



2160-A with LED Display

2160-A with LCD Display

## 2160-A

### Multifunction Power & Energy Meter

Masibus 2160-A is an easy-to-use, cost effective electrical energy meter that offers all the basic measurement capabilities required for monitoring an electrical installation.

2160-A is available in two display options either 16 x 4 LCD or bright LED display for superior readability in poor lighting conditions. It provides four parameters display at a same time.

Based on field requirement 2160-A offers various accuracy class options like Class 0.2s / Class 0.5s accuracy as per IS14697/ IEC 62053-22 and Class 1.0 accuracy as per IS13779.

The CT/PT ratio and installation type are site selectable, making it possible to use the meter in various types of three phase installations.

2160-A provides four-quadrant energy measurement along with ON (working) hour, RUN (Load) Hour, thus helping to measure and control energy cost.

More than basic metering, it optionally provides RS485 port supporting Modbus-RTU protocol, RJ45 port supporting Modnet protocol, THD measurements, Maximum Demand and Programmable pulse output.

Along with Maximum Demand option 2160-A can store Power Interruption count with (Last Power OFF & Latest Power ON) Time & Date

Meter stores energy and programmed parameters into non-volatile memory.

#### Features

- Available in Accuracy class 1.0 as per IS13779
- Optional Accuracy class 0.5s or 0.2s as per IS14697/ IEC 62053-22
- Field programmable CT/PT primary & secondary values
- True RMS measurement
- More than 100 Electrical parameters
- 4x16 LCD with back-lit **OR** Optional 4 lines 4 digit high-visibility LED display 0.4" [10mm] to display various parameters
- Isolated RS485 (Modbus-RTU protocol)
- Digital pulse output for energy
- Auto Scaling from Kilo to Mega to Giga watt
- Auto Scrolling feature for easy readability for all parameters
- Favorite page Store feature
- Store energy register efficiently during power failure.
- Four Quadrant measurement for PF, Power & Energy (Active & Reactive).
- ON Hour, LOAD HOUR & IDLE HOUR register in Non-Volatile Memory
- Password Protection for set parameters

#### Applications

- Control & Relay Panels
- Motor Control Center Panels
- Power Control Center Panels
- Process Control
- DG Set panels
- Original Equipment Manufacturers (OEMs)
- HVAC & Building Management System
- Energy Management System (EMS)
- HV & LV Switchgear Panels

# Technical Specifications

Meter Type	
3Ph4W/ 3Ph3W (Site selectable)	
Input	
Voltage	
Direct Voltage	20 to 650V L-N
PT Secondary (Nominal Voltage)	63.5V L-N, 110V L-N or 240V L-N (Site selectable) Configurable for 3Ph3W or 3Ph4W system
Burden	<0.2VA per phase
PT Ratio	1 to 9999.999 Programmable
Overload	1.2 x Nominal Voltage (Continuous)
Current	
Secondary Current	1 or 5A (Site selectable)
Burden	<0.2VA per phase
CT Ratio	1 to 9999.999 Programmable
Overload	For 5A CT: 8A Continuous/ 20A for 1Sec For 1A CT: 2A Continuous/ 20A for 1Sec
Starting Current	0.1% of Nominal Current
Frequency	45 to 55 Hz

Display & Keys	
Standard	4x16 Backlit LCD
Optional	4 line 4 digit 0.4" [10mm] 7-segment Display [3 line 4 digit in Red & 1 line 4 digit in Green] 3mm Round LED for Parameter Indication Bar type LED for 'I' indication & % Load
Keys	PROG/Enter, Esc/Shift. UP, Down

Calculated Parameters	
Voltage	L1-L2, L2-L3, L1-L3 and Average (3Ph3W & 3Ph4W) L1-N, L2-N, L3-N & average (1Ph & 3Ph4W)
Current	All phase currents & their average
Frequency	System Frequency
Power (Phase wise & Total)	Active Power Reactive Power Apparent Power
Energy (Phase wise & Total)	Active Energy for Import & Export (Separate) Reactive Energy for Import & Export (Separate) Apparent Energy
Demand	Maximum Demand on KW/KVA (Block/Sliding)
Power Quality	Harmonics for each Voltage and Current (3rd to 15th odd) THD for Voltage & Current (Phase wise)

Special Features	
Real clock & date	
ON hour, LOAD hour, IDLE hour	up to 65000 hours Recording
PINTR Power Interruption count	up to 65000 PINTR counts
PINTR Time Stamp (Available with MD option only)	Last Power OFF & Latest Power ON Time & Date stamp

Output	
Communication Output RS485 (Optional)	
Interface	RS485
Baud Rate	9600, 19200, 38400 (Selectable)
Start bit	1
Stop bit	1
Protocol	Modbus-RTU
Communication Output Ethernet (Optional)	
Interface	RJ-45 (Optional)
Baud rate	10/100 Mbps
Protocol	Modnet

Pulse Output (Optional)	
Type	WH/VARH/VAH
Pulse rate	Programmable from 1to 65000 pulses per Energy
Pulse duration	40 mSec $\pm$ 10%

Accuracy			
	Class 0.2 Optional	Class 0.5 Optional	Class 1.0 (Standard)
Voltage	0.25% of reading		
Current	0.1% of reading	0.2% of reading	0.5% of reading
Frequency	$\pm$ 0.01Hz		
Power Factor	0.2% of FS	0.25% of FS	0.5% of FS
Active Power*	0.2% of reading $\pm$ 0.01% of FS	0.3% of reading $\pm$ 0.01% of FS	1.0% of reading $\pm$ 0.01% of FS
Reactive Power*	0.2% of reading $\pm$ 0.02% of FS	0.5% of reading $\pm$ 0.01% of FS	1.0% of reading $\pm$ 0.01% of FS
Apparent Power* ( $\geq$ 0.02 of lb)	0.2% of reading $\pm$ 0.01% of FS	0.3% of reading $\pm$ 0.01% of FS	1.0% of reading $\pm$ 0.01% of FS
Active Energy*	Class 0.2s as per IS14697/ IEC 62053-22	Class 0.5s as per IS14697/ IEC 62053-22	Class 1.0 as per IS3779
Reactive Energy*	Class 0.2s as per IS14697/ IEC 62053-23	Class 0.5s as per IS14697/ IEC 62053-23	Class 1.0 as per IS3779
Apparent Energy*	Class 0.2s	Class 0.5s	Class 1.0

(\*PF 0.5 Lag-1.0 - 0.8 Lead Applicable for Power & Energy Parameter)

Auxiliary Power Supply	
Power Supply	90-270VAC, 50/60Hz or 110-370VDC
Burden	Less than 3VA for LCD Display Less than 4VA for LED Display

#### Isolation (Withstanding voltage)

▪ Between primary terminals\* and secondary terminals\*\*: At least 1500 V AC for 1 minute

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▪ Between secondary terminals\*\*: At least 500 V AC for 1 minute

\* Primary terminals indicate power terminals and Aux Supply terminals.

\*\* Secondary terminals indicate Communication O/P and Power O/P.

Insulation resistance: 20M $\Omega$  or more at 500 V DC between power terminals and grounding terminal

Physical	
Mounting Type	Panel mount
Size (in mm)	96 (H) x 96(W) x 110 (D)
Front Bezel (in mm)	96 (H) x 96(W)
Panel cutout (in mm)	92 (H) x 92(W)
Depth behind panel	110 mm
Material	ABS
Accessory	2 Panel mount clamps
Weight	0.5 Kg
Enclosure Protection	IP 51
Terminal	Barrier Type terminal Cable Size [3.3 mm <sup>2</sup> (12 - 22 AWG)]

Environmental	
Working temperature	0 to 55 °C
Storage temperature	-10 to 70°C
Relative Humidity	30 to 95% non-condensing
Warm up time	5 minutes

## Ordering code

Model	Accuracy		Communication		Max. Demand		THD		Output		Display Type	
2160-A	S	Class 1.0	N	None	N	None	N	None	N	None	LCD	LCD [4x16]
	1	Class 0.5s	1	RS485 Modbus	Y	Required	Y	Required	1	Pulse Output	LED	7 seg LED [4 x 4]
	2	Class 0.2s	2	Ethernet								