



# S2A

## LVDT Signal Conditioner



**For use in:**  
Steam Valve Position Feedback  
Governor and Throttle Valves  
Interceptor and Stop Valves  
Boiler Feedwater Pumps  
Turbine Control Systems

### Advanced Smart Power Gen AC-LVDT Signal Conditioner

Alliance Sensors Group's model S2A DIN-rail-mounting LVDT signal conditioner is designed specifically for the power generation industry. It offers comprehensive diagnostics for sensor and wiring failure, real-time recalibration of the Full Scale and Zero outputs, enhanced ground loop noise rejection, and backward compatibility to legacy S1A signal conditioners. Utilizing front panel push buttons for easy calibration, the S2A is engineered to work with the widest range of LVDT, RVDT, and inductive half-bridge LVRT sensors by providing four excitation frequencies that will operate most AC-LVDTs over a 50 to 5,000 mVrms range of sensor output. S2A modules offer a choice of 8 analog outputs and half-duplex RS-485 digital communications to facilitate remote setup and for saving a module's setup parameters to hot swap them with another module.

Additional information can be found at: [www.alliancesensors.com](http://www.alliancesensors.com).

#### Functional Features:

- Cybersecurity lock to prevent tampering
- Smart calibration by front panel push buttons
- Color-coded screw terminal plugs
- Auto-mastering
- Hot swapability
- Differential input for superior noise immunity
- Real-time recalibration

#### Diagnostic Features:

- Shorted, disconnected, or open primary
- Shorted, grounded, disconnected, or open secondaries
- Output voltage shorts or current loop opens
- Errors during installation and setup

#### Specifications:

<b>Operating Power:</b>	+15 to +30 V DC (+24 V nominal), 80 mA max. at 24 V DC; +15 V DC and -15 V DC needed for $\pm 10$ V DC bipolar output
<b>Analog DC Outputs:</b>	0 - 5 V, 1 - 5 V, 0.5 - 4.5 V, 0.5 - 9.5 V, 0 -10 V, -10 to +10 V, 0 - 20 mA sourcing (3-wire), 4 - 20 mA sourcing (3-wire) 850
<b>Loop Resistance:</b>	Ohms maximum with 24 V DC supply
<b>-3 dB Response:</b>	10% (min.) of excitation frequency (normal setting); 10 Hz (default) user adjustable (low noise setting)
<b>Noise and Ripple:</b>	$\leq 1$ mVrms (voltage output); $\leq 2$ $\mu$ Arms (current loop output)

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## Specifications (Cont):

Output Non-Linearity:	$\leq \pm 0.025\%$ of Full Span Output (FSO)
Operating Temperature:	0 to 75 C
Temperature coefficient:	$\pm 0.002\%$ of FSO/ $^{\circ}\text{C}$ (combined zero and span shift)
Excitation Frequencies:	1 kHz, 3 kHz, 5 kHz, 10 kHz (nominal)
LVDT Output Range:	50 to 5000 mVrms at LVDT's full scale position
Excitation Voltage:	3.0 Vrms (nominal) push-pull drive (factory default) 4.5 Vrms (nominal) push-pull drive (via jumper change) 1.5 Vrms (nominal) single ended drive (for low impedance primary)
Auto-Master Syncing:	Master output controls up to fifteen slave units
Fault Detection:	Open LVDT windings, shorted or grounded LVDT connections, cable disconnected, voltage output shorted or current loop open
Failure Indications:	Front panel LED's; output out of range; NO/NC open-collector switch
Null Detection:	Front panel LEDs; $\pm 3$ V DC null output signal
Zero Set:	Front panel push button or RS-485 command
Full Scale Set:	Front panel push button or RS-485 command
Digital Interface:	RS-485 2-wire multi-drop network, 16 addresses
Cybersecurity Lock:	User enabled

<b>J1</b> 1 2 3 4	<b>J1-1 Black</b>	LVDT Primary High <i>or</i> Half-bridge High End
	<b>J1-2 Black</b>	LVDT Primary Low <i>or</i> Half-bridge Low End
	<b>J1-3 Black</b>	LVDT Secondary Low ( <i>Ground if J201 is ON for S1A mode</i> )
	<b>J1-4 Black</b>	LVDT Secondary High <i>or</i> Half-bridge Mid-tap
<b>J2</b> 1 2 3 4	<b>J2-1 Blue</b>	LVDT Secondaries Junction Point ( <i>Shield Ground if J9 is ON</i> )
	<b>J2-2 Blue</b>	Failure Warning Output ( <i>Open Collector Switch, 50 mA max.</i> )
	<b>J2-3 Blue</b>	-15 V DC input for $\pm 10$ V DC output ( <i>Shield Ground if J8 is ON</i> )
	<b>J2-4 Blue</b>	Sync Input / Output ( <i>Master / Slave Bus</i> )
<b>J3</b> 1 2 3 4	<b>J3-1 Green</b>	RS-485 Data Line ( <i>D +</i> )
	<b>J3-2 Green</b>	RS-485 Data Line ( <i>D -</i> )
	<b>J3-3 Green</b>	Analog Output Ground ( <b>Common Ground</b> )
	<b>J3-4 Green</b>	Analog Output (+) ( <i>Voltage or Current, as selected with DS1</i> )
<b>J4</b> 1 2 3 4	<b>J4-1 Red</b>	Null Indicator Differential DC Output ( <i>floating</i> )
	<b>J4-2 Red</b>	Null Indicator Differential DC Output ( <i>floating</i> )
	<b>J4-3 Red</b>	Power Ground ( <b>Common Ground</b> )
	<b>J4-4 Red</b>	Power Input (+) ( <i>15 to 30 V DC</i> )

S2A LVDT Signal Conditioner Module I/O Connections

