Technology of Measurement...
defined

emfis

- Digital Multi-Function Meter
- Load Manager
- Demand Controller

Energy Metering, Monitoring &
Management System for Industrial
and Commercial Application

HPL provides wide range of multifunction meters which displays more than 45 parameters with AC/DC and HT applications.

ISO-9001:2008

HPL
POWER OF TECHNOLOGY
METERING

emfis

Digital Multifunction Meters

emfis vif

Voltage • Current • Frequency

emfis vifp

Voltage • Current • Frequency • Power

Salient Features

- Three Line Backlit LCD Display
- Suitable for 3 Phase 4 Wire LT Network
- Three Push Buttons on Front Panel for Programing and scrolling
- Optically Isolated Energy Pulse Output available in emfis vifpe
- RS485 MODBUS Communication available in emfis vifpe
- Provision for Special Pre-defined pages for display parameters available in emfis vifp & emfis vifpe
- CT Secondary -/1A or -/5A (site selectable)
- Power On Hours / Run Hours Parameters

Typical Applications

- Electrical Panels - Industrial LT Panels.
- Motor Control Centres, Distribution Control and Relay Panels.
- Air Conditioning and Refrigeration Panels etc.
- Genset Panels
- Generation, Transmission and Distribution Panels
- Test Benches and Laboratory Equipment
- Uninterrupted Power Supplies
- Special OEM Application

HPL

emfis vie

Voltage • Current • Energy

emfis vifpe

Voltage • Current • Frequency • Power • Energy

Technical Specifications

ENCLOSURE

Dimensions	96mm x 96mm x 86mm
Weight	<400gms

FRONT PANEL

Display	Three Line backlit LCD Display
Digit Height	8mm x 5mm
Protection Index	IP54

INPUT CURRENT

Via Current Transformer with Primary	From 5A to 6000A Configurable in multiples of 5 for -/5A & from 1A to 1200 A configurable in multiples of 1 for -/1A
Insulated Secondary	5A / 1A (Selectable)
Current circuit burden	<0.25VA
Starting current	5mA (Secondary)
Overload without CT	7A
Overload with CT	6500A

INPUT VOLTAGE

Measurement range	120V AC to 300V AC P - N
Voltage circuit burden	≤ 2VA

AUXILIARY SUPPLY

Supply Value	230V AC, ±30%, 50Hz
Burden	≤ 2.5VA

Accuracy

Class	1.0

PULSE OUTPUT

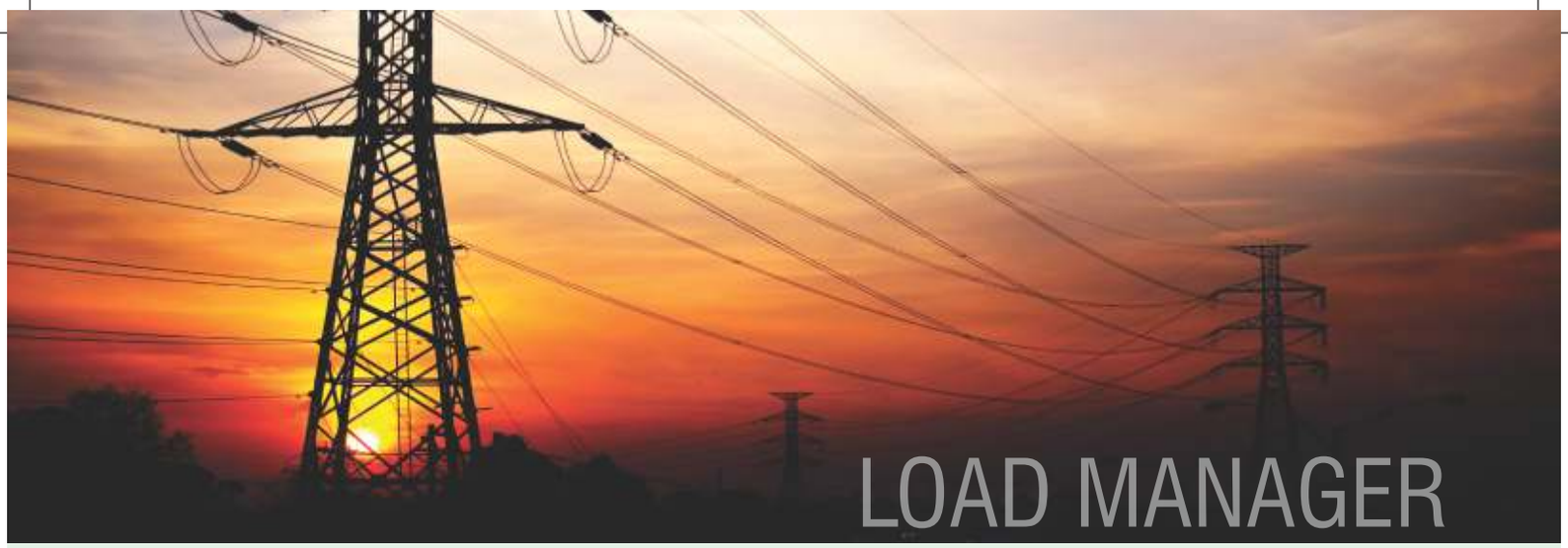
Duration	100ms
Width	1pulse=1kWh

Special Features

- For ease in monitoring, Special Pre-defined pages have been provided with following display.

Screen 1	Screen 2	Screen 3
R Phase	Y Phase	B Phase
Active Power	Active Power	Active Power
PF, Current	PF, Current	PF, Current
Voltage	Voltage	Voltage

Note: Available in emfis vifp & emfis vifpe



LOAD MANAGER

emfis HT

For HT Application

emfis Basic

Voltage • Current • Frequency • Power • Energy

Salient Features

- Last 6 months history parameters for kWh, kVAh, kVArh (lag, lead), kW MD & kVA MD with Date & Time on RS 485 Communication which gets updated at 00.00 hours on the last day of the month.
- Maximum Demand with Real Date & Time
- Scroll Lock Facility provided to monitor the desired Parameters
- CT & PT Primary both Field Programmable
- Available in 3P,4W & 3P, 3W* Network
- RS485 MODBUS Communication (Optional)
- Provision for Special Pre-defined pages for display parameters*

Note: PT Primary is applicable only for Emfis HT Meter.
* Applicable only for Emfis HT Meter

Technical Details of emfis HT & emfis Basic Meter

ENCLOSURE

Dimensions	96mm x 96mm x 86mm
Weight	< 400 gms

INPUT CURRENT

Via Current Transformer	From 5A to 6000A in Multiples of 5 for -/5A & From 1A to 1200A in Multiples of 1 for -/1A
Insulated Sec.	5A / 1A (Selectable)
Current Circuit Burden	<0.25 VA
Starting Current	5mA*/10mA (Secondary)
Overload without CT	7A
Overload with CT	6500A

FRONT PANEL

Display	Three Line Backlit LCD Display
Digit Height	8mm x 5mm
Protection Index	IP 54

INPUT VOLTAGE

Measurement Range	120V AC to 300V AC P - N (Basic) 60V AC to 110V AC P - N (HT)
Via Voltage Transformer: Primary (for emfis HT Only)	110V/1.1kV/2.2kV/3.3kV/6.6 kV/11kV/22kV/ 33kV/66kV/121kV/132kV (Selectable)
Via Voltage Transformer: Secondary (for emfis HT Only)	110V (Fixed)
Voltage Circuit Burden	≤ 2VA

AUXILIARY SUPPLY

Supply Value	230V AC, ±30%, 50Hz (Basic) 60V AC to 300V AC, ±5%, 50Hz (HT)
Burden	≤ 2.5 VA

ACCURACY

Class 1.0	Available in Emfis Basic & Emfis HT
Class 0.5	Available in Emfis Basic Only

PULSE OUTPUT (Only for emfis Basic)

Duration	100ms
Width	1 Pulse = 1 kWh

* Value applicable only for emifs basic

HPL

Demand Controller

emfis Plus

(Demand Controller)

Voltage • Current • Frequency • Power • Energy • THD

Salient Features

- Last 6 Months history Parameters for kWh, kVAh, kVArh (lag, lead) & MD through Communication
- Provision for Special Pre-defined pages for display parameters
- Scroll Lock Facility provided to monitor the desired Parameters
- Maximumum Demand with Date and Time
- Measures Total Harmonic Distortion
- Relay Output for V, I, Total kW, Total kVA, F, kW MD, kVA MD
- Last 30 days load Survey through Communication
- Last 10 occurrence/restoration event for each Relay 1 & Relay 2 through Communication

Technical Details of emfis Plus

ENCLOSURE

Dimensions	96mm x 96mm x 86mm
Weight	< 400 gms

INPUT CURRENT

Via Current Transformer	From 5A to 6000A in Multiples of 5 for -/5A & From 1A to 1200A in Multiples of 1 for -/1A
Insulated Sec.	5A / 1A (Selectable)
Current Circuit Burden	<0.25 VA
Starting Current	5mA (Secondary)
Overload without CT	7A
Overload with CT	6500A

FRONT PANEL

Display	Three Line Backlit LCD Display
Digit Height	8mm x 5mm
Protection Index	IP 54

INPUT VOLTAGE

Measurement Range	120V AC to 300V AC P - N
Voltage Circuit Burden	≤2VA

AUXILIARY SUPPLY

Supply Value	230V AC, ±30%, 50Hz
Burden	≤2.5 VA

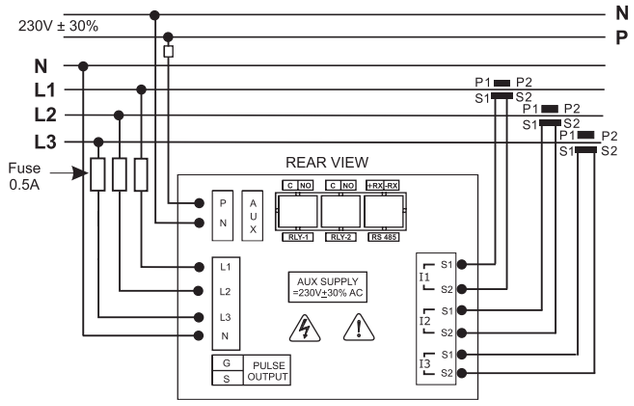
ACCURACY

Class	1.0

Pulse Output

Duration	100ms
Width	1 Pulse = 1 kWh

Wiring Diagram of Emfis Plus Meter



emfis DC

For DC Applications

Salient Features

- Displays : Voltage, Current, Power , Energy
- RS485 MODBUS RTU Communication (Optional)
- Password Protected Programming
- 6 Months History for kWh, MD kW, Channel Peak Load available on communication
- Reverse Shunt Connection Indication
- Reverse Voltage Connection Indication
- Shunt disconnection Indication

Resolution of Emfis DC Meter

System Voltage	XX.X V
Current Channel Wise	XX.XX A (< 100A)
	XXX.X A (≥100A)
Power Channel Wise	XX.XX kW (≥1kW)
	0.XXX kW (< 1kW)
Energy Channel Wise	XXXXXX.X kWh

Display Parameters of Emfis DC meter

Measures & Displays the following parameters :

- Real Date / Time
- System Voltage
- Current Channel wise
- Power Channel wise
- Energy Channel wise
- Total Energy

Communication Parameters of emfic DC meter

- Real Date / Time
- System Voltage
- Current Channel wise
- Power Channel wise
- Total & Channel wise Cumulative Energy
- Last 6 Months kWh Channel wise
- Last 6 Months MD (integration period 30 minutes) Channel wise
- Last 6 Months Peak Load (integration period 30 seconds) Channel wise

Technical Details of emfis DC

ENCLOSURE

Dimensions	96mm x 96mm x 86mm
Cutout Size	92mm x 92mm
Weight	< 350 gms
Termination	Rear Side
Operating Temp.	-10 to 70°C

FRONT PANEL

Display	16x2 Line Dot Matrix Backlit LCD Display
Character Size	5.0mm x 3.65mm
Protection Index	IP 54 (Front Panel)

INPUT CURRENT

Current Channels	4 Channels / 6 Channels
Current Sensor	External Shunt (configurable shunt rating from 10 to 120 mV in multiples of 1 mV)
Current Range	Configurable (1 to 1000 Amps in multiples of 1A)

INPUT VOLTAGE

Input Voltage	20V DC to 60V DC
Over Voltage	80V (Continues)

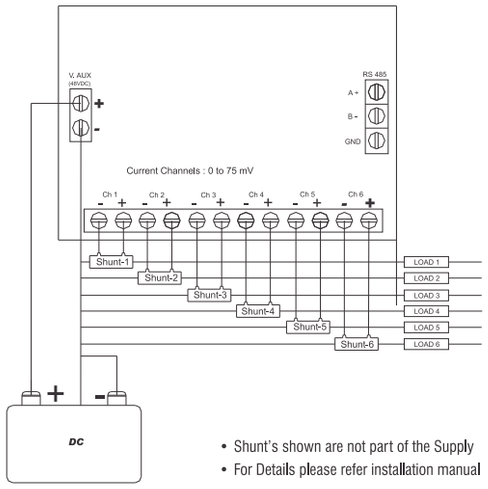
AUXILIARY SUPPLY

	Self Powered
Power Consumption	<1 Watt (20V to 60V)
Accuracy	± 1% (for 5% to 120% of range)

COMMUNICATION

Protocol	MODBUS in RTU mode
Slave ID	1 to 247 (Programmable)
Baud rate	4800/9600/19200/28800/38400 Configurable
Stop Bit	1
Parity	None
Data Bit	8 bits

Wiring Diagram of Emfis DC Meter



- Shunt's shown are not part of the Supply
- For Details please refer installation manual

Parameters Measured

S.No.	Parameters	vif	vie	vifp	vifpe	Basic	Plus	HT Basic
1	Inst. Phase -- Neutral Voltage	✓	✓	✓	✓	✓	✓	✓
2	Inst. Phase wise Current (Amp)'	✓	✓	✓	✓	✓	✓	✓
3	Inst. Phase wise Active Power (kW)			✓	✓	✓	✓	✓
4	Inst. Phase wise Apparent Power (kVA)			✓	✓	✓	✓	✓
5	Inst. Phase wise Reactive Powder (kVAr)			✓	✓	✓	✓	✓
6	Inst. Phase wise Power Factor (PF)			✓	✓	✓	✓	✓
7	Inst. Frequency (Hz)	✓		✓	✓	✓	✓	✓
8	System Power Factor (PF)			✓	✓	✓	✓	✓
9	Real Date & Time					✓	✓	✓
10	Active Energy		✓		✓	✓	✓	✓
11	Apparent, Reactive Lag Energy					✓	✓	✓
12	Reactive Lead Energy					✓	✓	✓
13	Inst. Line Voltage (Volts)	✓	✓	✓	✓	✓	✓	✓
14	Total Active, Apparent & Reactive Power			✓	✓	✓	✓	✓
15	Avg. Active, Apparent & Reactive Power			✓	✓	✓	✓	✓
16	Max. Active, Apparent & Reactive Power			✓	✓	✓	✓	✓
17	Phase Wise Average Voltage (Volts)						✓	
18	Phase Wise Maximum Voltage (Volts)						✓	
19	Phase Wise Average Current (Amps)	✓	✓	✓	✓	✓	✓	✓
20	Phase Wise Maximum Current (Amps)	✓	✓	✓	✓	✓	✓	✓
21	Total Current (Amps)	✓	✓	✓	✓	✓	✓	✓
22	Meter Run Hour (Hr)	✓	✓	✓	✓	✓	✓	✓
23	Meter Power on Hour (Hr)	✓	✓	✓	✓	✓	✓	✓
24	kW MD with Date & Time					✓	✓	✓
25	kVA MD with Date & Time					✓	✓	✓
26	R Phase -- kW, Current, Voltage & PF			✓	✓	✓	✓	✓
27	Y Phase -- kW, Current, Voltage & PF			✓	✓	✓	✓	✓
28	B Phase -- kW, Current, Voltage & PF			✓	✓	✓	✓	✓
29	Total Harmonic Distortion in Phase Voltage (%)						✓	
30	Total Harmonic Distortion in Phase Current (%)						✓	
31	Total Harmonic Distortion in Line Voltage (%)						✓	
32	CT Ratio	✓	✓	✓	✓	✓	✓	✓
33	PT Ratio							✓
	Communication Parameters							
1	Pulse Output		✓		✓	✓	✓	
2	Special Screens shots feature			✓	✓	✓	✓	✓
3	RS485 MODBUS Communication				✓	✓	✓	✓
4	Slave ID Programmable				✓	✓	✓	✓

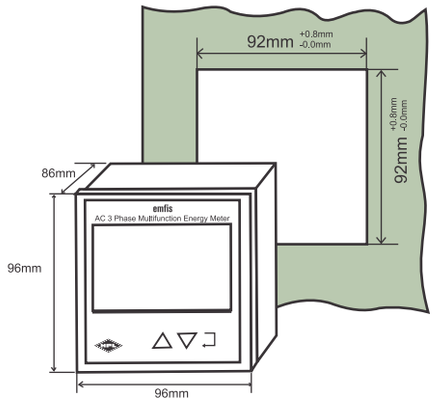
Ordering Information

TYPE	Model Number
EMFIS PLUS	
Emfis Plus Basic	NEMFPCT2EMFA1
Emfis Plus Basic with RS485	NEMFPCT2EMFA2
Emfis Plus Basic with 2Nos. Relay Output	NEMFPCT2EMFA3
Emfis Plus Basic with 2Nos. Relay Output with RS485	NEMFPCT2EMFA4
EMFIS Basic	
Emfis Basic Class 1.0	NEMFCT2EMFA1
Emfis Basic Class 1.0 with RS485	NEMFCT2EMFA2
Emfis Basic Class 0.5	NEMFCT2EMFA15
Emfis Basic Class 0.5 with RS485	NEMFCT2EMFA25
EMFIS HT	
Emfis HT Basic 3P, 4W	NEMFCT2EMFB1
Emfis HT Basic 3P, 4W with RS485	NEMFCT2EMFB2
Emfis HT 3P, 3W Model	NEMFCT2EMFB13W
Emfis HT 3P, 3W Model with RS485	NEMFCT2EMFB23W
EMFIS LT 3 PHASE 4 WIRE	
emfis vif	NEMFVIF00000
emfis vie	NEMFVIE00000
emfis vifp	NEMFVIFP0000
emfis vifpe	NEMFVIFPE000
emfis vifpe with RS 485	NEMFVIFPEA20
EMFIS DC	
Emfis DC Basic 4 Channels	EMFDC4CHA0SHXXX
Emfis DC Basic 6 Channels	EMFDC6CHA0SHXXX
Emfis DC Basic 4 Channels with RS485	EMFDC4CHA1SHXXX
Emfis DC Basic 6 Channels with RS485	EMFDC6CHA1SHXXX

Cutout Details

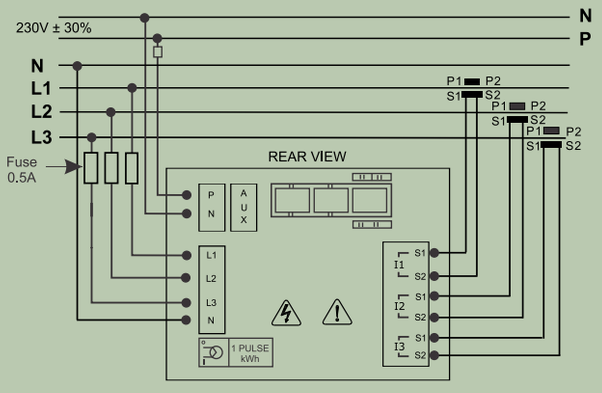
The Panel Meter is to be firmly secured using the 4 transparent fixing clips.

Use 0.5mm^2 to 2.5mm^2 Cable for Voltage terminals Use 3 mm^2 to 6mm^2 cable for Current terminals.

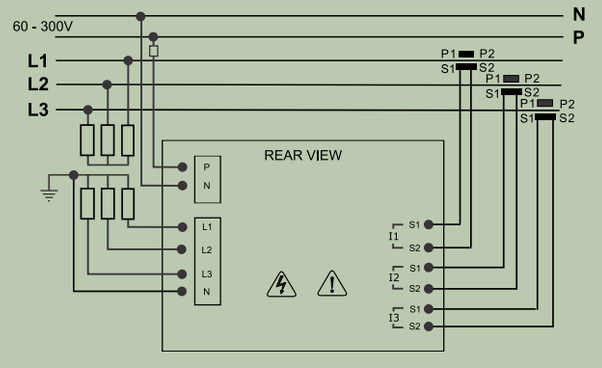


Wiring Diagram of Emfis meters

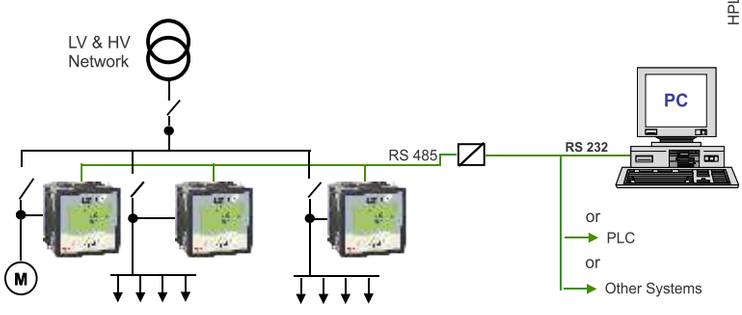
1. For 3 phase 4 wire emfis for LT application (for vif, vie, vifp, vifpe, & Basic)



2. 3 phase 4 wire emfis HT Meter for HT application.



Communication



HPL/EMFIS/JUNE-15

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