

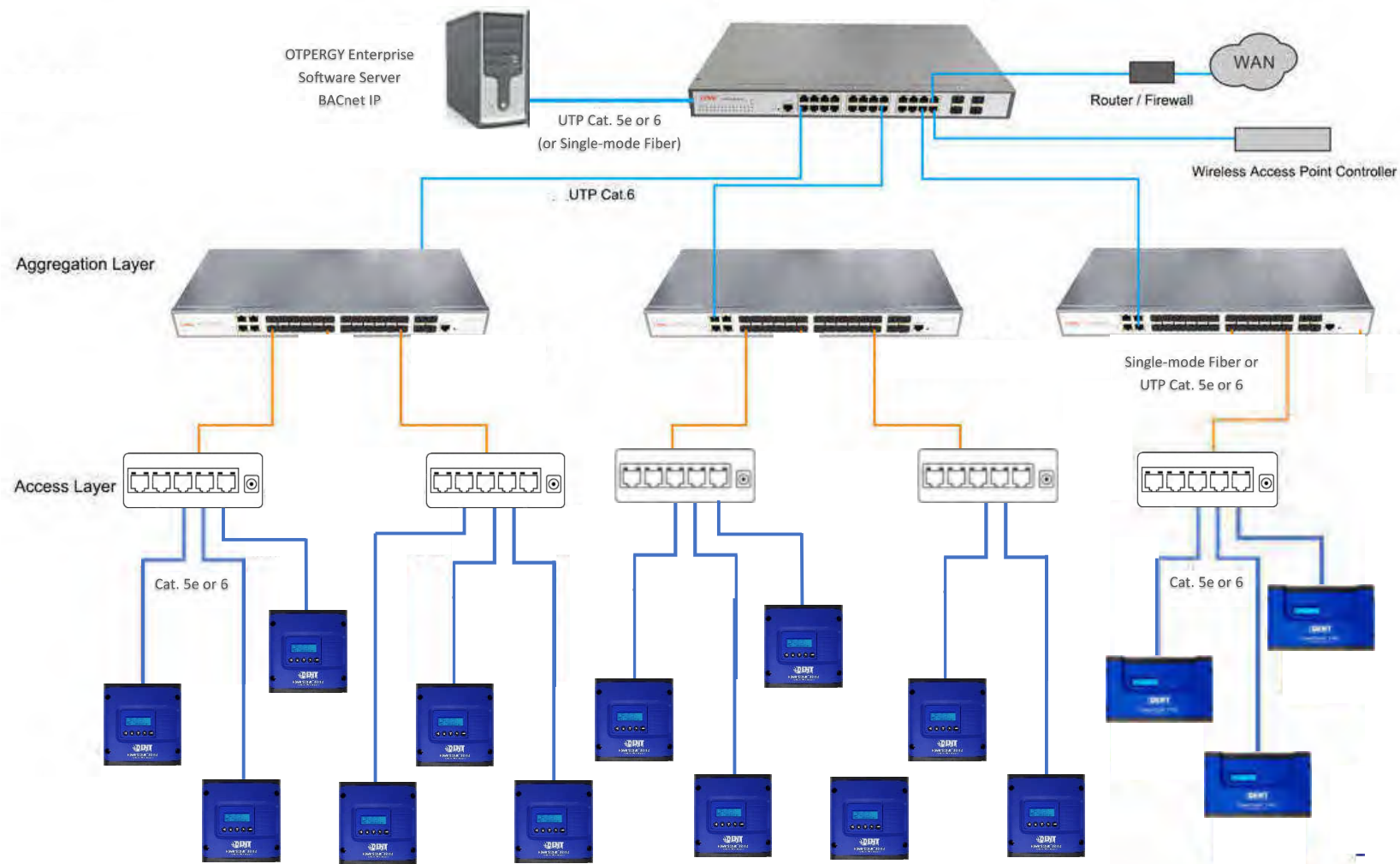
Bill of Materials

Electrical Single Line Diagrams

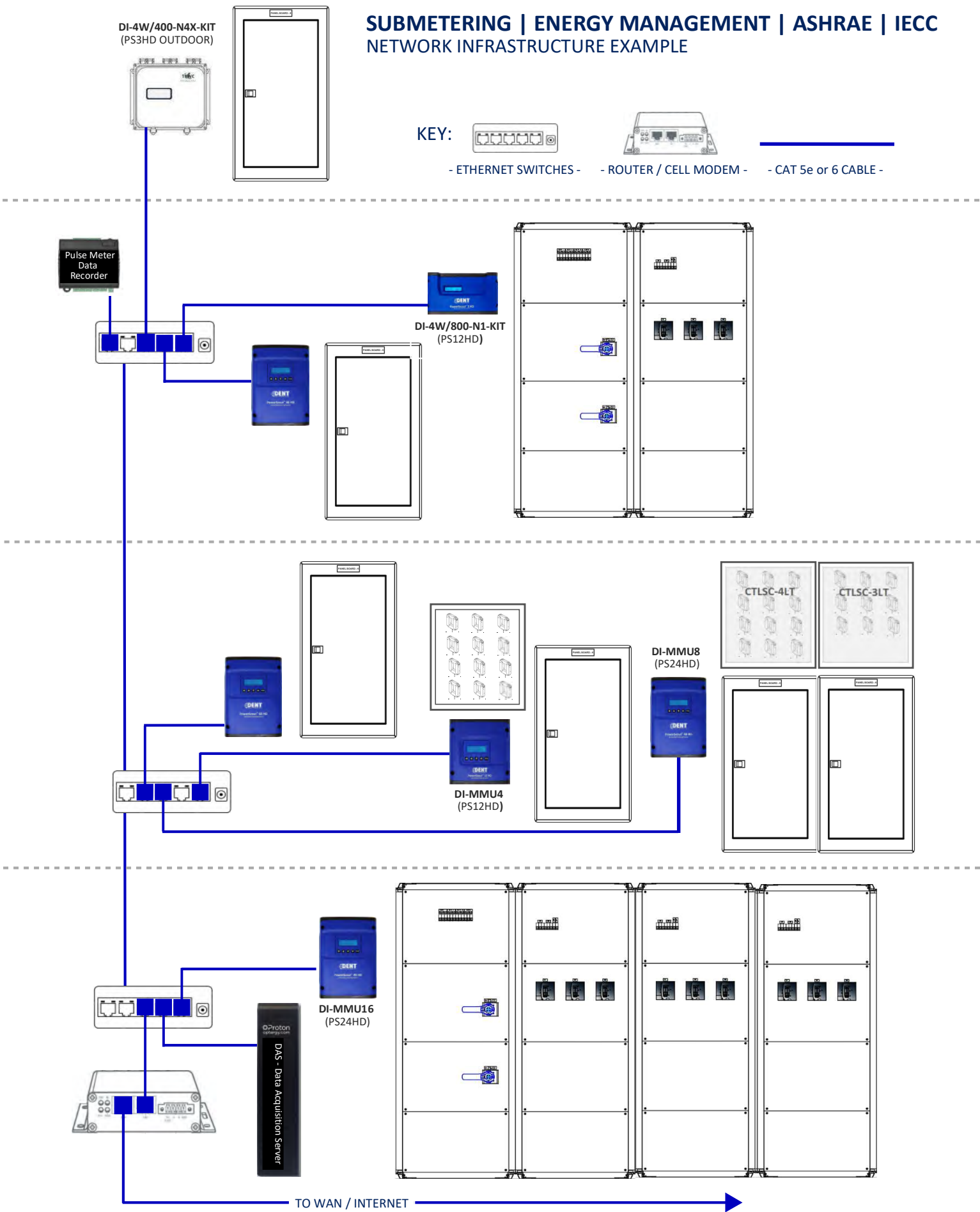
AMS / EMS / BMS SYSTEM ARCHITECTURE

SUBMETERING | ENERGY MANAGEMENT | ASHRAE

NETWORK INFRASTRUCTURE EXAMPLE



SUBMETERING | ENERGY MANAGEMENT | ASHRAE | IECC
NETWORK INFRASTRUCTURE EXAMPLE



Product Cutsheets

UTILITY SUBMETERING & ENERGY MANAGEMENT PRODUCT SOLUTIONS

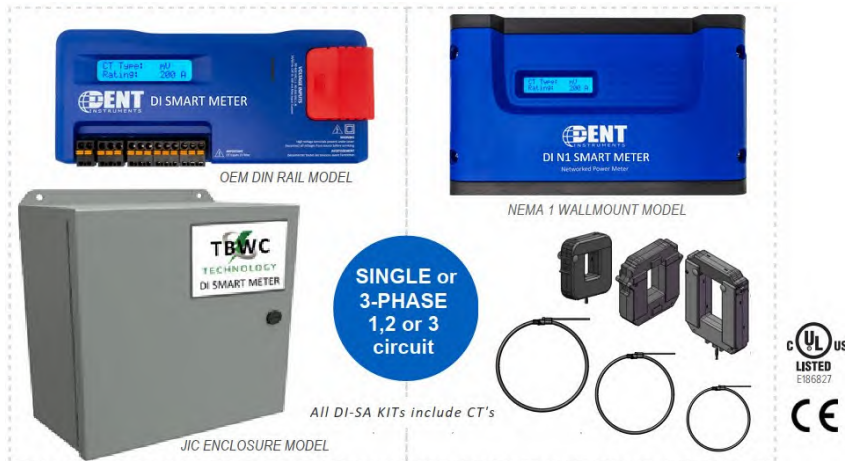


HIGH PERFORMANCE SUBMETERING PRODUCTS, SOLUTIONS & SERVICES FOR ALL INDUSTRIES

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- ϕ (1) SPLIT-CORE CT

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

TWO-POLE: 90-600V, 3-Wire, Single- ϕ (2) SPLIT-CORE CT

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

3-PHASE: 90-600V, 4-Wire Wye, Three- ϕ (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 / 1800¹ / 2000 / 3000 / 4000¹

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- ϕ 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.
- ¹1800-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

PS3HD Certificate of Calibration

Meter information

Test date: 1/5/2023

Test Time: 1:11 PM

Serial #: P032501044

Technician: 'ALS'

Firmware Version: 2.03

Alt-Port #: PS3-xxxxx

MAC ID: 98-8D-63-33-1D-A6

Wireless MAC ID:

Meter Measurements

| Volts Measurement | Voltage Reading | Voltage Reference | Percent of Error | Pass/Fail |
|---------------------|------------------|--------------------|------------------|-----------|
| V _{LN1-L2} | 208.043 | 208.162 | -0.057 | PASS |
| V _{LN1-L3} | 208.043 | 208.171 | -0.053 | PASS |
| V _{LN2-L3} | 199.996 | 199.991 | 0.003 | PASS |
| Element A Current | Amperage Reading | Amperage Reference | Percent of Error | Pass/Fail |
| CT1 | 100.005 | 100.006 | 0.001 | PASS |
| CT2 | 99.997 | 99.994 | 0.003 | PASS |
| CT3 | 100.001 | 99.999 | 0.001 | PASS |

Calibration Reference Instruments Used

| Reference | Make | Model | Serial # |
|-----------|-------|-------|----------|
| Reference | Radco | RC-20 | 720502 |

HPPlot Test

| Make | Model | Serial # |
|---------|----------------------|----------|
| VITREK | V70 | 21441 |
| Voltage | Leakage Current (mA) | Result |
| 1250.0 | 3.13 | PASS |

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

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.



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- ϕ meters. w/(1) voltage references

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

MMU8: For up to (8) single, 2-Pole or 3- ϕ 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- ϕ 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- ϕ 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; **JIC** 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-JIC-(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) | JIC 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



JIC 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.

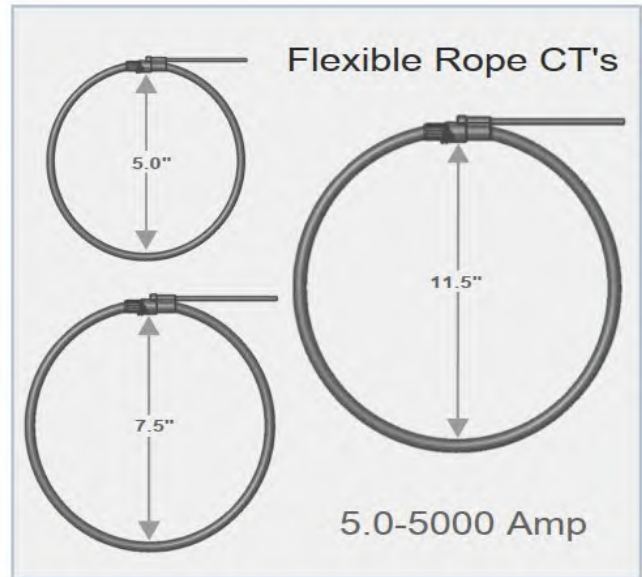
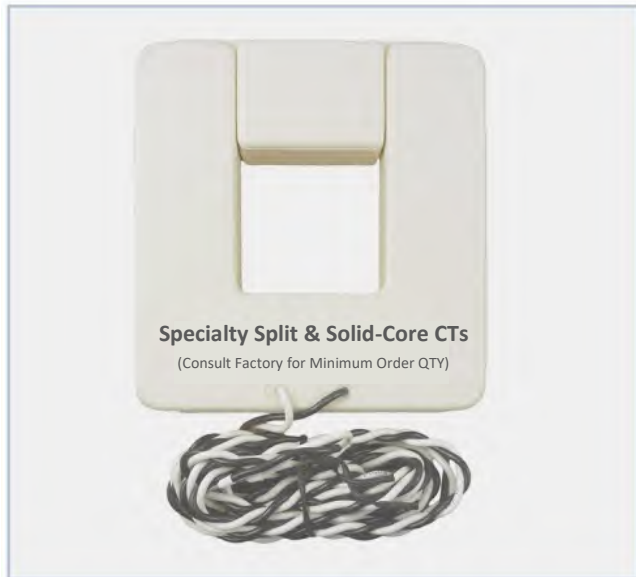
Reference NEMA, NEC and local electrical code rules for proper installation & BICSI TIA standards for both CT, FRCT and low-voltage RS-485 and Ethernet Category rated cables and connectivity.

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.



CT LOAD SEGREGATION CABINET Solutions



For applications where multiple circuits of the same load type are to be metered, (i.e., ASHRAE 90.1, LEED or etc.) consider specifying TBWC CT Load Segregation Cabinets to save time, money with a future-proof approach.

| CATALOG # | DESCRIPTION** | DIMENSIONS | WT (lbs) |
|---------------|---|-------------------------|----------|
| N1-CTLSC-4LT | NEMA 1 CT Cabinet for Meter of (4) Segregated Loads | 16"(H) x 12"(H) x 4"(D) | 30.0 |
| N1-CTLSC-3LT | NEMA 1 CT Cabinet for Meter of (3) Segregated Loads | " " " | 25.5 |
| N1-CTLSC-2LT | NEMA 1 CT Cabinet for Meter of (2) Segregated Loads | " " " | 21.0 |
| N1-CTLSC-3XLT | Extra deep Cabinet* for Meter of (3) Segregated Loads | 16"(H) x 12"(H) x 6"(D) | 32.0 |
| N1-CTLSC-2XLT | Extra deep Cabinet* for Meter of (2) Segregated Loads | " " " | 29.0 |

*NOTE: For use when one or more Load Type CTs >200 Amps

**For outdoor or environmental applications, change "N1" prefix to "N4X"

PART # SUFFIX

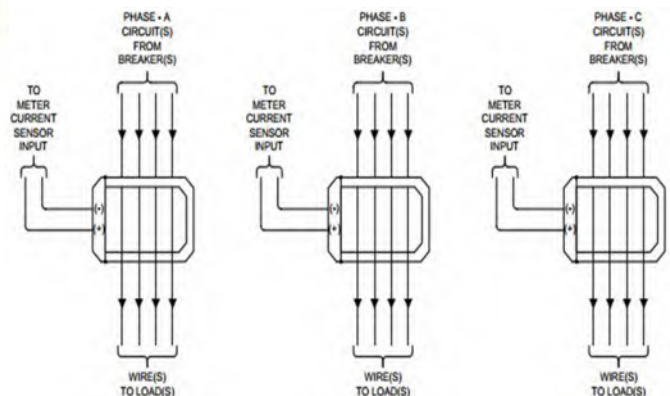
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N1-CTLSC-3LT -LT 100/200 -LT 100/200 -LT 100/200
N1-CTLSC-2LT -LT 100/200 -LT 100/200
N1-CTLSC-2XLT -LT 400/800 -LT 100-800
N1-CTLSC-3XLT -LT 400/800 -LT 100-800 -LT 100-800

1) SPECIFY LOAD TYPE DESIGNATION

- A = TE Total Energy
- B = HVAC Loads
- C = ILTG Indoor Lighting
- D = OLTG Outdoor Lighting
- E = REC Plug Loads & Receptacles
- F = RPL Refrigeration & Process Loads
- O = XXX Other Load Type (Specify)

2) SPECIFY CT AMPERAGE FOR EACH LOAD TYPE

**CT LOAD SEGREGATION CABINETS
ARE SHIPPED WITH CTs MOUNTED,
PHASE AND LOAD TYPE LABELED,
READY FOR INTSTALLATION**



ORDERING EXAMPLE (I)

N1-CTLSC-4LT-B200-C100-E200-F100

NEMA 1 CT Load Segregation Cabinet for (4) Load Types, one set of (3) CTs for each LT:
HVAC@200A; ILTG@100A; REC@200A; RPL@100A

ORDERING EXAMPLE (II)

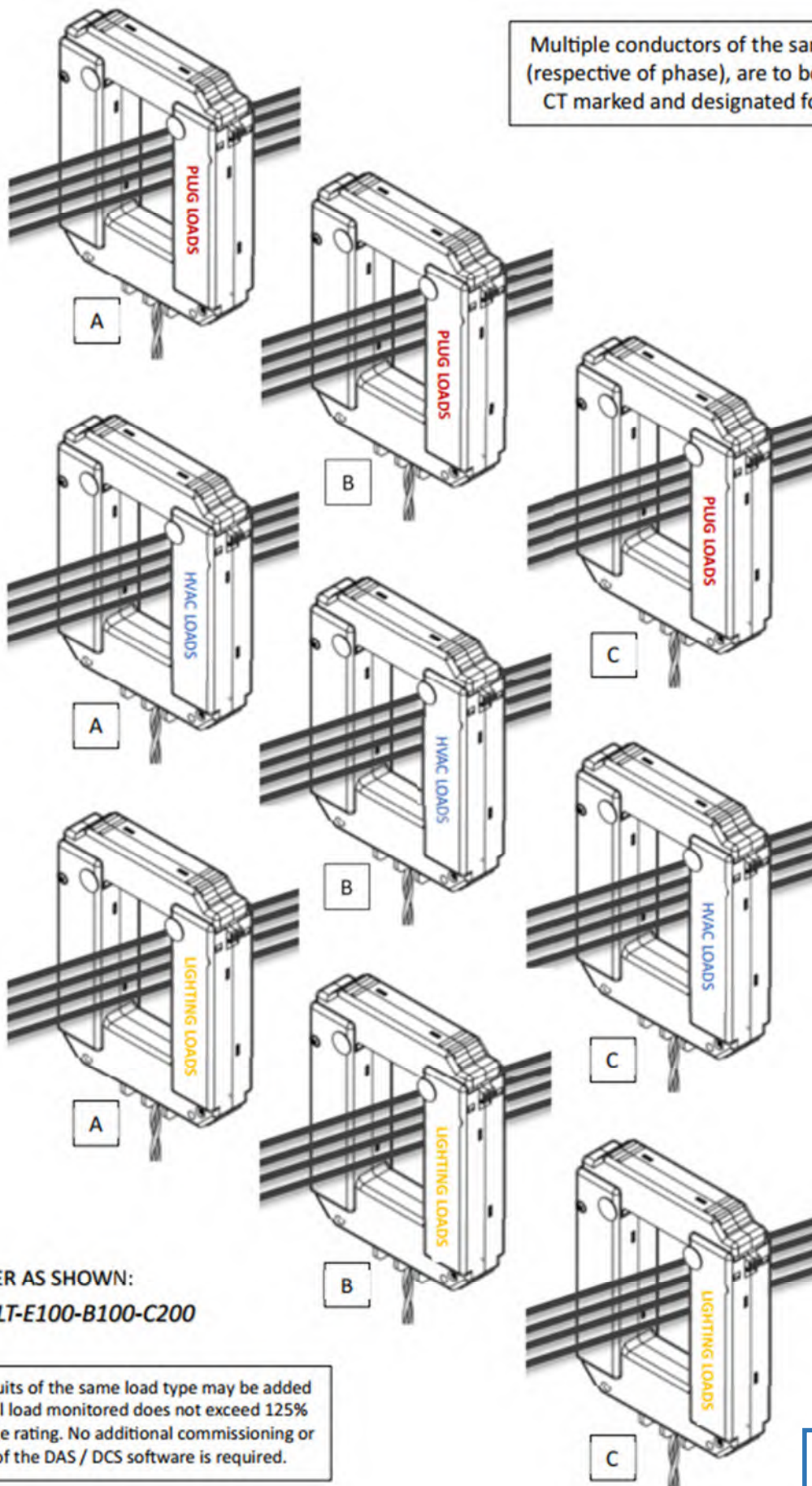
N4X-CTLSC-3XLT-A400-D100-F200

NEMA 4X CT Load Segregation Cabinet for (3) Load Types, one set of (3) CTs for each LT:
TE@400A; OLTG@100A; RPL@100A

For additional assistance with
ordering or specifying, please
contact info@TBWCinc.com



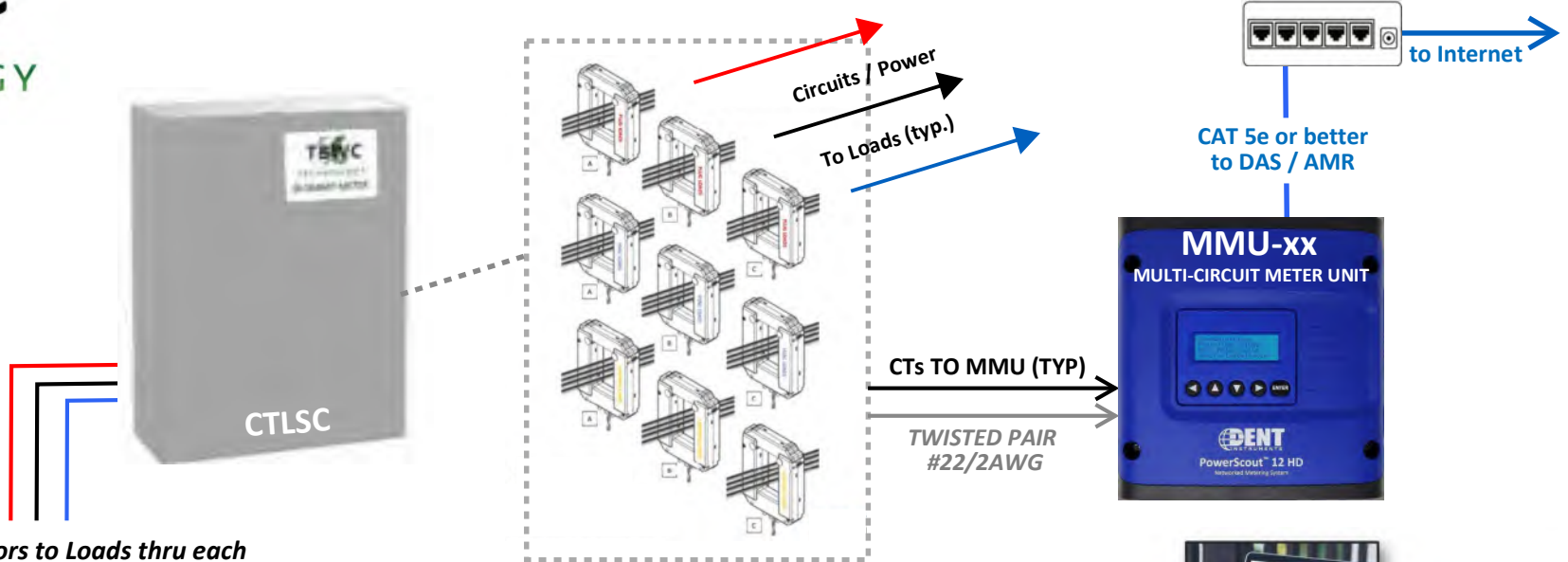
Multiple conductors of the same load type, (respective of phase), are to be run thru the CT marked and designated for that type.



PART NUMBER AS SHOWN:
N1-CTLSC-3LT-E100-B100-C200

NOTE: Future circuits of the same load type may be added provided the total load monitored does not exceed 125% of the CT amperage rating. No additional commissioning or programming of the DAS / DCS software is required.

'CTLSC-xx' - CT LOAD SEGREGATION CABINET



Route Conductors to Loads thru each CT Designed for each Load Type

PANELBOARD SCHEDULE:

DESIGNATION: PANEL GR7 (AG42)

VOLTAGE: 208Y/120V

3PH, 4W

PANEL OPTIONS: -

MAIN TYPE: 200A MCB

MAIN OPTIONS: -

BUS AMPS: 225 A

GROUND BUS: YES

MOUNTING: SURFACE

ENCLOSURE: Type 1

NEUTRAL BUS: 100%

OWNER METERS: -

BRANCH OCP TYPE: MOLDED CASE C/B

FAULT DUTY: EXISTING

INTEGRAL SPD: -

ACCESSORIES: -

| NO. | DESCRIPTION | OCP SIZE | OCP OPTIONS | A | B | C | A | B | C | OCP OPTIONS | OCP SIZE | DESCRIPTION | NO. |
|------|-----------------------|----------|-------------|------|------|------|-----|-----|-----|-------------|----------|------------------------------|------|
| A/1 | LTG. TEST CHAMBER | 20 A | NOTE 1 | 282 | | | 540 | 720 | | NOTE 2 | 20 A | REC. TEST CHAMBER NORTH WALL | A/2 |
| A/3 | LTG. CLIMATIC CHAMBER | 20 A | NOTE 1 | | 20 | | | | | NOTE 2 | 20 A | REC. TEST CHAMBER EAST WALL | A/4 |
| A/5 | LTG. OFFICE | 20 A | | | | 113 | | | 360 | NOTE 2 | 20 A | REC. TEST CHAMBER WEST WALL | A/6 |
| A/7 | AC-1.1 | 20 A | NOTE 3 | 1279 | | | 180 | | 540 | NOTE 2 | 20 A | REC. TEST CHAMBER FL. MOUNT. | A/8 |
| A/9 | | | | | 1279 | | | | 540 | | 20 A | REC. OFFICE | A/10 |
| A/11 | AC-1.2 | 20 A | NOTE 3 | | | 603 | | | | NOTE 2 | 20 A | REC. OFFICE | A/12 |
| A/13 | | | | 603 | | | 180 | | 360 | | 20 A | REC. CLIMATIC CHAMBER | A/14 |
| A/15 | GFCI/WP | 20 A | | | 180 | | | | | | 20 A | REC. DESK | A/16 |
| A/17 | | | | | | 1000 | | | 180 | | 20 A | RECEPTACLE | A/18 |
| A/19 | HUM-1 | 20 A | NOTE 3 | 1000 | | | 360 | | | NOTE 2 | 20 A | REC. CEILING TEST CHAMBER | A/20 |
| A/21 | | | | | 1000 | | | 600 | | NOTE 2 | 20 A | REC. SHADES | A/22 |
| A/23 | EWB | 30 A | | | | 2400 | | 360 | | GFCI | 20 A | RECEPTACLE | A/24 |
| A/25 | CU-1.1 | 20 A | | 1071 | | | 800 | | | GFCI | 20 A | REC. ELEC. RADIAN HEAT MATS | A/26 |
| A/27 | | | | | 1071 | | | 0 | | | 20 A | SPARE | A/28 |
| A/29 | EBB-1 | 20 A | | | | 1002 | | | 0 | | 20 A | SPARE | A/30 |
| A/31 | SPARE | 20 A | | 0 | | | 0 | | | | 20 A | SPARE | A/32 |
| A/33 | SPARE | 20 A | | | 0 | | | 0 | | | 20 A | SPARE | A/34 |
| A/35 | SPARE | 20 A | | | | 0 | | | 0 | | 20 A | SPARE | A/36 |
| A/37 | SPARE | 20 A | | 0 | | | 0 | | | | 20 A | SPARE | A/38 |
| A/39 | SPARE | 20 A | | | 0 | | | 0 | | | 20 A | SPARE | A/40 |
| A/41 | SPARE | 20 A | | | | 0 | | | 0 | | 20 A | SPARE | A/42 |

TOTAL PHASE A:6296 VATOTAL PHASE B:5770 VATOTAL PHASE C:6558 VA

TOTAL CONNECTED LOAD: 18624 VATOTAL DEMAND LOAD: 18624 VA

NOTES:

1 SUBMETER A - LIGHTING

2 SUBMETER B - RECEPTACLES

3 SUBMETER C - MECHANICAL EQUIPMENT

ASHRAE LOAD TYPE COLOR CODE KEY

- TOTAL ENERGY
- HVAC LOADS
- INTERIOR LIGHTING
- EXTERIOR LIGHTING
- PLUG LOADS

IECC LOAD TYPE COLOR CODE KEY

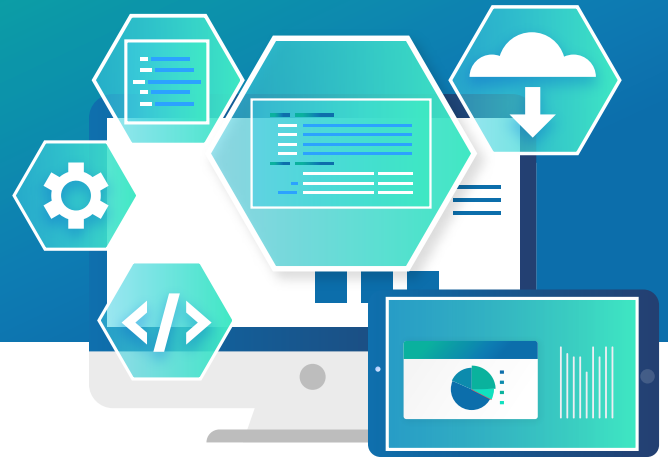
- HVAC LOADS
- INTERIOR LIGHTING
- EXTERIOR LIGHTING
- PLUG LOADS
- PROCESS LOADS
- BLDG OPERATIONS & MISC.



System Software / Specifications

Optergy Enterprise

Optergy Enterprise is web-based building management software that enables Improved Energy Efficiency, Optimised Building Performance, and Accurate Cost Recovery. Optergy Enterprise provides real-time control, measurement, and reporting of critical building data. It's scalable and is hosted locally on premises.



BUILDING CONTROL FEATURES



BACNET IP AND MODBUS

BACnet and Modbus combined offer the best interoperable solution with minimal integration effort. Optergy Enterprise supports BACnet and Modbus TCP-IP.



INTEGRATED REPORTING FOR BUILDING, ENERGY AND FINANCIAL MANAGEMENT

Optergy Enterprise'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

Scrolling public displays are supported by a list of accessible URLs which are displayed in order for a predetermined time. Optergy Enterprise 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 FOR ALARMS ESCALATION

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 Enterprise escalates alarms to any number of predetermined recipients after a user defined time period has elapsed.



BUILT-IN WEB BASED TOOLS

Display tool and built-in programming 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.



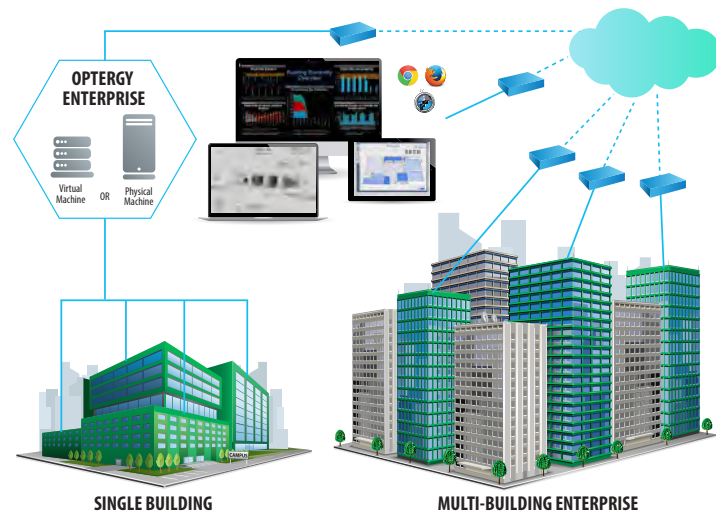
EMAIL OUT REPORTS

Easily generate and distribute customised reports via email to building occupants and stakeholders, keeping them informed on critical building data and performance metrics.



UNLIMITED USERS

Unlimited users with complete administrative configurations



API (APPLICATION PROGRAM INTERFACE)

With the Optergy Enterprise API, users can integrate their own custom applications and devices, enabling greater flexibility and control over their building operations. The API is a third-party API.



OPTIMUM START

It looks at external and environmental functions to minimize the time for the building to reach its desired set point. Optimum Start facilitates comfort control and compliance to specified building operation for tenant spaces.



DEMAND LIMITING

This feature allows users to set limits on the maximum power consumption of their building systems during peak demand periods, reducing the risk of blackouts and optimising energy efficiency.



BUILDING PERFORMANCE MANAGEMENT

Users can monitor energy consumption, track performance metrics, identify inefficiencies and areas for improvement, and implement optimisation strategies.

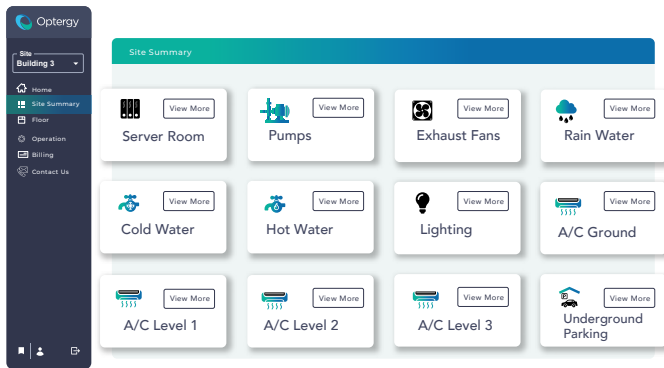
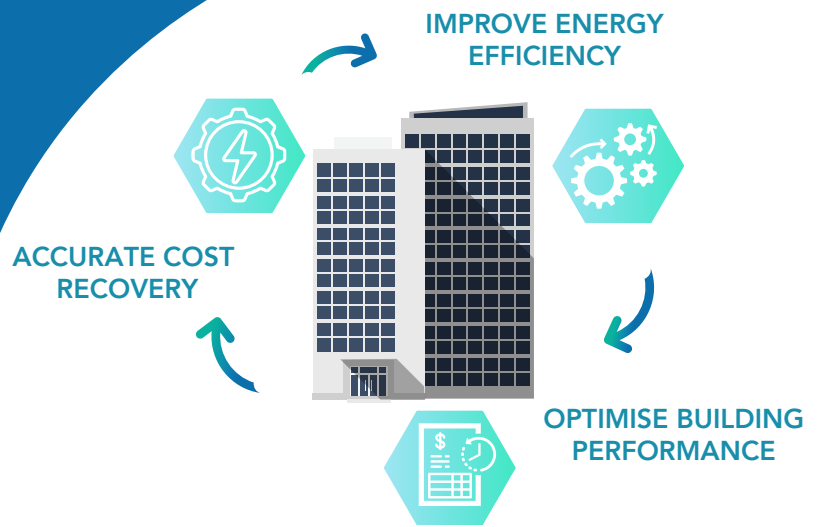


PROJECT PERFORMANCE MANAGEMENT

Provides real-time visibility into project status and performance, enabling users to identify and address issues and risks proactively.

Optergy Enterprise

The All-in-One Solution for Improved Energy Efficiency, Optimised Building Performance and Accurate Cost Recovery.

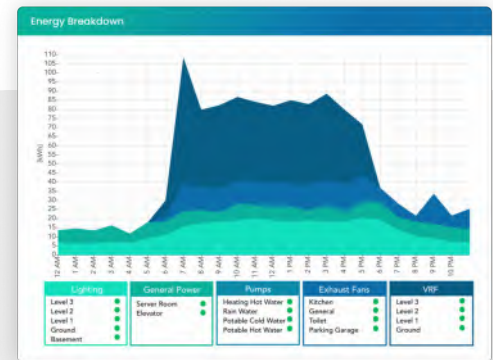


OPTIMISE BUILDING PERFORMANCE

With complete control across all your building systems, Optergy Enterprise gives you the tools to completely optimise the efficiency of your building. Easily achieve a high level of comfort for all building tenants while also reducing operational costs, such as labor and energy expenditures.

IMPROVE ENERGY EFFICIENCY

Achieve your energy and sustainability goals with Optergy Enterprise's energy management software helping you optimise your building's performance and supporting your efficiency strategies. Empower your team to better control and monitor energy consumption using Optergy's software which is pivotal in managing, reporting and analysing your performance.



ACCURATE COST RECOVERY

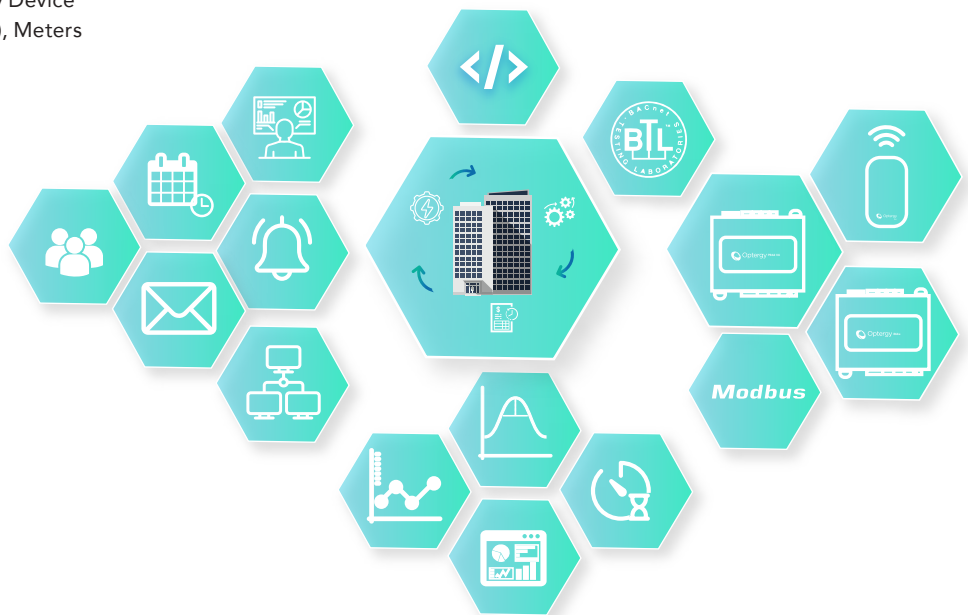
Giving building owners a helping hand with saving costs by automatically sending bills to tenants for utilities usage and after hours energy usage. Increase your business's return on investment (ROI) with this built-in, cost-saving feature. Optergy facilitates the billing process without collecting any payments from tenants.



Gain the insights needed to develop an effective, sustainable approach to optimising building performance and reducing energy usage, anytime, anywhere.

BASE LICENCE BUILT-IN FEATURES

- 150 Devices (expandable) – combined BACnet (by Device Number), Modbus Devices (converted to BACnet), Meters (physical or virtual)
- Unrestricted number of users and groups
- BACnet and Modbus protocol
- Unrestricted number of live displays
- Unrestricted number of scrolling displays
- Request maintenance system
- Automated email notification and reports
- System notifications
- Bookmarks
- System diagnostic and maintenance tools
- User activity monitoring and reporting
- Space management/hierarchy – identify buildings/levels/rooms/etc.
- Display tool for creating custom displays
- Public displays
- Auto data backup
- FTP remote data archiving/backup
- Weather and forecast



OPTIMISED BUILDING PERFORMANCE (BMS)

- Ability to manage BACnet objects – Alarms (Event Enrolments), Schedules, Trend logs, Calendars & Notification Classes
- BACnet alarm and alert management
- Allow for up to 50 (expandable) Optimum Start areas (zones)

IMPROVED ENERGY EFFICIENCY (EMS)

- Comprehensive meter/utility reporting
- Utility report automatic email functionality
- Automated graphical live meter display screens
- Meter status and hierarchy screens
- Customizable meter parameter alarming
- All meter parameters available as BACnet points
- Association meters with spaces
- Allow for up to 50 (expandable) Demand Limiting points
- Cumulative Analytical meter points (custom meter points)
- End-user web dashboard configuration

ACCURATE COST RECOVERY (TENANT BILLING)

- Allow for up to 3 (expandable) tenants
- After hours, activation and billing
- Utility tariff, activation and billing

LICENCE CODE

LICENCE OPTIONS

| | |
|------------|---|
| OBL | Base: Building and Energy Management Licence Devices (150 included with base licence) |
| PMM | Building Performance Management Module |
| PPM | Project Performance Module |
| TEN | Tenants (additional tenants for after hours and/or utility tariff) |
| OSA | Optimum Start Additional Areas |
| API | Application Program Interface Module |
| DLP | Demand Limiting Additional Points |

MINIMUM SYSTEM REQUIREMENTS

| NUMBER OF DEVICES | MINIMUM MEMORY | MINIMUM HARD DRIVE |
|-------------------|----------------|--|
| <500 | 16GB | 1x 1TB SSD - enterprise/server grade drive |
| >500 | 32GB | 1x 1TB SSD - enterprise/server grade drive |

***OPTERGY RECOMMENDS RUNNING A VM (VIRTUAL MACHINE) ON A WINDOWS PLATFORM**



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

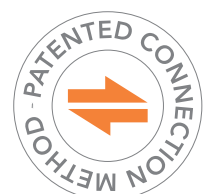
- High VPN throughput, end-to-end encryption between Tosibox devices, users and servers

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

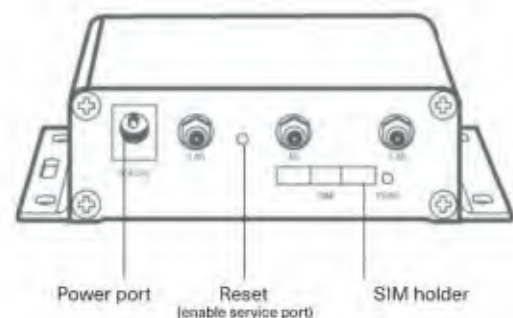
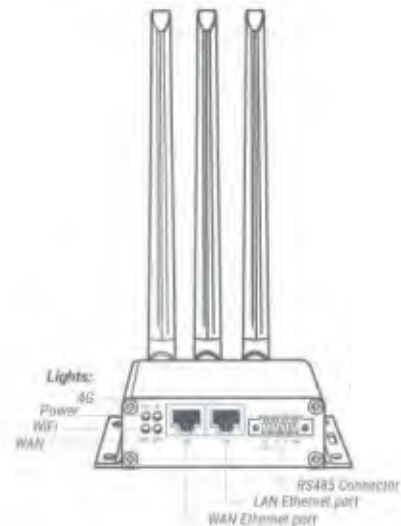
- RJ-45 Cat5e Ethernet cable
- 1 x LTE antenna
- 2 x WiFi antenna
- DIN rail mount
- DC feed plug
- Wall mounting screw set
- Power supply unit
 - AC adapter - Input 100 – 240 V AC, frequency 50/60Hz 0,3A, Output 12.0 V, 1.0 A, max 12.0 W. EU, UK, AU and US power socket

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

SOCAL SERVICE CENTER
2591 Lindsay Privado Drive

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

Order Entry:

ORDERS@TBWCinc.com

General Inquiries:

INFO@TBWCinc.com

Returns: PREPAPPROVAL IS REQUIRED

Email RMA Requests to: 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.

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.

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