# DPM-10

## Digital, fully featured Power Meter

Digital Power Meter DPM-10

## Multiple Display
### That Shows It All

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# DPM-10 Features

The DPM-10 is an advanced microprocessor-based Electronic Power Meter, which combines highly accurate readings with reliability, for full supervision and monitoring of electric power. By replacing several analogue devices and selector switches, the DPM-10 is a cost effective alternative providing the enhanced flexibility required by modern power systems.

Easily integrated into any energy management network, the DPM-10 includes RS 485 communication with open MODBUS protocol which can provide bi-directional access to and from any power monitoring system.

## Instantaneous Measurements

- Voltage - 3 phase to phase          (V, KV)
- Voltage - 3 phase to neutral        (V, KV)
- Current - 3 phases                  (A, KA)
- Maximum demand                      (A, KA)
- Active Power                        (KW, MW)
- Reactive power                      (KVAR, MVAR)
- Active Energy                       (KWH, MWH)
- Reactive Energy                     (KVARH, MVARH)
- Power Factor                        (Lag or lead)
- Frequency                           (Hz)

## Advantages at a Glance

- True RMS measurement (scan time 0.5 mSec.)
- Accurate calculation of non-sinusoidal waveform
- Power & Energy measurements
- Accuracy class 0.5 with long term stability
- Bright Seven Segment, visual clarity at long distance viewing
- Programmable parameters display configuration
- User-friendly programming via front panel or communication
- Programmable Pulse output Relay (KWH)
- Versatile communication RS 485 & 232 with Modbus Protocol
- Suitable for 3 or 4 wire systems, 2 or 3 C/Ts and P/Ts
- Isolated inputs
- Electro magnetic compatibility
- Compact 144 x 144 x 95 mm

## Typical Applications

- Panel boards, switchboards, switchgear, MCCs
- Diesel Generator sets (4 quadrants calculation)
- UPS systems
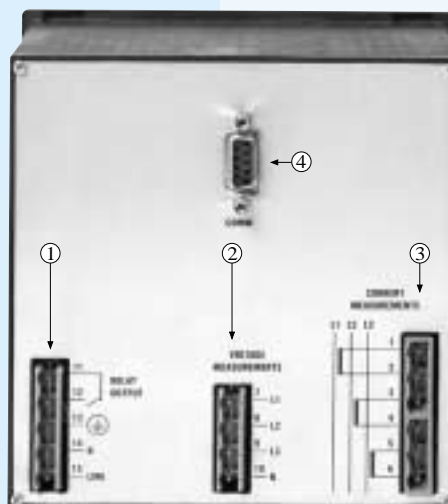- Stand alone display mode or as part of an energy monitoring system

# Front & Rear Panels

## Front Panel



User friendly four key front panel for easy programming.

## Rear Panel



① Control supply and Pulse (KWH) output
② Mains voltage measurement
③ Mains current measurements
④ RS232 and RS485 Modbus communication

## Ranges & Accuracy

| Parameter | Range | Accuracy ** |
|---|---|---|
| Voltage - L / L * | 0 -9999V | ± 0.3% of reading & ± 0.3% of full scale ± 1 digit (in the range of 10-115% of full scale) |
| Voltage - L / N * | 10-99.99KV, 100-999.9KV | |
| Current * | 0-9999A, 10-60KA | |
| Max Demand * | 0-9999A, 10-60KA | |
| Active Power | 0-9999KW 10-99.99, 100-999.9, 1000-2140MW | ± 0.5 % of reading & ± 0.3 % of full scale ± 1 digit (in the Voltage & Current ranges 10-120% of full scale & P.F range ± 0.5) |
| Reactive Power | 0-9999KVAR 10-99.99, 100-999.9, 1000-2140 MVAR | |
| Energy | 0-9999KWH 10-99.99, 100-999.9, 1000-9999MWH | |
| Reactive Energy | 0-9999KVARH 10-99.99, 100-999.9, 1000-9999MVARH | |
| Power Factor | 0-1 Lag or Lead | ± 0.005 |
| Frequency | 45 - 65 Hz | ± 0.1 |

*   Each phase.
**  Accuracy is at a temperature range of 15 - 30°C, add 0.02% for each degree above 30°C.

# Parameters Scrolling & Displays

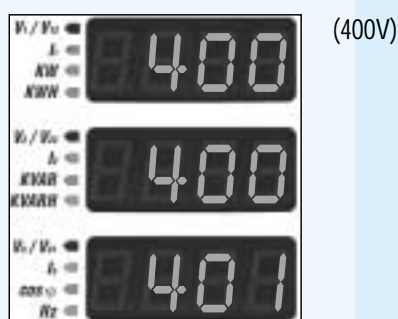## Parameter Scroll & Display

Parameters are shown on large Seven Segment Displays comprised of four digits, guided by four LEDs which characterize the displayed parameter.

When there is no decimal point - parameters are displayed in Volts, Amps, KW, KWH, KVAR or KVARH.
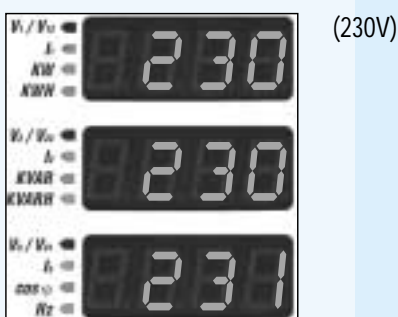
When a decimal point appears, the display will be in KV, KA, MW, MWH, MVAR or MVARH.

Parameter scrolling with the SELECT key:

**Voltage-Line to Line**



(400V)

**Voltage-Line to Neutral**



(230V)

## Special Display Mode

For special applications an additional display mode is available allowing selection of any combination of displays.



(V1)

(I2)

(Hz)

## Parameter Review & Setting

### List of Parameters:

| No | Description |
|----|-------------|
| 0 | Potential Transformer (P/T) ratio |
| 1 | Current Transformer (C/T) primary |
| 2 | Wiring configuration |
| 3 | Display Period |
| 4 | Max. Demand Period |
| 5 | Power Per Pulse (Pulse Initiator Relay) |
| 6 | Device No. - customer reference |
| 7 | Device No. on serial link |
| 8 | Baud rate for serial link |
| 9 | Special display selection, Upper window |
| 10 | Special display selection, Center window |
| 11 | Special display selection, Lower window |

### Example - First parameter

To review or modify parameters press PAGE key continuously until the upper display starts flashing:

The DPM response:



(Flashing)
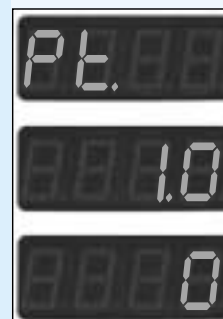
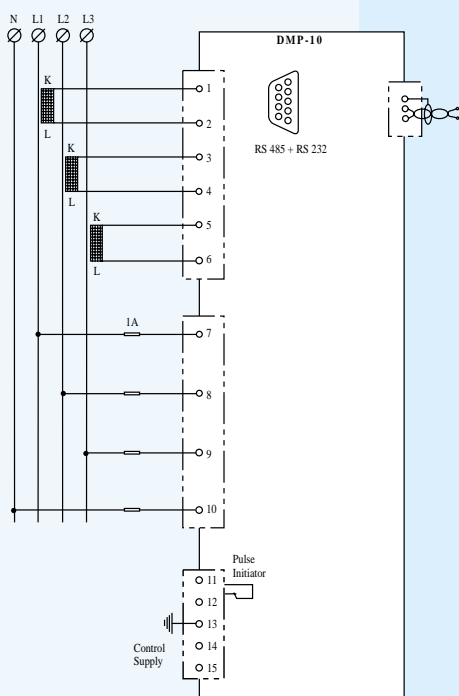Modify the parameter with ▲ ▼ keys. Store the new values in the non-volatile memory by pressing ▲ ▼ simultaneously.

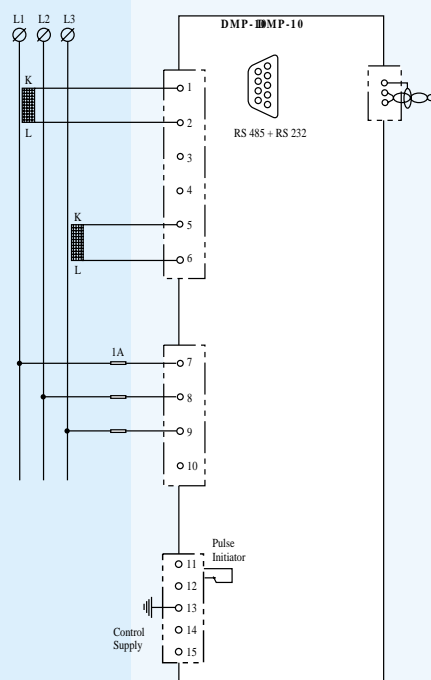The DPM response:

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# Wiring

The DPM-10 is designed for connection to
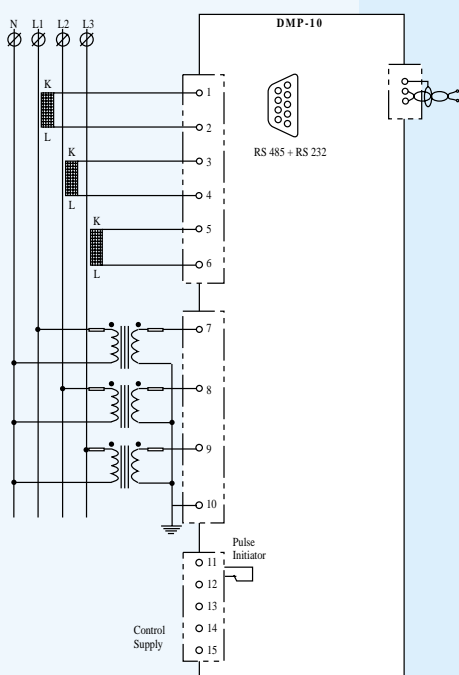three phase systems, with or without neutral wire.

## 4 Wire System with 3 C/Ts (no P/Ts)



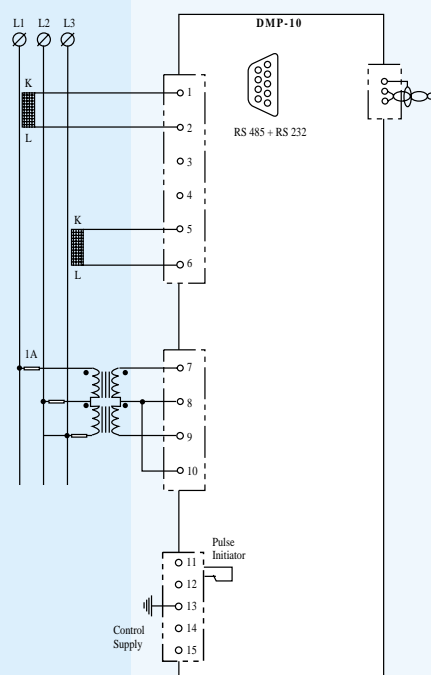## 3 Wire System with 2 C/Ts



## 4 Wire Medium Voltage Y-System with 3 C/Ts and 3 P/Ts



## 3 Wire System with 2 C/Ts and 2 P/Ts



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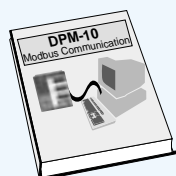# Communication

## Hardware & Software

The DPM incorporates RS 232 and RS485 with MODBUS Protocol, operating at baud rates of up to 9600 bits/sec.

### RS-232

For programming and supervision of single units via IBM-PC or compatible.

An optional communication package is available. The package includes:

1. Communication Manual
2. Communication cable - 2 meters
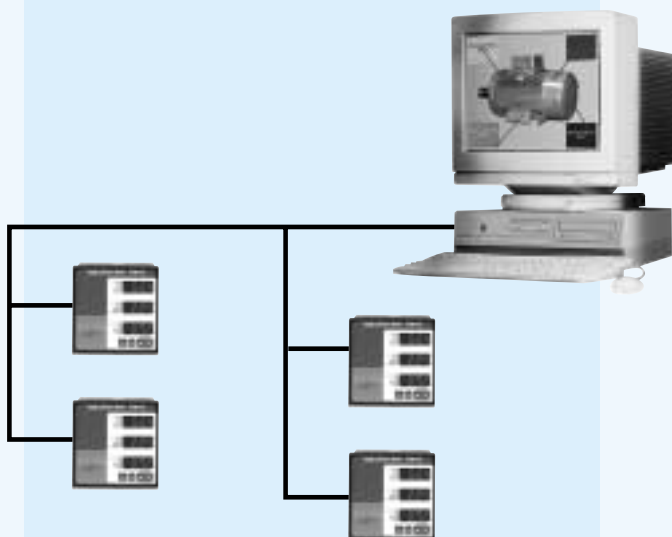3. Windows based (3.11 & 95) software package
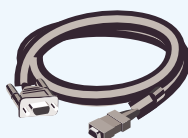
## System Integration

### RS-485

Serial link allows connection of up to 32 DPM's to the host computer. For detailed information see the Communication Manual.

Use any SCADA software to customize the displayed information.

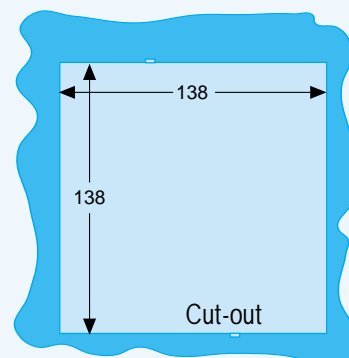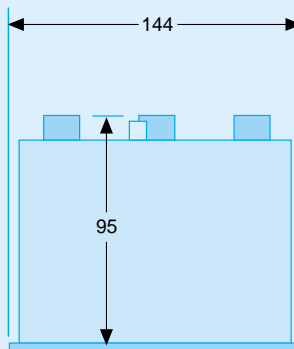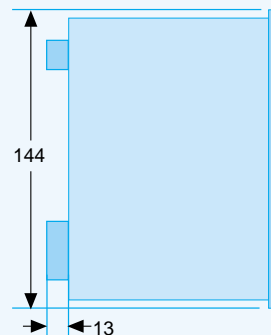When introduced into larger systems, a Data Highway may be used to enable multiple DPM-10 connections.
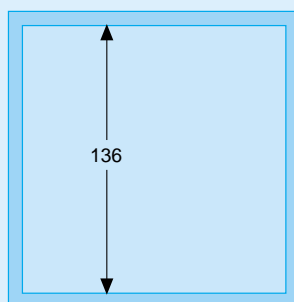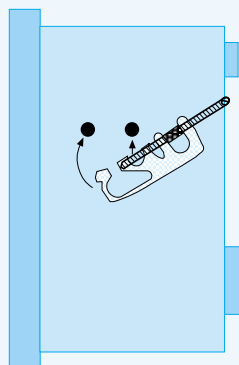
Up to 32 DMP's can be connected on a "twisted pair" numbering from 1 - 247.

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# Specifications

## Technical Specifications

**Auxiliary Power Supply**   230VAC (160-270V) or 115VAC (80-135V), 45 to 65Hz, power consumption ≤ 20VA

**Voltage Measurement**   Directly connected for systems up to 690V, P/T connected for higher voltages, power consumption ≤ 1VA

**Current Measurement**   True RMS, sample time 0.5mSec. C/T secondary 5A or 1A, power consumption: ≤ 0.5VA

**KWH Pulse Relay**   Programmable KWH per Pulse, Rated load: 8A/250VAC, 1800VA. 48Vdc, 0.25A Inductive 1.0A Resistive
Maximum voltage: 250VAC, 125Vdc, 0.4A

**Dielectric Strength**   1500VAC for 1 minute, to Ground.

**Temperature Range**   0 - 60°C

**Standards**   Impulse: Meets IEC255-4 (1976) & Amend #1 (1979), Meets IEC255-5 (1977) 5 KV common-mode test,
5 kV transverse-mode test Surge withstand Oscillatory - 2.5 kV peak, Fast transient - 4 kV crest voltage In
accordance with : ANSI C37.90.1 (1990), IEC55-4 (1976) & Amend # 1 (1979) Class III, IEC 255-22-2 (1988)
Class III RFI : In accordance with EMI standard ANSI C37.90.2

**Enclosure**   Front panel mounting, synthetic, flame resistant, IP 50 front, IP 30 rear, IP20 Plug-in connections

**Dimensions & Weight**   144x144x75mm (cut-out 138x138mm), weight 1.3 Kg

## Dimensions (mm)



## Ordering Information

When ordering specify, for example: DPM-10  230 - 5 - 0 - S:

1. Control voltage (230 or 115VAC)
2. C/T ratio - 5 for 5A sec., 1 for 1A Sec.
3. Options   (0 - no options)
4. Front panel

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# Additional Products

Additional catalogues available from Solcon's product range

## RVS-DN
**Low Voltage Digital Soft-Starter**
**8-2700A,  230-1000V**

## RVS-AX / RVS-DX
**Analogue & Digital soft-starter**

## SOLSTART
**Mininature soft-starter**
**For single & triple phase motors**

## RVS-BX / SEM-N
**Basic electronic soft-starter**
**Basic electronic naval soft-starter**

## MPR 2000
**Motor Protection Relay**
**Motor Protection Controller**

## MPC 2000
**Motor Protection Relay**
**Motor Protection Controller**

## MPR 6
**Motor Protection Relay**

## TPR 6
**Temperature Protection Relay**

## DPM 10
**Digital Power Meter**

## PFC 10
**Reactive Power Factor Controller**

## SU 124
**Generator Control & Protection**

## DGC 2000
**Digital Generator Control &**
**Protection**

## HIU
**Restart Relay**

## SMB
**DC Injection brake**

## HRVS-DN
**High Voltage Digital Soft-Starter**

## EPT
**Electronic Potential Transformer**
**1000-14000V**

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