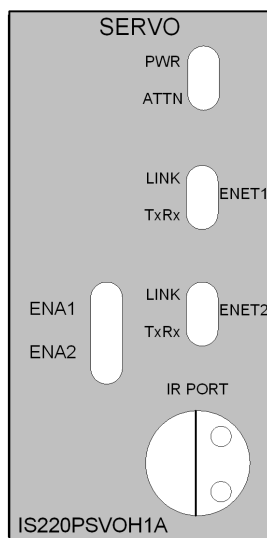


PSVO Servo Control Module

Servo Control I/O (PSVO)

Functional Description



Infrared Port Not Used

The Servo Control (PSVO) I/O pack provides the electrical interface between one or two I/O Ethernet networks and a TSVC servo terminal board. The I/O pack contains a processor board common to all distributed I/O packs and an I/O board specific to the servo function. The PSVO uses the adjacent WSVO servo driver module to handle two servo valve position loops, with a selection of five servo valve output currents from 10-120 mA dc. The I/O pack supplies LVDT excitation, and accepts eight LVDT feedbacks and two pulse rate inputs from fuel flow meters.

Input to the I/O pack is through dual RJ-45 Ethernet connectors, and 28 V dc power is supplied from the terminal board. Output is through a DC-62 pin connector that connects directly with the associated terminal board connector. Visual diagnostics are provided through indicator LEDs.

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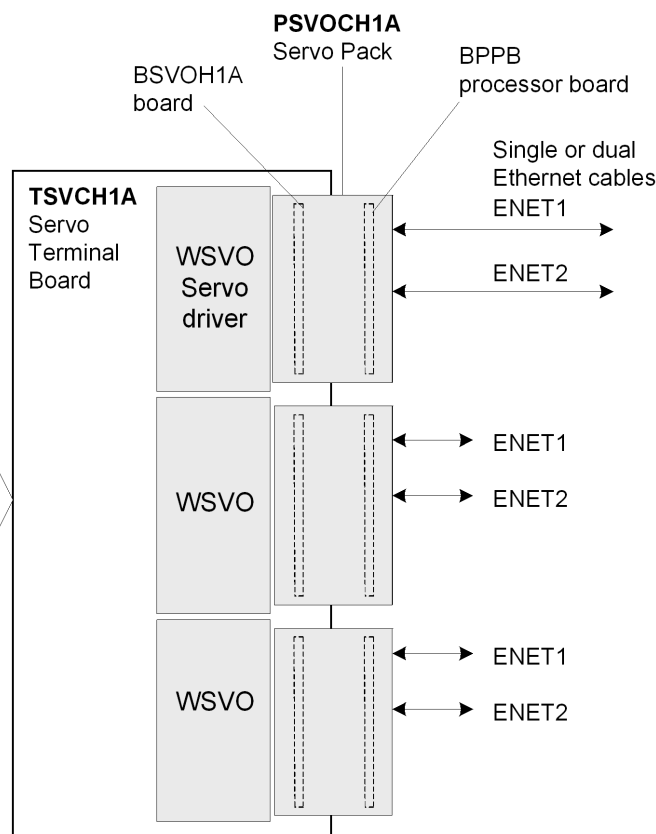
Website: www.xm-dcs.com

Address: Room 1503, Building B, Diamond Coast,
No. 96 Lujiang Road, Siming District, Xiamen Fujian



Servo coil outputs
LVDT excitation
LVDT inputs
Pulse rate inputs

Three PSVO packs and WSVOs for TMR
One PSVO pack and WSVO for Simplex



Compatibility

Terminal Board	Compatibility	
TSVCH1A	Simplex - yes Dual - no TMR - yes	Note Simplex mode uses one I/O pack with one or two network connections. TMR mode uses three I/O packs with one network connection on each I/O pack.
TSVOH1B	No	
DSVO	No	

The PSVO along with its associated WSVO servo driver assembly mounts directly to a Mark VIe TSVCH1A terminal board.

For additional installation instructions in Class I Division II locations, refer to GEI-100649.

Installation

➤ To install the PSVO I/O pack

1. Securely mount the desired terminal board.
2. Directly plug one (simplex) or three I/O packs (for TMR) into the terminal board connectors.
3. Mechanically secure the I/O packs using the threaded inserts adjacent to the Ethernet ports. The inserts connect with a mounting bracket specific to the terminal board type. The bracket location should be adjusted such that there is no right angle force applied to the DC-62 pin connector between the I/O pack and the terminal board. The adjustment should only be required once in the life of the product.
4. Plug the WSVO servo driver assemblies into the J2 48-pin connectors and secure with the four screws.
5. Plug in one or two Ethernet cables depending on the system configuration. The I/O pack operates over either port. If dual connections are used, standard practice is to hook ENET1 to the network associated with the R controller, however, the PSVO is not sensitive to Ethernet connections and negotiates proper operation over either port.
6. Apply power to the I/O packs and drivers using the power switches on TSVC. Use SW3 for R, SW2 for S, and SW1 for T, and check the indicator lights.



Caution

For simplex applications that have a connection to the TSVC JD1 or JD2 (the K1 relay is being used) verify that SW1 is in the ON position, and verify that the green DS1 LED is lit. This indicates that the necessary P28T power is available. If the DS1 LED is not lit, then the K1 trip override relay will not provide the intended protection.

7. Use the ToolboxST* application to configure the I/O packs as necessary. See also the [Auto-Reconfiguration](#) section.



Attention

If the configuration being downloaded contains I/O packs with different module IDs than the configuration currently running, the download may install incorrect firmware to some I/O packs. If this occurs, make sure the controller is running the new configuration, restart the entire system, and then start the ToolboxST Download Wizard again.

Operation

Refer to the following sections in the chapter, *Common Module Content*:

- [Auto-Reconfiguration](#)
- [Processor](#)
- [Processor LEDs](#)
- [ID Line](#)

Connectors

The terminal board provides fused power output from a power source that is applied directly to the terminal board, not through the I/O pack connector.

- A DC-62 pin connector on the underside of the I/O pack connects directly to a discrete output terminal board.
- An RJ-45 Ethernet connector named ENET1 on the I/O pack side is the primary system interface.
- A second RJ-45 Ethernet connector named ENET2 on the I/O pack side is the redundant or secondary system interface.

BSVO Servo Board

The BSVO board multiplexes 24 analog channels into a 16-bit A/D converter. The 100 kHz A/D has a ± 10 V dc range, and handles the servo current regulator signals, the LVDT inputs, and power supply monitoring. The current references for the analog current regulators on WSVO are generated on the BSVO by a 14-bit D/A converter. Excitation for the LVDTs uses a digital to analog converter, which outputs a sine wave with a frequency of 3.2 kHz. This is filtered and passed to the WSVO. The board provides signal conditioning for two pulse rate channels and passes the signals to the processor board to determine the pulse rate.

WSVO Servo Driver Assembly

The servo driver assembly has a power supply that converts the P28 voltage input to a positive 15 V and negative 15 V output for the servo current regulator circuits. There are two servo current regulators working off the current references from the servo I/O pack. The servo driver circuit has a selection of five configurable gains, and the assembly contains the servo suicide relays and excitation output driver circuits.

Verification

The three ways to verify servo performance through stroking the actuator are manual, position ramping, and step current. In manual mode, the desired value is entered numerically and the performance monitored from the trend recorder. Select **Verify Position** to apply a ramp to the actuator, and select **Verify Current** to apply a step input to the actuator. The trend recorder displays any abnormalities in the actuator stroke.

Flow Rate / Speed Pickups

An interface is provided for two passive magnetic speed inputs or two TTL active sensor inputs with a frequency range of 2 to 12,000 Hz. The PSVO signal-conditioning circuit is optimized for flow divider sensors, whereas the PTUR circuit is optimized for primary speed inputs.

Pulse rate inputs can be configured for a variety of applications. Flow types are used for flow divider fuel flow measurements. Speed type is used for normal single shaft turbines. Speed high type provides extended speed range above the standard speed type. Speed LM type is designed for LM applications. Speed_HSNG type is used for applications where compensation for inconsistent tooth spacing on the speed wheel is desired. This pulse rate type will map the spacing of the teeth on the speed wheel to remove this periodic variation from speed measurements. Mapping locked status bits (**HSNGn_Stat**) are in signal space so that the mapping status of the algorithm can be observed. If the status indicator for a pulse rate input is false then the mapping algorithm sees too much variation in the tooth-tooth measurements to lock onto the tooth geometry.

The **Lock_Limit** parameter can be adjusted in 1% increments to allow for more tooth-to-tooth variation per revolution. Increasing the Lock_Limit value will allow the next generation speed algorithm to stay locked with increased variation. The following are reasons why this parameter may need to be adjusted:

- Magnetized speed wheel
- Two-piece speed wheel
- Electro-magnetic interference from outside sources
- Improper wiring or shielding practices



Attention

The cost for opening the **Lock_Limit** is that it will allow for more speed variation. If the speed variation is too high when opening up the **Lock_Limit**, go to the source of the problem as listed above and correct the issue there.

Servo Recalibration

A liquid fuel regulator with no LVDTs would not have to be recalibrated.

The recalibration of a PSVO, PSVP, or PCAA servo is required when a new terminal board is used on a system. The controller saves the barcode of the terminal board and compares it against the current terminal board during reconfiguration load time. Any time a recalibration is saved, it updates the barcode name to the current board.

➤ To calibrate valve circuits

1. From the **Component Editor**, select the **Hardware** tab.
2. From the **Tree View**, select the desired PSVO, PSVP, PCAA, or PMVE with an attached MVRA or MVRF.
3. From the **Summary View**, select the **Variables** tab, then click **Go On/Offline**.
4. In the **Variables** tab, scroll to **CalibEnab1** and double-click it in the row header.

Note Only enabled regulators can be calibrated.

5. From the **Summary View**, click the **Regulators** tab.
6. From the **Regulators** drop-down list, select the desired regulator.
7. Click to select the **Enable** check box.

8. Click the **Calibrate** button. The **Calibrate Valve** dialog box displays.

Calibrate Valve - Regulator 1

Calibration Mode

Auto Calibrate

Minimum End

Fix Minimum End

Maximum End

Fix Maximum End

Calibrate

Save

Verification

Position

Current

Manual

SetPoint

Send

OFF

Dynamic Signals

Name	Variable Name	Value	Description
Reg1_Fdbk	PSVO_Reg1_Fdbk	0.83785933	Regulator 1 Feedback
Reg1_Error	PSVO_Reg1_Error	-0.83785933	Null bias error
CalibEnab1		True	Enable Calibration Reg1
Reg1_Ref	PSVO_Reg1_Ref	0	Reg1 Position Ref
Reg1_NullCor		0	Reg1 Null Bias Correction
ServoOutput1	PSVO_ServoOutput1	4.078619	Servo Output #1 Measured current in PerCent

LVDT Voltages

Name	Pack R	Pack S	Pack T		
MnLVDT1_Vrms	0	0	0.02023405		
MxLVDT1_Vrms	7	7	7.456313		
MnLVDT2_Vrms	0	0	0.02023405		
MxLVDT2_Vrms	7	7	8.829485		

OK Help

9. Click the **Calibration Mode** button to enable all command buttons and to start the calibration command in each I/O module. A Trender window displays dynamic signals.

Note Do not make any changes to the regulator configuration during valve calibration. Each calibration command is monitored by the ToolboxST application to verify performance.

10. To exit calibration mode, click the **Calibration Mode** button again.

Only one command state can be active at any one time.

Auto Calibrate commands occur in the following sequence:

1. Click **Minimum End** to stroke the actuator to the minimum end position.
2. Click **Fix Minimum End** to read the voltage at the minimum end position.
3. Click **Maximum End** to stroke the actuator to the maximum end position.
4. Click **Fix Maximum End** to read the voltage at the maximum end position.
5. Click **Calibrate** to use the calculated values.
6. Click **Save** to save the calculated values.

The calculated values are saved to the application code area of each I/O module, and to the current configuration loaded in the ToolboxST application.

Verification commands, which are not performed in any sequence, are as follows:

- Click **Position** to step and monitor the position.
- Click **Current** to step and monitor the current.
- Click **Manual** to enable manual movement of the actuator (used in conjunction with the **Send** button).
- Click **Send** to send the value in the SetPoint textbox to the I/O module.
- Click **OFF** to exit verification mode.

Note LVDT voltages are the values that represent the minimum and maximum actuator positions stored in the I/O module. These values are not live data. They display after the Save button is selected.

The ToolboxST application monitors the calibration permissive and calibration command. If the permissive is lost, all calibration and verification buttons on the dialog box are disabled. If the calibration command cannot be activated or is lost, all calibration and verification buttons, with the exception of the Calibration Mode button, are disabled.

Specifications

The following table provides information specific to the PSVO I/O pack and WSVO driver.

Item	Specification
Number of inputs	Eight LVDT windings Two pulse rate signals
Number of outputs	Two servo valve currents Two excitation sources for LVDTs Two excitation sources for pulse rate transducers
Power supply voltage	Nominal 28 V dc
LVDT accuracy	1% with 14-bit resolution
LVDT input filter	Low pass filter with 3 down breaks at 50 rad/sec $\pm 15\%$
LVDT common mode rejection	CMR is 1 V, 60 dB at 50/60 Hz
LVDT excitation output	Frequency of 3.2 ± 0.2 kHz Voltage of 7.00 ± 0.14 V rms
Pulse rate accuracy	0.05% of reading with 16-bit resolution at 50 Hz frame rate Noise of acceleration measurement is less than ± 50 Hz/sec for a 10,000 Hz signal being read at 10 ms
Pulse rate input	Minimum signal for proper measurement at 2 Hz is 33 mVpk, and at 12 kHz is 827 mVpk
Magnetic PR pickup signal	Generates 150 V p-p into 60 k Ω
Active PR Pickup Signal	Generates 5 to 27 V p-p into 60 k Ω
Servo valve output accuracy	2% with 12-bit resolution Dither amplitude and frequency adjustable
Fault detection	Servo current out of limits or not responding Regulator feedback signal out of limits Servo suicided Calibration voltage range fault The LVDT excitation is out of range The input signal varies from the voted value by more than the TMR differential limit Failed ID chip
Physical	
Size	8.26 cm high x 4.19 cm wide x 12.1 cm deep (3.25 in x 1.65 in x 4.78 in)
Technology	Surface-mount
Temperature	Operating: -30 to 65°C (-22 to 149 °F)

Diagnostics

The I/O pack performs the following self-diagnostic tests:

- A power-up self-test that includes checks of RAM, flash memory, Ethernet ports, and most of the processor board hardware
- Continuous monitoring of the internal power supplies for correct operation
- A check of the electronic ID information from the terminal board, acquisition board, and processor board to confirm that the hardware set matches, followed by a check that the application code loaded from flash memory is correct for the hardware set
- Each analog input has hardware limit checking based on preset (non-configurable) high and low levels near the end of the operating range. If this limit is exceeded a logic signal is set and the input is no longer scanned. The logic signal, L3DIAG_XXXX, refers to the entire board.
- Each input has system limit checking based on configurable high and low levels. These limits can be used to generate alarms, to enable/disable, and as latching/non-latching. RSTSYS resets the out of limits.
- The analog input hardware includes precision reference voltages in each scan. Measured values are compared against expected values and are used to confirm health of the analog to digital converter circuits.
- Analog output current is sensed on the terminal board using a small burden resistor. The I/O pack conditions this signal and compares it to the commanded current to confirm health of the digital to analog converter circuits.
- The analog output suicide relay is continuously monitored for agreement between commanded state and feedback indication.

Details of the individual diagnostics are available from the ToolboxST application. The diagnostic signals can be individually latched, and then reset with the RSTDIAg signal if they go healthy.

Configuration

Note The following information is extracted from the ToolboxST application and represents a sample of the configuration information for this board. Refer to the actual configuration file within the ToolboxST application for specific information.

SystemLimits	Allows the user to temporarily disable all system limit checks for testing purposes. Setting this parameter to Disable will cause a diagnostic alarm to occur.	Enable (default), Disable
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Servo Tab

Parameter	Servo Tab Description	Choices
ServoOutput# where # = 1 or 2	Servo Output X measured current in percent.	Point Edit (Input Real)
RegNumber	Maps a specific regulator to a given servo output.	Unused, Reg1, Reg2 (default is Unused)
Servo_MA_Out	Nominal servo current rating in milliamperes.	10 mA, 20 mA, 40 mA, 80 mA, 120 mA (default is 10 mA)
EnablCurSuic	Enable Current Suicide Function	Enable, Disable (default is Disable)
EnablFbkSuic	Enable Position Feedback Suicide Function	Enable, Disable (default is Disable)
EnblAutoGain	Enable Auto Gain function. Approved for 4_LV_LM, 3_LVLMX and 4_LVLMX regulator configurations.	Enable, Disable (default is Disable)
Coil_RS_Only	Configuration parameter is enabled when the PSVO is driving a 2-coil servo. For 2-coil servo, no load is connected to the SxTH/L where x = 1 or 2 terminal screws.	Enable, Disable (default is Disable)
AV_Selector	Configuration selector to map one of the specified variables to the PSVO variable, ServoxMonitorNV where x = 1 or 2.	Coil_OHMs, Compliance_Voltage LM_Auto_Gain MA_CMD_PCT (default is Compliance_Voltage)
Curr_Suicide	Current command is compared to the actual feedback current. If the error exceeds the configuration limit, Curr_Suicide (%), then the Servo output will suicide.	0 to 100 (default is 5)
Fdbk_Suicide	The position feedback, Regx_Fdbk (%) is compared against the value, 100% + Fdbk_Suicide (%). If Regx_Fdbk (%) where x = 1 or 2 exceeds that value, the regulator assumes the feedback has gone open loop and the servo must be suicided if this condition and the EnablFbkSuic = Enable.	0 to 10 (default is 5)
OpenCoilSuic	If configuration parameter, <i>OpenCoilSuic</i> = <i>Enable</i> , then the servo coil open detection function will suicide the servo if the function detects an open ckt. Note Set OpenCoildiag = Enable to receive a diagnostic message as to why the servo suicide occurred.	Enable, Disable (default is Disable)

Parameter	Servo Tab Description	Choices
OpenCoildiag	If enabled, a specific diagnostic message is generated for why the servo suicide occurred; for example, Servo x Suicide due to Open servo coil.	Enable, Disable (default is Disable)
ShrtCoilSuic	If configuration parameter, <i>ShrtCoilSuic</i> = <i>Enable</i>, then the servo coil short ckt. detection function will suicide the servo if the function detects a short ckt. Set <i>ShrtCoildiag</i> = <i>Enable</i> to receive a diagnostic message as to why the servo suicide occurred.  Use of dither with shorted coil detection enabled is not recommended. Attention	Enable, Disable (default is Disable)
ShrtCoildiag	If enabled, a specific diagnostic message is generated for why the servo suicide occurred; for example, Servo x Suicide due to Short circuit of servo coil.  Use of dither with shorted coil detection enabled is not recommended. Attention	Enable, Disable (default is Disable)
TBmAmpPos	TSVC terminal board mA jumper position selection. This should match the jumper selection on the TSVC to allow the open / short circuit servo coil detection to work correctly.	10 mA, 20 mA, 40 mA, 80 mA, 120 mA_A, 120 mA_B (default is 10 mA)
RopenTimeLim	Time in seconds required for the open circuit condition of the servo coil to be in effect before a diagnostic and / or suicide of the servo (if enabled) occurs.	0 to 100 (default is 1)
RShrtTimeLim	Time in seconds required for the short circuit condition of the servo coil to be in effect before a diagnostic and / or suicide of the servo (if enabled) occurs.	0 to 100 (default is 1)
RcoilOpen	This defines the initial value for the open circuit resistance in ohms. After the LVDT calibration, the value for $R_{coilOpen} = 2 * (\text{Servo Compliance Voltage} / \text{Servo Current})$ measured during the calibration mode. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 10000000000 (default is 1000000 simplex or 1000000,1000000,1000000 TMR)
RcoilShort	This defines the initial value for the short circuit resistance in ohms. After the LVDT calibration, the value for $R_{coilShort} = 0.5 * (\text{Servo Compliance Voltage} / \text{Servo Current})$ measured during the calibration mode. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 10000000000 (default is 0 simplex or 0,0,0 TMR)
TMR_DiffLimt	Diagnostic limit, TMR Input Vote difference in %	0 to 110 (default is 25)

Pulse Rates Tab

Parameter	Pulse Rates Tab Description	Choices
FlowRate_x where x = 1 or 2	Bipolar input = PR_xH – PR_xL, Unipolar = TTL_x - PR_xL	Point Edit (Input Real)
PRTYPE	Define the pulse rate feedback type or basic speed range. See section Speed Pickups for description of types.	Flow, Speed, Speed_High, Speed_HSNG, Speed_LM, Unused
PRScale	Scaling: pulses per revolution (outputs RPM)	0 to 1000
TeethPerRev (Speed_HSNG only)	Number of teeth on speed wheel (per revolution)	1 to 512
Speed_x_ms (Speed_HSNG only)	Calculation rate of speed in milliseconds. Speed is calculated at this rate and averaged over the previous time interval specified by this period.  Using a value other than an integer multiple of the application frame period can have adverse impact on use of this control. <i>Attention</i>	5 to 1000
Accel_x_ms (Speed_HSNG only)	This is the averaging period for acceleration calculation in milliseconds. The acceleration is calculated every Accel_X_ms. It is based on the difference between two speed samples divided by the sample period. Each acceleration calculation is the average of acceleration over the period specified by this parameter. For example, if Accel_x_ms is 40 then acceleration will be the average acceleration over the previous 80 ms.  Using a value other than an integer multiple of the application frame period can have adverse impact on use of this control. <i>Attention</i>	10 to 1000
Lock_Limit (Speed_HSNG only)	HSNG speed type locking limit for teeth mapping (percent). Refer to section <i>Speed Pickups</i> for description of Lock_Limit function.	1 to 100
SysLim1Enabl	If enabled, System Limit 1 is active.	Enable, Disable (default is Disable)
SysLim1Latch	If enabled, the System Limit 1 function will latch its state if the FlowRate exceeds the limit function defined by SysLim1Type and SysLimit1.	Latch, NotLatch (default is Latch)
SysLim1Type	Defines the compare function used in the Limit1 expression.	≤ or ≥ (default is ≥)
SysLimit1	Defines Limit1 value to be used for the input, FlowRate.	0 to 20,000 (default is 0)
SysLim2Enabl	If enabled, System Limit 2 is active.	Enable, Disable (default is Disable)

Parameter	Pulse Rates Tab Description	Choices
SysLim2Latch	If enabled, the System Limit 2 function will latch its state if the FlowRate exceeds the limit function defined by SysLim2Type and SysLimit2.	Latch, NotLatch (default is Latch)
SysLim2Type	Defines the compare function used in Limit 2's expression.	$\leq$ or $\geq$ (default is $\geq$)
SysLimit2	Defines Limit2 value to be used for the input, FlowRate.	0 to 20,000 (default is 0)
TMR_DiffLimt	Diagnostic limit, TMR Input Vote difference in %	0 to 20,000 (default is 5)

Regulators Tab

Parameter	Regulators Tab Description	Choices
Common	The following parameters are common for all regulator	
Reg_Type	Regulator Algorithm Type The Enable block must be checked to select a value for the configuration parameter, Reg_Type.	Unused, no_fbk, 1_LVposition, 1_PulseRate, 2_LVpilotCyl, 2_LVposMAX, 2_LVposMIN, 2_PlsRateMAX, 3_LV_LMX, 3_LVposMID, 4_LV_LM, 4_LV_LMX, 4_LVp/cylMAX
Dither_Freq	Dither rate in hertz.  Use of dither with shorted coil detection enabled is not recommended. <i>Attention</i>	12_5 Hz, 25 Hz, 33_33 Hz, 50 Hz, 100 Hz, Unused (default is Unused)
DitherAmpl	Dither in % current Dither magnitudes greater than 2 percent could interfere with the proper operation of the coil ohm calculation. If dither magnitude is a priority, disable the coil ohm calculation.	0 to 10 (default is 2)
LVDT_Margin	Defines the over range in % for the LVDT input. A diagnostic is generated if this value is exceeded.	1 to 100 (default is 2)
LVDT1input	This is the LVDT input selection. With 2_LVpilotCyl selected, LVDT1 is main and LVDT2 is pilot. With 4_LVp/cylMAX selected, LVDT1 is main, LVDT2 is main, LVDT3 is pilot, and LVDT4 is pilot.	LVDT1, LVDT2, LVDT3, LVDT4, LVDT5, LVDT6, LVDT7, LVDT8, Unused (default is Unused)
RegGain	Position loop Gain in % current / Eng Units or usually % current / % position.	-200 to 200 (default is 1)
RegNullBias	Regulator Null Bias provides a fixed current command in percent to cancel or null the spring force of the valve which will close the valve if the servo suicides or shuts down.	-100 to 100 (default is 0)
TMR_DiffLimt	Diagnostic limit, TMR Input Vote difference in %	-15 to 150 (default is 5)
RegType	Pulse Rate Regulator used with a single LVDT Input.	= 1 LV position

Parameter	Regulators Tab Description	Choices
MaxPOSvalue	Position in Eng. units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)
MnLVDT1_Vrms	This is the value of LVDT1 V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDT1 V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)
MxLVDT1_Vrms	This is the value of LVDT1 V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDT1 V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 5 simplex or 5,5,5 TMR)
RegType	Pulse Rate Regulator used with a single fuel flow divider feedback.	= 1_PulseRate
PRateInput1	Pulse Rate input selection	PR1, PR2, Unused (default is Unused)
RegType	Pilot Cylinder Regulator with two LVDT position feedbacks: LVDT1 (main) and LVDT2 (pilot).	= 2_LVpilotCyl
MaxPOSvalue	Position in Eng. units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)
MnLVDTx_Vrms where x = 1 to 2	This is the value of LVDTx V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR))
MxLVDTx_Vrms where x = 1 to 2	This is the value of LVDTx V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR))
PilotGain	Pilot loop gain in % current / Eng. unit	-200 to 200 (default is 1)
RegType	Position Regulator using the maximum select from 2 LVDT inputs for feedback.	= 2_LVposMAX

Parameter	Regulators Tab Description	Choices
MaxPOSvalue	Position in Eng. units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)
MnLVDTx_Vrms where x = 1 to 2	This is the value of LVDTx V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)
MxLVDTx_Vrms where x = 1 to 2	This is the value of LVDTx V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)
RegType	Position Regulator using the minimum select from 2 LVDT inputs for feedback.	= 2_LVposMIN
MaxPOSvalue	Position in Eng. units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)
MnLVDTx_Vrms where x = 1 to 2	This is the value of LVDTx V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)
MxLVDTx_Vrms where x = 1 to 2	This is the value of LVDTx V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)
RegType	Pulse Rate Regulator using the maximum select from two fuel flow divider feedbacks.	= 2_PlsRateMAX
PRateInput1	Pulse Rate 1 input selection	PR1, PR2, Unused (default is Unused)
PRateInput2	Pulse Rate 2 input selection	PR1, PR2, Unused (default is Unused)
RegType	Position Regulator using the median select from 3 LVDT inputs for feedback. Originally designed for the LMX100 gas turbine.	= 3_LV_LMX

Parameter	Regulators Tab Description	Choices
CurBreak	Current break for nonlinear servo current	-100 to 100 (default is 0)
CurClpNg	Servo Current Clamp (%) Negative	-300 to 300 (default is -100)
CurClpPs	Servo Current Clamp (%) Positive	-300 to 300 (default is 100)
CurSlope1	Slope current gain modifier for low position error values	0 to 10 (default is 1)
CurSlope2	Slope current gain modifier for position error > CurBreak limit	0 to 10 (default is 1)
DefltValue	If all position sensors or LVDTs are bad, the regulator feedback is assigned to this value in percent.	-1 to 110 (default is 100)
LagTau	Position loop Lag Breakpoint (seconds), zero to disable	0 to 10 (default is 0)
LeadTau	Position loop Lead Breakpoint (seconds), zero to disable	0 to 10 (default is 0)
MaxPOSvalue	Position in Eng. units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)
MnLVDTx_Vrms where x = 1 to 3	This is the value of LVDTx V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)
MxLVDTx_Vrms where x = 1 to 3	This is the value of LVDTx V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 5 simplex or 5,5,5 TMR)
SelectMinMax	If 2 of the 3 LVDTs are healthy, this parameter determines whether a minimum select or maximum select is made for the remaining two sensors.	Max, Min (default is Max)
SensorOofRTD	Sensor Out of Range Time Delay (seconds)	0 to 2000 (default is 10)
SenSpreadMx	Sensor Spread Maximum (%)	-2000 to 2000 (default is 1000)
SensoSpreadTD	Sensor Spread Time Delay (seconds)	0 to 2000 (default is 10)
RegType	Position Regulator using the median select from 3 LVDT inputs for feedback. Originally designed for heavy-duty gas turbines.	= 3_LVposMID

Parameter	Regulators Tab Description	Choices
MaxPOSvalue	Position in Eng. units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)
MnLVDTx_Vrms where x = 1 to 3	This is the value of LVDTx V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)
MxLVDTx_Vrms where x = 1 to 3	This is the value of LVDTx V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 5 simplex or 5,5,5 TMR)
RegType	Position Regulator selecting one of two ratio-metric LVDT pairs for the position feedback. Originally designed for the LM1600, LM2500, and LM6000 gas turbines.	= 4_LV_LM
CurBreak	Current break for nonlinear servo current	-100 to 100 (default is 0)
CurClpNg	Servo Current Clamp (%) Negative	-300 to 300 (default is -100)
CurClpPs	Servo Current Clamp (%) Positive	-300 to 300 (default is 100)
CurSlope1	Slope current gain modifier for low position error values	0 to 10 (default is 1)
CurSlope2	Slope current gain modifier for position error > CurBreak limit	0 to 10 (default is 1)
DefltValue	If all position sensors or LVDTs are bad, the regulator feedback is assigned to this value in percent.	-1 to 110 (default is 100)
LagTau	Position loop Lag Breakpoint (seconds), zero to disable	0 to 10 (default is 0)
LeadTau	Position loop Lead Breakpoint (seconds), zero to disable	0 to 10 (default is 0)
LVDTVsumMarg	Allowable rang exceed error (%) for ratio-metric sum	1 to 100 (default is 2)
MaxPOSvalue	Position in Eng. Units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)

Parameter	Regulators Tab Description	Choices
MnLVDTx_Vrms where x = 1 to 4	This is the value of LVDTx V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)
MxLVDTx_Vrms where x = 1 to 4	This is the value of LVDTx V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 5 simplex or 5,5,5 TMR)
PosDefltEnab	Position Default Enable / Disable	Enable, Disable (default is Enable)
PosDiffcmp1	Position Difference Limit1 (%)	-1 to 110 (default is 2)
PosDiffcmp2	Position Difference Limit2 (%)	-1 to 110 (default is 3)
PosDiffTime1	Position Difference Limit1 Timeout (seconds)	0 to 10 (default is 0.5)
PosDiffTime2	Position Difference Limit2 Timeout (seconds)	0 to 10 (default is 0.5)
PosSelect	Position Selection Mode	Avg, Max, Min (default is Avg)
RegType	Position Regulator selecting from 2 LVDT ratio-metric pairs for feedback.	= 4_LV_LMX
CurBreak	Current break for nonlinear servo current	-100 to 100 (default is 2)
CurClpNg	Servo Current Clamp (%) Negative	-300 to 300 (default is -100)
CurClpPs	Servo Current Clamp (%) Positive	-300 to 300 (default is 100)
CurSlope1	Slope current gain modifier for low position error values	0 to 10 (default is 1)
CurSlope2	Slope current gain modifier for position error > CurBreak limit	0 to 10 (default is 1)
DefltValue	If all position sensors or LVDTs are bad, the regulator feedback is assigned to this value in percent.	-1 to 110 (default is 100)
LagTau	Position loop Lag Breakpoint (seconds), zero to disable	0 to 10 (default is 0)
LeadTau	Position loop Lead Breakpoint (seconds), zero to disable	0 to 10 (default is 0)
MaxPOSvalue	Position in Eng. units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)

Parameter	Regulators Tab Description	Choices
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)
MnLVDTx_Vrms where x = 1 to 4	This is the value of LVDTx V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)
MxLVDTx_Vrms where x = 1 to 4	This is the value of LVDTx V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 5 simplex or 5,5,5 TMR)
SelectMinMax	If 2 of the 3 LVDTs are healthy, this parameter determines whether a minimum select or maximum select is made for the remaining two sensors.	Max, Min (default is Max)
SensorOofRTD	Sensor Out of Range Time Delay (seconds)	0 to 2000 (default is 10)
SenSpreadMx	Sensor Spread Maximum (%)	-2000 to 2000 (default is 1000)
SensoSpreadTD	Sensor Spread Time Delay (seconds)	0 to 2000 (default is 10)
SenSumChkTD	Volts RMS Sum Check Out of Range Time Delay (seconds)	0 to 2000 (default is 10)
RegType	Pilot Cylinder Regulator with four LVDT position feedbacks: LVDT1 (main), LVDT2 (main), LVDT3 (pilot), and LVDT4 (pilot).	= 4_LVp/cylMAX
MaxPOSvalue	Position in Eng. units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)
MnLVDTx_Vrms where x = 1 to 4	This is the value of LVDTx V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)

Parameter	Regulators Tab Description	Choices
MxLVDTx_Vrms where x = 1 to 4	This is the value of LVDTx V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 5 simplex or 5,5,5 TMR)
PilotGain	Pilot loop gain in % current / Eng. unit	-200 to 200 (default is 1)

Monitors Tab

Parameter	Monitors Tab Description	Value Range/Default
MonType	Monx will equal sensor position expressed in percent assigned in the 4_LVLM, 3_LVLMX, or 4_LVLMX regulator where x = 1 to 8	= 1_LMposition
LMPOSin	4_LVLM, 3_LVLMX, or 4_LVLMX position input selection	Reg1SenAPos, Reg1SenBPos, Reg1SenCPos, Reg1SenDPos, Reg2SenAPos, Reg2SenBPos, Reg2SenCPos, Reg2SenDPos, Unused (default is Unused)
TMR_DiffLimt	Diagnostic limit, TMR Input Vote difference in %	-15 to 150 (default is 5)
MonType	Monx will equal sensor position expressed in V rms assigned in the 4_LVLM, 3_LVLMX, or 4_LVLMX regulator where x = 1 to 8	= 1_LMVRMS
LVRMSin	4_LVLM, 3_LVLMX, or 4_LVLMX V rms input selection	Reg1SenAVrms, Reg1SenBVrms, Reg1SenCVrms, Reg1SenDVrms, Reg2SenAVrms, Reg2SenBVrms, Reg2SenCVrms, Reg2SenDVrms, Unused (default is Unused)
MonType	Monx will equal the scaled value from the LVDT assigned through LVDT1 input where x = 1 to 8	= 1_LVposition
LVDT_Margin	Defines the over range in % for the LVDT input. A diagnostic is generated if this value is exceeded.	1 to 100 (default is 2)
LVDT1input	LVDT1 input selection	LVDT1, LVDT2, LVDT3, LVDT4, LVDT5, LVDT6, LVDT7, LVDT8, Unused (default is Unused)

Parameter	Monitors Tab Description	Value Range/Default
MaxPOSvalue	Position in Eng. units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)
MnLVDT1_Vrms	This is the value of LVDT1 V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function, and must be manually entered. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)
MxLVDT1_Vrms	This is the value of LVDT1 V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function, and must be manually entered. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 5 simplex or 5,5,5 TMR)
MonType	Monx will equal the maximum selected scaled value from two LVDTs assigned through LVDTyinput where x = 1 to 8 and y = 1 to 2.	= 2_LVposMAX
LVDT_Margin	Defines the over range in % for the LVDT input. A diagnostic is generated if this value is exceeded.	1 to 100 (default is 2)
LVDTxinput where x = 1 to 2	LVDTx input selection	LVDT1, LVDT2, LVDT3, LVDT4, LVDT5, LVDT6, LVDT7, LVDT8, Unused (default is Unused)
MaxPOSvalue	Position in Eng. units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)
MnLVDTx_Vrms where x = 1 to 2	This is the value of LVDTx V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function, and must be manually entered. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)

Parameter	Monitors Tab Description	Value Range/Default
MxLVDTx_Vrms where x = 1 to 2	This is the value of LVDTx V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function, and must be manually entered. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 5 simplex or 5,5,5 TMR)
TMR_DiffLimt	Diagnostic limit, TMR Input Vote difference in %	-15 to 150 (default is 5)
MonType	Monx will equal the minimum selected scaled value from two LVDTs assigned through LVDTyinput where x = 1 to 8 and y = 1 to 2.	= 2_LVposMIN
LVDT_Margin	Defines the over range in % for the LVDT input. A diagnostic is generated if this value is exceeded.	1 to 100 (default is 2)
LVDTxinput where x = 1 to 2	LVDTx input selection	LVDT1, LVDT2, LVDT3, LVDT4, LVDT5, LVDT6, LVDT7, LVDT8, Unused (default is Unused)
MaxPOSvalue	Position in Eng. units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)
MnLVDTx_Vrms where x = 1 to 2	LVDTx V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function, and must be manually entered. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)
MxLVDTx_Vrms where x = 1 to 2	LVDTx V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function, and must be manually entered. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 5 simplex or 5,5,5 TMR)
TMR_DiffLimt	Diagnostic limit, TMR Input Vote difference in %	-15 to 150 (default is 5)
MonType	Monx will equal the median selected scaled value from three LVDTs assigned through LVDTyinput where x = 1 to 8 and y = 1 to 3.	= 3_LVposMID
LVDT_Margin	Defines the over range in % for the LVDT input. A diagnostic is generated if this value is exceeded.	1 to 100 (default is 2)

Parameter	Monitors Tab Description	Value Range/Default
LVDTxinput where x = 1 to 3	LVDTx input selection	LVDT1, LVDT2, LVDT3, LVDT4, LVDT5, LVDT6, LVDT7, LVDT8, Unused (default is Unused)
MaxPOSvalue	Position in Eng. units (usually %) at the maximum end stop of the valve.	-15 to 150 (default is 100)
MinPOSvalue	Position in Eng. Units (usually %) at the minimum end stop of the valve.	-15 to 150 (default is 0)
MnLVDTx_Vrms where x = 1 to 3	This is the value of LVDTx V rms at the minimum end stop of the valve. These values are normally set by the Auto-Calibrate function, and must be manually entered. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 1 simplex or 1,1,1 TMR)
MxLVDTx_Vrms where x = 1 to 3	This is the value of LVDTx V rms at the maximum end stop of the valve. These values are normally set by the Auto-Calibrate function, and must be manually entered. For TMR, the first value is LVDTx V rms from PSVO-R's perspective, the second from PSVO-S and the last from PSVO-T's perspective. Note There is one value for simplex I/O packs and three values for R, S, and T on TMR systems.	0 to 7.1 (default is 5 simplex or 5,5,5 TMR)
TMR_DiffLimt	Diagnostic limit, TMR Input Vote difference in %	-10 to 150 (default is 5)

Variables Tab

Name	Variables Tab Description	Description Type
L3DIAG_PSVO_p	PSVO I/O Diagnostic indication, where p = R, S, or T	Input non-voted Boolean-3 bits
LINK_OK_PSVO_p	PSVO I/O Link OK indication, where p = R, S, or T	Input non-voted Boolean-3 bits
ATTN_PSVO_p	PSVO I/O Attention indication, where p = R, S, or T	Input non-voted Boolean-3 bits
PS18V_PSVO_p	PSVO I/O 18 V Power Supply indication, where p = R, S, or T	Input non-voted Boolean-3 bits
PS28V_PSVO_p	PSVO I/O 28 V Power Supply indication, where p = R, S, or T	Input non-voted Boolean-3 bits
IOPack_Tmpr_p	PSVO I/O Pack Temperature (deg °F), where p = R, S, or T	Analog Input non-voted -3 real
Rx_SuicideNV_p	ServoOutputx Suicide relay status, where x = 1 or 2, where p = R, S, or T	Input non-voted Boolean-6 bits
Regx_CalibratedNV_p	Regulator has been calibrated status where x = 1 or 2 and p = R, S, or T	Input non-voted Boolean-6 bits
RegxFbkFail	Regulator x feedback fault status, where x = 1 or 2	Input non-voted Boolean-6 bits
RegxSenorSpreadAlm	Regulator x Sensor Spread Alarm status, where x = 1 or 2	Input voted Boolean-2 bits
Regx_Suicide	ServoOutput x Suicide relay status, where x = 1 or 2	Input voted Boolean-2 bits
HSNGx_STAT	Pulse rate x high speed next generation stability status (TRUE for tooth – tooth distance inside Lock_Limit for tooth geometry compensation)	Input voted Boolean
Regx_PosAFit	Regulator x, LM machine only, Position A failure, where x = 1 or 2	Input voted Boolean
Regx_PosBFit	Regulator x, LM machine only, Position B failure, where x = 1 or 2	Input voted Boolean
Regx_PosDif1	Regulator x, LM machine only, Position Difference 1 failure, where x = 1 or 2	Input voted Boolean
Regx_PosDif2	Regulator x, LM machine only, Position Difference 2 failure, where x = 1 or 2	Input voted Boolean
RegxSenAFIt	Regulator x Sensor A fault, where x = 1 or 2	Input voted Boolean
RegxSenBFIt	Regulator x Sensor B fault, where x = 1 or 2	Input voted Boolean
RegxSenCFIt	Regulator x Sensor C fault, where x = 1 or 2	Input voted Boolean
RegxSenDFIt	Regulator x Sensor D fault, where x = 1 or 2	Input voted Boolean
RegCalMode	Regulator under Calibration	Input voted Boolean
RegxSenA2LVSumFit	Regulator 1 Sensor A 2LV Summation Fault, where x = 1 or 2	Input voted Boolean
RegxSenB2LVSumFit	Regulator 1 Sensor B 2LV Summation Fault, where x = 1 or 2	Input voted Boolean
Regx_Fdbk	Regulator 1 position feedback, where x = 1 or 2	Analog Input voted REAL
MiscFdbk1a	Regulator 1 Position A when 2_LVpilotCyl, 4_LV_LM, 4_LV_LMX, and 4LVp/cylIMAX regs	Analog Input voted REAL
MiscFdbk1b	Regulator 1 Position B when 2_LVpilotCyl, 4_LV_LM, 4_LV_LMX, and 4LVp/cylIMAX regs	Analog Input voted REAL
MiscFdbk2a	Regulator 2 Position A when 4_LV_LM, 4_LV_LMX, and 4LVp/cylIMAX regs	Analog Input voted REAL

Name	Variables Tab Description	Description Type
MiscFdbk2b	Regulator 2 Position B when 4_LV_LM, 4_LV_LMX, and 4LVp/cylMAX regs	Analog Input voted REAL
Regx_Error	Position error for the Regulator 1 position loops and pulse rate error for the Pulse Rate reg, where x = 1 or 2	Analog Input voted REAL
Accel1	Acceleration value of the board point FlowRate1	Analog Input voted REAL
Accel2	Acceleration value of the board point FlowRate2	Analog Input voted REAL
Monx where x = 1 to 8	Value assigned to Monx based on configuration parameters found in the Monitor Tab.	Analog Input voted REAL
Excit_Monx	Excitation Monitor x (V rms) where x = 1 or 2	Analog Input voted REAL
RegxFdbkSelState	3LVLMX or 4LVLMX Regulator 2 Sensor Tri-select State, where x = 1 or 2	Input DINT
ServoOutxNV	Servo Output x measured current (%) where x = 1 or 2	Analog Input non-voted Real
ServoxMonitorNV	Servo x AvSelection Monitor where x = 1 or 2	Analog Input non-voted Real
CalibEnab1	Enable Calibration Regulator 1	Output Boolean
CalibEnab2	Enable Calibration Regulator 2	Output Boolean
SuicidForcex	Force Suicide on Servo x where x = 1 or 2	Output Boolean
PosDiffEnabx	Position Difference Enable for Regulator 1 when configured as 4_LV_LM where x = 1 or 2	Output Boolean
Reg1SenxFReq	Force a Sensor A fault on Regulator 1 configured as 4LVLMX or 3LVLMX where x = A, B, C, and D	Output Boolean
Reg2SenxFReq	Force a Sensor A fault on Regulator 2 configured as 4LVLMX or 3LVLMX where x = A, B, C, and D	Output Boolean
XSuicServo1	X I/O pack Force Suicide for Servo 1 where X = R, S, and T Output Boolean for LV_LMX_only	Output Boolean
XSuicServo2	X I/O pack Force Suicide for Servo 2 where X = R, S, and T Output Boolean for LV_LMX_only	Output Boolean
Regx_Ref	Regulator x Position reference (%) where x = 1 or 2	Output Boolean
Regx_NullCor	Regulator x Null Bias Correction (%) where x = 1 or 2	Output Boolean