Semi Universal Analog Input & Transistor Output Extension Modules



SMR1P1-00-01-04-00_1
SMR1P1-00-03-04-00_1



SMR1P1-00-20-04-00_1
SMR1P1-00-21-04-00_1

General Specifications :

* Modules have 2 or 4 input channels according to module type
* Analog input types (each analog input can be set in different type individually) :
  - Cu-50, PT100, PT1000, PTC, NTC, mV or
  - V, mA
* ON/OFF control, PID control, AutoTune, SelfTune
* 4 pieces Transistor Output (Active High)
* Modbus RTU communication protocol with RS485
* USB – Device (For device configuration)
* Modular connection (up to 16 modules including itself)
* Led indicators:
  - Power Supply, USB, RS-485
  - Analog Input error led indicators
  - Active Output led indicators

Technical Specifications

Module Type	SMR1P1-00-01-04-00	SMR1P1-00-03-04-00	SMR1P1-00-20-04-00	SMR1P1-00-21-04-00
Supply Voltage	24 VDC ±%20 (19,2 VDC - 28,8 VDC)			
Power Consumption	1W			
Communication	RS-485 Modbus RTU			
USB Device	Mini USB, USB 2.0			
Analog Inputs				
Number of Inputs	4	2	4	2
Input Sensor Type	Cu-50, PT-100, PT-1000, PTC, NTC, mV		V, mA	
Measurement Range / Resolution	Cu-50 -200 .... +200 °C / 0.1 °C -328 .... +392 °F / 0.1 °F PT-100 -200 ... +650 °C / 0.1 °C -328 ... +1202 °F / 0.1 °F PT-1000 -200 ... +650 °C / 0.1 °C -328 ... +1202 °F / 0.1 °F PTC -50 ..... +150 °C / 0.1 °C -58 ..... +302 °F / 0.1 °F NTC -50 ..... +100 °C / 0.1 °C -58 ..... +212 °F / 0.1 °F mV 0 ..... +50 mV / 10 µV		V 0 ..... +2V / 1 mV 0 ..... +5V / 1 mV 0 ..... +10V / 1 mV 2 ..... +10V / 1 mV mA 0 ..... +20mA / 1 µA 4 ..... +20mA / 1 µA	
ADC resolution	15 bit			
Input Impedance	Voltage type inputs > 48 KΩ mA type inputs > 47 Ω Other type inputs ~ 15,4 MΩ			
Overall accuracy	% 0.2 (full scale)			
Response time	Per channel 300msec	150 msec	150 msec	150 msec
Average function	The arithmetic average of the last read measurements according to the specified average number of samples			
Fault detections	1- short circuit, 2- sensor break, 3- over range			
Digital Outputs				
Number of Outputs	4 x Active High			
Output Current	0,3 A (one output), 1.2 A (total COM current)			
Transistor Power	External 24VDC supply must be connected			
Response Time	~170 µsn			
Protection	Short circuit protection			
Led Indicators				
Power	Always ON if the power input is in working limits, flashes 0.1s when undervoltage detected			

	Flashes 0.5s if the communication between Master and Slave module didn't start Flashes 1s if the communication between Master and Slave module broken Flashes 0.2s ON / 2s OFF if the device in Software Boot Mode
USB	Always ON if the USB cable plugged, flashes during data transfer
RS485	Flashes during Modbus data transfer
Analog Input	Always OFF in normal operation Always ON in case of fault detection (Sensor Break, Short Circuit, Over Range) Flashes during PID auto-tune or self-tune process ongoing
Transistor Output	ON when output active, OFF otherwise
Operation / Storage Environment	
Operation Temp.	-10°...+60° C
Storage Temp.	-20°...+70° C
Isolation	* There is no isolation between Analog Inputs * There is no isolation between Power, RS485 and USB * 500 VAC between Power Input and Analog Inputs * 1000 VAC between Power Input and Digital Outputs

Modbus Parameters Addresses

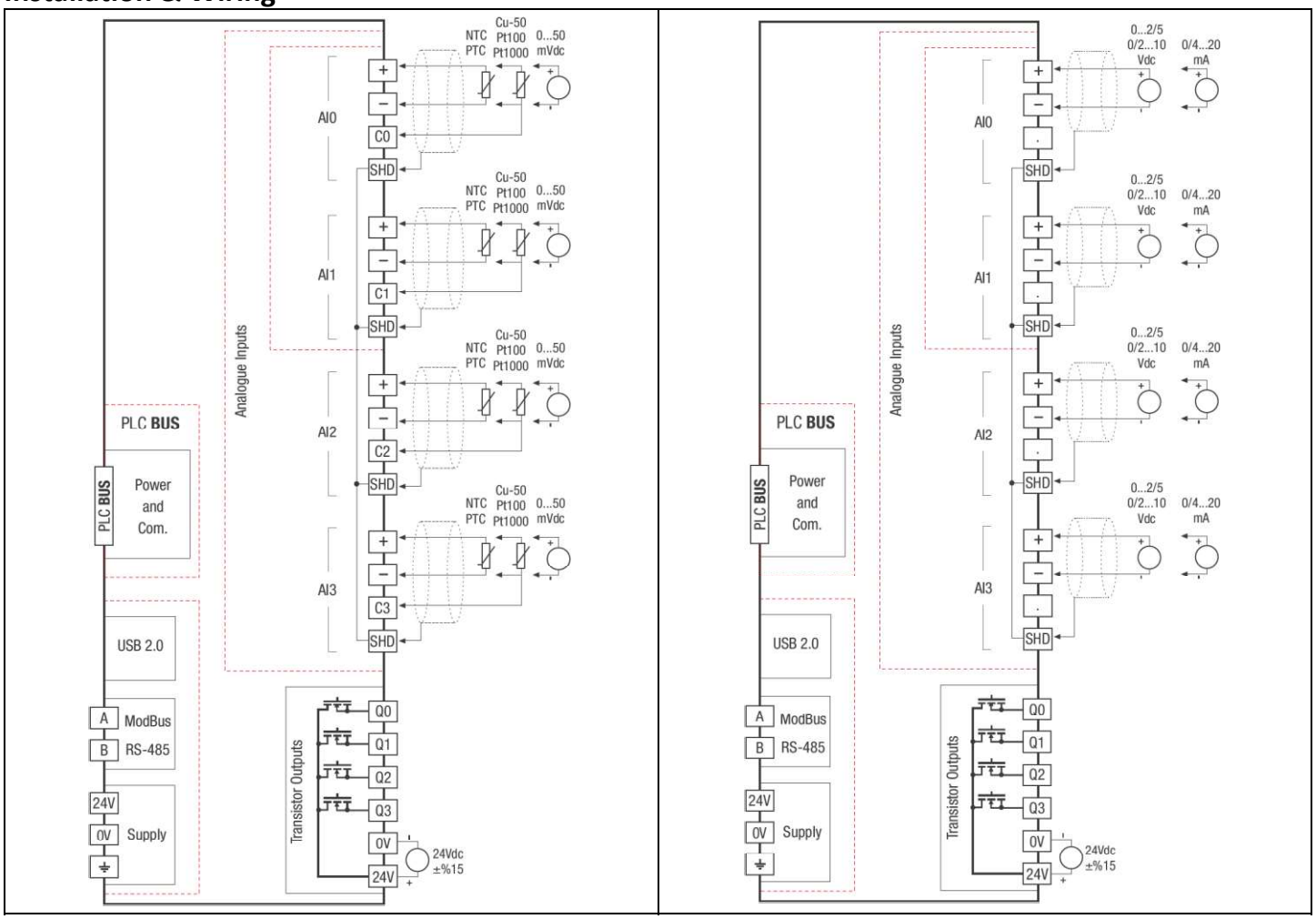
Address	R/W	Parameter Name	Definition	Default
Modbus Parameters				
40001	R/W	ID	Modbus ID can be set between 1 – 255	1
40002	R/W	Baud Rate (kbps)	0- 1200 3- 9600 6- 57600 1- 2400 4- 19200 7- 115200 2- 4800 5- 38400	6
40003	R/W	Stop Bit	0- 1 Bit 1- 2 Bit	0
40004	R/W	Parity	0- None 1- Even 2- Odd	0
Device Parameters				
40005	R	Reserved	In case of Master Mode, shows number of connected Slave Modules	-
40006	R	Type/Bus Order	**b15-b8** : module types according to code : SMR1P1-00-01-04-00_1 = 0xAC SMR1P1-00-03-04-00_1 = 0xA9 SMR1P1-00-20-04-00_1 = 0xAD SMR1P1-00-21-04-00_1 = 0xAA **b7-b0** : module bus order : 0- Master module N- N'th Slave module in the bus (max. 15) 17- Single module (No other device on bus)	-
40007	R	Version	HW and SW versions displayed on a bitwise basis **b15-b12** : Hardware Version **b11-b6** : Software Major Version **b5-b0** : Software Minor Version	-
40008	R/W	Error Status [2]	Error status displayed on a bitwise basis **b0** : Low Power Supply Voltage Level **b1** : Analog Input could not read **b2** : RS485 communication timeout error [1] **b8** : Error in slave module number [1] **b9** : Error in slave module type [1] **b10** : Error in communication between slave modules [1] **b15-b12** : The number of the Slave module in which the error was detected *Note-1 : Error bits are only valid for Master Module.* *Note-2 : In case of communication timeout error arises in Master Module, communication between slave modules interrupted. By writing 3083 to the relavent address, the error bit cleared and the communication started again.*	-

40009	R/W	Timeout Duration	Defined for Master Module Definition Range : (0 – 60sec)	3
Digital Output Parameters				
40129	R/W	Digital Outputs	Digital Output Status in bitwise notation 0 : OFF, 1 : ON **b3-b0** : Q3 - Q0	0

Address				R/W	Parameter Name	Definition	Default
AI0	**AI1**	**AI2**	**AI3**	**Analog Input Parameters**			
40011				R/W	Temperature Display Unit	Applies to all Analog Input sensor types except type V or mA. 0- Celcius (°C) 1- Fahrenheit (°F)	0
40012	40013	40014	40015	R/W	Sensor Type	SMR1P1-00-01-04-00_1 SMR1P1-00-20-04-00_1 SMR1P1-00-03-04-00_1 SMR1P1-00-21-04-00_1 for above module types: for above module types: 0- Cu-50 0- 0-2V 1- PT100 1- 0-5V 2- PT1000 2- 0-10V 3- PTC 3- 2-10V 4- NTC 4- 0-20mA 5- mV 5- 4-20mA	0
40016	40017	40018	40019	R/W	Sensor Offset Value	Depending on the sensor type, values up to ± %10 of measuring range can be entered. For dotted types, the value must be entered as x10	0
40020	40021	40022	40023	R/W	Average Sample Number	Number of last sample readings in Analog Input for average input value calculation. Value can be set between (1 – 20)	4
40024	40025	40026	40027	R	Average Value	Average analog input value	-
40028	40029	40030	40031	R	Present Value	Present analog input value	-
40032	40033	40034	40035	R	Errors	Stores error status in the relavant input in bitwise form **b0** : Sensor Break, Value : 32767 **b1** : Short Circuit, Value : 32766 **b2** : Over Sample, Value : 32765	-
Q0	**Q1**	**Q2**	**Q3**	**Control Parameters**			
40041	40063	40085	40107	R/W	Control Type	0- Passive (In case of this situation, related relay can be controlled manually) 1- PID Mode Active 2- ON-OFF Mode Active 3- Manual Proportional	0
40042	40064	40086	40108	R/W	Set Value	Can be set between (MinScale – MaxScale) values. For dotted type, value can be set as x10	0
40043	40065	40087	40109	R/W	Set Offset	Can be set between (-MaxScale/2 – MaxScale/2) values. For dotted type, value can be set as x10	0
40044	40066	40088	40110	R/W	Hysteresis	Used in ON-OFF mode, can be set between (0 – (MaxScale – MinScale)/2) values. For dotted type, value can be set as x10	0
40045	40067	40089	40111	R/W	Minimum Scale	Can be set between (MinMeasRange – MaxScale) values. For dotted type, value can be set as x10	Min Meas. Range
40046	40068	40090	40112	R/W	Maximum Scale	Can be set between (MinScale – MaxMeasRange) values. For dotted type, value can be set as x10	Max Meas. Range
40047	40069	40091	40113	R/W	Heating Proportio.	Can take values between (0 – 1000)	100
40048	40070	40092	40114	R/W	Heating Integral	Can take values between (0 – 3600)	100
40049	40071	40093	40115	R/W	Heating Derivative	Can take values between (0 – 1000)	250
40050	40072	40094	40116	R/W	Cooling Proportio.	Can take values between (0 – 1000)	100

40051	40073	40095	40117	R/W	Cooling Integral	Can take values between (0 – 3600)	100
40052	40074	40096	40118	R/W	Cooling Derivative	Can take values between (0 – 1000)	250
40053	40075	40097	40119	R/W	Output period	Can take values between (1 – 150s)	1
40054	40076	40098	40120	R/W	Heating/Cooling	0- Heating 1- Cooling	0
40055	40077	40099	40121	R/W	Configuration	**b0** : Control 0- Stop / 1- Run **b1** : Auto Tune 0- Off / 1- On **b2** : Self Tune 0- Off / 1- On **b3** : Power On Control 0- Active / 1- Passive	0 0 0 0
40056	40078	40100	40122	R/W	PID Instant Output Value %	Shows PID % output. In case of manual selected as Control Type, this value used as % output value.	-
40057	40079	40101	40123	R/W	Errors	**b0** : Tune operation terminated due to sensor break. **b1** : Tune operation terminated because it was not completed within 8 hours. **b2** : Tune operation terminated because the Temperature Set value or Heating/Cooling operation option was changed during the process. *Note: Tune error bits are cleared when a new tune operation is started.*	-

Installation & Wiring

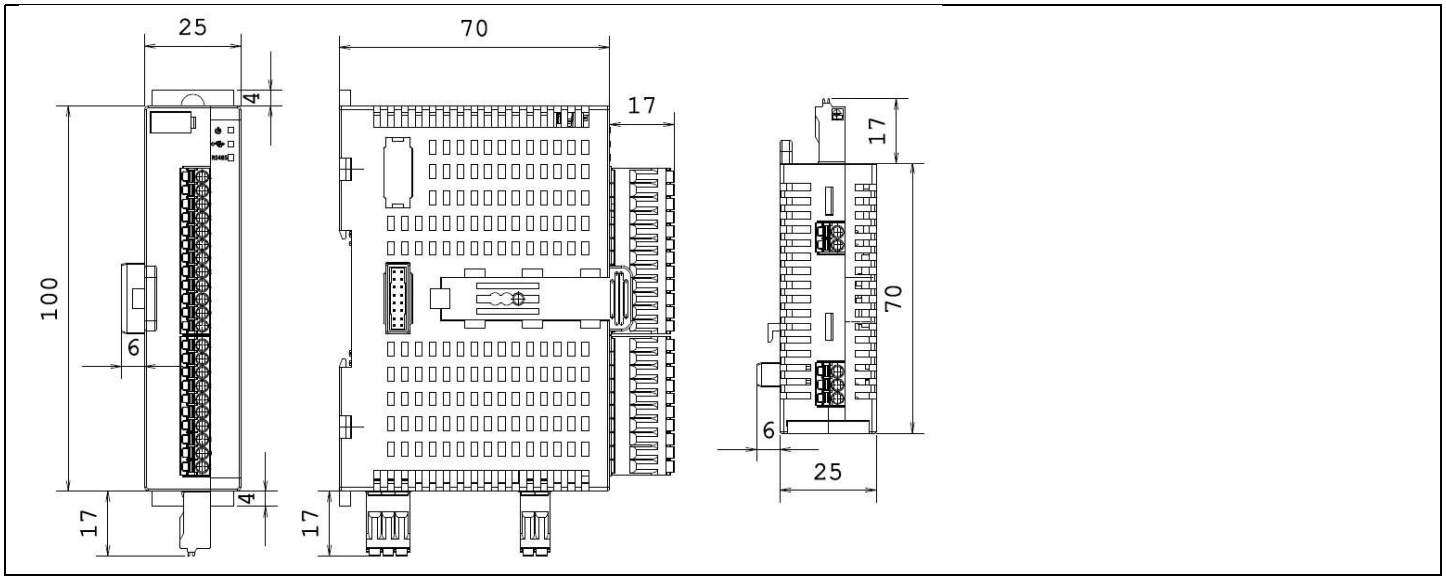


** Do not connect AC Power to any I/O terminal, otherwise serious damage may occur in module. Please check all wiring prior to energizing device. In order to prevent electromagnetic interference, be sure the grounding made corrected. Connect ground terminal in the power input connector to the overall system ground. Don't touch any terminals after energizing the device, in case of need to touch any terminal, de-energize the device before connection.*

** For analog input connections; use original cable of sensors. In order to avoid noise interference, keep sensor cables away from power cables. 3-wire RTD sensor provides line resistance compensation. 2-wire RTD sensor has no line resistance compensation. In order not to be affected from electromagnetic interference, sensor shield cables must be connected to SHD pins and SHD pin must be grounded to system earth.*

** For RS485 communication connection; Connect the termination resistor (120R) between A&B terminal of the master module (located at the far left of the extention module group). In case of more than one extension module group, connect it between the A&B terminals of the master module (located at the far left of the extension module group) of the group at the end of the communication line. Use shielded and twisted-pair communication cable. Ground the shield connection of the cable to power input earth terminal.*

Dimensions



Product Order Codes

Extension Modules with Analog Inputs	Digital Input	Analog Input	Digital Output	Analog Output	USB	PWR	RS 485
SMR1P1-00-01-04-00_1	-	4 x PT100/PT1000/PTC/NTC/mV	4 x Transistor	-	+	+	+
SMR0P0-00-01-04-00_1	-	4 x PT100/PT1000/PTC/NTC/mV	4 x Transistor	-	+	-	+
SMR1P1-00-03-04-00_1	-	2 x PT100/PT1000/PTC/NTC/mV	4 x Transistor	-	+	+	+
SMR0P0-00-03-04-00_1	-	2 x PT100/PT1000/PTC/NTC/mV	4 x Transistor	-	+	-	+
SMR1P1-00-20-04-00_1	-	4 x V/mA	4 x Transistor	-	+	+	+
SMR0P0-00-20-04-00_1	-	4 x V/mA	4 x Transistor	-	+	-	+
SMR1P1-00-21-04-00_1	-	2 x V/mA	4 x Transistor	-	+	+	+
SMR0P0-00-21-04-00_1	-	2 x V/mA	4 x Transistor	-	+	-	+