

CIM Plus - 816

8/16 Universal Channel
Analog Interface Module (AC Powered)

Operation Manual

This brief manual is primarily meant for quick reference to wiring connections and parameter searching. For more details on operation and application; please log on to www.ppiindia.net

PPI

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Oct 2022

Input Registers (Read-Only Parameters)										
Parameter	MODBUS Address	Values								
Process Value	1561 to 1568 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>PV Error Type</th> </tr> </thead> <tbody> <tr> <td>-32768</td> <td>Under Range</td> </tr> <tr> <td>+32752</td> <td>Over Range</td> </tr> <tr> <td>+32767</td> <td>Sensor Open</td> </tr> </tbody> </table>	Value	PV Error Type	-32768	Under Range	+32752	Over Range	+32767	Sensor Open
	Value	PV Error Type								
-32768	Under Range									
+32752	Over Range									
+32767	Sensor Open									
	1561 to 1576 (16 Channels)									
Alarm-1 Status	1577									
Alarm-2 Status	1578	Alarm-X Status for Channel-2								
Alarm-3 Status	1579	Alarm-X Status for Channel-3								
Alarm-4 Status	1580	Alarm-X Status for Channel-4								
Ambient Temperature	82	<p>Signed integer values from -30000 to +30000 representing the measured Ambient Temperature through the semi-conductor sensor mounted on the Module.</p> <p>The measured value is always in °C with 0.1 resolution. For example, 30.0°C is represented as 300.</p>								

Holding Registers (Read / Write Parameters)																																						
Parameter	MODBUS Address	Settings (Default Value)																																				
Input Type	83 to 90 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Type J Thermocouple</td> </tr> <tr> <td>1</td> <td>Type K Thermocouple</td> </tr> <tr> <td>2</td> <td>Type T Thermocouple</td> </tr> <tr> <td>3</td> <td>Type R Thermocouple</td> </tr> <tr> <td>4</td> <td>Type S Thermocouple</td> </tr> <tr> <td>5</td> <td>Type B Thermocouple</td> </tr> <tr> <td>6</td> <td>Type N Thermocouple</td> </tr> <tr> <td>7</td> <td>Reserved TC</td> </tr> <tr> <td>8</td> <td>RTD Pt100, 3-wire</td> </tr> <tr> <td>9</td> <td>0 to 20 mA</td> </tr> <tr> <td>10</td> <td>4 to 20 mA</td> </tr> <tr> <td>11</td> <td>0 to 80 mV</td> </tr> <tr> <td>12</td> <td>Reserved</td> </tr> <tr> <td>13</td> <td>0 to 1.25 V</td> </tr> <tr> <td>14</td> <td>0 to 5 V</td> </tr> <tr> <td>15</td> <td>0 to 10 V</td> </tr> <tr> <td>16</td> <td>1 to 5 V</td> </tr> </tbody> </table> <p>(Default : 0 to 10 V)</p>	Value	Type	0	Type J Thermocouple	1	Type K Thermocouple	2	Type T Thermocouple	3	Type R Thermocouple	4	Type S Thermocouple	5	Type B Thermocouple	6	Type N Thermocouple	7	Reserved TC	8	RTD Pt100, 3-wire	9	0 to 20 mA	10	4 to 20 mA	11	0 to 80 mV	12	Reserved	13	0 to 1.25 V	14	0 to 5 V	15	0 to 10 V	16	1 to 5 V
	Value	Type																																				
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	13	0 to 1.25 V																																				
	14	0 to 5 V																																				
15	0 to 10 V																																					
16	1 to 5 V																																					
Temperature Units	99 to 106 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>°C</td> </tr> <tr> <td>1</td> <td>°F</td> </tr> </tbody> </table> <p>(Default : °C)</p>	Value	Unit	0	°C	1	°F																														
	Value	Unit																																				
0	°C																																					
1	°F																																					
	99 to 114 (16 Channels)																																					
DC Resolution	115 to 122 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Resolution</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>0.1</td> </tr> <tr> <td>2</td> <td>0.01</td> </tr> <tr> <td>3</td> <td>0.001</td> </tr> <tr> <td>4</td> <td>0.0001</td> </tr> </tbody> </table> <p>(Default : 1 Unit for DC Linear input & 0.1 for Thermocouple & RTD)</p>	Value	Resolution	0	1	1	0.1	2	0.01	3	0.001	4	0.0001																								
	Value	Resolution																																				
0	1																																					
1	0.1																																					
2	0.01																																					
3	0.001																																					
4	0.0001																																					
	115 to 130 (16 Channels)																																					

Parameter	MODBUS Address	Settings (Default Value)																								
Signal Low	501 to 508 (8 Channels)	<p>Conditional Parameter ^(Note 2)</p> <table border="1"> <thead> <tr> <th>Input Type</th> <th>Settings</th> <th>Default</th> </tr> </thead> <tbody> <tr> <td>0 to 20 mA</td> <td>0.00 to Signal High</td> <td>0.00</td> </tr> <tr> <td>4 to 20 mA</td> <td>4.00 to Signal High</td> <td>4.00</td> </tr> <tr> <td>0 to 80 mV</td> <td>0.00 to Signal High</td> <td>0.00</td> </tr> <tr> <td>0 to 1.25 V</td> <td>0.000 to Signal High</td> <td>0.000</td> </tr> <tr> <td>0 to 5 V</td> <td>0.000 to Signal High</td> <td>0.000</td> </tr> <tr> <td>0 to 10 V</td> <td>0.00 to Signal High</td> <td>0.00</td> </tr> <tr> <td>1 to 5 V</td> <td>1.000 to Signal High</td> <td>1.000</td> </tr> </tbody> </table>	Input Type	Settings	Default	0 to 20 mA	0.00 to Signal High	0.00	4 to 20 mA	4.00 to Signal High	4.00	0 to 80 mV	0.00 to Signal High	0.00	0 to 1.25 V	0.000 to Signal High	0.000	0 to 5 V	0.000 to Signal High	0.000	0 to 10 V	0.00 to Signal High	0.00	1 to 5 V	1.000 to Signal High	1.000
	Input Type		Settings	Default																						
	0 to 20 mA		0.00 to Signal High	0.00																						
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	0 to 10 V		0.00 to Signal High	0.00																						
	1 to 5 V		1.000 to Signal High	1.000																						
			501 to 516 (16 Channels)																							
Signal High	517 to 524 (8 Channels)	<p>Conditional Parameter ^(Note 2)</p> <table border="1"> <thead> <tr> <th>Input Type</th> <th>Settings</th> <th>Default</th> </tr> </thead> <tbody> <tr> <td>0 to 20 mA</td> <td>Signal Low to 20.00</td> <td>20.00</td> </tr> <tr> <td>4 to 20 mA</td> <td>Signal Low to 20.00</td> <td>20.00</td> </tr> <tr> <td>0 to 80 mV</td> <td>Signal Low to 80.00</td> <td>80.00</td> </tr> <tr> <td>0 to 1.25 V</td> <td>Signal Low to 1.250</td> <td>1.250</td> </tr> <tr> <td>0 to 5 V</td> <td>Signal Low to 5.000</td> <td>5.000</td> </tr> <tr> <td>0 to 10 V</td> <td>Signal Low to 10.00</td> <td>10.00</td> </tr> <tr> <td>1 to 5 V</td> <td>Signal Low to 5.000</td> <td>5.000</td> </tr> </tbody> </table>	Input Type	Settings	Default	0 to 20 mA	Signal Low to 20.00	20.00	4 to 20 mA	Signal Low to 20.00	20.00	0 to 80 mV	Signal Low to 80.00	80.00	0 to 1.25 V	Signal Low to 1.250	1.250	0 to 5 V	Signal Low to 5.000	5.000	0 to 10 V	Signal Low to 10.00	10.00	1 to 5 V	Signal Low to 5.000	5.000
	Input Type		Settings	Default																						
	0 to 20 mA		Signal Low to 20.00	20.00																						
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	0 to 80 mV		Signal Low to 80.00	80.00																						
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	0 to 5 V		Signal Low to 5.000	5.000																						
	0 to 10 V		Signal Low to 10.00	10.00																						
	1 to 5 V		Signal Low to 5.000	5.000																						
			517 to 532 (16 Channels)																							
Range Low	131 to 138 (8 Channels)	<p>Conditional Parameter ^(Note 2)</p> <p>-30000 to 30000 (Default : 0)</p>																								
	131 to 146 (16 Channels)																									
Range High	147 to 154 (8 Channels)	<p>Conditional Parameter ^(Note 2)</p> <p>-30000 to 30000 (Default : 1000)</p>																								
	147 to 162 (16 Channels)																									
Offset for PV	163 to 170 (8 Channels)	<p>Conditional Parameter ^(Note 2)</p> <p>-30000 to 30000 (Default : 0)</p>																								
	163 to 178 (16 Channels)																									
Alarm-1 Type	179 to 186 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>None</td> </tr> <tr> <td>1</td> <td>Process Low</td> </tr> <tr> <td>2</td> <td>Process High</td> </tr> </tbody> </table> <p>(Default : None)</p>	Value	Type	0	None	1	Process Low	2	Process High																
	Value		Type																							
0	None																									
1	Process Low																									
2	Process High																									
	179 to 194 (16 Channels)																									
Alarm-2 Type	243 to 250 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>None</td> </tr> <tr> <td>1</td> <td>Process Low</td> </tr> <tr> <td>2</td> <td>Process High</td> </tr> </tbody> </table> <p>(Default : None)</p>	Value	Type	0	None	1	Process Low	2	Process High																
	Value		Type																							
0	None																									
1	Process Low																									
2	Process High																									
	243 to 258 (16 Channels)																									
Alarm-3 Type	307 to 314 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>None</td> </tr> <tr> <td>1</td> <td>Process Low</td> </tr> <tr> <td>2</td> <td>Process High</td> </tr> </tbody> </table> <p>(Default : None)</p>	Value	Type	0	None	1	Process Low	2	Process High																
	Value		Type																							
0	None																									
1	Process Low																									
2	Process High																									
	307 to 322 (16 Channels)																									
Alarm-4 Type	371 to 378 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>None</td> </tr> <tr> <td>1</td> <td>Process Low</td> </tr> <tr> <td>2</td> <td>Process High</td> </tr> </tbody> </table> <p>(Default : None)</p>	Value	Type	0	None	1	Process Low	2	Process High																
	Value		Type																							
0	None																									
1	Process Low																									
2	Process High																									
	371 to 386 (16 Channels)																									
Alarm-1 Set-point	195 to 202 (8 Channels)	<p>Min. to Max. Range specified for the selected Input Type Refer Table 1</p> <p>(Default : Min or Max Range depending on the Alarm type)</p>																								
	195 to 210 (16 Channels)																									
Alarm-2 Set-point	259 to 266 (8 Channels)																									
	259 to 274 (16 Channels)																									
Alarm-3 Set-point	323 to 330 (8 Channels)																									
	323 to 338 (16 Channels)																									
Alarm-4 Set-point	387 to 394 (8 Channels)																									
	387 to 402 (16 Channels)																									

Parameter	MODBUS Address	Settings (Default Value)						
Alarm-1 Hysteresis	211 to 218 (8 Channels)	<p>1 to 30000 (Default : 20)</p>						
	211 to 226 (16 Channels)							
Alarm-2 Hysteresis	275 to 282 (8 Channels)	<p>1 to 30000 (Default : 20)</p>						
	275 to 290 (16 Channels)							
Alarm-3 Hysteresis	339 to 346 (8 Channels)	<p>1 to 30000 (Default : 20)</p>						
	339 to 354 (16 Channels)							
Alarm-4 Hysteresis	403 to 410 (8 Channels)	<p>1 to 30000 (Default : 20)</p>						
	403 to 418 (16 Channels)							
Alarm-1 Inhibit	227 to 234 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Inhibit</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Disable</td> </tr> <tr> <td>1</td> <td>Enable</td> </tr> </tbody> </table> <p>(Default : Disable)</p>	Value	Inhibit	0	Disable	1	Enable
	Value		Inhibit					
0	Disable							
1	Enable							
	227 to 242 (16 Channels)							
Alarm-2 Inhibit	291 to 298 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Inhibit</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Disable</td> </tr> <tr> <td>1</td> <td>Enable</td> </tr> </tbody> </table> <p>(Default : Disable)</p>	Value	Inhibit	0	Disable	1	Enable
	Value		Inhibit					
0	Disable							
1	Enable							
	291 to 306 (16 Channels)							
Alarm-3 Inhibit	355 to 362 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Inhibit</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Disable</td> </tr> <tr> <td>1</td> <td>Enable</td> </tr> </tbody> </table> <p>(Default : Disable)</p>	Value	Inhibit	0	Disable	1	Enable
	Value		Inhibit					
0	Disable							
1	Enable							
	355 to 370 (16 Channels)							
Alarm-4 Inhibit	419 to 426 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Inhibit</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Disable</td> </tr> <tr> <td>1</td> <td>Enable</td> </tr> </tbody> </table> <p>(Default : Disable)</p>	Value	Inhibit	0	Disable	1	Enable
	Value		Inhibit					
0	Disable							
1	Enable							
	419 to 434 (16 Channels)							
Enable Bottom Clipping	435 to 442 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Enable</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No</td> </tr> <tr> <td>1</td> <td>Yes</td> </tr> </tbody> </table> <p>(Default : No)</p>	Value	Enable	0	No	1	Yes
	Value		Enable					
0	No							
1	Yes							
	435 to 450 (16 Channels)							
Bottom Clip Value	451 to 458 (8 Channels)	<p>-30000 to 30000 (Default : 0)</p>						
	451 to 466 (16 Channels)							
Enable Top Clipping	467 to 474 (8 Channels)	<table border="1"> <thead> <tr> <th>Value</th> <th>Enable</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No</td> </tr> <tr> <td>1</td> <td>Yes</td> </tr> </tbody> </table> <p>(Default : No)</p>	Value	Enable	0	No	1	Yes
	Value		Enable					
0	No							
1	Yes							
	467 to 482 (16 Channels)							
Top Clip Value	483 to 490 (8 Channels)	<p>-30000 to 30000 (Default : 1000)</p>						
	483 to 498 (16 Channels)							

CONFIGURING COMMUNICATION PARAMETERS																		
Parameter	MODBUS Address	Settings (Default Value)																
Modbus Slave ID	1	1 to 247 (Default : 1)																
Baud Rate	2	<table border="1"> <thead> <tr> <th>Value</th> <th>Baud Rate</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>2400 bps</td> </tr> <tr> <td>1</td> <td>4800 bps</td> </tr> <tr> <td>2</td> <td>9600 bps</td> </tr> <tr> <td>3</td> <td>19200 bps</td> </tr> <tr> <td>4</td> <td>38400 bps</td> </tr> <tr> <td>5</td> <td>57600 bps</td> </tr> <tr> <td>6</td> <td>115200 bps</td> </tr> </tbody> </table> <p>(Default : 9600 bps)</p>	Value	Baud Rate	0	2400 bps	1	4800 bps	2	9600 bps	3	19200 bps	4	38400 bps	5	57600 bps	6	115200 bps
		Value	Baud Rate															
		0	2400 bps															
		1	4800 bps															
		2	9600 bps															
		3	19200 bps															
		4	38400 bps															
5	57600 bps																	
6	115200 bps																	
Parity	3	<table border="1"> <thead> <tr> <th>Value</th> <th>Parity</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>None</td> </tr> <tr> <td>1</td> <td>Even</td> </tr> <tr> <td>2</td> <td>Odd</td> </tr> </tbody> </table> <p>(Default : Even)</p>	Value	Parity	0	None	1	Even	2	Odd								
		Value	Parity															
		0	None															
1	Even																	
2	Odd																	

Note 1

Thermocouples (J, K, T, R, S, B, N) and RTD Pt100 (3-wire) Inputs

The process value is always measured in 0.1°C/°F resolution. That is, for example, the value 300 means 30.0°C / °F.

The same should be followed while setting the values for the parameters that are resolution based (like Zero Offset, Alarm Set-point, Alarm Hysteresis, etc.). That is for example, set 300 counts for 30.0°C / °F.

DC mA / mV / V Inputs

(Also Refer Appendix A : DC Linear Signal Interface)

The measured PV is a Resolution-less Scaled Value derived using the values for the parameters : Signal Low, Signal High, Range Low and Range High. The parameter 'DC Resolution' holds the desired resolution that can be used to insert appropriate Decimal Place in the scaled PV. For example, if the DC Resolution value is 2 (0.01) then the scaled value of 3000 can be read as 30.00.

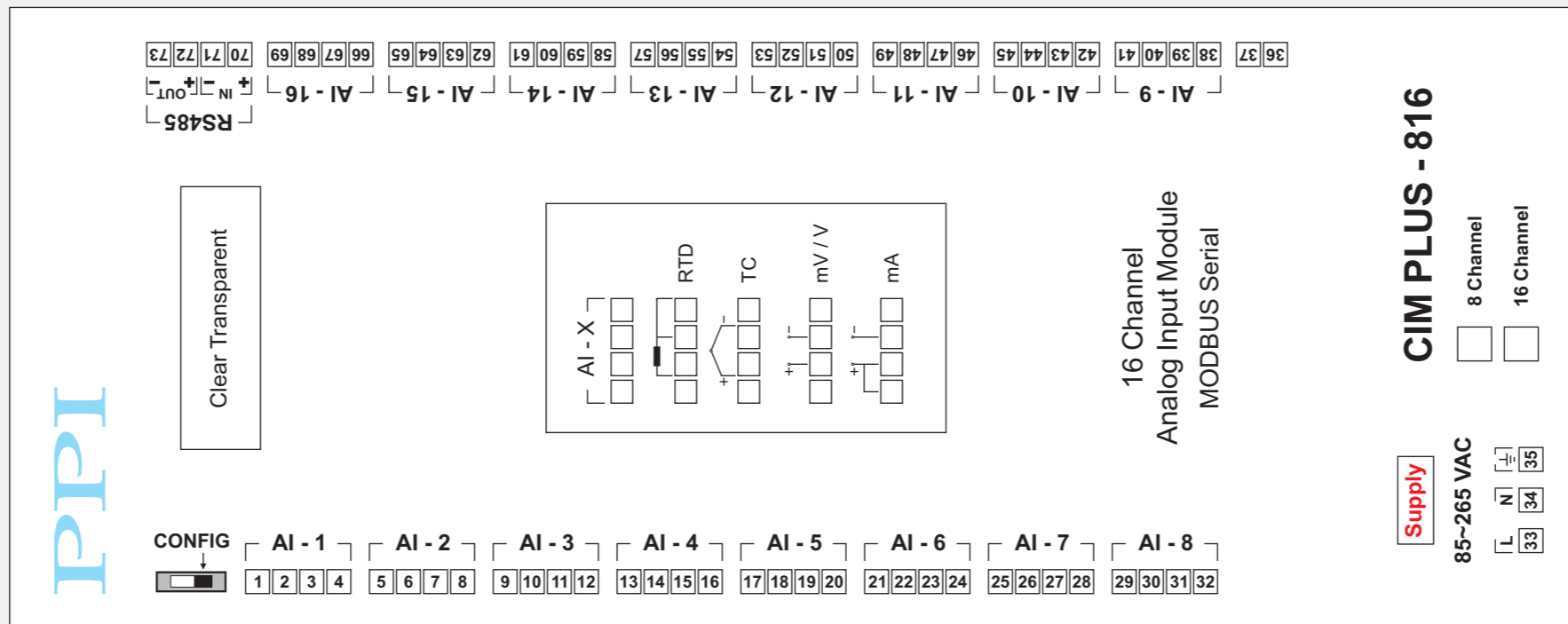
Similarly the corresponding parameters like Zero Offset, Alarm Set-point, Alarm Hysteresis, etc., are also resolution less and, if desired, the parameter value for 'DC Resolution' should be used for appropriate Decimal Place.

Note 2

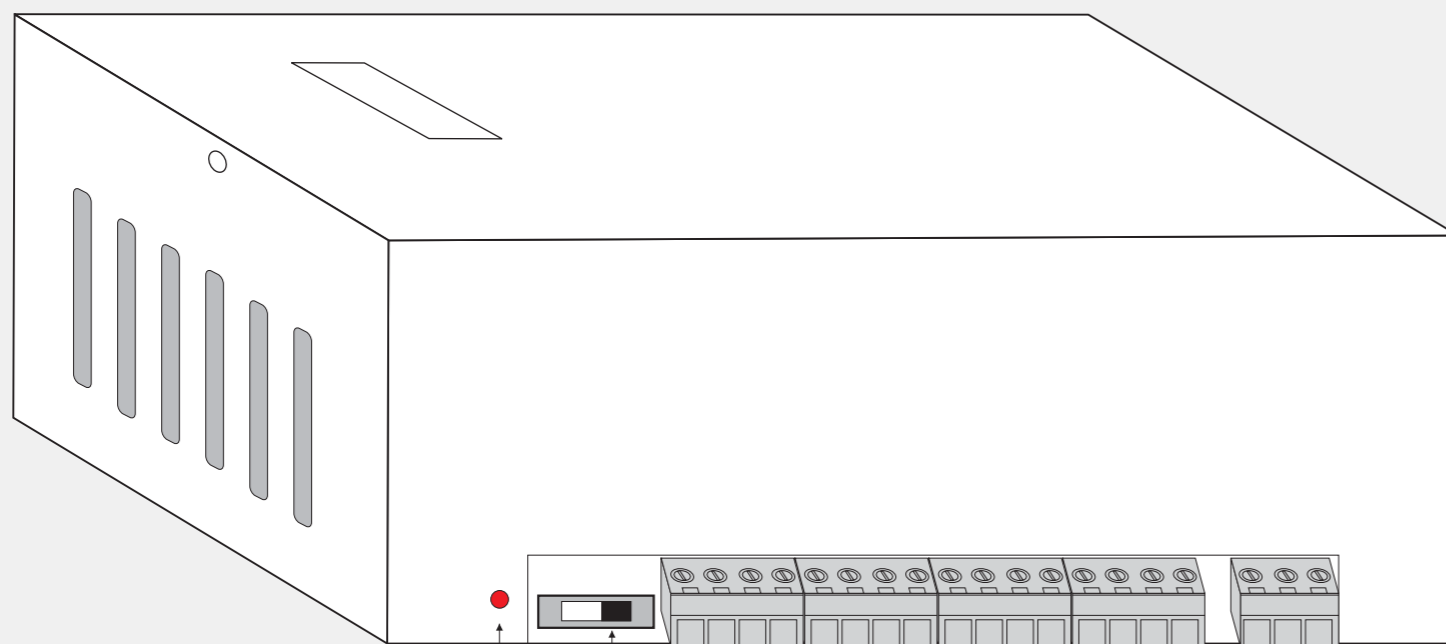
Conditional Parameters are those whose usage depend upon the values set for some other parameters. For example; the parameters 'Signal Low' & 'Signal High' for a selected channel are used only if the input type for the selected channel is DC Input (mV / V / mA). The access to the conditional parameters for Read / Write operation, however, is not restricted.



Table 1		
Input Type	Range (Min. to Max.)	Resolution
Type J Thermocouple	0 to +960.0°C / +32.0 to +1760.0°F	0.1 °C / °F
Type K Thermocouple	-200.0 to +1376.0°C / -328.0 to +2508.0°F	
Type T Thermocouple	-200.0 to +387.0°C / -328.0 to +728.0°F	
Type R Thermocouple	0 to +1771.0°C / +32.0 to +3219.0°F	
Type S Thermocouple	0 to +1768.0°C / +32.0 to +3214.0°F	
Type B Thermocouple	0 to +1826.0°C / +32.0 to +3218.0°F	
Type N Thermocouple	0 to +1314.0°C / +32.0 to +2397.0°F	
3-wire, RTD Pt100	-199.0 to +600.0°C / -328.0 to +1112.0°F	1 0.1 0.01 0.001 0.0001 Units
0 to 20mA DC current	-30000 to 30000 units	
4 to 20mA DC current		
0 to 80mV DC voltage		
0 to 1.25V DC voltage		
0 to 5.0V DC voltage		
0 to 10.0V DC voltage		
1 to 5.0V DC voltage		

ELECTRICAL CONNECTIONS



CONFIGURING COMMUNICATION



Slide Switch Position	 Switch positioned to Left	 Switch positioned to Right
Mode Indicator	OFF	ON
Operation Mode	Normal	Configuration
Communication Parameter Values	User Set values for Module Slave ID, Baud Rate & Parity	Module Slave ID : 1 Baud Rate : 9600 Parity : Even

Mode Indicator

Slide Switch for
Configuration Mode