DYNAMIC RATINGS

B100 Series

ELECTRONIC TEMPERATURE MONITOR (ETM)

Gauge, Operator Interface, Control and Communications for Transformers

Product Overview

B100 - E

Features

- Gauge, Operator Interface, Control and Communications for Transformers

- Multiple Secure Communications Options (DNP3 / Modbus / IEC 61850)

- Cooling Control and Alarming

- Large Day / Night Operator Interface

- Rugged NEMA-4X Enclosure

- CE Approved

B100 Series ETM

Following a long history of providing substation hardened, transformer and electrical equipment sensing, monitoring, control and communication systems, the reliable and affordable B100 Series electronic temperature monitor (ETM) and digital gauge provides the highest in measurement accuracy, relay outputs and secure communication capabilities.

One B100 ETM replaces multiple top oil and winding temperature gauges.

Design Advantages

B100 is compact and ideal for placement on new transformers and for retrofit / replacement programs whereby supplementing or retirement of historic mechanical devices, and their inherent inaccuracy, is desired.

Featuring a rugged NEMA-4X enclosure, B100 is substation ready with an environmentally hardened design.

The B100 provides the industry's most networking interconnection options, including local area networks (LAN) and wide area networks (WAN).

The B100 supports iBridge IED substation communications. iBridge facilitates rapid installation of IED communications in less than 30 minutes without the need for specialized labor.

Features & Benefits

- One B100 provides multiple winding temperature calculations, accomplishing the workload of several traditional mechanical gauges.

- The B100 provides users immediate access to critical performance data. Four pushbuttons allow user to access multiple temperatures from one device.

- A large, easy to read, clear, day / night readable LCD display, provides comprehensive information versus a mechanical gauge.

- Easy to use menus with an intuitive operator interface offer extremely intuitive and fast setup. The system will be up and running in minutes. No software to install.

- Direct SCADA connections help your network become more connected. Utilise IEC61850, DNP3 or Modbus, over copper or fibre and bring your temperature data back to your desired systems.

All-in-One Device, the B100 ETM is Far More Than a Gauge

The B100 ETM is the industry's premium electronic temperature gauge controller. B100 features allow operation as a gauge, operator interface, control and / or communications device for utilities and OEMs desiring temperature indication and control, data connectivity and optimum accuracy.


B100 Eliminates Loss of Indication and Control

Mechanical gauge indicators inherently provide <u>relative</u> measurement display versus the B100 ETM, which provides an <u>absolute</u> measurement display.

Further, gauges are generally reliable, but gauge lenses can become unreadable and their mechanical moving parts, including springs, age and create inaccurate measurements due to lagging or range of travel constraints. When a gauge has failed, it is often not obvious and will offer misleading data (or does not provide alarms or protection) until somebody realizes it is broken. The B100 resolves this.

Large, Clear, Day / Night Readable LCD Temperature Display:

- 30 mm (1.18") tall, seven segment digits for main temperature display
- Fifteen segment bar graph for temperature visualization
- 20 x 4 character section for menu and configuration messages
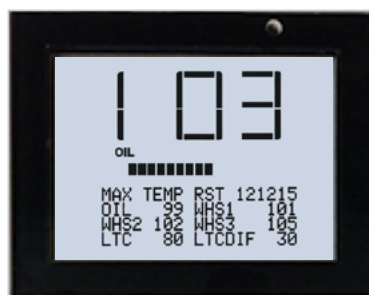
Large Day / Night Display

DYNAMIC RATINGS

Accurate Temperature Indication and Display

In the age of real time monitoring, where assets are often run at the upper end of their limits, accurately knowing the temperature of the transformer is critical to system optimization and avoiding failures; the B100 does this. The B100:

- Accurately measure top oil temperature (Pt100 three wire probe)
- Calculates winding temperatures (up to three) using current industry accepted methods and standards
- Is dual gradient capable for OF/OD transformers
- Optionally provides accurate LTC temperature monitoring option (including differential calculation) accomplished with two RTDs, one for main and one for OLTC tanks
- Operates relay outputs (alarms, trips and cooling circuits)

A large clear temperature display is easily readable, day or night, clearly displaying critical data

Accurate Temperature Display

B100 Eliminates Lack of Connectivity

Historically, temperature data was collected manually. Today, there is an expectation that data, events, and alarms are brought back to a control center in digital format for integration with other environmental operating metrics and data. The B100 does this with the following built-in connectivity, ready for data export features:

- Industry standard protocols (Modbus, DNP3, IEC61850)
- Ethernet connection over standard fibre (LC or ST connectors offered) / copper media (RJ45) or integrated iBridge option for rapid communications deployment utilizing in-place infrastructure.
- Serial connection over standard fibre / copper media.
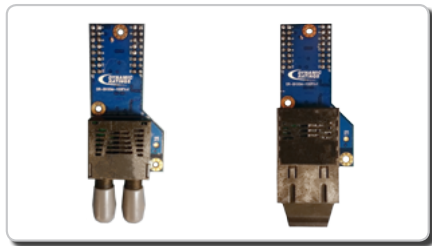- Data recording and download functions.

B100 Communications Options

Ethernet Communications

The B100 can be supplied with one of the following Ethernet communication options. Each ordering option is referenced by model number letter in the parentheses below:

- (N) No Ethernet communication (default selection)
- (L) 100Base-FX Fibre Ethernet port with LC connectors (compatible with 50/125, 62.5/125, and 100/140 micron glass core multimode fibre)
- (S) 100Base-FX Fibre Ethernet port with ST connectors (compatible with 50/125, 62.5/125, and 100/140 micron glass core multimode fibre)
- (R) 100Base-TX RS45 Copper Ethernet port
- (C) Integrated iBridge Point to Point Communications System

  The iBridge is an affordable communications system utilizing existing conductors that enables rapid installation and data communications to IED communications. When the B100 is ordered with the iBridge option, the Ethernet and serial ports are replaced with an internal connection to an iBridge module.

Fiber Ethernet Port Options   Copper Ethernet Port Option

Serial Communications

The B100 can be supplied with one of the following serial communication options. The ordering option by model number letter is referenced in the parenthesis below:

- (N) No serial communication (default selection)
- (4) RS-485/RS-422 copper serial port
- (F) Serial over fibre port with ST connectors (compatible with 50/125, 62.5/125, and 100/140 micron glass core multimode fibre)

DYNAMIC RATINGS

B100 Inputs and Output

Base Model

The base model provides the following I/O ports:

- 1 x USB 2.0 Type B device with USB Ethernet (RNDIS) for configuration and data download
- 1 GB of on-board memory for configuration and data logging
- 1 x Form B relay for 'device fail' output
- 4 x Form C relays for alarm outputs
- 1 x RTD input for main tank temperature input
- 3 x CT inputs for load current input and WTI calculation
- 1 x Digital input for dual winding gradient function

Enhanced IO Model (LTC Monitoring)

The enhanced IO model provides additional IO ports, offering LTC monitoring capabilities and additional outputs.

- 1 x RTD input for LTC temperature input
- 2 x Form C relays for alarm outputs
- 2 x Analog outputs for remote indication

Rugged NEMA - 4X Enclosure

With a wide temperature range and carefully selected components, be assured that this device will perform, even when exposed to nature's worst.

The B100 rugged design is substation-hardened to last for years. B100 is supplied in a cast aluminium enclosure rated to NEMA 4X / IP67 ingress protection. B100 enclosure features include:

- Custom designed cast aluminium enclosure with metal buttons - designed to last in extreme temperatures
- Powder coated to prevent surface damage from handling, installation, or corrosion in extreme environments
- Padlock loop to facilitate customer security by locking of the device's enclosure
- Gore® air vent for pressure and temperature compensation
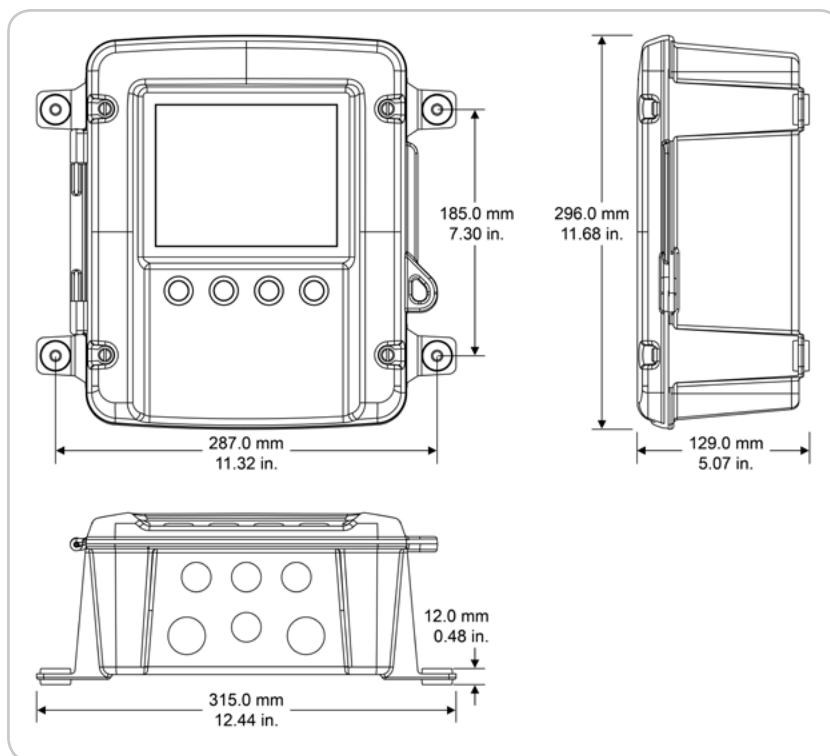
Rapid Installation and Ease of Field Wiring

Mounting is via four mounting holes (with supplied vibration mounts) on the sides of the housing. Cable entry is via multiple ports in the bottom of the unit. Staggered screw terminals for quick and robust in-the-field connection.

Four x M20 (0.75"), two x M25 (1.0") ports for cable glands, ensuring installation tool access.

Easy Field Wiring

Dimensions

185.0 mm
7.30 in.

296.0 mm
11.68 in.

287.0 mm
11.32 in.

129.0 mm
5.07 in.

12.0 mm
0.48 in.

315.0 mm
12.44 in.

B100 Series Enclosure

DYNAMIC RATINGS

SPECIFICATIONS

Power Requirement:	**40 - 275 VDC or 90 - 264 VAC (47 – 63 Hz)**
Internal Memory:	**Removable 2GB industrial Secure Digital (SD) memory**
Temperature Range:	**-40°C to 70°C (-40°F to 158°F)**
Humidity Range:	**0 to 95% non-condensing**
Ingress Protection:	**NEMA-4X (IP66 equivalent)**

B100 Series — ORDERING INFORMATION

To Order, Fill Boxes with Feature Selections

Each B100 base system includes the following Standard IO:
(1 x RTD, 3 x CT, 1 x Digital Input, 4 x Digital Outputs)

Select an Enhanced IO Option

Select an Enhanced Communications Option

Select a Serial Communications Option

B100 - ☐ - ☐ - ☐

Enhanced IO, Options

N	None.	N
E	Expanded IO, (LTC Monitoring) - Includes 1 x RTD, 2 x Dig Out, 2 x Analog Out.	E

Ethernet Communications, Options

N	None.	N
L	100-BaseFX Fibre Ethernet with (LC connectors)	L
S	100-BaseFX Fibre Ethernet with (ST connectors)	S
R	100-BaseT Copper Ethernet with (RJ45 connector)	R
C[1,2]	Integrated iBridge Communications System of Ethernet and Serial; Communications Over Existing Wire	C

Serial Communications, Options

N	None	N
4	RS-485 Copper Serial Port	4
F	Serial over Serial Fibre (ST connectors)	F

Notes

[1] This option includes one (CE-520) iBridge IED Networking Solution device inside the B100 enclosure and one (IND2000N) 9mm inductive coupler and RS-485 breakout board.

[2] This option requires ordering a second iBridge device and second inductive coupler for your application. Devices - see below: (CE-520, CE-525, CE-530, CE-535), inductive couplers - see below: (IND2000N, IND2020N, IND2040N, or IND2100N)

Cables, sensors, and wiring are not included and must be ordered separately.

The B100 is CE and RoHS approved.
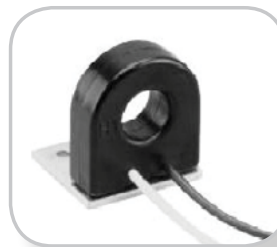
SENSORS — ORDERING INFORMATION

Part #	Description
CT-054	Auxiliary CT: Split Core CT 1000:1 Ratio w/5A Primary
CT-055	Auxiliary CT: Fixed Core CT 1000:1 Ratio w/5A Primary
MMTS-3C	One magnetic mount sensor, 3 wire PT-100 RTD, includes 1/2" NPT conduit connection.
MMTS-3W	One magnetic mount sensor, 3 wire PT-100 RTD, includes (7.6m / 25 ft.) of Stainless Steel armored cable with flying leads connection.
SE-060	Temperature Sensor, Probe for 1/2" NPT Thermal Well

The ordering table includes B100 compatible sensors.

CT-054

CT-055

MMTS

SE-060

The ordering tables below are B100 compatible, sensors and communications devices.

iBridge DEVICES and ACCESSORIES — ORDERING INFORMATION

| Part #	Description
CE-520	iBridge with a 1.83m / 6 ft. power cord with NEMA 5-15 plug
CE-525	iBridge with a field wiring plug
CE-530	Gateway with a 1.83m / 6 ft. power cord with NEMA 5-15 plug
CE-535	Gateway with field wiring plug
CE-562	One RS-232 connection adaptor
CE-564	One RS-232 (25 pin) connection adaptor
IND2000N	One 9mm / 0.35 in. signal coupler
IND2020N	One 13mm / 0.51 in. signal coupler
IND2040N	One 18mm / 0.71 in. signal coupler
IND2100N	One 25mm / 0.98 in. signal coupler
SLRS5DIN00RXX	iBridge mounting kit includes: (1) DIN mount L-bracket and hardware

iBridge CE-520

iBridge CE-525

CE-562

CE-564

SLRS5DIN00RXX
iBridge Mounting L-bracket, iBridge on Mounting Kit
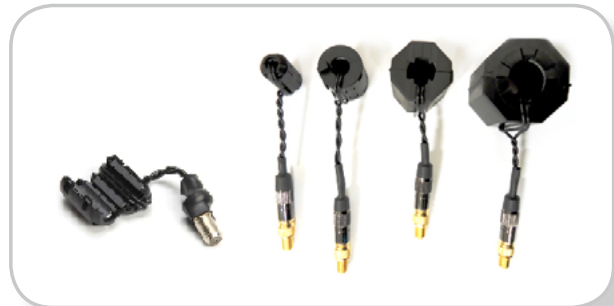
IND-; 2000N, 2020N, 2040N, 2100N

DYNAMIC RATINGS

*For any enquiry, please contact
your local Dynamic Ratings office.*

Asia /Africa /United Kingdom
+61 3 9574 7722
sales.asia@dynamicratings.com

Americas /Europe /India /Middle East
+1 262 746-1230
sales.us@dynamicratings.com

www.dynamicratings.com

©2016 Dynamic Ratings   *Specifications subject to change without notice. All rights reserved.*   B100 160323 ASIA