

## MS-2101

The MS-2101 is a single-point, microprocessor-based electrical heat trace controller. It expands on the features of the single-circuit TraceMate to give the user additional control and flexibility in their EHT applications. MS-2101 adds interface, communication and statistics menu options to provide a comprehensive, field-ready, and easy to install EHT control solution

### Models

- MS-2101
- MS-2101-E3
- MS-2101-BAC
- MS-2101-E3-BAC
- MS-2101-ETH
- MS-2101-E3-ETH



### Specifications

#### Temperature Input

Range:	-50 to +500°C (-58 to 932°F)
Accuracy:	±2°C
Repeatability:	±1°C
RTD:	Two, 100 ohm platinum, 3-wire RTD 20 ohms maximum lead resistance

#### Heater Switching

Configuration:	One circuit, Two-pole, one SCR per phase, 800 amp 1 cycle inrush
Ratings:	85-280Vac, 30A continuous
Line Frequency:	50 or 60Hz
GF Measurement:	10 to 1000mA 5%±2mA
Voltage Measurement:	0 to 300Vac 3%±2V

#### Control Power

Power Requirement:	Control power from heater voltage, 85-280VAC, 10VA max
Protection	Control power from heater voltage protected by 2A fuse, MOV transient protection

#### Communication

Port:	1 Serial network connection
Type:	RS485
Protocol:	Modbus® RTU.
Transmission Rate:	600,1200, 2400, 4800, 9600 baud.
Interconnect:	2-wire, shielded, twisted pair.
Highway Distance:	4,000 feet without repeater.
Modules per Highway:	32 Control Modules.

#### BACnet/IP Ethernet Communication

Models:	Models with option BAC only
Gateway:	1 configured & assembled MasterTrace Modbus to BACnet/IP gateway, separated from MS-2101 module
Serial Connection:	To be connected to serial ports @ 9600 baud on modules via RS485 cable
Ethernet Connection:	To be connected to Ethernet network via Ethernet cable

#### MODBUS TCP Ethernet Communication

Models:	Models with option ETH only
Gateway:	1 configured & assembled MasterTrace Modbus to Modbus TCP gateway, separated from MS-2101 module
Serial Connection:	To be connected to serial ports @ 1200~9600 baud on modules via RS485 cable
Ethernet Connection:	To be connected to Ethernet network via Ethernet cable

#### Measured Values

Temperature:	-50 to 500°C (-58 to 932°F)
Minimum Temperature:	-50 to 500°C (-58 to 932°F)
Maximum Temperature:	-50 to 500°C (-58 to 932°F)
Heater Current:	0.1 to 60A
Ground Fault Current:	10 to 1000mA
Min. Heater Voltage:	85 to 300Vac
Max. Heater Voltage:	85 to 300Vac
Power Consumption:	0 to 1,000 MWh
Operating Cost:	0 to \$1,000,000.00

#### User Interface

Display:	16-character x 2-line LCD Alpha numeric display display
Keypad:	9 tactile keys, polyester faceplate - Setpoint, measured, status - Message Up, Message Down - Value Up, Value Down, Reset, Store
Contrast:	Adjustable by potentiometer
Panel Indicators:	Power on, Heater on, Communication active, System fail, Process alarm
Security:	Controller parameters password protected

## Environment

Approvals:	CSA NRTL/C and FM; Class I, Div. 2, Groups A,B,C,D; Class I, Zone 2, Groups IIC; Class II, Div. 2, Groups F and G; Class III
Operating Temperature:	-40°C to +50°C (LCD: -20°C to +50°C)
Conformal Coating:	Boards conformal coated for hostile environments
Conformal Coating:	Boards conformal coated for hostile environments

## Enclosure

Type:	Models with option E3: Nema-4X SS steel, painted black Models without option E3: Nema-4X steel, painted black
Size:	10"Hx8"Wx6"D
Features:	Quick release latches to open door, flat aluminum plate to act as heatsink and mounting flange for mounting on Uni-Strut; One 3/4" conduit knockout for power and three 1/2" conduit knockouts for RTD and signal wiring.

## Alarm Output

Alarm:	Programmable for NO or NC contact One Mechanical (dry) contact
Alarm Rating	Mechanical contact: 30Vdc/100mA, 120Vac/0.52A, 62.5W Max
Alarm Output:	LED Indicator: 5Vdc/50mA

## Alarm Function

Temperature:	High Temp Alarm, Low Temp Alarm
Current:	Low Current Alarm, High Current Alarm
Ground Fault Current:	Ground Fault Current Alarm Ground Fault Current Trip
Voltage:	High Voltage Alarm, Low Voltage Alarm
Hardware:	Self-Check Failure, Switch Shorted, RTD Open, RTD Shorted, Continuity

## User-Definable Options

Heater Status:	Enable or Disable
Heater Name or Tag:	16 Character Alphanumeric
Temperature Units:	°C or °F
Proportional Control:	on or off
Deadband:	1 to 50C° (2 to 90F°)
PowerLimit:	0.1 to 30A, off
SoftStart:	10 to 999s, off
TraceCheck:	1 to 24hrs, off
Temperature Setpoint:	-50 to 500°C (-58 to 932°F), off, none
High Temp Alarm:	-50 to 500°C (-58 to 932°F), off
Low Temp Alarm:	-50 to 500°C (-58 to 932°F), off
High Current Alarm:	0.1 to 30A, off
Low Current Alarm:	0.1 to 30A, off
Ground Fault Alarm:	10 to 1000mA, off
Ground Fault Trip:	10 to 1000mA, off
High Voltage Alarm:	85V to 300V, off
Low Voltage Alarm:	85V to 300V, off
RTD Definition:	Single, Backup, Highest, Lowest, Average or High Temperature Cutout
RTD Fail-safe:	Heater On or Heater Off
Heat Trace Curve:	Disable, user, LT3, 5, 8, 10 HLT3, 5, 8, 10, 12, 15, 18, 20
Override:	On or Off
Alarm Contacts:	NO or NC for each contact
Alarm Light:	Alarm on, Alarm off, Flash during alarm then on, Flash during alarm then off

## Ground Fault

Maximum Trip Time:	3.7 seconds
--------------------	-------------