

Products & Services

A Complete Technical Solutions Provider

Metrologics, LLC

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Katy, TX 77494

Phone: 281-382-8987

www.metrologics.net

About us

- **Company**

- Texas Incorporation 2009
- Located in Katy Texas
- In-House Engineering Staff
 - Electrical/Electronics
 - Mechanical
 - Computer Science
- 40+ years experience for:
 - Remote Monitoring/Intelligent-Deterministic Edge Devices
 - End to End Solutions,
 - Edge device and communication
 - Advanced portal and server (private labeled for OEM's)
 - PCB Design/Embedded RTOS programming
 - Process Control Systems Integration
 - Communication Systems
 - Cellular
 - Satellite
 - 900 MHz Radio
 - LoRa
 - WiFi/BLE
 - Mechatronics/Robotics
 - Custom Manufacturing Machines design and build
 - Product Development/Management
 - Contract Product Manufacturing
 - Tech Business Management Consulting
 - Specialized Engineering Consulting
 - Measurement Systems Auditing
 - Etc.
- Factory direct and certified distributor for several industrial products manufacturers.

Services

- **Professional Services**

- New Product Development (custom designs)
 - Design
 - Testing
 - Management
 - Production
 - Documentation
 - Support
- PLC/HMI Systems design, programming, and integration
- Communication Infrastructure Design and Implementation
- Hosted Data and Visualization systems (SaaS)
- Training Class Development
- Technical documentation development
- Patent assistance
- Measurement Systems Engineering and Auditing
- Technology Business Acquisition Due-Diligence
- Robotics/Mechatronics systems design services
- Custom manufacturing/tending/inspection machine design and development
- Etc.

Services

- **PLC/HMI Application Programming, and Integration**

- **WAGO** (factory direct)
- **ODOT** - Distributor (16 states)
- **IDEC** – Premium Systems Integrator
- **Horner** (factory direct, made in USA)
- **EZ-Automation** (factory direct, made in USA)
- **Delta**
- **Weintek**
- Crouzet
- RENU
- Unitronics
- TRI-Logi
- Fuji
- VIPA
- Etc.



Projects

- **Partial listing of Project Examples**

- Robot and Custom industrial machining/parts tending control systems
- Automated multi-part simultaneous drilling machine with parts loading/unloading
- Parts Inspection Machine (automated loading/unloading, vision and laser measurement)
- Compressor valves quality testing machine
- Generator, Compressor, Pump monitoring & control systems (multi-unit interface using one master device)
- Saltwater Disposal Site control systems (geo-separated sites with remote control linkage)
- Oil & Gas Production/Tank farm control systems
- Pumping Systems Controllers
- Tanker Truck Loading/Delivery Systems
- LACT Monitoring & Control Systems
- ESD/Safety Systems
- Amine Plant Automation Systems
- Natural Gas Compressor
 - Networked Multi-unit Speed Controller (based on flowrate, nominations, inlet/outlet and pipeline pressure, remotely controllable)
 - Hydraulic Fan and Louver Controller
 - Pressure and temperature shutdown permissive end devices
 - Training Simulators
- Chemical Injection Pump Controllers (single controller for multiple pumps)
- Gas and Liquid Metering Skid Controls
- Gas Detection Systems
- Environmental Monitors (and sample pump control)
- Protocol/Data Translator
- Mister Control System
- Bus/Car/Van washing machine control (Mechatronics)
- Industrial Parts Washing Machine (mechanical design and control system)
- Agriculture Monitoring and Control Systems
- Miniature embedded wireless RO cartridge temperature/EC/pressure monitoring device
- Document Scanner systems
- Etc.,

Communication Devices

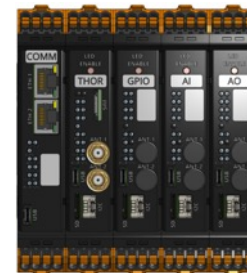
- Cellular modules
 - MCAM-Mini
 - MCAM-Nano
 - MCAM-Pico
 - Plug-in Modules (Digi socket based)
- Satellite terminals
 - Orbcomm
 - Iridium
 - *New devices coming online in NA soon.*

Communication Services

- Cellular/Satellite Service Plans
 - We have long-standing contracts with all carriers for NA and Global service.
 - Fit to the application
 - Based on IO, server/slave devices, tags, logging/push frequency, and alarms.
 - We manage all behind the scenes communication carriers/MVNO's.
 - We are first tier support for communication issue analysis and resolution.
 - Our automated notification system can also send no-comm event-based messages to you.
 - Usage reports available from our portal



THOR-M7



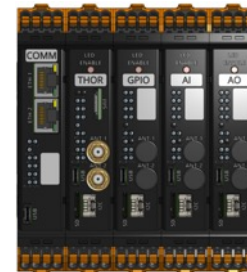
- Main Module

- RTU/PLC/Data-Logger
 - For PLC, plug-in Cortex-A7 SOM on THOR-COMM running LINUX and Codesys.
- Expansion Modules (up to 12 supported in base firmware)
 - THOR-COMM
 - THOR-GPIO
 - THOR-AI
 - THOR-AO
- C1D2/Zone 2 Certified for hazardous area use
- DIN-Rail mountable, 22.5 mm wide
- Removable, keyed, numbered, spring terminal blocks
- External DC powered, 9 to 35 VDC
- RTC, battery backed up
- 32-bit advanced MCU
- Optional plug-in expansion WiFi/BLE-5 board
- Multi-color LED Status Indicators, with timed enable button
- Micro-SD card (16 Gb included, up to 32 Gb supported)
- USB-C port (programming, log downloading, etc.)
- Expansion comm module sockets (cellular, radio, satellite)
- I2C bus connector (for external I2C sensors, external LCD, etc.)
- On-Board IO
 - 4 Digital GPIO, High Frequency, software selectable configuration
 - 2 Analog Inputs, 24-bit, software selectable configuration (0-5V, 0-10V, 4-20 mA)
- Comm Ports
 - Protocols: Modbus-RTU (Modbus-TCP using THOR-COMM module)
 - 2 RS485, isolated, software configurable as Client or Server, with selectable EOB term
 - 1 RS232, (TX, RX, GND), software configurable as Client or Server
 - 1 CAN-J1939
- On Module SMA antenna connectors





THOR-COMM



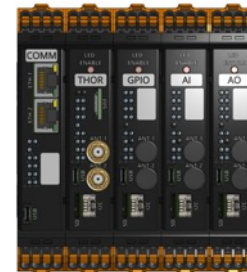
- **Communication Expansion Module**

- Adds additional comm ports
 - 2 Ethernet, same or separate IP addresses, or DHCP, Modbus-TCP, Ethernet/IP
- C1D2/Zone 2 Certified for hazardous area use
- DIN-Rail mountable, 22.5 mm wide
- Removable, keyed, numbered, spring terminal blocks
- External DC powered, 9 to 35 VDC
- 32-bit advanced MCU co-processor
- Optional plug-in PLC board, Cortex-A7 running LINUX & CodeSys
- Multi-color LED Status Indicators
- Micro-SD card
- USB-C port (programming)
- Expansion comm module sockets (cellular, radio)
- I2C bus connector (for external I2C sensors, external LCD, etc.)
- On-Board IO
 - 8 Digital GPIO, High Frequency, software selectable configuration
 - 2 Analog Inputs, 24-bit, software selectable configuration (0-5V, 0-10V, 4-20 mA)
- Comm Ports
 - Protocols: Modbus-RTU, and Modbus-TCP
 - 1 RS485, isolated, software configurable as Client or Server, with selectable EOB termination
 - 1 RS232, (TX, RX, GND), software configurable as Client or Server
 - 1 CAN-J1939
- On Module SMA antenna connectors





THOR-GPIO



- GPIO Expansion Module

- Adds additional Digital Inputs/Outputs
 - 8 Digital Inputs, High speed counters, Dry or voltage input, Frequency measurement
 - 8 Digital Outputs, at Vcc, @ 50 mA (use interposing relays), or PWM output
 - Software selectable by channel as input or output
- C1D2/Zone 2 Certified for hazardous area use
- DIN-Rail mountable, 22.5 mm wide
- Removable, keyed, numbered, spring terminal blocks
- External DC powered, 9 to 35 VDC
- 32-bit advanced MCU co-processor
- Multi-color LED Status Indicators
- Micro-SD card
- USB-C port (programming)
- Expansion comm module socket (cellular, radio)
- I2C bus connector (for external I2C sensors, external LCD, etc.)
- Comm Ports
 - Protocols: Modbus-RTU (Modbus-TCP using THOR-COMM module)
 - 2 RS485, isolated, software configurable as Client or Server, with selectable EOB term
 - Optional WiFi/BLE-5 expansion board
 - 1 CAN-J1939
- On Module SMA antenna connectors





THOR-AI



• Analog Input Expansion Module

- Adds additional Analog Inputs
 - 8, 4-20 mA Analog Inputs, 24-bit
 - Or 4, 3-wire 0-5V, 0-10V
 - Or 8 Thermocouples (Type K or J)
 - Or 4, 3-wire RTD (100 Ohm or 1000 Ohm Pt)
 - Software configurable by channel
- C1D2/Zone 2 Certified for hazardous area use
- DIN-Rail mountable, 22.5 mm wide
- Removable, keyed, numbered, spring terminal blocks
- External DC powered, 9 to 35 VDC
- 32-bit advanced MCU co-processor
- Multi-color LED Status Indicators
- Micro-SD card
- USB-C port (programming)
- Expansion comm module socket (cellular, radio)
- I2C bus connector (for external I2C sensors, external LCD, etc.)
- Comm Ports
 - Protocols: Modbus-RTU (Modbus-TCP using THOR-COMM module)
 - 2 RS485, isolated, software configurable as Client or Server, with selectable EOB term
 - Optional WiFi/BLE-5 expansion board
- On Module SMA antenna connectors





THOR-AO

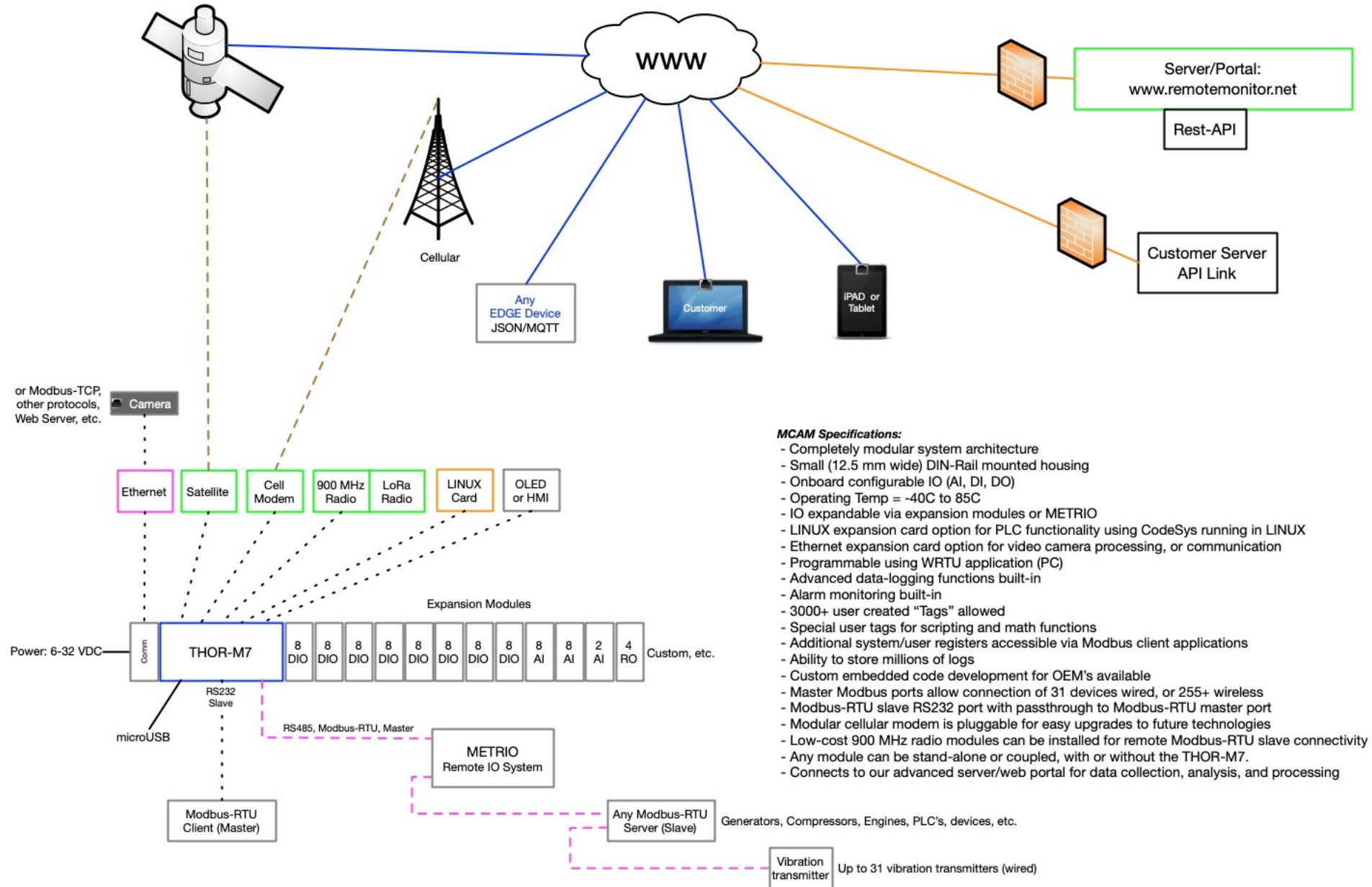


- **Analog Output Expansion Module**

- Adds additional Analog Outputs
 - 8, 4-20 mA Analog Outputs, 16-bit
 - Or 4, 3-wire 0-5V, 0-10V
 - Software configurable by channel
- C1D2/Zone 2 Certified for hazardous area use
- DIN-Rail mountable, 22.5 mm wide
- Removable, keyed, numbered, spring terminal blocks
- External DC powered, 9 to 35 VDC
- 32-bit advanced MCU co-processor
- Multi-color LED Status Indicators
- Micro-SD card
- USB-C port (programming)
- Expansion comm module socket (cellular, radio)
- I2C bus connector (for external I2C sensors, external LCD, etc.)
- Comm Ports
 - Protocols: Modbus-RTU (Modbus-TCP using THOR-COMM module)
 - 2 RS485, isolated, software configurable as Client or Server, with selectable EOB term
 - Optional WiFi/BLE-5 expansion board
- On Module SMA antenna connectors



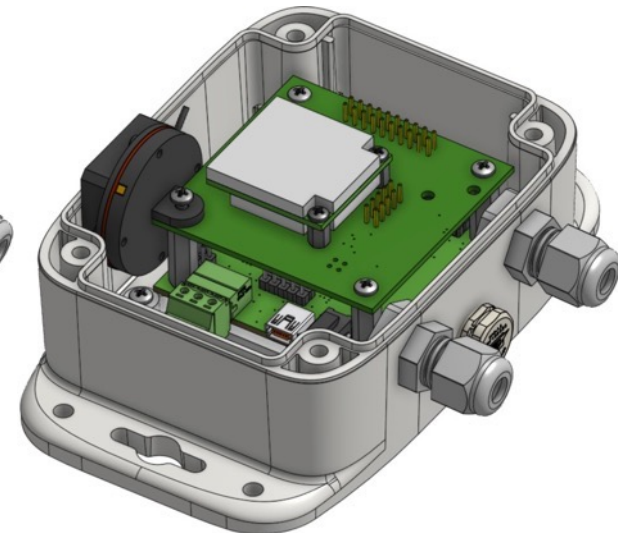
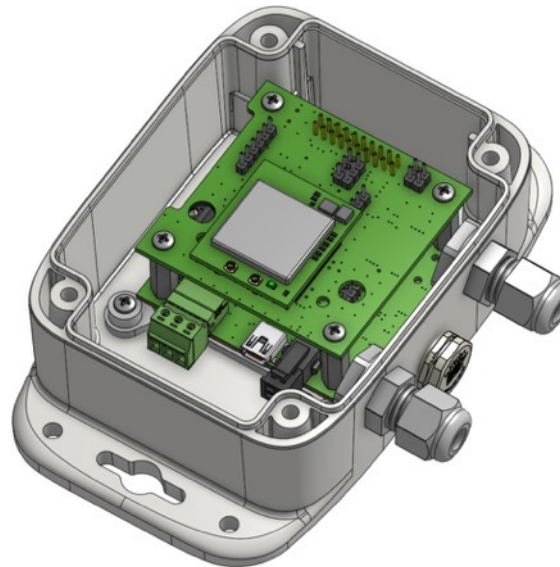
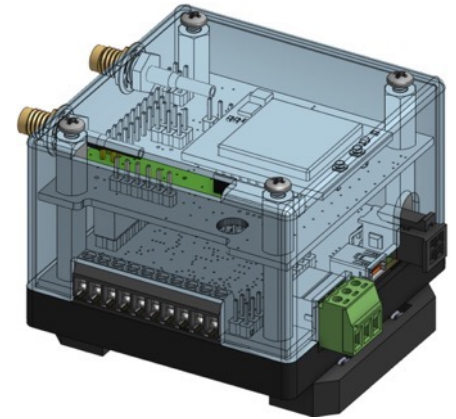
Metrologics Monitoring Platform Description



Products

• MCAM-Pico

- Small form factor (2.375" square)
- 5 GPIO, configurable as AI, DI, or DO
- 3 serial ports, (RS232, RS485, USB)
- Runs full MCAM code and WRTU project files
- Supports all expansion peripheral boards
 - AI
 - DI
 - Thermocouple/RTD
 - Relay
 - SD Card
 - Cell modem
 - Satellite modem
 - METRIO
 - Etc.



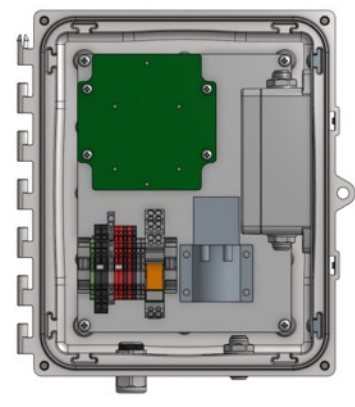
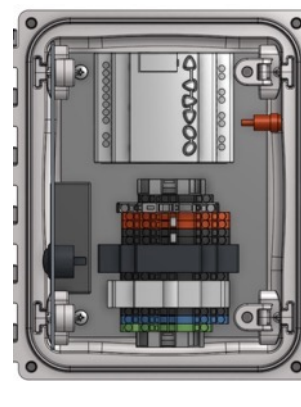
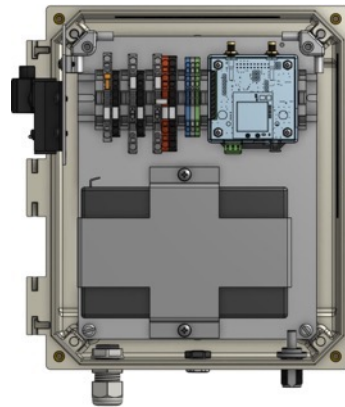
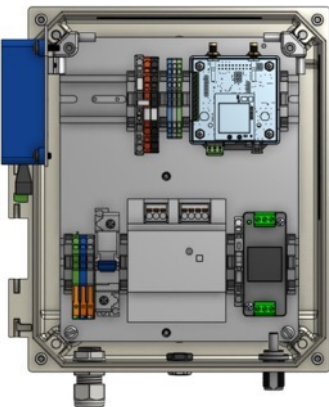
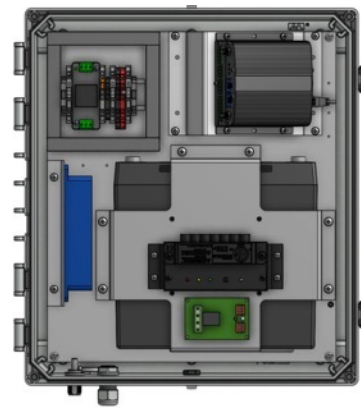
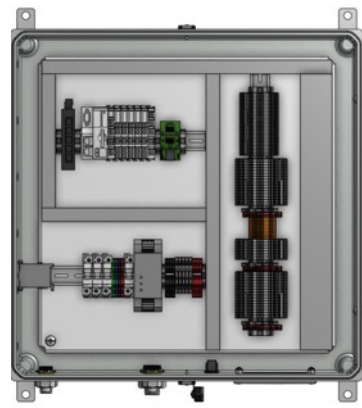
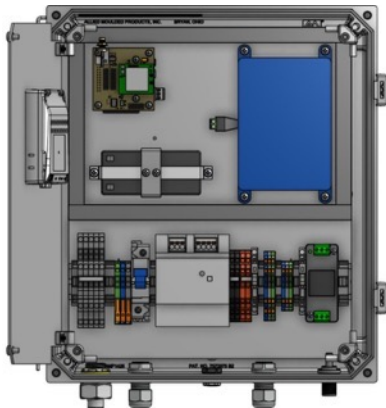
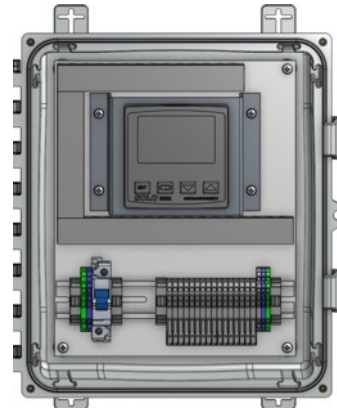
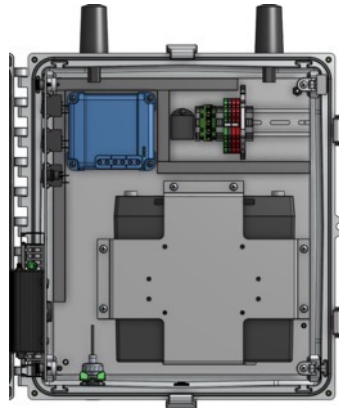
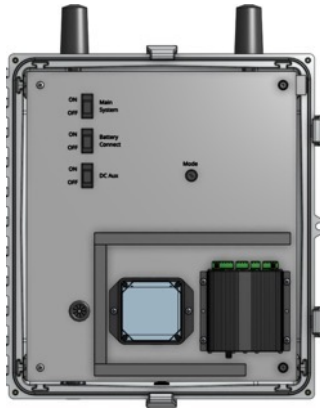
Products

- **MCAM-mini**

- Advanced Cellular/Ethernet Gateway
 - Runs our custom developer image in LINUX
 - Lifetime free project programming application
- Additional features:
 - Ethernet gateway (two Ethernet ports, standard)
 - GPS
 - Flexible IO
 - RS232 port
 - RS485 Port
 - CAN-J1939
 - I2C
 - GPIO, 3 lines, configurable as AI, DI, or DO
 - Modular internal modem. Easily upgraded to newest technology.
 - Optional internal backup battery.
 - Supports up to 3000 tags, for monitoring anything.
 - Single device for entire station with many compressors, generators, and other devices.
 - Optional add-on Luvit-Red programming environment (user custom applications).
 - Advanced security functions (passed Cisco penetration testing).



Pre-Packaged Enclosure Options



Comm Gateway

- M-RL-Gateway

- Replaces Monico/CDL
- Half the cost of a Monico
- Can be expanded with add-on modules
 - CAN-Open
 - CAN-J1939
 - Profibus
 - DeviceNet
 - Ethernet-IP
 - Many more...
- Three serial comm ports
 - 2 x RS232
 - 1 x RS422/RS485
- 10/100 Ethernet port
 - Communicates with up to 10 protocols simultaneously
 - Any protocol can be converted to Modbus-RTU registers
- USB-A host port and USB-B programming port
- On-board SD card slot for data-logging
- Power input from 10 VDC to 30 VDC
- Built-in Web Server
- Alarm messages via SMS or email
- Certified for use in C1D2 hazardous locations
- Metrologics programmed applications

Gateway



CAN-J1939 Module



Client App

- PC Based User Application

- Used for setup of MCAM's
- Simplifies complex programming
- Create and configure Tags
- Apply *Edge* based rules
- Collect and export logs
- Manage contacts list
- Update firmware
- Save Project Files
- Connect with cable or through Ethernet/Internet

Edit Tag

General Values Map Bit Map Calculations & Scaling Alarms

☐ Enable Bit Map

Bit Position 0 State

1 State

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

System Communications General Peripherals Tags Contacts Logged data Software Log

System Information

Device ID 05D52D31-35384152-51145139

State ONLINE

Hardware Type nanoWPOM

Firmware Version 3.52

Firmware Status Upgrade not required

SD Card Info Not Detected

ATAFLASH Info [32MB]

AQ-2543 NOT DETECTED/FAILED

Rate / Time 05/01/2018 16:01:52

Logger State STARTED

Data Push Info Not pushed yet

Cell Modem HL75XX [HL7588] (Firmware: A.2.11)

Cell Info SIM READY | REG. REGISTERED | CSQ 4 (-105dBm) | OPERATOR ATT

Address 10.188.2.221

Software Stack

System Communications General Peripherals Tags Contacts Logged data Software Log

Common

☐ Enable RS485 Modbus Forwarding

Modbus Interpacket Delay 250 ms

Cell Settings

☒ Allow Cell Communications

Server iotst.aer.net

User Name

Password

SMS/Email Settings

SMS/Email Retry Time Limit 5 minute(s)

Edit Tag

General Values Map Bit Map Calculations & Scaling Alarms

Calculations

Type Linear [A * X + B]

Value A 0.001

Value B 0.000

Scaling

☐ Enable Scaling

Current Counts

Zero Scale Counts 0

Full Scale Counts 65535

Zero Scale Output 0.000

Full Scale Output 65535.000

Synchronize

Disconnect

Start Logger

Stop Logger

Push Now

Synchronize Time

Restart Firmware

Upgrade Firmware ...

#	Time	Tag Name	Raw Value	Calculated Value	Units
22	05/01/2018 15:49:37	Channel 5 Reading	0.000	0.000	
23	05/01/2018 15:49:47	Channel 11 Reading	0.000	0.000	
24	05/01/2018 15:50:23	Channel 1 Reading	0.000	0.000	
25	05/01/2018 15:51:02	Channel 2 Reading	0.000	0.000	
26	05/01/2018 15:51:12	Channel 6 Reading	0.000	0.000	
27	05/01/2018 15:51:13	Channel 9 Reading	0.000	0.000	
28	05/01/2018 15:51:37	Channel 8 Reading	0.000	0.000	
29	05/01/2018 15:51:38	Channel 12 Reading	0.000	0.000	
30	05/01/2018 15:52:38	Channel 4 Reading	0.000	0.000	
31	05/01/2018 15:53:19	Channel 7 Reading	0.000	0.000	
32	05/01/2018 15:53:28	Channel 10 Reading	0.000	0.000	
33	05/01/2018 15:54:12	Channel 3 Reading	0.000	0.000	
34	05/01/2018 15:54:44	Channel 5 Reading	0.000	0.000	
35	05/01/2018 15:54:54	Channel 11 Reading	0.000	0.000	
36	05/01/2018 15:55:24	Channel 1 Reading	0.000	0.000	
37	05/01/2018 16:00:06	Battery	23966	23.966	VDC
38	05/01/2018 16:00:06	Channel 1 Reading	0.000	0.000	

System Communications General Peripherals Tags Contacts Logged data Software Log

ADC Calibration

Level Volts Calibrate

Level Volts Calibrate

Delay 6 sec

Behavior on reboot

OFF

OFF

DO by log period of tag

5 second(s) before log time

5 second(s) after log time

DI Counters

DI Channel #1

DI Channel #2

DI Channel #3

DI Channel #4

Board

DAQ-2543 [ADC]

Bottom Point 4095

Middle Point 4095

Top Point 4095

RS232 Port

Baudrate 9600

Parity None

Stop Bits 1

data Bits 8

RS485 Port

Baudrate 9600

Parity None

Stop Bits 1

data Bits 8

Read Timeout 1100 ms

Data Pushing Settings

☒ Enable data Pushing

Protocol HTTP

Port 80

Address www.nanowpom.com/pushdata

Period 1 hour

Offset 0 minutes (in range 0.59)

Check SMTP Settings

Alarm Info

Type Limit

Timeout 0 sec

Deadband 0.000

Low-Low 0.000

Low 0.000

Normal 0.000

High 0.000

High-High 0.000

Alarm Condition

Set Message

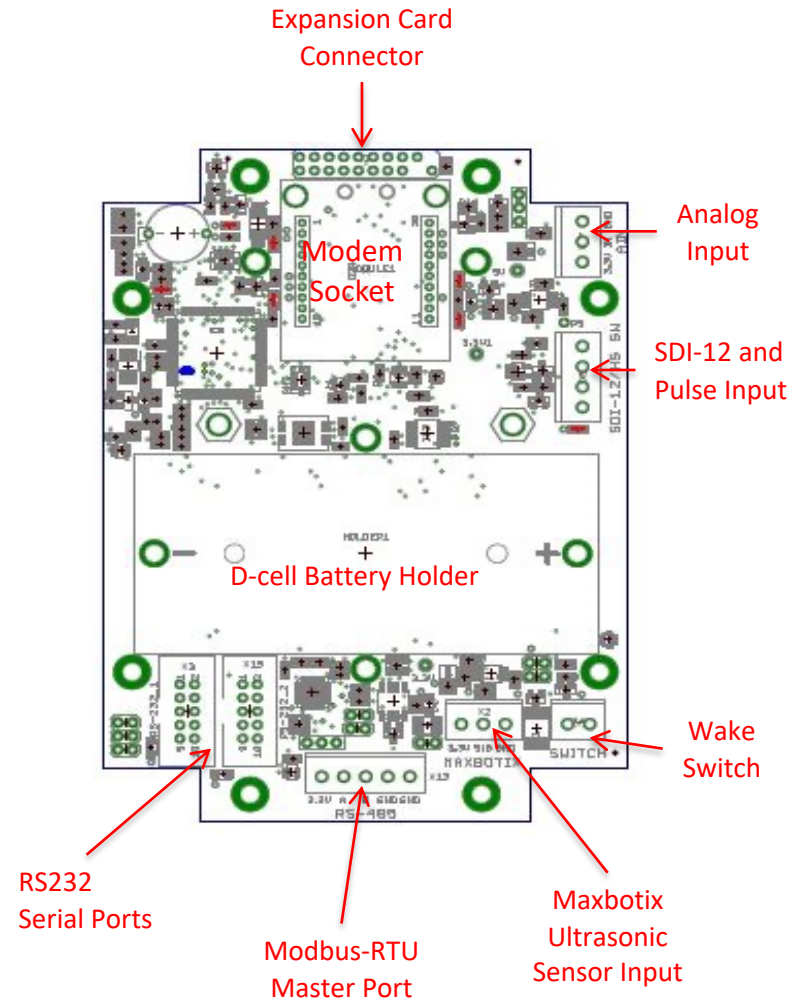
Clear Message

Set Contacts

#	Name	RTU	Address	Type	Log Period (sec.)	Alarms State	Realtime Value	Units	Raw Value
1	Battery	33	30003	AI	3000	Not Set	23.974	VDC	23974
2	Channel 1 Reading	1	40003	MODBUS	300	Not Set	0.000		0.000
3	Channel 2 Reading	1	40035	MODBUS	300	Not Set	0.000		0.000
4	Channel 3 Reading	1	40037	MODBUS	300	Not Set	0.000		0.000
5	Channel 4 Reading	1	40039	MODBUS	300	Not Set	0.000		0.000
6	Channel 5 Reading	1	40041	MODBUS	300	Not Set	0.000		0.000
7	Channel 6 Reading	1	40043	MODBUS	300	Not Set	0.000		0.000
8	Channel 7 Reading	1	40045	MODBUS	300	Not Set	0.000		0.000
9	Channel 8 Reading	1	40047	MODBUS	300	Not Set	0.000		0.000
10	Channel 9 Reading	1	40049	MODBUS	300	Not Set	0.000		0.000
11	Channel 10 Reading	1	40051	MODBUS	300	Not Set	0.000		0.000
12	Channel 11 Reading	1	40053	MODBUS	300	Not Set	0.000		0.000
13	Channel 12 Reading	1	40055	MODBUS	300	Not Set	0.000		0.000
14	Channel 1 Fault	1	40209	MODBUS	60	Not Set	9		9
15	Channel 2 Fault	1	40290	MODBUS	60	Not Set	9		9
16	Channel 3 Fault	1	40291	MODBUS	60	Not Set	9		9
17	Channel 4 Fault	1	40292	MODBUS	60	Not Set	9		9
18	Channel 5 Fault	1	40293	MODBUS	60	Not Set	9		9
19	Channel 6 Fault	1	40294	MODBUS	60	Not Set	9		9
20	Channel 7 Fault	1	40295	MODBUS	60	Not Set	9		9
21	Channel 8 Fault	1	40296	MODBUS	60	Not Set	0		0
22	Channel 9 Fault	1	40297	MODBUS	60	Not Set	0		0
23	Channel 10 Fault	1	40298	MODBUS	60	Not Set	0		0
24	Channel 11 Fault	1	40299	MODBUS	60	Not Set	0		0
25	Channel 12 Fault	1	40300	MODBUS	60	Not Set	0		0
26	Ch 1-16 Alarm Status	1	46026	MODBUS	60	Not Set	0000000000000000		0
27	Ch 17-32 Alarm Status	1	46027	MODBUS	60	Not Set	0000000000000000		0
28	Channels in Fault	1	46031	MODBUS	60	Not Set	Fault on Both		3

MAX-2

- **Ultra-Low Power MCAM variant**
 - Battery powered unit
 - Uses a single 19 Ah D-cell Lithium battery
 - 3+ years of operation before battery change
 - On-board I/O
 - 3.3 V transmitter interface
 - SDI-12 Sensors interface
 - Pulse Counter Input
 - Wake/Power Switch input
 - Ultrasonic Level Sensor interface
 - RS485 Modbus-RTU Master serial port
 - Two RS232 serial ports
 - Connector for expansion cards
 - Cell Modem/Radio support
 - Socketed for future technology upgrades
 - LTE-4G (current)
 - CAT-M1
 - 900 MHz ZigBee-Pro radio
 - LoRa Module
 - Uses standard WRTU PC interface software
 - Perfect solution for:
 - Agriculture
 - Environmental Monitoring
 - Remote Tank Monitoring
 - RBE Alarm/Event Monitoring
 - Any data-logging application (can store millions of logs)
 - Small /Low-Cost NEMA-4X outdoor enclosure available



METRIO

- **Features**

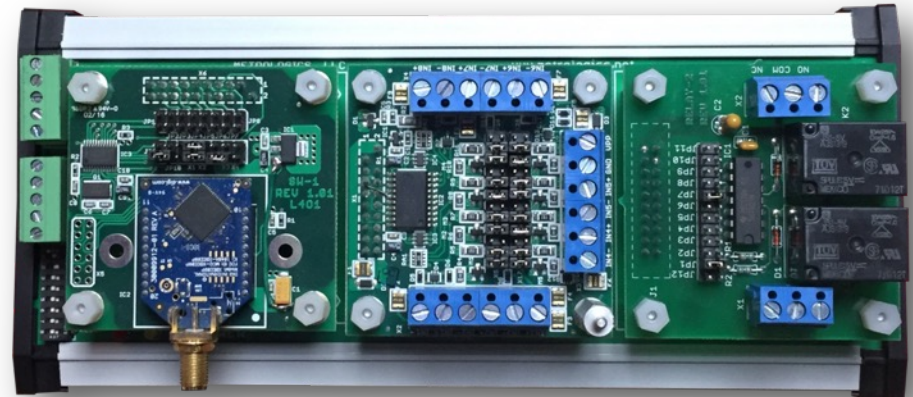
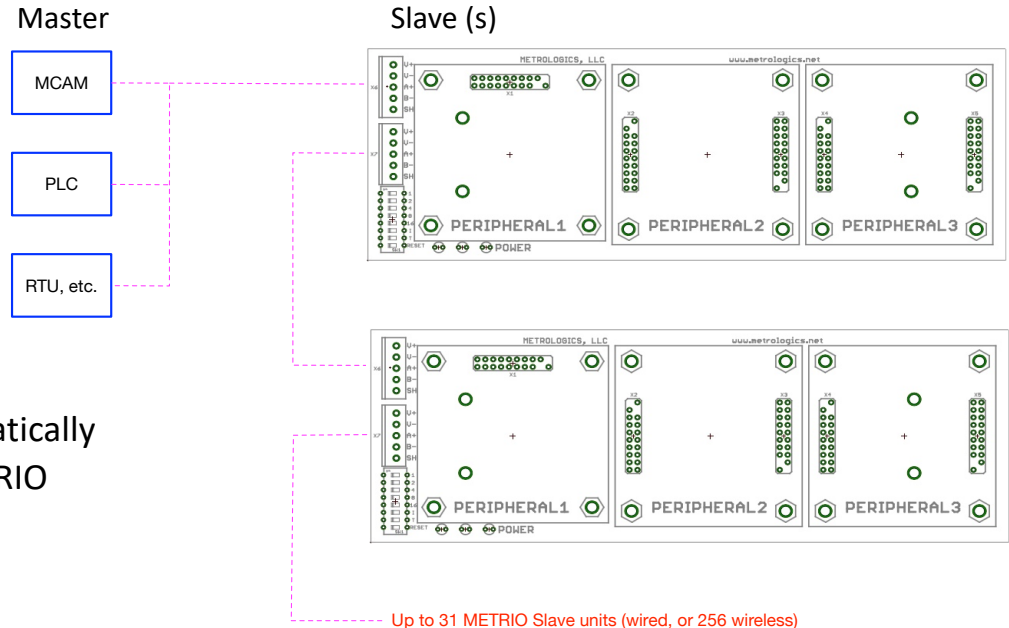
- Slave I/O Platform

- Modbus-RTU

- Wired (shown at right)
 - Wireless (shown in picture)

- Plug-in I/O expansion cards:

- IO recognized and mapped automatically
 - Up to 12 expansion cards per METRIO
 - Analog Inputs
 - Digital Inputs
 - Digital Outputs
 - Relay Outputs
 - Thermocouple/RTD Inputs
 - SDI-12
 - Temp/RH
 - Radio
 - Etc.
 - Custom board design available



Products

- **M-TPSA-130F**
 - **Engine Temperature Permissive**
 - Monitors engine water temperature.
 - Operators/Mechanics cannot change engine speed above idle until the engine water temp has reached 130F.
 - Connects to CAT Panel designated inputs on 3500 and 3600 based units.



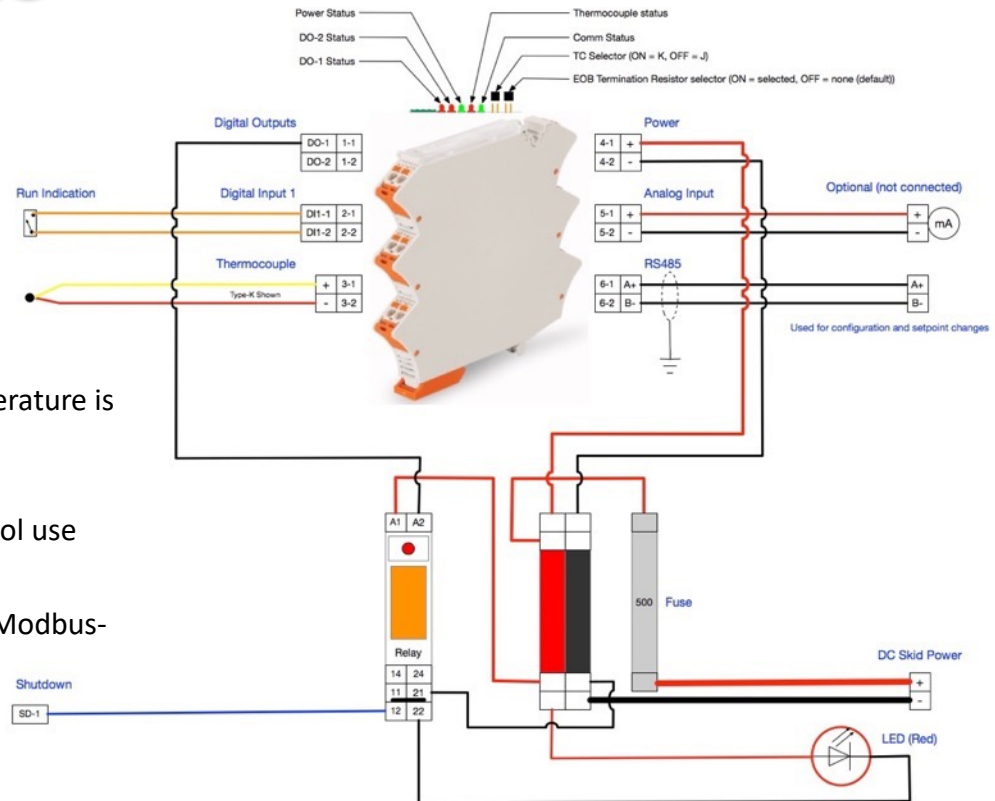
Products

• M-TPC-W-1

— Temperature Permissive

- Monitors exhaust manifold temperature
- DIN-Rail mounted module
- Engine allowed to be started only when temperature is below preset value
- 12 to 32 VDC power input
- Secondary independent analog input for control use
- Extensive Modbus register database
- Setpoint thresholds can be changed with our Modbus-RTU client app
- Connectable to SCADA or monitoring devices
- Configurable for Type K or J thermocouples
 - (K included in base kit)
- On-Board local LED's for status indication
 - Power
 - Thermocouple/shutdown
 - Analog Input condition
 - Modbus Communication
- External 22.5 mm RED LED for start permissive indication

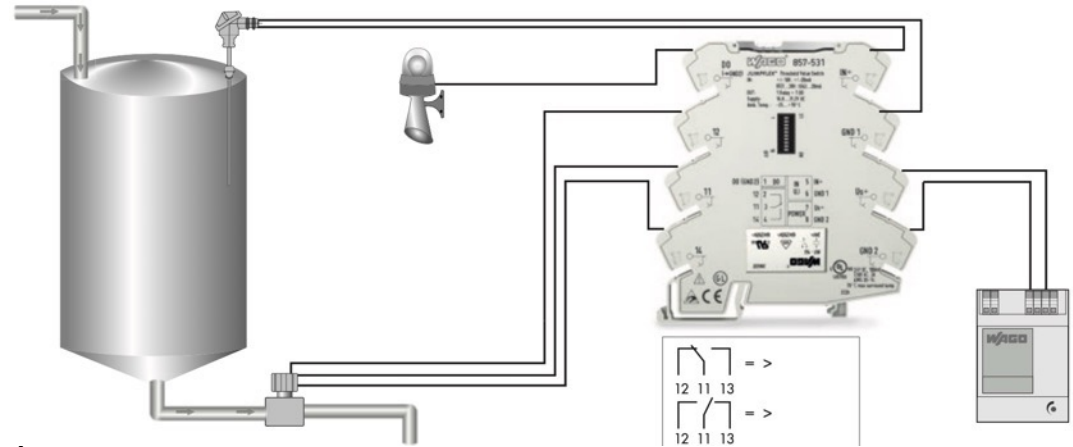
- Can easily be programmed as a universal temperature or analog/digital controller



Products

- **M-SPSL-W-1**

- Applications:
 - Tank level controller
 - Compressor Oil Day Tank Monitor
- 24 VDC powered
- Analog input for level sensors
- Output for annunciator permissive connection, or local indicator
- SPDT relay output for control
- Programmable using USB dongle or local DIP switches
- DIN-rail mounted module, 6 mm wide
- Cost effective solution



Products

- **MPC**

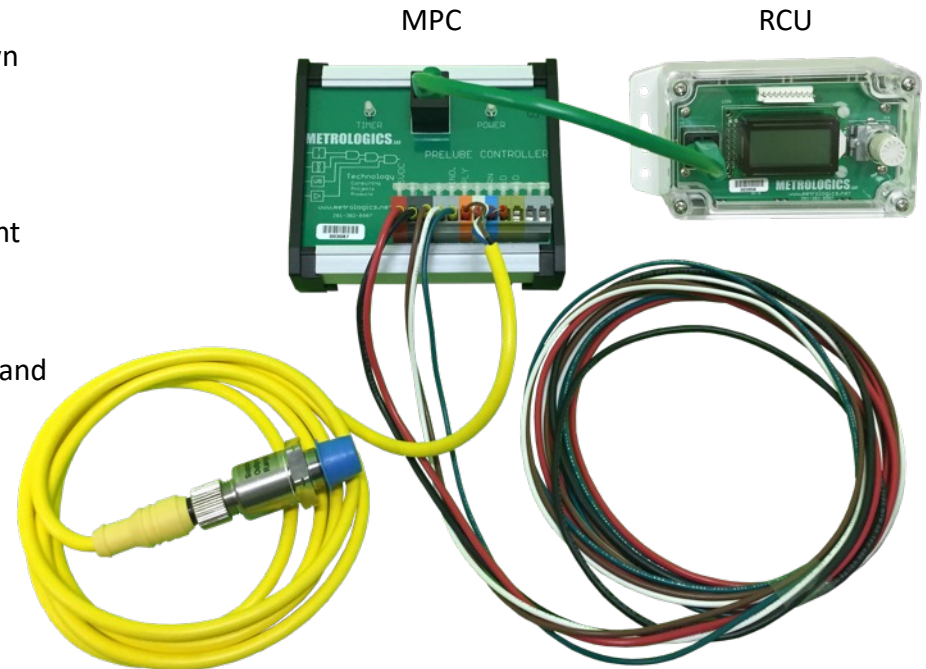
- **Compressor Pre-Lube Controller**

- Monitors pre-lube oil pressure
 - High setpoint crossing starts bypass timer, defaulted to 50 psig and 120 seconds
 - Bypasses shutdown during timer period to allow engine start
 - If a low pressure condition exists, unit shuts down engine
 - Modbus RTU communication available for integration with external systems
 - Status LED's for timer and power status
 - Color coded, tool-less, high vibration environment terminals
 - Pressure transmitter and cable included, factory calibrated
 - 10-36 VDC powered, reverse polarity protected, and has internal thermal self-resetting fuse
 - Setpoints changeable using RCU
 - **Programmable for any small control application**

- **RCU**

- **Remote Configuration Unit**

- Local LCD user interface
 - View system status of timer and pressure
 - Change timer, pressure, and temperature setpoints
 - Calibrate transmitter
 - No external power required, uses a single standard RJ45 Ethernet cable
 - Unique one-knob interface
 - Turn to highlight, push to select, turn to increase or decrease setting, push to enter. Simple & Easy!



Products

- **MDCS**

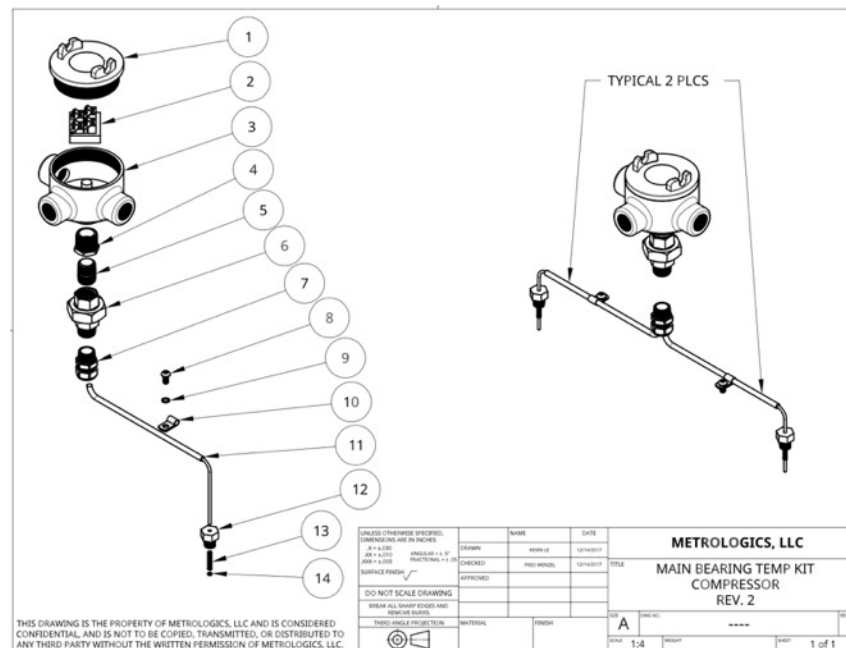
- Dielectric Constant Alarm Switch

- Detects calibrated changes in dielectric characteristics of multiple materials and trips preset switch contacts
 - Local LED indication of condition status
 - Stainless steel housing with standard ½" MNPT mounting threads
 - Can detect:
 - Oil in water
 - Water in oil
 - Boiler water changes
 - Coolant water breakdown
 - Oil breakdown
 - Material batch component changes
 - Etc.
 - LOW COST



Products

- **Mains Bearing Temperature Measurement Kits**
 - Kits for all Arial compressor frames
 - M-MBTP.K-KIT-1 (H, E, K, T)
 - M-MBTP.K-KIT-2 (J)
 - M-MBTP.K-KIT-3 (C, D, Z)
 - Covers four main bearing temp measurements
 - < Half the cost of Arial kits, and better design
 - Wireless unit in development for mains and rods (patent pending)



Products

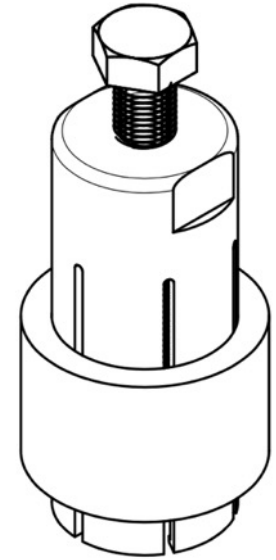
- **MrFIDR – New Product**

- Wireless bearing temperature monitor (*patent pending*)
- Measures main and rod bearing temperatures
- Local LCD for user setup and viewing
- User configurable Alarms:
 - Two Digital Outputs
 - Modbus registers
- Communications:
 - USB-C
 - RS485 (Modbus-RTU server)
 - Ethernet (Modbus-TCP server)
 - Cell Modem (plugged into Zigbee socket, optional)
 - WiFi
 - Bluetooth
- Housed in C1D1 explosion proof enclosure
- Uses passive RFID temperature tags (mounted in bearing caps)
- 6 to 35 VDC power input
- Easy to install
- Free configuration application (PC or MAC)



Products

- **M-BPK-1, Bearing puller**
 - Designed for replacing CAT fuel valve bearings
 - Drastic cost reduction compared to CAT puller
 - Kit includes bearing puller, seals, SKF bearing
 - Made from 316L stainless steel



Products

- **Communication Converters**

- Modbus-RTU

- RS232/RS485 to
 - CAN-J-1939
 - CANbus
 - LonWorks
 - Profibus-DP
 - Ethernet
 - HART
 - Lowest cost solution on the market
 - Modbus registers can be mapped to any register position



Radios

- **Radio Products**

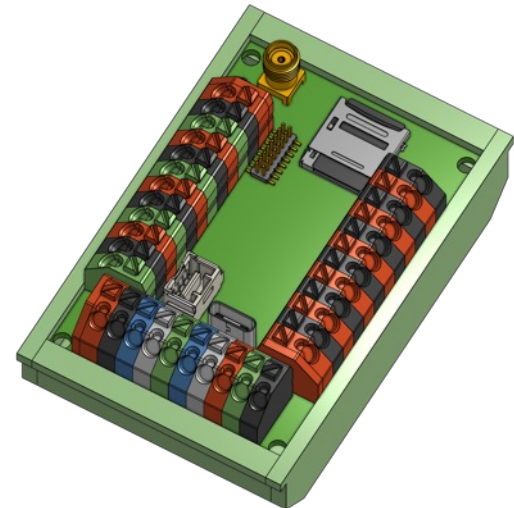
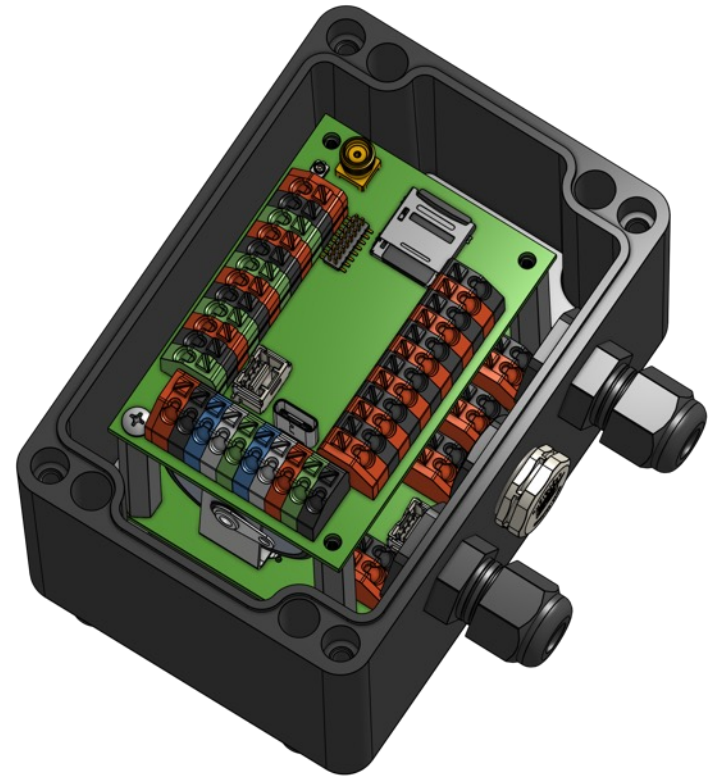
- RS485 Modbus-RTU
- Ethernet and Modbus-TCP
- Plug and play
- Radio with on-board IO, and addressable Modbus-RTU registers
- Meshed, point-to-point, point-to-multipoint, store and forward, peer to peer
- Successfully implemented on sites with 15 compressors/generators



LoRa Remote Nodes

- M-LoRa-915-1

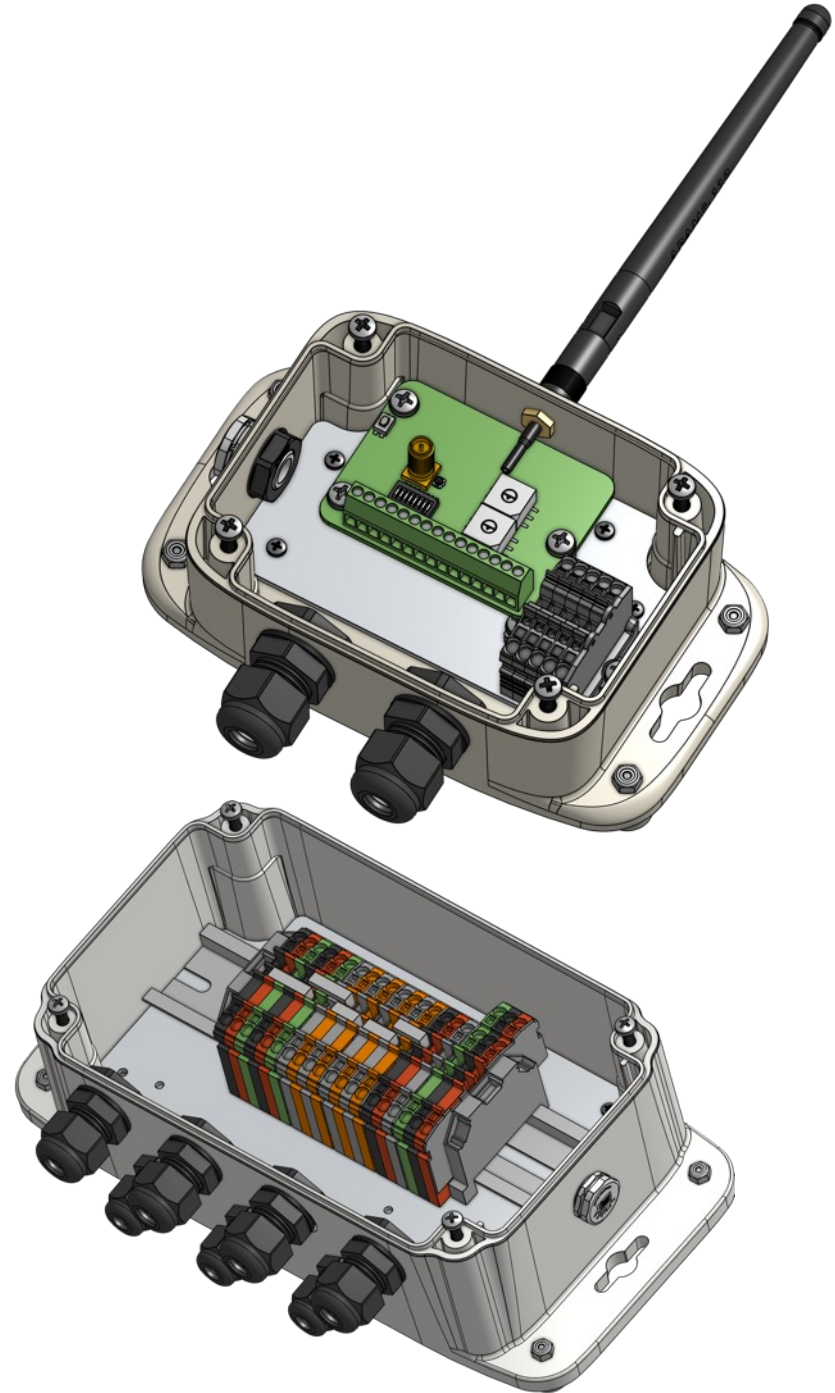
- Small DIN-rail mounted module (50mm x 72mm)
- Color coded tool-less terminal blocks
- USB port for downloading config files, viewing live status data, and diagnostics (PC app)
- RS485 and RS232 ports for Modbus-RTU comm
- I2C communication port for external sensors
- 4 Analog Inputs (16-bit)
- 4 Digital Inputs (dry contact)
- 2 Digital Outputs (for driving relays)
- Micro-SD card socket for local data-logging (2Gb to 32 Gb)
- SMA and u.FL antenna connections
- Can be mounted in your panel, or our C1D2 enclosure.
- Automatically connects to our gateway
- Uses advanced data compression algorithms
- Optional 19Ah D-cell battery powered.
- Can be used for remote wireless collection of annunciator data or other physical or Modbus-RTU data from any device from as far away as 16 K (10 miles) LOS



Modbus-IO Radios

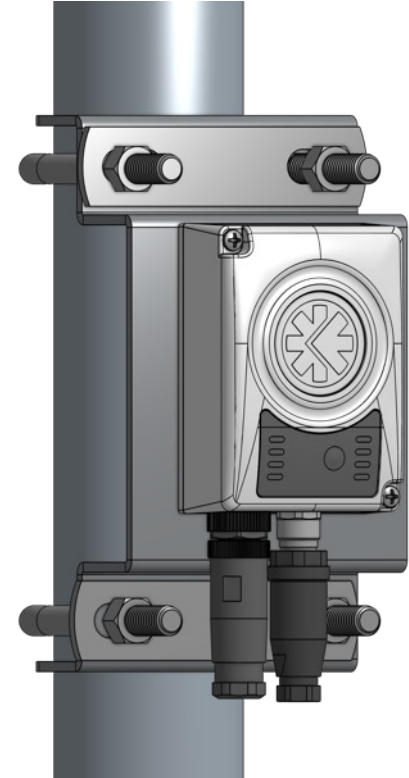
- M-485R-Kit-4

- RS485 port for server connections
- Local IO
 - 2 – Analog Inputs
 - 2 – Analog Outputs
 - 2 – Digital Inputs
 - 2 – Digital Outputs
 - IO can be mapped between nodes
 - IO state change on one node can change state of IO on any other node
 - All IO mapped to Modbus-RTU registers
- Small Nema-4X enclosure
- Antenna included
- Can be used for remote wireless collection of annunciator data or other physical or Modbus-RTU data from any device from as far away as 16K LOS (10 miles, dependent on antenna).
- Options:
 - Magnet mount kit
 - External antenna bracket and whip
 - IO Expansion enclosure for easier field wiring



Products

- **Ethernet Radio**
 - Ethernet/Modbus-TCP
 - Saves wiring installation costs
 - Successfully implemented on sites with 15 compressors (max network nodes = 255)
 - Plug and play 1-button configuration
 - M-12 Connectors for Power and Ethernet
 - NEMA-4X bracket/pole or magnet mounts
 - C1D2 hazardous area certified

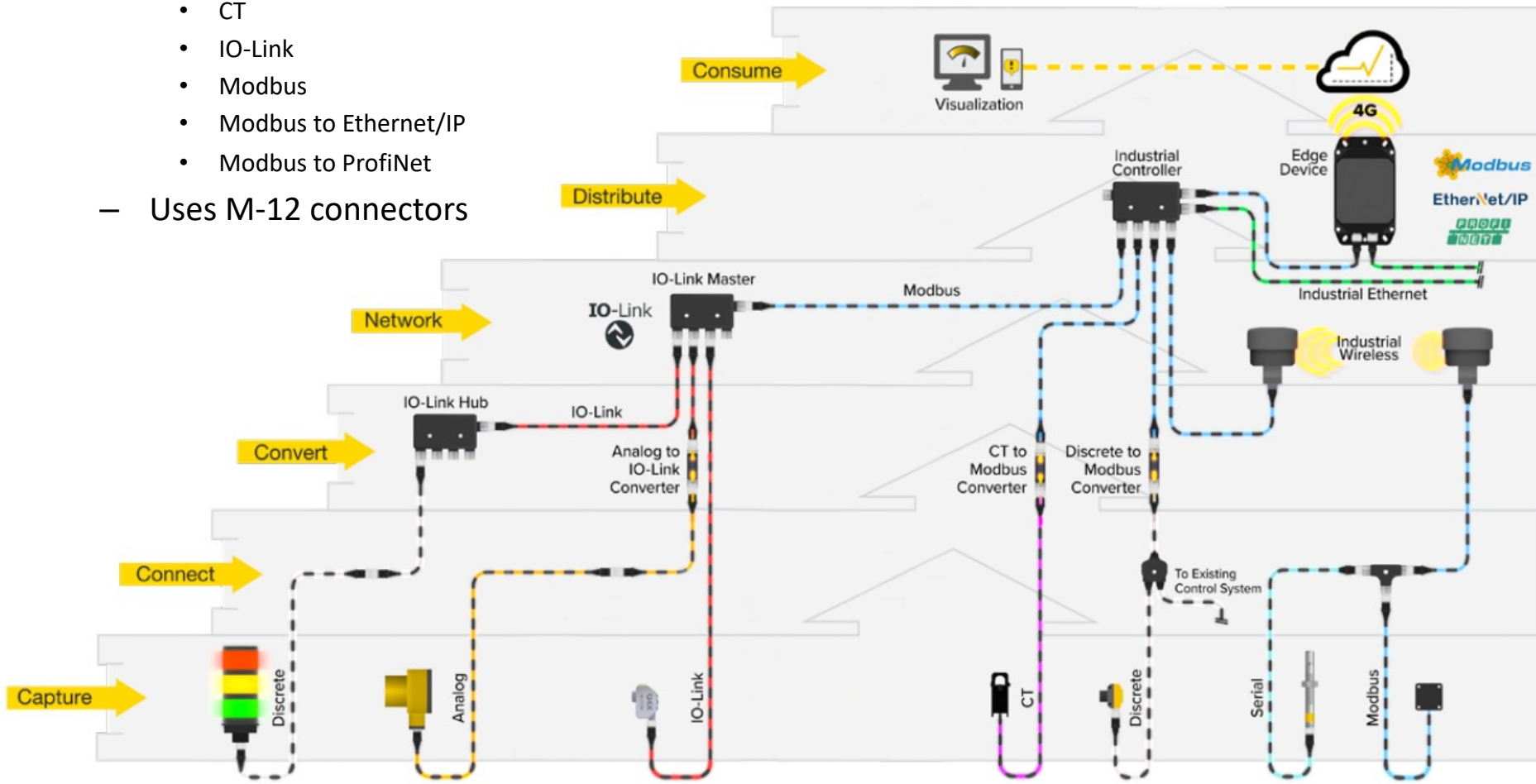


Device Protocol Converters

- Network any device into a Modbus Network

- Bring your existing older devices into the modern IIOT world.
- Supports:
 - Discrete
 - Analog
 - CT
 - IO-Link
 - Modbus
 - Modbus to Ethernet/IP
 - Modbus to ProfiNet
- Uses M-12 connectors

Converter



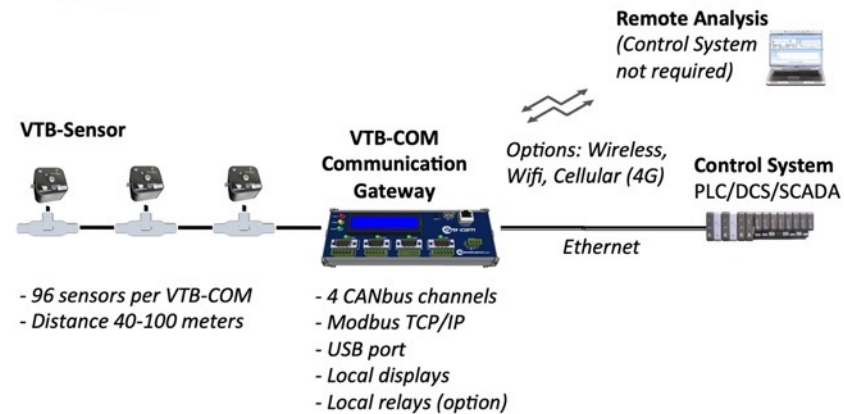
Products

• Vibration Systems

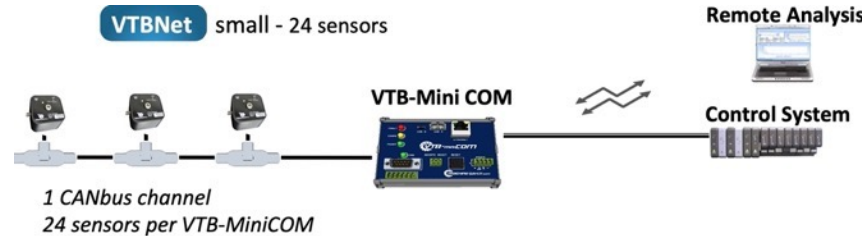
- Distributed smart vibration nodes
- Easy to wire M-12 connectors
- Screw or magnet mounted sensors
- Six 3-axis sensors and one temperature sensor in each node
- 0.4 to 5000 Hz measurement range
- Outputs for Acceleration, Velocity, and Displacement
- Impact monitoring
- Communications:
 - CANbus
 - Modbus-RTU
 - Ethernet/Modbus-TCP
- Operating temp: -40°C to 105°C (-40°F to 221°F)
- C1D2 hazardous area certified
- Sensor Network Gateways:
 - 24 nodes
 - 96 nodes
- Single channel Vibration switch
- Advanced setup and analysis software available



VTBNet Multiple sensors- scalable



VTBNet small - 24 sensors

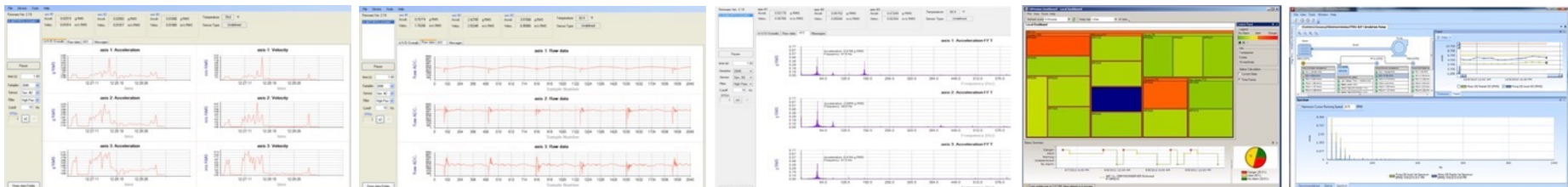


TriVibe- Vibration Switch Single point (2) 10 amp relays, (1) 4-20mA, Modbus RS485



VTB-Sensor Only

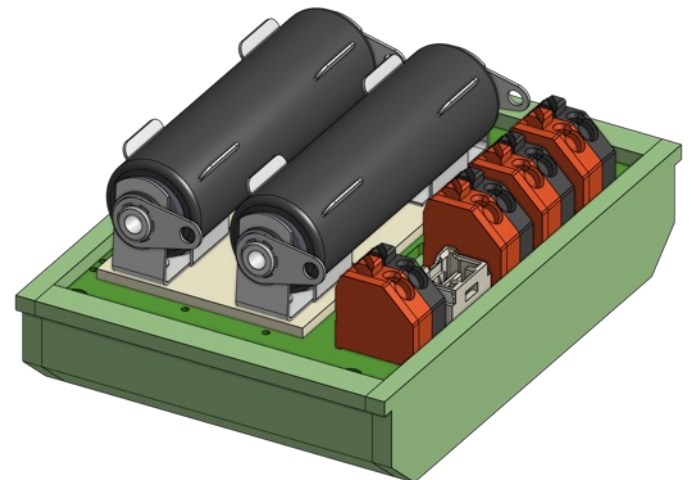
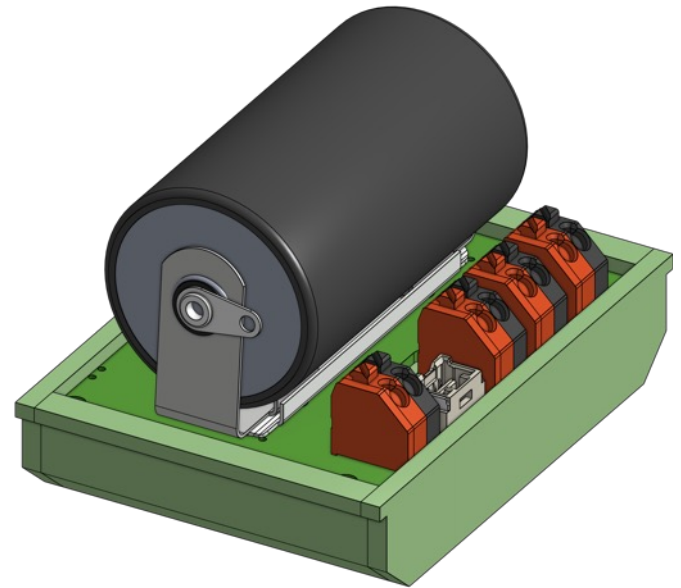
Modbus RS485, 1200 meters, multi-drop or Industrial CANbus



Smart Battery Charger/Power Supply

- M-UBC-PS

- Small DIN-rail mounted backup battery module
- Color coded tool-less terminal blocks
- I2C port for charger, battery, temperature information
- Settable LVD thresholds or timed variables
- Intelligently charges (MPPT) multi-chemistry batteries with external temp compensation
 - Lithium (LiFePo) batteries
 - Single A, 2.4 Ah
 - Dual A, 4.8 Ah
 - Single C, 7.2 Ah
 - Single D, 19 Ah
 - Dual D, 38 Ah
 - Sealed Lead Acid (SLA) Batteries
- Accepts inputs from 6VDC to 32 VDC sources, or Solar Panels
- Selectable DC load voltages: 3.3, 5, 12, 24
- Used for powering: MCAM-M7, MCAM-Pico, M-LoRa-915-x nodes, M-485R-Kit-4, etc., or your device.

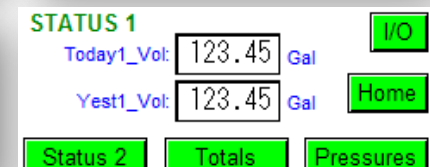
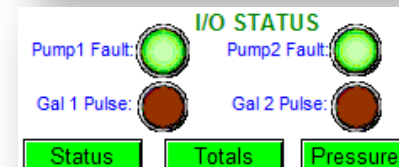
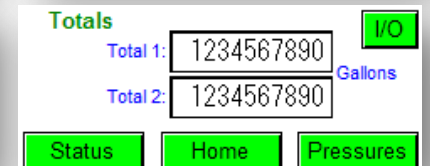
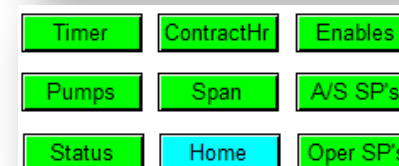
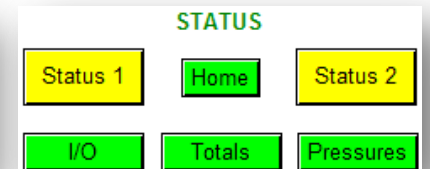
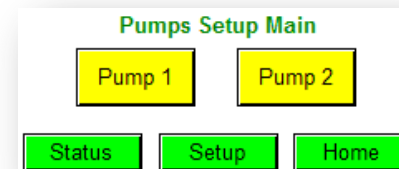
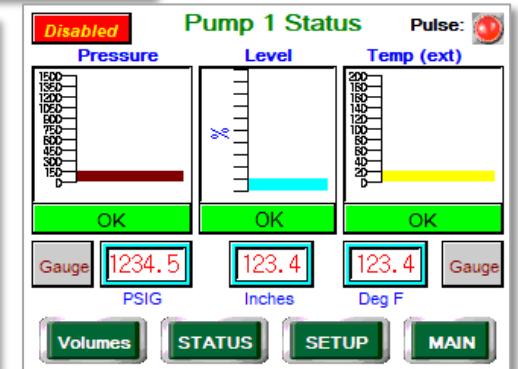
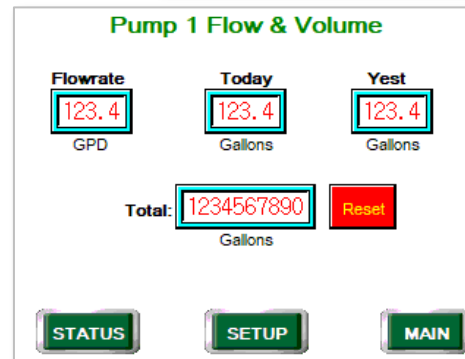
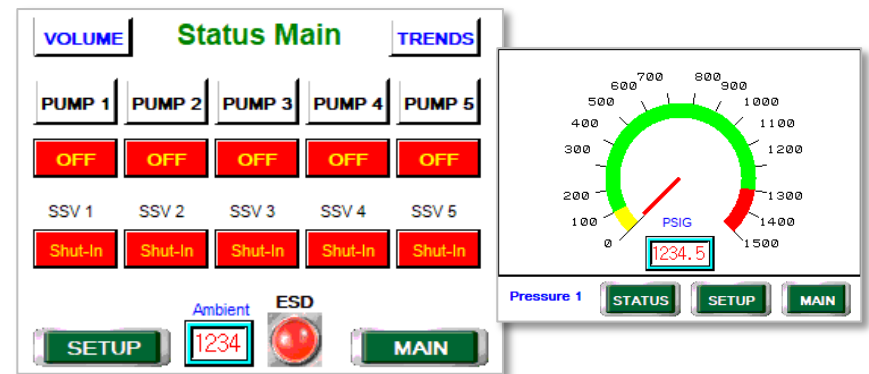


Products

• MCIPS

– Universal Chemical Injection Pump Controller

- Pneumatic (up to 4 pumps in one controller)
- Single Phase DC
- 3-Phase DC
- Single phase AC
- 3-Phase AC
- Setpoints for desired chemical delivery/Day
 - Quarts
 - Liters
 - Gallons
 - Barrels
- Temperature and Flow Overrides
- Integrated accurate flow meter
 - Volume calculations
- Optional tank level transmitter
- Extensive Modbus RTU database
- Remote communication/control
 - RS485/RS232
 - Radio
 - Cellular
 - Satellite
- Optional back-end data collection and web interface
- Local color touchscreen user Interface



Products



- **Database Server and Web Portal**

- Hosted at Microsoft Azure
- Oracle SQL Database
- Web Portal
 - Tightly integrated to all MCAM products
 - Designed for IIOT data pushing
 - Accepts any registered JSON or MQTT device connections
 - Google maps interface for asset tracking
 - Connection to remote assets for real-time information
 - Advanced graphing and report generation
 - Customizable to meet your needs (designed for private labeling)
 - Remote unit firmware update OTA
 - Real-time remote unit connections
 - Secure connectivity with two-level authentication
 - Bi-directional Modbus-RTU support (poll and monitor live)
 - Your server to our server API available
 - User customizable dashboards
 - Rest API interface

Remote Monitor Login

USERNAME

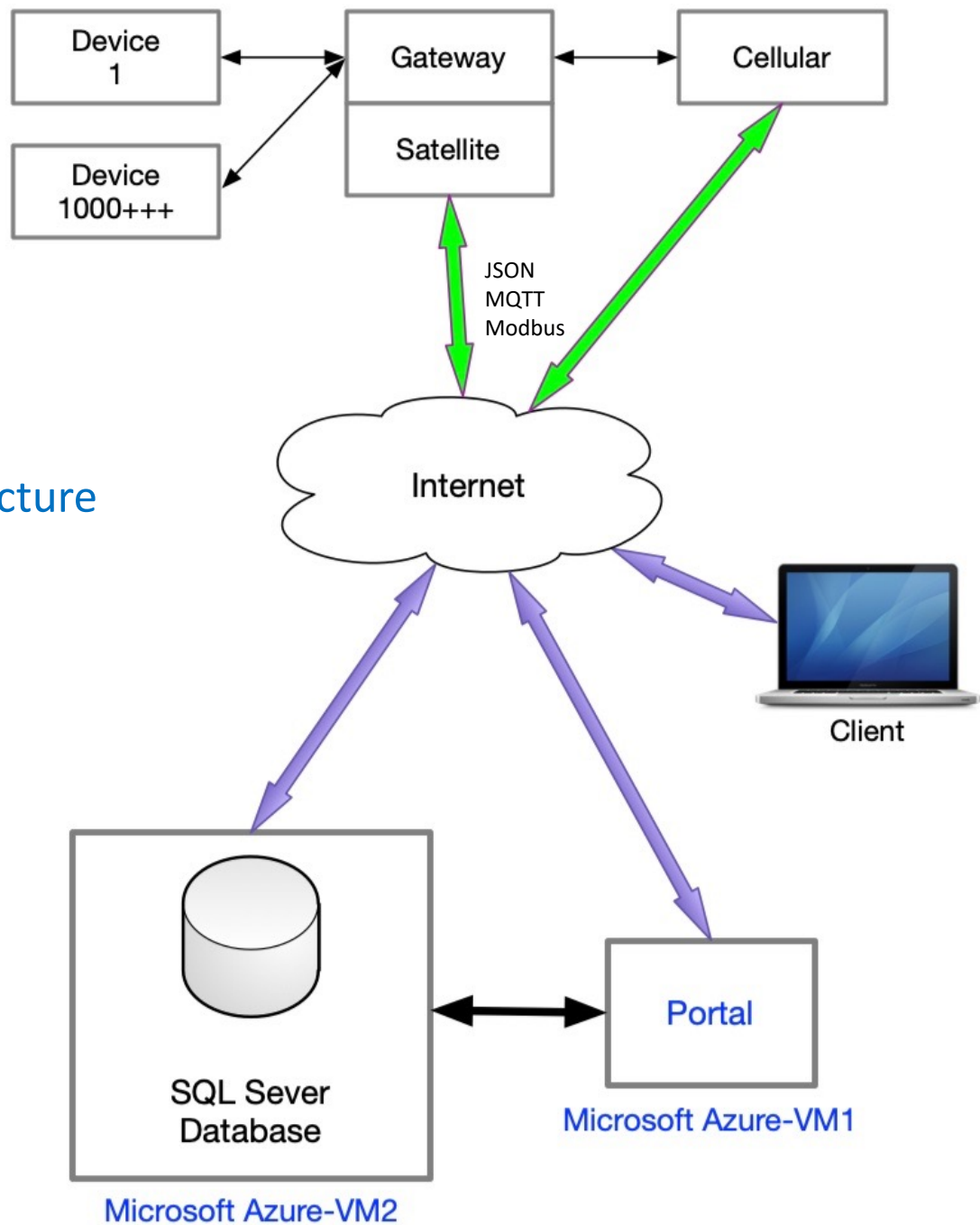
PASSWORD

☐ Remember Me [Forgotten Password?](#)

Portal

- Advanced OEM Graphics Portal



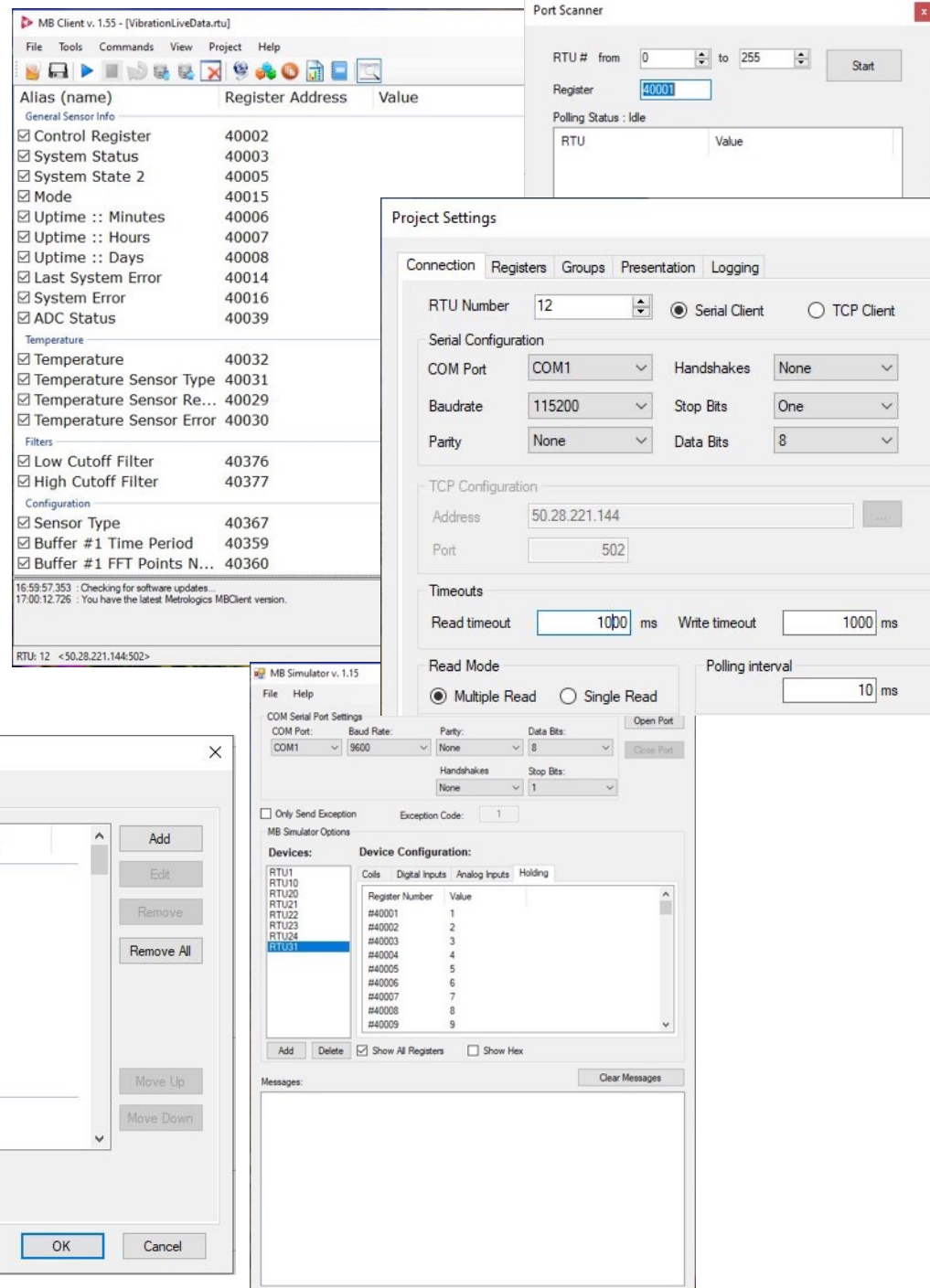


Basic Server/Portal Architecture

Modbus-Client

- PC Based User Application

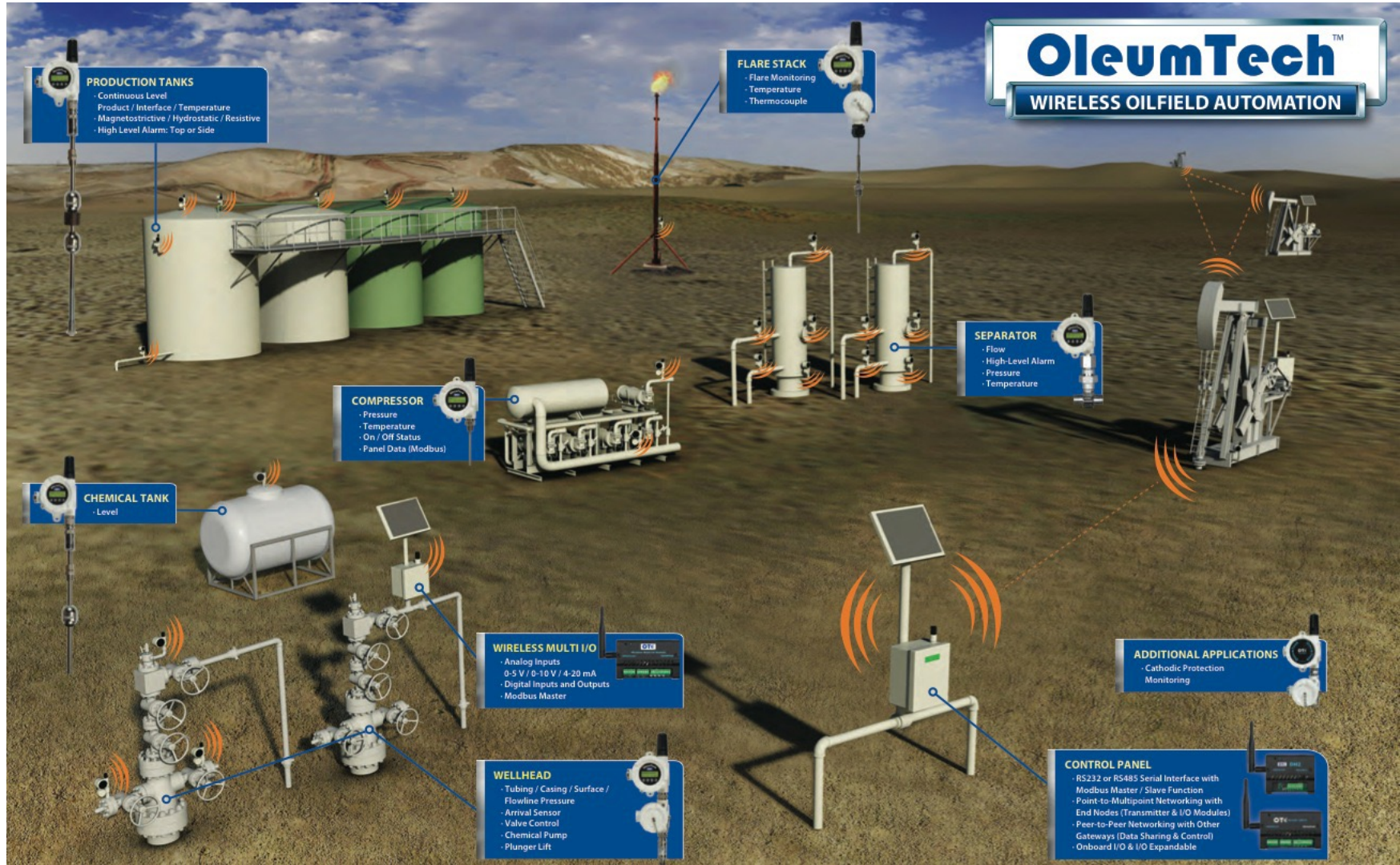
- Supports Modbus-RTU or Modbus-TCP requests
- Easily create Modbus tags to poll
- Save Project Files
- Connect with cable or through Ethernet/Internet (remote devices)
- Includes a Modbus slave simulator & port scanner
- More features than any other Modbus tool available





Products

- **Oleumtech** Distributor/Systems Integrator



Support Services

- 24/7 phone and online support contract
 - After hours live support
 - Online chat/support assistance ticket system
 - Virtual voice callout service
 - Call center services available
 - Automated alarms via SMS and email
 - Server level notification alarms
 - As defined by customer needs
 - Staffed in Katy TX
 - Contract terms negotiable based on features/fleet size

Contact

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