



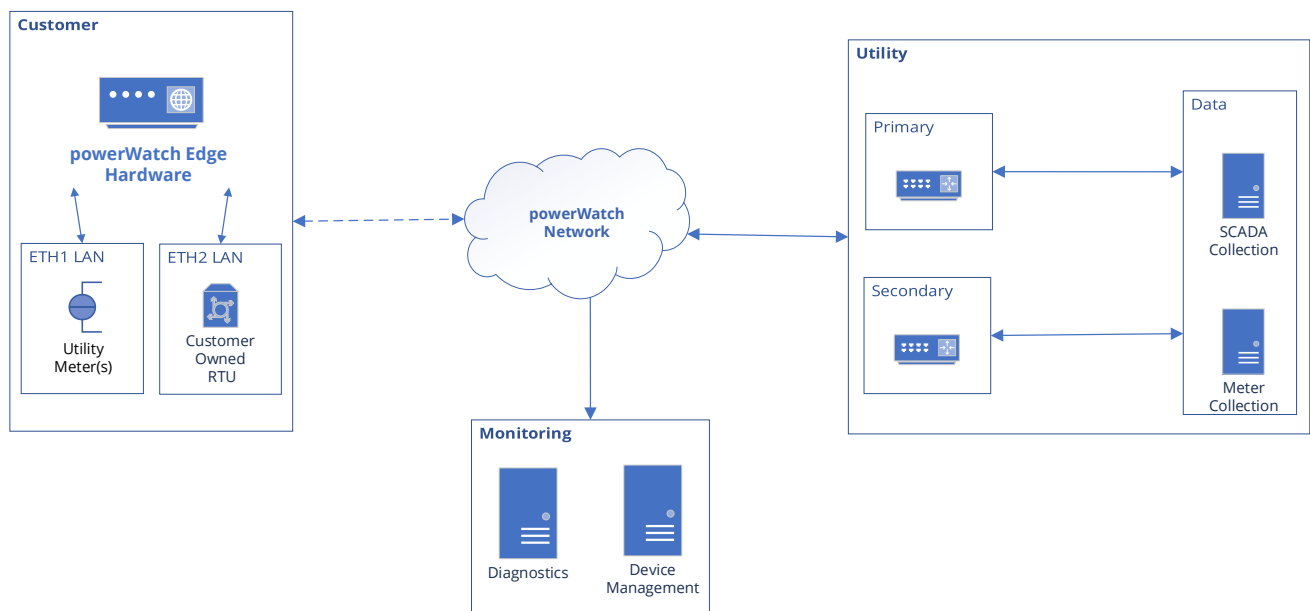
Customer Guide

With Communication Diagrams for Central Maine Power

Summary

powerWatch is a communication solution overlaid on a private cellular network with configured hardware and proprietary software to support the secure transfer of SCADA and meter data between utility customer sites and the utility. The powerWatch solution is built around four components: site validation, the Edge device, activation, and an annual subscription. The guide includes all necessary information for a powerWatch deployment.

The diagram below illustrates the standard deployment of the powerWatch solution. On the left is a typical utility customer site, equipped with a utility provided meter and a utility customer owned RTU. Data transfers through a private network to the SCADA and meter collection systems at the utility. In addition to the data link, the annual subscription includes monitoring, reporting, and outage notifications. The solution is applicable to both tariff and kilowatt-hour applications.

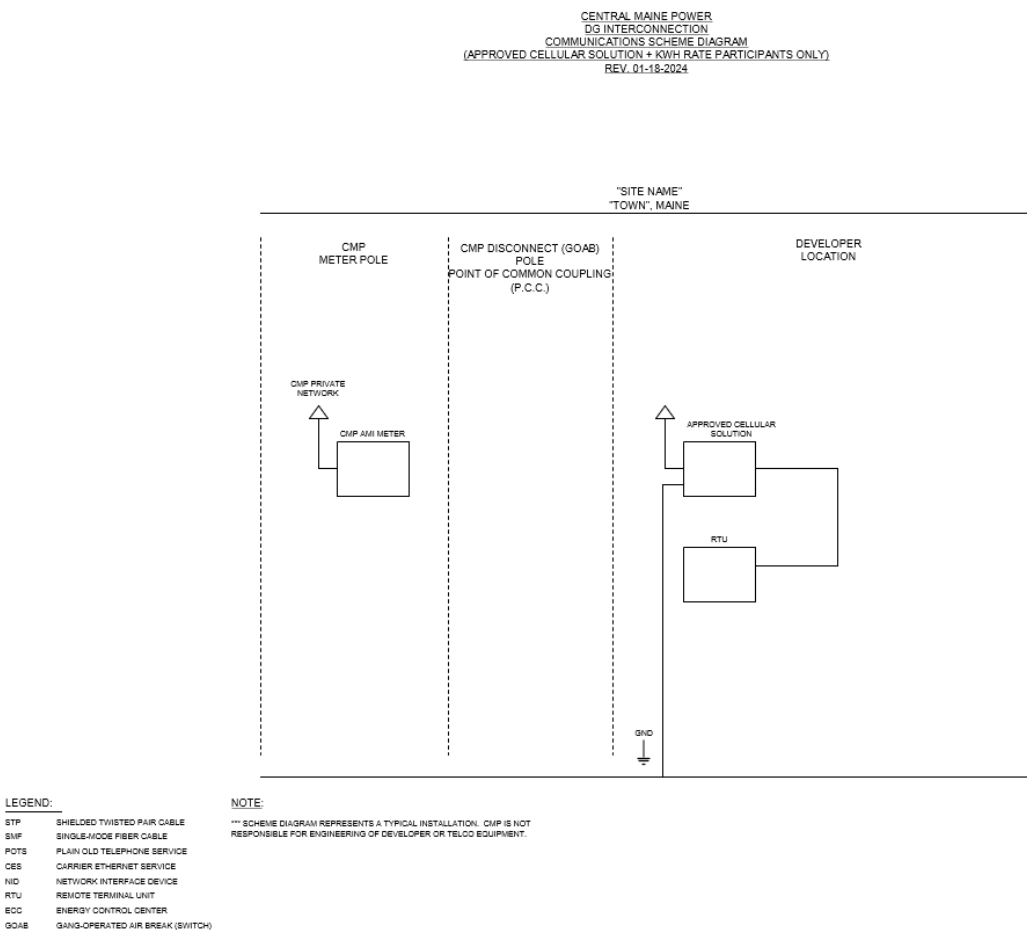


Typical Solution Diagram

The diagrams below represent the scenarios that this solution has been approved by Central Maine Power. **The solution supports SCADA communications for both applications.**

The first application is for kilowatt-hour projects. In this application, the solution communicates only SCADA data. The kilowatt-hour utility meter uses a private metering network provided by the utility to communicate.

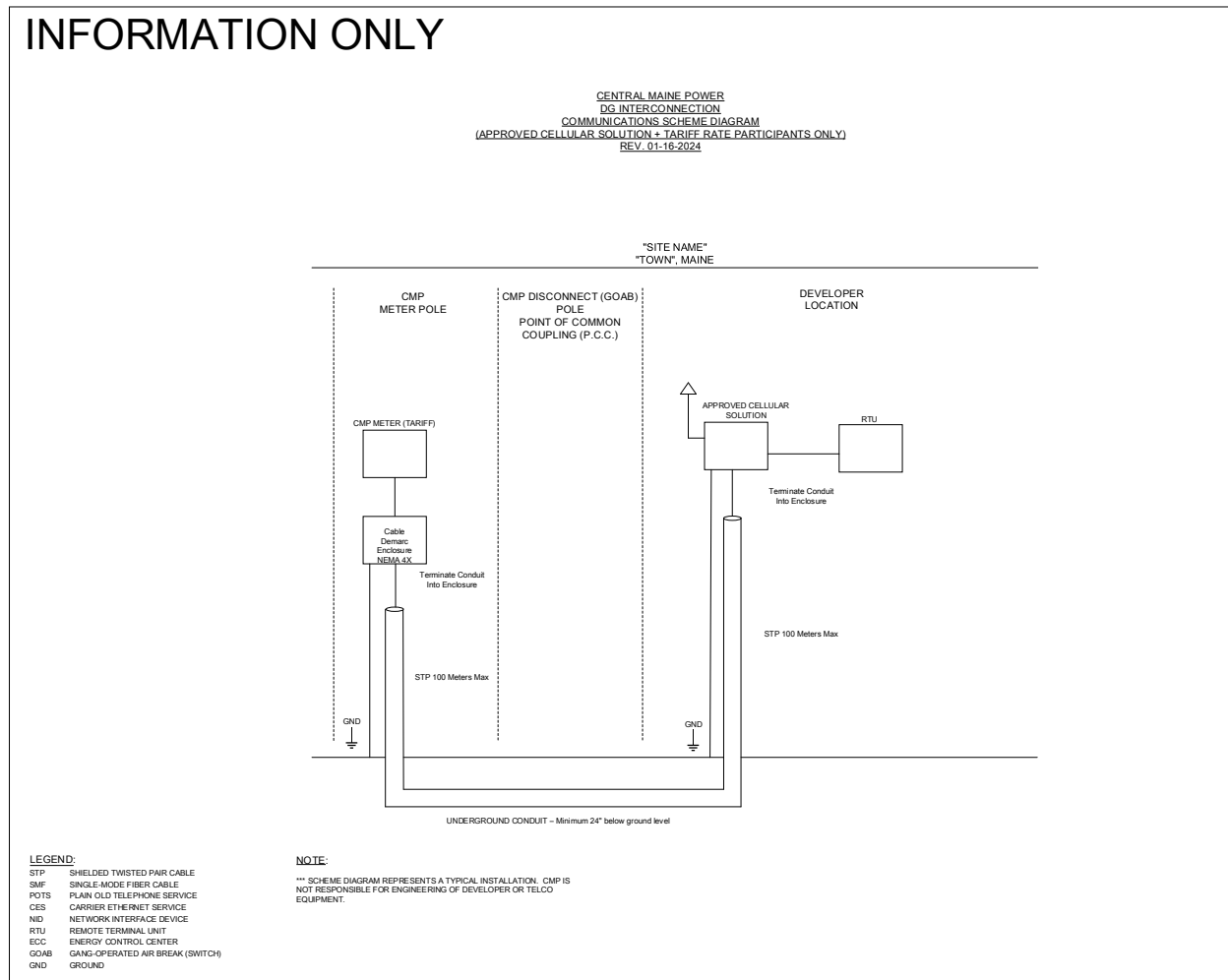
INFORMATION ONLY



Central Maine Power Informational Diagram – Kilowatt-hour

The second application is for tariff projects. The solution will service both SCADA and meter data in this application. **The need for separate communication services for SCADA and metering is eliminated.**

INFORMATION ONLY



Central Maine Power Informational Diagram – Tariff

Responsibilities

The utility customer is responsible for following the steps outlined in this document which include: **Step 1:** Site Validation, **Step 2:** Purchase, and **Step 3:** Installation. Installation is the responsibility of the utility customer. The utility customer is also responsible for installing the hardware, ensuring its physical security, and maintaining an active subscription.

For questions or support use the portal at help.power.watch.

Cost

For a standard site, the first-year cost for a utility customer is \$7,085, covering the initial hardware purchase, equipment configuration, and a one-year subscription. Excluded are site validation billed by the hour, directional antennas dependent on site conditions, the optional Bridge Kit, taxes, and expedited shipping. A tax-exempt certificate can be applied upon request. The detailed breakdown is as follows:

- \$4,485 for the powerWatch Edge hardware. This device is provisioned hardware housed inside a NEMA 4X rated enclosure, equipped with a power supply and battery backup.
- \$2,100 annual subscription fee. The annual subscription fee maintains the link between the utility customer site and the utility.
- \$500 activation fee. This fee covers the provisioning of the equipment.
- Standard shipping is included in the cost of the Edge.

In certain cases, the distance between the utility meter and the RTU may justify the use of two powerWatch Edge devices. The first-year cost for the utility customer amounts to \$12,830. This cost includes the initial hardware purchase, equipment configuration, and a one-year subscription. Excluded are site validation billed by the hour, directional antennas dependent on site conditions, the optional Bridge Kit, taxes, and expedited shipping. A 40% discount is applied to the annual subscription for the second device, resulting in a savings of \$840 per year compared to two separate subscriptions. The detailed breakdown for the dual configuration is as follows:

- \$8,970 for two powerWatch Edge devices: one configured for a utility meter and another configured for a utility customer-owned RTU where a conduit and cable run between the two is impractical.
- \$3,360 annual subscription fee.
- \$500 activation fee. This fee covers the provisioning of the equipment.
- Standard shipping is included in the cost of the Edge.

The pricing in this section is valid for orders placed before January 1, 2025. Orders placed after January 1, 2025, are subject to potential price adjustments, with equipment costs not exceeding a 7% annual increase.

Step 1: Site Validation

powerWatch deployment begins with site validation. This step is completed to verify that the site has adequate cellular coverage. As part of this step, the utility is notified that the utility customer site is pursuing this solution.

Site validation, performed by a qualified technician at \$105 per hour, includes a site walk-through and tests with utility customer on-site contacts to ensure the cellular signal meets specified ranges below.

- Received Signal Strength Indicator (RSSI) ≥ -85 dBm
- Reference Signal Received Power (RSRP) ≥ -105 dBm
- Reference Signal Received Quality (RSRQ) ≥ -12 dB
- Signal to Interference & Noise Ratio (SINR) ≥ 6 dB

If the tests do not meet the requirements, the technician will inform the utility customer during the visit. The utility customer should then contact the utility to explore other communication options.

Schedule at sitevalidation.power.watch.

Email Address *

Name *

Company *

Phone *

Availability * ⓘ

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Type something

Utility Company *

Choose... ▼

Utility Assigned Project Number *

GPS Coordinates: Latitude

GPS Coordinates: Longitude

Site Address *

Site Validation Scheduling Interface

In the form above, include contact details for the utility customer site contact meeting the technician onsite, project name, utility, utility-assigned project number, GPS coordinates, and site address. Submit the ticket for processing. A confirmation email for the site validation request will be sent following submission.

A report detailing the details of the site validation including site conditions, cellular signal strength, and installation location photos will be shared with both the utility customer and the utility. This report will be sent to the email address provided in the form above.



powerWatch Site Validation Report

Site Information

Utility Name	Central Maine Power Co.
Utility Project Number	654321
Customer Company Name	Sunshine Solar Company
Customer Address	25 Sunshine Way
Customer City	Augusta
Customer State	ME
Customer Zip Code	04330
Contact Name	Manny Rays
Site Name	Sunny Days Augusta
Site Coordinates	44.8505673, -70.24212356
Site Elevation	426'

Cellular Signal Testing Results

Received Signal Strength Indicator (RSSI)	-78	dBm
Reference Signal Received Power (RSRP)	-100	dBm
Reference Signal Received Quality (RSRQ)	-7	dB
Signal to Interference & Noise Ratio (SINR)	8	dB
Nearest Cellular Tower	77	°, azimuth

Results

Pass	X
Pass with Conditions	
Fail	

Conditions, if any:

Layout

Are the utility poles for the RTU and meter installed?	Yes
Is the meter enclosure installed or site selected?	Yes
Has the Edge location been selected?	Yes
What is the distance between the RTU and Edge?	3'
What is the distance between the meter and Edge?	75'
Is the conduit for the Ethernet connection in place between the Edge and the meter?	Yes
Is the conduit for the Ethernet connection in place between the Edge and the RTU?	Yes
Is AC power installed at the location where the Edge will be installed?	Yes

Example Site Validation Report

Step 2: Purchase

If the site validation determines that the site is eligible, an email will be sent containing a detailed invoice. The invoice itemizes the necessary hardware for the site, along with charges for the subscription, activation, and site validation. Payments can be made through Stripe, a secure payment portal, accessible via a link in the emailed invoice. The invoice is sent with 7-day payment terms. **The invoice must be paid before shipping.** The payment credit card will be automatically charged yearly for the subscription.

An example invoice is on the next page.

Invoice

powerWatch

Invoice number 3ECC552C-0005
Date of issue February 13, 2024
Date due February 20, 2024

powerWatch

Bill to

\$7,917.78 USD due February 20, 2024

[Pay online](#)

Description	Qty	Unit price	Tax	Amount
powerWatch Edge	1	\$4,485.00	5.5%	\$4,485.00
powerWatch Annual Subscription	1	\$2,100.00	5.5%	\$2,100.00
powerWatch Activation	1	\$500.00	5.5%	\$500.00
powerWatch Site Validation	4	\$105.00	5.5%	\$420.00
Subtotal				\$7,505.00
Total excluding tax				\$7,505.00
Sales tax - Maine (5.5% on \$7,505.00)				\$412.78
Total				\$7,917.78
Amount due				\$7,917.78 USD

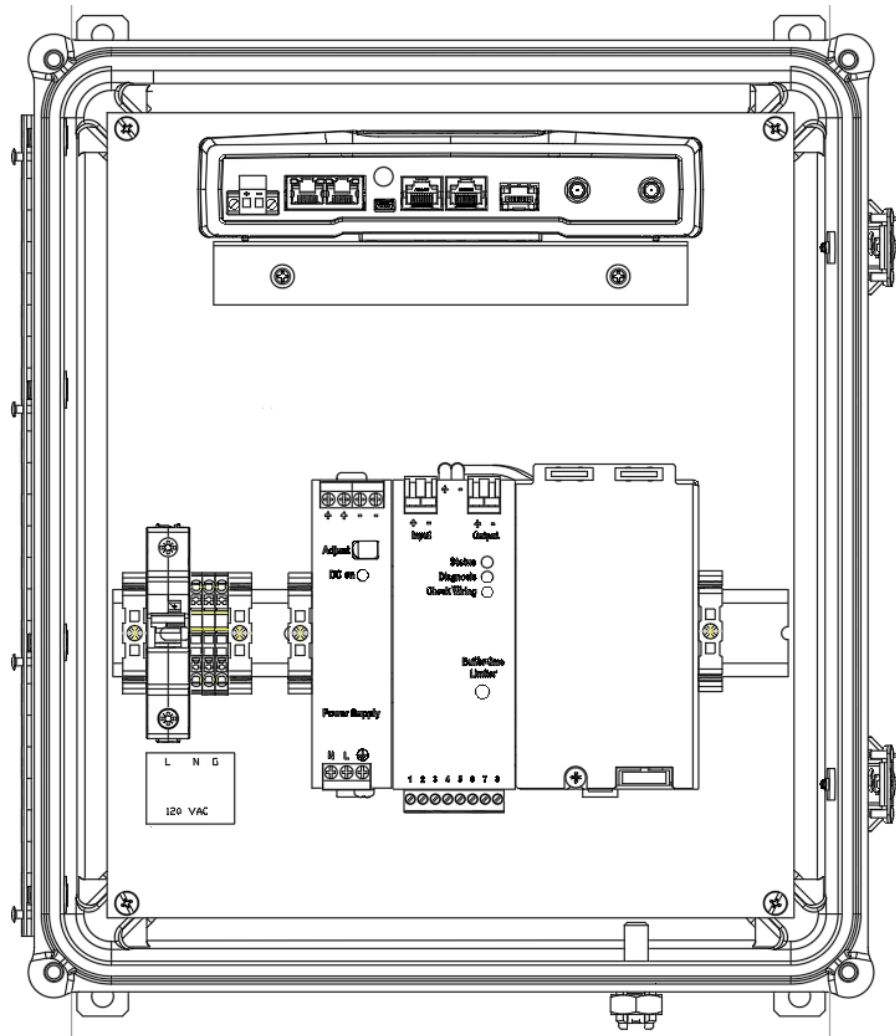
Example Invoice

The following products are available as part of the solution.

powerWatch Edge | \$4,485

- One (1) cellular router provisioned and activated.
- One (1) 115VAC power system, and one (1) 5AH battery backup with estimated 8-hour backup system housed in a NEMA 4X rated enclosure equipped with a circuit breaker and grounding terminal.
- Two (2) antennas and antenna cables, pre-installed.
- One (1) pole mounting bracket.
- A five (5) year manufacturer warranty covering the enclosure and the cellular router.
- A three (3) year warranty for the battery backup system, excluding the battery itself. Based on site conditions, the battery will likely need replacement every 3 years.
- Installation guidelines for the utility customer electrician or contractor.

- Standard UPS ground shipping.
- Estimated delivery of 2-4 weeks.



powerWatch Edge Internal Layout

One-Time Activation Fee | \$500

There is a one-time activation fee for the powerWatch solution. This fee covers the setup and testing of the powerWatch Edge, initiation of the cellular service, and integration of the utility customer connection into the powerWatch network.

Annual Subscription | \$2,100

This annual fee covers the costs of network monitoring and remote troubleshooting through the powerWatch network, as well as the LTE cellular data plan needed to connect the powerWatch Edge. Details about the monitoring can be found in the **Monitoring** section of this document.

The annual subscription starts when the powerWatch Edge is shipped. **The card on file will be automatically billed 30 days before the subscription end date.** To cancel, the utility customer must submit a support ticket and inform the utility 60 days before the subscription ends. If the site changes ownership, the new owner should open a support ticket to transfer the account and continue the existing subscription plan.

Find support at help.power.watch.

powerWatch Bridge Kit | \$595

The kit includes a NEMA 4X Ethernet junction box with pole mounting hardware and a pass-through connector. The junction box is designed to connect a short utility meter Ethernet lead to an underground cable on the same pole as the meter panel, meeting utility pole mount standards. A 10-foot Ethernet cable is also provided for connection between the Edge and RTU enclosure connectivity. For physical security, the kit comes with two combination locks for securing the Edge and junction box.

MIMO Directional Antenna 4GLTE | \$160

A directional antenna may be required to improve a site's cellular signal strength to acceptable levels. During the powerWatch Site Validation Service, the technician will also try testing with a directional antenna if the measured cellular signal strength from the initial test is below acceptable levels.



Step 3: Installation

Installing the powerWatch Edge hardware is the responsibility of the utility customer.

Safety

- Follow local, state and Federal guidelines related to electrical safety.
- Reference NFPA and NEC electrical safety documentation and codes for proper installation.
- Only qualified personnel should complete the installation.

Mount

- Securely mount the powerWatch Edge hardware onto the utility pole using the provided bracket.
- Tighten the mounting lag bolts and washers (not provided) to achieve a secure and stable installation.
- Ensure that the hardware is firmly secured and stable on the utility pole with no wobbling.
- Attach the provided antennas to a suitable structure. Ensure a minimum of 12 inches of clearance around the antennas.

Conduit and Cable

- In standard tariff installations, a buried conduit between the Edge enclosure and the utility meter is required.
- **The utility customer is responsible for the excavation and installation of the conduit and cable, following applicable sections of NFPA 70 of the National Electrical Code (NEC). Attention should be paid to mitigate the risk of water and debris intrusion into the conduit.**
- It is essential to place proper bedding material both below and above the conduit to lower the chances of damage during backfill and from the effects of frost and thaw cycles.
- **Use Ethernet cable rated for outdoor/wet locations conforming to TIA/EIA-568 standards, minimum Cat5e or higher, within the conduit.**
- Refer to the Cost section for pricing when two Edge solutions are preferable to a long conduit run.
- Flexible conduit may be used between the RTU and Edge enclosure.

Electrical

- Refer to the **Power and Networking** section for power connections.
- Connect the power supply wires to the designated terminals, ensuring secure connections.
- Once the power connections are verified, energize the system.

Network









- Program RTU with IP addresses as outlined in the installation guidelines.
- Install and test the Ethernet connection from the powerWatch Edge to the RTU.
- Connect the other end of the Ethernet cable to the designated Ethernet port with a surge protector inline. Recommend using the L-Com AL-CAT6HPW surge protector for reliable performance.
- Double-check that both Ethernet cables are securely connected to their designated jacks on the Edge router.
- For tariff application metering equipment, follow the steps below.
 - Run ethernet to junction box procured by the utility customer.
 - Terminate ethernet connection at powerWatch Edge through buried conduit.
 - Coordinate with the utility for meter installation. The utility meter will have a short Ethernet cable that will terminate in the junction box provided by the utility customer.

After the Edge is installed, submit a support ticket to powerWatch so the site can be commissioned at the utility. Before the utility is notified, the communication between the Edge and RTU will be remotely verified.

Support

Submit issues, commissioning updates, requests, or inquiries through our portal. Responses are typically given within one business day. An example support ticket is below. Fill out the required fields and provide as much detail as possible.

Find the portal at help.power.watch.

Email Address *	<input type="text"/>
Name *	<input type="text"/>
Company *	<input type="text"/>
Phone *	<input type="text"/>
Topic *	<input type="text"/>
Type *	<div>Choose...<div></div></div>
Priority	<div>Low<div></div></div>
Product	<div>powerWatch<div></div></div>
Description *	<div><div><div>B</div><div><i>i</i></div><div><u>U</u></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div>Type something</div><div></div></div></div>
Utility Company	<div>Choose...<div></div></div>
Utility Assigned Project Number	<input type="text"/>
GPS Coordinates: Latitude	<input type="text"/>
GPS Coordinates: Longitude	<input type="text"/>
Site Physical Address	<input type="text"/>

Support Request Interface

Monitoring

The subscription includes continuous remote monitoring, collecting diagnostic data with a minimum resolution of 15 minutes. Device availability is checked every minute. System logs and device backups are updated regularly. Service disruptions are reported to the utility customer and utility in the timeframes below.

1. The impacted utility customer and utility is notified via automated email within one (1) hour of the start of an event. The start of the event is triggered by three missed polls from our monitoring system, which are run at 15-minute intervals.
2. Both the impacted utility customer and utility will receive a detailed email regarding the outage within five (5) hours of the event starting or eight (8) hours during non-business hours. This email will include an estimated restoration time and a description of the issue.
3. A notification email is sent to both the utility and the impacted utility customer within one (1) hour of the event conclusion, which is marked by two consecutive successful polls at 15-minute intervals.

Service tickets are utilized to monitor and document outages. They are emailed to both the utility customer and utility at the event's start, along with any updates during the event, and provide a cause after the event concludes. These tickets can be accessed by both the utility customer and utility for detailed review.

Reports

powerWatch network performance details are provided in a weekly report, which is emailed to the utility customer on a scheduled basis. All emails and network alerts originate from notifications@power.watch. The utility customer can add or remove recipients by submitting a support ticket.

An example report is on the next two pages.

Please find your powerWatch Edge device summary below. The data is a summary of diagnostic information collected at regular intervals from your Edge device

Cellular Signal

RSRP is strong at -70 dBm to weak at -120 dBm, RSRQ has high quality at -9 dB to low at -20 dB, RSSI is strong at -50 dBm to weak at -110 dBm, and SNR above 20 dB means excellent clarity, below 0 dB is poor. RSRP measures signal power, RSRQ evaluates signal quality and interference, RSSI gauges overall signal strength, and SNR assesses clarity against background noise.

Date	RSRP	RSRQ	RSSI	SNR
2024-02-04	-105.4	-13.2	-72.7	4.2
2024-02-05	-105.6	-13	-72.8	3.7
2024-02-06	-105.8	-13	-72	4
2024-02-07	-105.6	-13	-72	3.3
2024-02-08	-106.1	-13	-72.7	3.5
2024-02-09	-106.9	-13.7	-74.6	3
2024-02-10	-107	-14.8	-73.4	3

Network Signal Diagnostics

Voltage

Voltage levels should be maintained between at 24 volts, with an allowable variance of +/- 1 volt.

Date	Voltage
2024-02-04	23.6
2024-02-05	23.6
2024-02-06	23.6
2024-02-07	23.6
2024-02-08	23.6
2024-02-09	23.6
2024-02-10	23.7

Device Voltage Diagnostics

Availability

Checks are performed every minute to assess device responsiveness and ensure availability. Values under 100 milliseconds are good. Total refers to the number of checks completed daily. Uptime is calculated based on the ratio of responses received to the number of attempts made.

Date	Min	Avg	Max	Total	Uptime (%)
2024-02-04	54	57	61	1438	100
2024-02-05	57	58	61	1440	100
2024-02-06	58	60	63	1440	99.99
2024-02-07	54	58	62	1440	99.99
2024-02-08	53	56	60	1440	100
2024-02-09	53	55	59	1440	99.99
2024-02-10	55	58	62	1440	100

Device Latency and Uptime

Service Level Agreement

The utility maintains a Service Level Agreement (SLA) with us, stipulating specific outage thresholds that vary by utility. For your utility, service level outages are reported when durations exceed 45 minutes. Investigation for outage reason is updated to both the utility and customer.

Start	End	Outage (hours)
There were no SLA reportable events during this reporting period.		

Reportable Events to the Utility Customer and Utility

Warranty

The powerWatch Edge comes with a five (5) year manufacturer warranty on the enclosure and cellular router, and a three (3) year warranty on the battery backup system, excluding the battery itself. Based on site conditions, utility customers should anticipate replacing the battery approximately every 3 years.

1. If the communication issue is identified as a failure of the cellular router or battery backup system (excluding battery):
 - a. A programmed replacement router or battery backup system will be shipped via overnight shipping to the utility customer.
 - b. This shipping is initiated within six (6) hours of recognizing the issue if it is during business hours, or within the first six (6) hours of the next business day.
2. Both the utility and the affected utility customer will receive updates about the shipping status within one (1) hour of the shipment.
3. The faulty router will be remotely deactivated.
4. It is the responsibility of the utility customer to replace the faulty equipment.
5. The utility customer must send the faulty powerWatch equipment, at their expense, to 204 Fifth Avenue, Suite 502, Pittsburgh, PA 15222, for an evaluation of the damage and its cause.

If an enclosure is faulty, a new one will be shipped. The original enclosure will need to be removed from the utility pole and the replacement mounted in its place.

The 5-year warranty covers manufacturing defects, excluding physical damage such as that caused by lightning strikes. Quotes for replacement parts will be provided once the cause of the failure has been determined.

Change of Ownership

In the event of a site ownership change, submit a support ticket. This step updates records and ensures the new owner has uninterrupted service and support. Providing the new owner contact information with the ticket will facilitate a smooth transition. There is a special category for ownership transfer available on the support ticket portal, as detailed below.

Find the portal at help.power.watch.

Phone *

Topic *

Type *

Choose...

Billing

Startup

Ownership Transfer

Notifications

B i U

Type something

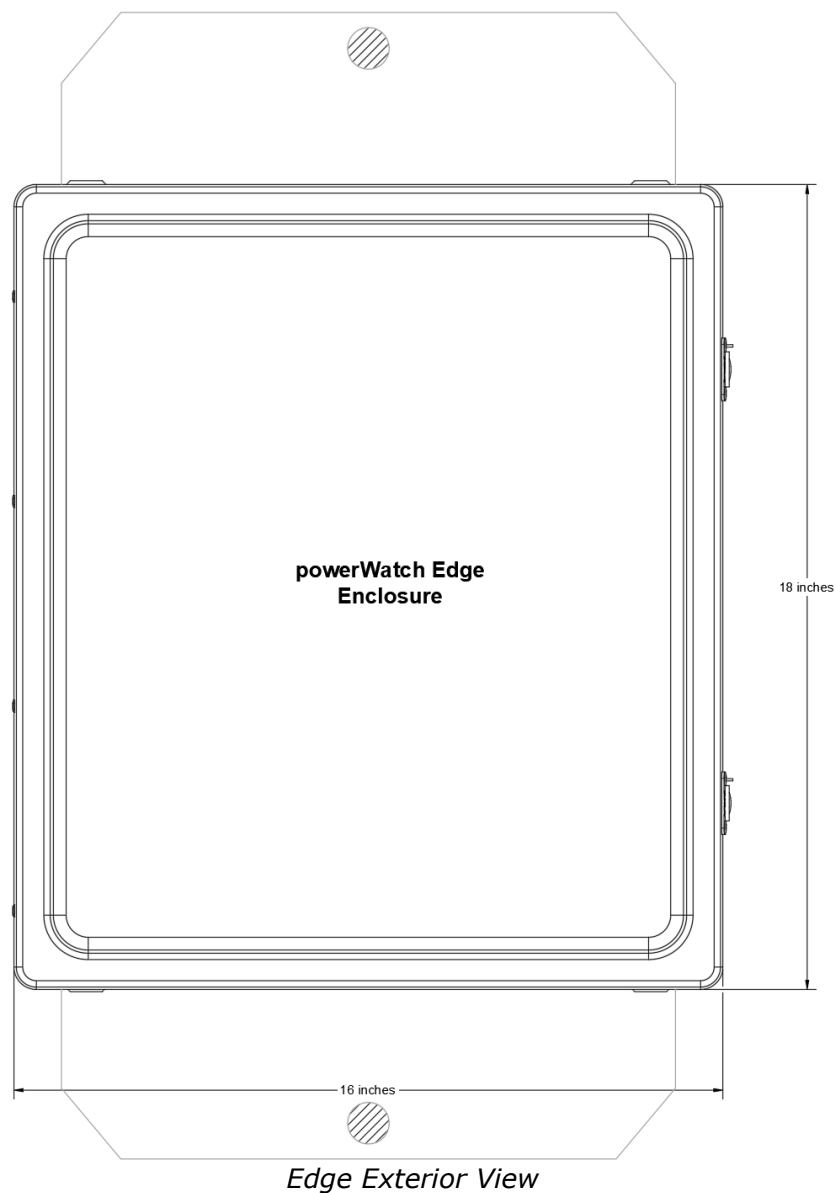
Support Ticket Field Selection for Ownership Transfer

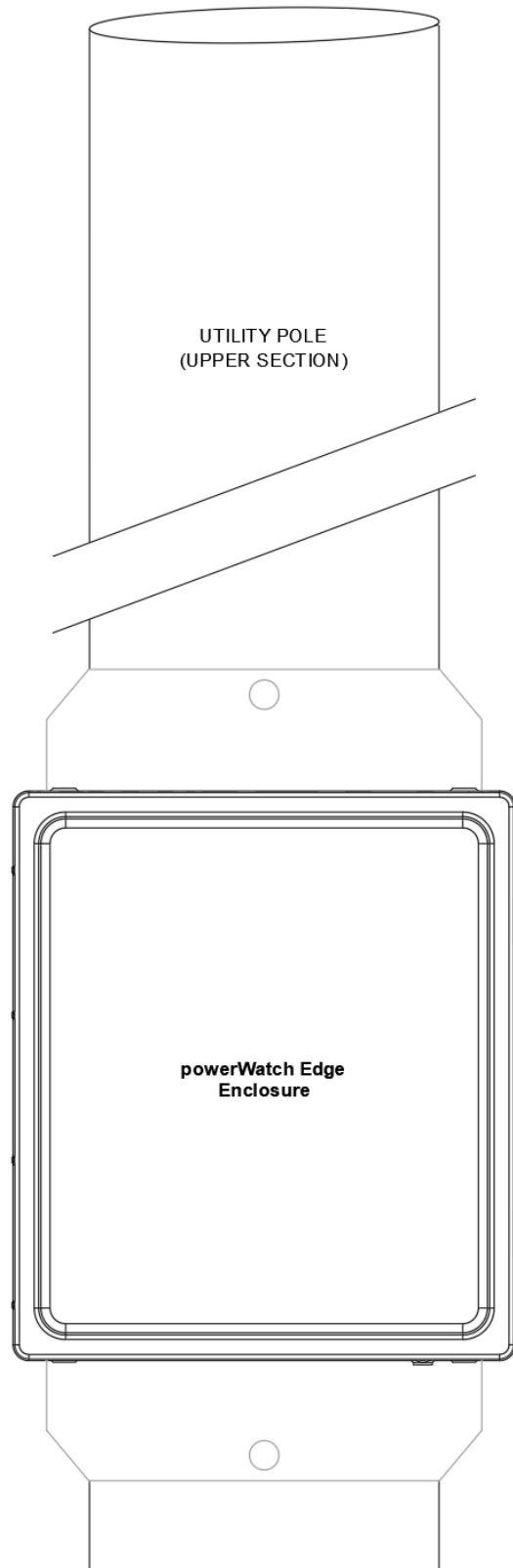
Enclosure Details

The drawings below give an overview of the powerWatch Edge.

Exterior

The dimensions of the enclosure are 16" W x 18" H x 8" D. With the utility-pole bracket, the overall height is 24 3/8". The hashes show where the mounting bracket should be secured to the pole using lag bolts and washers. The utility customer must provide two lag bolts and two washers.





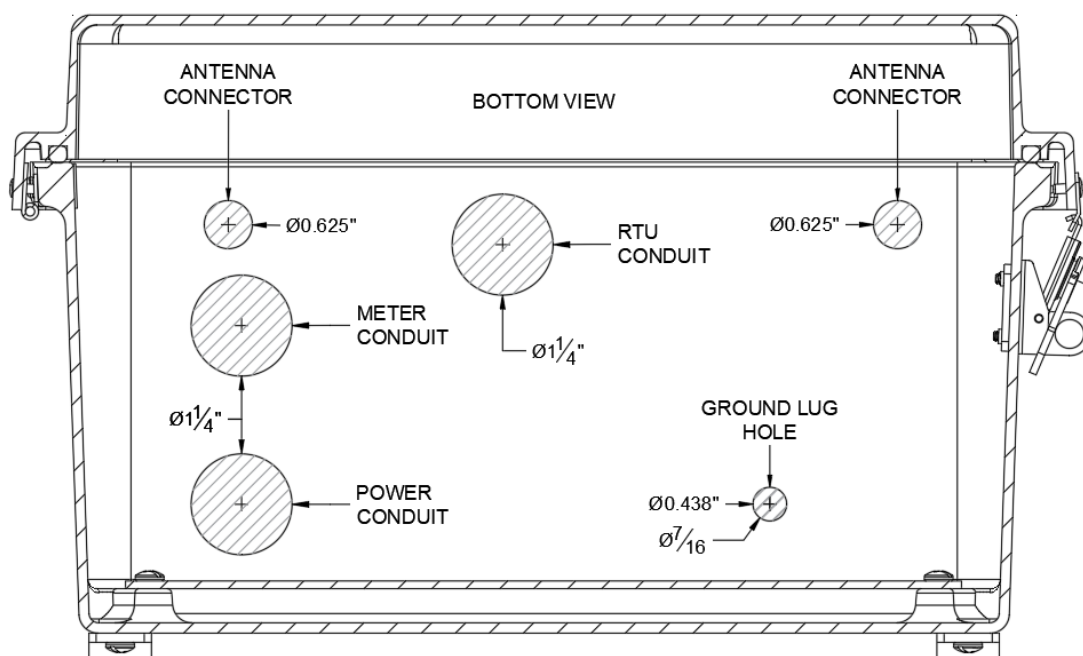
Edge Pole Mount Detail

Edge Enclosure Connections

The enclosure is shipped with antenna connectors and a ground lug pre-installed. The utility customer is responsible for installing conduit penetrations for RTU data, metering data, and power as well as mounting the antennas.

There are three recommended conduit penetrations:

- **METER CONDUIT:** Connect the enclosure to the utility meter using two CAT6 Ethernet cables - one as the primary and one as a spare.
- **RTU Conduit:** Enclosure to RTU using CAT6 Ethernet cable.
- **POWER CONDUIT:** 120 VAC site power.



Edge Conduit Detail

Power and Network

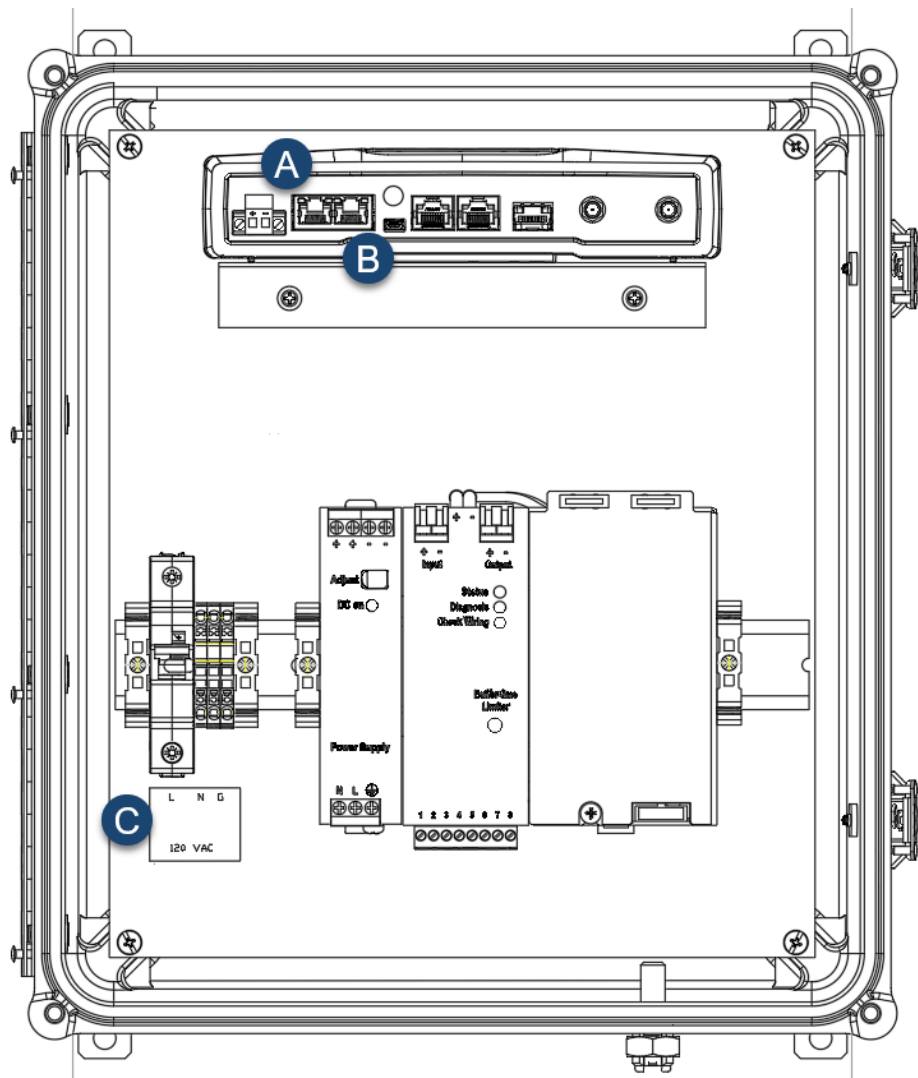
One set of field wiring terminations must be made along with landing two Ethernet cables. Details below on these connections:

- 120 VAC site landed on the circuit breaker and terminal blocks.
- Two Ethernet connections: from utility meter and from RTU.

A: Ethernet connection for utility customer supplied RTU

B: Ethernet connection from utility meter

C: 120 VAC power, supplied by utility customer



Edge Connection Detail for Utility Customer