OSENSA INNOVATIONS

Excellence in Innovation

Industrial Fiber Optic Temperature Monitoring

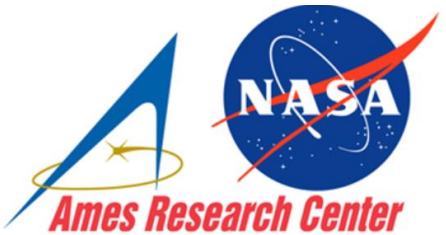
March 2022

About OSENSA Innovations

- **OSENSA is the technology leader for fiber optic temperature sensing in industrial, medical, and research applications**
- **Headquartered in Vancouver, British Columbia, Canada**
- **Incorporated in 2010**
- **Products are designed and manufactured in Canada**
  - ✓ **ISO-9001:2015 certified**
  - ✓ **CE, UL and Marine certified products**
  - ✓ **RoHS compliant**
- **More than 20% of revenues are re-invested into R&D each year**
- **Exceptional track record for high performance, high quality, and excellent support**

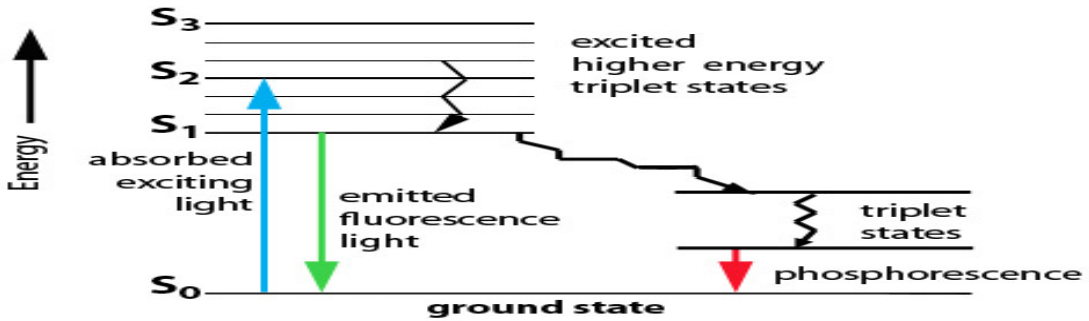
Industry Leaders Rely on OSENSA Technology

- 100's of customers world-wide
- Thousands of systems sold



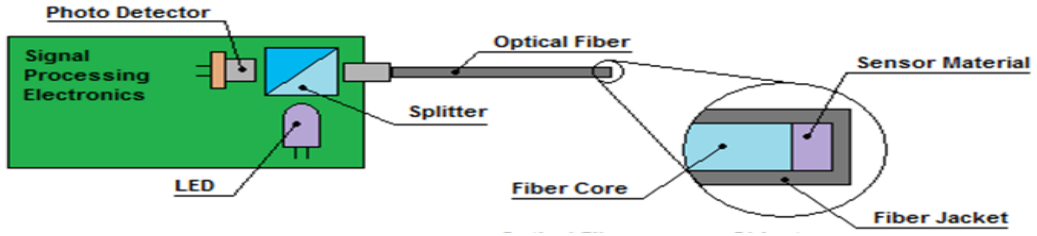
OSENSA's Fluorescent Technology

The scientific principle is "Fluorescent Time Decay"



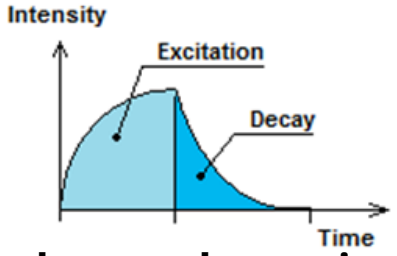
OSENSA's technology leads the world in accuracy

A special fluorescent phosphor is excited with light



OSENSA uses an exceptionally long-life LED source

Electronics measure the time- constant (τ) for the glowing phosphor which is proportional to temperature

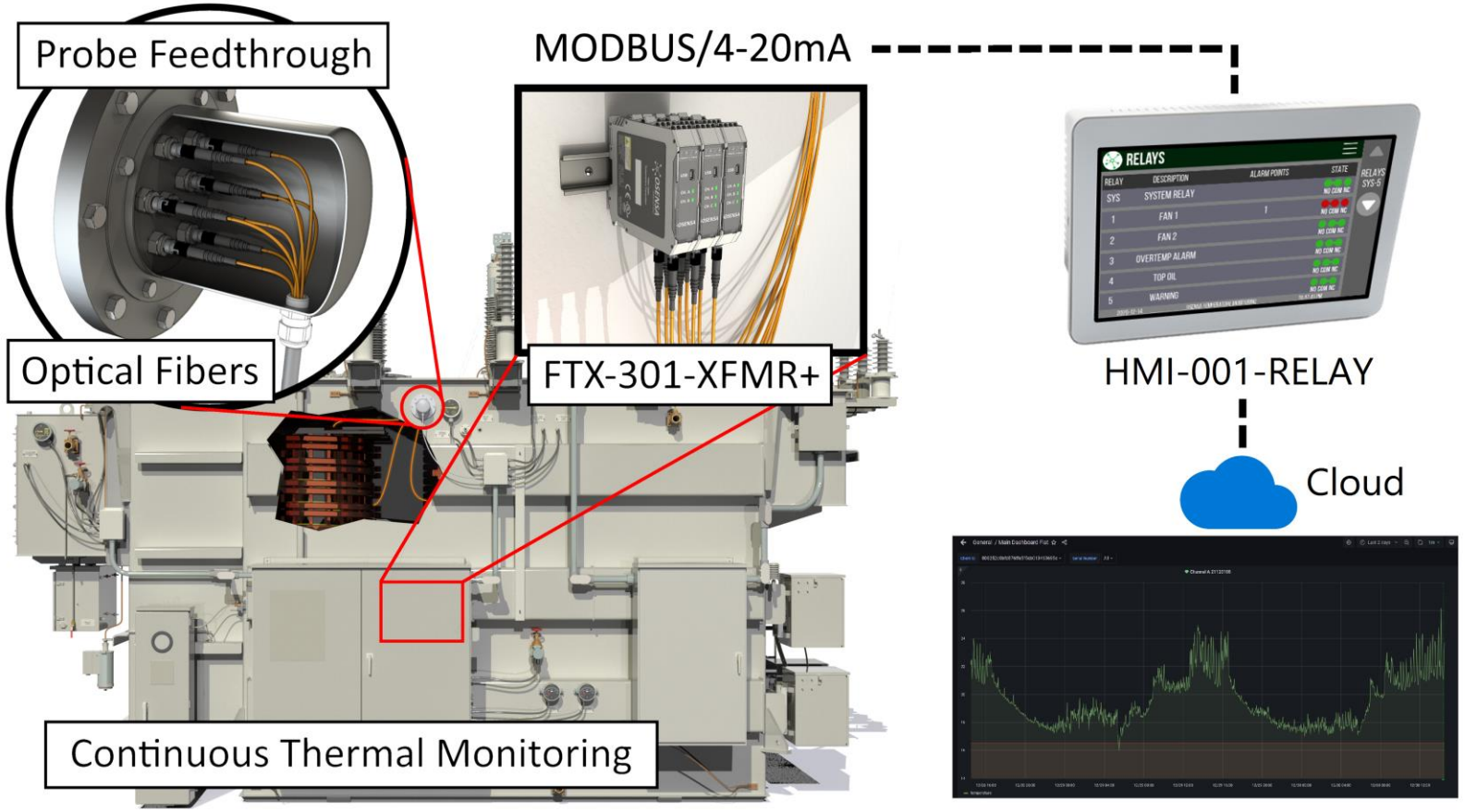


$$I_{(t)} = I_o e^{-t/\tau}$$

A shorter decay time means higher temperature

Transformer Winding Hot-Spot Monitoring

- Real-time local and cloud monitoring for early detection of fault conditions
- Maximize peak capacity and extend life of the transformer
- Optimize maintenance schedules & extend equipment lifetime
- Immune to EM interference & switching noise
- Historical data and alarms

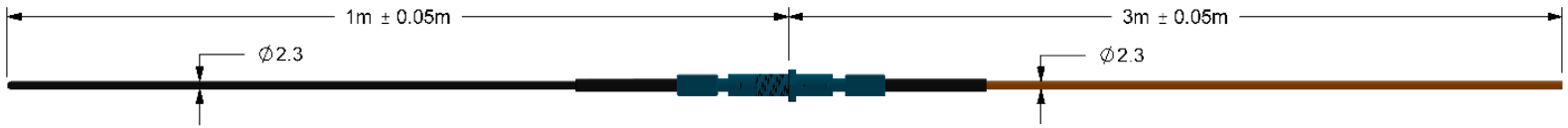


Dry-Type (Cast Resin) Transformer Solutions

- FTX-310-PWR+ 3 Channel Temp Transmitte
- FTX-610-PWR+ 6 Channel Temp Transmitte
- FTX-910-PWR+ 9 Channel Temp Transmitte

Measurement Range	-40°C to +200°C
Resolution	0.1°C
Accuracy	±1.0°C

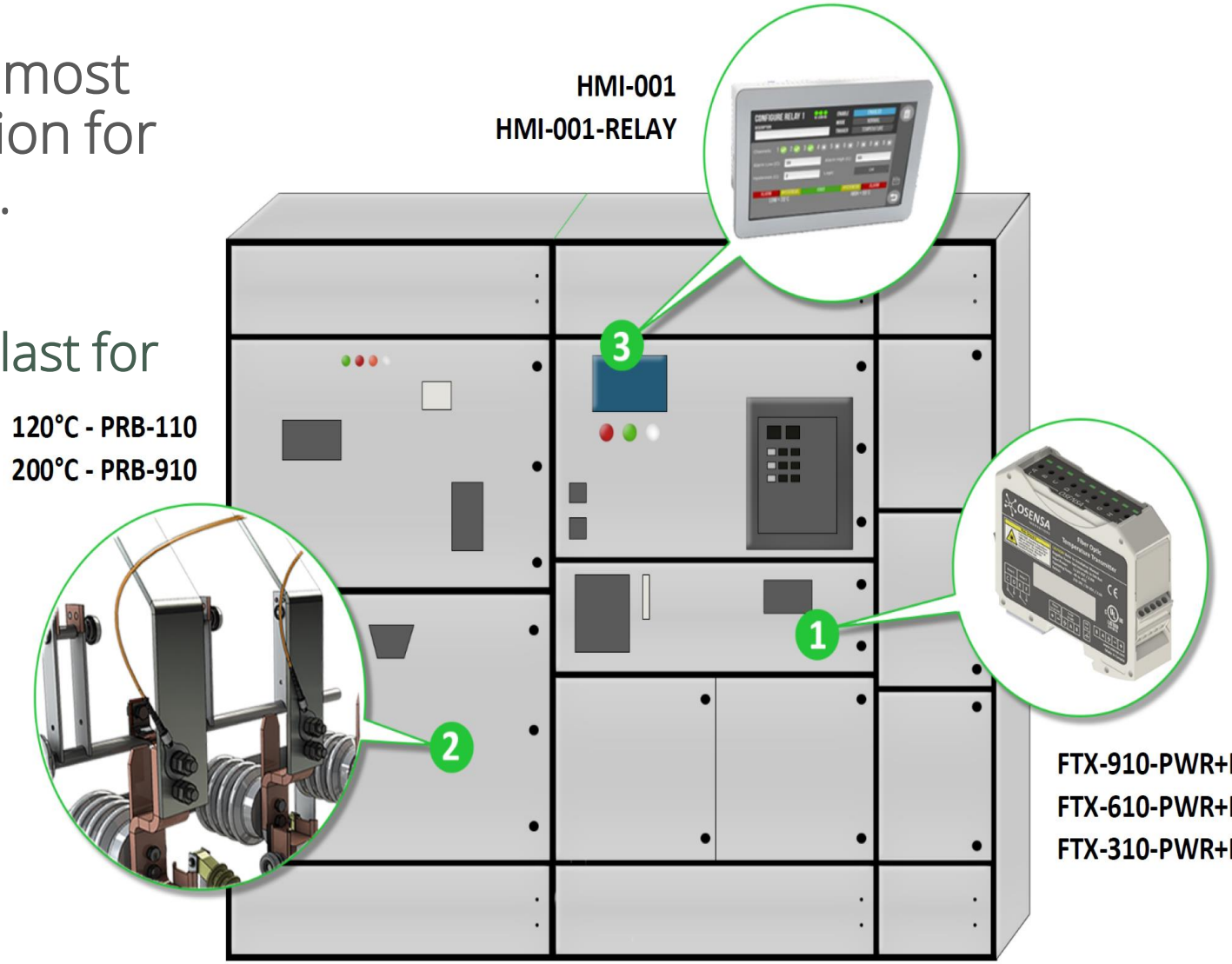
PRB-910 (200°C max. for 1m probe tip)



Switchgear and Busbar Thermal Monitoring

Osensa has developed the world's most reliable temperature sensing solution for switchgear and busbar monitoring.

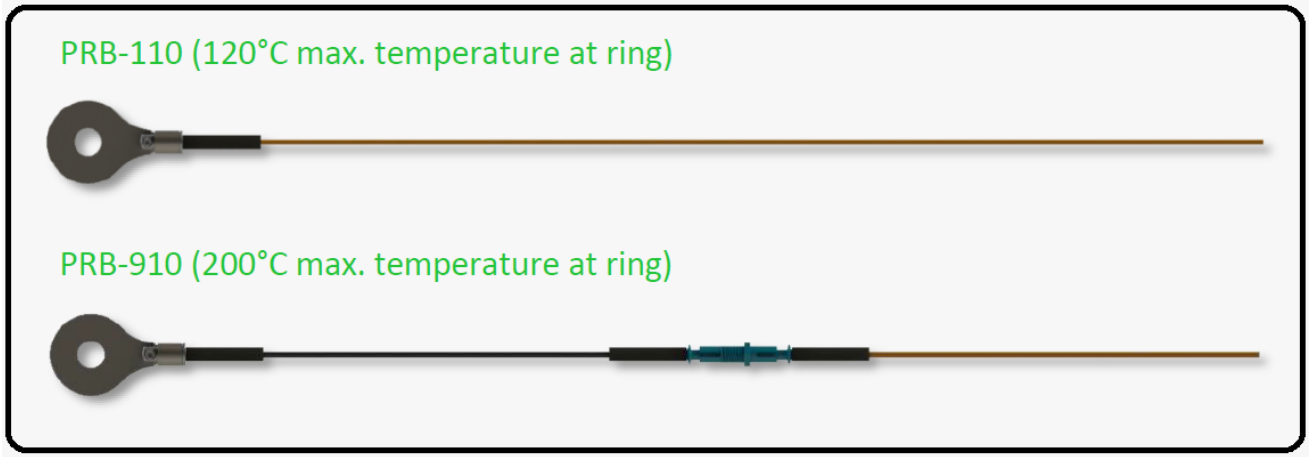
- ✓Electronics and Probes designed to last for the life of the switchgear
- ✓No calibration is required, ever
- ✓High accuracy, wide sensing range
- ✓Simple installation
- ✓Lowest cost per channel



Hardware Options

- 3, 6, or 9 channel transmitters with 2 relay outputs for alarms
  - FTX-310-PWR+R
  - FTX-610-PWR+R
  - FTX-910-PWR+R
- Two 38kV fiber optic probe options
  - PRB-110-5M-ST-TP2
  - PRB-910-5M-ST-TP2

FTX-910-PWR+R

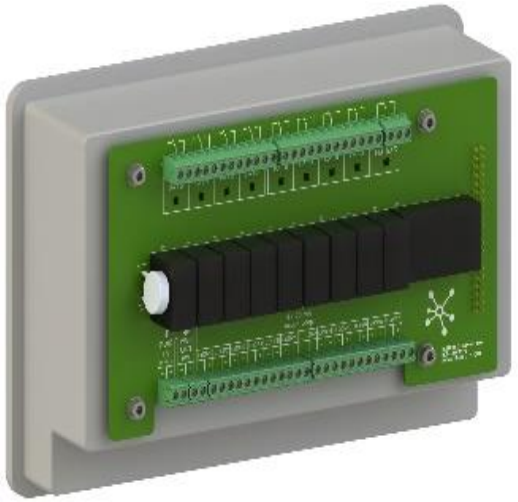


Measurement Range	-40°C to +200°C
Resolution	0.1°C
Accuracy	±1.0°C

Optional Accessories

HMI Touch screen for configuring alarms, data logging, and ethernet communications

HMI-001
(Touch Screen Only)



HMI-001-RELAY
(Relay and Analog outputs)

Portable handheld device with local read-out and Bluetooth connectivity for verifying probe signal levels during installation

HTX-110-PWR

TOUCH SCREEN DISPLAY, RELAY CONTROL, and CLOUD READY

HMI Touch screen for configuring alarms, data logging, and ethernet communications

HMI-001
(Touch Screen Only)

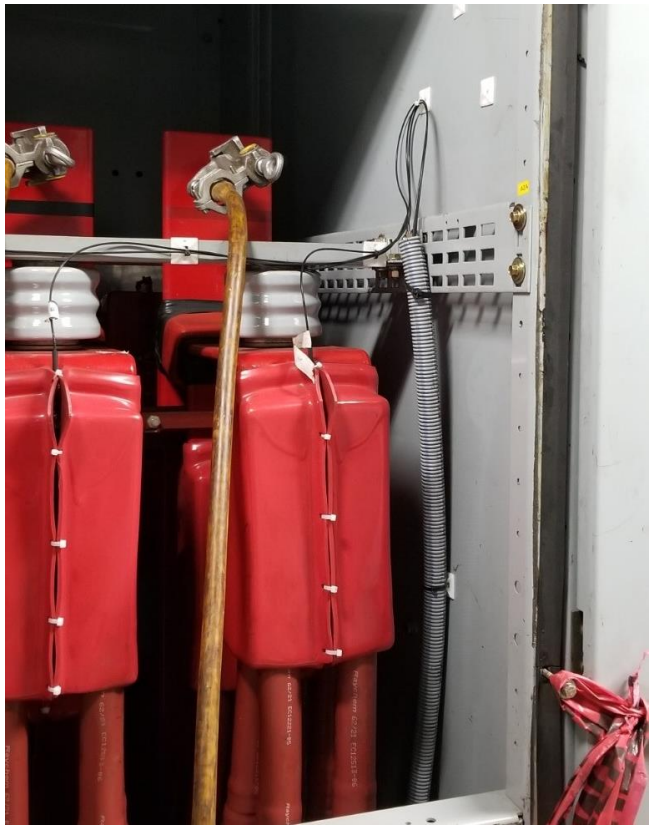
HMI-001-RELAY
(Relay and Analog outputs)

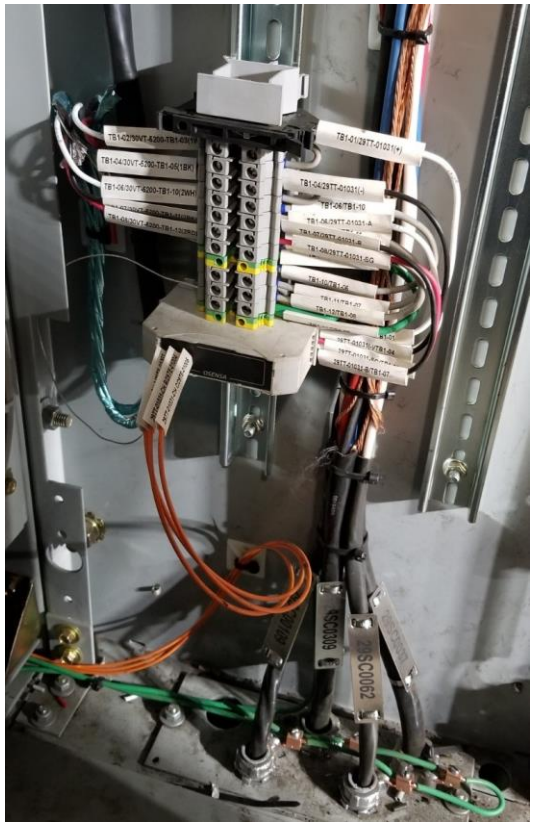
HMI-001-RELAY

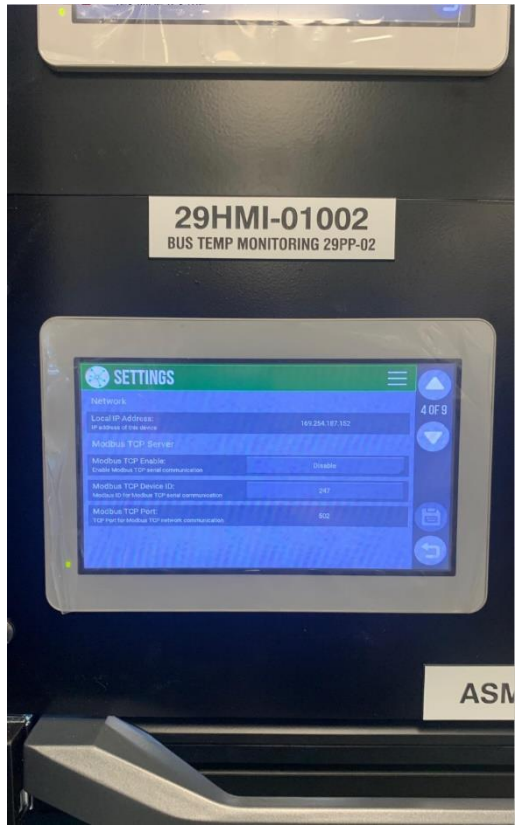
- Modbus RTU communication to Transmitters
- Modbus TCP/IP to SCADA systems
- DNP3 over TCP/IP with Transport Layer Security
- Secure communications to OSENSA Cloud (requires subscription)
- 9x 10A, 250VAC Form C Relays for alarms and control
- Programmable high/low setpoint and differential alarms
- 8x 4-20mA analog outputs
- 3x USB 2.1 ports for additional coms
- Support for up to 99 fiber optic temperature sensors
- Support for an additional 9 auxiliary third party sensors
- 8Gb of storage with 3 configurable dataloggers
- CE and UL approvals
- Requires 24VDC power

Retrofit on Eaton Switchgear

Images from left to right showing Osensa's fiber optic probes installed at feeder terminations and routed back to the low voltage cabinet and plugged into the fiber optic transmitter







New Installation on Schneider Switchgear

Any Questions

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