive sled.
2. Pull out the Motor Drive sled.
3. Disconnect the three cables from the Motor Drive sled.
4. Remove the old motor drive sled and replace with the new one.
5. Reconnect the cables to the Motor Drive sled.
6. Return Motor Drive sled to its position in the drive end column.
7. Turn On power to the controller and complete the Motor Controller Setup procedure. See [“Motor Drive Setup \(ABB ACS-100\)”](#) on page 72.

Note: If the motor happens to run backwards, swap the wires in JDRV-1 and JDRV-3.

8. Execute the standard frame tuning procedure (ft) in the software.

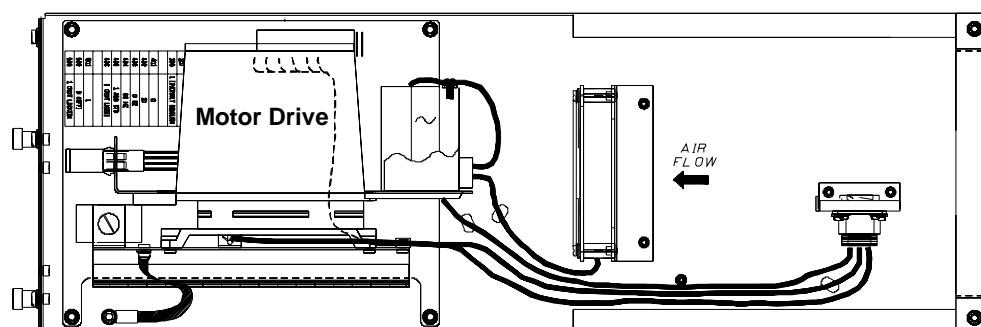


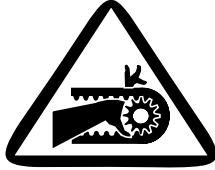
Figure 10-16 SP1200 Motor Drive Assembly

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Drive Motor Controller (Fincor and Lovejoy)

Complete the following procedure to replace the Drive Motor Controller. Refer to [Figure 10-17 on page 224](#).



Exercise care when working with toothed belt and toothed gear equipment. Do not wear ties or loose clothing while working near equipment.

1. Turn Off power to the drive motor controller.
2. Slide out the motor controller shelf.
3. Remove the cover for the drive motor controller.
4. Disconnect wiring for the drive motor controller.

Note: Be sure to note the wiring configuration and mark cabling if necessary. This will assure that the new controller matches the old controller. Failure to do so can result in damage to the motor and/or motor controller.

5. Remove motor controller.
6. Install new drive motor controller and make all wiring connections.
7. Turn On power to the controller and complete the Motor Controller Setup procedure. If the platform scans in the reverse direction, reverse the wires on terminals V and W on the motor controller.
8. Replace cover to the motor controller.

Replace the motor controller shelf.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

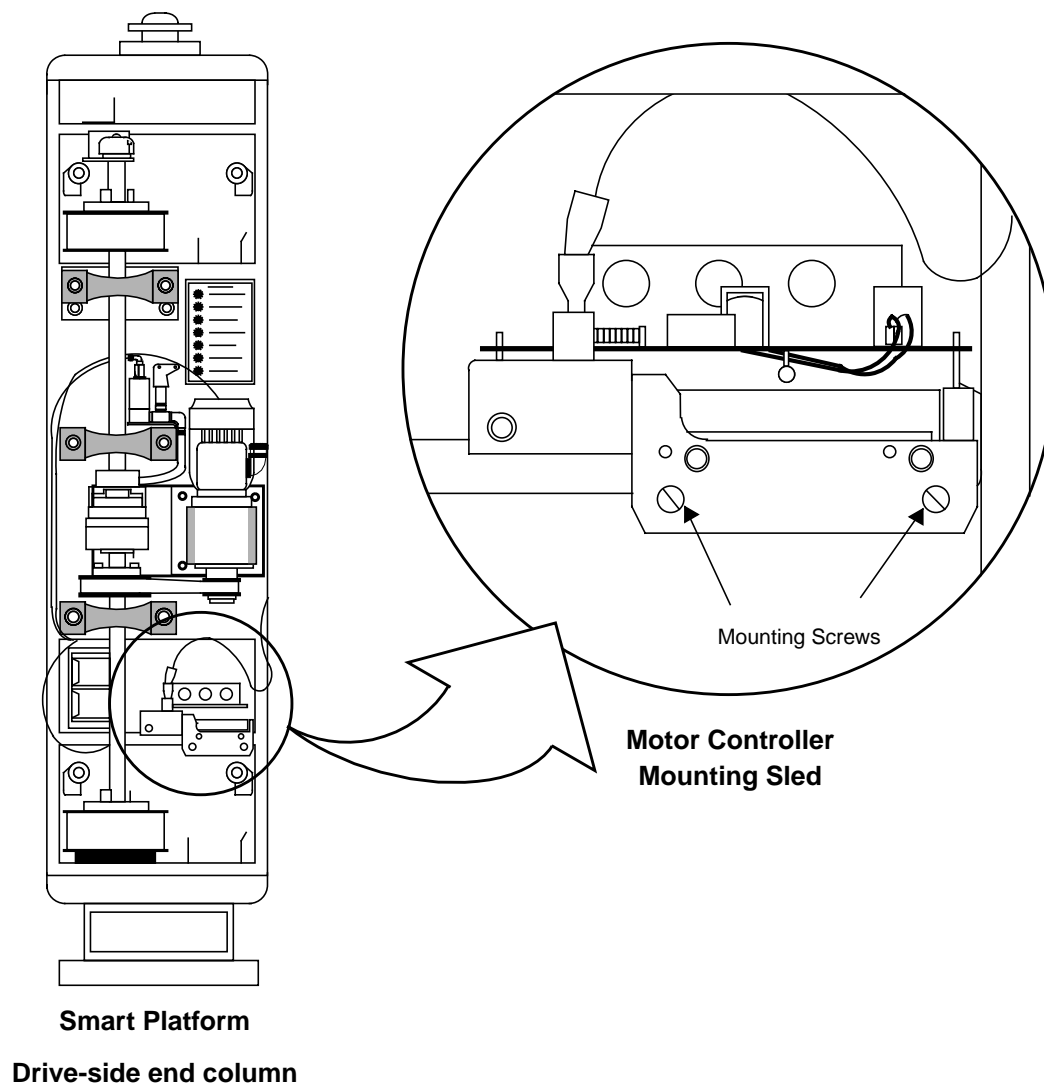


Figure 10-17 Drive Motor Controller

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Pressure Switch

Complete the following procedures to replace the pressure switch. Refer to [Figure 10-18](#).

1. At the drive end, remove the bolt that holds the bracket on which the solenoid and pressure switch rest.
2. After the bracket has been removed, detach the two wires from the top of the the pressure switch.
3. Unscrew the pressure switch.
4. Install the new pressure switch and make the wiring connections.
5. Reattach the bracket to the drive end of the Smart Platform.

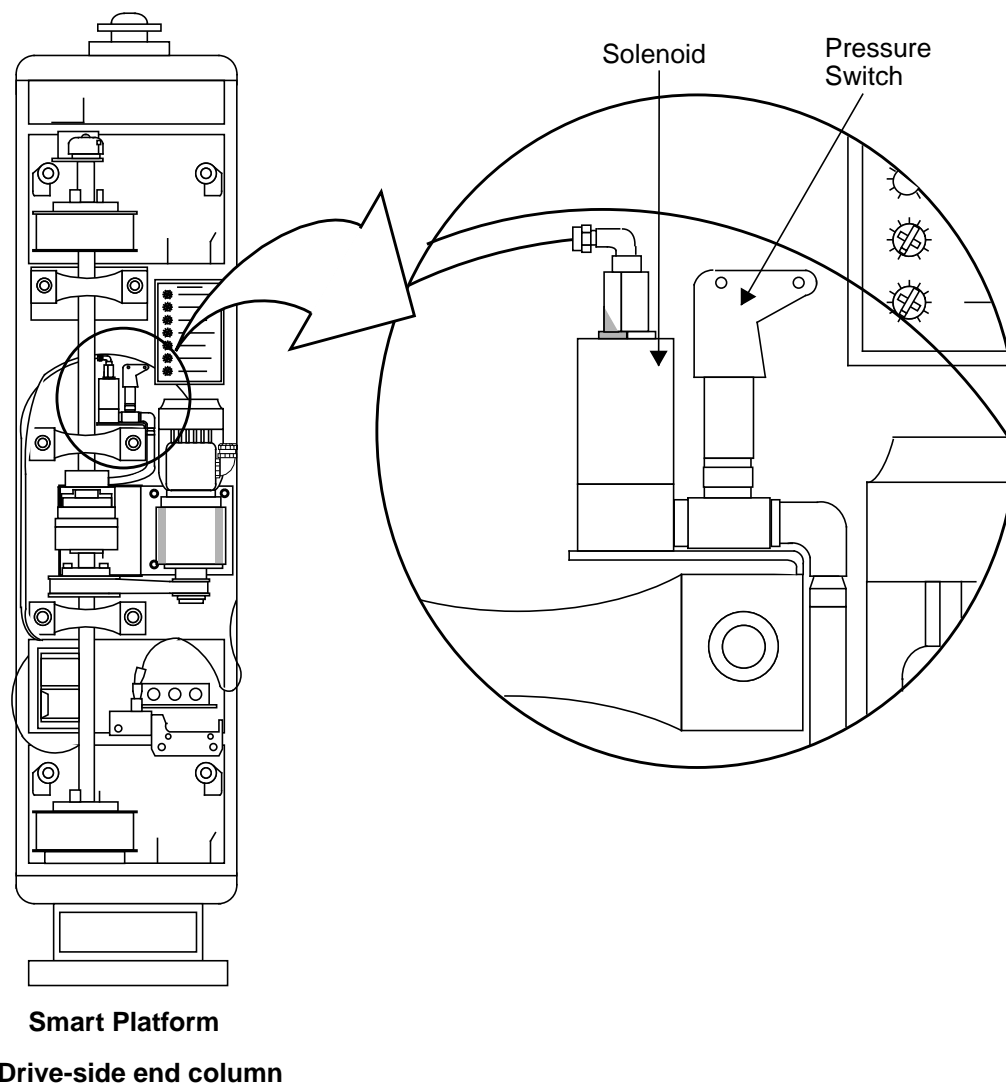


Figure 10-18 Pressure Switch

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Encoder

Complete the following procedure to replace the Encoder. Refer to [Figure 10-19 on page 229](#).

1. Unplug the D connector from the encoder cable.
2. Remove the four screws which are holding the encoder to the metal plate.

Lift the encoder from the plate.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Replacement Parts List

Refer to:

- [Table 10-1](#)
- [Figure 10-19 on page 229](#)

Table 10-1

Key Letter	Smart Platform Replacement Parts List	Part Numbers
	END COLUMN, DRIVE-SIDE	
	Drive Motor Belt (54 T)	015125-008
G	Pillow Block (3 req'd)	011756-106
B	Drive Pulley (2 req'd)	121849-001
	Key (4 req'd)	046102-013
	Ball Bearing Flange	011230-107
F	Gear Motor, incl. reducer	100456-003
E	Pressure Switch (15 A)	SC0001-001
D	Air Solenoid Valve (1/8")	MW0018-001
A	Encoder	019775-004
	END COLUMN, IDLER-SIDE	
	Bushing (2 req'd)	121802-001
	Pulley Assembly (2 req'd)	121850-002
	Manifold	127202-001
	MOTOR DRIVE	
C	SP1200 Motor Drive Assembly including MDPANEL and Filter	126620-005
	Motor Drive Subassembly (Remote Junction Box only)	133853-001
	Motor Controller Choke Assy. (Remote Junction Box only)	086277-001
	240 VAC Fan	102258-001
	CONTROL PANEL	
	Control Panel (Keypad)	100472-012
	Control Panel Interface Board (Serial)	086351-003
	DOOR HARDWARE	
	LH Hinge	100497-002
	RH Hinge	100497-001
	Latch, adjustable	100498-001

(continued on next page)

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 10-1 (continued)

Key Letter	Smart Platform Replacement Parts List	Part Numbers
	SMART PLATFORM	
	Limit switches, std.	100524-001
	Adjustable limit switch kit	121994-002
	Seal Belt, polyester	100524-001
	CARRIAGE FRAME	
	Carriage Light Assy.	084910-001
	Cover, way adjuster	121966-001
	CARRIAGE, INTERNAL	
	Cable Carrier, Divided	100490-005
	Hose, Dual flat	101497-001
	Signal Cable, flat (for divided cable carrier)	101575-037
	Power Cable, flat flex	100983-003
	Connector (37 Pos, receptacle)	101403-037
	Connector (37 Pos, plug)	101403-137
	Connector (37 Pos) Screw Retainer Kit	101403-901
	Stabilizer (37 Pos)	101405-837
	Cable Carrier, Undivided	100490-001
	Signal Cable, Flat, for undivided cable carrier	100577-037
	Drive Belt	100446-001
	Wheel assy.	121975-001
	Wheel assy., expansion	121975-002
	Carriage Connection board	085218-001
	PURGE BLOWER	
	High Capacity Purge Blower	101495-006
	Purge Blower Assembly without Cabinet and with High Capacity Purge Blower	123595-008

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

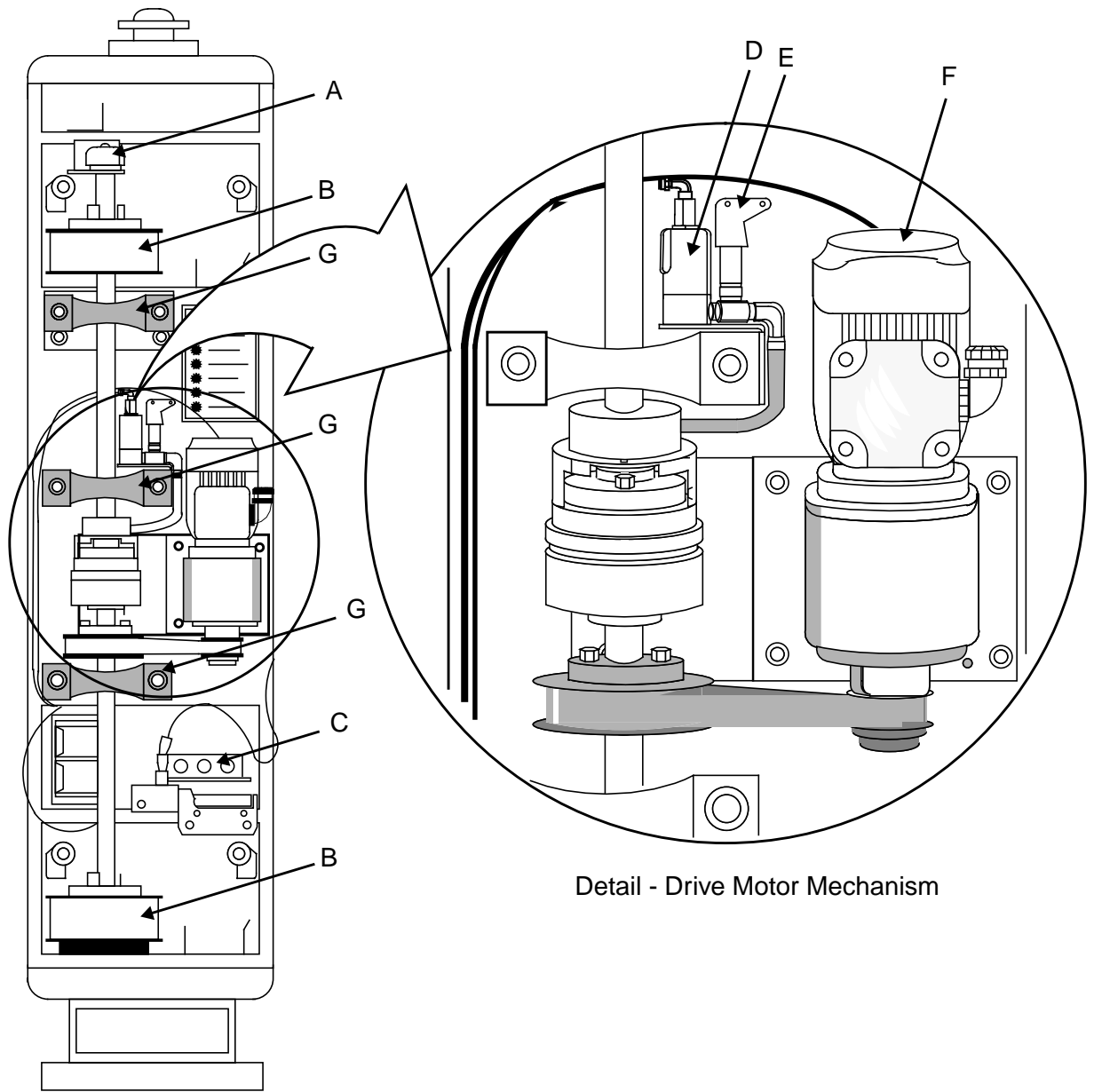


Figure 10-19 Drive End Column Parts

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Replacement Parts for the ASPC

Refer to:

- [Table 10-2](#)
- [Figure 10-20 on page 232](#)
- [Figure 10-21 on page 233](#)
- [Figure 10-22 on page 234](#)
- [Figure 10-23 on page 235](#)

Table 10-2

Key Letters	Smart Platform Electronics	Part Numbers
A	ECS Board	086329-103
B	SMI (located on the ECF and ECS boards) (IR CoatWeight and Aseptic Only)	086339-101 086339-002
C	ECF	086348-001
D*	MPRC	086349-102 or 086444-101
E	BRAM (located on MPRC board)	086318-001
F	ECPSR	086370-001
G	Heat Exchanger	101376-001
H	Fan, 24 VDC	128950-001
I	OSPS2	086363-002
J	EC24V	086362-001
K	HAM	086369-001
J1	12 VDC Plug-on for EC24V	101554-912
J2	Fuse, Plug-on for EC24V (3 amp) and HAM	101560-003
M	AC to DC Converter, 300 VDC	101554-300
K1	48 VDC Plug-in for HAM	101554-148
L	5 Amp Fuse	018252-008
N	ECC	086387-001

* When replacing an 086349-002 with an 086444-001, a kit should be ordered (086444-101). This kit includes the 086444-001 MPRC board plus instructions for loading the required software upgrade from ABBIE.

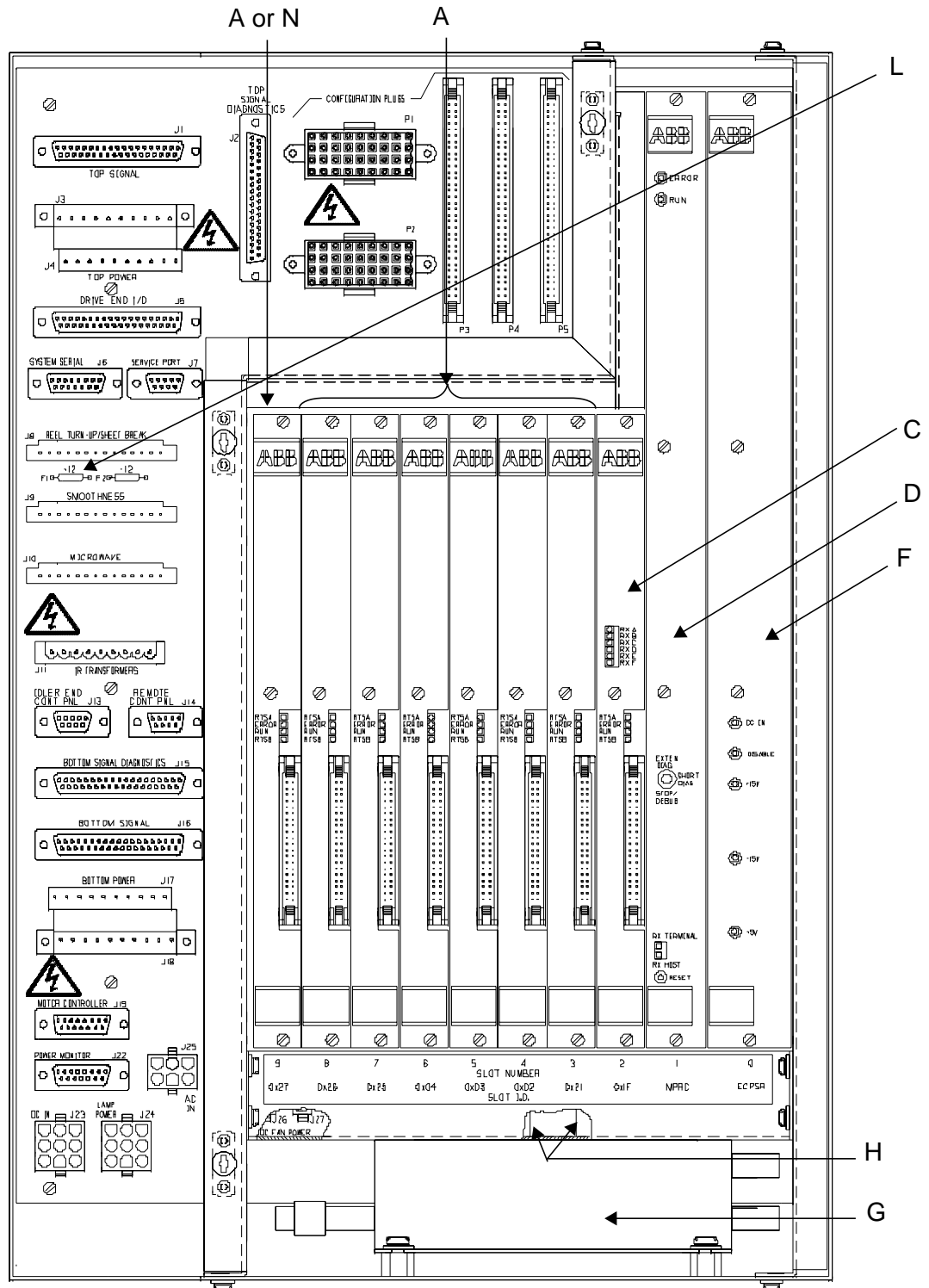
For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Note: Modules attached to printed wiring boards must be ordered separately. Modules are not supplied as part of printed wiring board assemblies. Always order the exact part number which is on the defective part. If a newer dash number is available, the parts department will supply it. Some systems will have dash numbers newer than the above list.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

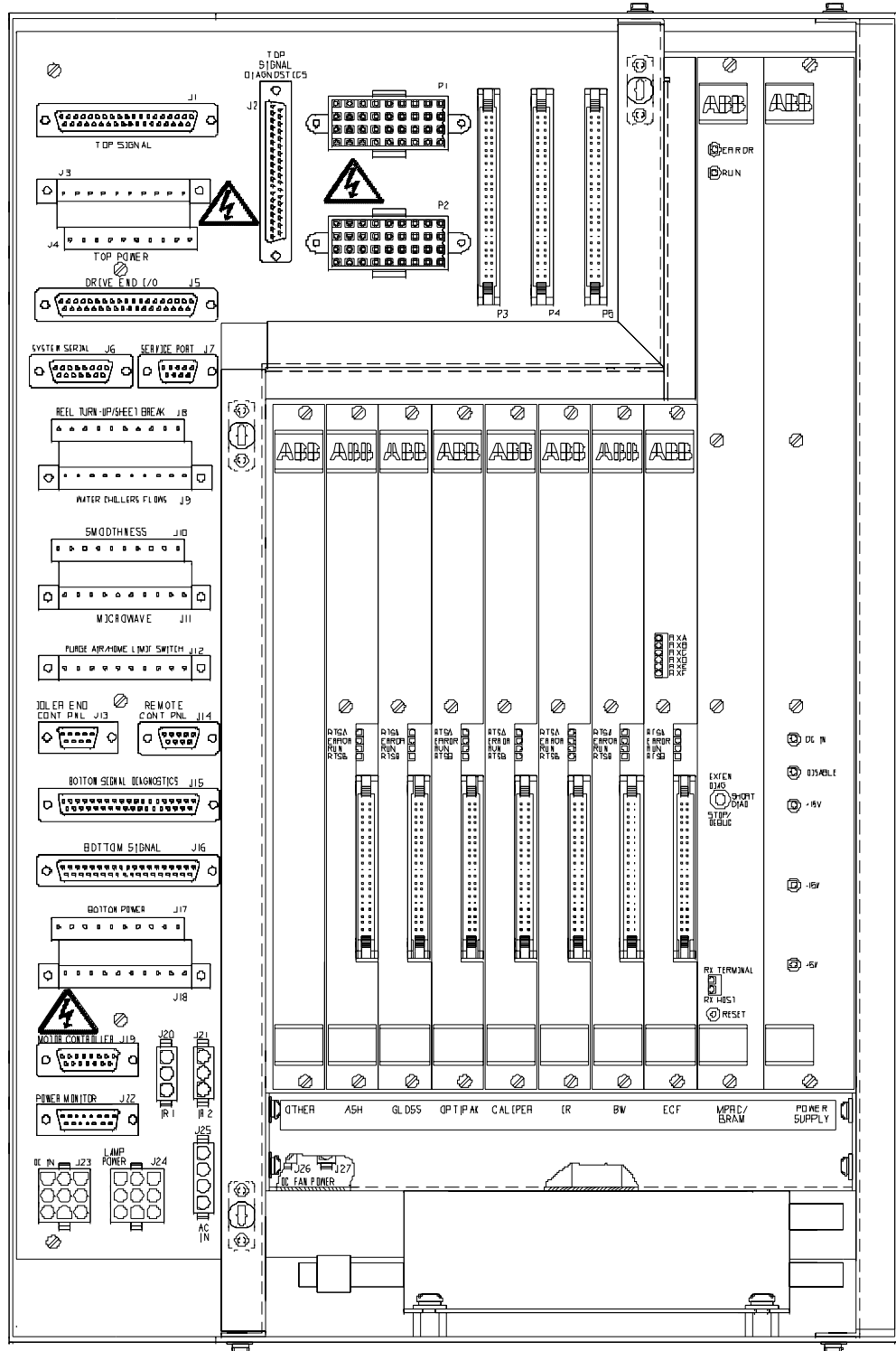


ASPC-4

Figure 10-20 SP Electronics Cabinet (086345-004 Backplane Version)

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.



ASPC-3

Figure 10-21 SP Electronics Cabinet (086345-003 Backplane Version)

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

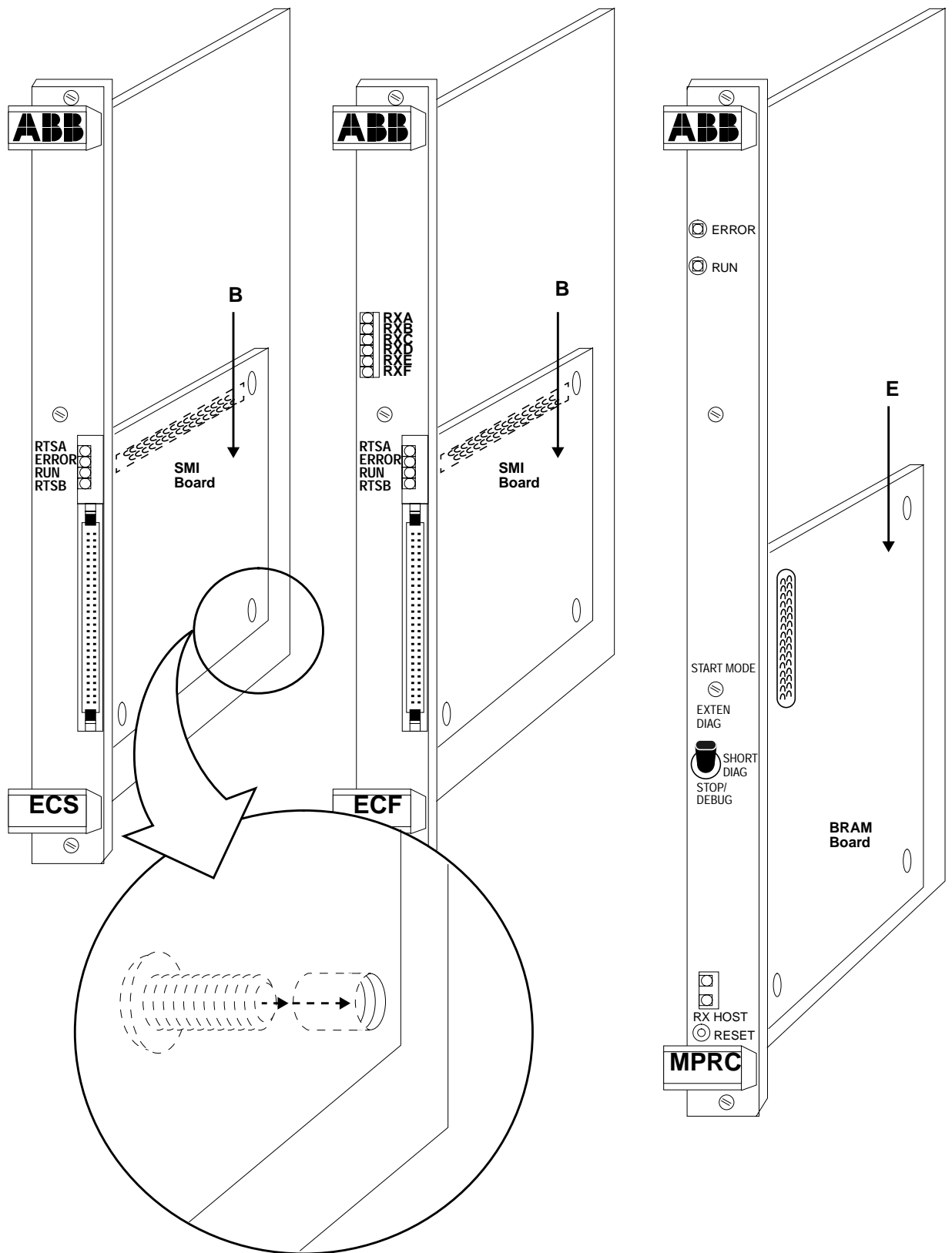


Figure 10-22 Location of SMI and BRAM Boards

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

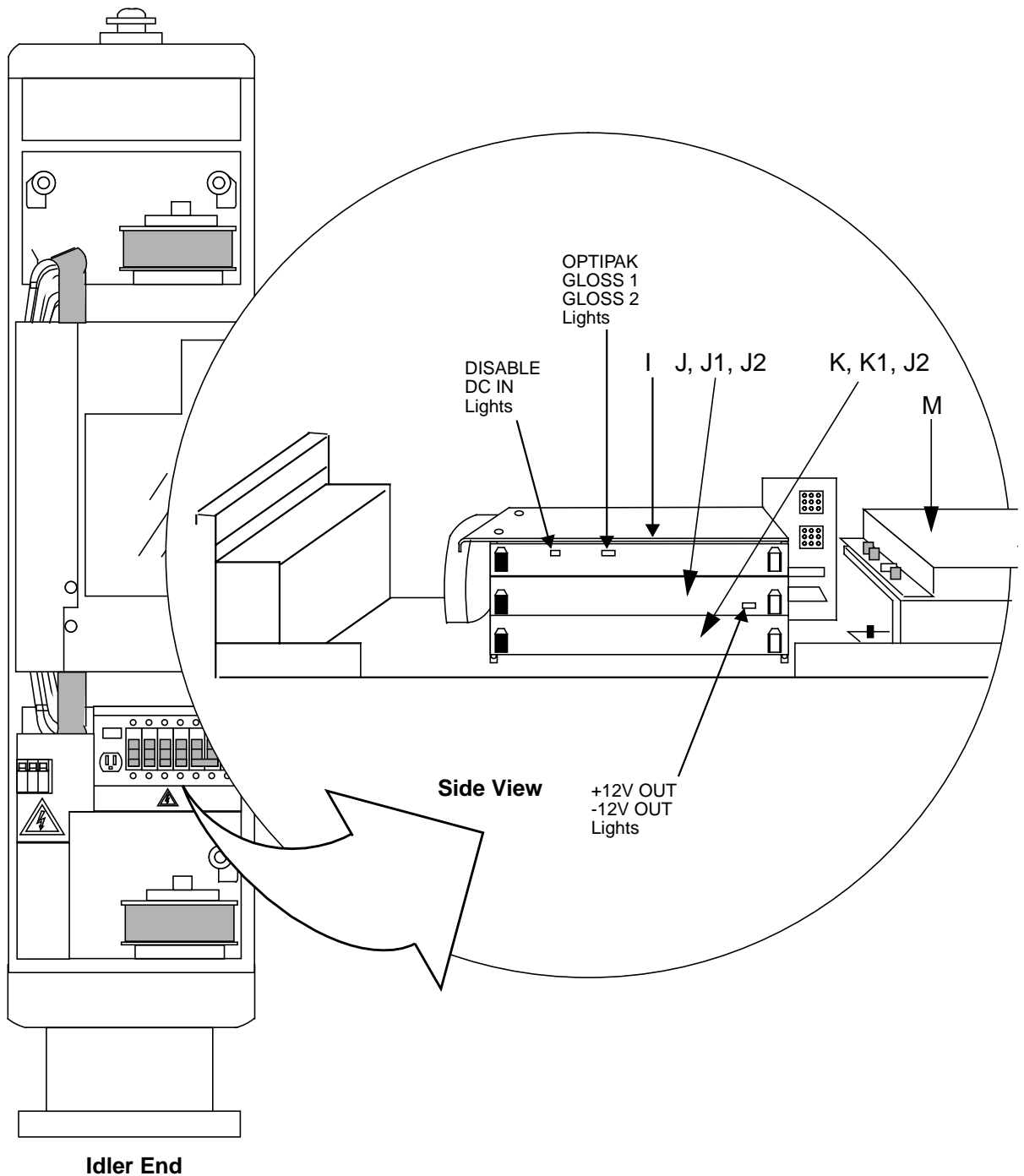


Figure 10-23 Location of OSPS2 and EC24V

Blank Page

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

11

Troubleshooting

This chapter describes basic troubleshooting that can be done using the LED in the Smart Platform electronics cabinet and through console messages that are displayed at startup.

This chapter contains the following major sections:

Section.....	Page
Alarm Messages	238
LED Interpretation	242
Power Down and DC Power Analysis	246
Diagnostic Card Operation	249
Troubleshooting Start-Up Messages	261

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Alarm Messages

Alarm messages are associated with each of the Service Workstation Health Reports. The alarm messages below may appear on the Report pages for Electronics Health and Frame Health. Alarms from other health reports are explained in manuals describing operation and maintenance for those features.

Messages which appear in the 'pe' log are not explained here. These appear only in manuals targeted for advanced troubleshooting.

Note: Most actions suggested below assume the hardware path leading back into the software is functioning. This includes the ECF board, the SMI daughter board, and the MPRC board. These are also candidates for replacement during any troubleshooting.

Electronics Health Report

End Column Power Temp Out of Limits

The temperature of the power supply converter board, located in the end column card cage, has exceeded the maintenance limit of 50°C. If it reaches 65°C, the Smart Platform will power down.

A Board Temperature Is Out of Limits

The temperature of one of the microcontroller ECS boards or the MPRC board, located in the end column card cage, has exceeded the maintenance limit of 50°C. If it reaches 65°C, the Smart Platform will power down. If the ECF is the one affected, then the limits are 59°C and 69°C.

Chiller Flow Out of Limits

The digital input indicating the state of flow (on/off) from the chiller flow unit is showing no flow. The chiller flow unit provides cooling for both the end column card cage as well as any IR Moisture sensor mounted on the scanner. If a second chiller unit does NOT exist, then the alarm for the second unit can be disabled by using the *dim* utility to invert the input bit.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Voltage Level Out of Limits

Various board voltages on each microcontroller are derived from the + and - 15 volt power supply board voltages. The range of each voltage is as follows:

	low	high
AnalogPosVolt01_ai	14.6	15.4 *
AnalogNegVolt01_ai	-15.4	-14.6 *
DigitalVolt01_ai (ECF)	4.9	5.1 *
ThermRefVolt01_ai	4.44	4.56
A2DRefVolt01_ai	4.45	4.55
A2D Test Volts (ECF)	4.85	5.15 **

* Voltage is derived from the ECPSR power supply board.

** A feedback test signal from the ECF A2D converter.

Communications Loss For Frame Micro

Beta Micro

IR Micro

Caliper Micro

Optipak Micro

Gloss Micro

Ash Micro

General Micro

HDLC communication to the specified sensor/frame microcontroller has been lost. Usually a reconnect results in recovery without any loss of performance. If multiple microcontrollers are disconnected, it could mean a defective MPRC board. Persistent disconnects of a single microcontroller may mean that the board is defective.

There are two HDLC comm lines used. The assignments are as follows:

LINE 1 - ECF, Basis Weight, Gloss, Ash

LINE 2 - IR Moisture, Caliper, OptiPak, General/Color

Undefined Alarm

Some alarm condition has occurred for which there is no display text. Note the associated code and call the Support Line for assistance.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Frame Health Report

Motor Stopped by Obstacle

There has been no detected motion along the current trajectory causing an excessive position error. Possible areas of investigation are the motor controller, a mechanical failure of the drive train, incorrect setup of the motor controller, or `vminTune` turned off with active `Vmin` set too low.

Head Position Verify Test - Timeout

The 'Self Test' push button on the Frame Control Panel has been pushed with the frame in LOCAL (hand) and the sequence of resynchronizing and positioning to off-sheet has not been able to complete. Check for defective motor controller, encoder, ECF board, and home limit switch. The red LED on the panel push button should be flashing.

Head Position Verify Outside Limits

The 'Self Test' results are not within acceptable limits. The resultant off-sheet position reached was not within 20 encoder counts of the original position. The red LED on the push button will remain flashing. Possible problem with the encoder slipping, or a bad ECF board.

Head Resynchronize - Timeout

Encoder synchronization has failed to take place after being initiated. Could be a problem with the encoder or ECF board.

Head Speed Inconsistency

Caused when the system response to the servo commands results in one of the following three conditions: (1) `vmin` tuning has been aborted, (2) there is an excessive `ddc` error, or (3) the servo has timed out. First check for a mistuned servo setup, including the motor controller itself. Could also have hardware problems with MPRC and ECF boards.

Beam Air Flow Off

There currently is no air flow switch monitoring the beam air flow. If this alarm appears, it means that the bit in the ECF board is being seen as set. Correct by using the *dim* utility to invert the bit.

Power Shelf Temperature Out of Limits

The temperature of the power supply shelf has exceeded the maintenance limit of 50°C. If it reaches 65°C, the SP will power down.

Motor Controller Temp Out of Limits

Temperature feedback from the motor controller assembly has exceeded the maintenance limit of 50°C. If it reaches 65°C, the SP will power down.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

AI Slope and Offset Calc Failed

Failure of the ECF board to set up properly for processing the head position signal.
Could be a bad ECF board.

Undefined Alarm

Some alarm condition has occurred for which there is no display text. Note the associated code and call the Support Line for assistance.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

LED Interpretation

Basic troubleshooting that can be done using the LEDs in the Smart Platform electronics cabinet.

Power Supply LEDs

The power supply is in the Smart Platform electronics cabinet. Use the following table to assist you in troubleshooting the Smart Platform electronics. Refer to [Table 11-1](#) and [Figure 10-21](#) on page 233.

Table 11-1 Interpretation of LEDs

LEDs	DESCRIPTION
DC IN on ECPSR	This LED refers to the 24 VDC power supply for the Smart Platform electronics cabinet. When this LED is lit, the power supply is on, but may not be within acceptable tolerance.
DISABLE	This LED refers to the 24 VDC power supply for the Smart Platform Electronics cabinet. When this LED is lit, 24 volts is not within acceptable tolerance and the +5V and $\pm 15V$ power supply has been shut down.
+15 V -15 V +5 V	These LEDs refer to the presence of their respective voltages within the Smart Platform electronics cabinet. When these LEDs are lit, the respective voltages are within acceptable tolerances.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

ECF and ECS LEDs

These LEDs are located on the ECF and ECS boards in the Smart Platform electronics cabinet. Use the following table to assist you in troubleshooting. Refer to [Table 11-2](#) and [Figure 10-21](#) on page 233.

Table 11-2 ECF/ECS LED Interpretation

LEDs	DESCRIPTION
RTSA (green)	The LED flashes when HDLC Port A has set its request to send and is attempting to transmit data. The intensity of the flashing depends on how much data is being transmitted.
ERROR (red)	This LED indicates status of local diagnostics; it is under software control on a reset. If the LED stays on after reset, replace the SMI. If the LED is flashing check the service console. If the LED is off and the RUN light is flashing, conditions are normal. If there are no LEDs lit, check to make certain there is power to the board.
RUN (green)	This LED is driven by the data strobe and indicates the level of 68332 external bus activity. The intensity of the LED varies from dim to bright depending upon bus activity.
RTSB (green)	This LED is not currently being used and should be off.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

MPRC LEDs

These LEDs are located on the MPRC board in the Smart Platform electronics cabinet. Use the following table to assist you in troubleshooting. Refer to [Table 11-3](#) and [Figure 10-21](#) on page 233.

Table 11-3 MPRC 086349-002 LED Interpretation

LEDs	DESCRIPTION
ERROR (red)	<p>This LED indicates status of local diagnostics; it is under software control on a reset.</p> <p>If the LED stays on after reset, replace the SMI.</p> <p>If the LED is flashing, check the service console.</p> <p>If the LED is off and the RUN light is flashing, conditions are normal.</p> <p>If there are no LEDs lit, check to make certain there is power to the board.</p>
RUN (green)	<p>This LED is driven by the data strobe and indicates the level of 68332 external bus activity.</p> <p>The intensity of the LED varies from dim to bright depending upon bus activity.</p>
RX TERMINAL	<p>When the LED is lit (flashing), there is a physical connection to the terminal.</p> <p>When the LED is not lit (flashing), the physical connection to the terminal is broken.</p>
RX HOST	<p>When the LED is lit (flashing), there is a physical connection to the terminal.</p> <p>When the LED is not lit (flashing), the physical connection to the terminal is broken.</p>

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 11-4 MPRC 086444-001 LED Interpretation

LEDs	Description
ERROR (red)	<p>This LED indicates status of local diagnostics; it is under software control on a reset.</p> <p>If the LED stays on after reset, replace the MPRC.</p> <p>If the LED is flashing, check the service console.</p> <p>If the LED is off and the RUN light is flashing, conditions are normal.</p> <p>If the LEDs are not lit, check to make certain there is power to the board.</p>
RUN (green)	<p>This LED is driven by “Transfer in Progress” and indicates the level of 68040 external bus activity.</p> <p>The intensity of the LED varies from dim to bright depending upon bus activity.</p>
NET TX_B (green)	When lit, the Ethernet port on J2 (Port B) is transmitting data.
NET TX_A (green)	When lit, the Ethernet port on the ASPC Host Connector (Port A) is transmitting data.
RTS 0 (green)	HDLC Port 0 is transmitting to the sensor microcontrollers.
RTS 1 (green)	When lit, HDLC Port 1 is transmitting to the sensor microcontrollers.
RTS 2 (green)	When lit, HDLC Port 2 is transmitting (unused in Smart Platform).
RTS 3 (green)	When lit, HDLC Port 3 is transmitting (unused in Smart Platform).
RX TERMINAL (green)	<p>When the LED is lit or flashing, there is a physical connection to the terminal.</p> <p>When the LED is not lit, the physical connection to the terminal is broken.</p>
RX HOST (green)	<p>When the LED is lit or flashing, there is a physical connection to the host.</p> <p>When the LED is not lit, the physical connection to the host is broken.</p>

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Power Down and DC Power Analysis

If the system resets because of a power down condition, the cause can be determined by printing out an array of temperature and DC power data through a shell script. The temperature values within the system are monitored and checked against safety limits. When a safety limit is violated, the system will issue an alarm message and record, in a buffer, the current values of all of the temperatures. When the power down limit is exceeded, the temperature data is again read into the buffer. This buffer is stored in the /ss01 BRAM disk area so that it is available at the next startup. Upon startup, the file is read in, where it is available for display using the shell script command. While several variables may have exceeded their safety alarm limit, the file shows the snapshot of the data at the moment the first power down event occurs. [Figure 11-1 on page 247](#) shows the subsystem temperature report. The information in italics is not printed, but is shown here to help decipher the somewhat cryptic labels.

[Table 11-5](#) shows the associated alarm limits for each of the variables.

Table 11-5 Alarm Limits for Each Variable

Temperature Categories	Safety limit (°C)	Power Down (°C)
All board and platform temperatures	50	65
Basis Weight Temperatures with gap	100	125
Basis Weight Temperatures without gap	130	148
Ash Temperatures with gap	100	125
Ash Temperatures without gap	90	125
Caliper Temperatures	130	148

[Figure 11-2 on page 248](#) shows the historical trend of each microcontroller’s DC voltages. It is a rotating buffer of the last 20 updates. A snapshot update of all the DC power on the board is made each time a new high or low value for any of the DC levels is detected. This check is made every minute. This data can be viewed periodically by executing the shell script. Reviewing this data is useful in determining trends in power supply drift.

To print out both reports, at the AVOS shell (\$\$ prompt), type:

. /ss01/clm/pwrDnInf

The system displays, on the screen and printer (if available), the Power Down report including the microcontroller temperature and the DC power history for each microcontroller in the system.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

UNCONTROLLER SUBSYSTEM TEMPERATURES: 12-21-1991 12:57:14

brdTemp[0]:	33.90	<i>(frame)</i>
brdTemp[1]:	28.99	<i>(Basis Weight)</i>
brdTemp[2]:	29.55	<i>(IRMoisture)</i>
brdTemp[3]:	0.00	<i>(Caliper)</i>
brdTemp[4]:	30.15	<i>(OptiPak)</i>
brdTemp[5]:	0.00	<i>(Gloss)</i>
brdTemp[6]:	30.75	<i>(Ash)</i>
brdTemp[7]:	35.87	<i>(General)</i>
ecespTemp:	5.00	<i>(End Column Temperature)</i>
beamAirFlowAlm:(BOOL)1 ALARM		
chillFlowAlmA:(BOOL)1 ALARM		
chillFlowAlmB:(BOOL)1 ALARM		
spare:(BOOL)0 UNUSED		
ash_sct	0.00	<i>(with gap source CAP temperature)</i>
ash_dct	0.00	<i>(with gap detector CAP temperature)</i>
ash_sht	44.52	<i>(without gap head CAP temperature)</i>
beta_sct	0.00	<i>(with gap source CAP temperature)</i>
beta_dct	0.00	<i>(with gap detector CAP temperature)</i>
beta_sgt	53.91	<i>(without gap source gap temperature)</i>
beta_dgt	53.87	<i>(without gap detector CAP temperature)</i>
beta_sht	54.90	<i>(without gap source column temperature)</i>
beta_dht	55.81	<i>(without gap detector column temperature)</i>
caliper_probtemp:	0.00	

(Text in italics is shown for clarification and does not appear on the actual report.)

Figure 11-1 Subsystem Temperature Report

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Date	Temp	Vapos	Vaneg	Vref	Vtref	Vdig
12-12-1991 11:19:56	33.90	15.10	-14.96	5.00	5.00	5.00
12-12-1991 11:20:58	33.40	15.10	-14.96	5.00	5.00	5.00
12-12-1991 11:25:01	33.90	15.02	-14.96	5.00	5.00	5.00
12-12-1991 11:28:03	33.90	15.10	-14.96	5.00	5.00	5.00
12-12-1991 11:36:07	33.90	15.10	-14.92	5.00	5.00	5.00
12-12-1991 11:52:13	33.40	15.10	-14.96	5.00	5.00	4.96
12-12-1991 13:56:14	32.90	15.10	-14.96	5.00	5.00	5.00
12-12-1991 14:32:40	33.40	15.10	-14.96	5.00	5.00	5.04
12-12-1991 14:40:48	33.40	15.10	-14.96	5.00	5.04	5.00
12-12-1991 16:31:46	33.40	15.10	-14.96	4.96	4.96	5.00
12-13-1991 08:31:33	32.90	15.10	-14.96	5.00	5.00	5.00
12-13-1991 08:32:35	33.40	15.10	-14.96	5.00	5.00	5.00
12-13-1991 08:34:38	33.40	15.10	-14.96	5.00	4.96	5.00
12-13-1991 08:35:39	33.40	15.10	-14.92	5.00	5.00	5.00
12-13-1991 08:36:40	33.40	15.02	-14.92	5.00	5.00	5.00
12-13-1991 08:45:47	33.40	15.10	-14.96	5.00	5.00	4.96
12-13-1991 08:47:49	33.90	15.10	-14.96	5.00	5.00	4.96
12-13-1991 09:20:07	33.40	15.02	-14.96	5.00	4.92	5.00
12-13-1991 10:06:07	33.40	15.10	-14.96	4.96	5.00	5.00
12-13-1991 11:02:43	33.90	15.10	-14.96	5.00	5.04	

Figure 11-2 Historical Trend Report for Microcontroller DC Voltages

Note the following definitions for [Figure 11-2](#):

- V_{ref} - is the A to D signal
- V_{tref} - is the thermistor reference
- V_{dig} - is the logic signal for the ECF board only

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Diagnostic Card Operation

The Smart Platform diagnostic card (See “Diagnostic Cards” on page 252.) slides into a plug-in unit that provides a source for easy checks for voltages and signals. The Smart Processing Center and the Sensor Electrical Interconnect board (SEI) have diagnostic connectors with which the plug-in unit connects.

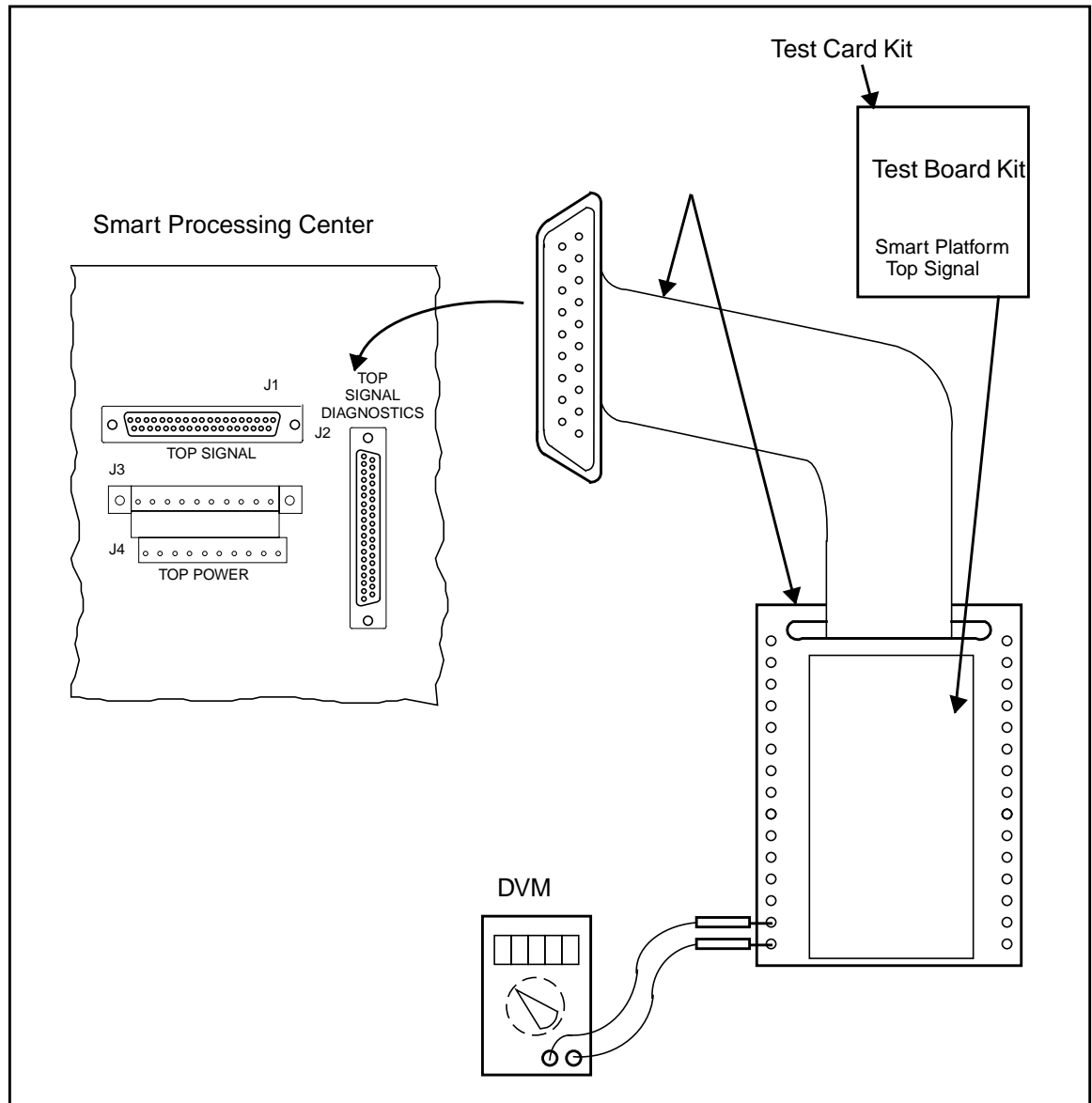


Figure 11-3 Test Board Hookup

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Diagnostics Performed at the Sensor

Reference [Figure 11-4 on page 251](#) and [Figure 11-5 on page 251](#).

The Sensor Electrical Interconnect board (SEI) is a printed circuit board used in basis weight and ash source and detector modules. The SEI distributes signals and power to the proper connectors. It contains the sensor diagnostics plug which allows external access to internal signals for troubleshooting. Electrical ORUs have cables or plugs that interface to this board. The air solenoids, PTC module, and the CAP thermistor make connections to this board in the source module. The Gap sensor printed circuit board, ELHV board, PTC power and CAP thermistor all plug into this board in the detector module.

The diagnostic access port is the cover located in the sensor module housing allowing external access to the diagnostic connector located on the SEI. Head package sheet guides may have to be removed to gain access to this panel.

The sensor diagnostic plug is a 37-pin connector designed to accept the diagnostic tool typically used to troubleshoot Smart Platforms and Smart Processing Centers. This diagnostic access is important for STLK-11 and STLP-3 sensors since it is impossible to gain internal access to powered up assemblies. Side plate access to internal assemblies does not exist. Sensor power is automatically disconnected through the connector if internal access is required.

There are three Light Emitting Diodes (LEDs) on the SEI board. The LEDs indicate the shutter status, internal check sample and PTC heater assembly on the source module. On the detector module the status of the PTC heater assembly is indicated, the other two lights are not used. They can be viewed through acrylic windows at the end of the sensor housing. Removal of the sheet guides may be necessary for clear viewing of the LEDs.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

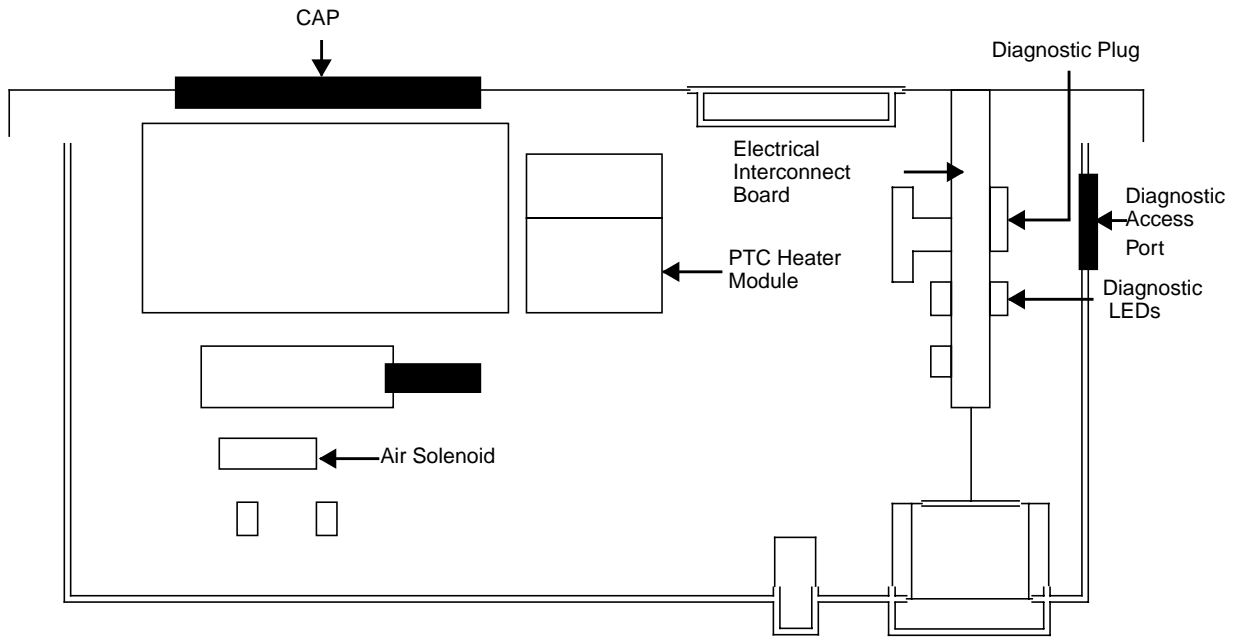


Figure 11-4 Basis Weight Source Module

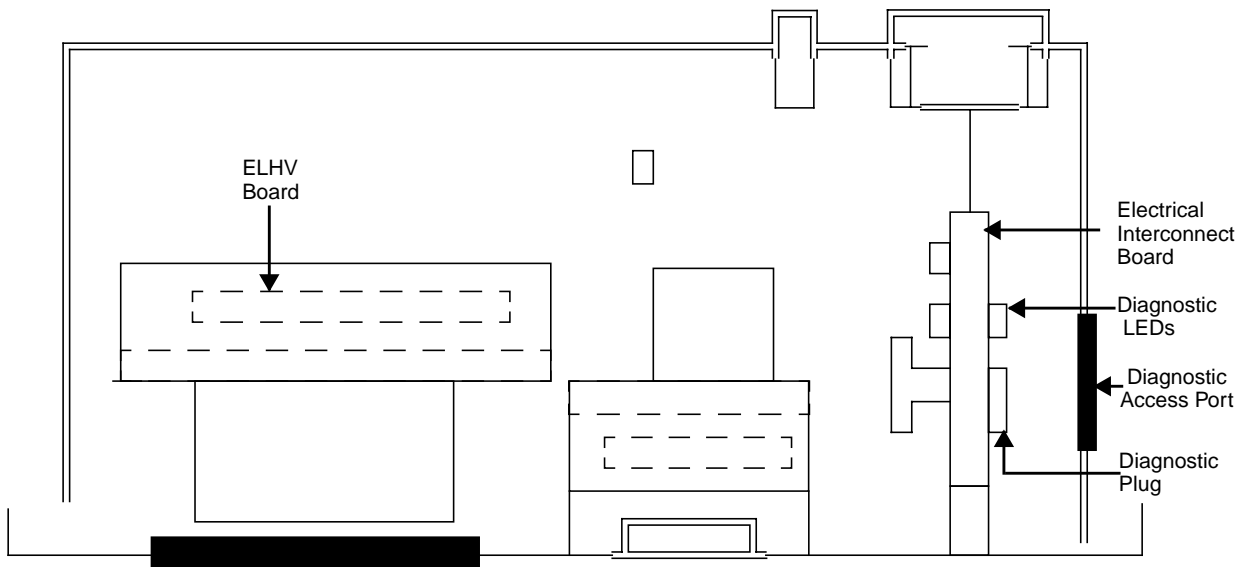
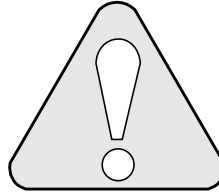


Figure 11-5 Basis Weight Detector Module

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Diagnostic Cards



The pictured diagnostic cards may not represent those for your system.

The Top Power card is to be used for diagnostics performed at the sensor only. Refer to [Figure 11-6 on page 253](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

1	POWER COMMON SYSTEM	AccuRay®		
20	-12 VDC		LO	19
2	HV TEST CARRIAGE ONLY	IR 120 VAC	HI	37
21	+12 VDC SYSTEM	CALIPER PRESSURE	LO	36
22	RETURN GLOSS LAMP	HEATED AIR WIPE	LO	35
23	POWER	120 VAC	HI	34
24	RETURN OPTIPAK LAMP	ASH HEATER	LO	33
25	POWER	120 VAC	HI	32
28	-15 VDC	BW HEATER	LO	31
27	SIGNAL COMMON SYSTEM	CALIPER HEAD LIFT SOLENOID	LO	30
28	+15 VDC			
SMART PLATFORM TOP POWER 086086-052, SIDE 1, REV A				

Figure 11-6 Sample Diagnostic Card: Top Power

The Bottom Power card is to be used for diagnostics performed at the sensor only. Refer to [Figure 11-7 on page 254](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

		AccuRay®	
1	POWER COMMON		
20	-12 VDC		19
	SYSTEM		37
21	+12 VDC	BW SHUTTER	
		LO	36
22	SHUTTER	CALIPER HEATER/ VACUUM/PURGE	
	ASH	LO	35
23	FLAG	120 VAC	
		HI	34
24	RETURN	ASH HEATER	
	GLOSS LAMP	LO	33
25	POWER	120 VAC	
		HI	32
26	-15 VDC	BW HEATER	
		LO	31
27	SIGNAL SYSTEM COMMON	HEATED AIR WIPE	
		LO	30
28	+15 VDC		
SMART PLATFORM BOTTOM POWER 086086-052, SIDE 2, REV A			

Figure 11-7 Sample Diagnostic Card: Bottom Power

The Top Signal card is to be used for diagnostics performed both at the sensor and the AccuRay Smart Processing Center backplane. Refer to [Figure 11-8 on page 255](#).

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

1	ASH (Purge)		AccuRay®	
20	COMMON	DIAGNOSTIC	IR LAMP SENSOR	19
2	BW (Purge)		GLOSS CLAMP	37
21	HI	BW	OPTIPAK CLAMP	18
3	LO			36
22	HI	ASH		17
4	LO		AUTO EDGE OF SHEET	OFF 35
23	HI	BRIGHTNESS		ON 16
5	LO		ELECTROMETER TEST/CLAMP	ASH 34
24	HI	GAP SENSOR	ATC GAP	BW 15
6	LO		BW INTERLOCK	LO 33
25	HI	GLOSS	SHEET TEMPERATURE	HI 14
7	LO		ASH	THERMISTOR 32
26			+4.5V BIAS	13
8			IR LOGIC	LO 31
27	HI	CALIPER AIR BEARING		HI 12
9	LO			30
28	CAP or ATC COLUMN	BW		11
10	+4.5V BIAS	THERMISTOR		29
SMART PLATFORM TOP SIGNAL 086086-051, SIDE 1, REV A				

Figure 11-8 Sample Diagnostic Card: Top Signal

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

The Bottom Signal card is to be used for diagnostics performed both at the sensor and the AccuRay Smart Processing Center backplane. Refer to [Figure 11-9](#) and to [Figure 11-10](#) on page 257 for the Backplane diagnostic card.

		AccuRay®	
1	ASH (Purge)		
20	COMMON DIAGNOSTIC		19
2	BW (Purge)	GLOSS CLAMP	37
21	HI (-) CALIPER PROXIMETER	OPTIPAK CLAMP	18
3	LO	ASH	SHUTTER SWITCH 36
22	HI FORMATION		CURRENT MONITOR 17
4	LO		MONITOR COMMON 35
23	HI OPACITY		X-RAY H.V. MONITOR 16
5	LO		34
24	INTERNAL CAP or ATC COLUMN		15
6	+4.5V BIAS BW THERMISTOR	BW	ALARM GRID 33
25	HI GLOSS		SHUTTER SWITCH 14
7	LO		INT. CHECK SAMPLE 32
26	HI OPTIPAK VACUUM		GAIN MONITOR 13
8	LO		LO 31
27	HI CALIPER VACUUM/ THERMISTOR	IR	SIGNAL HI 12
9	LO		DECREASE GAIN 30
28	THERMISTOR ASH		GAIN +15V 11
10	+4.5V BIAS		INCREASE GAIN 29
SMART PLATFORM BOTTOM SIGNAL 086086-051, SIDE 2, REV A			

Figure 11-9 Sample Diagnostic Card: Bottom Signal Sensor

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

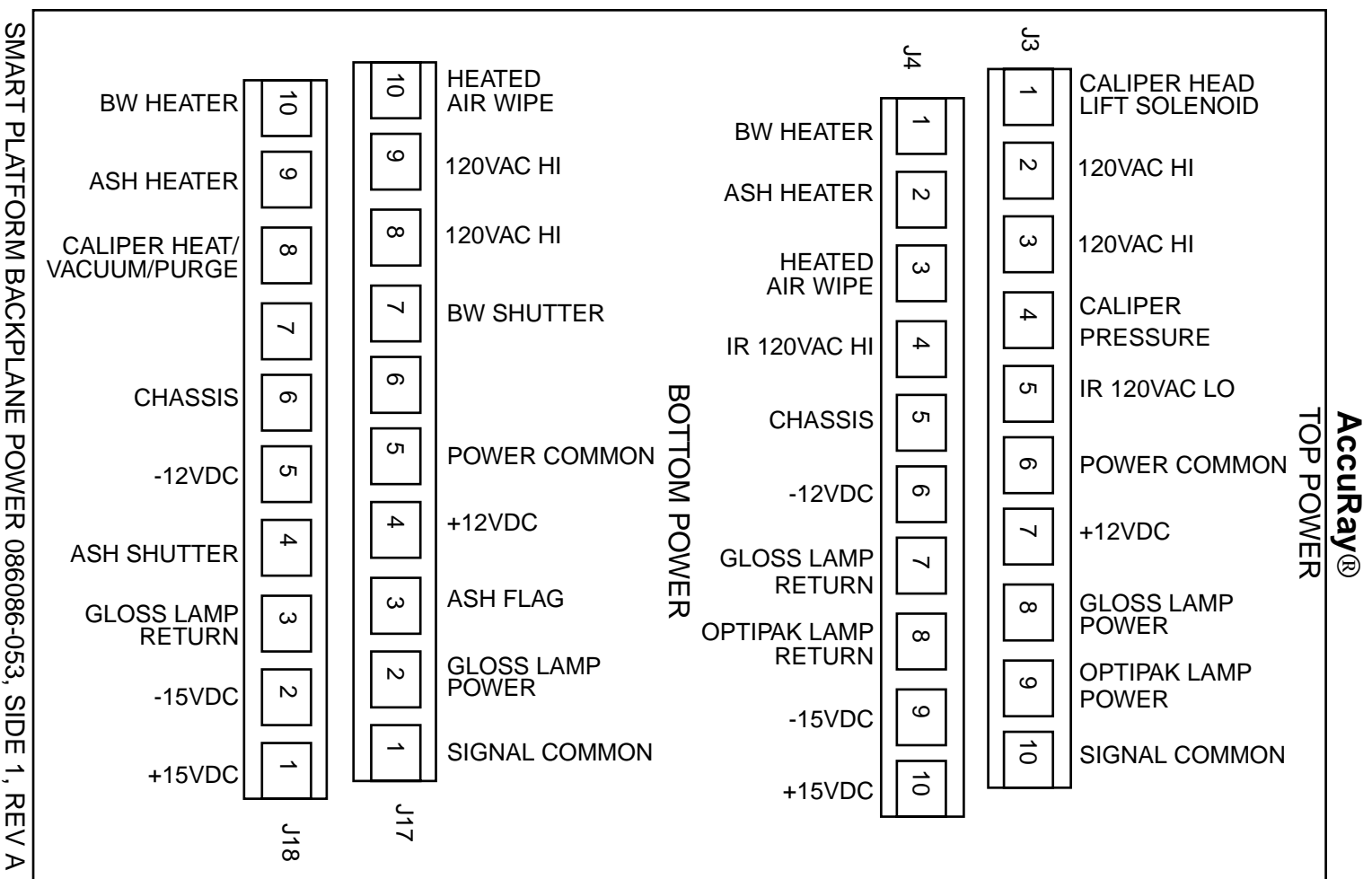


Figure 11-10 Sample Diagnostic Card: Backplane Power

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

The Bottom Auxiliary Power card is to be used for diagnostics performed at the sensor only.

		AccuRay®	
1	ASH +15V		
20	-12 VDC	ASH FILAMENT	VOLTAGE RETURN
	SYSTEM		19 37
21	+12 VDC		36
22	ASH COMMON	ASH +28V	35
23	ASH -15V	120 VAC	HI 34
24	LO	ASH +28V RETURN	33
	ASH H.V. ADJUST		
25	WIPER	120 VAC	HI 32
26	-15 VDC		31
27	SIGNAL COMMON		30
28	+15 VDC		
SMART PLATFORM BOTTOM AUX (ASH WITH REMOTE J-BOX) 086086-053 SIDE 2, REV			

Figure 11-11 Sample Diagnostics Card: Bottom Auxiliary Power

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

The Detector Module card is to be used for diagnostics performed at the sensor only.

		AccuRay®	
1	+12 VDC		
20		Purge Sensor Volts	19
2	-12 VDC (not used)	PTC Monitor (Switch)	37
21	ELHV PcBd °C/10	Chassis Ground	18
3	Chassis Ground	PTC Monitor (High)	36
22		CAP Thermistor Low	17
4	+15 VDC	Chassis Ground	35
23		CAP Thermistor High	16
5	-15 VDC	GAP Signal Low ²	34
24			15
6	Signal Common	Gap Signal High ²	33
25	Signal Common	ELHV Test (Test=Low)	14
7	Gap PcBd °C/10 ²		32
26			13
8			31
27		Electrometer Low	12
9			30
28	Chamber HV/100	Electrometer High	11
10	Gap Oscillator ²		29
² (TOP) Detector Module, STLK11, STLP3, STLXR3 STLK11 and STLP3 only			

Figure 11-12 Sample Diagnostics Card: Detector Module

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

The Source Module card is to be used for diagnostics performed at the sensor only.

		AccuRay®	
1	+12 VDC		
20	Alarm Grid, STLP3	Purge Sensor Volts	19
2	-12 VDC ²	PTC Monitor (Switch)	37
21		Chassis Ground	18
3	Chassis Ground	PTC Monitor (High)	36
22		CAP Thermistor Low	17
4		Chassis Ground	35
23		CAP Thermistor High	16
5			34
24		NC Shutter Stat (Red)	15
6			33
25		NO Shutter Stat (Grn)	14
7		Filament Monitor ²	32
26		Chk Samp Stat (Future)	13
8	Ctrl, Shutter	Monitor Common ²	31
27	+5V Ref ²		12
9	Ctrl, Int Chk Samp	Anode Curr. Mon. ²	30
28			11
10		X-ray HV/1000 ²	29
(BOTTOM) Source Module, STLK11, STLP3, STLXR3 ² STLXR3 only			

Figure 11-13 Sample Diagnostics Card: Source Module

Troubleshooting Start-Up Messages

Use the following tables to troubleshoot the Smart Platform at startup or after a reset. The tables list the start-up messages in sequence along with a description of system activities and corrective actions (where appropriate).

Table 11-6 086349-002 MPRC Board

Expected Start-up Console Message	Activity	Corrective Action
Smart Platform start-up revision IMP 200 001 (c) Copyright 1991, ABB Process Automation Inc. All Rights Reserved	Prior to messages, the MPRC is running internal diagnostics on the CPU memory and the HDLC serial interface. The messages are at the beginning of the start-up file and indicate the first attempts to read the RAM disk area.	If the messages never appear on the screen either the MPRC diagnostics have failed or the RAM disk area cannot be read.

Expected Start-up Console Message	Activity	Corrective Action
<pre> HDLCLoop back Test (Dev0/ChanB): PASSED HDLCLoop back Test (Dev0/ChanA): PASSED BRAM address:0x2000000 BRAM size:0x200 Checksum Table:0x207fc00 BRAM checksumsOK BRAM address 0x2080000 BRAM size:0x9ff Checksum table:0x22ff000 BRAM ChecksumsOK /bram1 (NO WRITE) File System: Volume: ** Phase 1 Check Blocks and Sizes ** Phase 2 Check Pathnames ** Phase 3 Check Connectivity ** Phase 4 Check Reference Counts ** Phase 5 Check Free List 46 files 389 blocks 112 free /bram2 (NO WRITE) File System: Volume: ** Phase 1 Check Blocks and Sizes ** Phase 2 Check Pathnames ** Phase 3 Check Connectivity ** Phase 4 Check Reference Counts ** Phase 5 Check Free List 70 files 2502 blocks 12 free </pre>	<p>These messages are responses to diagnostic exercises which include a check on the MPRC microprocessor serial link (HDLCL) and a check on the RAM disk area integrity and condition.</p> <p>The fsck repair utility is run for both braml and bram2 RAM disk areas. The utility response will only be to report conditions found.</p>	<p>The loading process will not halt during these checks but it will be up to service personnel to go back later and correct any RAM disk file errors found. Errors found during the HDLC checks will probably prevent communications with the micro-controllers and any BRAM errors will prevent the libraries from loading.</p>

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Expected Start-up Console Message	Activity	Corrective Action
<pre>lib: /lib01/drv/session.lib loaded. btoken[12] task: /lib01/drv/hdlc loaded. btoken [13], entry[0x14c8c0], stacksize[2048] lib: /lib01/lib/libm loaded. btoken [16] lib: /lib01/lib/libsl loaded. btoken [17] Using revision file found on: /lib01/avrev, the following diskettes are required: disk: /lib01/avrev at release av280.5 Avos diskette ss280.5 ss01 diskette task: /lib01/drv/slvpm loaded. btoken [18], entry[0x1834a8], stacksize[2048] lib: /lib01/lib/insp_lib loaded. btoken [20]</pre>	<p>AVOS SCNs and special operating system drivers are loaded into memory from the MPRC PROM area.</p> <p>A special utility to check the revision levels of the diskettes from which the software was loaded, is run here.</p>	<ol style="list-style-type: none"> 1. If any AVOS task cannot be loaded, it will be noted. The problem is probably a bad image. Use the last saved version of the AVOS lib01 directory. 2. If any AVOS library cannot be loaded, an "Entering Migration Mode" message will be issued. Use the last saved version of the AVOS lib01 directory. <p>Use CTRL-SHIFT , to get Avos prompt. Look at the list of diskettes used to find the offending diskette. Reload with the correct diskette.</p>
<pre>expanding and loading po_clas.lc . . . expanding and loading pm_msdbg.lc task: /appl/lib/pm_appl.lib loaded. btoken[53], entry[0x23e408], stacksize[4096]</pre>	<p>The system then starts to load the various libraries from the bram2 RAM disk area. The final activity is to load the appl.lib configuration.</p> <p>If there are any application SCNs, they will be installed at this time also.</p>	<p>If a module cannot be loaded, the "Entering Migration Mode" message will be issued. Restore the system files from the backup copy.</p>

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Expected Start-up Console Message	Activity	Corrective Action
<p>Smart Platform Application; rev.:@(#)appl_init.m:190.1 <<*****Application start-up in progress: please wait.*****>></p> <p>[1]:APPL_INIT defining exception handlers [2]:APPL_INIT defining Network Object Dictionary [3]:APPL_INIT creating global object collection [4]:APPL_INIT creating error history [5]:APPL_INIT creating appl_start community</p> <p>The system release is: SP280.5 Host communications is set for: Station ID = 1 Baud Rate = 9600</p> <p>[01_0]\$\$</p>	<p>The configuration files are read and the system software is linked.</p>	<p>Any failure in this process indicates that one or more configuration files are defective. Restore the last saved .init files from diskette and restart.</p>
<p>Down-line load Message Banner announcing OK to connect to Host Computer</p>	<p>Announcement that the down-loaded command from the Host computer is ready to be received. Gives conditions for the manual or automatic loading.</p>	<p>Any failure in this process indicates that one or more configuration files are defective. Restore the last saved .init files from diskette and restart.</p>

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table 11-7 086444-001 MPRC Board

Expected Start-up Console Message	Activity	Corrective Action
Smart Platform start-up revision IMP 200 001 (c) Copyright 1991, ABB Process Automation Inc. All Rights Reserved	Prior to messages, the MPRC is running internal diagnostics on the CPU memory and the HDLC serial interface. The messages are at the beginning of the start-up file and indicate the first attempts to read the RAM disk area.	If the messages never appear on the screen either the MPRC diagnostics have failed or the RAM disk area cannot be read.

Expected Start-up Console Message	Activity	Corrective Action
<pre> BRAM address 0x2000000 BRAM size: 0xaff Checksum table:0x22bf000 BRAM Checksums OK. /braml (NO WRITE) File System: Volume: ** Phase 1 Check Blocks and Sizes ** Phase 2 Check Pathnames ** Phase 3 Check Connectivity ** Phase 4 Check Reference Counts ** Phase 5 Check Free List 35 files 155 blocks 2610 free AccuRay Virtual Operating System (c) Copyright 1991-1998, Process Automation Business, Inc. /braml (NO WRITE) File System: Volume: ** Phase 1 Check Blocks and Sizes ** Phase 2 Check Pathnames ** Phase 3 Check Connectivity ** Phase 4 Check Reference Counts ** Phase 5 Check Free List 79 files 3418 blocks 517 free </pre>	<p>These messages are responses to diagnostic exercises which include a check on the MPRC microprocessor serial link (HDLC) and a check on the RAM disk area integrity and condition.</p> <p>The fsck repair utility is run for both braml and bram2 RAM disk areas. The utility response will only be to report conditions found.</p>	<p>The loading process will not halt during these checks but it will be up to service personnel to go back later and correct any RAM disk file errors found. Errors found during the HDLC checks will probably prevent communications with the micro-controllers and any BRAM errors will prevent the libraries from loading.</p>

Expected Start-up Console Message	Activity	Corrective Action
<pre> All Rights Reserved lib: /lib01/drv/session.lib loaded. btoken[15] task: /lib01/drv/hdlc360loaded.btoken[16],entry[0x8aff4f4],stacksize[4000] lib: /lib01/lib/stack.lib loaded. btoken [19] Using revision file found on: /lib01/avrev, the following diskettes are required: disk: /lib01/avrev, at release av300_0 Avos diskette disk: /appl/clm/prrev, at release pr300_0 Product diskette disk: /appl/clm/serev, at release se300_0 Sensors diskette disk: /appl/clm/alrev, at release a1300_0 APPL1 diskette disk: /appl/clm/a2rev, at release a2300_0 APPL2 diskette Using revision file found on: /lib01/avrev, the following disks are required: SP300.0 SystemRelease ac300_0 Ace diskette av300_0 Avos diskette hl300_0 Health1 diskette h2300_0 Health2 diskette pr300_0 Product diskette se300_0 Sensors diskette a1300_0 APPL2 diskette a2300_0 APPL2 diskette sa300_0 SCNA diskette sb300_0 SCNB diskette ss300_0 SS01 diskette task: /lib01/drv/ethertsk loaded. btoken[20], entry[0x8b3860c], stacksize[8000] task: /lib01/bin/sokit2me loaded. btoken[23], entry[0x8b3b5a4], stacksize[10000] Sokit2me Running... lib: /lib01/lib/insp_lib loaded. btoken [24] lib: /lib01/lib/libm loaded. btoken[25] lib: /lib01/lib/libsl loaded. btoken[26] </pre>	<p>AVOS SCNs and special operating system drivers are loaded into memory from the MPRC PROM area.</p> <p>A special utility to check the revision levels at the diskettes from which the software was loaded, is run here.</p>	<ol style="list-style-type: none"> 1. If any AVOS task cannot be loaded, it will be noted. The problem is probably a bad image. Use the last saved version of the AVOS lib01 directory. 2. If any AVOS library cannot be loaded, an "Entering Migration Mode" message will be issued. Use the last saved version of the AVOS lib01 directory. <p>Use CTRL-SHIFT , to set the AVOS prompt. Look at the list of diskettes used to find the offending diskette. Reload with the correct diskette.</p>

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Expected Start-up Console Message	Activity	Corrective Action
<pre>task: /appl/bin/slvpm loaded. btoken[28], entry[0x8b45304], stacksize[2048] lib: p0_clas.lib loaded. btoken[30] . . . lib: pm_msdm.lib loaded. btoken[63] task: /appl/lib/pl_appl.lib loaded. btoken[64], entry[0x8c757b4], stacksize[4096]</pre>	<p>The system then starts to load the various libraries from the bram2 RAM disk area. The final activity is to load the appl.lib configuration.</p> <p>If there are any application SCNs, they will be installed at this time also.</p>	<p>If a module cannot be loaded, the "Entering Migration Mode" message will be issued. Restore the system files from the backup copy.</p>
<pre>Smart Platform Application; rev.:@(#)appl_init.m 1.12 <<*****Application start-up in progress: please wait.*****>> [1]:APPL_INIT defining exception handlers [2]:APPL_INIT defining Network Object Dictionary [3]:APPL_INIT creating global object collection [4]:APPL_INIT creating error history [5]:APPL_INIT creating appl_start community THE SYSTEM RELEASE IS: SP300.0 The current system release number has not been stored in: appl.ini--- you may want to gstore: appl.ini! HOST COMMUNICATIONS IS SET UP FOR: stationID = 1 baudRate = 9600 task: /lib01/bin/swi loaded. btoken[65], entry[0x8c9013c], stacksize[3000] task: /lib01/bin/asi loaded. btoken[66], entry[0x8c98fec], stacksize[4096] asiServer: Using nIndex = 0 startdmp: comout_no in use is 4 AVOS Shell 300.1.1.2</pre>	<p>The configuration files are read and the system software is linked.</p>	<p>Any failure in this process indicates that one or more configuration files are defective. Restore the last saved .init files from diskette and restart.</p>
<pre>[01_0] \$\$ If the Host is down it will automatically download files to the Smart Platform when it is started up. If the HOST is already up, then request a manual reload of this Smart Platform.</pre>	<p>Announcement that the down-loaded command from the Host computer is ready to be received. Gives conditions for the manual or automatic loading.</p>	<p>Any failure in this process indicates that one or more configuration files are defective. Restore the last saved .init files from diskette and restart.</p>

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.



Appendix A: Service Workstation Activities

To modify the Smart Platform performance you will use the Service Workstation. These are procedures you will need for maintenance of the Smart Platform.

This chapter contains the following major sections:

Section	Page
Service Workstation Setup	270
Displaying Reports	271
Utilities	274
Identifying Sensor Configuration	277
Determining Software Release Levels	278
Preparing On-Site Documentation	279

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Service Workstation Setup

To use the Service Workstation for exercising the Smart Platform you have to have the following software loaded into the workstation and install a cable between the workstation and the platform.

Note: For systems manufactured before October 1995, the ASPC backplane part number is 086345-003. For systems manufactured after October 1995, the ASPC backplane part number is 086345-004. For a diagram of the -003 and -004 ASPC backplanes, see Chapter 1, Product Overview.

Software

Refer to the appropriate *AccuRay Smart Platform System Software Manual*, 101760-xxx.

Hardware

Connect the custom nine-pin connector from the serial port on the Service Workstation to the debug port (see [Figure A-1](#)) on the Smart Platform.

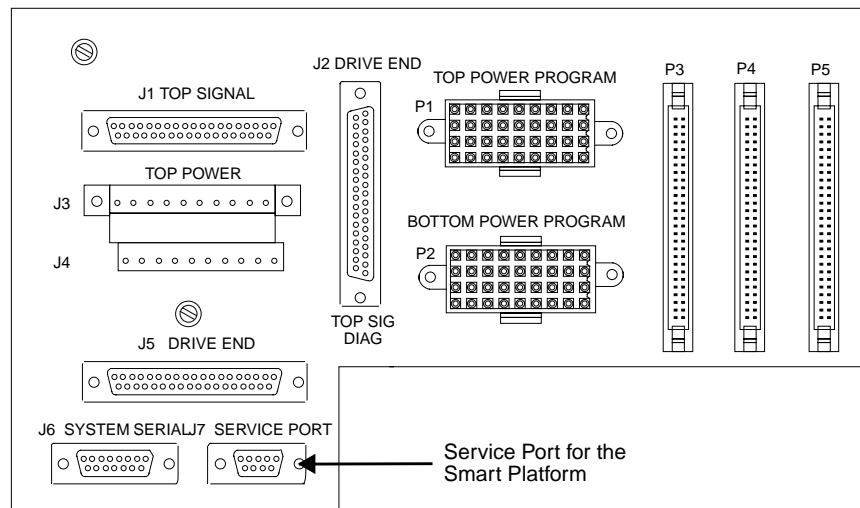


Figure A-1 Debug Port on the Smart Platform (-003 Backplane shown)

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Displaying Reports

The Service Workstation can be used to view Standardize, Check Sample and Calibrate Sample reports. These reports contain the same information sent to the Host computer system but the data is displayed differently.

Standardize Report

There are two report arrays associated with the Standardize results: **stdzResultsPending** and **stdzResults**. **stdzResultsPending** reports on the results of the last standardize whether the results are within limits or not. **stdzResults** reports the results of the last acceptable standardize.

The procedure for displaying these reports is as follows:

1. Access the **inspect** utility.
2. Type: **betaSensor01->stdzResultsPending** (for example)

The system will report back the address of that report.

3. Type in the address of the report.

The system will display the results of the last standardize. See [Figure A-2](#).

```

I> betaSensor01->stdzResults
stdzResults:      0x307bb2                (int *)
I> 0x307662
0x307bb2 (id)
0x307bb2:          "0X307bb2"              (STRUCT_PRIVATE)
ISA:              BWStdzRs1ts           (STRUCT_SHARED *)
mySelf:          0x307bb2                (long)
problemList      0x30d72                 (id)
tempCompFlag     0                      '\0'      (char)
zeroScaleInput   0.000338776            (double)
zeroScaleInputSigma 7.21414e-09                (double)
lastCleanStdz:   0x307bd0                (char [20])
dirt:            0                      (double)
fullScaleTempRef: 55.0098                (double)
fullScaleTempSigma: 1.2531e-09            (double)
logRangeClean:   1.45815                 (double)
logVoltageRange: 1.45815                 (double)
voltageRange     4.29802                 (double)
voltageSigma:    3.70175e-05             (double)
tClean           0                      (long)
sourceTemperature 54.8                  (double)
detectorTemperature 55.06                (double)
sourcePurge       3.70309                (double)
detectorPurge     3.41578                (double)
    
```

Figure A-2 Example of Standardize Report

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

To view the results of the last acceptable standardize, type in the variable: **stdzResults**. When there are no standardize failures, the address of the **stdzResults** and **stdzResultsPending** will be the same. The system will respond with the address of that report. Type in the address and the system will display the report.

If you want to know when the last clean standardize occurred, type in the address of the **lastCleanStdz** and the system will display the date and time of the last clean standardize.

Sample Check Report

The procedure for displaying the Sample Check report is as follows:

1. Access the **inspect** utility.
2. Type: **betaSensor01->checkSampleResults** (example for basis weight)

The system will report back the address of that report.

3. Type in the address of the report.

The system will display the results of the last sample check. See [Figure A-3](#).

```
-----  
I> betaSensor01->checkSampleResults  
checkSampleResults: 0x30842a          (int *)  
I> 0x30842a  
0x30842a          (id)  
  
0x30842a:          "0x30842a"          (struct_PRIVATE)  
isa:              BWChkSmRslt        (struct_SHARED *)  
mySelf:          0x30842a          (long)  
problemList:    0x30848a          (id)  
name:           0x26b182          (id)  
transPPT:       1000.46          (double)  
mylarWt:        -0.0277454        (double)  
slope:          1                (double)  
offset:         0                (double)  
tempCompFlag:   0                '\0'  
tempComp:       0.80165          (double)  
wtTempComp:    0                (double)  
processBW:     -0.0277454        (double)  
-----
```

Figure A-3 Example of Sample Check Report

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Calibrate Sample Report

The procedure for displaying the Calibrate Sample report is as follows:

1. Access the **inspect** utility.
2. Type: **betaSensor01->calibrateSampleResults** (example for basis weight)

The system will report back the address of that report.

3. Type in the address of the report.

The system will display the results of the last Calibrate Sample. See [Figure A-4](#).

```
-----  
I> betaSensor01->calibrateSampleResults  
calibrateSampleResults: 0x312c7a  
I> 0x312c7a  
0x312c7a (id)  
  
0x312c7a:          "0x312c7a"          (struct_PRIVATE)  
isa:              BWCalsmRslt      (struct_SHARED *)  
mySelf:          0x312c7a          (long)  
problemList:    0x308b22          (id)  
name:           0x26b182          (id)  
headPosition:   64                (double)  
transPPT:       602.285           (double)  
mylarWt:        29.3038           (double)  
slope:          1                  (double)  
offset:         0                  (double)  
tempCompFlag:   0                  '\0' (char)  
tempComp:       0.802075          (double)  
wtTempComp:     0                  (double)  
processBW:      29.3038           (double)  
-----
```

Figure A-4 Example of Calibrate Sample Report

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Utilities

AVOS is the operating system for the Smart Platform. The operating system controls the Smart Platform's scanning, measurement processing and other computing resources. AVOS also supports a console interface between the Smart Platform's computer hardware and technicians requiring access to the software for setup and troubleshooting.

This section will describe some of the important utilities and procedures required to interact with the Smart Platform through the Service Workstation.

The inspect Utility

The **inspect** utility allows examination and modification of instance variables contained in the Smart Platform software. To use the **inspect** utility, it is necessary to know two things: the name of the object where the variable resides, and the name of the variable.

The names of the objects which are accessible with the **inspect** utility are given in the **:global** printout. The names of the instance variables residing in any given object, can be listed by entering the object name while in the **inspect** utility.

The following procedure illustrates how to run the utility and perform some basic operations.

1. Place the desired Service Workstation in the **inspect** utility mode by typing **inspect** at the \$\$ prompt.

The response is as follows if it is the first time **inspect** has been invoked since the last Smart Platform restart or if class files need to be reloaded:

```
inspect - @(#)inspect.c 1.1 - 88/10/05
```

```
inspect:reading class files.
```

```
I>
```

During normal operation only the I> prompt will appear. The I> is the line prompt for the **inspect** utility.

2. Use the following format to enter the requested instance variable:

To display an entire object list of instance variables:

```
objectName
```

To display a single instance variable and its value:

```
objectName->instanceVariableName
```

To change an instance variable's value:

```
objectName->instanceVariableName=value
```

To list all available object names:

```
:global
```

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Where:

objectName is the name of the software object containing the desired instance variable.

instanceVariableName is the instance variable name to be examined.

Value is the new number to be added. It must be in the same format as defined in the instance variable list.

3. For repeated display or value entry, simply enter a period (.) and press RETURN. The previously entered command will be repeated.

The gstore Utility

Modified coldstart instance variables must be stored in their respective **.ini** files located in BRAM.

Use the following procedure to store modified instance variables.

1. Make the desired value changes to the coldstart instance variables using the **inspect** or **genrpt** utilities.
2. Make a disk copy of all the existing **.ini** files in the **/clm** directory using the backup procedure.

This puts each **.ini** file onto diskette where it can be retrieved if something goes wrong with the subsequent **gstore** command later in this procedure.

3. After all the changes have been made, write the information to the BRAM using the **gstore** utility in the AVOS shell at the \$\$ prompt:

```
gstore
```

The utility responds with a menu selection, see [Figure A-5](#). Use [Table A-1](#) on [page 276](#) to help make a selection. Answer all the interactive messages as required.

When a selection has been made, the utility will offer the opportunity to overwrite the existing file, write to a new file, or quit without saving the file.

```
$$ gstore

Object Graph Storing Utility (imp200.002~)
Selection    Object Graph    Head of Graph
~~~~~
1            frame          (scanner01)
2            frameHI       (fhi01)
3            io            (ucHardware)
4            pmm           (pmmInterface)
ENTER selection or q to quit:
```

Figure A-5 gstore Menu Screen

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table A-1 gstore Menu Item Descriptions

Selection	Object Graph	Head of Graph	Function (This section is not part of the actual menu)
1	frame	(scanner01)	All coldstart variables associated with the Smart Platform scanning and sensors
2	frameHI	(fhi01)	All coldstart variables associated with the push button assignments on the Smart Platform control panel
3	io	(VmeHardware)	All coldstart variables associated with the analog and digital I/O
4	pmm	pmmInterface	All coldstart variables associated with the Host interface objects

Note: Object Graph refers to the file_name. Head of Graph refers to the object_name.

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Identifying Sensor Configuration

To examine the current configuration of a scanner, follow the steps below.

1. At the \$\$ prompt type **inspect**.
2. At the I> prompt type:
 () [scanner01 print] for the frame community
 or () [pmmInterface01 print] for the pmm community.
3. You will receive a printout. See the examples below.

The **Scanner01** printout contains the following information.

Example: scanner01 (Scanner1180M) : with AEOS
sheetBrkDet01 (SheetBrkDet)
Servo01 (Servo)
head01 (Head)
Real Sensors:
 BetaSensor01 (BetaSensor):with ATC
 IRSensor01 (IRSensor) : Type HEMI+
Derived Sensors:
 CondWtSensor01 (CondWtSensor)
Sensors Not In Operation:
 (any sensors which are asleep)

The **pmmInterface0x** printout contains the following information.

Example: pmmInterface (PmmInterface)
pmmDriver (PmmDriver):
pmmFrames:
 pmmFrame01 (Pmm Frame)
pmmSensors:
 pmmBeta01 (Pmm Beta)
 pmmCondWt01 (pmmCondWt)
 pmmIRSensor01 (pmmIRSensor)

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Determining Software Release Levels

The Smart Platform software is controlled by a release level mechanism. This mechanism makes maintenance control and site software identification possible. Each major area of the system contains an image which reveals the release level of that component. The major areas are:

- Application software
- Microcontroller software
- Lib01 library software
- AVOS software

The following procedure will result in a report which identifies the release level of each major area.

1. Type the following command while in the **AVOS (\$\$)** shell:
./ss01/clm/revid
2. The system will respond with a report. See the following example.

```
revision level of LIB01 libraries
/lib01/lib01rev:
  lib01_rev.c300.070Copyright 1993-1994 ABB Industrial Systems Inc.

revision level of the micro-controller software
  smi_id.c 140.0 04/26/95 (c) Copyright 1991-1994
what: Cannot open /appl/smi/ecc.b

revision level of the application libraries
/appl/lib/pl_scan.lc:
  Scanner.ml40.1

revision level of AVOS software
@(#)avos_rev.c 300.005
```

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Preparing On-Site Documentation

Each time the Smart Platform subsystem is restarted, it dynamically recreates the various objects and their linkages. As a result, the absolute address of any object and their associated instance variables can change from startup to startup.

Therefore, access to the various instance variables and objects is primarily done through ASCII names and tokens. These are used as arguments to the utility commands which in turn gives access to the data in memory.

It is important to have available the lists of names and token numbers which are recognizable within the subsystem. This section identifies the activities which must be done to obtain these name and token lists. In some cases, the list should be printed out each time the system is upgraded. This will insure that certain address locations can be accessed for troubleshooting purposes in case of processor halts. See [Table A-2](#).

Table A-2 Hardcopy Reports for On-Site Documentation

Report Name	Utility Command	Printout Frequency	Purpose
System ProcessorRun List	dproc	First startup	Gives a list of all of the processes that are running
Sub-System Release Levels	._Δ/ss01/clm/revid	First startup	Gives a list of the release levels within the system
Module Map	map -m	Each upgrade	Provides the name, type, and stack size of each module in the order in which it was loaded
inspect Utility Object Names	inspect :global	First startup	Provides a list of module names which will be recognized by the inspect utility

Table A-2 (Continued on next page)

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Table A-2 (continued)

Report Name	Utility Command	Printout Frequency	Purpose
Scanner and Sensor Instance Variable List	inspect <each object> (see partial list below) scanner01 betaSensor01 IRSensor01 caliperSensor01 ashSensor01 optipakSensor01 pmmFrame01	After calibration, tuning, and setup for each scanner and sensor has been completed or changed	Provides a complete list of the instance variables, their names and current values, as a record of setup and calibration activity
I/O Configuration	()[ucHardware printOnConsole]	First startup	Provides a list of all of the analog and digital I/O and their channel assignments on one report

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Index

Symbols

+/- 12 Volt Fuses, 6

A

A Board Temperature is Out of Limits, 238
Acceptable Range for Standardize Limits, 149
AccuRay Smart Processing Center (ASPC)
 Backplane Identification, 4
Air and Water Supply, 59
Air Column Measurement (Smart Basis Weight
 Sensor Only), 129
Air Gap Alignment, 52
Air Profile Compensation for Basis Weight, Gloss,
 and Caliper, 161
Air Profile Compensation for OptiPak, 164
Air Profile Data Collection, 161
Air Purge, 58
Air Purge Filter Inspection, 197
Air Temperature Compensation for Basis Weight,
 157
Al Slope and Offset Calc Failed, 241
Alarm Messages, 238
Alarms and Fault Reporting, 78
Alignment of the Customer Pedestals, 36
Apparent Density, 125
Apparent Density Setup, 114
Appendix A
 Service Workstation Activities, 269
 determining software release levels, 278
 displaying reports, 271
 calibrate sample report, 273
 sample check report, 272
 standardize report, 271
 identifying sensor configuration, 277
 preparing on-site documentation, 279
 Service Workstation setup, 270
 hardware, 270
 software, 270
 utilities, 274
 the gstore utility, 275
 the inspect utility, 274
Ash Sensor, 151
Ash Sensor Setup, 113
Ash Units Setup, 126

ASPC Location, 32
At the Host Computer, 162, 164, 165
At the Platform, 165
At the Service Workstation, 162, 164, 165
Attaching the Platform to the Pedestals, 38
Automatic Edge-of-Sheet, 102
Automatic Startup, 181

B

Background, 155
Basic Tuning, 83
Basis Weight Sensor, 127
Basis Weight Sensor Setup, 112
Beam Air Flow Off, 240
Blower Location, 33

C

Cabinet Environmental Checks, 202
Cabling, 31
Calibrate Sample (Sample Cut), 174
Calibrate Sample Report, 273
Caliper Sensor, 139, 148, 152
Caliper Sensor Setup, 114
Carriage Alignment, 45
Carriage Drive Belt, 206
Carriage Wheel, 203
Changing Caliper Output Units, 125
Changing Ream Size, 124
Changing the Motion Restriction Sensitivity, 107
Changing the Standardize Mode of the FCP
 Standardize Request, 145
Checklist, 24
Chiller Flow Out of Limits, 238
Cleaning the Air Purge Filter, 198
Cleaning the Compressed Air Filter, 199
Control Panel Description, 170
Control Panel Functions, 72, 173
Control Panel Operation, 169
 control panel description, 170
 control panel functions, 173
 calibrate sample (sample cut), 174
 jog, 173
 local, 173
 off-sheet, 173
 on-sheet, 173

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Control Panel Operation (Continued)
remote, 173
sample check, 174
scan limit set, 176
self test, 175
standardize, 174
head split switches, 177
Smart Platform modes of operation, 171
local, 171
local/head split, 172
remote/off-sheet, 171
remote/on-sheet, 171

Controlling the Type of Standardize for a Specific Sensor, 146

Current Far Scan Position (KFEOS), 92
Current Home Scan Position (KHEOS), 91

D

Data Collection, 165
DC Voltage Level Checks, 202
Default Single Point Position (SPPOS), 91
Definition of Head Package Dimensions, 96
Determining and Entering the Head Dimensions, 99
Determining Software Release Levels, 278
Diagnostic Card Operation, 249
Diagnostic Cards, 252
Diagnostics Performed at the Sensor, 250
Digital Input Invert Adjustment for the Smoothness Sensor, 166
Dimensions and Weight, 27
Displaying Reports, 271
Downloading Parameters, 76
Drive Belt Tension and Tip Adjustment, 189
Drive Belt Tension Measurement, 188
Drive Motor Adjustment, 190
Drive Motor Belt, 204
Drive Motor Belt Inspection, 190
Drive Motor Controller (Fincor and Lovejoy), 223
Drive System, 9

E

ECF and ECS LEDs, 243
Electric Chassis, 218
Electric Chassis Replacement Procedure, 218
Electrical and Cable Systems, 10
Electrical Hook-Up, 61
Electrical Supply and Grounding Requirements, 30
Electronics Health Report, 238
Enabling Air Profile Compensation, 163
Encoder, 226
End Column Power Temp Out of Limits, 238
Enter Calibration Head Constants, 127

Entering AEOS Setup Parameters, 104
Environmental Data, 30
Equipment Location, 32
Error Conditions, 138

F

Fine Tuning ATC with dBWDT, 159
Flex Cable, 215
Flex Cable Replacements, 220
Flex Power Cable Retrofit Kit, 220
Frame Health Report, 240

G

Garage Position (OFF), 91
General Description, 72
General Information, 141
Gloss Sensor, 136, 154
Gloss Sensor Head Constant Tuning, 137
Gloss Sensor Setup, 113
Grounding, 30

H

Handling Instructions, 25
Handling the Source, 18
Hardware, 270
Hardware Installation, 23
attaching the platform to the pedestals, 38
carriage alignment, 45
handling instructions, 25
dimensions and weight, 27
space requirements, 27
installation requirements, 30
cabling, 31
electrical supply and grounding requirements, 30
grounding, 30
Smart Platform distribution center (SPDC), 31
supply, 30
environmental data, 30
equipment location, 32
ASPC location, 32
blower location, 33
Smart Platform Power Distribution Center (SPDC), 33
equipment locations
operator control panel location, 33
liquid cooling unit setup, 34
pass angle alignment, 46

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Hardware Installation (Continued)

- air gap alignment, 52
- process direction alignment, 49
- pedestal installation and alignment, 35
 - alignment of the customer pedestals, 36
 - installation guidelines, 35
- platform alignment, 43
- safety, 28
 - machine, 29
 - personnel, 28
- scan direction alignment, 54
- unpacking instructions, 24
 - checklist, 24
- verify air gap, 53
- Head Package Dimensions Setup, 96
- Head Position Setup, 91
- Head Position Verify Outside Limits, 240
- Head Position Verify Test - Timeout, 240
- Head Resynchronize - Timeout, 240
- Head Separation and Limit Switch Inspection, 193
- Head Speed Inconsistency, 240
- Head Split Switches, 177
- Health Page Standardize Reports, 145

I

- Identifying Different Backplanes, 4
- Identifying Sensor Configuration, 277
- Idler Pulley, 208
- Implementation of the Sensor Verification Program, 156
- Individual Responsibility, 20
- Inspecting the Compressed Air Filters, 199
- Inspecting the Drive System, 187
- Inspecting the Incoming Power, 186
- Inspecting the Water Filter, 200
- Installation Guidelines, 35
- Installation of the Source, 19
- Installation Requirements, 30
- Introduction, 4
- IR CoatWeight Sensor Setup, 115
- IR Moisture Sensor, 131, 150
- IR Moisture Sensor Setup, 112

J

- Jog, 173

L

- LED Interpretation, 242
- Liquid Cooling Unit Setup, 34
- Local, 171, 173
- Local/Head Split, 172

LOCAL/REMOTE, 75

M

- Machine, 29
- Maintenance Procedures, 183
 - air purge filter inspection, 197
 - cleaning the air purge filter, 198
 - purge blower replacement process, 197
 - inspecting the compressed air filters, 199
 - cleaning the compressed air filter, 199
 - inspecting the drive system, 187
 - drive belt tension and tip adjustment, 189
 - drive belt tension measurement, 188
 - drive motor adjustment, 190
 - drive motor belt inspection, 190
 - head separation and limit switch inspection, 193
 - seal belt tension adjustment, 192
 - seal belt tension inspection, 191
 - inspecting the incoming power, 186
 - inspecting the water filter, 200
 - platform alignment inspection, 196
 - power and temperature checks, 201
 - cabinet environmental checks, 202
 - DC voltage level checks, 202
 - Smart Platform maintenance logs, 184
 - wheel inspection, 195
- Manual Startup, 180
- Maximum Far Measure Position (LFEOS), 92
- Measurement Setup, 111
 - air profile compensation for basis weight, gloss, and caliper, 161
 - air profile data collection, 161
 - at the Host computer, 162
 - at the Service Workstation, 162
 - enabling air profile compensation, 163
 - air profile compensation for OptiPak, 164
 - data collection, 165
 - at the host computer, 165
 - at the platform, 165
 - at the Service Workstation, 165
 - setup, 164
 - at the Host computer, 164
 - at the Service Workstation, 164
 - using the data, 165
 - at the Service Workstation, 165
 - air temperature compensation for basis weight, 157
 - fine tuning ATC with dBWDT, 159
 - verification of setup and stability, 157
 - digital input invert adjustment for the smoothness sensor, 166

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Measurement Setup (Continued)

- enter calibration head constants, 127
 - air column measurement (Smart basis weight sensor only), 129
 - basis weight sensor, 127
 - caliper sensor, 139
 - gloss sensor, 136
 - gloss sensor head constant tuning, 137
 - error conditions, 138
 - IR moisture sensor, 131
 - microwave moisture sensor, 140
- operation of the sensor Health Pages, 116
- setup checklists, 112
 - apparent density setup, 114
 - ash sensor setup, 113
 - basis weight sensor setup, 112
 - caliper sensor setup, 114
 - gloss sensor setup, 113
 - IR CoatWeight sensor setup, 115
 - IR moisture sensor setup, 112
 - microwave sensor setup, 115
 - OptiPak sensor setup, 113
 - sheet temperature sensor setup, 114
 - Smart Color sensor setup, 115
 - smoothness sensor setup, 115
- setup of customer units, 124
 - apparent density, 125
 - ash units setup, 126
 - changing caliper output units, 125
 - ream size, 124
 - changing ream size, 124
- standardize limits, 141
 - acceptable range for standardize limits, 149
 - ash sensor, 151
 - caliper sensor, 152
 - gloss sensor, 154
 - IR moisture sensor, 150
 - OptiPak sensor, 151
 - caliper sensor, 148
 - changing the standardize mode of the FCP standardize request, 145
 - controlling the type of standardize for a specific sensor, 146
 - general information, 141
 - health page standardize reports, 145
 - reporting of "internal" check sample during standardize, 145
 - standardize delay after long off-sheet periods, 144

Measurement Setup (Continued)

- the selection of CLEAN or DIRTY standardize modes, 142
- time interval between standardizes, 141
 - procedure for changing standardize limits, 141
 - Smart basis weight sensors, 147
- temperature controller setup for basis weight, ash, and caliper sensors, 118
- Smart ash and Smart basis weight, 120
- temperature controller tuning parameters, 122
 - using the optional temperature controller utility, 123
- verification, 155
 - background, 155
 - implementation of the sensor verification program, 156
 - phase I - initial static verification, 155
 - phase II - process measurement verification, 155
 - phase III - continuing certification, 155
- Mechanical Structure, 7
- Microwave Moisture Sensor, 140
- Microwave Sensor Setup, 115
- Minimum Home Measure Position (LHEOS), 91
- Motion Restriction Sensitivity, 106
- Motor Controller Setup, 79
- Motor Controller Temp Out of Limits, 240
- Motor Drive Parameters, 73
- Motor Drive Replacement, 222
- Motor Drive Setup (ABB ACS-100), 72
- Motor Stopped by Obstacle, 240
- Moving Around the Menu, 75
- MPRC LEDs, 244

N

- Notes about LHEOS and LFEOS (Scanning Measurement Limits), 94

O

- Off-Sheet, 173
- On-Sheet, 173
- Operation of the Sensor Health Pages, 116
- Operation Overview, 109
- Operator Control Panel Location, 33
- OptiPak Sensor, 151
- OptiPak Sensor Setup, 113
- Other Host Setup Procedures, 110

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

P

- Panel Operations, 75
- Pass Angle Adjustment, 46
- Pedestal Installation and Alignment, 35
- Personnel, 28
- Phase I - Initial Static Verification, 155
- Phase II - Process Measurement Verification, 155
- Phase III - Continuing Certification, 155
- Platform Alignment, 43
- Platform Alignment Inspection, 196
- Platform Software Setup Checklist, 70
- Platform Tuning, 69
 - automatic edge-of-sheet, 102
 - entering AEOS setup parameters, 104
 - procedure, 104
 - setup guidelines, 103
 - basic tuning, 83
 - procedure, 83
 - changing the motion restriction sensitivity, 107
 - head package dimensions setup, 96
 - definition of head package dimensions, 96
 - determining and entering the head dimensions, 99
 - head position setup, 91
 - current far scan position (KFEOS), 92
 - current home scan position (KHEOS), 91
 - default single point position (SPPOS), 91
 - garage position (OFF), 91
 - maximum far measure position (LFEOS), 92
 - minimum home measure position (LHEOS), 91
 - notes about LHEOS and LFEOS (scanning measurement limits), 94
 - procedure for LHEOS and LFEOS, 94
 - procedure for determining position values, 95
 - standardize position (STDZ), 91
 - motion restriction sensitivity, 106
 - motor controller setup, 79
 - procedure, 79
 - motor drive setup (ABB ACS-100), 72
 - control panel functions, 72
 - general description, 72
 - motor drive parameters, 73
 - panel operations, 75
 - alarms and fault reporting, 78
 - downloading parameters, 76
 - LOCAL/REMOTE, 75
 - moving around the menu, 75
 - setting a parameter value, 75
 - uploading parameters, 77

- Platform Tuning (Continued)
 - other host setup procedures, 110
 - platform software setup checklist, 70
 - standardize off-sheet delay setup, 108
 - operation overview, 109
 - setup procedure, 108
- Power and Temperature Checks, 201
- Power Down and DC Power Analysis, 246
- Power Shelf Temperature Out of Limits, 240
- Power Supply LEDs, 242
- Preparing On-Site Documentation, 279
- Pressure Switch, 225
- Print Books, 6
- Procedure, 79, 83, 104
- Procedure for Changing Standardize Limits, 141
- Procedure for Determining Position Values, 95
- Procedure for LHEOS and LFEOS, 94
- Process Direction Alignment, 49
- Product Overview, 1
 - AccuRay Smart Processing Center (ASPC)
 - backplane identification, 4
 - +/- 12 volt fuses, 6
 - identifying different backplanes, 4
 - introduction, 4
 - print books, 6
 - slot assignments, 5
 - drive system, 9
 - electrical and cable systems, 10
 - mechanical structure, 7
 - way system, 8
 - service tools, 13
 - Service Workstation, 12
 - Smart Platform 1200 options, 3
 - scanner options, 3
 - sensor options, 3
- Purge Blower Replacement Process, 197

R

- Radiological Safety, 15
 - handling the source, 18
 - individual responsibility, 20
 - installation of the source, 19
 - safety features, 16
- Ream Size, 124
- Remote, 173
- Remote/Off-Sheet, 171
- Remote/On-Sheet, 171
- Replacement Parts for the ASPC, 230
- Replacement Parts List, 227
- Replacement Procedures, 203
 - carriage drive belt, 206
 - carriage wheel, 203
 - drive motor belt, 204

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Replacement Procedures (Continued)
drive motor controller (Fincor and Lovejoy),
223
electric chassis, 218
electric chassis replacement procedure,
218
flex cable replacements, 220
flex power cable retrofit kit, 220
encoder, 226
flex cable, 215
idler pulley, 208
motor drive replacement, 222
pressure switch, 225
replacement parts for the ASPC, 230
replacement parts list, 227
seal belt, 210
split rollers, 213
Reporting of "Internal" Check Sample During
Standardize, 145

S

Safety, 28
Safety Features, 16
Sample Check, 174
Sample Check Report, 272
Scan Direction Alignment, 54
Scan Limit Set, 176
Scanner Options, 3
Seal Belt, 210
Seal Belt Tension Adjustment, 192
Seal Belt Tension Inspection, 191
Self Test, 175
Sensor Options, 3
Service Tools, 13
Service Workstation, 12
Service Workstation Setup, 270
Service Workstation Software Startup, 182
Setting a Parameters Value, 75
Setup, 164
Setup Checklists, 112
Setup Guidelines, 103
Setup of Customer Units, 124
Setup Procedure, 108
Sheet Temperature Sensor Setup, 114
Slot Assignments, 5
Smart Ash and Smart Basis Weight, 120
Smart Basis Weight Sensors, 147
Smart Color Sensor Setup, 115
Smart Platform 1200 Options, 3
Smart Platform Distribution Center (SPDC), 31
Smart Platform Maintenance Logs, 184
Smart Platform Modes of Operation, 171

Smart Platform Power Distribution Center (SPDC),
33
Smoothness Sensor Setup, 115
Software, 270
SP1200 Power Up Procedure, 63
Space Requirements, 27
Split Rollers, 213
Standardize, 174
Standardize Delay After Long Off-Sheet Periods,
144
Standardize Limits, 141
Standardize Off-Sheet Delay Setup, 108
Standardize Position (STDZ), 91
Standardize Report, 271
Starting Up the Software, 67
Startup Options, 179
automatic startup, 181
manual startup, 180
Service Workstation software startup, 182
Supply, 30

T

Temperature Controller Setup for Basis Weight,
Ash, and Caliper Sensors, 118
Temperature Controller Tuning Parameters, 122
The gstore Utility, 275
The inspect Utility, 274
The Selection of CLEAN or DIRTY Standardize
Modes, 142
Time Interval Between Standardizes, 141
Troubleshooting, 237
alarm messages, 238
electronics health report, 238
a board temperature is out of limits,
238
chiller flow out of limits, 238
end column power temp out of limits,
238
frame health report, 240
AI slope and offset calc failed, 241
beam air flow off, 240
head position verify outside limits,
240
head position verify test - timeout,
240
head resynchronize - timeout, 240
head speed inconsistency, 240
motor controller temp out of limits,
240
motor stopped by obstacle, 240

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

Troubleshooting (Continued)

- power shelf temperature out of limits, 240
- undefined alarm, 241
- voltage level out of limits, 239
 - undefined alarm, 239
- diagnostic card operation, 249
 - diagnostic cards, 252
 - diagnostics performed at the sensor, 250
- LED interpretation, 242
 - ECF and ECS LEDs, 243
 - MPRC LEDs, 244
 - power supply LEDs, 242
- power down and DC power analysis, 246
- troubleshooting start-up messages, 261
- Troubleshooting Start-Up Messages, 261

U

- Undefined Alarm, 239, 241
- Unpacking Instructions, 24
- Uploading Parameters, 77

Using the Data, 165

- Using the Optional Temperature Controller Utility, 123
- Utilities, 274
- Utility Service Installation, 57
 - air and water supply, 59
 - air purge, 58
 - electrical hook-up, 61
 - SP1200 power up procedure, 63
 - starting up the software, 67

V

- Verification, 155
- Verification of Setup and Stability, 157
- Verify Air Gap, 53
- Voltage Level Out of Limits, 239

W

- Way System, 8
- Wheel Inspection, 195

Blank Page

For ABB Employee Use Only

Any other use is in violation of International Copyright Laws. For an end user copy of this manual, send a fax to: U.S.A. 614-261-2172 Attn: Documentation.

User Comments Request Form

We appreciate your comments on this manual.

Please call or send comments to:

ABB Industrial Systems Inc.
Pulp and Paper BU
Technical Publications Department
650 Ackerman Road
Columbus, Ohio 43202-9972
Attention: Documentation
(614) 261-2000

Comments can also be sent via FAX to:

Documentation
(614) 261-2113

