

Total ECLIPSE ™



Same Great Features & I/O of the ECLIPSE Including:

- ◆ Direct Fiber Winding Temperature
- ◆ Built-In Annunciator
- ◆ GIC Core Saturation Detection
- ◆ Programmable Function Buttons
- ◆ SCADA Communications via TCP/IP
- ◆ Web-Based GUI
- ◆ NERC CIP Secure
- ◆ Automatic OLTC Voltage Control

Introducing a New Member of the ECLIPSE Family Featuring More Card Capacity + USB B + IEC61850 with GOOSE Messaging, Ethernet Fiber, IEC62439 PRP/HSR

- ◆ No Calibration Required, Ever
- ◆ Real-Time Loading Prediction
- ◆ Automatic E-mail Notifications
- ◆ Integrated Condition Based Assessment for OLTCs
- ◆ Analog and Digital Input Data Concentrator
- ◆ Real-Time “Loss-of-Life” Calculations



Monitor With Confidence™

Total ECLIPSE



TM

A Complete Monitoring Platform

Up to **7** Temperature Probes

Up to **16** Direct Fiber Winding Inputs

Up to **16** Relay Outputs

Up to **36** CT Inputs

Up to **32** Analog Inputs

Up to **90** Digital Inputs

Data Concentrator

Collect data around your transformer for use in QuickMath™ equations, or simply communicate it back to SCADA

Patented **Dual-Algorithm OLTC Condition Monitoring™**

Patented **Sensorless OLTC Position Monitoring™**

Patented **Load Pickup Cooling™**

Event and Data Logging

Monitor With Flexibility

QuickMath™

QuickMath™ allows you to take full control of your monitoring through easily programmable logic.

- Math **Functions**: +, -, x, ÷, e^x , $\ln x$, y^x , x^2 , $\sqrt{\quad}$, $1/x$, ()

- Perform Comparisons: =, >, <, ≥, ≤, ≠

- Program Your Own Condition-Based Assessment Criteria Including **Loss of Life**.

- Automatic OLTC Voltage Control

- **Create** Your Own Set Points

- Up to **16** User Equations

- Up to **32** Comparison Evaluations

- Include the Following **Directly** into QuickMath:

Liquid and Winding Temperatures

Analog Inputs

Aux **CT** Inputs

Constants

GIC Detection & Mitigation

- ◆ Quantifiable Detection of Core Saturation
 - ◆ 3 Levels of Alarm: Minor, Major, & Critical
 - ◆ Large Split-Core Hall-Effect Sensor
 - Accommodates up to a 4 inch bus bar
- U.S. & Foreign Patents Pending

Built-In Annunciator

- ◆ User Programmable Names & Targets
- ◆ **Events Log** with User Selected Events
- ◆ Time Synchronization via DNP

Test Mode

- ◆ Interactively test set points using temperature and current ramps

E-mail Notifications

- ◆ Receive e-mail notifications for user-customizable events

Total ECLIPSE PLUS

Visualize Your Transformer's Health



Retain all functionality of the Total ECLIPSE while gaining significantly increased I/O capacity with up to 15 modules.

Ethernet

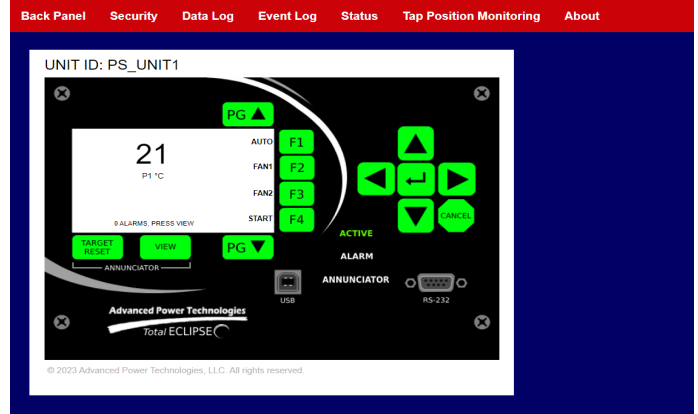
Ethernet Simultaneously Supports

- ◆ IEC61850 w/ GOOSE Messaging
- ◆ DNP 3.0 or MODBUS TCP/IP
- ◆ Automatic E-Mail Notifications
- ◆ Secure HTML Browser-Based GUI Access for:
 - Data logging and Event Data
 - Annunciation
 - Settings View/Edit
 - File Transfer

Advanced Power Technologies

Total Eclipse

World Class Monitoring



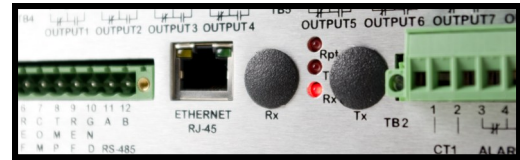
Browser-Based Graphical User Interface

For Monitoring, Annunciation, Settings,

File Transfer, and Data Log

Additional Communication Options

- ◆ Dedicated Fiber for DNP 3.0 or MODBUS
- ◆ Wired RS-485 for DNP 3.0 or MODBUS
- ◆ RS-232 and USB B Serial Communications



Built-In Function Buttons

The **8** built-in **function buttons** allow replacement of switches normally found in the transformer control cabinet for manual fan or tap changer control

Comprehensive LTC Condition Based Assessment

Apply:

Dual-Algorithm OLTC Condition Monitoring™ along with OLTC Position Monitoring for comprehensive LTC Condition Monitoring. The true value of this feature is realized through reliable predictive maintenance of your OLTCs

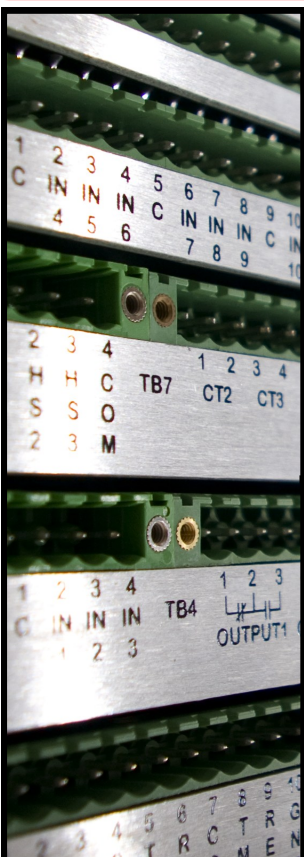
Direct Fiber Winding Temps

Real-Time Winding Hotspot

- ◆ No calibration or maintenance
- ◆ High dielectric strength
- ◆ Rated for use at 765 kV
- ◆ Compatible with existing Phosphor tip fiber installs
- ◆ **16** fiber probe capable
- ◆ Works with legacy Phosphor Probes

Please see the ECLIPSE DFWT Datasheet for more details

Advanced Power Technologies



Additional Specifications

Total ECLIPSE Enclosure & Dimensions: 8.028 W x 4.882 H x 6.40 D Chromated Steel

Total ECLIPSE Front Panel Dimensions: 8.378 W x 5.686 H

Total ECLIPSE Plus Enclosure & Dimensions: 16.858 W x 8.028 H x 6.437 D

Total ECLIPSE Plus Front Panel Dimensions: 19.210 W x 8.340 H

Power Supply Input Operating Range: 38 VDC to 290 VDC or 120 VAC +/- 10%, 10 Watts Max

Operating Temperature Range: -50 °C to +85 °C, 95% Relative Humidity (non condensing)

Temperature Measurement Accuracy: Avg error over entire measurement range ± 1 °C. Absolute error at any temperature ± 1.5 °C for temperatures within the range of 23°C - 160°C. Below 23 °C the error is ± 3.5 °C.

Alarm and Output Contact Rating: 30 amps make for 250 msec at 290 VDC, 8 amps continuous at 250VAC, 0.4 amps break at 160 VDC, 0.15 amp continuous at 290 VDC

Optically Isolated Inputs: Operates from 38 to 290 VDC or 24 VAC to 260 VAC. External wetting voltage required.

Analog Output: Self powered and selectable, 0 to 1 mA or 4 to 20 mA. Maximum load 10,000 Ohms (0 to 1mA), 510 Ohms (4 to 20 mA).

Analog Input: 0 to 10 VDC or -5 to +5 VDC, Accuracy +/- 1%

Auxiliary CT Inputs: 0 to 50 Amps or 0 to 100 Amps RMS ± 3.5 % of full scale, High-Speed Channels can derive up to the 8th Harmonic

GIC/DC Sampling Rate: 4 Samples per Second

Communications Interfaces: Front Panel Mounted RS-232 DB-9 Null Modem Interface or USB B (USB-CDC class), Type 2, Full Speed 12 Mbps

Ethernet: 10/100 Base-T metallic interface with transformer isolation of 1,500 Volts AC RMS in accordance with IEEE/ANSI 802.3

Current Measurement Range: 0 to 50 A or 0 to 100 A

Surge Withstand/Fast Transient: Relay outputs and station battery inputs: ANSI C37.90.1

EMI Withstand: ANSI C37.90.2

Electrostatic Discharge: IEC 801-2

EMC Directive (2004/108/EC): IEC61326-1 and CISPR-11

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