MIB 8000C

4921210166A

Multi-instrument

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1. About the MIB

1.1 Application

MIB 8000C is a microprocessor-based multi instrument, designed for measuring most electrical quantities on a 3-phase electric energy distribution network.

The unit contains all necessary measuring circuits and can replace many standard analogue instruments in any electrical measuring application.

True RMS values on all 3-phase network topologies are measured with/without neutral and with both balanced and unbalanced load

Built-in display with backlight

Measurements are shown on the unit display, which has 4-digit resolution for all measurements and a white backlight. The on time duration of the backlight is selectable.

Operation

MIB 8000C is flexible, logical and simple to operate.

The user can easily adapt the instrument to suit the individual application. Counter reset and change of settings can be password protected.

Extension module

A single I/O extension module can be added to the MIB 8000C. This module is available as one of three variants.

Module	Description	Weight
AXM-IO1	6 digital inputs (DI), 2 relay output (RO), 24 V DC isolated voltage output	90 g (0.198 lb)
AXM-IO2	4 digital inputs (DI), 2 digital outputs (DO), 2 analogue output (AO)	80 g (0.176 lb)
AXM-IO3	4 digital inputs (DI), 2 relay output (RO), 2 analogue input (AI)	85 g (0.187 lb)

See *Available accessories* for ordering information.

1.2 Features

Measured and calculated values	
Voltage	True RMS – each phase and line-to-line voltage.
Current	Each phase, average and neutral.
Active power (P)	Active, total and demand – power.
Reactive power (Q)	Reactive, total and demand reactive – power.
Apparent power (S)	Apparent and total apparent power.
Power factor	Power factor and total power factor.
Frequency	Actual frequency of L1.
Load nature	L/C/R.
Digital output (DO)	For alarm output or energy pulse output.

Measured and calculated values	
Min./max.	Min./max. of voltage – max. of current and demand.
Energy pulse output	Two ports of pulse output (assign to any energy and reactive energy).
THD (up to 31st harmonics)	Voltage THD of each phase and total, current THD of each phase and total.
Demand	Demand of each phase current, power and reactive power.
Energy	Import and export of energy, inductive and capacitive of reactive energy.
Alarm	Alarm can be related to any metering parameters.
Running hour	Meters the duration of the operation.
Unbalance factor	Voltage and current.

1.3 Connection

MIB 8000C can be used in almost all 3-phase network topologies with/without neutral and with both balanced and unbalanced load. The voltage and current input wiring modes are set separately in the parameter setting process.

The voltage wiring mode can be:

- 3LN 3-phase 4-line Y
- 2LN 3-phase 4-line Y with 2 VT
- 1LN 1-phase 2-line
- 2LL 3-phase 3-line open delta
- 3LL 3-phase 3-line direct connection

The current input wiring mode can be:

- 3CT Unbalance system
- 2CT Unbalance system without N
- 1CT Balance system

MIB 8000C is supplied configured in 3-phase 4-wire unbalanced mode, that is to say, voltage wiring mode 3LN and current input mode 3CT (3W4).

1.4 Communication

Suitable for SCADA systems, RS-485 serial output, and Modbus RTU protocol.

2. Technical specifications

2.1 Electrical specifications

Auxiliary power supply	
Supply voltage AC/DC	100 to 415 V AC +/-10%, 50/60Hz, 100 to 300 V DC
Consumption	≤ 2 VA
Fuse	1A/250 V AC
Power consumption	3 VA @230 V AC
RTC clock	Time and date backup

Voltage measurement	
Nominal voltage U_n	L-N 400 V AC L-L 690 V AC
Measuring range	0 to 1.2 x U_n
Overload capacity	1500 V AC continuous 2500 V AC, 50/60 Hz for 60 s
VT primary	10 V to 1000 kV
VT secondary	10 V to 400 V
Fuse	1 A/230 V

Current measurement	
Nominal current I_n	1 A or 5 A AC
Measuring range	0 to 1.2 x I_n
Overload capacity	20 A continuous 100 A for 1s

Frequency measurement	
Nominal frequency f_n	50 Hz to 60 Hz
Measuring range	45 Hz to 65 Hz
Measuring point	V1 phase voltage

Accuracy	
Voltage	0.1 % of range
Current	0.1 % of range
Power	0.5 % of reading
Power factor	0.5 % of range
Frequency	0.1 % of range
Energy	0.5 % of range
Harmonics	1.0 % (up to 31st harmonic)
Phase angle	2.0% of range

Digital input	
Input form	Circuit form is Photo-MOS
Voltage range	20 to 160 V AC/DC "1" voltage level is 15 V "0" voltage level is 5 V
Input current	2 mA (maximum)
Switch response time	< 2 ms
Pulse frequency	100 Hz (maximum) 50 % duty ratio (5 ms ON, 5 ms OFF)
Output voltage	24 V DC
Output current	42 mA
Load	21 DI (maximum)

Digital output	
Output form	Circuit form is Photo-MOS
Voltage range	0 to 250 V AC/DC
Load current	100 mA (maximum)
Output frequency	Output frequency 25 Hz 50 % Duty Ratio (20 ms ON, 20 ms OFF)
Isolation voltage	2500 V

Relay output	
Switching voltage	250 V AC, 30 V DC (maximum)
Load current	5 A (R), 2 A (L)
Set time	10 ms (maximum)
Contact resistance	30 mΩ (maximum)
Isolation voltage	2500 V
Mechanical life	1.5×10^7

Analogue input	
Input range	0 to 20 mA/4 to 20 mA
Accuracy	0.2 %
Temperature drift	50 ppm/°C typical
Isolation voltage	500 V
Impedance	100 Ω

Analogue output	
Output range	0 to 20 mA/4 to 20 mA
Accuracy	0.5 %
Response time	300 ms
Temperature drift	50 ppm/°C typical

Analogue output	
Isolation voltage	500 V
Load resistance	500 Ω (maximum)

Consumption	
AXM-IO1	1 W
AXM-IO2	1.3 W
AXM-IO3	0.8 W

2.2 Communication

Communication	
Signal levels	RS-485
Connection type	Multi-drop
Devices per link	Maximum 32 units
Cable type	Belden 3105A or equivalent (twisted pair)
Maximum cable length	Up to 1000 m
Transmission mode	Asynchronous
Message format	Modbus RTU
Data rate	2400 to 115200 bits/s

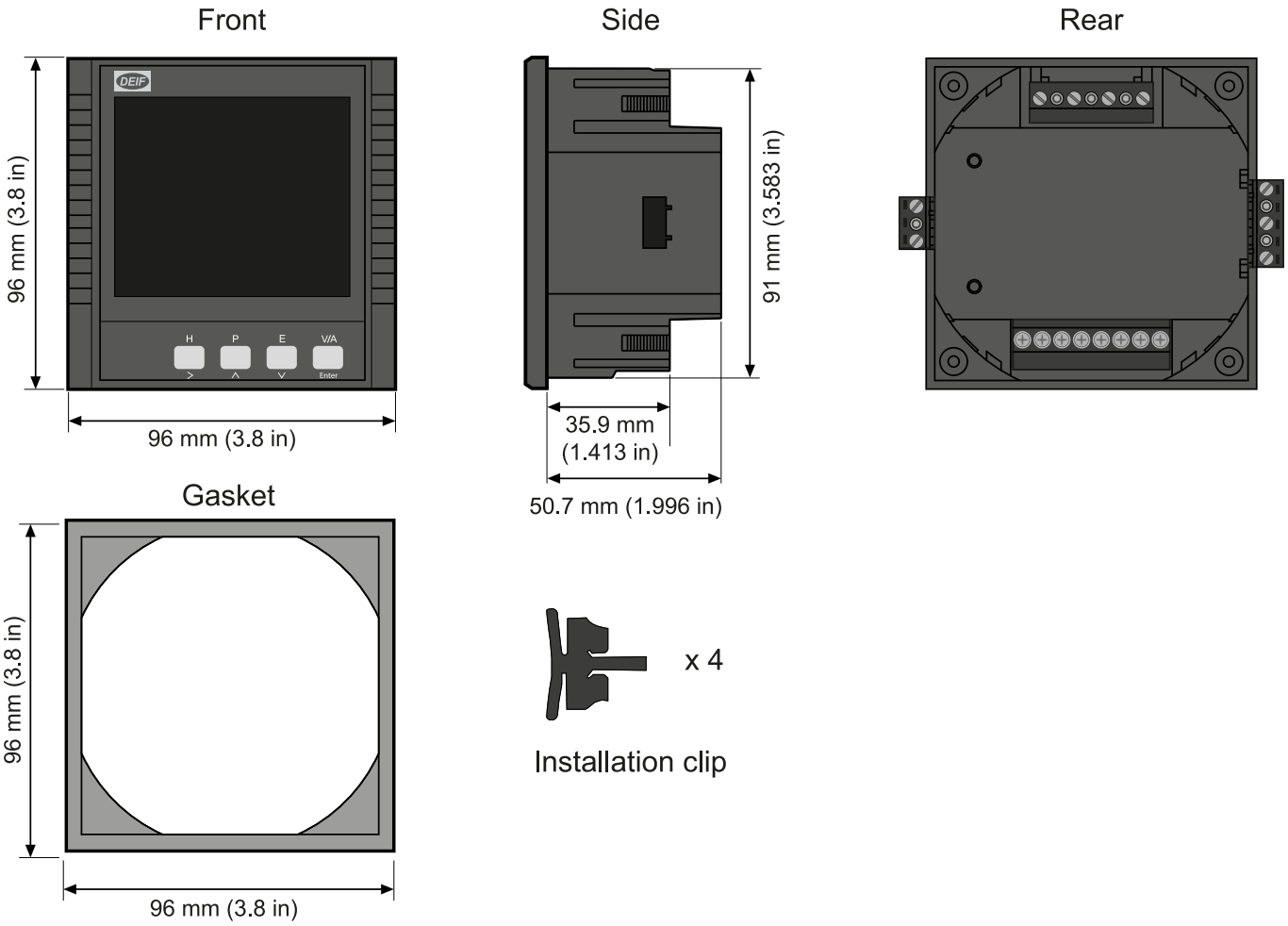
2.3 Environmental specifications

Operation conditions	
Working temperature, display	-25 to +70 °C (-13 to +158 °F)
Storage temperature	-40 to +85 °C (-40 to +185 °F)
Relative humidity	5 to 95 % non-condensing
Temperature drifts	< 100 ppm/°C
Measurement Standard	IEC 62053-22, ANSI C12.20, IEC 61557-12
Material	IEC 60068-2, RoHS
EMC	IEC 61000-4-2/3/4/5/6/8/11, CISPR-22, IEC 61000-3-2, IEC 61000-6-2/4, EN 55011
Safety	IEC 61010-1, UL 61010-1, Cat. III, pollution degree 2 I/O extension modules: 300 V installation cat. III, pollution degree 2 600 V installation cat. II, pollution degree 2
Test voltage	2.2kV according to EN 61010-1
Protection- Front	IP52 (EN 60529)
Protection- Rear	IP30 (EN 60529)
Vibration	I/O extension modules: IEC 60068-2-6 Db

2.4 Connections

Connections	
Measuring inputs	Fixed terminal block
Maximum wire	5 mm²/AWG10
Screw torque	0.5 Nm / 5.5 lb-inch

2.5 Dimensions and weight



Dimensions and weight	
Dimensions	Length: 96 mm (3.8 in) Height: 96 mm (3.8 in) Depth: 50.7 mm (1.996 in)
Panel cutout	**Square (IEC 92 DIN)** Length: 92 mm + 0.5 (3.62 in) Height: 92 mm + 0.5 (3.62 in) **Round (ANSI C39.1)** Diameter: 101.6 mm + 0.5 (4 in)
Maximum panel thickness	6 mm (0.24 in)
Weight	350 g (0.8 lbs)

3. Ordering

3.1 MIB 8000C

Item	Description	Item no.
MIB 8000C	Standard, RS485	2961050020.01

Available accessories

Item	Description	Item no.
Bracket	Bracket for DIN-rail mounting.	2961021911.10
AXM-IO1	6 digital inputs (DI), 2 relay outputs (RO), 24 V DC isolated voltage output.	2961021911.02
AXM-IO2	4 digital inputs (DI), 2 digital outputs (DO), 2 analogue outputs (AO).	2961021911.03
AXM-IO3	4 digital inputs (DI), 2 relay outputs (RO), 2 analogue inputs (AI).	2961021911.04

4. Legal information

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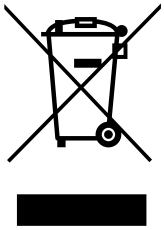
5. End-of-life

Disposal of waste electrical and electronic equipment

WEEE symbol



All products that are marked with the crossed-out wheeled bin (the WEEE symbol) are electrical and electronic equipment (EEE). EEE contains materials, components and substances that can be dangerous and harmful to people's health and to the environment. Waste electrical and electronic equipment (WEEE) must therefore be disposed of properly. In Europe, the disposal of WEEE is governed by the WEEE directive issued by the European Parliament. DEIF complies with this directive.

You must not dispose of WEEE as unsorted municipal waste. Instead, WEEE must be collected separately, to minimise the load on the environment, and to improve the opportunities to recycle, reuse and/or recover the WEEE. In Europe, local governments are responsible for facilities to receive WEEE. If you need more information on how to dispose of DEIF WEEE, please contact DEIF.