DECK Monitoring LLC | 830 SW 10th Ave, Ste #200 • Portland, OR 97205 | www.deckmonitoring.com | 503.224.5546

Wiring & Configuration for PVPowered Inverters

There are two methods of connecting PV Powered inverters to communicate with DECK Monitoring data servers:

- For the commercial line of inverters that are ModBus compatible, you can connect via RS485 Modbus to the DECK provided data acquisition server (DAS).
- Both residential and commercial lines of PV Powered inverters support communication via the PVM1010 board.

Reference the appropriate section depending on the configuration you select.

This document is intended to be a supplement to the manufacturer's documentation. Generally the only deviation from the manufacturer's documentation is in the area of network wiring, particularly regarding wiring methods for SHIELD DRAIN and DC REF conductors. Rational for this deviation is laid out in the DECK Installation Appendix "RS485 / Modbus RTU Wiring Standards."

Contents:

PVM1010 Communications

PV Powered string inverters can include PVM1010 modules. These modules can be configured to upload data to PV Powered. Please contact PV Powered Support for information on how to install and configure the inverter and PVM1010.

Once the data is properly reporting to PV Powered, send an e-mail to support@deckmonitoring.com with the following information: "PV Powered," Model Number, serial number, JOB ID and/or Project Name.

Modbus Network Communications

It is the goal of this document to provide installing contractors a resource for installation and commissioning information. The topics covered include Modbus network termination landing details, network address/ID configuration, and common Modbus network troubleshooting steps.

Applies To:

- PVP30kW Inverter
- PVP35/50kW Inverter
- PVP75/100kW Inverter

Important Notes to Prepare

Exercise extreme caution when working with, in or around power equipment.

Always refer to the manufacturer's documentation regarding deployment for information regarding operating hazards associated with, in or around the equipment.

Please review the DECK Monitoring Installation Guide, and the Installation Appendix for RS485/Modbus RTU Wiring Standards, prior to deployment of your communications network.

PVP30kW Inverter

Modbus Cable Terminal Landing and Jumper Positions

The PVP30kW Inverter's network connections will be made at the connector labeled "MODBUS SLAVE."

Connect the Data +, Data –, and DC REF conductors of your network cable to the corresponding connector positions as identified in figure 1.

Terminate the SHIELD DRAIN at a chassis ground point.

ALWAYS ENSURE THAT THE INVERTER IS CORRECTLY AND SAFELY GROUNDED PER THE MANUFACTURER'S DOCUMENTATION.

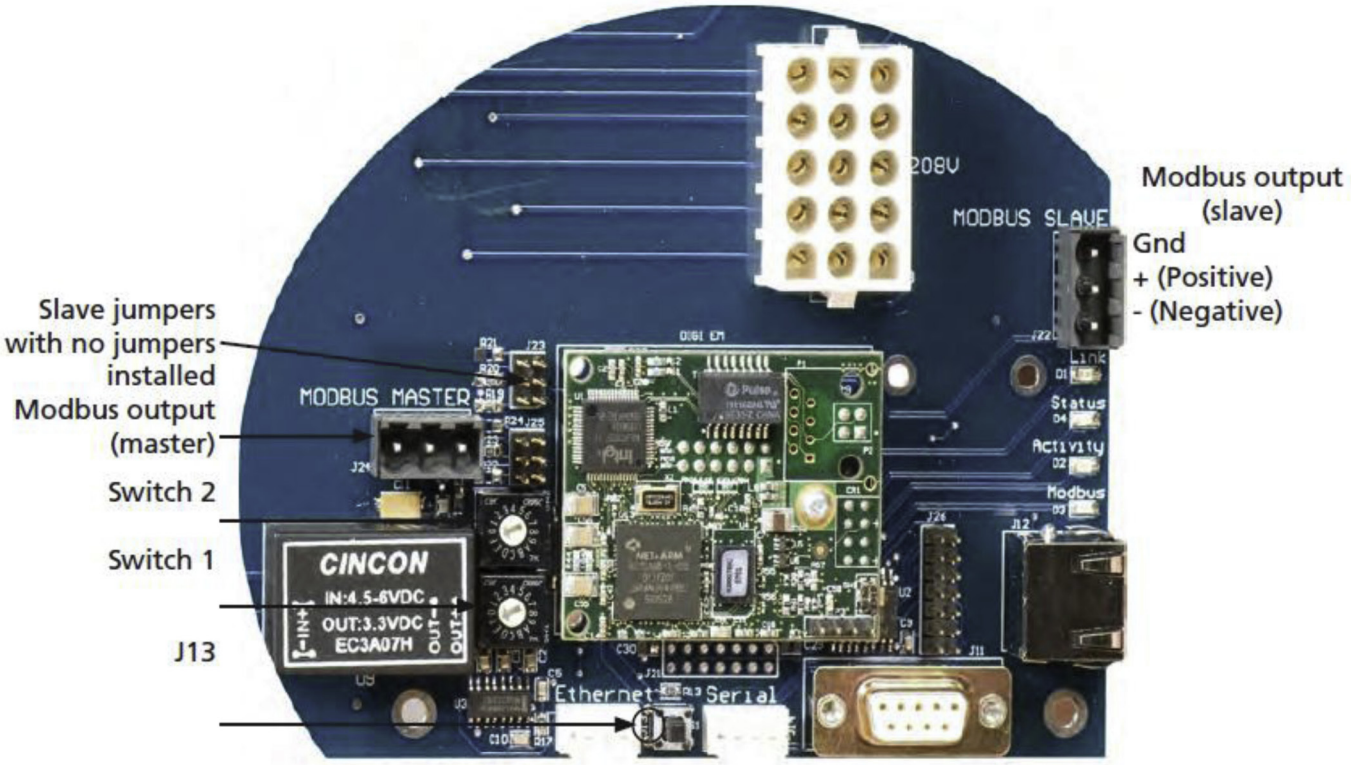

fig. 1

The PVP30kW Inverter provides RS485 termination and Line Bias via jumpers J23 on the PCB. Refer to figure 2 for setting termination and/or Line Bias as required:

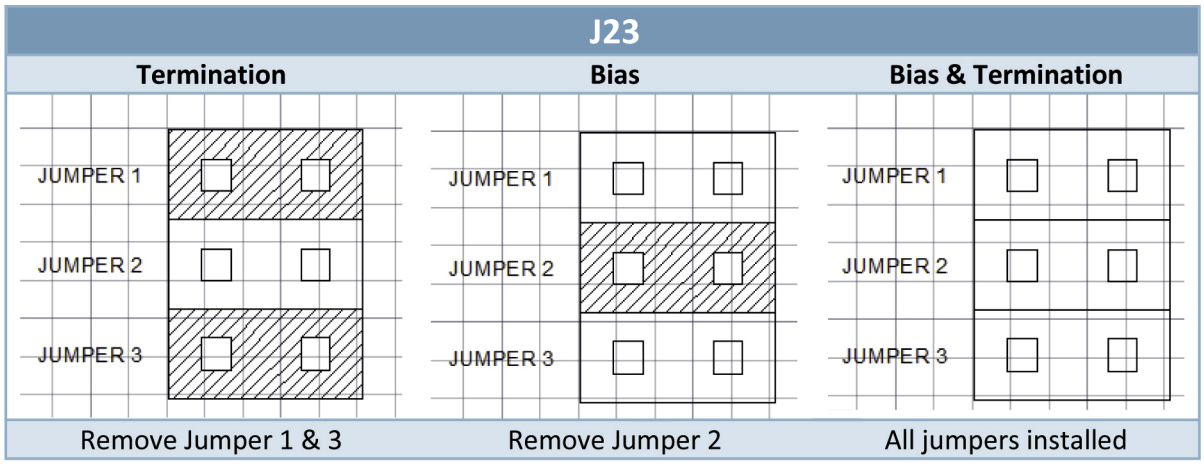

fig. 2

Modbus Device Address/ID Configuration

The Modbus device address/ID is configured via rotary switches labeled Switch 1 and Switch 2. Refer to figure 1 for the switch locations.

Refer to figure 3 when setting the device address/ID.

Remember: each device on a Modbus network must have a unique address/ID.

Address	Switch		Address	Switch		Address	Switch		Address	Switch		Address	Switch	
	1	2		1	2		1	2		1	2		1	2
1	0	1	21	1	5	41	2	9	61	3	D	81	5	1
2	0	2	22	1	6	42	2	A	62	3	E	82	5	2
3	0	3	23	1	7	43	2	B	63	3	F	83	5	3
4	0	4	24	1	8	44	2	C	64	4	0	84	5	4
5	0	5	25	1	9	45	2	D	65	4	1	85	5	5
6	0	6	26	1	A	46	2	E	66	4	2	86	5	6
7	0	7	27	1	B	47	2	F	67	4	3	87	5	7
8	0	8	28	1	C	48	3	0	68	4	4	88	5	8
9	0	9	29	1	D	49	3	1	69	4	5	89	5	9
10	0	A	30	1	E	50	3	2	70	4	6	90	5	A
11	0	B	31	1	F	51	3	3	71	4	7	91	5	B
12	0	C	32	2	0	52	3	4	72	4	8	92	5	C
13	0	D	33	2	1	53	3	5	73	4	9	93	5	D
14	0	E	34	2	2	54	3	6	74	4	A	94	5	E
15	0	F	35	2	3	55	3	7	75	4	B	95	5	F
16	1	0	36	2	4	56	3	8	76	4	C	96	6	0
17	1	1	37	2	5	57	3	9	77	4	D	97	6	1
18	1	2	38	2	6	58	3	A	78	4	E	98	6	2
19	1	3	39	2	7	59	3	B	79	4	F	99	6	3
20	1	4	40	2	8	60	3	C	80	5	0	100	6	4

fig. 3

PVP35/50kW Inverter

Modbus Cable Terminal Landing and Jumper Positions

The PVP35/50kW Inverter's network connections will be made at the connector labeled "SLAVE."

Connect the Data +, Data –, and DC REF conductors of your network cable to the corresponding connector positions as identified in figure 4.

Terminate the SHIELD DRAIN at a chassis ground point.

ALWAYS ENSURE THAT THE INVERTER IS CORRECTLY AND SAFELY GROUNDED PER THE MANUFACTURER'S DOCUMENTATION.

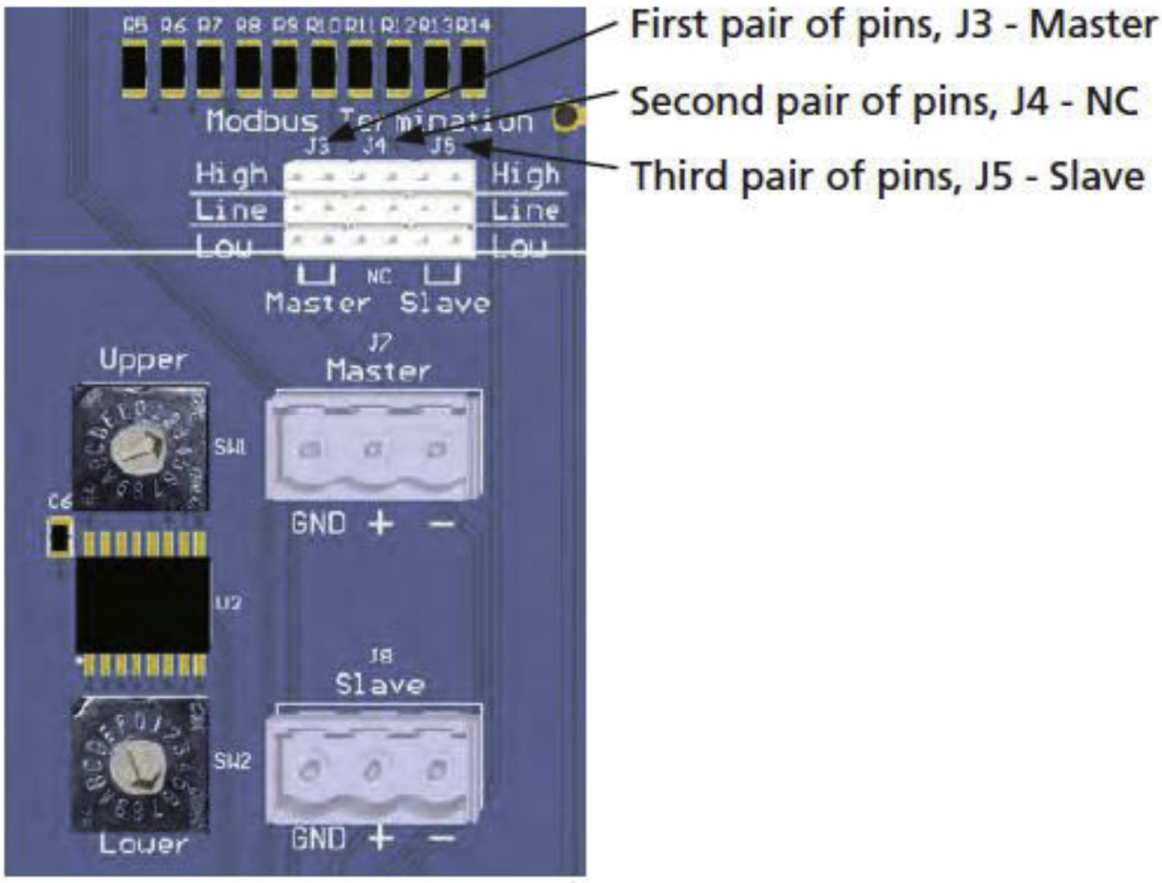

fig. 4

The PVP35/50kW Inverter provides RS485 termination and Line Bias via jumpers J5 on the PCB. Refer to figure 5 for setting termination and/or Line Bias as required:

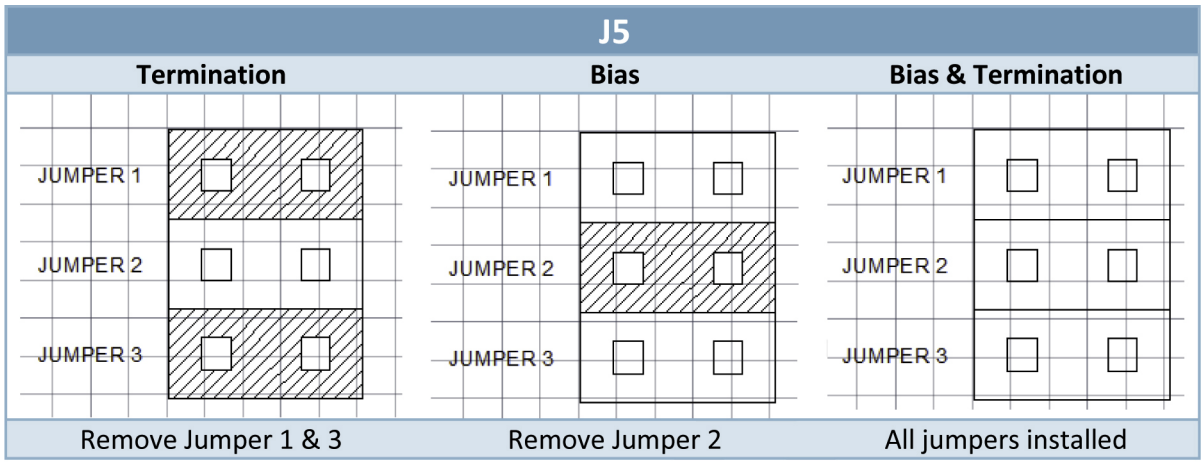

fig. 5

Modbus Device Address/ID Configuration

The Modbus device address/ID is configured via rotary switches labeled SW1 (Switch 1) and SW2 (Switch 2). Refer to figure 4 for the switch locations.

Refer to figure 6 when setting the device address/ID.

Remember: each device on a Modbus network must have a unique address/ID.

Address	Switch		Address	Switch		Address	Switch		Address	Switch		Address	Switch	
	1	2		1	2		1	2		1	2		1	2
1	0	1	21	1	5	41	2	9	61	3	D	81	5	1
2	0	2	22	1	6	42	2	A	62	3	E	82	5	2
3	0	3	23	1	7	43	2	B	63	3	F	83	5	3
4	0	4	24	1	8	44	2	C	64	4	0	84	5	4
5	0	5	25	1	9	45	2	D	65	4	1	85	5	5
6	0	6	26	1	A	46	2	E	66	4	2	86	5	6
7	0	7	27	1	B	47	2	F	67	4	3	87	5	7
8	0	8	28	1	C	48	3	0	68	4	4	88	5	8
9	0	9	29	1	D	49	3	1	69	4	5	89	5	9
10	0	A	30	1	E	50	3	2	70	4	6	90	5	A
11	0	B	31	1	F	51	3	3	71	4	7	91	5	B
12	0	C	32	2	0	52	3	4	72	4	8	92	5	C
13	0	D	33	2	1	53	3	5	73	4	9	93	5	D
14	0	E	34	2	2	54	3	6	74	4	A	94	5	E
15	0	F	35	2	3	55	3	7	75	4	B	95	5	F
16	1	0	36	2	4	56	3	8	76	4	C	96	6	0
17	1	1	37	2	5	57	3	9	77	4	D	97	6	1
18	1	2	38	2	6	58	3	A	78	4	E	98	6	2
19	1	3	39	2	7	59	3	B	79	4	F	99	6	3
20	1	4	40	2	8	60	3	C	80	5	0	100	6	4

fig. 6

PVP75/100kW Inverter

Modbus Cable Terminal Landing and Jumper Positions

The PVP35/50kW Inverter's network connections will be made at the connector labeled "MODBUS SLAVE."

Connect the Data +, Data –, and DC REF conductors of your network cable to the corresponding connector positions as identified in figure 4.

Terminate the SHIELD DRAIN at a chassis ground point.

ALWAYS ENSURE THAT THE INVERTER IS CORRECTLY AND SAFELY GROUNDED PER THE MANUFACTURER'S DOCUMENTATION.

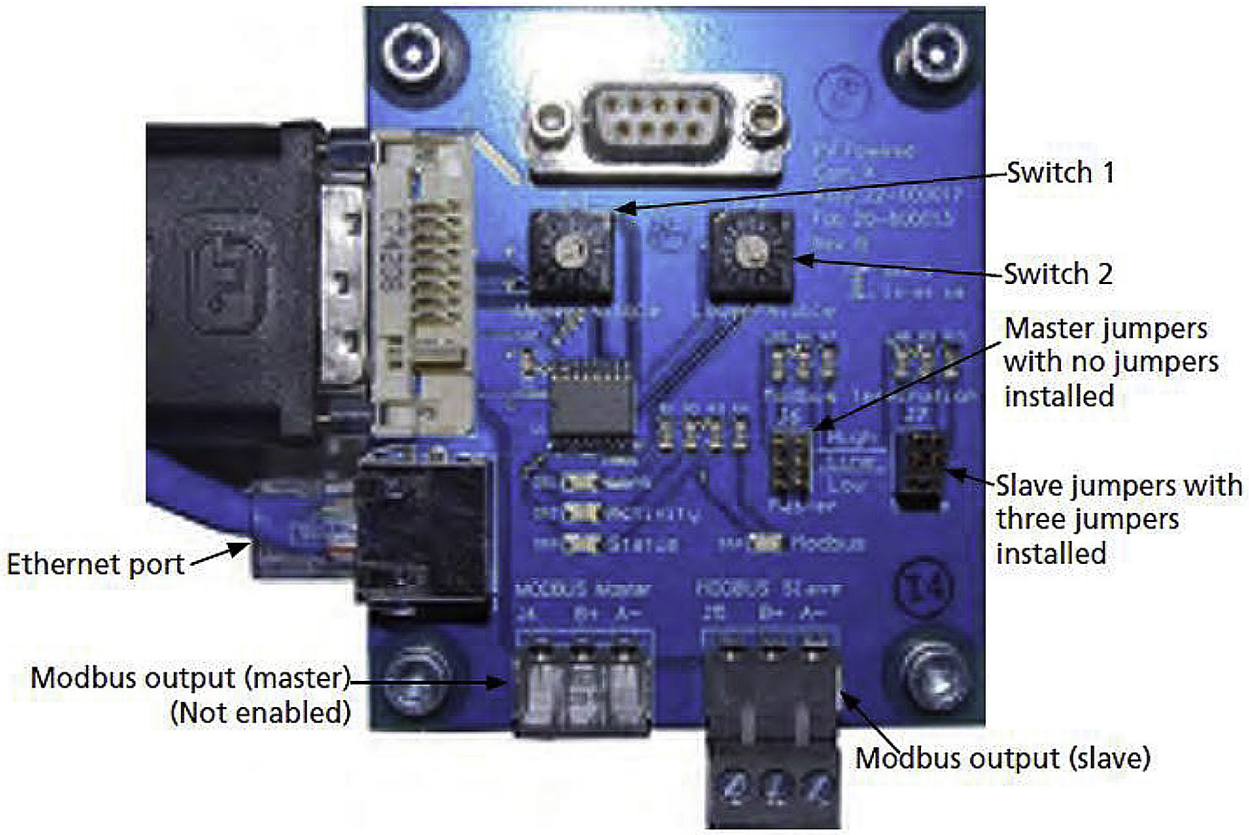

fig. 7

The PVP75/100kW Inverter provides RS485 termination and Line Bias via jumpers J5 on the PCB. Refer to figure 8 for setting termination and/or Line Bias as required:

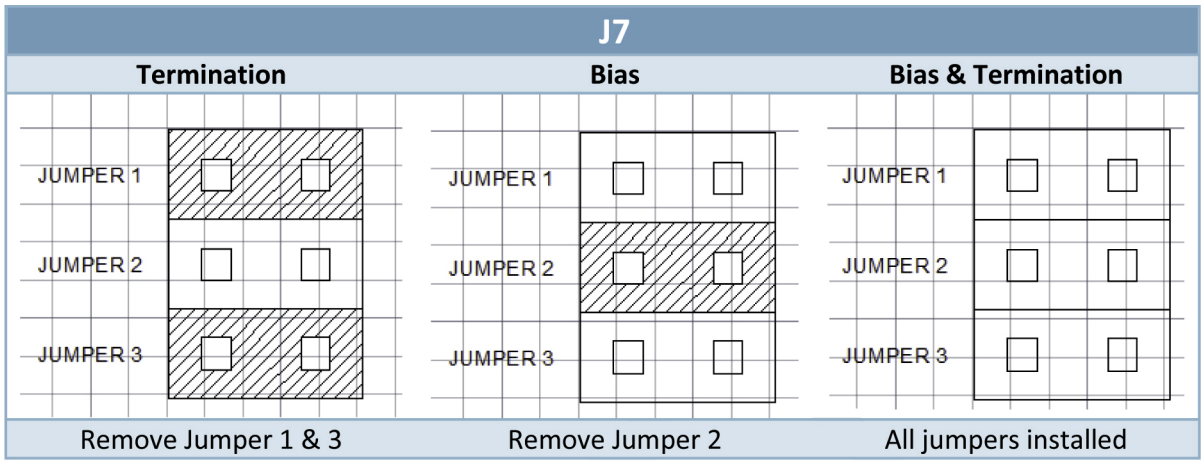

fig. 8

Modbus Device Address/ID Configuration

The Modbus device address/ID is configured via rotary switches labeled SW1 (Switch 1) and SW2 (Switch 2). Refer to figure 4 for the switch locations.

Refer to figure 9 when setting the device address/ID.

Remember: each device on a Modbus network must have a unique address/ID.

Address	Switch		Address	Switch		Address	Switch		Address	Switch		Address	Switch	
	1	2		1	2		1	2		1	2		1	2
1	0	1	21	1	5	41	2	9	61	3	D	81	5	1
2	0	2	22	1	6	42	2	A	62	3	E	82	5	2
3	0	3	23	1	7	43	2	B	63	3	F	83	5	3
4	0	4	24	1	8	44	2	C	64	4	0	84	5	4
5	0	5	25	1	9	45	2	D	65	4	1	85	5	5
6	0	6	26	1	A	46	2	E	66	4	2	86	5	6
7	0	7	27	1	B	47	2	F	67	4	3	87	5	7
8	0	8	28	1	C	48	3	0	68	4	4	88	5	8
9	0	9	29	1	D	49	3	1	69	4	5	89	5	9
10	0	A	30	1	E	50	3	2	70	4	6	90	5	A
11	0	B	31	1	F	51	3	3	71	4	7	91	5	B
12	0	C	32	2	0	52	3	4	72	4	8	92	5	C
13	0	D	33	2	1	53	3	5	73	4	9	93	5	D
14	0	E	34	2	2	54	3	6	74	4	A	94	5	E
15	0	F	35	2	3	55	3	7	75	4	B	95	5	F
16	1	0	36	2	4	56	3	8	76	4	C	96	6	0
17	1	1	37	2	5	57	3	9	77	4	D	97	6	1
18	1	2	38	2	6	58	3	A	78	4	E	98	6	2
19	1	3	39	2	7	59	3	B	79	4	F	99	6	3
20	1	4	40	2	8	60	3	C	80	5	0	100	6	4

fig. 9

Pre-Commissioning Checklist

Check the following items before powering on the Modbus network:

- Data +, Data - & DC REF have continuity throughout the Modbus network
- SHIELD DRAIN is connected on one end only of each length of Modbus network cable
- SHIELD DRAIN is terminated following the recommendations set out in the RS485 / Modbus RTU Wiring Standards document

Note that many Modbus network devices often have diagnostic indicators such as LEDS. Refer to the manufacturer's documentation for the presence and functional definition of such indicators. Often these indicators can aid in quickly identifying a functional network versus a non-functional network by allowing visual indication of Modbus network activity, bus power, etc.