



DPM-MRTU

Digital Voltage Monitor
ModbusRTU Communication
Single & Three Phase
115 to 277VAC, Single Phase
200 to 600VAC, Three Phase



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Purpose

The purpose of the DPM-MRTU is to monitor the line voltage supplying single and three phase systems, providing the opportunity to disconnect equipment if the voltages are outside of the selectable operational parameters.

Operation

If the voltages and rotation are within the selectable set-up parameters, the DPM-MRTU will energize the internal relay, transferring the output contacts. If the voltages and/or rotation are outside any of the set-up parameters, the DPM internal relay will not be energized. All of the display information will be communicated via Modbus to your operational controller.

If the line voltage does not meet all of the set-up parameters, the Default screen will toggle between the voltage screen showing the actual voltages and words describing the fault.

During transitions to relay energized or relay de-energized, the remaining time in seconds is displayed above the present relay condition ("ON" or "off").

General Operational Specifications

Line Voltages Monitored: 115 to 277VAC, 1Ø, 50/60Hz
200 to 600VAC, 3Ø, 50/60Hz

Faults:	Overvoltage Undervoltage Phase Loss Phase Rotation Phase Imbalance Frequency Out of Range
Set-Up:	Membrane Buttons & Digital Display <ul style="list-style-type: none">• Nominal Line Voltage• Over/Undervoltage percentage (3% to 15%)• Trip Time Delay (2 seconds to 10 seconds)• Re-Start Time Delay (1 second to 5 minutes)• Phase Imbalance Percentage (3% to 15%)
Screens:	Manufacture Name and Firmware Version Average Voltage, Imbalance %, Crest Factor, Relay Status A-B, B-C & C-A Voltages, Relay Status Nominal Voltage Selection (Pay attention to 1Ø and 3Ø at the end of the voltages) Over/Undervoltage Percentage Selection Trip Time Delay Re-Start Time Delay Phase Imbalance Percentage Selection History with Last 4 Faults (Wraps back to Manufacture Name and Firmware Version)

Default Set-Up

The default set-up for the DPM-MRTU as shipped from R-K Electronics is:

Line Voltage:	460VAC, 3Ø
Over & Undervoltage:	±10%
Trip Time Delay:	5 seconds
Re-Start Time Delay:	5 seconds
Phase Imbalance:	5%
ModbusRTU Address	49

Custom Set-Up

The DPM-MRTU uses 4 membrane buttons to allow the customer to change the set-up criteria for their particular line voltage and preferred parameters. The following listings show the arrangement and selections available by moving through the menu choices. The membrane buttons allow for movement right or left with wrap around to selection criteria and up and down within a selection for specific parameters.

You can select the set-up parameters with only the supply voltage connected.

Example: From the Default screen (A-B, B-C & C-A voltages with relay status) pressing the right Arrow will take you to the line voltage selection parameters. If you want to change the nominal voltage to a different voltage, press the Up or Down arrows. Once you have the line voltage (and number of phases) that you want displayed on the screen:

1. Pressing either the Right or Left arrow will set the new line voltage parameter into memory and take you to the next screen, or
2. After 30 seconds of no action, the new voltage parameter will be set into memory and the screen will go back to the default screen.

Example: If you want to change the Re-Start Delay to 3 minutes (default is 5 seconds) and you are on the Default screen:

1. Press the Right arrow until you get to the Re-Start Delay screen
2. Press the Up button until you have 3 Minutes on the screen
3. Pressing either the Right or Left arrow will set the new Re-Start Delay into memory and take you to the next screen, or
4. After 10 seconds of no action, the new Re-Start Delay will be set into memory and the screen will go back to the Default screen.

Screens

Manufacturer's Screen

R-K Electronics
DPM-MRTU v1.0.05

Average Voltage Screen

VAvg lmb Hz
460 0 60 off

Default –

The Default screen shows the real time voltage detected on each of the 3 phases:

A-B B-C C-A
460 459 461 ON

Voltage Selection Screen (Vertical Format)

115, 1Ø; 120, 1Ø; 200, 1Ø; 208, 1Ø; 220, 1Ø; 230, 1Ø; 240, 1Ø; 265, 1Ø; 277, 1Ø;
200, 3Ø; 208, 3Ø; 220, 3Ø; 230, 3Ø; 240, 3Ø; 380, 3Ø; 415, 3Ø; 440, 3Ø;
460, 3Ø; 480, 3Ø; 575, 3Ø; 600, 3Ø;

Over/Undervoltage Percentage Screen (Vertical Format)

3%, 4%, 5%, 6%, 7%, 8%, 9%, 10%, 11%, 12%, 13%, 14% & 15%

Trip Time Delay Screen (Vertical Format)

2S, 3S, 4S, 5S, 6S, 27S, 8S, 9S & 10S

Re-Start Time Delay Screen (Vertical Format)

Manual, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 30S, 1M, 2M, 3M, 4M & 5M

Phase Imbalance Percentage Screen (Vertical Format)

3%, 4%, 5%, 6%, 7%, 8%, 9%, 10%, 11%, 12%, 13%, 14% & 15%

Modbus Address (Vertical Format)

1 to 247

Fault Screen (Vertical Format)

"0" most recent fault, "1" previous fault, "2" third oldest fault & "3" fourth oldest fault

Fault words:

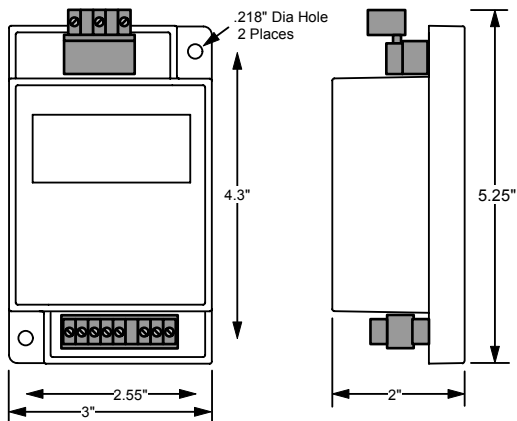
"Voltage Low" (Average line voltage is less than selected Undervoltage percentage)
"Voltage High" (Average line voltage is more than selected Overvoltage percentage)
"Imbalance" (One Phase is lower than the average voltage by more than the Imbalance percentage)
"Phase Loss" (One phase is more than 30% below the Line Voltage selection)
"Bad Rotation" (The phase rotation sequence is reversed)
"Bad Freq" Line frequency out of allowable range of 45 to 65Hz)

Specifications

Supply Voltage:	12VDC, 24VDC, 24VAC, 120VAC, & 240VAC, 1Ø, ±10%	
Part Number:	<i>Pluggable Blocks</i>	
12 VDC:	DPM-12D-MRTU-T	DPM-12D-MRTU-B
24 VDC:	DPM-24D-MRTU-T	DPM-24D-MRTU-B
24 VAC:	DPM-24A-MRTU-T	DPM-24A-MRTU-B
110-120 VAC:	DPM-120A-MRTU-T	DPM-120A-MRTU-B
208-240 VAC:	DPM-240A-MRTU-T	DPM-240A-MRTU-B
Display:	16 Character, 2 line; Back Lighting	
Voltage Accuracy:	Approx ±1%	
Buttons:	(4) Right & Left, Up & Down	
Line Voltage Ranges:	115 to 277VAC, 1Ø 200 to 600VAC, 3Ø	
Frequency Range:	45 to 65Hertz for all voltages	
Over & Undervoltage:	3% to 15%	
Phase Imbalance:	3% to 15%	
Phase Loss:	≥30% low voltage in any one phase	
Phase Rotation:	A-B-C	
Re-Start Time Delay:	1 second to 5 minutes Manual Reset Option	
Trip Time Delay:	1 second to 30 seconds	
Output:	SPDT Contact, 10A @ 120VAC ModbusRTU	
Termination:	Tabs: Control Voltage: 0.187" Push-On tabs 3Ø Voltage: 0.250" Push-On tabs	
Packaging:	Blocks: Pluggable Approx. 3"W x 5"L x 2"H Dust Cover and Epoxy Filled Base	
Mounting:	Surface or DIN Mount	



Dimensions



Connections

