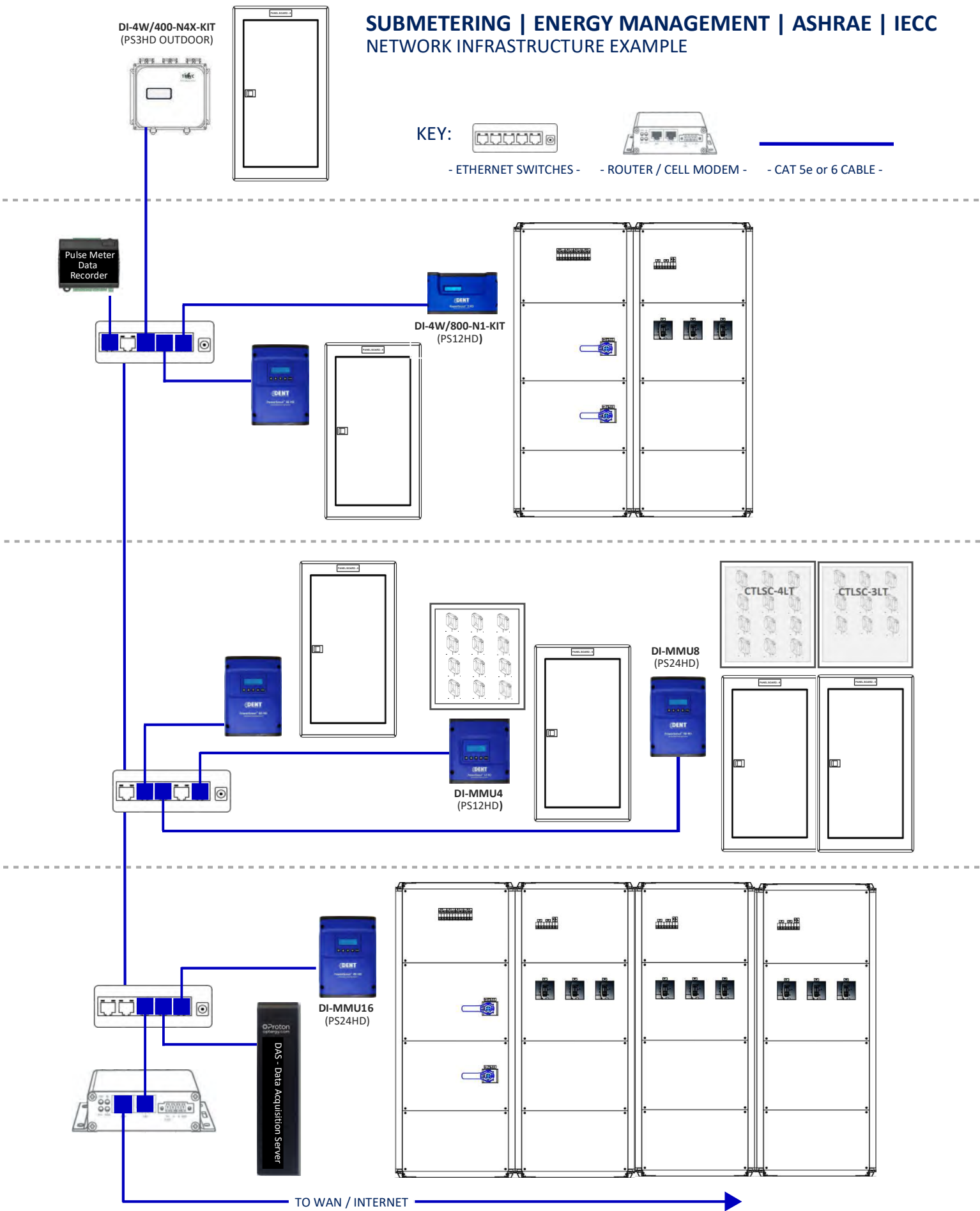


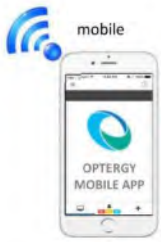
## Bill of Materials

# Electrical Single Line Diagrams

# AMS / EMS / BMS SYSTEM ARCHITECTURE

SUBMETERING | ENERGY MANAGEMENT | ASHRAE | IECC  
NETWORK INFRASTRUCTURE EXAMPLE





## OPTERGY PROTON WEBSERVER

CONNECTING SMART METERS TO THE INTERNET  
VIA RS-485 OR ETHERNET (*PREFERRED*)  
NETWORK COMMUNICATIONS CABLING

1. INSTALL SMART METER(s)\*  
& PROTON DAS APPLIANCE
2. RUN COMMUNICATIONS  
BETWEEN PROTON-DAS  
AND SMART METER
3. CONNECT PROTON TO  
INTERNET VIA STATIC IP,  
WI-FI, OR CELL MODEM
4. CALL TBWC TECH FOR  
START-UP & TRAINING



ADDITIONAL SMART METER(s)  
(RS-485 OPTION)

STRAIT THRU DAISY-CHAIN ONLY

\*REFERENCE METER INSTALL  
TECH SHEET FOR MORE INFO.

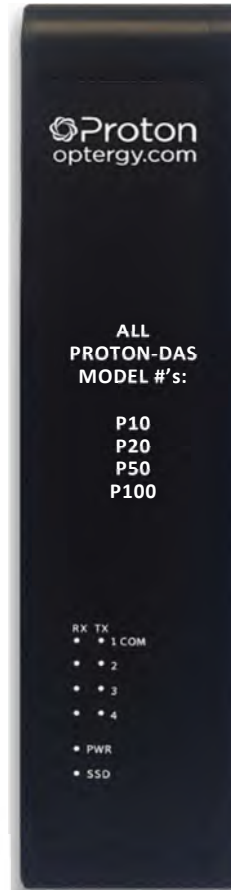
### OPTERGY PROTON (FRONT VIEW)

(TOP VIEW)

RS-485 COM PORTS  
(4) METER INTERFACES  
MAX RUN EA = 4000 FT

RS-485 BACNET MSTP OR MODBUS RTU CABLE

CAT5e/6 ETHERNET MODBUS TCP/IP OR BACNET IP



PROTON 24-VOLT  
POWER SUPPLY  
INCL W/PROTON

ETHERNET IP PORT  
INTERNET INTERFACE

HDMI DISPLAY PORT  
(DISPLAY OPTIONAL)

VGA MONITOR  
(NOT INCLUDED)



ADD'L SMART METER(s)

AND ETHERNET IP SWITCHES  
(1) 5-PORT SWITCH SUPPLIED WITH DAS

**PROTON ACCESS VIA THE INTERNET:**  
FROM ANY BROWSER ON ANY SMART DEVICE  
OR LAN, WAN, PC, SERVER, VIA WIRELESS  
CYBER SECURE ROUTER OR CELL MODEM, ETC.



# Product Cutsheets

UTILITY SUBMETERING & ENERGY MANAGEMENT PRODUCT SOLUTIONS

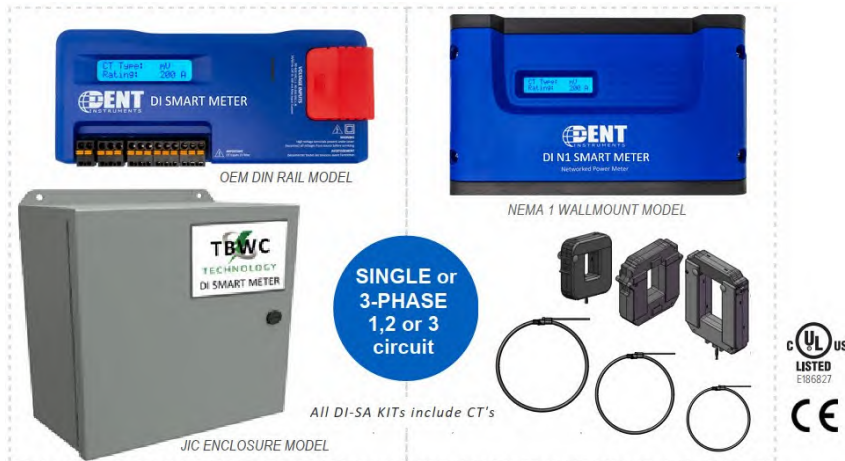


HIGH PERFORMANCE SUBMETERING PRODUCTS, SOLUTIONS & SERVICES FOR ALL INDUSTRIES

SUBMETERS & ENERGY MANAGEMENT PRODUCTS

## NETWORKED SINGLE & 3-PHASE SMART METER KITS

REVENUE GRADE INSTRUMENTS FOR SUPERIOR ENERGY MEASUREMENT



### DI-SA SMART METER KITS

Submetering Made Easy! Whether monitoring a single circuit or a facility's main service entrance, Industry Professional count on DI Smart Meter Kits to accurately deliver the energy use information needed for Energy Management, Energy Conservation, utility cost allocation and recovery applications. Easy-to-install, easy-to-own and easy-to-manage, DI Smart Meters are designed to accurately and reliably deliver the data you need over the life of the system.

### REVENUE-GRADE PERFORMANCE

With a high-speed, continuous input sampling rate of 1 Hz, ANSI C12.20-2015 Class 0.2 revenue grade accuracy can be achieved. All DI-SA Smart Meters are well-suited for accountability metering in commercial, retail, and industrial facility for demand response, energy management and tenant based submetering

### LINE VOLTAGE POWERED

DI-SA Smart Meters are designed to be powered from the same voltage as the load monitored, saving time and money installing. Designed to offer year of hassle-free duty, meter can be retro-commissioned, field reprogrammed and redeployed to a new location as facility or application changes may occur.

### ADVANCED COMMUNICATIONS INCLUDED

DI-SA Smart Meters support both Modbus, (reference SunSpec IEEE-754) and BACnet communications protocols. The meter communications interface is accomplished via serial RS-485 (Modbus RTU or BACnet MS/TP) or via Ethernet (Modbus TCP or BACnet IP) networks, or via a Static IP Modem.

### READY TO INSTALL SUBMETERING KITS

DI-SA Smart Meter Kits include CTS and NEC required instrument overcurrent protection. Available in NEMA 1 wallmount, JIC and NEMA 4X, 6P non-metallic enclosures for safety, security, & protection from the elements in all applications.

### POWERFUL & COST-EFFECTIVE

Line powered and designed to operate on any voltage from 90-600VAC, meters are shipped pre-configured to match your specific project or application. Units feature a USB utility port to enable quick and accurate field installation. An on-board LCD display with thumb wheel makes it easy to verify proper setup.

### POWERFUL TROUBLESHOOTING

Patented circuitry immediately identifies installation errors. HD Series software can be downloaded at no-charge when advanced analytics such as waveform visualization, vector polar plotting, and harmonic distortion analytics are required.

## POWERED BY



### APPLICATIONS

- Tenant Submetering
- Bi-Directional Metering
- Data Centers
- Real-Time Power Monitoring for Saving, Energy Management, Load Segregation & Cost Allocation



### FEATURES

- 3 channels: 3-phase submeter monitors voltage, current, power, energy, and many other electrical parameters on single or three phase systems
- Secure wall mount JIC 3R, 4, 12 & 13 environmental or NEMA 1 indoor enclosure
- Revenue grade. ANSI C12.20-2015 Class 0.2 certification.
- Interval Data Recording: Store up to 63 days of 15-minute kWh consumption data
- Continuous sampling: No blind cycles
- DI Smart Meter Kits are pre-configured and supplied with Solid, Split-Core or Rope Style CTs from 1 to 5000 amp rated
- Line-Powered: 90-600V phase-to-phase
- Display shows real-time information regarding the meter configuration and metered data
- Communicate via industry standard BACnet or Modbus serial or IP protocols
- User-configurable alarm with isolated output
- Data is updated every 1.0 second
- On-board diagnostics confirm proper installation and commissioning
- UL Listed, CE Mark, BTL Certified
- Advanced technology enables units to be easily field reconfigured to meet facility changes and energy monitoring needs.
- Most cost-effective high-density submetering solution available in the industry today.



## NETWORKED SINGLE & 3-PHASE METERS

REVENUE GRADE INSTRUMENTS FOR IOT ENERGY MANAGEMENT

BUILD AN INTELLIGENT METER KIT TO MATCH YOUR SPECIFIC APPLICATION

All models equipped with BACnet and Modbus IP or Serial communications\*.

**SINGLE-POLE: 90-600V, 2-Wire, Single- $\phi$  (1) SPLIT-CORE CT**

**DI-2W/AMP-PKG-KIT.XX**

**TWO-POLE: 90-600V, 3-Wire, Single- $\phi$  (2) SPLIT-CORE CT**

**DI-3W/AMP-PKG-KIT.XX**

**3-PHASE: 90-600V, 4-Wire Wye, Three- $\phi$  (3) SPLIT-CORE CT**

**DI-4W/AMP-PKG-KIT.XX**

(NOTE: \*For 3-phase, 3-Wire Delta applications, use the "3W" model, only (2) CTs are required.)

**TO COMPLETE YOUR PART # SELECT ONE FROM EACH OF THE FOLLOWING:**

**AMP** Amps: 20 / 50 / 100 / 200 / 400 / 800 / 1200 / 1600 / 1800<sup>1</sup> / 2000 / 3000 / 4000<sup>1</sup>

**PKG** Packaging: 'N1' Nema 1 / 'JIC' 3R/4 steel / 'N4X' Non-Metallic

**\*.XX** Pre-programmed Communication Protocol Options:

'.02' = Modbus RTU; '.03' = BACnet MSTP; '.04' = Modbus TCP/IP (default) or '.04-DC01' = DENTCloud™; '.05' = BACnet IP

### PART # EXAMPLES:

DI-2W/50-N1-KIT.02      120-600 Volt, 50 Amp, Single-Phase, NEMA 1 wallmount meter, (1) CT; Modbus RTU  
DI-3W/100-JIC-KIT.04      208-600 Volt, 100 Amp, 2-Pole Single- $\phi$  Meter, JIC steel enclosure, (2) CTs; Modbus TCP/IP  
DI-4W/400-N4X-KIT.05      480-600 Volt, 400 Amp, 3-Phase Meter, NEMA 4X non-metallic enclosure, (3) CTs; BACnet IP

### ADDITIONAL SMART METER DETAIL & OPTIONS:

- For Solid-Core CTs, change suffix "-KIT" to "-SCCTKIT" 100, 200 or 400 Amp. Special order for higher ratings.
- Meter Kits include CTs: Split and Solid-Core supplied with 3-foot (1M) leads. 1800 and 4000Amp F RCT with 23ft. (7M) leads.
- <sup>1</sup>1800-Amp FRCT feature flexible rope CTs with 5.0" diameter opening and 23' (7M) shielded leads.  
4000-Amp FRCT models: Specify size by adding suffix number for "-7.5"; "-11.0"; or "-15.0" diameter window openings.
- NOTE: NEC Overcurrent Protection: DI meters have internal, NEC compliant overcurrent protection built in, If voltage to the meter is > #12, proper OCP device is required. See TBWC OCP Tech sheet for detail.
- Optergy Proton browser based Automatic Meter Reading / Energy Management software appliance. Base model supports up to 10 Meters, upgradable to 100. Tenant Billing option for 3 to 60 Tenants.
- Scalable Enterprise Energy Management AMR/EMS Server Software for large and portfolio systems.
- Secure, private wireless Internet service; system and meter reading wellness service plans available.

### DI-SMART METER PACKAGING "PKG" OPTIONS



NEMA 1 WALLMOUNT MODEL



JIC ENCLOSURE MODEL



NEMA 4X NON-METALLIC  
ENCLOSURE

### DI Smart Meter KITS

Dimensions & Estimated Ship Weight:

N1-KIT (H) 5.50" x (W) 10.12" x (D) 2.12"  
JIC-KIT (H) 10.0" x (W) 12.0" x (D) 5.00"  
N4X-KIT (H) 10.00" x (W) 12.0" x (D) 5.00"

WT: 12-15 LBS  
WT: 19-22 LBS  
WT: 15-18 LBS

NEMA 1 Wall Mount  
NEMA 3R, 4/12 Security Enclosure  
NEMA 4X, with Viewing Window Display

All meters tested to ANSI C.12.11.20.2 prior to shipment  
Certificate of Calibration test report supplied with each

The equipment used to calibrate this device has been calibrated by a certified ISO 17025  
Laboratory accredited by A2LA, using standards that are traceable to the National  
Institute of Standards and Technology (NIST).

## MMU MULTI-CIRCUIT HIGH-DENSITY METERING

REVENUE GRADE INSTRUMENTS FOR SUPERIOR ENERGY MEASUREMENT



### MAXIMUM FLEXIBILITY FOR MONITORING

DI-HD Multiple Meter Unit (MMU) cabinets make submetering easy. Their flexible design allows them to be configured for monitoring multiple electrical circuits. Units are supplied pre-programmed and ready to install. Using 0.333mV, internally shunted CTs, up to 64 single, 2-pole or 3-phase meters (192 circuits) can be monitored with a single MMU Cabinet. With data updates every 1 second and revenue-grade accuracy (depending on CT), these MMU cabinets are well suited for data center monitoring, tenant submetering, California T24 or ASHRAE 90.1 load segregation projects and accountability metering in commercial, industrial, retail and other energy monitoring and management applications.

### INDUSTRY STANDARD BACNET OR MODBUS

DI-MMU high-density cabinets are configured to support both BACnet or Modbus communications protocols. Interface to communicate can be accomplished via standard serial RS-485 or Ethernet using either BACnet MS/TP, Modbus RTU or BACnet or Modbus IP. Additionally, DI-MMU16 models allow inputs for up to (2) 3rd-party, 2-wire pulse-output meters (i.e., Electric, Gas, Water & BTU energy) meters to be integrated.

### EASY TO INSTALL AND MANAGE

Save time and money while mitigating any risk associated with the installation of multiple meters and networks. Line powered and designed to operate on any

voltage from 90-600V, DI-MMU Meter Cabinets are NEC compliant. Select models are capable of accepting up to 8 independent voltage references making DI-HD meters ideal for achieving and maintaining ANSI C.12 accuracy compliance.

### PRE-CONFIGURED TO YOUR SPECIFICATION

Prior to shipment, TBWC carefully configures every DI-MMU high-density meter matching the appropriate CTs inputs for each specific meter element: Every DI-HD furnished includes a "CT Load / Panel Schedule", a road map that reduces the amount of time and potential for errors both in installation and post-installation applications where meters need to be added or re-configured. combined with DI Dent Instruments patented\* PhaseChek™ technology, proper CT-phasing in the installation is achieved easily, eliminating expensive trips back to correct.

### SUBMETER NETWORK MANAGEMENT MADE EASY

Whether on-site or remote, contractors & end users appreciate Dent Instruments ViewPoint HD software. Available at no charge, ViewPoint allows a technician to quickly scan the local area network, discover their existing as well as commission any new DI-HD (and DI-SA) meters added to the network. Data provided includes System Description, Basic Meter Setup, and Diagnostics from the scan window. Data provided includes kWh Power Consumption, Kw Demand, PF Power Factor, Waveform Capture Phasor Diagrams, and THD Total Harmonic Distortion.

### POWERED BY



A TBWC MANUFACTURING PARTNER  
TECHNOLOGY

### APPLICATIONS

- Tenant Submetering
- Bi-Directional Metering
- Data Centers
- Real-Time Power Monitoring in Commercial, Retail, and Industrial environments



### FEATURES

- Up to 64 meter elements (192 circuits) to monitor voltage, current, power, energy, and many other electrical parameters on any combination of single and/or three-phase systems
- Up to 8 reference voltage inputs allow DI-MMU HD high-density submeters to be used simultaneously in the same cabinet
- DI-MMU cabinets are supplied with NEC required meter/instrument overcurrent protection
- Line-Powered: 90-600V phase-to-phase
- Revenue grade. ANSI C12.20-2015 Class 0.2 certification
- Display shows real-time information regarding the meter configuration and metered data
- Communicate via BTL Certified BACnet or Modbus RS-485 serial or IP protocols.
- User-configurable alarm with isolated output. On-board diagnostics confirm proper installation and commissioning
- Interval Data Recording: Store up to 63 days of 15-minute kWh consumption data. Consumption data updated every 1.0 sec. Continuous sampling: No blind cycles
- In addition, the DI-HD meters feature a real-time clock (RTC) ensuring an accurate time stamp on all recorded data records. without need for batteries or maintenance.
- Advanced technology enables units to be easily field reconfigured to meet facility changes and energy monitoring needs.
- Most cost-effective high-density submetering solution available in the industry today.



# MMU MULTIPLE METER UNIT CABINETS

REVENUE GRADE INSTRUMENTS FOR SUPERIOR IOT ENERGY MEASUREMENT

(CTs sold separately)

## BUILD AN INTELLIGENT HIGH-DENSITY METER KIT TO MATCH YOUR SPECIFIC APPLICATION

All models equipped with BACnet and Modbus IP or Serial communications\*.

**MMU4:** For up to (4) single, 2-Pole or 3- $\phi$  meters. w/(1) voltage references

**DI-MMU4-PKG-(1)VR-KIT.xx**

**MMU8:** For up to (8) single, 2-Pole or 3- $\phi$  meters. w/(1 or 2) voltage references

**DI-MMU8-PKG-(1 or 2)VR-KIT.xx**

**MMU16:** For up to (16) single, 2-P or 3- $\phi$  meters. w/(1 or 2) voltage references

**DI-MMU16-PKG-(1 or 2)VR-KIT.xx**

**MMU20-64:** For (20 to 64) single, 2-P or 3- $\phi$  meters. w/(2-8) voltage references

**DI-MMU##-PKG-(2 to 8)VR-KIT.xx**

## TO COMPLETE YOUR PART # SELECT ONE FROM EACH OF THE FOLLOWING:

**##** = # of Meters: 4 / 8 / 16 / 20 / 24 / 32 / 36 / 40 / 48 / 52 / 56 / 64

**PKG** = Packaging: **N1** Nema 1; **J1C** 3R/4 steel; **N4X** Non-Metallic (MMU4 to 32 models only)

\* **.xx** = Pre-programmed Communication Protocol Options.

**‘.02’** = Modbus RTU; **‘.03’** = BACnet MSTP; **‘.04’** = Modbus TCP/IP (default) or **‘.04-DC 04, 08, 16’** DENTCloud™; **‘.05’** = BACnet IP

**(1 to 8)VR** = Specify the number of voltage reference inputs, based on the number available per each MMU model below:

MMU8 = (1 or 2) | MMU16 = (1 or 2) | MMU20 = (1 or 2) | MMU24 = (1, 2 or 3) | MMU32 = (1, 2 or 3)

MMU36 = (1, 2, 3 or 4) | MMU40 = (1 thru 5) | MMU48 = (1 thru 6) | MMU52 = (1 thru 7) | MMU56 & 64 = (1 thru 8)

## PART # EXAMPLES:

**DI-MMU8-N1-(2)VR-KIT** 8-Element (24 Circuit) Multiple Meter Unit. NEMA 1 Enclosure w/(2) Voltage Ref., BACnet/Modbus

**DI-MMU16-J1C-(1)VR-KIT** 16-Element (48 Circuit) Multiple Meter Unit. NEMA 3R, 4/12 Cabinet w/(1) Voltage Ref, BACnet/Modbus

**DI-MMU32-N4X-(4)VR-KIT** 32-Element (96 Circuit) HD Multiple Meter Unit. NEMA 4X, w/(4) Volt Ref., BACnet/Modbus

## ADDITIONAL SMART METER DETAIL & OPTIONS:

- NOTE: DI meters are equipped with internal NEC compliant overcurrent protection. The input voltage terminals on the meter can accept up to a #12 AWG conductor. If the voltage source is >20 Amp, an TBWC OCP-3P-0.5 can be used to accommodate.
- OPTIONS—(Consult your TBWC Technology Representative for additional information):
  - OEM or special applications, DI-MMU4, 8 & 16 units available in backpanel mount configurations (no enclosure)
  - Automatic Meter Reading, Load Segregation, Utility Cost Recovery and Tenant Billing software solutions available
  - MMU Cabinets in 304 or 316 Stainless, Aluminum or custom enclosures (all NEMA types) available upon request.
- Optergy Proton browser based Automatic Meter Reading / Energy Management software appliance. Base model supports up to 10 Meters, upgradable to 100. Tenant Billing option for 3 to 60 Tenants.
- Scalable Enterprise Energy Management AMR/EMS Server Software for large/portfolio systems: No annual licensing fees. Options: VPN internet WAN services, AMR system wellness checks, meter reading/management reporting & service agreements.

## DI-MMU High-Density Smart Meter

Dimensions (H x W x D) & Estimated Ship Weight (LBS):

SIZE (HxWxD)	J1C NEMA 3R/4/12/13	WT. (LBS)	N4X NEMA 4X/6P	WT. (LBS)	N1 NEMA 1	WT. (LBS)
MMU4	16.0" x 14.0" x 7.0"	37	12.0" x 10.0" x 4.0"	7	9.8" x 9.8" x 3.1"	4
MMU8	16.0" x 14.0" x 7.0"	38	16.0" x 14.0" x 7.0"	10	13.3" x 9.8" x 3.1"	5
MMU16	16.0" x 14.0" x 7.0"	39	16.0" x 14.0" x 7.0"	11	13.3" x 9.8" x 3.1"	6
MMU20-32	24.0" x 30.0" x 8."	74	16.0" x 20.0" x 8.0"	17		
MMU36-64	42.0" x 30.0" x 8."	132				



N1 ABS PLASTIC  
WALLMOUNT MODEL



J1C NEMA 3R, 4, 12  
SECURITY ENCLOSURE



N4X NON-METALLIC  
PAD LOCKABLE  
SECURITY ENCLOSURE

# SPLIT-CORE CT's

## 0.333mV CURRENT TRANSFORMERS

0.5-100 Amp



1.0-200 Amp



2.0-400 Amp



4.0-800 Amp



### Notes:

All DI-SA Smart Meter Kits supplied include CTs.

CTs for DI-HD MMU High-Density Meter models must be ordered separately.

CT's may be extended up to 500-ft away from stand alone or high density smart meters.

Split & solid-core CTs are supplied with 36" (1M) leads that can be extended up to 500 ft. Specify UL1015-20-XXTP2 600-Volt Rated, AWG 20/2 unshielded twisted pair cable.

Flexible Rope CTs are supplied with 23-ft (7M) lead lengths that can be extended up to 100 ft.

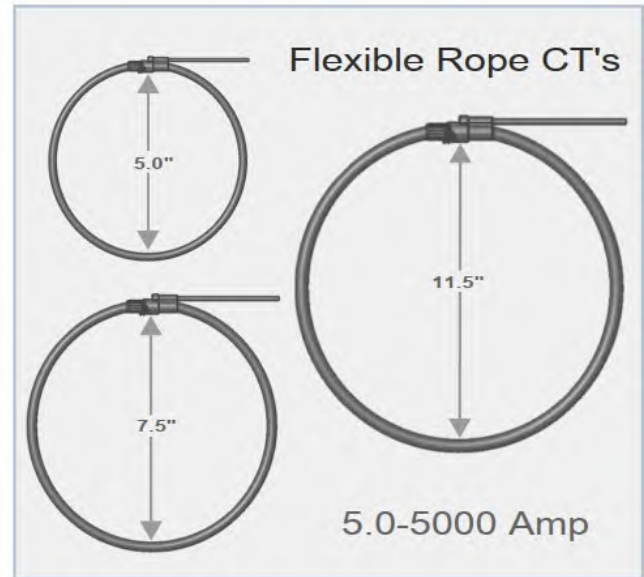
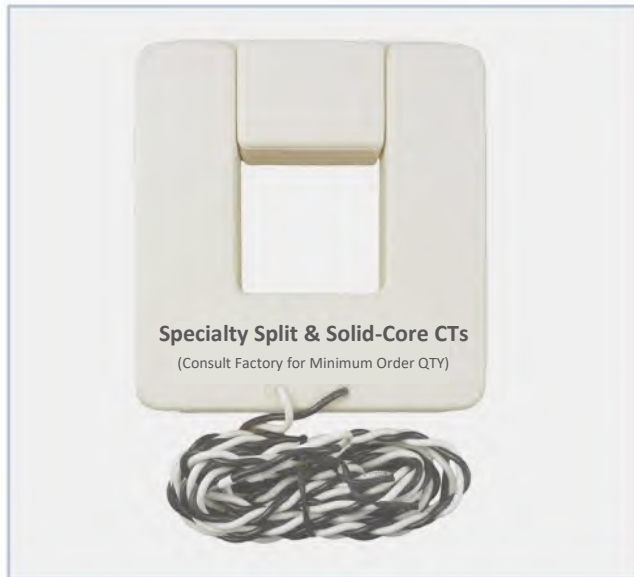
Reference NEMA, NEC and local electrical code rules for proper installation & BICSI TIA standards for both CT, FRCT and low-voltage RS-485 and Ethernet Category rated cables and connectivity.

### Split-Core Model Numbers

Model #	Amperage	Window Dim.	Weight
20A-CT	20	0.40"x 0.40"	0.35 lbs
50A-CT	50	0.72"x 0.62"	0.55 lbs
100A-CT	100	0.72"x 0.62"	1.25 lbs
200A-CT	200	1.0" x 1.40"	1.75 lbs
400A-CT	400	1.3" x 1.70"	2.00 lbs
800A-CT	800	1.63" x 2.50"	2.50 lbs
1200A-CT	1200	2.0" x 5.50"	4.00 lbs
1600A-CT	1600	2.0" x 5.50"	4.00 lbs
2000A-CT	2000	2.0" x 5.50"	4.00 lbs

# SOLID-CORE & FLEXIBLE ROPE CT's

0-0.333mV & 0.131mV/1000



## SOLID-CORE CT's



## CT LEAD-LENGTH EXTENSION CABLE



### Flexible Rope CT Model Numbers

Model #	Amps	Length	Weight
1800A-FRCT-5.0	1800	16.0"	0.85 lbs
4000A-FRCT-7.5	4000	24.0"	1.25 lbs
4000A-FRCT-11.0	4000	36.0"	1.60 lbs
4000A-FRCT-15.0	4000	47.0"	1.85 lbs

### Solid-Core CT Model Numbers

100A-SCCT	50	0.6"	0.20 lbs
200A-SCCT	100	0.8"	0.20 lbs
400A-SCCT	200	1.4"	0.20 lbs

### CT Lead Length Extension Cable

For Split or Solid-Core CTs, 20AWG Twisted Pair, 600V  
**CBL-SOSCCT-(CTL)**  
 Specify CT Cable Length in feet: CTL = 60, 250, 500, 1000

For Flexible Rope CTs, 26AWG Shielded Cable, 1000V  
**CBL-ROCOIL-(RCT)**  
 Specify Rope CT Cable Length in feet = 60, 328, 820, 1640

#### \*\* IMPORTANT \*\*

When looking from the source side of the load(s) being monitored, you should see an arrow on the CT assembly, with the direction of the arrow pointing clockwise around the conductor(s) being monitored.

If the arrow is not on source side, inaccurate readings may result.

# System Software / Specifications

Browser based energy management tool for monitoring

Electric, Gas, Water and BTU Meters

Cost Allocation / Load Segregation / Energy Profiling  
Electric, Gas, Water and BTU Meters



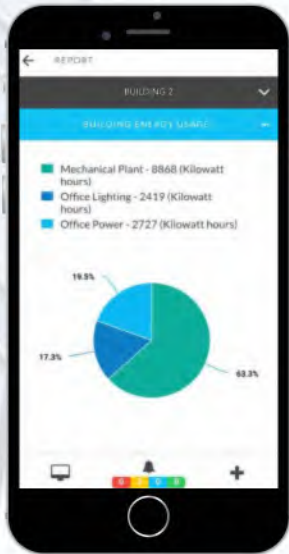
# ProtonWebMon

Proton is a building controller that integrates building data and systems in real time, providing tools to visualize, monitor, control and report building performance and operation.

Powerful and flexible, Proton allows for seamless integration with your existing building systems.

Proton supports BACnet MS/TP, IP and Modbus IP, RTU with 4 onboard communication ports.

The system can be accessed via a web browser or using the companion mobile app.



## PROTON MODELS

**E-MON P10** supports up to 10 connected meters .

**E-MON P20** supports up to 20 connected meters and adds scrolling public displays.

**E-MON P50** supports up to 50 connected meters , tenant management (3 tenants), utility billing and after hours billing.

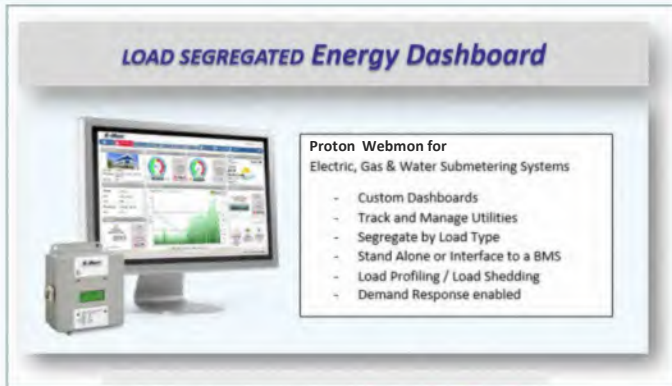
**E-MON P100** supports up to 100 connected meters , tenant management (10 tenants), utility billing and after hours billing.

The number of users for Proton is not restricted. The administrator group has the ability to add or modify users, define access, and set the navigation path specific to the user role.

Product feature by model	P10 PROTON	P20 PROTON	P50 PROTON	P100 PROTON
Devices (BACnet/Modbus/Meters)	10	20	50	100
Optimum start points	10	20	50	100
Demand limiting points	10	20	50	100
Public displays	✗	✓	✓	✓
Tenants	✗	✗	3	10
Utility billing	✗	✗	✓	✓
After hours billing	✗	✗	✓	✓
Weather & Forecast	✓	✓	✓	✓



## KEY FUNCTIONS



### 1. BUILDING MANAGEMENT (Graphics, schedules, trends, alarms & calendars)

Easily connect and manage any BACnet or Modbus meters , including schedules, trends and alarms. Metering applications include HVAC, fans, hydraulic systems, lighting and plug loads, cogen and central plant.

### 2. ENERGY MANAGEMENT (Energy metering, dashboards & automated reporting)

Use dashboards, automated reporting and energy alarming to reduce energy, costs and improve overall building performance.

### 3. FACILITY MANAGEMENT (Automated billing & public displays)

Users can easily manage tenants with automated afterhours A/C and utility billing reports.

Engage building occupants with scrolling displays and mobile app notifications.

## WE PUT THE EFFORT INTO BUILDING THE RIGHT FEATURES SO YOU DON'T HAVE TO

**Reporting** – Built-in reports to monitor and track building and energy performance. This flexible reporting system contains pre-packaged reports with specified time periods. It allows the simple generation of custom reports, with multiple output options such as Web, PDF and CSV.

**Email notification** – Saved reports can be automatically emailed at a user defined frequency to any user with email credentials.

**Text message (SMS) alarm with escalation and acknowledgment** – Alarms that are not acknowledged will escalate to any number of predetermined recipients after a user defined time period has elapsed. This ensures the issue is resolved.

**BACnet and Modbus** – BACnet and Modbus protocols offer the very best interoperable solution to bring your building systems together.

**Web Based Programming** – Allows the user to create application specific control logic using web based drag and drop programming for complete customization.

**Tools** – All the necessary web based tools to customize, configure and program Proton are included with easy to use help.

## A WORLD OF BENEFITS

### Manage your buildings wherever you go.

Stay connected with your buildings anytime, anywhere from your compatible devices with the mobile app.

### Make the most of your building.

An economical and powerful building controller, Proton's database and on-board 120GB SSD will provide years of valuable data. This facilitates informed decision making, time, resources and financial savings.

### Smart and responsive buildings.

Less downtime will reduce costs using automated alarming via SMS and email.

### Customize the system to suit you.

Proton allows complete customization of the user interface to suit your building and energy requirement needs.

### Simple and economical licensing.

Simple licensing based on number of devices with unlimited data points (10/20/50/100). There are no ongoing fees!



**Electric, Gas, Water & BTU Metering...**  
Proactively managing your  
buildings is just a few clicks away.



**WEB MON FROM TBWC**  
**TECHNOLOGY**  
Branded Wholesale Company



**Optergy**  
optergy.com

## Optergy Proton

Optergy Proton is a web-based building interface device that integrates building automation, energy management & facility management. The tools allow you to visualise, monitor, control and report on system operation in real time to ensure exceptional building performance and energy efficiency ensuring you reach your sustainability goals.



## CORE BUILDING CONTROL FEATURES



### BACNET IP AND MODBUS

BACnet IP and Modbus combined offer the best interoperable solution with minimal integration effort. Optergy Proton supports BACnet IP and Modbus RTU/TCP-IP with four onboard RS-485 communication ports used for Modbus devices.



### COMBINED EMS/BMS REPORTING

*Energy metering and reporting.*

Optergy Proton's flexible reporting system contains pre-packaged reports with specified time periods. It allows the simple generation of custom reports, with multiple output options such as web, PDF and CSV. These can be automatically emailed at predetermined intervals.



### PUBLIC DISPLAYS (Optergy P20 / P50 / P100)

Scrolling public displays are supported by a list of accessible URLs which are displayed in order for a predetermined time. Optergy Proton supports an unlimited number of public displays on a per-user basis allowing you to communicate with building users.



### TRENDS, ALARMS, SCHEDULES AND CALENDARS

Users can create trends, alarms, schedules and calendars. Trend graphs can be modified to view multiple trends and view over a defined time interval. Users will be able to view a list of all alarms, with the ability to acknowledge and/or to clear. Multiple schedules can be linked to a calendar that overrides standard schedule entries.



### EMAIL NOTIFICATION WITH ESCALATION AND ACKNOWLEDGMENT

Alarm notifications and saved reports can be automatically emailed at a pre-defined frequency to any user with email credentials. If alarms are not acknowledged, Optergy Proton escalates alarms to any number of predetermined recipients after a user defined time period has elapsed.



### BUILT-IN WEB BASED TOOLS

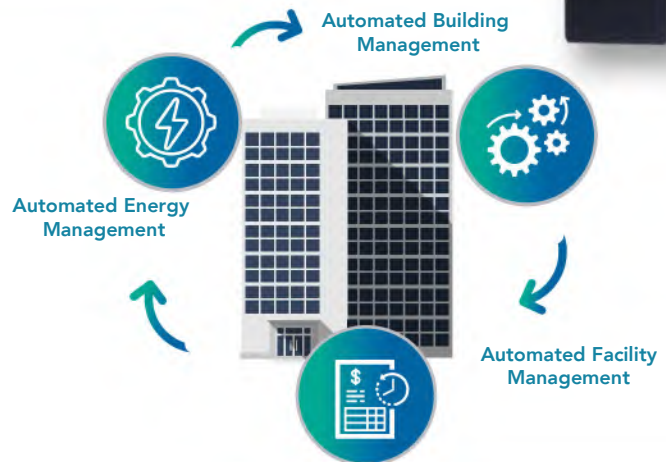
*Display tool to develop customised graphic interfaces.*

All the necessary web based tools to customise, configure, and program are included with a built-in help file.



### UNLIMITED USERS

Unlimited users with complete administrative configurations.



## OPTIMISATION FEATURES

### OPTIMUM START POINTS

Calculates the optimal plant start time to ensure the building achieves temperature when the occupied period begins.

### DEMAND LIMITING

Reduce the amount of energy consumed by your devices during peak periods. This feature allows the user to create and arrange analog or binary load controls.

## FACILITY MANAGEMENT FEATURES

### MAINTENANCE TICKETS

Users can report problems to facility management. Optergy Proton administrators can post follow ups and keep track of progress.

### TENANTS (Optergy Proton 50 / 100)

Tenants are building occupants who usually pay for their own utility needs. Tenants can have their profile entered into the system and attached to a space.

### UTILITY BILLING (Optergy Proton 50 / 100)

Tenant spaces can be linked to utility meters with automatic billing. Invoices contain the energy and cost details as well as payment instructions.

### AFTER HOURS BILLING (Optergy Proton 50 / 100)

Tenants may create after hours scheduling events that incur energy use charges. This feature can log events, create after hours usage invoices and automatically notify the tenants.

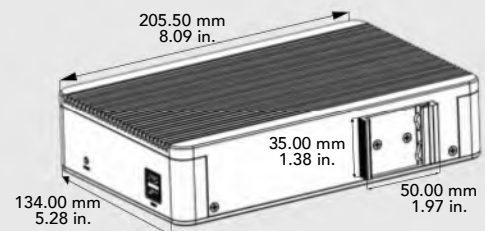
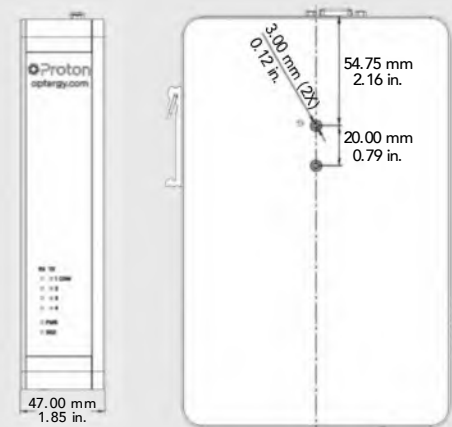


Product feature by model	Optergy Proton 10	Optergy Proton 20	Optergy Proton 50	Optergy Proton 100
Devices (BACnet/Modbus/Meters)	10	20	50	100
Optimum start points	10	20	50	100
Demand limiting points	10	20	50	100
Weather & Forecast	✓	✓	✓	✓
Public displays	✗	✓	✓	✓
Tenants	✗	✗	3	10
Utility billing	✗	✗	✓	✓
After hours billing	✗	✗	✓	✓

## HARDWARE SPECIFICATIONS

Model	Optergy Proton (P10 / P20 / P50 / P100)	
Processor	Integrated Intel J1900 2.00GHz Quad Core processor	
Ethernet	1 (Active) x RTL8111F GbE port	
Storage	120GB mSATA SSD	
RAM	4GB	
Connections and Indicators	PWR led (power) HDD led (drive activity) TX (Red) & RX (Green) led on each RS-485 Port 4 x 3 pin connector (RS-485) 1 (Active) x RJ-45 Ethernet Port 1 x 3 pin connector (12V DC)	
RS-485 baud rates	9.6k, 19.2k, 38.4k, 76.8k, 115.2k	
Power	12V DC input 3-pin connector	
Operating Temp	-10°C ~ 60°C	
Storage Temp	-20°C ~ 70°C	Agency Certifications
Relative Humidity	5%-95% (non-condensing)	• CE
OS	Debian LINUX OS ver Debian 7	• FCC

## HARDWARE DIMENSIONS





## Advantages of TOSIBOX®



### Simple

Build and manage secure OT infrastructure in minutes



### Secure

Tested & audited security



### Modular

Unlimited expandability and flexibility



### Timeless

Deals with legacy and future systems



### Unique

Globally patented point-to-point connection

# TOSIBOX® 175 (with three antennas)

## Cost-effective Plug & Go™ connectivity device

TOSIBOX® 175 is ideal for demanding industry sectors that require an all-in-one solution that is compact, able to handle all environments and suited to global market usage. The 4G module and external 4G antenna provides stable Internet access, so the node can be easily configured anywhere. The versatile connectivity options, utilized in conjunction with leading edge Cyber security technology from Tosibox enable diverse application scenarios. The durable aluminium alloy shell and small form factor allows for ideal mounting conditions. Creating secure and sustainable infrastructure has never been this easy.

The node is compatible with all existing TOSIBOX® products.

### Main features

#### Performance

- High VPN throughput, end-to-end encryption between Tosibox devices, users and servers

#### Reliability

- Integrated WiFi as connectivity method or access point for wireless devices on site
- Built-in global LTE modem – no external modem needed
- TosiOnline™ automatic reconnection of dropped connections

#### Industrial design

- Robust and fanless enclosure, DIN rail attachment



# TOSIBOX® 175 Technical Data

Product code TBL175

Certifications CE, FCC, RCM, MIC/JATE

## Ports

- 1 x RJ-45 WAN connection, 10/100 Mb/s, auto-negotiation (MDI / MDI-X)
- 1 x RJ-45 LAN connection, 10/100 Mb/s, auto-negotiation (MDI / MDI-X)
- LAN can be assigned as Service connection, 10/100 Mb/s, auto-negotiation (MDI / MDI-X)
- RS485 port is not supported in the software. The device can be powered through the port

## Connections

- 9-35V DC
- 2 x WiFi antenna connector, RP-SMA Male
- 1 x LTE antenna connector, SMA Female
- DIN rail attachment (back)

## Connection features

- 3-way WAN priority
- Proxy server support
- WAN access with static addressing or DHCP
- Network Time Protocol (NTP) server
- Automatic LAN network discovery
- LAN access with mixed static addressing and DHCP server
- Static routes
- Works in all Internet connections (operator independent)
- Firewall friendly
- Works with dynamic, static and private IP addresses
- Built-in firewall, NAT
- Up to 10 concurrent VPN connections
- VPN throughput up to 10 Mbit/s
- TosiOnline™ Automatic network recovery that recovers from most mobile operator and modem problems

## 4G Module

- Cellular module: Quectel EG25-G
- Region: GLOBAL
- LTE Cat-4
- Up to 150 Mbps DL, 50 Mbps UL

## Frequency Bands

- LTE FDD: B1, B2, B3, B4, B5, B7, B8, B12, B13, B18, B19, B20, B25, B26, B28
- LTE TDD: B38, B39, B40, B41
- WCDMA: B1, B2, B4, B5, B6, B8, B19

## WLAN

- IEEE 802.11 b/g, 2.4 GHz, max. 150 Mbps
- Encryptions WEP, WPA-PSK, WPA2-PSK, WPA-PSK/WPA2-PSK mixed mode
- Frequency 2.412 – 2.462 GHz, 11 channels
- Access point or client mode
- Output power 20 dBm max

## Included accessories

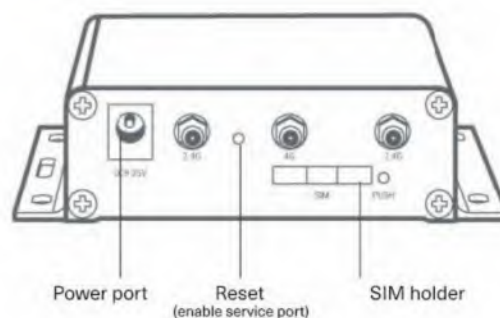
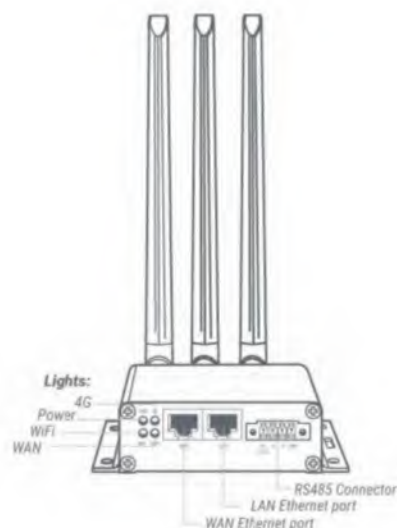
- RJ-45 Cat5e Ethernet cable
- 1 x LTE antenna
- 2 x WiFi antenna
- DIN rail mount
- DC feed plug
- Wall mounting screw set
- Power supply unit
  - AC adapter - Input 100 – 240 V AC, frequency 50/60Hz 0,3A, Output 12.0 V, 1.0 A, max 12.0 W. EU, UK, AU and US power socket

## Physical properties

- 104 mm x 28 mm x 110 mm / 4.09" x 1.10" x 4.33" (L x W x H)
- Storage temperature -30 °C ... +70 °C / -22 °F ... +158 °F
- Weight 305 g / 0.67 lbs (net weight article)
- Operating temperature -20 °C...+55°C / -4°F...131°F
- Power supply operating temperature: 0 °C ... +40 °C/ 32 °F ... +104 °F
- Power supply storage temperature: -20 °C ... +80 °C/ -4 °F ... +176 °F

## Safety Precaution

Do not use the provided power supply at temperatures exceeding 40 °C. To use the device in high temperatures, replace the power supply with a source rated for the used temperature.



Represented by:



**CORPORATE MAILING ADDRESS**  
6130 W Flamingo Rd Unit #256  
Las Vegas, NV, 89103-2280

**SOCAL SERVICE CENTER**  
2591 Lindsay Privado Drive  
Ontario, CA 91761 Ph: (888)974-0111

**Terms & Conditions:** NET 30 DAYS from date of invoice, upon approval of credit

**NOTE:** CREDIT CARD PURCHASES ARE SUBJECT TO A 4% SURCHARGE

**Shipping & Handling:** FOB Ontario, California 91761 (or MFR supply point of origin)

**Minimum Order:** \$250.00 or a small order fee of \$10.00 will be applied to the invoice

**Freight:** PREPAID AND ADD

NOTE: DROP SHIPMENTS TO JOB SITES ARE NOT ALLOWED

Any claim by buyer for shortage in any shipment must be reported to TBWC Technology within (5) days of receipt of said shipment by buyer. If no shortage is reported it shall be conclusively deemed buyer received quantity of goods shown on TBWC shipping documents.

For Pricing Requests:  
[QUOTES@TBWCinc.com](mailto:QUOTES@TBWCinc.com)

Order Entry:  
[ORDERS@TBWCinc.com](mailto:ORDERS@TBWCinc.com)

General Inquiries:  
[INFO@TBWCinc.com](mailto:INFO@TBWCinc.com)

**Returns:** PREPAPPROVAL IS REQUIRED

Email RMA Requests to: [ORDERS@TBWCinc.com](mailto:ORDERS@TBWCinc.com)  
Subject to approval, material for return must be shipped with RMA authorization number attached.

NOTE: At TBWC discretion, returns may be subject to a 25% or greater restocking fee.  
Restocking fee waived for warranty returns. Credit issued will be at original purchase price.  
Warranty replacement unit will be billed at price in effect at time of the order.

TBWC will only accept return of product in original, factory unopened packaging and resalable condition.  
- Distributor will be responsible for the return freight cost.  
- Special products, custom or non-stock, built to order items are non-returnable.  
- Upon receipt and inspection of product returned, TBWC reserves the right to accept or reject the item.

#### **TBWC Technology Disclaimer**

##### **For all TBWC Product & Tech Services...**

- Any estimate, quote, (whether verbal or in writing) is valid for 30-days only.
- Beyond 30-days, orders will be priced at the TBWC price in effect at time of shipment
- Projects must be approved prior to acceptance of an order.
- Final Counts, BOM and scope of work are the responsibility of the buyer.
- TBWC shall be held harmless relative to any liability the buyer(s) may assume.
- General Warranty (see below): No other warranty, expressed or implied is offered.
- TBWC Commissioning & Training services by Authorized TBWC Tech only.

**Minimum of (3) weeks advance notice.**

NOTE: Regulatory Compliance is responsibility of Owner or Owner's Rep.

#### **General Product & Service Warranty:**

TBWC, Inc. promises buyer the products sold by TBWC Technology shall be free from material defects in design, materials, or manufacturing for the period shown on MFR's current data sheet or Owners Manual for each specific product beginning from the manufacture date; provided, the warranty shall not extend to wear and tear or replaceable components.

During the warranty period, TBWC, Inc. may work with their manufacturer who can repair or replace (at its sole discretion) any product suffering from a warranty defect and returned freight prepaid by buyer, with no charge to buyer for any warranty repair or replacement. The warranty shall remain in full force and effect for said period, provided that the product: (1) was installed, operated, and maintained properly; (2) has not been abused or misused; (3) has not been repaired, altered, or modified outside of our manufacturers' authorized facilities; (4) has not been sold subject to other warranty terms specified at the time of sale. This warranty provides specific legal rights that may vary by local laws.

Seller warrants to Buyer that all Meter instruments are free from substantial defect in material and workmanship under normal use given prior installation and maintenance for the period of 5 years (60 months) after delivery. Webmon Proton, Enterprise Servers, Controllers, CT's, accessories are free from substantial defect in material and workmanship under normal use given prior installation and maintenance for the period of 1 year (12 months) after delivery. Buyer will promptly notify Seller of any defect in the product or service. Seller or its agent will have the right to inspect the product or workmanship on Buyer's premises. Seller has the option to: (a) repair, replace or service at its factory or on Buyer's premises the product or workmanship found to be defective; or (b) credit Buyer for the product or service in accordance with Seller's depreciation policy. Refurbished material may be used to repair or replace the product. Products returned to Seller for repair, replacement or credit will be shipped prepaid by Buyer. accessories for a period of 12 months after delivery.

Confidentiality Notice: The contents of this document and any attachments are intended solely for the addressee(s) and contain confidential and/or legally privileged information. If you are not the intended recipient of this document or if you have received this document in error, please immediately alert the sender and delete this document or any associated attachments. If you are not the intended recipient, you are notified that any use, dissemination, distribution, copying, or storage of this message or any attachments is strictly prohibited. To do so violates State and Federal privacy laws. Thank you for your cooperation.