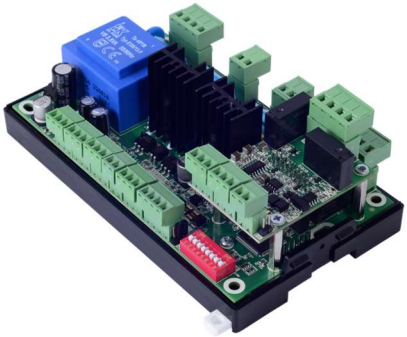
Features



- 220V AC power supply
- 7 pcs Passive Analog Inputs that can be used as voltage-free dry contacts or NTC10K sensors
- 2 pcs 0-10V Active Analog Inputs
- 6 pcs Digital Outputs / 5 A Relay
- 4 pcs 0-10V Analog Outputs
- 2 pcs Triac Output
- Configuration DIP Switch (CONFIGURATION)
- Modbus RTU communication

Applications

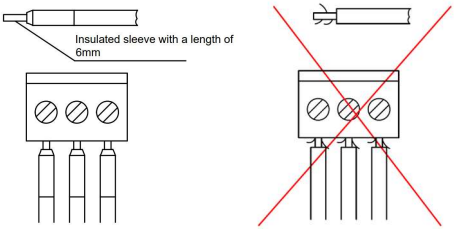
HM100 series is used in building automation and HVAC applications. The module is designed and manufactured to work seamlessly with all devices thanks to Modbus communication.

Usage Notes

Please read the document carefully. HM100 has been designed and manufactured in accordance with the latest technological developments and safety rules. To avoid injury and property damage safety warnings must be observed.

Security Advice-Caution

Installation, maintenance, and repair of the device should be made by authorized personnel. The device has 220 V AC and 1 A internal fuse power supply. Relay outputs do not have internal protection due to the variety of components that can be used. It is recommended to use an external C type fuse suitable for the required current level. Each pin of the supply and relay terminals can carry a maximum current of 20 A. Before making relay output connections, attention should be paid to recommended current levels.



The ends of the connection wires must be protected against delamination using insulated sleeves as shown on the figure.

Order Information

Product code	Definition	Power	Communication (Optional)
HM100 .11	6 pcs Digital Outputs/Relays 4 pcs Analog Outputs 7 pcs Passive Inputs 2 pcs Analog (Active) Inputs 2 pcs Triac Outputs	Max. 4VA	Modbus RTU

Technical Specifications

Power Supply	220VAC + 10% -15%, 50/60Hz
Power consumption	Max. 4VA
Operating temperature	0°C... +50 ℃
Storage Temperature	- 20°C ... +70°C
Relative humidity	% …. 95 rh, non-condensing
Cable Connections	Socket Terminal, Max. 1 x 2.5mm2
Measurement Range	NTC10K: -50°C …+150°C Analog Input Voltage: 0-10V
Measurement Accuracy	NTC: 0.1°C Analog Input: 0.1V
Inputs	7 pcs Passive Inputs (NTC10K Temperature Sensor, Voltage-Free Dry Contact) 2 pcs Pieces 0-10V Active Analog Input
Outputs	6 pcs Digital Outputs* 4 pcs 0-10V Analog Outputs 2 pcs Triac Outputs**
Communication	1 pc RS-485, Modbus RTU
Box Type	Rail Type Box (Optional Junction Box)
Plastic Box Material	ABS (UL 94 V-0)
Dimensions	157 x 56.7 x 103mm (W x H x D)

* There are relays with 5A current capability on the product. The recommended maximum current level for optimum relay life is 4A for resistive loads and 2A for inductive loads.
**Recommended maximum current is 8A. Considering the inrush current, a 10 A fuse is installed.

Mounting Location
Due to its structure, the device is suitable for wall mounting or rail mounting within the panel. It is recommended to leave space for cable connections to the terminals to be made while mounting on the rail.

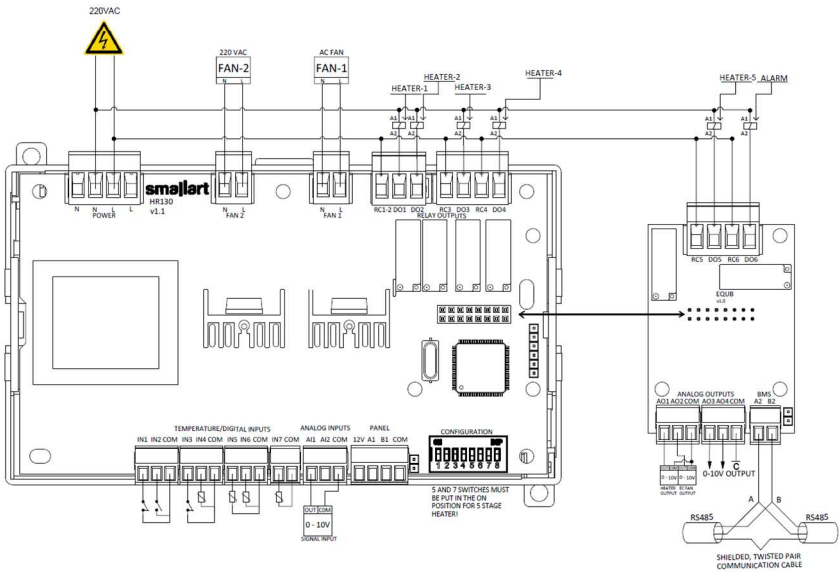
CAUTION: Power off the supply at C type circuit breaker or glass fuse before installation to avoid fire, shock or death

Mounting Instructions

Please follow the below instructions during mounting.

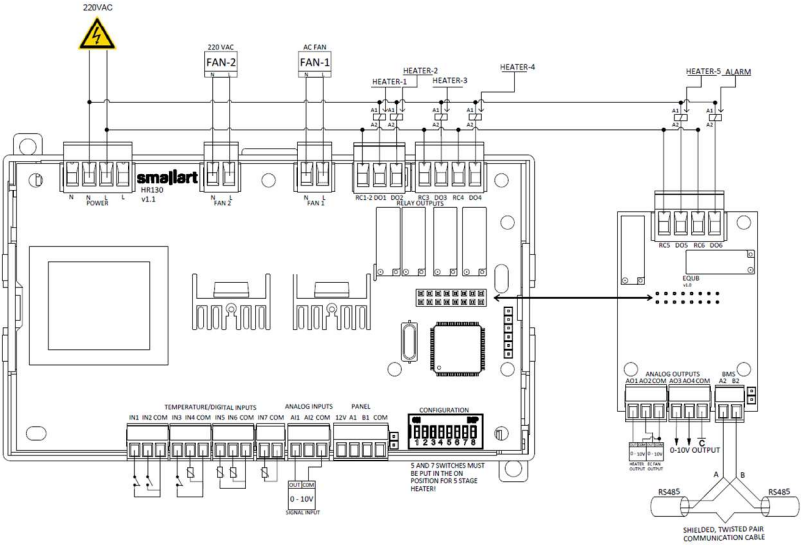
1. **Step:** Make sure the device is powered OFF.
2. **Step:** Connect the wires and equipment according to the connection diagrams below.
3. **Step:** Scenario selection and factory reset operations are done via the CONFIGURATION DIP Switches.
4. **Step:** Make sure that all connections are made correctly.
5. **Step:** Power the device.

Connection Diagram



Connections Diagram for HM100 Input-Output

Note: Connections of general inputs and outputs are given in the diagram above. In heater multiplexing scenarios, connections appropriate to the scenario must be made.



Connection Diagram for HM100 5 Stage Heater Scenario

Note: The wiring diagram given above is for Scenario 5. Connections must be made to the selected scenario appropriately.

Usage Details of HM100 Scenarios

HM100 device can be used as an input/output module and heater multiplexer. Configuration Dip Switch can be used to choose between two scenarios.

Input/Output Module

When the 5th, 6th, and 7th dip switches OFF the device can be used as an input/output module. The 8th switch is used for factory reset, it must be in the OFF position except for the reset process.

Heater Multiplexing Scenarios

Scenario 1: When the 5th switch is ON, the device operates in one stage. DO1 relay output becomes active according to the signal read from the analog input.

Scenario 2: When the 6th switch is ON, the device operates in two stages. DO1 and DO2 relay outputs are activated according to the signal read from the analog input.

Scenario 3: When the 5th and 6th switches are ON, the device operates in three stages. DO1, DO2, and DO3 relay outputs are activated according to the signal read from the analog input.

Scenario 4: When the 7th switch is ON, the device operates in four stages. DO1, DO2, DO3, and DO4 relay outputs are activated according to the signal read from the analog input.

Scenario 5: When the 5th and 7th Switches are ON, the device operates in five stages. DO1, DO2, DO3, DO4, and DO5 relay outputs are activated according to the signal read from the analog input.

Note: AO1 output is staged according to the number of stages of the heater scenario.

Note: When the 5th, 6th, and 7th or 6th, and 7th dip switches are ON, the heater will be controlled as a 5-stage.

Alarm Conditions

There are 3 contact alarms on the heater multiplexing card. It can be monitored via the BMS menu according to the incoming alarm value. If one or more alarms are active, all outputs are turned off.

IN1: Fan Safety Contact

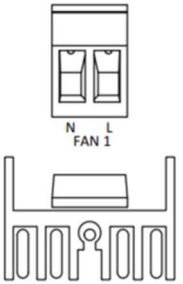
IN2: DPS Security Contact

IN3: Overheat Contact

Device Power Connection

Line output of 220VAC power supply is connected to L(Line) terminal and neutral output of the 220VAC power supply is connected to N(Neutral) terminal. The maximum current that can pass through the power terminal is 20A.

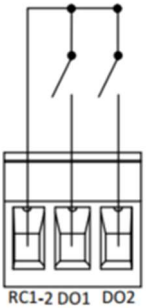
Triac Connection



Fan connections L(line) and N (Neutral) cables are connected to the relevant terminals on the board as shown in the left figure The maximum fan current that can be used at triac outputs is 8 A.

In heater multiplexing scenarios, Triac-1 output can be used as a fan and Triac-2 output can be used as 220V supply.

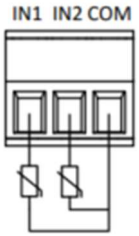
Digital Outputs



The voltage to be switched with DOx relays should be connected to the RC terminal. The voltage connected to RC terminals can be received from the DOx terminals when the DOx relays are closed. This applies to all digital output terminals.

If the device is used in heater multiplexing scenarios, the necessary connections must be made to the heater stage outputs according to the scenario.

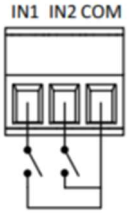
Passive Inputs (NTC10K)



Connect the two cables of the NTC10K sensor as shown in the left picture. You can also make this connection for other passive input terminals.

If the device is used in heater multiplexing scenarios, connections must be made to the inputs here according to the assignments made in the scenarios. Unassigned inputs can be used for monitoring purposes.

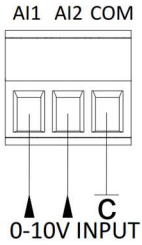
Passive Inputs (Dry Contact)



Connect the two cables of the Dry contact as shown in the left picture. You can also make this connection for other passive input terminals.

If the device is used in heater multiplexing scenarios, connections must be made to the inputs here according to the assignments made in the scenarios.

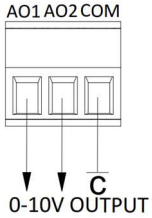
Analog Inputs



Connect the 0-10V output cables coming from the sensors, field devices, etc. to the AIx input. Connect the GND or COM cable of the relevant device to the "COM" terminal of the HM100 module as shown in the left picture.

If the device is used in heater multiplexing scenarios, connections must be made to the inputs here according to the assignments made in the scenarios.

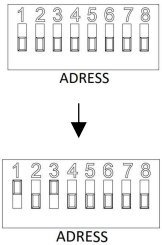
Analog Outputs



The 0-10V output is connected to the 0-10V input of the relevant device and the GND or COM cable of the relevant device is connected to the "COM" terminal of the EQUB module as shown in the figure on the left.

If the device is used in heater multiplexing scenarios, connections must be made to the inputs here according to the assignments made in the scenarios.

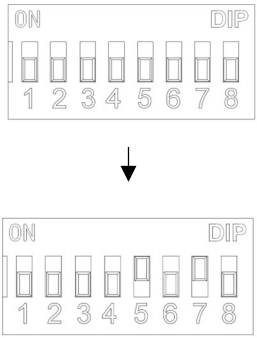
Configuration Switch Setting



Modbus address can be set in binary between 1 and 15 with the first 4 DIP switches.

Addressing can be done via BMS when the first 4 DIP switches are in the Off position. Up to 247 addresses can be provided via BMS.

→ **Ex:** When **1.** and **3**. switches are turned **ON;** the device address will be 5.

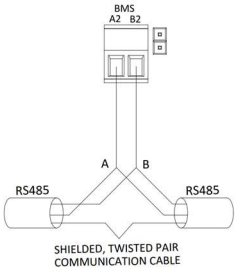


Switches 5, 6, and 7 are used for scenario selection. Scenario selection can be made from the Dip Switch as Binary.

To return to factory settings, turn ON and OFF the 8th dip switch and then power reset the card.

→ **Ex:** When the 5. and 7. switches are turned ON; the device operates in the 5. scenario.

Communication Connection and End of Line Resistance (EOL)



Communication connection can be made as shown in the left figure. Make a connection on the EQUB module between the "A" or "+" terminal of the device communication port and the A2 terminal of the control card and between the "B" or "- "terminal and the B2 terminal. To activate the end-of-line resistor, activate the jumper above the word A2 B2 on the EQUB module.

Default baud rate value: 9600 bps
Default parity value: None
Default address value: 1

Note: Baud rate and address value can be changed via the communication menu.

HM100 Modbus Parameters

Modbus Address	Parameter First Name	Read/ Write (R/W)	Default	Minimum	Maximum	Explanation
Decimal: 200	Hardware Version	R	110	0	9999	It is the parameter that shows the Hardware ID value of the device. The version number corresponding to the value of the parameter is as in the example below. Value: 110 - > Version: v1.10
Decimal: 201	Software Version	R	100	0	9999	It is the parameter that shows the Software ID value of the device. The version number corresponding to the value of the parameter is as in the example below. Value: 100 - > Version: v1.00
Decimal: 202	Modbus Address	R/W	1	1	247	This parameter shows the address information of the device read through the Address Dip Switch. Note: If related address switches are in the Off position, Modbus addressing can be made with this point.
Decimal: 203	Device Scenario Information	R	0	1	5	This parameter shows the scenario information read through the Dip Switch.
Decimal: 204 : Decimal: 299	Reserved	-	-	-	-	-
Decimal: 300	Temperature Input 1	R	-	-500	1500	NTC10K temperature sensor value read from IN1 input.
Decimal: 301	Temperature Input 2	R	-	-500	1500	NTC10K temperature sensor value read from IN2 input.
Decimal: 302	Temperature Input 3	R	-	-500	1500	NTC10K temperature sensor value read from IN3 input.
Decimal: 303	Temperature Input 4	R	-	-500	1500	NTC10K temperature sensor value read from IN4 input.
Decimal: 304	Temperature Input 5	R	-	-500	1500	NTC10K temperature sensor value read from IN5 input.
Decimal: 305	Temperature Input 6	R	-	-500	1500	NTC10K temperature sensor value read from IN6 input.
Decimal: 306	Temperature Input 7	R	-	-500	1500	NTC10K temperature sensor value read from IN7 input.

Decimal: 307	Digital Input 1	R	0	0	1	Input state of IN1. NC 0: Closed Contact 1: Open Contact NO 0: Open Contact 1: Closed Contact
Decimal: 308	Digital Input 2	R	0	0	1	Input state of IN2. NC 0: Closed Contact 1: Open Contact NO 0: Open Contact 1: Closed Contact
Decimal: 309	Digital Input 3	R	0	0	1	Input state of IN3. NC 0: Closed Contact 1: Open Contact NO 0: Open Contact 1: Closed Contact
Decimal: 310	Digital Input 4	R	0	0	1	Input state of IN4. NC 0: Closed Contact 1: Open Contact NO 0: Open Contact 1: Closed Contact
Decimal: 311	Digital Input 5	R	0	0	1	Input state of IN5. NC 0: Closed Contact 1: Open Contact NO 0: Open Contact 1: Closed Contact
Decimal: 312	Digital Input 6	R	0	0	1	Input state of IN6. NC 0: Closed Contact 1: Open Contact NO 0: Open Contact 1: Closed Contact
Decimal: 313	Digital Input 7	R	0	0	1	Input state of IN7. NC 0: Closed Contact 1: Open Contact NO 0: Open Contact 1: Closed Contact
Decimal: 314	Passive Input (IN1) Dry Contact Type Selection	R/W	0	0	1	This parameter determines the contact type of IN1. 0: Normally Open (NO) 1: Normally Closed (NC)
Decimal: 315	Passive Input (IN2) Dry Contact Type Selection	R/W	0	0	1	This parameter determines the contact type of IN2. 0: Normally Open (NO) 1: Normally Closed (NC)
Decimal: 316	Passive Input (IN3) Dry Contact Type Selection	R/W	0	0	1	This parameter determines the contact type of IN3. 0: Normally Open (NO) 1: Normally Closed (NC)
Decimal: 317	Passive Input (IN4) Dry Contact Type Selection	R/W	0	0	1	This parameter determines the contact type of IN4. 0: Normally Open (NO) 1: Normally Closed (NC)
Decimal: 318	Passive Input (IN5) Dry Contact Type Selection	R/W	0	0	1	This parameter determines the contact type of IN5. 0: Normally Open (NO) 1: Normally Closed (NC)
Decimal: 319	Passive Input (IN6) Dry Contact Type Selection	R/W	0	0	1	This parameter determines the contact type of IN6. 0: Normally Open (NO) 1: Normally Closed (NC)

Decimal: 320	Passive Input (IN7) Dry Contact Type Selection	R/W	0	0	1	This parameter determines the contact type of passive input IN7. 0: Normally Open (NO) 1: Normally Closed (NC)
Decimal: 321	Analog Input 1	R	0	0 - > 0,00 V	1000 - > 10,00 V	This parameter shows the voltage value read from AI1 input.
Decimal: 322	Analog Input 2	R	0	0 - > 0,00 V	1000 - > 10,00 V	This parameter shows the voltage value read from AI2 input.
Decimal: 323	Triac Output-1	R	0	0	13	Used as AC fan output. It shows the AC fan value according to the signal it receives from the analog input.
Decimal: 324	Triac Output	R	13	0	13	-
Decimal: 325	Digital Output 1	R/W	0	0	1	This parameter shows 1st stage output status for heating multiplexing scenarios. In this case, the parameter will be read-only. For the I/O module scenario, the parameter will be used to operate DO1. 0: Relay closed 1: Relay open
Decimal: 326	Digital Output 2	R/W	0	0	1	This parameter shows 2nd stage output status for heating multiplexing scenarios. In this case, the parameter will be read-only. For the I/O module scenario, the parameter will be used to operate DO2. 0: Relay closed 1: Relay open
Decimal: 327	Digital Output 3	R/W	0	0	1	This parameter shows 3rd stage output status for heating multiplexing scenarios. In this case, the parameter will be read-only. For the I/O module scenario, the parameter will be used to operate DO3. 0: Relay closed 1: Relay open.
Decimal: 328	Digital Output 4	R/W	0	0	1	This parameter shows 4th stage output status for heating multiplexing scenarios. In this case, the parameter will be read-only. For the I/O module scenario, the parameter will be used to operate DO4. 0: Relay closed 1: Relay open
Decimal: 329	Digital Output 5	R/W	0	0	1	This parameter shows 5th stage output status for heating multiplexing scenarios. In this case, the parameter will be read-only. For the I/O module scenario, the parameter will be used to operate DO5. 0: Relay closed 1: Relay open

Decimal: 330	Digital Output 6	R/W	0	0	1	This parameter shows 6th stage output status for heating multiplexing scenarios. In this case, the parameter will be read-only. For the I/O module scenario, the parameter will be used to operate DO6. 0: Relay closed 1: Relay open
Decimal: 331	Analogue Output 1	R/W	0	0 - > 0,00 V	1000 - > 10,00 V	This parameter shows analog stage output status for heating multiplexing scenarios. In this case, the parameter will be read-only. For the I/O module scenario, the parameter will be used to operate AO1. 0 -> 0,0 V 100 -> 10,0V
Decimal: 332	Analogue Output 2	R/W	0	0 - > 0,00 V	1000 - > 10,00 V	This parameter shows analog stage output status for heating multiplexing scenarios. In this case, the parameter will be read-only. For the I/O module scenario, the parameter will be used to operate AO2. 0 -> 0,0 V 100 -> 10,0V
Decimal: 333	Analogue Output 3	R/W	0	0 - > 0,00 V	1000 - > 10,00 V	This parameter shows analog stage output status for heating multiplexing scenarios. In this case, the parameter will be read-only. For the I/O module scenario, the parameter will be used to operate AO3. 0 -> 0,0 V 100 -> 10,0V
Decimal: 334	Analogue Output 4	R/W	0	0 - > 0,00 V	1000 - > 10,00 V	This parameter shows analog stage output status for heating multiplexing scenarios. In this case, the parameter will be read-only. For the I/O module scenario, the parameter will be used to operate AO4. 0 -> 0,0 V 100 -> 10,0V
Decimal: 335 : Decimal: 399	Reserved	-	-	-	-	-
Decimal: 400	Temperature Sensor Beta Value	R/W	3435	2000	6000	This parameter determines the beta value used for NTC10K temperature sensors. Note: Please note that if the value of this point is changed, it will affect all temperature inputs.

Decimal: 401	Temperature Input 1 Calibration Point	R/W	0	-30	30	This parameter determines the calibration value of the NTC10K temperature sensor read from the IN1.
Decimal: 402	Temperature Input 2 Calibration Points	R/W	0	-30	30	This parameter determines the calibration value of the NTC10K temperature sensor read from the IN2.
Decimal: 403	Temperature Input 3 Calibration Points	R/W	0	-30	30	This parameter determines the calibration value of the NTC10K temperature sensor read from the IN3.
Decimal: 404	Temperature Input 4 Calibration Points	R/W	0	-30	30	This parameter determines the calibration value of the NTC10K temperature sensor read from the IN4 input.
Decimal: 405	Temperature Input 5 Calibration Points	R/W	0	-30	30	This parameter determines the calibration value of the NTC10K temperature sensor read from the IN5 input.
Decimal: 406	Temperature Input 6 Calibration Points	R/W	0	-30	30	This parameter determines the calibration value of the NTC10K temperature sensor read from the IN6 input.
Decimal: 407	Temperature Input 7 Calibration Points	R/W	0	-30	30	This parameter determines the calibration value of the NTC10K temperature sensor read from the IN7 input.
Decimal: 408	Baud Rate	R/W	0	0	3	0 = 9600bps 1 = 19200bps 2 = 38400bps 3 = 76800bps
Decimal: 409 : Decimal: 799	Reserved	-	-	-	-	-
Decimal: 800	Alarm Output	R	0	0	7	It shows the alarm values occurring on the card. 0: No alarm 1: Fan Safety Contact Alarm 2: DPS Security Contact Alarm 4: Overheat Contact Alarm Note: If more than one alarm is active, the summary of the alarm values will be shown. Example: If the Fan Safety Contact Alarm and Overheating Contact Alarm are active, value 5 will show.

Dimensions (mm)