



# T401 with H2SENS

## TRANSFORMER MONITOR

ROBUST | RELIABLE | RESPONSIVE

# T401 with H2SENS FUNCTIONS

Real Time Monitoring and Advance Control

## Transformer Monitoring

- Oil Temperature
- Winding Temperature
- Load Current
- OLTC Tap Position
- Liquid Level
- Tank Pressure

## Bushing Monitoring Integration

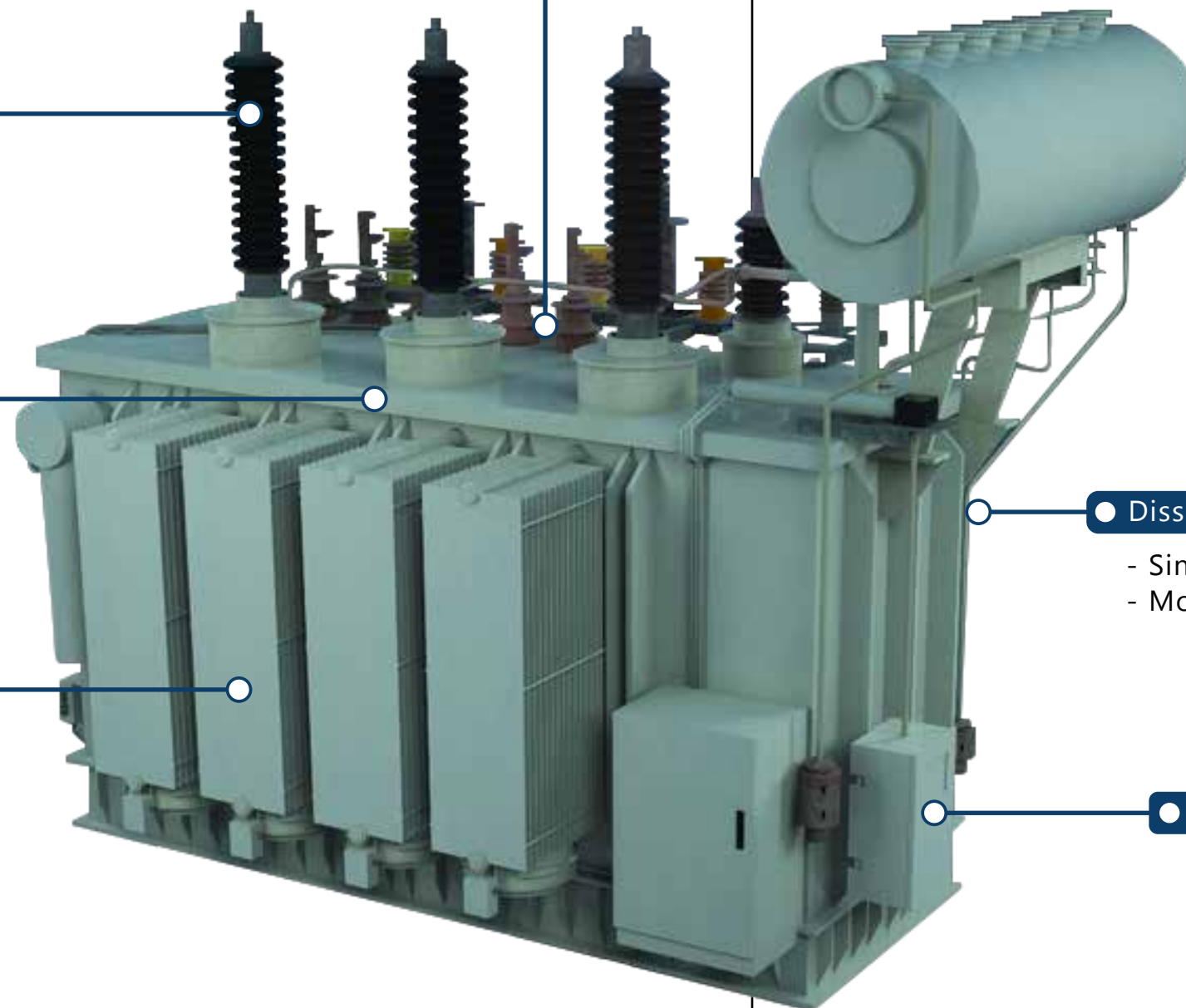
- TanDelta (Power Factor)
- Capacitance

## PD Monitoring Integration

- PD Amplitude
- PD Discharge Rate

## Cooling Control

- Fan/Pump Status
- Fan Bank Motor Current
- Cooling Efficiency
- Fan bank Exercise



## Transformer Health Assessment

- Remote Monitoring and Control
- Insulation Life Estimation
- Overload Capacity
- Bubbling Temperature
- Moisture in Insulation
- Real time Alarm and Notifications
- Easy Integration

## Dissolved Gas analyzer Integration

- Single gas DGA
- Moisture



## OLTC Monitoring

- Oil Temperature
- Oil Level
- OLTC Tap Position
- OLTC Motor Current
- Contact Wear

## Dry Type TR Monitoring



## Transformer Monitoring



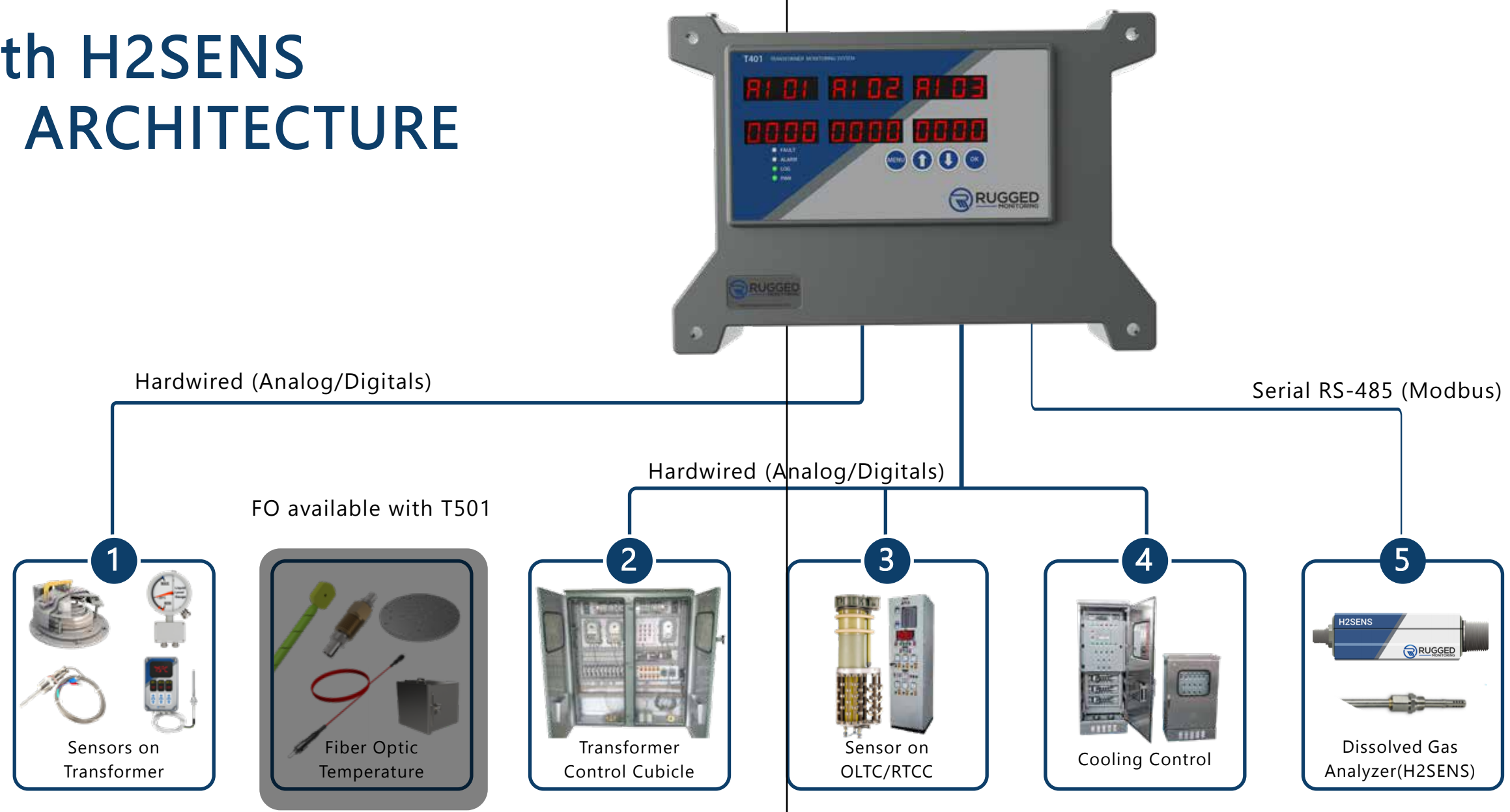
## Vault Monitoring



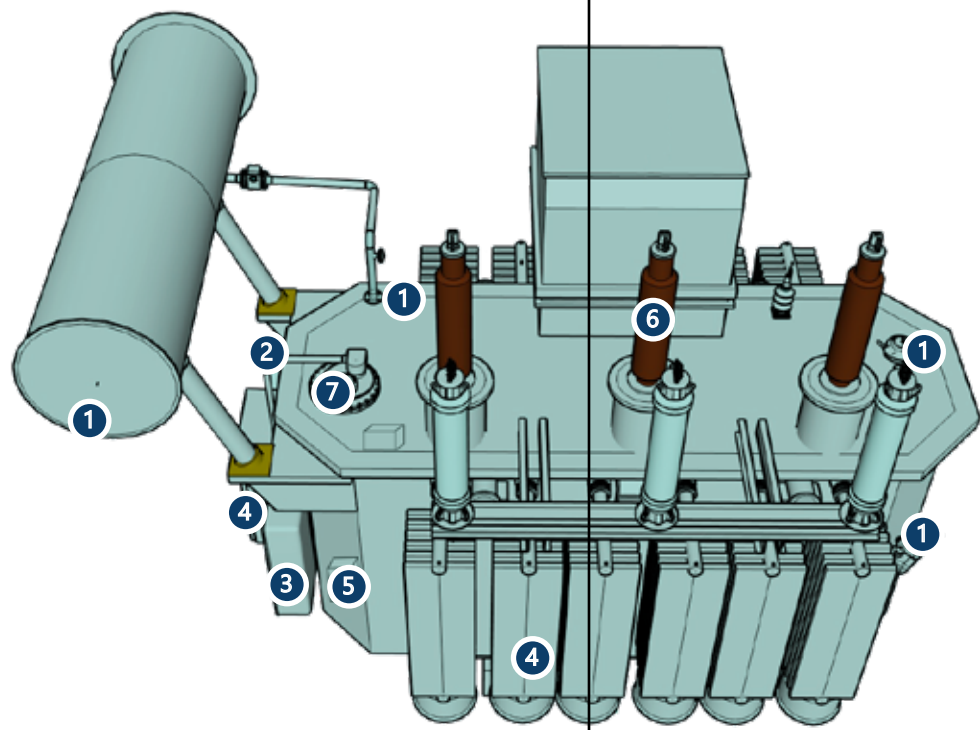
# T401 with H2SENS SYSTEM ARCHITECTURE

ARCHITECTURE

KEY BENEFITS



1. OTI,WTI, RTD, PRD, Breather, Buchholz Relay, LLG/OLI, Pressure Sensor etc.
2. Transformer Control Cubicle
3. OLTC and RTCC Panel
4. Cooling System and Control Cabinet
5. Dissolved Gas Analyzer  
(H2SENS with Moisture sensor)
6. Bushing Monitoring
7. Partial Discharge Monitor



## Certifications

- ATEX
- Lloyds
- CE / RoHs

## Variants

- Offshore / Marine
- Ethernet Redundancy: PRP
- Enterprise Monitoring Software

# T401 with H2SENS FEATURES

Comprehensive Features to Meet Market Demand

## POWER INPUT

- 24 / 48 Vdc
- Power Supply Unit / Adaptor provide as Accessories (OPTIONAL)

## RELAY OUTPUTS

- 08 x Form C Relay contacts
- NO-C-NC
- Cooling control
- Alerts (H2 & Moisture) / Alarms (H2 & Moisture)

## ANALOG OUTPUTS

- 04 x User Programmable
- DC Voltage Output (0-5V/0-10V)
- DC Current Output (4-20mA)
- (H2 ppm 4-20mA / Moisture ppm 4-20mA)

## ANALOG / DIGITAL INPUTS

- Up to 08 x Configurable Inputs
- RTD (PT-100), Potentiometer
- AC Current (Clamp-On CT)
- DC current (4-20mA)
- (Optional : Moisture sensor)
- Digital (Dry Contacts)
- AC/DC Voltage

## SERIAL PORT (R485) FOR H2SENS

- Data Input/output Integration
- Modbus Protocol

## POWER INPUT

- 10 - 48 Vdc



## RUGGED CONNECT SOFTWARE

- Desktop and Web Client
- Remote Configuration
- Advanced Visualization
- Data Logging, Reporting
- Supports Industry Standard Protocols
- Customization available on request
- Secure access to data & Configuration
- Multiple Language Support

## LOCAL DISPLAY

- Industrial Grade LED
- Current Values of all Parameters

## LED INDICATORS

- Power On/OF
- System Fault
- Alarm & Log

## USB PORT

- Configuration & Troubleshooting
- Data Export

## ETHERNET PORTS

- 02 x configurable Ports (RJ-45/SFP)
- Full Redundancy
- PRP Protocol
- Modbus, DNP3.0, IEC60870-104 and IEC 61850

TECHNICAL SPECIFICATIONS (T401)

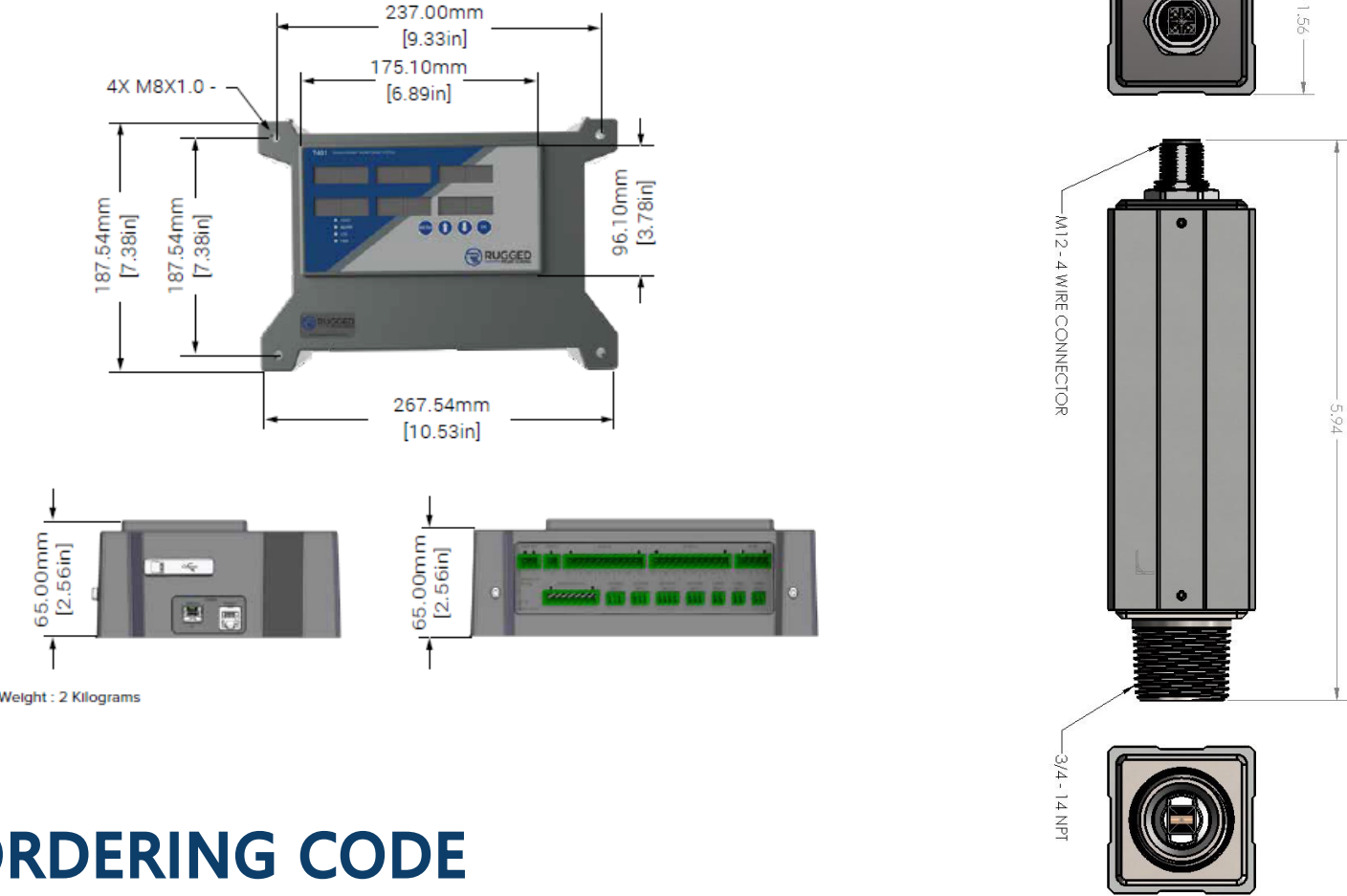
POWER SUPPLY	Input Power Requirement	24 - 48 Vdc
	Power Consumption	20 Watts
ANALOG/DIGITAL INPUT MODULE	# of Input Channels	Up to 08 Channels
	Input Channel Types	Configurable from a range of input options, RTD, AC/DC current, AC/DC voltage, Potentiometer, Dry/Powered contact switch
	Accuracy of Channels	±0.5% full scale input range
	Input Channel Sample Rate	10Hz
ANALOG OUTPUT MODULE	# of Output Channels	04 Channels
	Output format	4-20 mA or 0-5Vdc / 0-10Vdc (Configurable for any measured / calculated value)
OUTPUT RELAY MODULE	# of Output Channels	08 Form C relays (5A)
	User Programmable	Yes, from Rugged Connect Software
DATA STORAGE & CONFIGURATION	Data Storage Capacity	4 or 8 GB, Industrial Grade micro-SD, extendable to 2TB
	Logging Rate	User Configurable, 1 sec interval on USB
	System Fault Indication	1 System Fault Relay, with Local LED light
	Config port	USB (to use with Rugged connect windows software)
COMMUNICATION	Serial Communication	01 x RS-485 (RS-232 optional converter)
	CANBUS Communication	01 x CANBUS Port
	Ethernet Communication	02 Ethernet Ports, configurable to RJ-45 or SFP (Gigabit Optical)
	Redundancy	Support PRP Redundancy
	Protocol Supported	Modbus, DNP3.0, IEC60870-104, IEC61850, CANBUS Other protocols provided on request
EMC TYPE TESTING	Conducted & Radiated Emissions	ICES-003 (2016), CISPR32 (2015), CISPR11 (2015)
	ESD and EM Field Immunity	IEC61000-4-2, C37.90-3, IEC61000-4-3, C37.90.2
	Fast Transient & Surge Immunity	IEC61000-4-4, IEC61000-4-5, C37.90.2
	Magnetic Field Immunity	IEC61000-4-8, IEC61000-4-10
	Immunity from Conducted Disturbances	IEC61000-4-6, IEC61000-4-16
	Ripple, Dips & Damped Oscillatory	IEC61000-4-17, IEC61000-4-18, IEC61000-4-29
ENVIRONMENTAL AND MECHANICAL	Safety	IEC60255-26 and CE Certified
	Operating Temperature	-40 to 72 °C
	Operating Humidity	95% Non Condensing
	Storage Temperature	-40 to 85 °C
	Dimensions	W26.7 cm x H7.2 cm x D18.7 cm (10.5" x 2.8" x 7.4")
	Weight	App. 1.5 to 2.0 Kg. (based on number of configuration)

TECHNICAL SPECIFICATIONS (H2SENS)

Parameter	Oil Phase	Gas Phase
Measurement Accuracy Range	25 - 5,000 ppm	500 - 100,000 ppm
Accuracy <sup>1</sup>	20% of reading or 25 ppm <sup>†</sup>	20% of reading or 500 ppm
Repeatability <sup>2</sup>	10% of reading or 15 ppm <sup>†</sup>	10% of reading or 300 ppm
Response Time	< 60 minutes	< 60 minutes
Operating Temperature (Ambient)	40°C to +70°C	-40°C to +70°C
Storage Temperature	-40°C to +85°C	40°C to +85°C
Oil Temperature Range <sup>3</sup>	-40°C to +105°C	n/a
Data Log Storage	1 Year	1 Year
Cross-sensitivity to H2O, CO2, C2 H2, C2 H4, CO, etc.	<1%	<1%
Serial Communications	RS485, MODBUS RTU	RS485, MODBUS RTU
Power Supply	9-48 VDC, 10 Watt	9-48 VDC, 10 Watt

<sup>†</sup> whichever is greater

PRODUCT DRAWINGS



ORDERING CODE

Please Contact Factory for Odering Code and Quotation

# RUGGED MONITORING



## Certification

- ISO9001
- ISO14000
- ISO 45001 (OHSAS 18000)
- ISO17025 Certification
- NIST Certification
- ATEX Certification








## Website

[www.ruggedmonitoring.com](http://www.ruggedmonitoring.com)

## Visit us to see more

- Solutions  
<https://www.ruggedmonitoring.com/fibre-optic-temperature-solutions>
- Blogs  
<https://www.ruggedmonitoring.com/blogs/1>
- Video  
<https://www.ruggedmonitoring.com/fiber-optic-videos>
- Application Notes  
<https://www.ruggedmonitoring.com/downloads/application-notes/1>
- Software  
<https://www.ruggedmonitoring.com/downloads/dcsoftware>
- Technical Drawings  
<https://www.ruggedmonitoring.com/downloads/dctechnicaldrawings>
- Product Manuals  
<https://www.ruggedmonitoring.com/downloads/dcproductmanual>
- Ebook  
<https://www.ruggedmonitoring.com/fiber-optic-technical-ebooks>

## Social Media

-  <https://www.linkedin.com/company/ruggedmon/>
-  <https://www.facebook.com/ruggedmon>
-  <https://www.instagram.com/ruggedmon/>
-  <https://www.youtube.com/c/ruggedmonitoring>
-  <https://twitter.com/ruggedmon>
-  <https://in.pinterest.com/ruggedmonitoring/>
-  <https://www.xing.com/companies/ruggedmonitoring>

## Rugged Monitoring Services

Rugged Monitoring provides customization of sensors, monitors & software. In addition we offer on-site commissioning services, maintenance contracts and technical support to all customers worldwide.

## About Rugged Monitoring

Industry leading team of fiber optic experts with 100+ years of combined experience committed to delivering customizable solutions for challenging applications. We offer a range of reliable, high performance, customizable sensors and monitoring solutions that are immune to external influence.

## Contact Us

### Address

1415 Frank-Carrel, Suite 230,  
Quebec, QC - G1N 4N7,  
CANADA

### Contact Details

Phone: +1-418-767-0111  
Email: [info@ruggedmonitoring.com](mailto:info@ruggedmonitoring.com)