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This publication update contains the following additions and changes:

- Section 3 - Correct part numbers for High Performance HART module in Table 3-1
- Section 4 - Changes in “Locally Powered Current Input Connections” drawing in Figure 4-3 on Page 4-7
- Section 5 - Correct Figure 5-4
- Section 6 - Correct Section 6-2.2 and Figure 6-7
- Section 13 - Corrected Tables 13-6 and 13-8
- Section 14 - Correct description for LEDs 1-8 on Table 10
- Section 19- Corrections in Table 19-3 on Page 19-3
- Section 22 - Various
- Section 25 - Various
- Section 27 - Correct Table 27-1

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Add the Following Table Change to Section 3

Page 3-11, Replace Table 3-1 with the following:

Module Type	Channel	Electronic Module	Personality Module
Analog Input (± 100mV) (13 bit)	8	1C31113G03	1C31116G01
Analog Input (± 100 mV w/temp. sensor) (13 bit)	8 [1]	1C31113G03	1C31116G04
Analog Input (± 20mV) (13 bit)	8	1C31113G01	1C31116G01
Analog Input (± 20mV w/temp. sensor) (13 bit)	8 [1]	1C31113G01	1C31116G04
Analog Input (± 50mV) (13 bit)	8	1C31113G02	1C31116G01
Analog Input (± 50mV w/temp. sensor) (13 bit)	8 [1]	1C31113G02	1C31116G04
Analog Input (± 1 VDC) (13 bit)	8	1C31113G04	1C31116G01
Analog Input (± 10 VDC) (13 bit)	8	1C31113G06	1C31116G01
Analog Input (± 5 VDC) (13 bit)	8	1C31113G05	1C31116G01
Analog Input (0-20 or 4-20 mA Local PS) (13 bit)	8	1C31113G05	1C31116G03
Analog Input (0-20 or 4-20 mA Remote PS) (13 bit)	8	1C31113G05	1C31116G02
Analog Input (4-20 mA) (14 bit Low Speed)	8	1C31224G01	1C31227G01
Analog Input (± 1 VDC) (14 bit Low Speed)	8	1C31224G02	1C31227G02
Analog Input (4-20 mA) (14 bit High Speed (HS))	8	5X00070G01	1C31227G01
Analog Input (± 100mV, ± 250mV, ± 1V) (14 bit HS)	8	5X00070G02	1C31227G02
Analog Input (± 5V, ± 10V) (14 bit HS)	8	5X00070G03	1C31227G02
Analog Input (± 1mA, (using 250mV) 2 wire Local PS) (14 bit HS) (Turbine)	8	5X00070G02	1C31116G03
Analog Input (± 1mA, (using 250mV) 4wire field powered) (14 bit HS) (Turbine)	8	5X00070G02	1C31116G02
Analog Input (± 20mV, ± 50mV, ± 100mV) (14 bit MS)	8	5X00070G04	1C31116G01
Analog Input (± 20mV, ± 50mV, ± 100mV) (Thermocouple) (14 bit MS)	8	5X00070G04	1C31116G04

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Module Type	Channel	Electronic Module	Personality Module
Analog Output (0 to +10 V)	4	1C31129G02	1C31132G01
Analog Output (0 to +5 V)	4	1C31129G01	1C31132G01
Analog Output (0-20 or 4-20 mA w/diagnostics)	4	1C31129G03	1C31132G01
Analog Output (0-20 or 4-20 mA w/o diagnostics)	4	1C31129G04	1C31132G01
Contact Input w/Onboard 48 V wetting (Compact)	16	1C31234G01	Cavity Insert [2]
Contact Input w/Onboard 48 V wetting	16	1C31142G01	1C31110G03
Digital Input (125 VAC/VDC differential)	16	1C31107G02	1C31110G02
Digital Input (125 VAC/VDC single ended)	16	1C31107G02	1C31110G01
Digital Input (24 VAC/VDC or 48 VDC differential)	16	1C31107G01	1C31110G02
Digital Input (24 VAC/VDC or 48 VDC single ended)	16	1C31107G01	1C31110G01
Digital Input (125 VAC/VDC Indiv. Fused) (Compact)	16	1C31232G03	5X00034G01
Digital Input (125 VAC/VDC differential) (Compact)	16	1C31232G03	Cavity Insert [2]
Digital Input (24/48 VAC/VDC Indiv. Fused) (Compact)	16	1C31232G02	5X00034G01
Digital Input (24 or 48 VAC/VDC differential) (Compact)	16	1C31232G02	Cavity Insert [2]
Digital Input (24 or 48 VDC single ended) (Compact)	16	1C31232G01	Cavity Insert [2]
Digital Output (5-60 VDC) Single ended direct	16	1C31122G01	1C31125G01
Digital Output (relay pnl comm, Local PS)	16	1C31122G01	1C31125G02
Digital Output (relay pnl comm Remote PS)	16	1C31122G01	1C31125G03
HART Analog Input 16 Bit (4 - 20 mA)	8	5X00058G01	5X00059G01
HART Analog Output14 Bit (4 - 20 mA)	8	5X00062G01	5X00063G01
HART High Performance Analog Input (4 - 20 mA) Local or Remote PS.	8	5X00106G01	5X00109G01
Link Controller RS232	-	1C3116G01	1C31169G01
Link Controller RS485/422 Four Wire	-	1C3116G01	1C31169G02

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Module Type	Channel	Electronic Module	Personality Module
Loop Interface (AI: 0-10V AO: 0-10V)	2-4 analog 4 digital	1C31174G01	1C31177G01
Loop Interface (AI: 0-10V AO: 0-10V) User defined Digital Inputs[3]	2-4 analog 4 digital	1C31174G21	1C31177G01
Loop Interface (AI: 0-5V AO: 0-10V)	2-4 analog 4 digital	1C31174G02	1C31177G01
Loop Interface (AI: 0 - 5V AO: 0 - 10V) User defined Digital Inputs[3]	2-4 analog 4 digital	1C31174G22	1C31177G01
Loop Interface (AI: 4 - 20mA AO: 4 - 20mA Remote PS)	2-4 analog 4 digital	1C31174G03	1C31177G03
Loop Interface (AI: 4 - 20mA AO: 4 - 20mA Remote PS) User defined Digital Input[3]	2-4 analog 4 digital	1C31174G23	1C31177G03
Loop Interface (AI: 4 - 20mA AO: 4 - 20mA Local PS)	2-4 analog 4 digital	1C31174G03	1C31177G02
Loop Interface (AI: 4 - 20mA AO: 4 - 20mA Local PS) User defined Digital Input[3]	2-4 analog 4 digital	1C31174G23	1C31177G02
Loop Interface (AI: 4 - 20mA Remote PS)	2-4 analog 2 digital	1C31174G04	1C31177G03
Loop Interface (AI: 4 - 20mA Remote PS) User defined Digital Input[3]	2-4 analog 4 digital	1C31174G24	1C31177G03
Loop Interface (AI: 4 - 20mA Local PS)	2-4 analog 2 digital	1C31174G04	1C31177G02
Loop Interface (AI: 4 - 20mA Local PS) User defined Digital Input[3]	2-4 analog 4 digital	1C31174G24	1C31177G02
Pulse Accumulator (24/48V or 5/12V med speed Remote PS, pos/neg com)	2	1C31147G01	1C31150G03
Pulse Accumulator (24/48V or 5/12V med speed Local PS, neg com)	2	1C31147G01	1C31150G01
Pulse Accumulator (24/48V or 5/12V med speed Local PS, pos com)	2	1C31147G01	1C31150G02
Pulse Accumulator (5V high speed Remote PS)	2	1C31147G02	1C31150G03
Pulse Accumulator (5V high speed, Local PS neg com)	2	1C31147G02	1C31150G01
Pulse Accumulator (5V high speed, Local PS pos com)	2	1C31147G02	1C31150G02

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Module Type	Channel	Electronic Module	Personality Module
Relay Output Module G2R	16	1C31219G01	1C31223G01 or (Base Unit)
Relay Output Module KUEP (Form C or X)	12	1C31219G01	1C31222G01 or (Base Unit)
RTD Interface	4	1C31161G01	1C31164G01
RTD Interface (CE Mark certified) (50-60 Hz filtered)	4	1C31161G02	1C31164G02
RTD Interface	8	5X00119G01	5X00121G01
Seq. of Events (125VDC differential)	16	1C31157G02	1C31110G02
Seq. of Events (125VDC single ended)	16	1C31157G02	1C31110G01
Seq. of Events (24/48VDC differential)	16	1C31157G01	1C31110G02
Seq. of Events (24/48VDC single ended)	16	1C31157G01	1C31110G01
Seq. of Events contact input w/48V wetting	16	1C31157G03	1C31110G03
Seq. of Events (125VDC indiv. fused com rtn) (Compact)	16	1C31233G03	5X00034G01
Seq. of Events (125VDC differential) (Compact)	16	1C31233G03	Cavity Insert [2]
Seq. of Events (24/48VDC indiv. fused com rtn)) (Compact)	16	1C31233G02	5X00034G01
Seq. of Events (24/48VDC differential) (Compact)	16	1C31233G02	Cavity Insert [2]
Seq. of Events (24VDC or 48VDC single ended) (Compact)	16	1C31233G01	Cavity Insert [2]
Seq. of Events (24VDC or 48VDC single ended) (Compact)	16	1C31233G01	Cavity Insert [2]
Serial Link Controller RS232	1	1C31166G01	1C31169G01
Serial Link Controller RS485 4 wire	1	1C31166G01	1C31169G02
Servo Driver (19VAC 1KHz to an AC LVDT)	6	1C31199G02	1C31201G02
Servo Driver (19VAC 3KHz to an AC LVDT)	6	1C31199G03	1C31201G02
Servo Driver (±16VDC to a DC LVDT)	6	1C31199G01	1C31201G01
Speed Detector Interface	8	1C31189G01	1C31192G01
Valve Positioner (17 Volt 1Khz to an LVDT 82 Ohm Coil)	8	1C31194G01	1C31197G01
Valve Positioner (17 Volt 1Khz to an LVDT 250Ohm Coil)	8	1C31194G01	1C31197G02

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Module Type	Channel	Electronic Module	Personality Module
Valve Positioner (17 Volt 1Khz to an LVDT 1000 Ohm Coil)	8	1C31194G01	1C31197G03
Valve Positioner (17 Volt 1Khz to an LVDT 125Ohm Coil)	8	1C31194G01	1C31197G04
Valve Positioner (23.75 Volt 3Khz to an LVDT 82 Ohm Coil)	8	1C31194G02	1C31197G01
Valve Positioner (23.75 Volt 3Khz to an LVDT 250 Ohm Coil)	8	1C31194G02	1C31197G02
Valve Positioner (23.75 Volt 3Khz to an LVDT 1000 Ohm Coil)	8	1C31194G02	1C31197G03
Valve Positioner (23.75 Volt 3Khz to an LVDT 125 Ohm Coil)	8	1C31194G02	1C31197G04

1 A ninth channel is provided when using the Analog Input module with temperature sensor. This ninth point is needed for the **CJ Compensation field** of the Point Builder Instrumentation Tab when defining the eight other thermocouple points for the AI module (refer to Section 8) for additional information).

2 Cavity insert (1C31238H01) that fits into the Personality module position providing a wiring schematic label for the module. Typically, there is no actual Personality module required for this module type.

3 Raise and Lower Runback inputs can be disabled and used as user-defined input points. Configuration instructions are included in Kit 1C31174G20.

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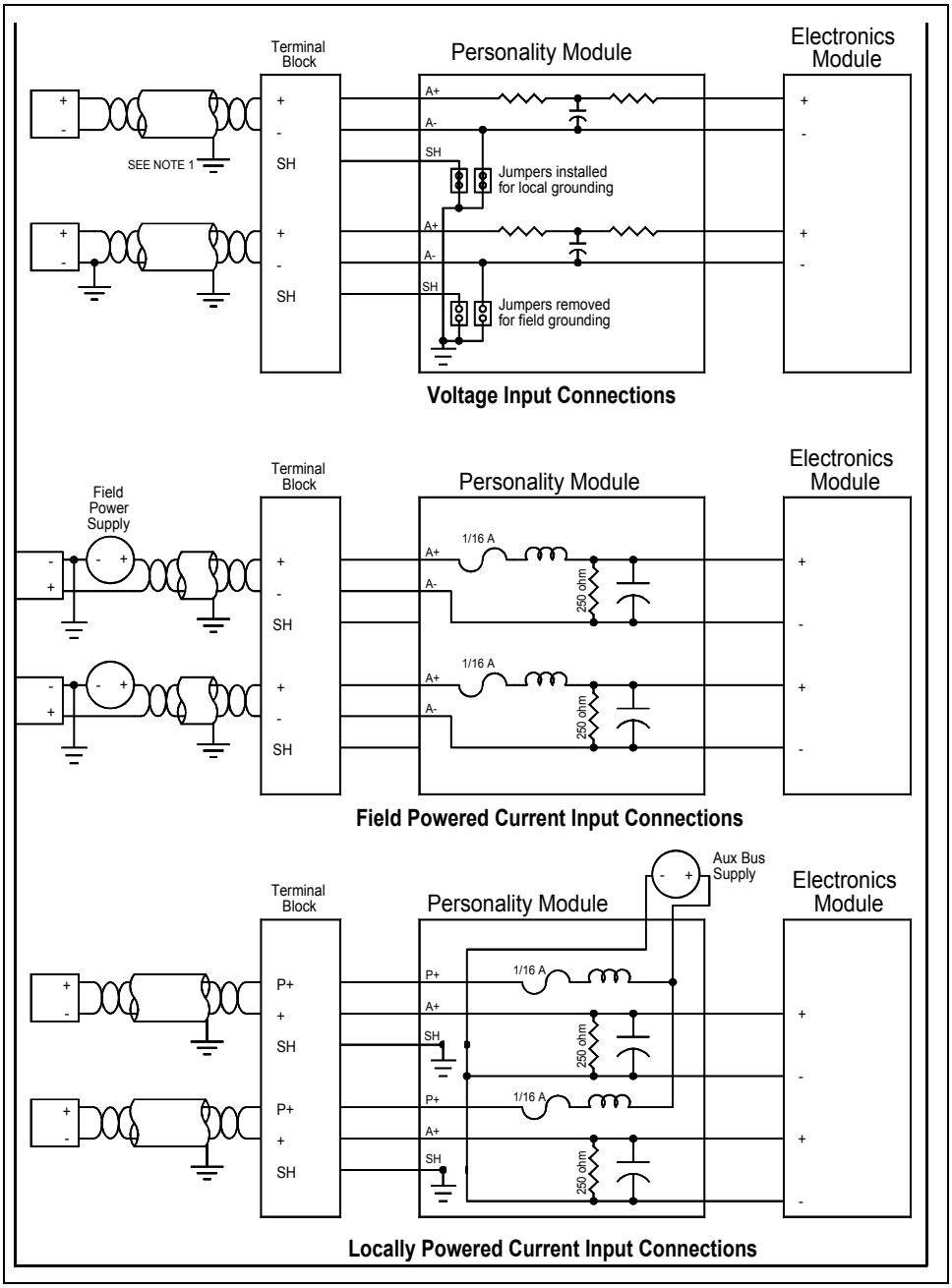
Add the Following Figure Change to Section 4

Page 4-8, Replace Figure 4-3 with the following:



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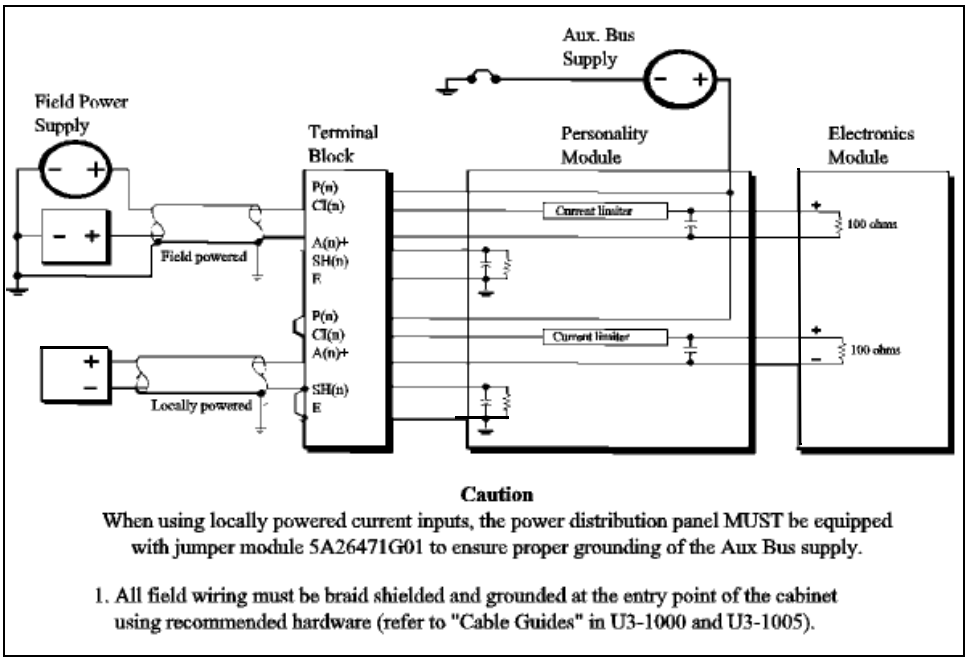
Add the following Change to Section 5

Page 5-7, Replace Figure 5-4 with the following:



Caution

When using locally powered current inputs, the power distribution panel MUST be equipped with jumper module 5A26471G01 to ensure proper grounding of the Aux Bus supply.

1. All field wiring must be braid shielded and grounded at the entry point of the cabinet using recommended hardware (refer to "Cable Guides" in U3-1000 and U3-1005).

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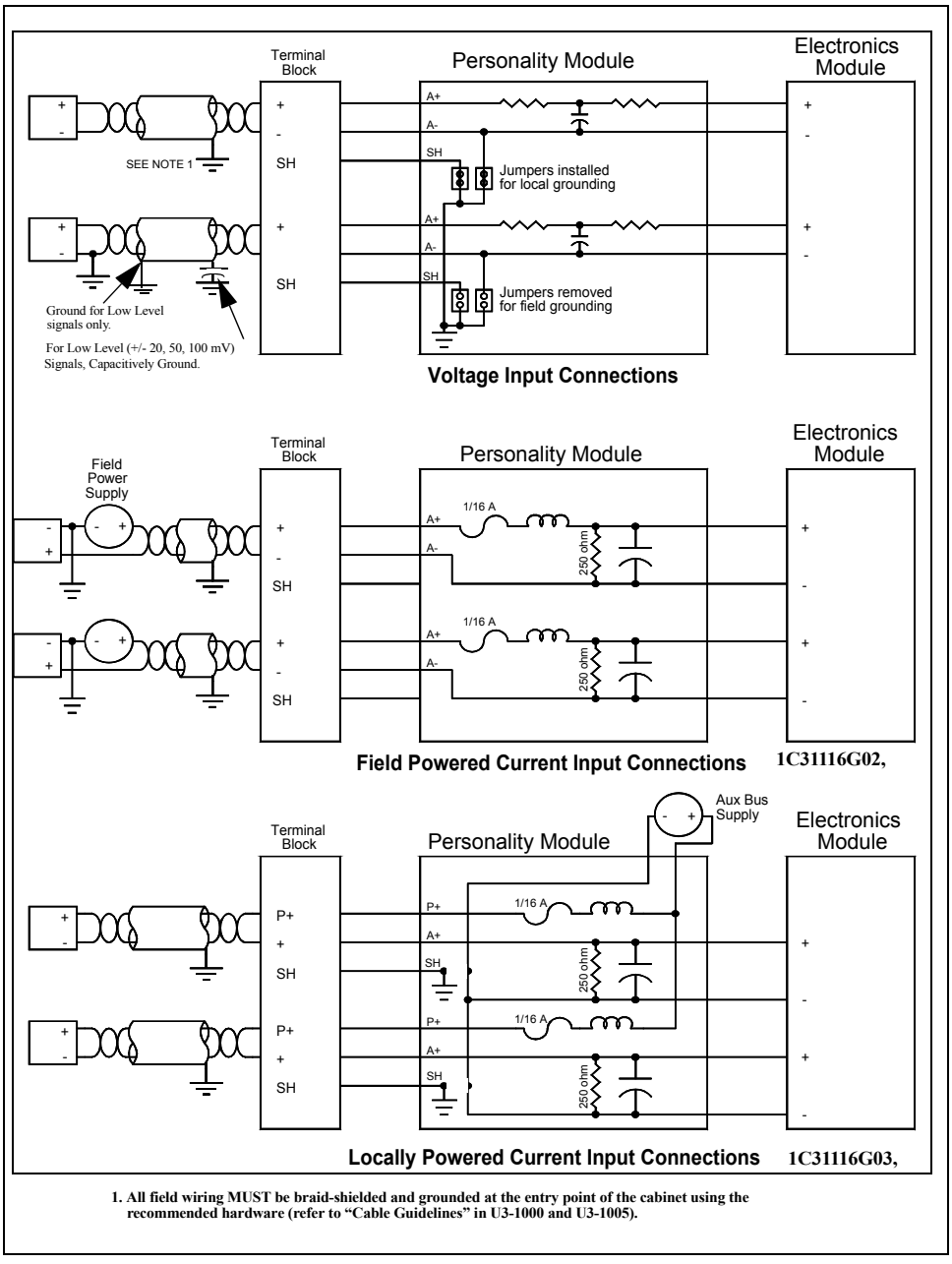
Add the following Change to Section 6

Page 6-2, Replace the first bulleted item in Section 6-2.2 with the following:

- 1C31227G01 interfaces to current input with an input range of 4-20 mA.

Page 6-12, Replace Figure 6-7 with the following:



1. All field wiring MUST be braid-shielded and grounded at the entry point of the cabinet using the recommended hardware (refer to "Cable Guidelines" in U3-1000 and U3-1005).

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Add the Following Changes to Section 13

Page 13-13, Replace Table 13-6 with the following:

Reg	Data Description - Configuration Register (Write)	Data Description - Status Register (Read)
0	Indirect Memory Index	NA
1	Indirect Memory Data	Indirect Memory Data
2	NA	Analog Input - Channel 1
3	NA	Analog Input - Channel 2
4	NA	Analog Input - Channel 3
5	NA	Analog Input - Channel 4
6	NA	Analog Input - Channel 5
7	NA	Analog Input - Channel 6
8	NA	Analog Input - Channel 7
9	NA	Analog Input - Channel 8
10	NA	Firmware Status Flags
11	NA	HAI Firmware Revision
12	NA	Channel Error Bits
13	Module Configuration Register	Module Status Register
14	HART Enable (See Table 13-9 for further information).	N/A
15	NA	Module Electronic ID Data

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Page 13-15, Replace Table 13-8 and other information with the following:

Bit	Data Description (Write)	Data Description (Read)
0	Configure Module	Module Configured (1 = configured; 0 = unconfigured)
1	Force Error	Internal or forced error (1 = forced error; 0 = no forced error)
2	Reserved	
3	Reserved	
4	Reserved	
5	Reserved	
6	Reserved for Factory Test (must always be set to 0)	
7	Reserved for Factory Test (must always be set to 0)	
8		Hardware Error
9		Bank 1 reference error
10		Bank 2 reference error
11	Not Used	Not Used
12	Not Used	Not Used
13	Not Used	Not Used
14		Field power failed
15	Reserved	Reserved

Bit 0: This bit configures the module (write) or indicates the configuration state of module (read). A “1” indicates that the module is configured.

Bit 1: Forces the module into error state, illuminating the module’s Error LED.

Bits 2-5: Not used by the module.

Bits 6-7: Reserved for factory test, must always be set to 0.

Bit 8: Hardware Error. Indicates one or more of the following are true:

- The FPGA did not program correctly on startup.
- The EE memory checksum is incorrect
- The PROM checksum test has failed.
- Internal memory diagnostic has failed.

Bit 9: Reference error on first mux/AD combination.

Bit 10: Reference error on second mux/AD combination.

Bit 14: Field power failed

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Add the Following Changes to Section 14 (IPU-237)

Page 14-15, In Table 14-11, regarding LED's 1-8 add the following:

> If the analog channel is healthy, the LED is illuminated. Then, if a HART message exchange occurs correctly, the LED is blinked off for 100 mSec. If the analog channel is healthy, and if the module sends a message and does not receive a correct response, the LED is blinked off for 400 mSec.

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Add the Following Changes to Section 19

Page 19-3, Replace Table 19-3 with the following:

Scale # (HEX)	Wires	Type	Temp °F	Temp °C	Rcold (ohm)	Rhot (ohm)	Excitation current (ma)	Accuracy ± ±counts	Accuracy ± ±% of SPAN
1	3	10 Ohm PL	0 to 1200	–18 to 649	6	106.3	0.1556	9	0.22
2	3	10 Ohm CU	0 to 302	–18 to 150	8.5	16.5	1.51	13	0.32
D	3	50 Ohm CU	32 to 284	0 to 140	50	80	1.0756	11	0.27
11	3	50 Ohm CU	32 to 230	0 to 110	53	78	1.1291	12	0.30
19	3	100 Ohm PL	–4 to 334	–16 to 168	92	163.67	0.5121	11	0.27
22	3	100 Ohm PL	32 to 520	0 to 269	100	200	0.4087	10	0.25
23	3	100 Ohm PL	32 to 1040	0 to 561	100	301	0.2554	10	0.25
25	3	120 Ohm NI	12 to 464	–11 to 240	109	360	0.2104	10	0.25
26	3	120 Ohm NI	32 to 150	0 to 70	120	170	0.5240	13	0.32
28	3	120 Ohm NI	32 to 278	0 to 122	120	225	0.3682	11	0.27
80	4	100 Ohm PL	32 to 544	0 to 290	100	208	0.3921	10	0.25
81	4	100 Ohm PL	356 to 446	180 to 230	168	186	0.5240	30	0.74
82	4	200 Ohm PL	32 to 698	0 to 370	200	473	0.1675	12	0.30
83	4	200 Ohm PL	514 to 648	268 to 342	402	452	0.2142	29	0.71
84	4	100 Ohm PL	32 to 124	0 to 51	100	120	0.7860	19	0.47
85	4	100 Ohm PL	32 to 217	0 to 103	100	140	0.6386	13	0.32
86	4	100 Ohm PL	32 to 412	0 to 211	100	180	0.4644	11	0.27
87	4	100 Ohm PL	32 to 714	0 to 379	100	240	0.3296	10	0.25
88	4	120 Ohm PL	511 to 662	266 to 350	200	230	0.4170	24	0.59

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Add the following Changes to Section 22

Page 22-2, Add the following information after the second paragraph (The dual-channel...sequence.) in Section 22-2 (Operation):

> Starting with revision 0C, RSR firmware supports a cascaded PI configuration in which the output of PI 1 is used as the target position input for PI 2. Additional features to support cascading operation are flags to select direct/indirect PI operation, and an anti-windup feature called “retreat”. Some of these new features are actually independent of cascading, but all are described in detail in this document.

Page 22-9, Delete all of the remaining paragraphs (six) after the second paragraph (Arbitrary limits...10.0 volts.) in the Full Calibration bullet under the Calibrate Mode Section:

Page 22-9, Add the following information in place of the deleted paragraphs in above item:

> When full calibration is requested, the valve first travels to 0%. At 0%,demodulator gain is adjusted until the feedback voltage is near 10 volts. The demodulator gain at this point is the maximum possible demodulator gain.
>
> Then the valve travels to 100%. If the voltage is greater than 10 volts, or off-scale, demodulator gain is reduced, and a reading of the voltage is taken. This reading is the 100% calibration valve.
>
> Then the valve travels to 0% and a voltage reading is taken. This reading is the 0% calibration value.
>
> After the 0% calibration valve is determined, the new values are written to EE memory.

Page 22-17, Under Section 22-8 (Valve Position Control), replace the Section “Seating and Backseating” with the following:

22-8.1 Seating, Backseating, and Retreat

Seating and BackSeating are similar functions, with the exception that Seating closes the valve, and BackSeating opens it. Therefore, only Seating is described.

Retreat is an anti-windup function. It is important to remember that when the RSR servo output is near 0 volts, the valve is stationary. When the servo output moves away from the midpoint, the valve moves to the desired position, and the servo output goes back to near 0 volts.

Retreat is a feature that occurs after Seating. It is highly programmable.

When the target position is less than seatLimit, the RSR goes into a seating mode. In this mode the RSR wants to close the valve as fast as possible. It accomplishes this by driving the output hard to the rail in the direction of valve closure.

Retreat occurs after a timer has expired (retreatHoldT), and once the valve position is close to where the RSR wants it to be (ABS|Target-Feedback| < posErrorRetreat). When a valve retreats, the servo output goes from the rail to a programmed value (exitSeatVal) at a predefined rate (retreatRate).

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In a typical scenario, the user would determine the voltage required to null the servo spool; i.e., overcome the mechanical bias adjustment. Let,s assume the value is –200 mV. The user would then set exitSeatVal to –200 mV plus an arbitrary amount in the direction of valve closure, 100 mV perhaps. So, the user would set exitSeatVal to –100 mV. Also, assume the user leaves the other associated constants to their default values. When seating is entered, the servo output goes to +10 volts and will remain there for at least 10 seconds. When the 10 second timer expires, and when position feedback is within 2 percent of the target position (probably 0), the servo output ramps from 10 volts to –100 mV at 10% per second. Ten volts is about 50% of output range, so the servo output would return to –100 mV after 5 seconds. At –100 mV, the servo spool is letting a small amount of fluid escape, thus closing the valve.

If the target position went higher, thus removing the RSR from seating, the servo output would be readily available to begin to move the valve, and would not rely on integral action to bring it from 10 volts back to 0.

When the RSR is moving between these various modes, the PI tracks the output when it is begin driven by one of the non-normal modes such as seating. Therefore, the transition back to normal operation is bumpless.

If the system is not properly tuned, the valve could start to go open when the servo output reaches the retreat value. If this occurs and ABS|Target-Feedback| > posErrorRetreat, a bit is set in register D to announce the condition. The RSR sends the output back to the rail and will not allow the channel to retreat again until seating is exited. The user should ensure that the bits in register D generate alarms to notify the operator should this occur.

Page 22-18, Add the following section after Section 22-8.2 “PI Position Control”:

22-8.3 CASCADE PI MODE

Cascading of the PI controllers can be selected by entering “CASCADE = 1” and saving the setting by typing “SC”.

When cascading is selected, the +100% to -100% output of PI 1 is converted to -100% to 0% target position. This target position value is then used as the target position, or demand, for PI 2.

Page 22-20, Delete Section 22-9.7 “Controller Tracking”:

Page 22-24, Delete Section 22-10.3 “Configuration”:

Page 22-26, Add the following information in Table 22-6 “Tuning Constant Commands:”

Command	Description
retreatRate	% per second rate of output retreat.
DIRECT =1	PI mode. In direct mode (DIRECT=1) the output goes in a direction with respect to target position. In indirect mode (DIRECT=0) the output goes negative when target position moves negative with respect to position feedback.
posErrorRetreat=2.0	The output will not retreat until ABS| posFB - TargetPos| < posErrorRetreat

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exitSeatVal=5000	When the RSR is seating the valve, then decides to retreat, this is the output in mV to which the output goes.
exitBkSeatVal=-5000	When the RSR is backseating the valve, then decides to retreat, this is the output in mV to which the output goes.
CASCADE=0	If this flag is set to 1, the two PI's are cascaded.

Page 22-35, Make the following changes to Table 22-9 "Servo Driver Configuration/Status Register":

Bit	Data Description (Write)	Data Description (Read)
9	Not Used	Ch1 - Retreat in progress
10	Not Used	Ch2 - Retreat in progress
11	Not Used	Ch1 - Retreat is disabled
12	Not Used	Ch2 - Retreat is disabled

Page 22-38, Make the following changes to Table 22-11 "Servo Driver Diagnostic":

For LED E (Red) Description, delete the following Possible causes:

"SLIM not connected," and
"No auxiliary voltage,"

For LED I (Red), delete the following:

"Fatal error occurs"

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Add the following Changes to Section 25

Page 25-7, Replace the middle section of Table 25-1 with the following:

When using the Point Builder to define points for a Valve Positioner module, only the following point types are valid for each channel:

I/O Channel	Name	Type	Input Source or Output Destination	Terminal Block Connection [2]
1	Shutdown Status	Input	Valve Positioner	DI1
2	Auxiliary (wetting) Voltage Sense	Input	Valve Positioner	DI2
3	SLIM ON Signal	Input	Valve Positioner	DI3
4	Position Feedback	Input	Valve Positioner	
5	Coil 1 Voltage (Read-back	Input	Valve Positioner	Coil 1
6	Coil 2 Voltage (Read-back	Input	Valve Positioner	Coil 2
7	Coil 3 Voltage (Read-back)	Input	Valve Positioner	Coil 3
8	Raw Demodulator Voltage	Input	Valve Positioner	
9	VP Status	Input	Valve Positioner	
10	Demand Feedback	input	Valve Positioner	
11	VP Command	output	Valve Positioner	
12	VP Demand	output	Valve Positioner	
13	Partner Position Feedback	output	Valve Positioner	

Page 25-8, Replace the table (concerning the VP module firmware releases) with the following:

VP Firmware Level (Electronics Module)	VP Revision Level (Electronics Module)	Firmware Features
0F	9	Added support for the following: ■ Calibration from the Controller using graphics. ■ Upload/download of calibration constants to and from the Controller. ■ New tuning constants kServo and kServoDb to replace hard-coded constants. They add flexibility in dealing with differing coil impedances. ■ Reduction of valve calibration time.
0C	6	Added support for VP Redundancy.
0B	5	First full production firmware release.
0D		obsolete
0E		obsolete
0G	11	Redundancy support changed so that multiple failovers are precluded. Improvements to calibration. Fixed problem with coil diagnostics for “coilCount = 0”. Position feedbacks rollover problem fixed.
0H	13	Added “priority Demand” tuning constant to support Rockport project. Fixed overflow problem in PI math.

Page 25-21, Delete Section 25-7.2 “Calibration Required,” Repetitive.

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Page 25-28, Section 25-9.3 “Shutdown Input”, change the name to the following, then add the text that follows to the end of the section:

25-9.3 Shutdown Input (Priority Demand Input)

For VP firmware revisions 0H and later, the shutdown input is redefined to “Priority Demand Input”. When the input is activated, the target position is set to a tunable constant. For compatibility with previous firmware revisions, the default value of priorityDemand is -5%.

This allows the user to rapidly move the valve to some intermediate position during upset conditions. The user has the flexibility to create his own scheme to handle an upset.

While the “priority demand input”, or “Shutdown” input is active, the VP is in the local mode and the controller must unconditionally track demand feedback.

Page 25-29, Section 25-10.5. “Open Coil Diagnostic Error”, replace “is incorrect” at the end of the second sentence with:

has been adjusted to yield that result.

Page 25-29, Section 25-10.5. “Open Coil Diagnostic Error”, add the following text after the first paragraph of the section:

For firmware revisions prior to 0F, the diagnostic works as described below. For later revisions servo coil voltage is measured and compared to a model described by tuning constants “kServo” and “kServoDb’. If the voltage does not fit into the model, due to being too large, “open coil” is blamed and the internal diagnostic bit is set. Then the timing sequence described below is used to post the error bit to the controller.

Page 25-30, Section 25-10.6. “Shorted Coil Diagnostic”, add the following text after the first paragraph:

For firmware revisions prior to 0F, the diagnostic works as described below. For later revisions servo coil voltage is measured and compared to a model described by tuning constants “kServo” and “kServoDb”. If the voltage does not fit into the model, due to being too large, “open coil” is blamed and the internal diagnostic bit is set. Then the timing sequence described below is used to post the error bit to the controller.

Page 25-32, Replace Table 25-7.” Operating Mode Memory Map” with the following:

Valve Positioner Card Register	I/O Channel Number in the Point Builder	R/W	Definition
0	N/A	N/A	Indirect ram pointer (Output FIFO Put Pointer)
1	N/A	N/A	Indirect ram data register
2	4	R	Position feedback (-1560 to 32760 equals -5.0 to 105%)
3	5	R	Coil voltage 1 (traditionally called S1)
4	6, 13	R, W	Coil voltage 2 (traditionally called S2) (non-redundant configuration only)
5	7	R	Coil voltage 3 (non-redundant configuration only)

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Valve Positioner Card Register	I/O Channel Number in the Point Builder	R/W	Definition
6	8	R	Raw demodulator voltage
7	N/A	R	Status Word 2 Bits 0 through 15 - Not used.
8	9 1 2 3	R	Status Word 1 Bits 0 through 3 - modes 0000 - not used 0001 - PE mode 0010 - start mode 0011 - test mode 0100 through 0111 - not used 1000 through 1011 - local modes 1000 - local mode 1001 - calibrating in local - seated 1010 - calibrating in local - backseated 1011 - calibrating in local 1100 through 1111 - normal modes 1100 - normal mode 1101 - calibrating in normal - seated 1110 - calibrating in normal - backseated 1111 - calibrating in normal mode Bit 4 - Shutdown input status, 0 = inactive, 1 = activated Bit 5 - Auxiliary voltage sense Bit 6 - SLIM-ON signal Bit 7 - VP alive flag. The VP toggles this bit to indicate that it is running. Bit 8 - At null point (Bits 9 through 14 - for redundant configuration) Bit 9 - Quality- Used by redundant VP configuration Bit 10 - Primary/Backup status for redundancy, 0 = Primary, 1 = Backup Bit 11 - LVDT Trouble - LVDT problem indicator for redundant configuration. Held True for five seconds. Bit 12 - RVP disarmed. Bit 13 - Data Validation Error - The position demand over the Ovation and redundancy link do not match. Bit 14 - Mode mismatch - In a redundant pair, one VP is in Normal mode and the other VP is in Local mode. Bit 15 - poor quality calibration
9	10	R	Demand feedback (-1560 to 32760 equals -5.0 to 105%) = (Position feedback - bfpB) / bfpM (bfpM and bfpB are described below) For non-boiler feed pump applications, bfpM = 1.0 and bfpB = 0.0, therefore “Demand feedback” and “Position feedback” are exactly equal.

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Valve Positioner Card Register	I/O Channel Number in the Point Builder	R/W	Definition
A	11	W	Command Register Bit 0, 1, and 2 – calibration requests 000 = no request 001 = zero hot cal request 010 = top hot cal 011 = full calibration 100 = go to null point 101 invalid 110 invalid 111 = full calibration and stop at null point Bit 3 - Not used Bit 4 - Partner Quality (redundant VP configuration) 0=OK, 1=BAD Bit 5 - Partner Alive Bit (redundant VP configuration) from register 8, bit 7 or Partner VP Bit 6 - Redundant VP's Partner's Primary/Backup Status. The Controller copies Bit 10 from the partner's status register 1 to inform the VP that the partner is a Primary or Backup drop. Bit 7 - Not used Bit 8 - arm RVP. When this bit is set, the backup RVP is re-armed and can take over control if the primary fails. When a backup RVP is disarmed, it will not take over control for certain types of failures. Bit 9-F - Not used
B	12	W	Demand (-1560 to 32760 equals -5.0 to 105.0%)
C			Point Status Register
D		R/W	Module Configuration Status Register (see Table 25-12)
E		R	Secondary Module Configuration Status Register (see Table 25-13)
F			Electronic ID

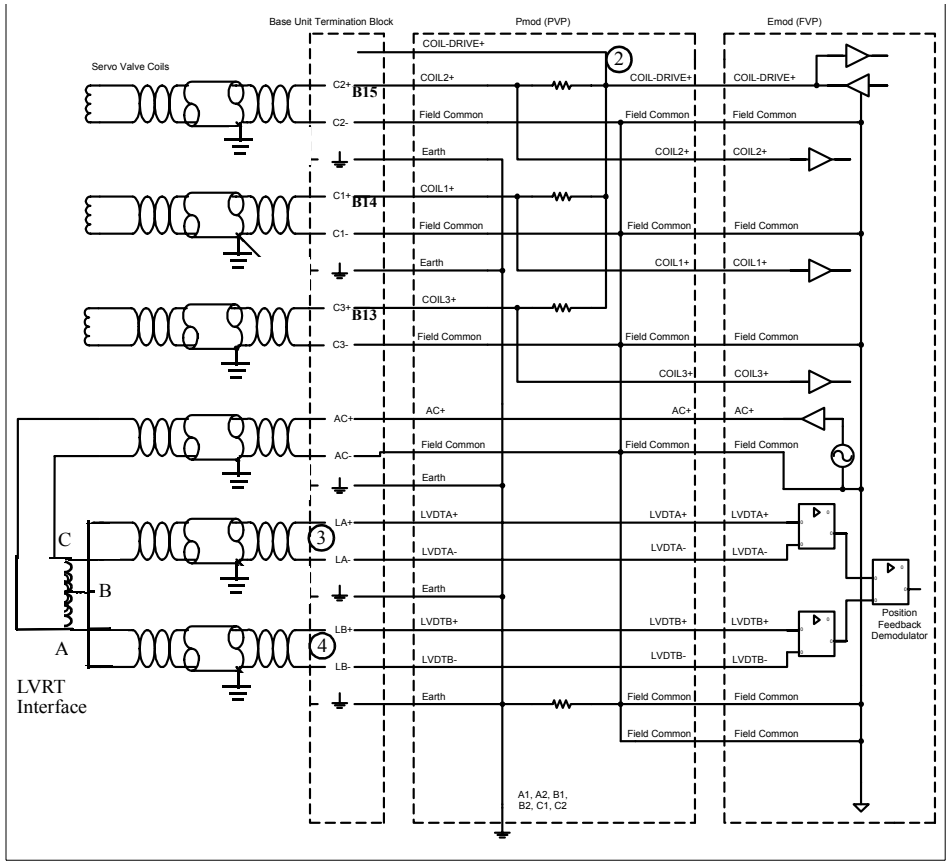
Page 25-38, Change Table 25-8:"Configuration Commands":

In the first column, "**CoilCount**" should read "**CoilCount = 2**"

Page 25-40, Add the following to the bottom of Table 25-8:"Configuration Commands":

priorityDemand = -5.0 For firmware revisions 0H and later, "priorityDemand" is the target position used when the shutdown input is activated. The default value is selected so that upgraded modules are backward compatible. The user can set this value to an intermediate value in order to create his own scheme for handling of plant upsets.

Page 25-50, Replace Figure 25-10 with the following:



Notes

1. All field wiring must be braid-shielded and grounded at the entry point of the cabinet using the recommended hardware (refer to “Cable Guidelines” in U3-1000 and U3-1005).
2. Negative voltages on terminals B15, B14, and B13 cause the valve to open.
3. The amplitude of this signal decreases as the valve goes open.
4. The amplitude of this signal increases as the valve goes open.
5. Node A is connected to terminals AC+ and LB+,
   Node B is connected to terminals LB- and LA+,
   Node C is connected to terminals AC- and LA-.

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Make the following Change to Section 27

Page 27-5, Make the following change toTable 27-1:

The last line in Note 2 should be changed to read:

“...(using 1C31204G03 Personality modules.)”

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