SMART PANEL WITH MODBUS COMMUNICATION

12 digital inputs and 4 digital outputs

TECHNICAL DATA

Supply voltage:	19V...26V AC 27V...35V DC
Power consumption:	9,15 VA @ 24V AC
Digital inputs:	12 x dry contact
Digital outputs:	4 x C-NO relay (277V AC 5A Resistive) or (30V DC 3A Resistive)
Indicators LED:	Status, TX, RX, DI, DO
Communication:	RS 485 Modbus RTU
RS485 unit load:	1/8 Unit Load Up to 256 Bus nodes
Speed:	9600 / 19200 / 57600 / 115200
Parity:	Even
Stop bits:	1
Address:	1-247
Terminating:	120Ω via jumper J2
Pull down biasing:	0V dc VSS via jumper J3
Pull up biasing:	5V dc VDD via jumper J4
Ambient temperature:	-30...+60°C
Cable inlets:	1 x PG16 and 4 x PG21
Wiring Terminals:	Pluggable terminal blocks Max 1x2,5 mm² or 4x0,5 mm² per terminal
Weight:	610 grams (Packaged)
Dimensions (WxHxD):	225x85x190 mm (Packaged)
Protection class:	IP67 (With suitable cable gland)

CHARACTERISTICS

The Smart Panel is a junction box designed to provide; Supplying power and enabling RS485 Modbus RTU communication for the field equipments to which it is connected.

It eliminates cabling from each field equipment to individual DDC panels, and even DDC panels.

Saving meters of cables, DDC panels and troublesome workmanship

A small junction box specially designed for HVAC BMS field equipment

Gains communication capability to field HVAC BMS field equipment

FUNCTION

Smart Panel is an IP67 enclosed RS485 Modbus RTU I/O module.

Smart Panel has capability to be a slave I/O module for any device which has RS485 Modbus RTU master communication capability.

Setting Smart Panel' s Modbus address and baud rate is done by RS485 Modbus RTU commands.

In the case of RS485 Modbus RTU communication failure during approximately for 20 seconds Smart Panel will turn off all digital outputs for BMS HVAC equipment safety.

APPLICATION

Smart Panel designed and engineered especially for HVAC BMS equipment and systems. It is also good solution for cost effective PLC systems.

MOUNTING

Smart Panel is wall-mounted indoors and outdoors.

MAINTENANCE

Smart Panel is maintenance-free.

ORDERING EXAMPLE

Item code	**Description**
Smart Panel	I/O Module with RS485 Modbus RTU communication.

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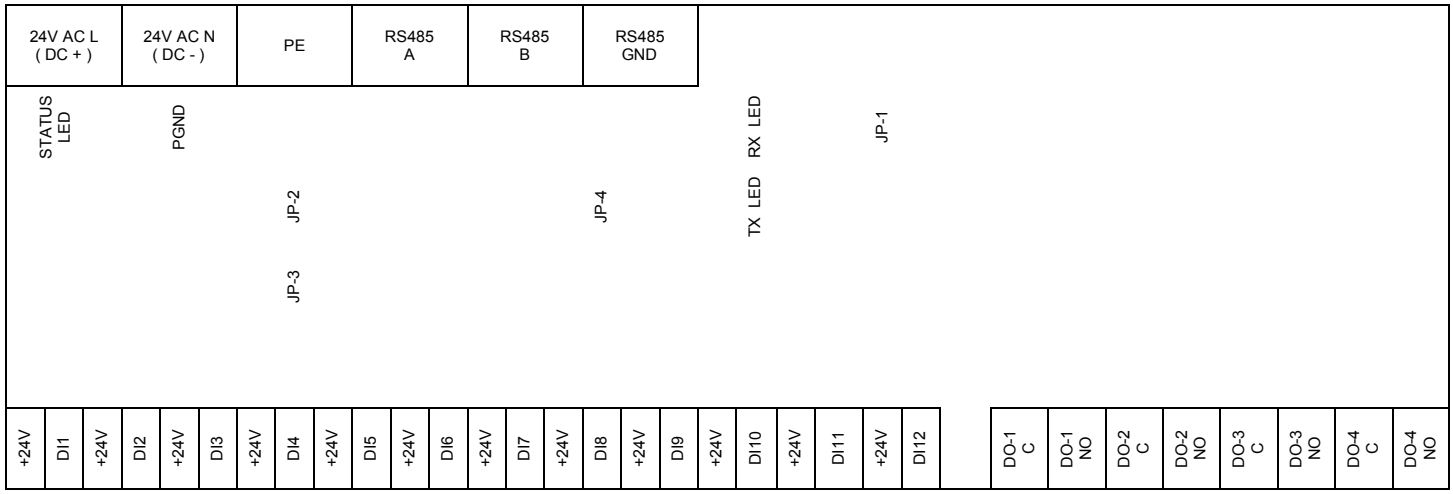
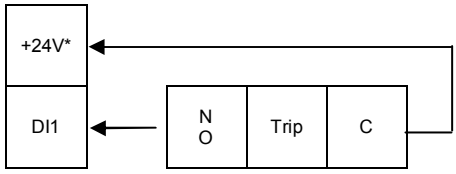
SMART PANEL INSTALLATION INSTRUCTIONS

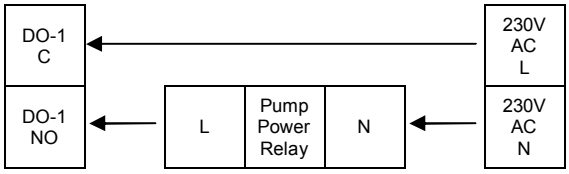


SMART PANEL WIRING



Digital Input Wiring

***Any +24V DI input terminal can be used as a common signal input for all DI. Do not use any power supply terminal for common signal source.**



Digital Output Wiring

Indicators LED

TX	Transmitting data to master
RX	Receiving data from master
STATUS	Heart beat, normal operating
DI1...12	DI On, LED On
DO1...4	DO On, LED On

Jumpers ON (Plugged) OFF (Unplugged) Default

JP-1	Modbus address and baud rate setting and temperature calibration	Normal operating
JP-2	RS485 line 120 ohm termination	No line termination
JP-3	Pull down biasing	No pull down biasing
JP-4	Pull up biasing	No pull up biasing
PGND	GND connected to PE	No connection between GND and PE

Serial Port Configuration

Baud rate (JP-1 OFF)	9600 / 19200 / 57600 / 115200
Data bits	8
Stop bits	1
Parity	Even
Flow control mode	None
Modbus data mode	RTU

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Setting mode address (JP-1 ON before turn on power supply)	247
Setting mode baud rate (JP-1 ON before turn on power supply)	57600

Factory default Modbus address is the last 3 digit of serial number.
Example, for serial number 080621D10076, Modbus address is 76.
Except serial numbers 248, 249, 250.
Default address for these are 248=1, 249=2 and 250=3.
Factory default Modbus baud rate is 57600.

Modbus Registers

Coils (0x)		**Function**	**Range**	**Value**
1	0x0001	Digital output #1	On / Off	On / Off
2	0x0002	Digital output #2	On / Off	On / Off
3	0x0003	Digital output #3	On / Off	On / Off
4	0x0004	Digital output #4	On / Off	On / Off
Discrete inputs (1x)		**Function**	**Range**	**Value**
10001	1x0001	Digital input #1	On / Off	On / Off
10002	1x0002	Digital input #2	On / Off	On / Off
10003	1x0003	Digital input #3	On / Off	On / Off
10004	1x0004	Digital input #4	On / Off	On / Off
10005	1x0005	Digital input #5	On / Off	On / Off
10006	1x0006	Digital input #6	On / Off	On / Off
10007	1x0007	Digital input #7	On / Off	On / Off
10008	1x0008	Digital input #8	On / Off	On / Off
10009	1x0009	Digital input #9	On / Off	On / Off
10010	1x0010	Digital input #10	On / Off	On / Off
10011	1x0011	Digital input #11	On / Off	On / Off
10012	1x0012	Digital input #12	On / Off	On / Off

SETTING SMART PANEL' S MODBUS ADDRESS AND BAUD RATE (Setting mode by JP-1) ***[PLC Addresses BASE 1]***

1. Set JP-1 On
2. Turn on Smart Panel's power supply
3. Status led will verify entering setting mode by blink once
4. After status led blink once, Smart Panel address will be 247 and baud rate will be 57600
5. Be sure that master device online with Smart Panel

6. Write 1 to Modbus address 5 *[use 05 : write single coil, write 1 (on) to address 5]*
7. Status led will turn on and verify Smart Panel is ready for new address
8. Write 100 to Modbus address 40005 (100 is example) *[use 06 : write single register, write 100 to address 5]*
9. Read Modbus address 30005 for verifying new address (100) *[use 04 : read input registers, read 100 from address 5]*
10. Write 0 to Modbus address 5 *[use 05 : write single coil, write 0 (off) to address 5]*
11. Status led will turn off and verify Smart Panel' s addressing is completed

12. Write 1 to Modbus address 6 *[use 05 : write single coil, write 1 (on) to address 6]*
13. Status led will turn on and verify Smart Panel is ready for new baud rate
14. Write 1 to Modbus address 40006 (1=9600 2=19200 3=57600 4=115200) *[use 06 : write single register, write 1 to address 6]*
15. Read Modbus address 30006 for verifying new baud rate (1) *[use 04 : read input registers, read 1 from address 6]*
16. Write 0 to Modbus address 6 *[use 05 : write single coil, write 0 (off) to address 6]*
17. Status led will turn off and verify Smart Panel' s setting baud rate is completed

18. Turn off Smart Panel's power supply
19. Wait for approximately 10 seconds
20. Set JP-1 Off
21. Turn on Smart Panel's power supply
22. See heartbeat by status led
23. Settings are finished now, Smart Panel' s Modbus address is 100 and baud rate is 9600 baud

If you are a Tridium, Niagara Framework user, we will be glad to share our station for this procedures.