Franklin Electric
GRID SOLUTIONS

UTILITY MONITORING

OPTIMIZER3 CIRCUIT BREAKER MONITOR

The INCON® Optimizer3 Circuit Breaker Monitor delivers advanced automated reporting of all critical circuit breaker diagnostics to ensure uptime and facilitate predictive maintenance. The early small-scale problem detection and automated system performance evaluation capabilities of the Optimizer3 help to improve the efficiency, service life, and reliability of electric utility systems.

CONDITION BASED MAINTENANCE

EXTEND BREAKER LIFE

24/7 MONITORING

HIGHLIGHTS & TECHNOLOGY

Deploy maintenance with intelligence and only as it's needed, limiting truck rolls, speeding reaction time, and lowering overall maintenance costs — all while reducing on-site exposure.

Targeted maintenance enables utility technicians to repair a small issue before it causes a substantial failure that may require equipment replacement or an entire overhaul of a high-cost asset.

Along with its array of sensors, the Optimizer3 monitors both the mechanical and electrical performance of the circuit breaker to perform trending analysis that predicts the date of future service.

Performance measurements including opening (trip) and closing times, arc duration, clearing time, and open/close travel times and velocities are automatically analyzed to provide a full assessment of the circuit breaker's health.

- Provides automated SF_6 loss data for regulatory reporting
- 8 sensor inputs, 20V excitation provided
- 5 timing inputs (trip/close coils, 52a/52b)
- Onboard ambient temperature sensor
- Onboard supply voltage monitor
- Web server user interface — no special software required
- Circuit breaker & gas monitor reports in CSV format
- USB port for data downloads
- Mini-USB port for local communication
- Dual RS-485 full duplex ports for DNP3 communication
- Ethernet over copper & fiber optic for DNP3, networking & firmware upgrades

APPLICATIONS

POWER UTILITIES

The Optimizer3 is ideal for high-voltage, live or dead-tank, oil, vacuum or gas circuit breakers.

SPECIFICATIONS

Circuit Breaker Monitoring Capabilities

- Breaker State (Open/Closed)
- Breaker Timing
  - Opening & Closing Time (Latch Time)
  - Opening & Closing Travel Time
  - Arc Time
  - Interrupting Time
- Opening & Closing Travel Velocity
- Operations Count
  - Fault-Interrupt Count
  - Non-Fault-Interrupt Count
- Days Since Last Operation
- Trip & Close Coil Circuit Integrity
- Charging Motor Current Draw & Run Time
- Contact Wear & Restrike Detection

Circuit Breaker Monitoring Reporting

- 2-Hour Current Log (5000 Records – FIFO)
  - Min., Max., & Average Current
- Event History (5000 Records – FIFO)
  - Opening Coil (1 or 2)
  - Timing Measurements
  - Opening & Closing Velocity
  - Peak Fault Current
  - Alarm Status for Each Operation
  - Contact Wear for Each Operation
  - Accumulated Contact Wear

SF_6 Gas Monitoring Capabilities

- Gas Density
- Gas Pressure
- Gas Temperature
- Leakage Trend & Confidence Level
- Forecasts Days until Low Gas Alarm

SF_6 Gas Monitoring Reporting

- Daily Average (750 Records – FIFO)
  - Pressure, density, temperature & SF6 mass
- 2-Hour History Log (5000 Records – FIFO)
  - Pressure, density, temperature

Sensor Types Supported

- SF_6 Gas Density, Temperature, Pressure
- SF_6 Gas Dew Point
- Generic AC/DC Voltage & Current
- Generic (Hydraulic, Air) Pressure
- Generic Temperature
- Tank Heaters (UPSM-241)
- Analog: 4-20mA (Loop-Powered)
- Digital: Frequency/Pulse-Width Modulated

Environmental

- Operating Temperature: -40 to 65° C
- Storage Temperature: -40 to 65° C
- Humidity: 0 to 95% Non-condensing

Communications

- RS-485 Full/Half Duplex
- Ethernet
- Fiber-optic

Relay Output

- Dry Contact; 1 ea. Form C

Relay Contact Rating

- N.O: 5 Amps @ 250 VAC or 3 Amps @30 VDC
- N.C: 2 Amps @ 250 VAC or 1 Amp @ 30 VDC

Relay Contact Fuses

- 3.15 A Slow-Blow

Power Supply Input Voltage

- 110-250 VDC / 90-264 VAC, 50 / 60 Hz

Power Consumption

- 60VA Maximum

Power Supply Input Fuses

- 3.15 A Slow-Blow

Aux Input Voltage

- 0 to 48 - 250 VDC

Aux Input Fuses

- ¼ A Fast-Blow

Aux Input Impedance

- 540K Ohms

CT Pickup Coil Input Signal

- 0 to 5 VAC

Input Sampling Rate

- 32 Samples per line cycle

Sensor Signal

- Analog: 4 to 20 mA
- Digital: Frequency & Pulse-Width Modulated

Sensor Power

- 20 VDC @ 25mA Max

Analog Sensor Accuracy

- +/-1% of Full-Scale Max, +/-0.5% Typ.

Dimensions

- 280 mm L x 70 mm W x 143 mm H
- 11" L x 2¾" W x 5 5/8" H

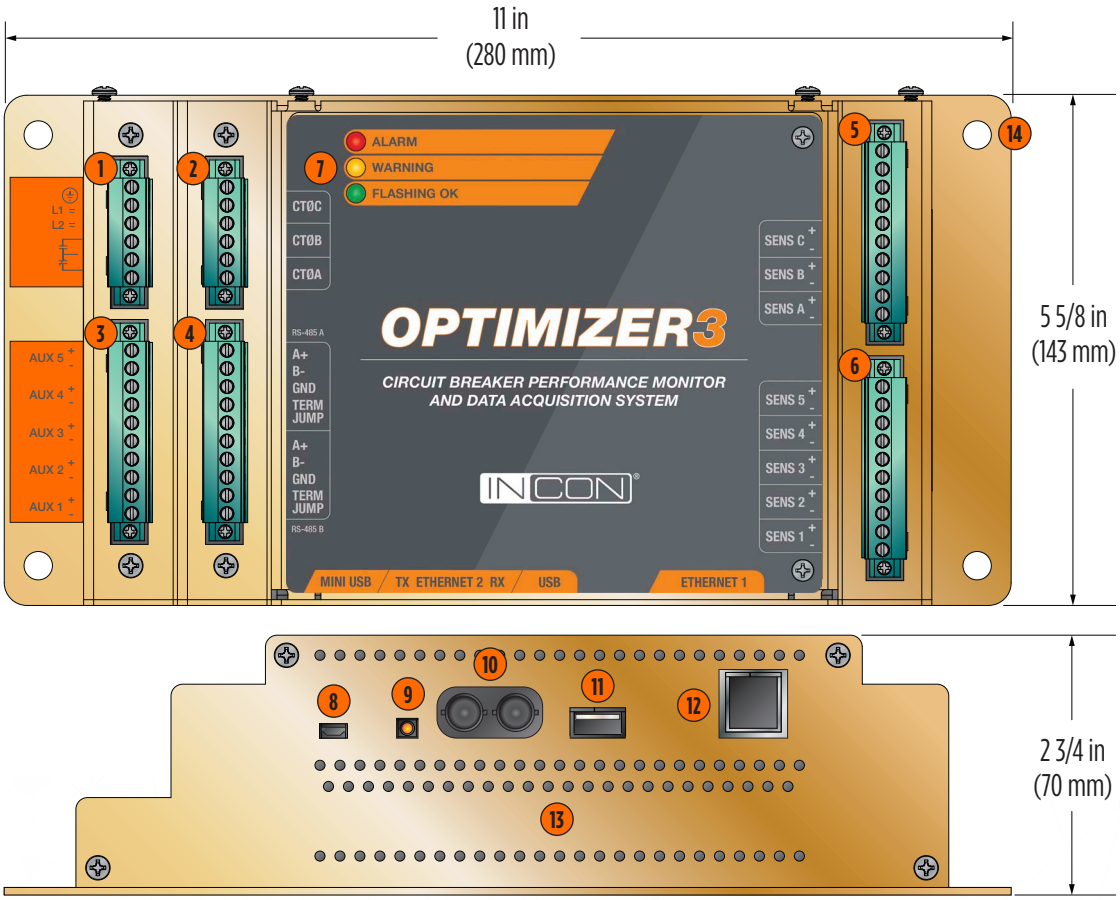
Shipping Weight

- 6 lbs. (2.25Kg)

Immunity and Emissions Certification

- CISPR 16-2-1 (Conducted Emissions)
- CISPR 16-2-3 (Radiated Emissions)
- IEC61000-4-2 (ESD)
- IEC61000-4-3 (Radiated RF)
- IEC61000-4-4 (EFT)
- IEC61000-4-5 (Surge)
- IEC61000-4-6 (Conducted RF)
- IEC 61000-4-11 (Voltage Dips & Interrupts)
- IEC 61000-4-12 (Damped Osc. Wave, Power Ports)
- FCC Part 15, Subpart B; ICES-003 (Emissions)

COMPONENTS & DIMENSIONS

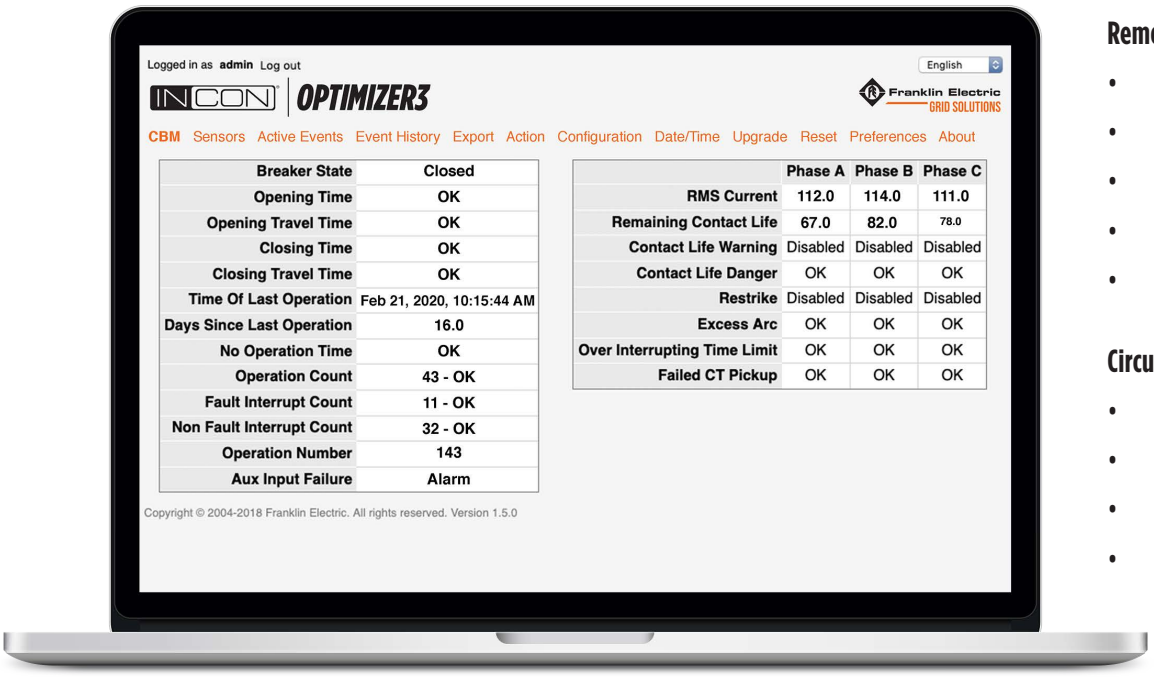


Components

1. Power input & relay output
2. CT inputs
3. Timing inputs
4. RS-485 ports
5. Digital/analog sensor inputs
6. Analog sensor inputs
7. Status LEDs
8. Mini USB port
9. Ambient temperature sensor
10. Fiber-optic port (optional)
11. USB 2.0 port
12. Ethernet port
13. Vents
14. Mounting holes

COMMUNICATION

The Optimizer3 functions as a web server itself, with no additional software required to communicate with it. It is connected to a network via either a fiber optic, Ethernet, or RS-485 connection to facilitate the transfer of data. The web-based interface allows users to securely connect directly to the Optimizer3 data from any web-enabled device without having to host anything on a server.

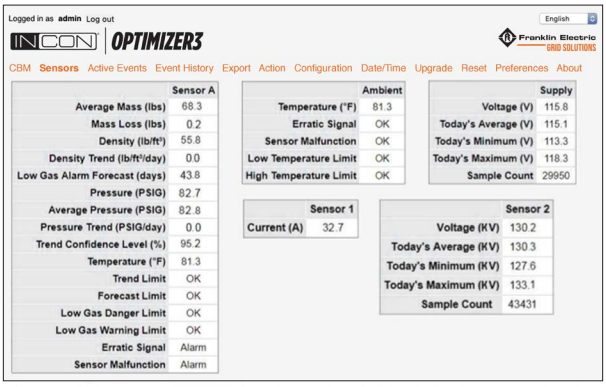


Remote Functions

- Setup
- Programming
- Alarm clearing
- Alarm resetting
- Firmware upgrades

Circuit Breaker Status

- Alarm status
- Date/time of last operation
- Operation number
- Real-time RMS current



Sensor Status

- SF_6 gas compliance info
- Ambient temperature
- Supply voltage
- Sensor information

Setup & Configuration

- The completed configuration can be downloaded and saved as an XML file
- The configuration file can be edited with a word processor and uploaded to other Optimizer 3 units, enabling them to be quickly configured for breakers of the same type

Data Security

To accommodate the high level of importance power utilities place on security, the Optimizer3 employs a multitude of contemporary security methods to prevent unauthorized access to data including:

- Secure access via HTTPS port only
- Encrypted USB flash drive access
- 10-minute inactivity timeout
- No default passwords
- Generic feedback from failed logins
- Hidden password characters
- Successful third party vulnerability threat testing:
  - San Diego Electric & Gas
  - Lower Colorado River Authority

ORDERING INFORMATION

OPTIMIZER3 CIRCUIT BREAKER MONITORS

Model	Description
OM3D	Optimizer3 circuit breaker monitor, density measurement-ready
OM3D-F	Optimizer3 circuit breaker monitor, density measurement-ready with fiber-optic communication port
OM-MMK	Optimizer3 magnetic mounting kit

Magnetic Mounting Kit

- Non-drill, easy mounting to ferrous metal panels and enclosures
- NEMA cabinet rating is not compromised by having to drill
- All hardware included: (4) clip nuts, (4) screws, and (4) magnets