

All of the DPMS X series panel meters have communication capabilities as shown below.

Model Type	Model Option Code	Software Configuration	Modbus	Ethernet WEB Browser	Profibus
DPMS XL+	Base Unit	☆	☆		
	Ethernet	☆	☆	☆	
	Profibus				☆
DPMS XL	'C' version	☆	☆		
DPMS XPQ	Base Unit	☆	☆		
DPMS X1	Base Unit	☆	☆		

One Communication Option  
(Ethernet or Profibus) allowed with the base unit

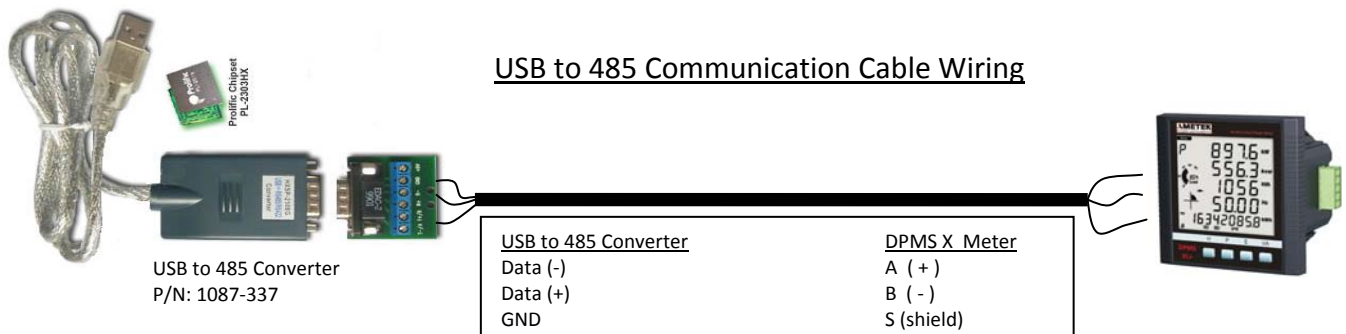
### Software Configuration

Each of the models above has its own software application for configuring the unit. The Modbus RS-485 port can be connected to a PC for software configuration using the RS-485 to Serial or USB Converter Cable. (When using the Serial to USB converter, you must make sure the USB port is redirected to a COM Port.) The DPMS XL+ model can also use the Ethernet Port for connection to the configuration Software.

The Software Configuration application has the following capabilities:

- Display the current status of the I/O
- Display Analog Power measurements
- Display the: Min/Max values, Alarm Log, SOE Log, Harmonics and Phasor Display (depending on the model)
- Display the current settings
- Make configuration changes.

Each DPMS X Series unit includes a CD with the configuration software for all models.



## Modbus Port

The Modbus Port is used for the unit's software configuration and for communicating to remote devices.

The port is equipped for:

- RS-485
- Half Duplex
- 1,200 to 38,400 Baud
- Modbus RTU
- Slave Mode

The port can be used for the following Modbus functions.

Function Code	Description	Action
1	Read Relay Output Status	Obtain current status of Relay Output
2	Read Digital Input(DI) Status	Obtain current status of Digital Input
3	Read Data	Obtain current binary value in one or more registers
5	Control Relay Output	Force Relay to a state of on or off
16	Press Multiple-Register	Place specific binary values into a series of consecutive Multiple-Registers

The Capabilities of the Modbus Protocol are shown below. Some of the data is limited to specific models and the options that are provided.

Item	Details	Read/Write Capability	Data Type
System Set-up	These are all the unit's set-up parameters which are configured through the software. They can be viewed or edited.	Read/Write	16 bit
Analog Measurements	These are all the instantaneous measurements in the meter which can be configured for Primary or Secondary units: (V, I, Watts, VARS, VA, PF, Frequency, Unbalance, Demand)	Read	32 bit
Energy Measurements	These energy measurements can be retrieved or reset (cleared to 0) and include: Whr, VARhr,(delivered, received, Total, & Net), VAhr (Range: 0-999,999,999)	Read/Write	32 bit
Harmonics	The harmonic measurements include: Current & Voltage THD and Individual per phase	Read	16 bit
Max/Min	This data includes all the Max/Min data (if provided for that meter type) along with the timestamp when it occurred	Read	16 bit
Alarm Data	This provides all the alarms set along with the timestamp	Read	16 bit
Pulse Counter	This provides the total number of pulses counted for that input	Read	16 bit
Sequence of Events	This provides the last 20 events with the time stamp and digital input number	Read	16 bit
Unit Status	Provides the current status of all I/O options. For Digital I/O, it provides the ON/OFF status. For Analog I/O, it provides the actual value	Read	16 bit
Control Outputs	This provides the ability to turn and off the digital outputs	Write	16 bit
Date and Time	This is used to retrieve and set the system date and time	Read/Write	16 bit



## Ethernet Port

The Ethernet option is provided on a plug-in module for the DPMS XL+ and includes its own WEB server that can host a web page using an internet Browser. The WEB Browser is used to display the power measurements and system status. In addition, you can view the system set-up and make changes to some meter configuration via the web browser. The Ethernet Port can also be used simultaneously for the Modbus TCP/IP protocol. For demonstration purposes, you can connect the DPMS Ethernet port directly to your PC Ethernet port using a crossover cable. Alternatively, you can use a standard one to one Ethernet cable when connecting the DPMS Ethernet directly to your Hub or Switch.

The Ethernet Option has the following capabilities:

- RJ45 Connection
- 10/100 Auto Adapted
- Fixed IP or Dynamic (DHCP)
- Selectable Port Address for HTTP(WEB Browser) and Modbus TCP/IP
- Email notification via SMTP
- Password Protected

### Modbus TCP/IP

All of the same features and functions as described in the Modbus Protocol.

### WEB Browser

The Ethernet Port will provide the following capabilities via the WEB Browser:

- Display the current status of the I/O
- Display Analog Power measurements
- Display the: Min/Max values, Alarm Log, SOE Log, Harmonics and Phasor Display (depending on the model)
- Display the current settings
- Make configuration changes
- Set-up the email notification

The WEB Browser is password protected to keep unauthorized users from changing the configuration.



## Profibus Port

The Profibus option is provided on a plug-in module for the DPMS XL+.

PROFIBUS (Process Field Bus) is an international field bus standard which is widely used in automation technology of manufactures and flow industry. It is a widely used, open digital communication system, which is suitable for high-speed, time-critical, and high reliability communications.

The Profibus Module has the following capabilities:

- Profibus DP
- RS-485
- Slave Mode, addressable from 0-126
- 9.6K to 12Mbs Baud Rate
- 9 Pin D Type connector

The Profibus port provides the same data as the Modbus port.

The DPMS X series panel meters have various I/O capabilities as shown below.

Model Type	Model Option Code	I/O Variations				
		Digital Inputs	Digital Outputs	Relay Outputs	Analog Inputs	Analog Outputs
DPMS XL+	IO1	6	-	2	-	-
	IO2	4	2	-	-	2
	IO3	4	-	2	2	-
DPMS XL	A	-	-	-	-	-
	B	-	2	-	-	-
	C	-	-	-	-	-
DPMS XPQ	D	4	2	2	-	-
	E	4	2	2	-	-
	F	4	2	2	-	-
	G	4	2	2	-	-
DPMS X1	DI	4	-	-	-	-
	RO	-	-	2	-	-
	AO1,2,3	-	-	-	-	1



I/O Module

### **DPMS XL+**

The **DPMS XL+** uses plug-in I/O modules and is limited to two I/O option modules per meter.

Up to (3) I/O modules per meter can be used when there is no communication option ordered- max of (2) of the same type.

#### Digital Inputs (Qty. 4 to 16)

The Digital Inputs accept a *wetted* field contact input (voltage supplied externally) with a voltage of 20-250VAC/VDC. The IO1 option includes a 24VDC isolated power supply which can provide the input wetting voltage for up to 21 'dry' contact inputs.

The Digital Inputs can be configured to either:

- Provide status of the input contact (on/off and time stamp)
- Act as a pulse counter.

#### **Input Status**

When detecting the status, the display and Modbus Output will indicate whether the input is ON (contact closed) or OFF (contact open). In addition, the I/O module will record the time and date to the millisecond (SOE feature) and store the last 20 events. The time clock can be initially set on the DPMS-XL+ using the configuration software, front panel menus or Modbus commands and it is synchronized with an internal crystal that has 0.5 sec/day accuracy.

#### **Pulse Counter**

This mode will count the number of open/closed contact operations. It will display the number of pulses which can be scaled in the software as well as indicate the quantity via the Modbus communications. The counter can be cleared via the front display or Modbus communications.

### Digital Outputs (Qty. 2 or 4)

Digital Outputs are provided via solid state MOS capable of switching 0-250VAC/VDC, 100mA maximum. Each Form A output can be configured as an alarm or energy output. Alarms can be triggered through a configurable setting of various power measurements including volts, amps, power, THD and the Analog Inputs if used. Energy outputs can be configured to pulse upon a scalable delivered or received Whr or VARhr.

### Relay Outputs (Qty. 2 to 6)

Relay Outputs are provided via Form A contacts capable of switching 3A @ 250VAC or 30VDC. The relay operation is configurable as an alarm or control output. Each pair of relay outputs work in parallel so the configuration of either an Alarm Function or Control Function applies to both relays.

The Alarm Function can be triggered through a configurable setting of various power measurements including volts, amps, power, THD and the Analog Inputs if used. Each Relay Output can have its own alarm trigger.

The Control Output function allows you to operate the contact through the Modbus Communications.

### Analog Inputs (Qty. 2 or 4)

This option will accept two Analog inputs for 0-20Ma, 4-20mA, 1-5V or 0-5V (must select one). The input is displayed from a linear scale of 0-4095 in Hex that corresponds to the input signal. The Analog Inputs can also be used to trigger the alarms for the Digital and Relay Outputs.

### Analog Outputs (Qty. 2 or 4)

The Analog Outputs are available for 0-20Ma, 4-20mA, 1-5V or 0-5V (must select one). The Analog outputs can be individually configured to represent various power measurements (Volts, Amps, Watts, VARS, etc). The actual analog output can also be displayed from a linear scale of 0-4095 in Hex that corresponds to the output signal.

The Displayed Value = Analog Output in mA x 4096 / Full Scale (.02A or 5V).

Example: Analog Output = 10mA, the displayed value will be =  $0.01 \times 4096 / 0.02 = 2048$

## DPMS XL



The **DPMS XL** has 2 built-in Digital Outputs available in the 'B' version.

### Digital Outputs (Qty. 2)

Digital Outputs are provided via solid state MOS capable of switching 0-250VAC/VDC, 100mA maximum. Each Form A output can be configured as an alarm or energy output. Alarms can be triggered through a configurable setting of various power measurements including volts, amps, power, THD and the Analog Inputs if used. Energy outputs can be configured to pulse upon a scalable delivered or received Whr or VARhr.



## DPMS XPQ

The **DPMS XPQ** includes built-in I/O to support: Qty. 4 Digital Inputs, Qty. 2 Digital Outputs and Qty. 2 Relay Outputs.

### Digital Inputs (Qty. 4)

The Digital Inputs accept a *wetted* field contact input (voltage supplied externally) with a voltage of 5-30VDC. All models include a 15VDC isolated power supply which can provide the input wetting voltage for up to 21 'dry' contact inputs.

The Digital Inputs can be configured to:

- Provide status of the input contact (on/off and time stamp)
- Trigger the recorder to capture waveforms

#### **Input Status**

When detecting the status, the display and Modbus Output will indicate whether the input is ON (contact closed) or OFF (contact open). In addition, the I/O module will record the time and date to the millisecond (SOE feature) and store the last 20 events. The time clock can be initially set on the DPMS-XPQ using the configuration software, front panel menus or Modbus commands and it is synchronized with an internal crystal that has 0.5 sec/day accuracy.

#### **System Trigger**

The trigger of waveform recording can be combined with the same functions as Input Status. Once initiated, the waveform will capture 5 cycles before and after the trigger of each voltage and current input (6 channels) and will store a maximum of 5 events. The waveform capture is performed at 16 samples/cycle.

#### Digital Outputs (Qty. 2)

Digital Outputs are provided via solid state MOS capable of switching 0-250VAC/VDC, 100mA maximum. Each Form A output can be configured as an alarm or energy output. Alarms can be triggered through a configurable setting of various power measurements including volts, amps, power, THD and the Analog Inputs if used. Energy outputs can be configured to pulse upon a scalable delivered or received Whr or VARhr.

#### Relay Outputs (Qty. 2)

Relay Outputs are provided via two Form A contacts capable of switching 3A @ 250VAC or 30VDC. The relay operation is configurable as an alarm or control output. The two relay outputs work in parallel so the configuration of either an Alarm Function or Control Function applies to both relays.

The Alarm Function can be triggered through a configurable setting of various power measurements including volts, amps, power, THD and the Analog Inputs if used. Each Relay Output can have its own alarm trigger. The Control Output function allows you to operate the contact through the Modbus Communications.



### **DPMS X1**

The **DPMS X1** has 3 options for built-in I/O and can include 1 of each type per meter. (4 Digital Inputs, 2 Relay Outputs, 1 Analog Output)

#### Digital Inputs (Qty. 4)

The Digital Inputs accept a *wetted* field contact input (voltage supplied externally) with a voltage of 16-30VDC. The Digital Inputs can be configured to provide status of the input contact (on/off). When detecting the status, the display and Modbus Output will indicate whether the input is ON (contact closed) or OFF (contact open).

#### Relay Outputs (Qty. 2)

Relay Outputs are provided via two Form A contacts capable of switching 3A @ 250VAC or 30VDC. The relay operation is configurable as an alarm or control output. The two relay outputs work in parallel so the configuration of either an Alarm Function or Control Function applies to both relays.

The Alarm Function can be triggered through a configurable setting of various power measurements including volts, amps, power, THD and the Analog Inputs if used. Each Relay Output can have its own alarm trigger. The Control Output function allows you to operate the contact through the Modbus Communications.

#### Analog Outputs (Qty. 1)

The Analog Output is available for :4-20mA (option AO1), 0-1mA (Option AO2) or 0-5V (Option AO3). The Analog output can be configured to represent various power measurements (Volts, Amps, Watts, VARS, etc). The actual analog output can also be displayed from a linear scale of 0-4095 in Hex that corresponds to the output signal.

The Displayed Value = Analog Output in mA x 4096 / Full Scale (.02A or 5V).

Example: Analog Output = 10mA, the displayed value will be =  $0.01 \times 4096 / 0.02 = \mathbf{2048}$