SELECTRONIX, INC.
WOODINVILLE, WA

SUPERSTEP SERIES 4000

SEQUENCING STEP

CONTROLLERS

INSTALLATION & OPERATING

TECH NOTE 209

Quick Reference Datapoints and GPDI Decode Table

1 Hot Water Boiler

- Temperature setpoint is **AV17** in degrees (PID1 Unmodified Setpt)
- Actual water temperature is **AI31** in degrees

2 Steam Boiler

- Pressure setpoint is **AV33** in PSI (PID2 Unmodified Setpt)
- Actual boiler Pressure is **AI39** in PSI

3 Enable/Disable All Boilers **AV3 (Load Limit input)**

3.1 *BMS Enable/Disable all boilers and any proportion by using the Load Limit input*

   a. Use AV0003
      i. Boiler Enable = 0
      ii. Both Boiler Disable = 99
      iii. -1 enables the Aux Load Limit, which is the electrical signal on the master SLC4000 board, terminals TB5 and TB6. For other Load Limit configurations, see "SLC4000Addendum_LoadLimitCfgs.pdf" available in the support section of SLC4000 at selectronix.us.
      iv. Intermediate values disable proportionate quantity of stages.
      v. For systems with SLC4000-1, using POPS, use values that result in the quantity of available 'relays' that are divisible by 7 to maintain POPS operation.

3.2 *Enable/Disable all boilers from the front panel using "Aux/DDC" switch*

   b. There is an input on the master SLC4000 for an auxiliary input. If you are not using this input, you can switch the "Aux/DDC" on any of the touchscreen panel pages to the "Aux" position, which will cause the output of the master and expansion SLC4000 sequencers to turn off their output.
      i. Install a jumper between the master SLC4000 TB2 and TB3 to ensure the command is 0 Volts.
      ii. Verify that the master SLC4000 master DIP switch SW1 is for a 0-10V Aux input.
      iii. **Note: The ON position is when the top of the rocker switch is pushed down.**
         1. SW1-1 OFF
         2. SW1-2 ON
         3. SW1-3 ON
         4. SW1-4 ON
         5. SW1-5 OFF
      iv. The BMS may also remotely activate the "Aux/DDC" switch at AV0001
         1. A value of 0 is the "Aux" position
         2. A value of 90 is the "DDC" position

4 Active Relays of Individual SLC4000 Sequencer Boards

The active relays of each of the SLC4000 are monitored at AI0006 through AI0009 for the master through expansion unit 3, respectively. The data is a binary representation of the actual relays that are active on each board, with a range of 0-255 for an 8-step board.
For instance:

- A value of 3 means that relays 1 and 2 are on.
- A value of 128 means that relay 8, only, is on.
- A value of 255 means that all relays are on.

For a **POPS/PPS SLC4000-1**, the analog output may be determined by:
Analog output Volts dc= (Quantity of bits set * 10)/7
Digital Alarm Points
Digital Alarm Points are monitored by the General Purpose Digital Inputs (GPDI) and are interpreted as a packed integer at **AI38.**
Binary Inputs, bi 1 – bi4, for GPDI 01-04, respectively is available with:

- **TSGW Version 2.23 or greater**
- **For MS/TP, requires BootConfigV105 or greater, in addition.**

- The value of each bit is determined by the signal input modified by the inversion bit assignment. When the inverted bit is set, it changes a 'hot' or active signal to a logical inactive signal. For instance, if a Low Water signal is 'hot' when the water level is acceptable, and no signal when the level is low, the alarm is active when there is no signal.

4.1 Single Hot Water Boiler example

GPDI1 -Bit 0 is Low Water (alarm)
GPDI2 -Bit 1 is High Limit (alarm)
GPDI3 -Bit 2 is Status (Not an alarm)
GPDI4 -Bit 3 is Hi Water (Not an alarm)

Substitute the actual GPDI assignments in the corresponding columns
A shutdown alarm causes the command to go to 0, until the alarm is reset

Description	High Water GPDI4 BI 4	Status GPDI3 BI 3	High Limit GPDI2 BI 2	Low Water GPDI1 BI 1	AI38
Causes shutdown On active	N	N	Y	Y	
Normal condition	0	1	0	0	4
Low Water	0	0	X	1	1,3
High Limit	X	0	1	X	2,3,10,11
High Water	1	0	X	0	8,10
High Limit & High Water	1	0	1	0	10
Low Water & High Limit	0	0	1	1	3

4.2 Multiple Boiler examples

GPDI1 - Bit 0   Boiler L/O #1 (Alarm,,, LowLow Water OR HighHigh Pressure OR Boiler Alarm)
GPDI2 - Bit 1   Boiler L/O #2 (Alarm,,, LowLow Water OR HighHigh Pressure OR Boiler Alarm)
GPDI3 - Bit 2   Boiler #1 Status (**Not an alarm…Safety string is satisfied**)
GPDI4 - Bit 3   Boiler #2 Status (**Not an alarm…Safety string is satisfied**)

A shutdown alarm causes the command to go to 0, until the alarm is reset

Description	Boiler #2 Status GPDI4 BI 4	Boiler #1 Status GPDI3 BI 3	Boiler #2 L/O GPDI2 BI 2	Boiler #1 L/O GPDI1 BI 1	AI38 Value(s)
Blr #1 L/O Causes Shutdown	X	X	X	1	**1,3,5,7,9,11,13,15**
Blr #2 L/O Causes Shutdown	X	X	1	X	**2,3,6,7,10,11,14,15**
Only Blr #1 Enabled Status	0	1	0	0	4
Only Blr #2 Enabled Status	1	0	0	0	8
Blr #1 & Blr#2 Enabled Status	1	1	0	0	12