April 2009

Description

Part of the Moore Industries **FS FUNCTIONAL SAFETY SERIES**, the TÜV SIL 2 certified STA Safety Trip Alarm performs as a logic solver and acts on potentially hazardous process conditions; warns of unwanted process conditions; provides emergency shutdown; or provides on/off control in Safety Instrumented Systems (SIS) and traditional alarm trip applications.
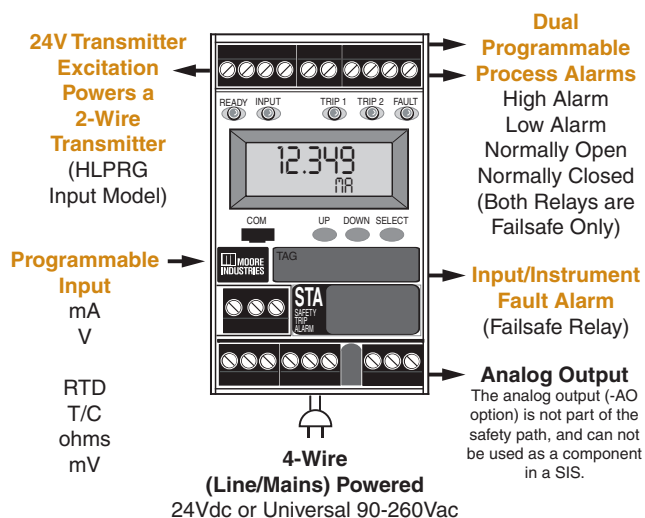
The 4-wire (line/mains-powered) STA models accept a signal input from transmitters, temperature sensors and a wide array of other monitoring and control instruments (see Figure 1) including:

- **Current and Voltage Signals**
- **Temperature (RTD and T/C) Sensor Inputs**
- **Resistance and Potentiometer Devices**
- **Direct Millivolt Sources**

Dual Process Alarms, One Fault Alarm
Two configurable process alarms trip when a monitored process variable falls outside of user-set high and/or low limits. Alarm #3 is permanently set as a latching input/instrument fault alarm (see Page 2).

The STA features a metal, RFI/EMI resistant housing with display that snaps onto standard DIN-style rails.

Features

- **TÜV certified to IEC 61508: Parts 1, 2 and 3.** TÜV Rheinland has approved the STA for single use in Safety Instrumented Systems up to SIL 2 and that the firmware is suitable for a SIL 3 system. This allows the STA to be used in a redundant architecture (1oo2, 2oo3, etc.) up to SIL 3.

- **Comprehensive FMEDA certified safety data.** Upon request, TÜV-certified FMEDA (Failure Modes, Effects and Diagnostics Analysis) data is provided to be used by a competent functional safety practitioner to determine the STA's applicability as a logic solver in specific safety-related applications.

- **20-bit input resolution with long-term stability.** Delivers industry-best digital accuracy with up to 5 years between scheduled calibrations.

- **Site-programmable with password protection.** Front panel pushbuttons with menu-guided configuration deliver confident and secure set up.

- **Large 5-digit process and status readout.** Display shows menu prompts during configuration and, when in operation, shows the process variable, the output or toggles between the two in selectable engineering units.

- **Isolated and RFI/EMI protection.** Delivers superior protection against the effects of ground loops and plant noise.

- **Combined alarm trip and transmitter.** The analog output (-AO) option, while not part of the safety path, reduces costs and installation time when both alarm and transmitter functions are needed at the same location.

Figure 1. *Dual process alarms with input/instrument fault alarm.*

24V Transmitter Excitation Powers a 2-Wire Transmitter (HLPRG Input Model)

Programmable Input
mA
V

RTD
T/C
ohms
mV

4-Wire (Line/Mains) Powered
24Vdc or Universal 90-260Vac

Dual Programmable Process Alarms
High Alarm
Low Alarm
Normally Open
Normally Closed
(Both Relays are Failsafe Only)

Input/Instrument Fault Alarm
(Failsafe Relay)

Analog Output
The analog output (-AO option) is not part of the safety path, and can not be used as a component in a SIS.

Certifications

TÜV Rheinland Industrie Service GmbH
IEC 61508 2002; Parts 1, 2 and 3
Functional safety of electrical/electronic/programmable electronic safety-related systems

CE Conformant - EMC Directive 2004/108/EC EN61326; Low Voltage Directive - 2006/95/EC EN61010

STA

FS **FUNCTIONAL SAFETY SERIES**

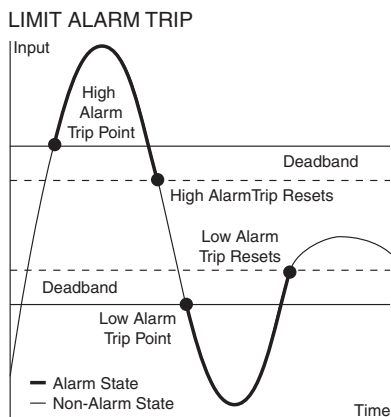## SIL 2 Compliant Programmable Current/Voltage and RTD/Thermocouple Safety Trip Alarms

Dual Safety Trip Process Alarms with One Input/Instrument Fault Alarm

Dual High or Low Limit Process Alarms—The STA monitors a temperature, pressure, level, flow, position or status variable. If the input exceeds a user-selectable high or low limit, independent dual alarm outputs warn of unwanted process conditions (Figure 2), provide emergency shutdown or provide on/off control (Figure 3).

Input/Instrument Fault Alarm—The STA checks its own operation and configuration upon start up, and then continuously monitors its status during operation. It also continuously monitors its input signal.

Alarm #3 is permanently set as a latching fault alarm that will trip if internally-diagnosed faults or external faults, such as loss of sensor or "bad quality input", occur. This alarm will trip without affecting the other relays being used to monitor the process, and can be used to warn of a failure without tripping more critical process alarms or shutting down the process.
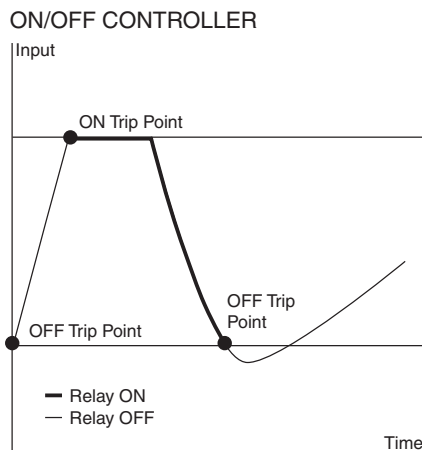
Figure 2. High and/or low limit alarms, with a selectable deadband to reduce false alarms, can be used to warn of unwanted process conditions or to provide emergency shutdown.

LIMIT ALARM TRIP

Input

High Alarm Trip Point

Deadband

High AlarmTrip Resets

Low Alarm Trip Resets

Deadband

Low Alarm Trip Point

– Alarm State
— Non-Alarm State

Time

Total Sensor Diagnostics for RTD Inputs

Our STA Alarm Trip (TPRG input model) performs continuous sensor diagnostics. This industry-first and patented Moore Industries feature saves you time and money by letting you know when a problem occurs, and its type and location. If the RTD input breaks, the fault alarm is tripped. A plain-English error message on the display indicates exactly which RTD wire has broken. Specific error messages eliminate the work of removing the sensor or checking all lead wires to diagnose a problem.

Figure 3. The STA can be used as a simple on/off controller such as those required in level applications (pump/valve control) when filling, emptying or preventing overflow of a container or tank.

ON/OFF CONTROLLER

Input

ON Trip Point

OFF Trip Point

OFF Trip Point

OFF Trip Point

– Relay ON
— Relay OFF

Time

STA Performs as a Single Loop Logic Solver in Safety Instrumented Systems (SIS)*

A Safety Instrumented System (SIS) is defined as an instrumented system used to implement one or more Safety Instrumented Functions (SIF). A SIS is composed of any combination of sensors, logic solvers (such as the STA) and final elements.

**Examples of SIF applications include:**

- Shutdown fuel supply to a furnace
- Open a valve to relieve excess pressure
- Add coolant to arrest exothermic runaway
- Close a feed valve to prevent tank overflow
- Initiate release of a fire suppressant
- Initiate an evacuation alarm

Typical examples of the STA used in Safety Instrumented System architectures include High Integrity, High Availability and 1oo2 Redundant/Voting.

* The user of this data is responsible for determining it's applicability of the subject device used in any particular environment.

Typical examples of the STA in Safety Instrumented Systems (SIS) include:

Figure 4. The STA in a High Integrity Architecture.
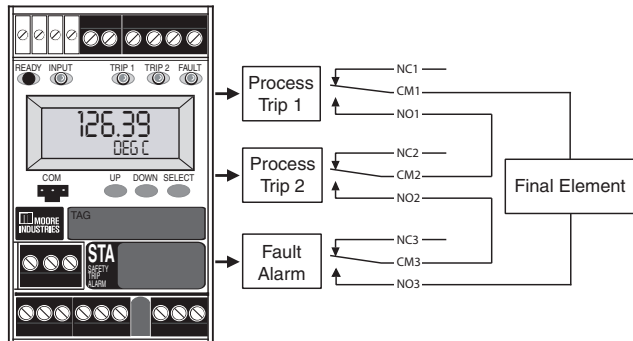
High Integrity Architecture—This configuration offers the highest trip integrity in a non-redundant application (Figure 4). Since all three relays are wired in series, any trip alarm or fault alarm will trip the final element or logic solver.

Figure 5. The STA in a High Availability Architecture.
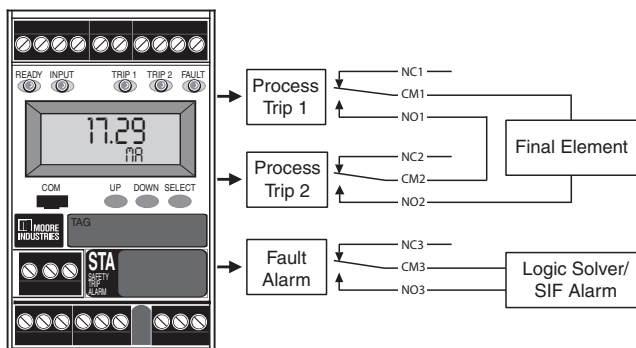
High Availability Architecture—In this configuration, the Safety Trip Alarm provides higher process or system availability (Figure 5). The fault alarm is wired separately to inform a safety system that there is a fault alarm and that this component's ability to carry out its portion of the Safety Instrumented Function cannot be performed. This configuration would be used in applications where it is desirable to keep the process running should a fault occur because of a bad input or instrument fault. The output process trip relays are connected in a 1oo2 scheme to trip, providing security against a single relay failure. However, should the fault relay become active, the fault should be removed before the Safety Trip Alarm can provide proper safety coverage.

1oo2 Redundant Architecture—In this architecture, every component appears twice, and may be applicable for use in SIS systems up to SIL 3 (Figure 6). Advantages are improved reliability of trip action and reduced vulnerability to a single failure compared to a 1oo1 architecture. The logic in this configuration is an 'OR' statement for the safety function; if either sensor input reaches a trip condition or a fault relay is activated, the loop or function will reach a tripped state.

Figure 6. The STA in a 1oo2 Redundant/Voting Architecture is Applicable for Use in SIS Systems Up to SIL 3.

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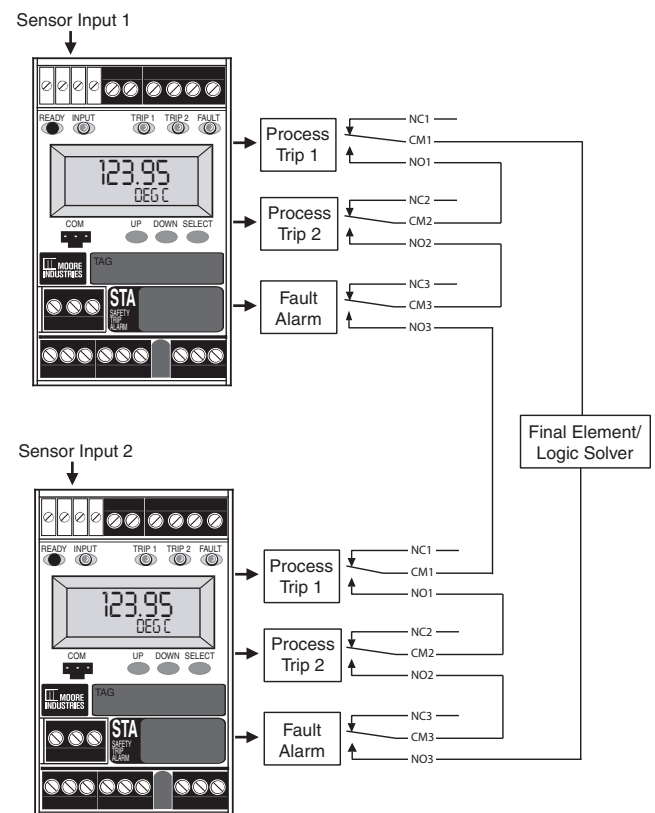
SIL 2 Compliant Programmable Current/Voltage and RTD/Thermocouple Safety Trip Alarms

Site-Programmable with Secure Password Protection

Selectable operating parameter functions:

- Security password protection on/off (via internal jumper) and password creation

- Input type and measurement range

- Input and output trimming

- High or low process alarm(s) with trip points

- Normally open or normally closed alarm relays (latching/non-latching selectable for process alarms; fault alarm is fixed as latching)

- Alarm deadband and alarm time delay

- Display parameters (scale, engineering units and set number of digits after the decimal point)

- Analog output range*

- On input failure, analog output can be set to drive upscale or downscale or fail to last value*

- Analog signal output damping (0-30 seconds)*

Configuration and Input Validation make it impossible to program the STA with an invalid configuration.

Quick Ranging Calibration

Using the front panel pushbuttons, precise zero and span settings can be made in seconds. Just select the zero and span values, and the push of a button locks the values into the alarm trip's memory.

Transfer a Configuration to Multiple STA Safety Trip Alarms Saves Time

The STA comes free of charge with a Transfer Utility Software program (Figure 7). This allows a configuration that has been entered into an STA by keypad to be copied from one STA to any number of additional units. This saves time when multiple STA Alarms require the same configuation. The utility also allows viewing of the STA's current operating status as well as listing all of the configured operating parameters. The set up can also be stored and printed. For safety, an uploaded STA configuration cannot be altered in any way using the Transfer Utility Software.

Superior Reference Junction Compensation (RJC)

Uncompensated plastic terminals are very suscep- tible to ambient temperature changes that may result in readings that are "off" by several degrees. STA models that accept temperature inputs (TPRG input)

Figure 7. Transfer Utility Software allows a configuration from one STA to be downloaded to any number of additional STA units.
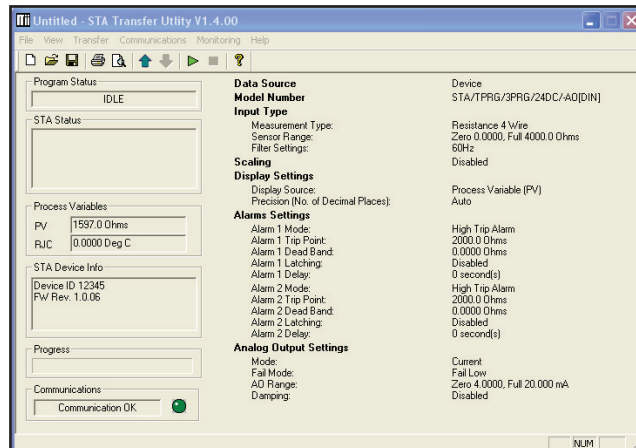
feature metal terminals and advanced electronic com- pensation techniques that provide a stable measure- ment in fluctuating ambient temperature conditions.

Combination Alarm and Isolated Transmitter*

When ordered with the Analog Output (-AO) option, the STA provides a proportional and isolated analog retransmission (non-safety path) of the input signal that can be sent to remote monitoring/control devices like a DCS, PLC, PC, indicator or data recorder. All analog parameters can be selected using the STA pushbuttons. Upon input failure, the analog output can be user-set for upscale or downscale drive or fail to last value.

Trim to Specific Curve Segments

The STA can be trimmed with two data points within the selected zero and span measurement range. This allows a complete process range to be moni- tored while placing measurement emphasis on a critical segment of the range. This provides incred- ible precision over a limited portion of the span while measuring the remainder of the span with outstanding accuracy.

Powers a 2-Wire Transmitter

The STA (HLPRG: current/voltage input model) comes standard with 2-wire transmitter excitation that provides 24Vdc to power the loop. This saves the cost of specifying and installing an additional instru- ment power supply to power a 2-wire transmitter on the input loop.

* Models with Analog Output (-AO) option. The analog output is not part of the safety path, and cannot be used as a component in a SIS.

Specifications (HLPRG: mA and V Input Model)

Performance

Input Range: Current Input, 0-50mA (1mA minimum span); Voltage Input, 0-11V (250mV minimum span)

Input Accuracy and Alarm Trip Repeatability: Current inputs, 2microamps (0.01% of 20mA span); Voltage inputs, 1mV (0.01% of maximum span)

Overall Accuracy: The overall accuracy of the unit is the combined input and output accuracies. It includes the combined effects of linearity, hysteresis, repeatability and adjustment resolution. It does not include ambient temperature effect.

Stability: Refer to Table 1

Dead Band: 11V or 50mA, maximum in Linear Mode; equivalent of maximum input range in user-set engineering units in Scaling/Custom Mode

Input to Output Trip Response Time: 256msec maximum from step change on input to alarm state change when alarm is set to trip at mid-point of step

Alarm Trip Delay: Programmable from 0-120 seconds

Isolation: 500Vrms between case, input, output and power

Dielectric Strength: 1966Vdc for 2 seconds, between case, input, output and power

Power Supply: 24DC range, 18-30Vdc; UAC range, 90-260Vac

Power Consumption: 3.5W maximum for DC supply; 4W maximum for UAC supply

Power Supply Effect: ±0.002% of span per 1% line voltage change

Input Over-Range Protection: Current, ±100mA, maximum; Voltage, ±30Vdc, maximum

Input Impedance: Current, 20 ohms; Voltage, 1Mohm

TX Power Supply: 24Vdc, ±10% @ 24mA (regulated)

Performance (continued)

Output Relays Dual Process Relays and One Fault Relay (Relays are single-pole/double-throw SPDT, 1 form C, rated 3A@250Vac or 3A@30Vdc, 50/60Hz, non-inductive)

Performance of Analog Output (-AO Option)

Non-Safety-Critical Analog Output Option

Output Accuracy: Current, ±0.01% of maximum span (±2 microamps); Voltage, ±0.01% of max. span (±1mV)

Input to Analog Output Response Time: 256msec for the output to change 10% to 90% of its scale for an input step change of 0 to 100%

Analog Output Step Response Time: 100msec maximum

Analog Output Ripple (up to 120Hz): 50mV peak-to-peak maximum on voltage output; 10mV peak-to-peak measured across a 250 ohm load resistor for current output

Analog Output Current Limiting: Current outputs,

Output	Failure Limits
0-20mA	0, 23.6mA
4-20mA	3.6, 23.6mA
X-20mA (0<X<4)	(90% of X), 23.6mA

Voltage output, -0.50 -11.0V

Load Capability: Source Mode (Internal Power Supply), 0-1 kohms for current output; 2 kohms for voltage output; Sink Mode (External Power Supply), 42Vdc Max

Load Effect (current outputs): ±0.01% of span from 0 to maximum load resistance on current output

Ambient Conditions

Operating Range: -40°C to +85°C (-40°F to +185°F)

Relay Range: -40°C to +85°C (-40°F to +185°F)

Ambient Conditions (continued)

Storage Range: -40°C to +85°C (-40°F to +185°F)

Ambient Temperature Effect: Current, 2 microamps/°C; Voltage, 1mV/°C; Output, ±0.009% of max. span/°C

Relative Humidity: 0-95%, non-condensing

RFI/EMI Protection: 20V/m@80-1000MHz, 1kHz AM, when tested to IEC 61326 with 0.5% of span or less error

Noise Rejection: Common Mode, 100dB@50/60Hz Normal Mode, Current Input, 70dB typical @ 50mAp-p@ 50/60Hz; Voltage Input, 70dB typical@1Vp-p@ 50/60Hz

Adjustments Front panel push-buttons for parameter configurations; Internal jumper and menu password protect parameter settings

Indicators

LCD: 2x5 14-segment characters, backlit, alphanumeric readout accurate to the nearest digit. **Range:** -99999 to 99999; Decimal point can be user-set

LED Type: INPUT LED: Dual color LED indicates input failure READY LED: Green LED indicates unit is operating properly ALARM 1 and 2 LED: Dual color LED per relay indicates alarm status FAULT LED: Green LED indicates unit is operating properly; Red LED indicates unit has fault or is latched.

Display Accuracy: ±1 digit; when scaling the display (or in custom mode), high input-to-display span ratios decrease display accuracy

Weight 513 g to 564 g (18.1 oz to 19.9 oz)

Table 1. *Long-Term Stability (HLPRG Input Model)*

Stability (% of maximum span)	Input to Non-Safety Critical Analog Output (Years)			Input to Relay (Years)		
	1 yr	3 yrs	5 yrs	1 yr	3 yrs	5 yrs
Current Inputs	0.081	0.14	0.18	0.047	0.81	0.105
Voltage Outputs	0.093	0.16	0.21	0.066	0.114	0.147

STA **FS** FUNCTIONAL SAFETY SERIES

SIL 2 Compliant Programmable Current/Voltage
and RTD/Thermocouple Safety Trip Alarms

Specifications (TPRG: RTD, T/C, Ohm, mV and Potentiometer Input Model)

Performance | **Input Accuracy and Alarm Trip Repeatability:** Refer to Table 2
Overall Accuracy: The overall accuracy of the unit is the combined input and output accuracies. It includes the combined effects of linearity, hysteresis, repeatability and adjustment resolution. It does not include ambient temperature effect. For T/C input, add the RJC error.
Reference Junction Compensation Accuracy (T/C inputs only): ±0.45°C
Stability: Refer to Table 3
Dead Band: User-set within selected input range; fully scalable and set in user-selected engineering units
Input to Output Trip Response Time: 256msec maximum from step change on input to alarm state change when alarm is set to trip at mid-point of step
Alarm Trip Delay: Programmable from 0-120 seconds
Isolation: 500Vrms between case, input, output and power
Dielectric Strength: 1966Vdc for 2 seconds, between case, input, output and power
Power Supply: 24DC range, 18-30Vdc; UAC range, 90-260Vac
Power Consumption: 3.5W maximum for DC supply; 4W maximum for UAC supply
Power Supply Effect: ±0.002% of span per 1% line voltage change
Input Over-Range Protection: ±5Vdc, maximum
Input Resistance: T/C and mV inputs, 40Mohms, nominal
Excitation Current: RTD and Ohms, 250 microamps, ±10%

Performance (continued) | **Output Relays**
Dual Process Relays and One Fault Relay (Relays are single-pole/double-throw SPDT, 1 form C, rated 3A@250Vac or 3A@30Vdc, 50/60Hz, non-inductive

Performance of Analog Output (-AO Option) | **Non-Safety-Critical Analog Output Option**
Output Accuracy: Current, ±0.01% of maximum span (±2 microamps); Voltage, ±0.01% of maximum span (±1mV)
Input to Output Response Time: 256msec for the output to change 10% to 90% of its scale for an input step change of 0 to 100%
Output Step Response Time: 100msec maximum
Output Ripple (up to 120Hz): 50mV peak-to-peak maximum on voltage output; 10mV peak-to-peak measured across a 250 ohm load resistor for current output (frequencies up to 120Hz)
Output Current Limiting: Current outputs,

Output	Failure Limits
0-20mA	0, 23.6mA
4-20mA	3.6, 23.6mA
X-20mA (0<X<4)	(90% of X), 23.6mA

Voltage output, -0.50 -11.0V
Load Capability: Source Mode (Internal Power Supply), 0-1 kohms for current output; 2 kohms for voltage output; Sink Mode (External Power Supply), 42Vdc Max

Load Effect (current outputs): ±0.01% of span from 0 to maximum load resistance on current output

Ambient Conditions | **Operating Range:** -40°C to +85°C (-40°F to +185°F)
Relay Range: -40°C to +85°C (-40°F to +185°F)
Storage Range: -40°C to +85°C (-40°F to +185°F)
Ambient Temperature Effect: Refer to Table 4

Ambient Conditions (continued) | **Effect of Ambient Temperature on Reference Junction Compensation (T/C inputs only):** ±0.005°C per °C change of ambient temperature;
With Non-Safety-Critical Analog Output: ±0.009% of maximum span/°C
Relative Humidity: 0-95%, non-condensing
RFI/EMI Protection: 20V/m@80-1000MHz, 1kHz AM, when tested to IEC 61326 with 0.5% of span or less error
Noise Rejection: Common Mode, 100dB@50/60Hz Normal Mode, refer to Table 5

Adjustments | Front panel push-buttons for parameter configurations; Internal jumper and menu password protect parameter settings

Indicators | **LCD:** 2x5 14-segment characters, backlit, alphanumeric readout accurate to the nearest digit.
Range: -99999 to 99999; Decimal point can be user-set
LED Type:
INPUT LED: Dual color LED indicates input failure
READY LED: Green LED indicates unit is operating properly
ALARM 1 and 2 LED: Dual color LED per relay indicates alarm status
FAULT LED: Green LED indicates unit is operating properly; Red LED indicates unit has fault or is latched.
Display Accuracy: ±1 digit; when scaling the display (or in custom mode), high input-to-display span ratios decrease display accuracy

Weight | 527 g to 581 g (18.6 oz to 20.5 oz)

Table 3. *Long-Term Stability (TPRG Input Model)*

Stability (% of maximum span)	Input to Non-Safety Critical Analog Output (Years)			Input to Relay (Years)		
	1 yr	3 yrs	5 yrs	1 yr	3 yrs	5 yrs
	0.067	0.116	0.15	0.012	0.020	0.026

Table 2. *Accuracy (TPRG Input Model)*

Input	Type	α	Ohms	Conformance Range	Minimum Span	Input Accuracy/ Repeatability	Maximum Range
RTD 2-Wire, 3-Wire, 4-Wire	Platinum	0.003850	100	-200 to 850°C (-328 to 1562°F)	10°C (18°F)	±0.1°C (±0.18°F)	-240 to 960°C (-400 to 1760°F)
			200				
			300				
			400				
			500				
			1000				
		0.003902	100	-100 to 650°C (-148 to 1202°F)			-150 to 720°C (-238 to 1328°F)
			200				
			400				
			500				
			1000				
		0.003916	100	-200 to 510°C (-328 to 950°F)			-240 to 580°C (-400 to 1076°F)
	Nickel	0.00672	120	-80 to 320°C (-112 to 608°F)			-100 to 360°C (-148 to 680°F)
	Copper	0.00427	9.035	-50 to 250°C (-58 to 482°F)		±0.85°C (±1.53°F)	-65 to 280°C (-85 to 536°F)
Ohms	Direct Resistance	n/a	0-4000	0-4000 ohms	10 ohms	±0.4 ohms	0-4095 ohms
	Potentiometer		100-4000	0-100%	10%	±0.1%	0-100%
T/C	J	n/a	n/a	-180 to 760°C (-292 to 1400°F)	35°C (63°F)	±0.25°C (±0.45°F)	-210 to 770°C (-346 to 1418°F)
	K	n/a	n/a	-150 to 1370°C (-238 to 2498°F)	40°C (72°F)	±0.3°C (±0.54°F)	-270 to 1390°C (-454 to 2534°F)
	E	n/a	n/a	-170 to 1000°C (-274 to 1832°F)	35°C (63°F)	±0.2°C (±0.36°F)	-270 to 1013°C (-454 to 1855.4°F)
	T	n/a	n/a	-170 to 400°C (-274 to 752°F)	35°C (63°F)	±0.25°C (±0.45°F)	-270 to 407°C (-454 to 764.6°F)
	R	n/a	n/a	0 to 1760°C (32 to 3200°F)	50°C (90°F)	±0.55°C (±0.99°F)	-50 to 1786°C (-58 to 3246.8°F)
	S	n/a	n/a	0 to 1760°C (32 to 3200°F)	50°C (90°F)	±0.55°C (±0.99°F)	-50 to 1786°C (-58 to 3246.8°F)
	B	n/a	n/a	400 to 1820°C (752 to 3308°F)	75°C (135°F)	±0.75°C (±1.35°F)	200 to 1836°C (392 to 3336.8°F)
	N	n/a	n/a	-130 to 1300°C (-202 to 2372°F)	45°C (81°F)	±0.4°C (±0.72°F)	-270 to 1316°C (-454 to 2400.8°F)
	C	n/a	n/a	0 to 2300°C (32 to 4172°F)	100°C (180°F)	±0.8°C (±1.44°F)	0 to 2338°C (32 to 4240.4°F)
mV	DC	n/a	n/a	n/a	4mV	±30 microvolts	-50 to 1000mV

Table 4. *Ambient Temperature Effect (TPRG Input Model)*

	Accuracy per 1°C (1.8°F) Change in Ambient
RTD*	0.0035°C
Millivolt	0.5 microvolts + 0.005% of reading
Ohm	0.002 ohms +0.005% of reading
Thermocouple	
	Accuracy per 1°C (1.8°F) Change in Ambient
J	0.00016°C + 0.005% of reading
K	0.0002°C + 0.005% of reading
E	0.00026°C + 0.005% of reading
T	0.0001°C + 0.005% of reading
R, S	0.00075°C + 0.005% of reading
B	0.0038°C + 0.005% of reading
N	0.003°C + 0.005% of reading
C	0.00043°C + 0.005% of reading
mV	0.5 microvolts + 0.005% of reading

*Accuracy of Ni672 is 0.002°C

Table 5. *Normal Mode Rejection Ratio (TPRG Input Model)*

Sensor Type		Max. p-p Voltage Injection for 100dB at 50/60Hz
T/C: J, K, N, C, E		150mV
T/C: T, R, S, B		80mV
Pt RTD: 100, 200, 300 ohms		250mV
Pt RTD: 400, 500, 1000 ohms		1V
Ni: 120 ohms		500mV
Cu: 9.03 ohms		100mV
Resistance	**mV**	
1-4 kohms	250-1000	1V
0.25-1 kohms	62.5-250	250mV
0.125-0.25 kohms	31.25-62.5	100mV

STA FS FUNCTIONAL SAFETY SERIES

SIL 2 Compliant Programmable Current/Voltage and RTD/Thermocouple Safety Trip Alarms

Ordering Information

Unit	Input	Output	Power	Options	Housing
STA Programmable SIL 2 Compliant Programmable Safety Trip Alarm	**HLPRG** Programs to accept: <u>Current</u>: Any range between 0-50mA including: 0-20mA, 4-20mA, 10-50mA <u>Voltage</u>: Any range between 0-10Vdc including: 0-5Vdc, 1-5Vdc, 0-10Vdc **TPRG** Programs to accept: <u>RTD</u>: 2-, 3- and 4-wire; platinum, copper, and nickel <u>Thermocouple</u>: J, K, E, T, R, S, N, C, B <u>Ohms</u>: 0-4000 ohms (Potentiometer, 4000 ohms max.) <u>Millivolts</u>: −50 to +1000mV	**3PRG** Dual Process Relays and One Fault Relay (Relays are single-pole/double-throw; SPDT, 1 form C, rated 3A@250Vac or 3A@30Vdc, 50/60Hz, non-inductive) Process Relays #1 and #2 individually configure for: High Alarm Low Alarm Normally Open Normally Closed (Both relays are fixed as Failsafe) Fault Relay #3 is fixed as Failsafe	**24DC** ±25% **UAC** Accepts any power input range between 90-260Vac	**-AO** Analog output (isolated and linearized) scalable for any range between 0-21.6mA into 1 kohms or −0.2-10.5V into 2 kohms (Current output is user-selected for internal, source or external power, sink) **NOTE:** The analog output is not part of the safety path, and can not be used as a component in a SIS	**DIN** Universal DIN-style housing mounts on 32mm (EN50035) G-type and 35mm (EN50022) Top Hat DIN-rails **FLD** Externally-mounted flange provides a secure mount for high vibration applications

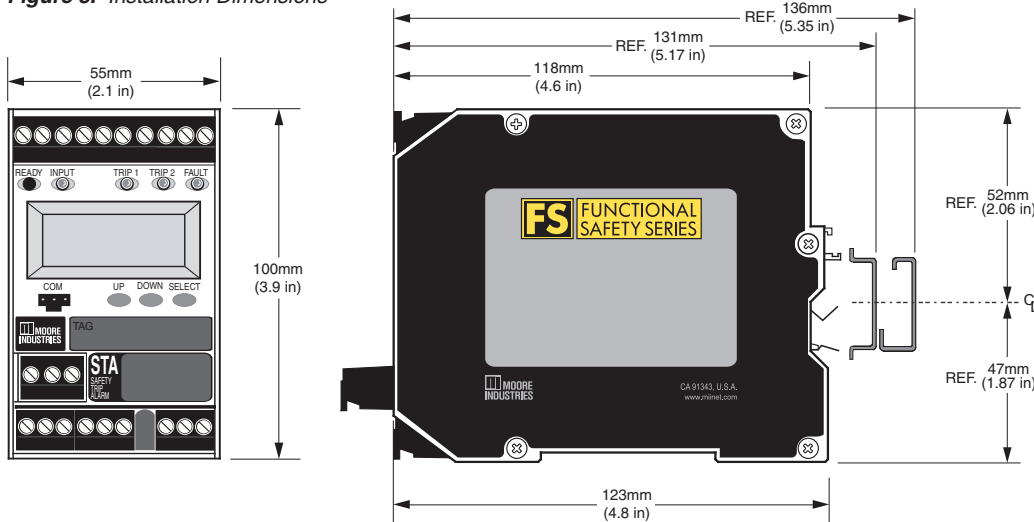**When ordering, specify:** Unit / Input / Output / Power / Options [Housing]
Model number example: STA / TPRG / 3PRG / 24DC / -AO [DIN]

Accessories:

Part Number	
Part Number **700-702-32**	**FMEDA Report** consistent with IEC 61508-2:2002 providing the information necessary to design a Safety Instrumented System (One copy provided free with each order Upon Request)
Part Number **750-75E05-01**	**Transfer Utility Software CD** One copy provided free with each order (Standard) or, Line Item or Unit (Upon Request)
Part Number **803-053-26**	**9-Pin Transfer Utility Software Cable** for use in connecting the STA to a PC (one cable provided free with each order)
Part Number **208-836-00**	**USB Communication Cable** for the Transfer Utility Software (Optional at added cost)

To Request a FMEDA (Failure Modes, Effects and Diagnostics Analysis) Report with a STA Safety Trip Alarm Order, See "Accessories"

Figure 8. Installation Dimensions

55mm (2.1 in)
100mm (3.9 in)
REF. 136mm (5.35 in)
REF. 131mm (5.17 in)
118mm (4.6 in)
REF. 52mm (2.06 in)
REF. 47mm (1.87 in)
123mm (4.8 in)

READY INPUT TRIP 1 TRIP 2 FAULT
COM UP DOWN SELECT
TAG
STA SAFETY TRIP ALARM
MOORE INDUSTRIES
FS FUNCTIONAL SAFETY SERIES
MOORE INDUSTRIES CA 91343, U.S.A. www.miinet.com

NOTE: While all STA models (model with HLPRG input shown) are dimensionally identical, the STA that accepts temperature inputs (TPRG input) features metal terminal blocks for enhanced reference junction compensation.

For Terminal Designations, see the STA HLPRG and STA TPRG Installation Manuals on the Moore Industries Web Site: www.miinet.com

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Specifications and information subject to change without notice.