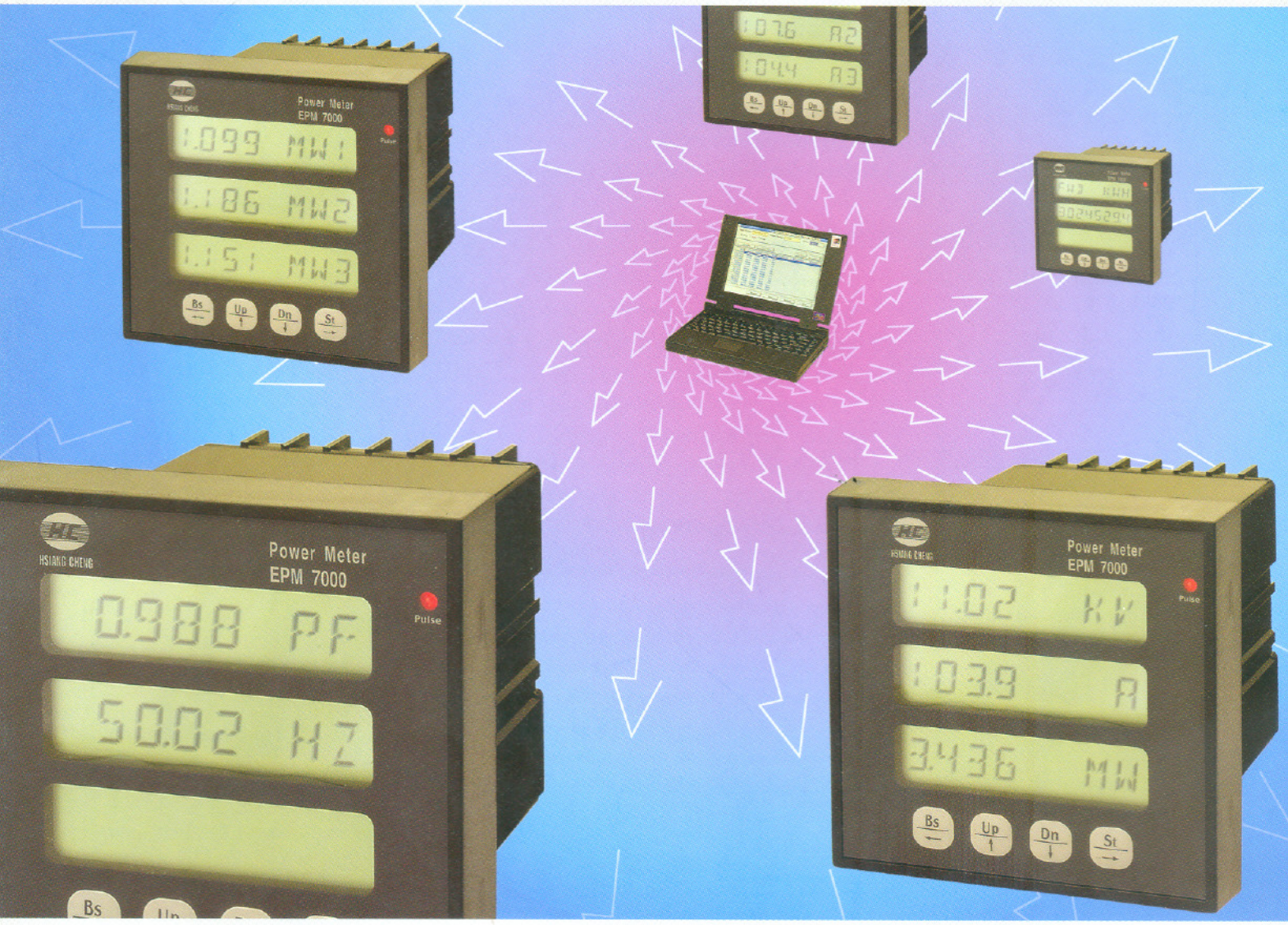
Model: EPM 7000

Power Meter



HSIANG CHENG

Introduction

About Power Meter EPM 7000

EPM 7000 power meters are conceptualized and intelligent to revolutionize the approach to traditional power metering.

Each power meter is a compact, electronically advanced and programmable multi-display metering device (MDMD). It is the answer to future generation of electrical metering needs and methodology.

Environmental Impact & Cost Saving

A power meter can replace many units of conventional analog or digital instruments and change over switches (e.g. Amp, Volt, KVA, KW, PF, KWH, KVarH, Freq. etc.).

This saves on the wiring material usage and reduces the cost on metering needs.

With the power meter modern and practical MDMD, the front layout of switch boards and control panels are aesthetically refined.

Increase Productivity & Efficiency

The power meters are specifically designed to be compatible with the world's 2 most widely used DIN standard panel instruments (It fits the DIN 92 x 92 mm panel cutout holes).

The power meter as a MDMD greatly reduced cabling complexity and time. It is also a standardize hardware suitable for either 1 phase 2 wires, 1 phase 3 wires, 3 phase 3 wire or 3 phase 4 wires networks.

Improved Technical Superiority and Reliability

The power meters are endowed with technical specifications, (overload capabilities, accuracy levels, long term stability, readout dependability etc.) far exceeding those of conventional instruments. To overcome the critiques of digital metering, the power meter MDMD supports a LCD screen with alphanumeric readouts. The multi-display readings can be "damped" through it readout resolution besides the option to manually or automatically prioritize and sequentially view the more than 30 electrical parameters.

To meet future metering environments, the power meter is equipped with a serial port (RS-485 or RS-232), to allow connection to an open architecture computerized network. Running on PC or data acquisition system and complying with Modbus® protocol. The software provides a simple yet practical solution to energy management in factories and plant, small industries, building services, etc.

Parameters Conversion

The microprocessor-based power meter now provides compatibility with the modicon Modbus® system as a standard featured. From the LCD multi-display reading V, A, VA, W, Var, WH, etc. more than 30 power and energy parameters.

Features

- For factory and building automation
- Modbus® RTU protocol
- Maximum 600V
- True RMS conversion
- LCD display
- Field programmable PT / CT ratio
- Accuracy up to 0.2%
- Memory for all setup and energy data
- Comprehensive self test diagnostics
- Low input burden 0.1VA (5A / 120V)
- Wide power supply range 80~260V AC / DC
- Compact physical configuration
- Compatible for DIN & ANSI cut out
- 2KV RMS input / output / power isolation

Factory & Building Automation (FA & BA)

The power meter was developed for factory and building automation (FA & BA) applications, more all of power and energy parameters can easily apply to wide range of AC switch-gear or industrial power distribution system for metering.

PLC Modbus® Compatible

The Modbus® communications protocol allows information and data to be efficiently transferred between EPM 7000 and modicon programmable logic controller (PLC) or other third party Modbus® compatible monitoring and control system. The EPM 7000 can also establish a monitoring system just simply adopt an IPC-based centralized master display software. The RTU mode Modbus® protocol with default baud rate 9600 bps, 8 data bit.

Memory for all setup and energy data

All of the meter status setting and energy data are retaining in memory while was lost power. EPM 7000 power meter records includes the watt-hour that been measured, PT and CT ratio, the measured system configuration, displaying setting, and communication related.

Field Programmability

The field programmable power meter is able to set e.g. CT and PT ratio, Modbus® address, communication baud rate, meter's display, etc. either programming by push-bottom or by rear RS-485 / RS-232 communication port from a PC.

Accuracy up to 0.2%

With a well developed conversion, sampling and software compensation technology that make EPM 7000 power meter successfully meet the accuracy requirement of modern metering, that voltage and current up to 0.2% and other power up to 0.25%.

Comprehensive System Integration

The EPM 7000 power meter now provides the Modbus® (are compatible with the Modicon system as a standard feature for comprehensive system integration. The PLC compatible RS-485 / RS-232 Modbus® communication protocol allows information and data to be efficiently transferred between power meter EPM 7000 and Modicon programmable logic controller (PLC) existing RTU Power SCADA system and DCS system or other Modbus® protocol compatible system. For more detail information or software backup please contact Hsiang Cheng Electric Corp. or representative sales department.

Model & Ordering Number

Model : EPM 7000

Ordering : **EPM 7000 - A - 5.0A - H - 1**

Version

Current

1.0A

5.0A

Power

H : AC 80-260V, DC 80-330V

L : DC 20-60V

Communication Port

1 : RS-485

2 : RS-232

Specification

Programmable measurements / Accuracy / Display readouts

Parameter	Digits	Display (maximum)	Accuracy	Phase1	Phase2	Phase3	Total	Average
V x 3	4	9.9.9.9. V/KV	0.2% fs	V1	V2	V3		VE
A x 3	4	9.9.9.9. A/KA	0.2% fs	A1	A2	A3		AE
Watts	4	9.9.9.9. W/KW/MW/GW	0.25% fs	W1	W2	W3	W	
Vars	4	9.9.9.9. Var/KVar/MVar/GVar	0.25% fs	Var1	Var2	Var3	Var	
VA	4	9.9.9.9. VA/KVA/MVA/GVA	0.25% fs	VA1	VA2	VA3	VAE	
PF	3	0.999	0.25% fs	PF1	PF2	PF3	PF	
WH	8	9.9.9.9.9.9.9.9. WH/KWH/MWH	0.8% rd				WH	
VarH	8	9.9.9.9.9.9.9.9. VarH/KVarH/MVarH	1% rd				VarH	
A0	4	9.9.9.9. A/KA	0.5% fs					
Hz	4	70.00	0.03% rd					

◎ Accuracy : Corre3sponding to each auto-range scale

◎ VAB/VBC/VCA : Line to line voltage

VAN/VBN/VCN : Line to neutral voltage

◎ PF1/PF2/PF3 : Related conversion elements

◎ A0 (neutral current, only for 3 phase 4 wires)

◎ Accuracy performance range for WH/VarH/PF

Cos θ : 1-0.5 for WH/PF

Sin θ : 1-0.5 for VarH

Voltage $\geqq$ 75V, Current $\geqq$ 10% of rate

◎ Phase rotation

SEQ POST : Positive sequence

SEQ NEG : Negative sequence

Input

◎ Range

Voltage : 10-600V

Current : Suitable for CT secondary rating(option)

Maximum 6A for 5A rating

Maximum 1.2A for 1A rating

Frequency : 40-70 Hz

◎ Burden

Voltage < 0.4VA at 600V

< 0.04VA at 150V

Current < 0.1VA at rating

◎ Overload rating

Current	Voltage
2 x rated continuous	750V continuous
10 x rated 30 seconds	1000V 10 seconds
25 x rated 2 seconds	1200V 3 seconds
50 x rated 1 second	

Measured system

◎ Suitable for 3 phase 4 wires / 3 phase 3 wires / single phase 2 & 3 wires / 3 phase balance

◎ Select by input wiring & software configuration

Programmability

◎ Software accessible / password lock

◎ System selection : 3 phase 4 wires / 3 phase 3 wires /1 phase 2 & 3 wires and 3 phase balance

◎ PT : 1 - 5000.0 ; CT : 1-5000.0

◎ Readout display control

4 digits / auto scan or manual selection / scanning time

◎ Communication

Baud rate 1200 / 2400 / 4800 / 9600 / 19200

Address setting 1 - 254

◎ Calibration : software with password lock

◎ Memory : all of energy date and status setting

Communication port

RS485 (standard) ; RS232 (option)

Modbus® RTU protocol

Display

LCD 0.4" display, 3 rows of 8 alphanumeric

Dielectric strength

IEC 255-5

2KV AC rms 1 minute between input / output / power

Impulse and surge test

ANSI/IEEE C37.90.1-1989 (3KV) SWC test

IEC 255-22-1 class Ⅲ SWC test

IEC 255-22-4 class Ⅳ (IEC 801-4) SWC test

IEC 255-5 1.2 x 50us (5KV) impulse test

Stability

Temperature range -25 to +55℃, maximum 100 ppm/℃

Long term stability 0.15% drift maximum per year

Operating condition

Temperature range -25 to +60℃,

RH 20 - 95% non-condensed

Storage condition

Temperature range -25 to +70℃,

RH 20 - 95% non-condensed

Power supply

AC 80 - 260V, 40 - 70 Hz, DC 80 - 330V

DC 20 - 60V

Dissipation maximum 12VA for AC and 6 Watts for DC

Mounting / Dimension

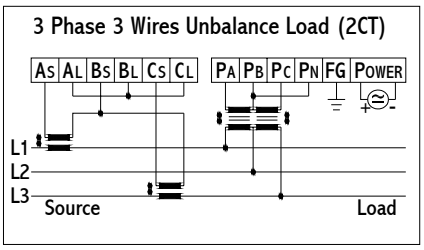
Panel type mounting

Size : 120 x 120 x 130.5mm

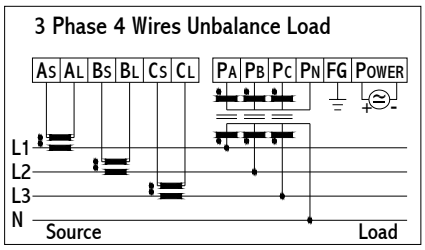
Cut out : 92 x 92mm

Wiring

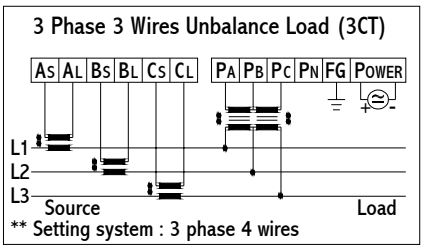
* 3P3W



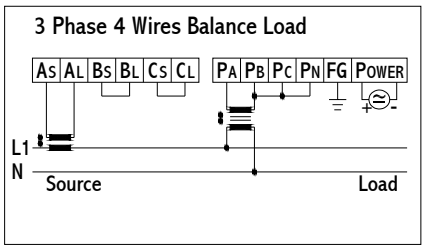
* 3P4W



* 3P4W



* 3P4WB

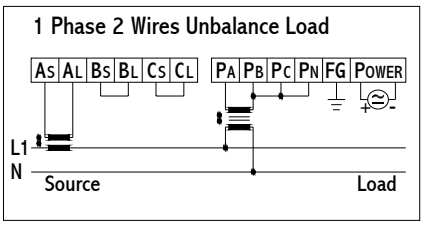


Communication Port
RS-485 only

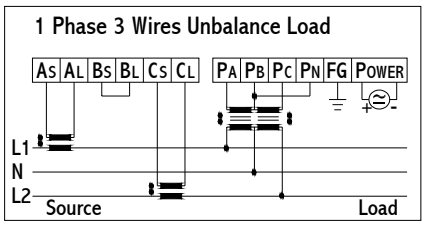
D+ D- Com

X	Y	Z

* 1P2W



* 1P3W



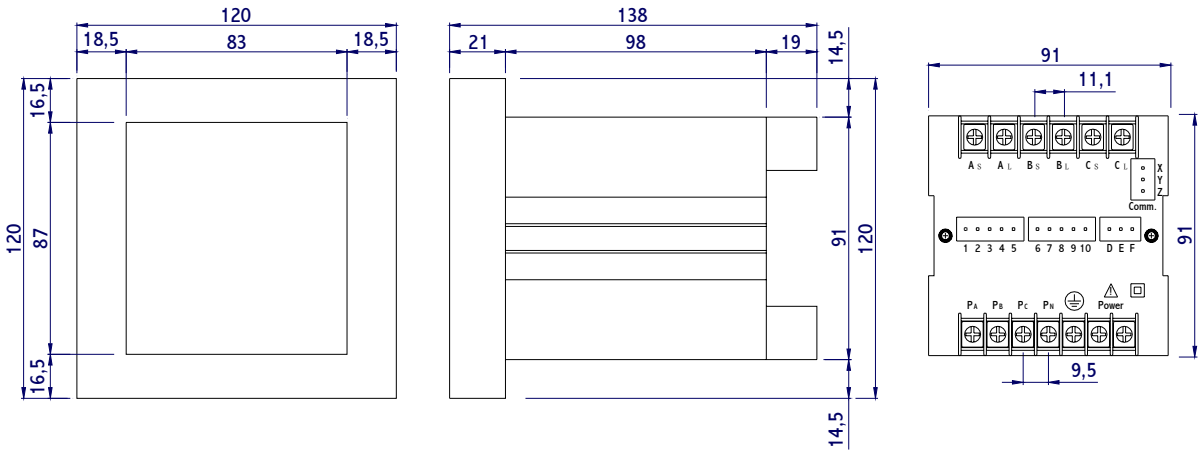
Communication Port
RS-232 only

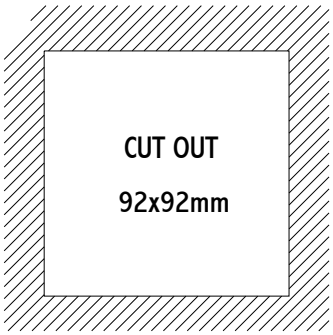
RxD TxD SG

X	Y	Z

Note : * for power system setting display code.

Dimension



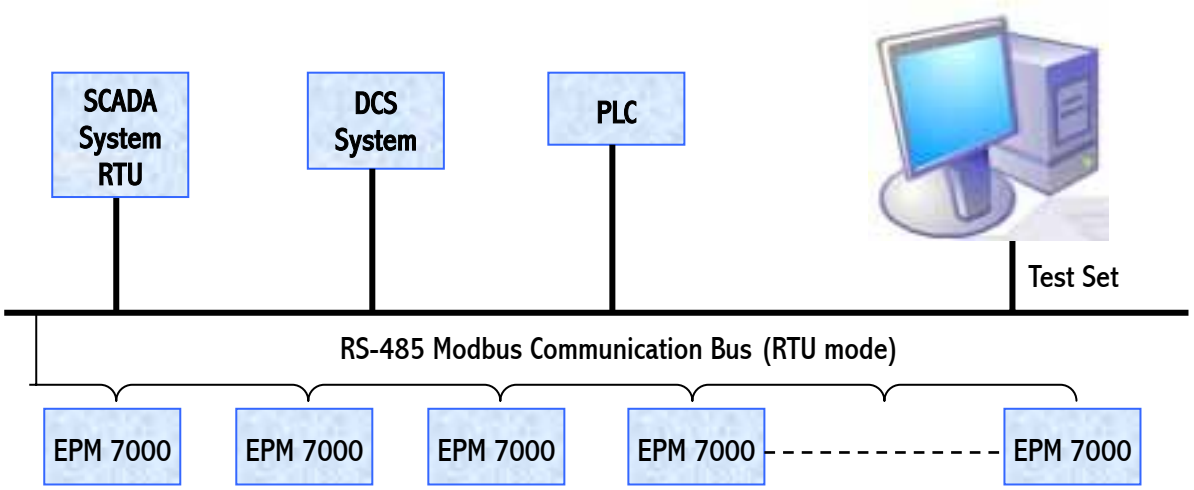


Applications

The EPM 7000 PC tool a utility program that can help user to connect to "EPM 7000 Power Meter" rapidly. The EPM 7000 PC Tool is provided along with every EPM 7000, which allows easy access to all meter setup information and actual values via a personal computer running Windows 95/98 and one of the PC's communication ports (COM1 or COM2). The PC Tool is able to do the function as bellows:

- ◎ Program / Modify setup information
- ◎ Load / save setup information files from / to disk
- ◎ Read actual "Basic" value (current / voltage / power / frequency)

The EPM 7000 PC Tool can be used as stand-alone without a EPM 7000 meter to create or edit EPM 7000 setup information file.



Communication wiring