

 **Edge Control Node 7000 Series
Installation Guide**

FIRST REVIEW DRAFT

078-xxxx-01A

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Echelon Corporation
www.echelon.com

Welcome

To improve both reliability and efficiency, national and regional power distribution grids must become smarter. They must also be able to manage themselves using intelligent distributed control and be able to communicate with any device, over any network or protocol, to optimize grid operations and anticipate problems before they occur.

The Echelon® Edge Control Node (ECN) 7000 Series of open and extensible hardware products enable power distribution grids to become smarter. The ECN 7000 Series distributes the intelligence that public and private electrical power utilities need to monitor and control devices at the edge of the grid. The edge of the grid is the critical point where the distribution network connects to customers and where energy supply and demand are becoming increasingly unpredictable and complex.

The ECN 7000 Series is powered by the Echelon Control System (ECoS) software platform, which is part of the Echelon Networked Energy Services (NES) system. ECoS software provides an open, secure, and modular software framework that allows you to host hundreds of new applications that are needed for a smarter grid. This powerful hardware and software combination brings intelligent distributed control to the edge of the grid for maximum reliability, survivability, and responsiveness.

This manual describes how a utility worker installs an ECN 7650 device on a utility power pole or a transformer pad.

Audience

This document assumes that you have a good understanding of medium (<50 kV) and low (<1 kV) power electrical power distribution grids. You should be able to make electrical connections to medium and low power distribution transformers, and be able to make physical connections for electrical devices within the medium and low power electrical distribution grid. You must also understand the safety requirements for working within this environment.

Related Documentation

The following manuals are available from the Echelon Web site (www.echelon.com) and provide additional information that can help you deploy Edge Control Node devices and develop applications for them:

- *Edge Control Node 7000 Series Hardware Guide* (078-xxxx-01A). This manual describes the hardware for the ECN.
- *Edge Control Node 7000 Series Expansion Card Development Guide* (078-xxxx-01A). This manual describes the functional requirements for third-party development of expansion cards that plug into the ECN 7000 Series of products.
- *ECoS User's Guide* (078-xxxx-01A). This document describes how to configure the i.LON SmartServer and use its applications to manage control networks.

- *ECoS Power Line Repeating Guide* (078-xxxx-01A). This document describes how to manage, control, and monitor a power line repeating network using the SmartServer.
- *ECoS Vision User's Guide* (078-xxxx-01A). This document describes how to create custom Web pages for monitoring and controlling LONWORKS® networks and other control networks.
- *ECoS App Programming Tools User's Guide* (078-xxxx-01A). This guide describes how to create and use FPMs on your SmartServer, and how to localize the language of the SmartServer Web interface.
- *Introduction to the LONWORKS Platform* (078-0183-01B). This manual provides an introduction to the ISO/IEC 14908-1 (ANSI/CEA-709.1 and EN14908) Control Network Protocol, and provides a high-level introduction to LONWORKS networks and the tools and components that are used for developing, installing, operating, and maintaining them.

All of the Echelon documentation is available in Adobe® PDF format. To view the PDF files, you must have a current version of the Adobe Reader®, which you can download from Adobe at: get.adobe.com/reader.

FCC Compliance Notice

Federal Communications Commission Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules, per sections 15.107 and 15.109. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause interference with radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Changes or modifications not expressly approved by Echelon Corporation could void the user's authority to operate the equipment.

RF Statements

This equipment also complies with the limits for wireless devices per FCC sections 15.203, 15.205, 15.207, 15.209 and 15.247. It uses frequency 2.4 GHz per Institute of Electrical and Electronics Engineers (IEEE) standard 802.15.4-2006, and uses a frequency bandwidth from 2400 MHz to 2483.5 MHz.

This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

EMC and Safety Statements

TBD

TÜV	Certified per EN 60950, 2000, IEC60950, 2000, UL60950, and CSA60950 by TÜV under NRTL
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Declaration of Conformity

To Be Added

89/336/EEC, Electromagnetic Compatibility Directive (EMC), 73/23/EEC, Low Voltage Directive (LVD)

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1

Introduction

This chapter introduces the Edge Control Node 7000 Series of products.

Introduction to the Edge Control Node

Residential and commercial energy customers are increasingly focused energy efficiency and reliability, while also reducing the environmental impact of electricity use. National and regional power distribution grids in the 21st century must address these customer concerns, while at the same time monitoring electricity as it flows through many types of devices and transmission media (substation elements, high, medium, and low voltage power lines, capacitor banks, transformers, meters, communicating thermostats, load-control devices, and so on).

A modern smart power grid network must be able to manage itself using intelligent distributed control and be able to communicate with any device, over any network or protocol, to optimize grid operations and anticipate problems before they occur.

The Echelon Edge Control Node (ECN) 7000 Series of open and extensible hardware products enable power distribution grids to become smarter. The ECN 7000 Series distributes the intelligence that public and private electrical power utilities need to monitor and control devices at the edge of the grid. The edge of the grid is the critical point where the distribution network connects to customers and where energy supply and demand are becoming increasingly unpredictable and complex.

The ECN 7000 Series of products use the Echelon Control System (ECoS) software platform, which provides the open, secure and modular software framework needed to host hundreds of new applications needed for a smarter grid. This powerful combination of hardware and software brings intelligent distributed control to the edge of the grid for maximum reliability, survivability and responsiveness.

The ECN 7650 is the first member of the ECN 7000 Series of products. The ECN 7650 supports a variety of local, wide-area, and device radio frequency (RF) networks, with up to nine antennas, all contained within the ECN 7650 enclosure to reduce vandalism and security risks.

The cover of the ECN 7650 is secured with one-way screws, which virtually eliminates unauthorized access. When the ECN 7650 is pad mounted, you secure the power and network connections inside a metal housing with a padlock. The ECN 7650 is also rugged and sturdy enough to allow a person (for example, a utility working gaffing a utility pole) to stand on it.

The ECN 7650 is designed for quick and secure installation using a rapid-mount bracket on either a utility pole or a pad-mounted distribution transformer. Because the ECN 7650 is small enough (H: 305 mm, 12 in – W: 356 mm, 14 in – D: 178 mm, 7 in) and light enough (<5.4 kg, <12 lb) to hand carry, installation is simple and easy.

The rest of this manual describes how to install the ECN 7650, either to a utility pole or to a pad-mounted distribution transformer.

2

Pole Mount Installation

This chapter describes how to install the ECN on a utility pole.

Introduction

You can install an ECN on any standard utility pole, in either the supply space or the common area. The ECN provides a carrying loop that you can tie with a rope so that you can easily carry the ECN while climbing the pole. The ECN is also small and light enough that you can carry it while working from a boom lift.

After installation, the ECN can withstand a 1330 J/m (300 ft-lb) force, for example, from a utility worker standing on the unit. The ECN is designed to be small enough that a utility worker can gaff up the pole and around the unit with minimal difficulty.

The installation includes a bracket that you attach to the utility pole. You then attach the ECN to the installed bracket. Subsequent replacement or installation of an ECN can reuse the installed bracket, thus substantially reducing replacement installation time and effort. In addition, you can connect or disconnect the ECN from either power or the communications network easily, without having to uninstall the entire unit.

Required Tools

To perform the installation for the ECN and the Pole Mounting Bracket, you will need the following tools:

- A drill, with drill bit appropriate for a 1.6 cm (5/8 inch) diameter bolt that is 12 to 70 cm (4.5 to 27.5 inches) in length
- A 1.6 cm (5/8 inch) wrench
- A wire stripping tool
- A fiberglass or plastic cable puller tool
- A standard Phillips® screwdriver, Point Size 2

In addition to the tools listed above, you need an ECN Pole Mount Kit, which includes the following components:

- Pole Mounting Bracket
- Support bolt: 12 to 70 cm (4.5 to 27.5 inches) in length (depends on the pole class and the planned installation height for the ECN), 1.6 cm (5/8 inch) in diameter
- Two 1.6 cm (5/8 inch) washers
- One 1.6 cm (5/8 inch) square-head nut
- Input power cable accessory:
 - The input power cable accessory is available in three lengths: 3 m, 9 m, and 12 m (10 ft, 30 ft, and 40 ft).
 - The cable type conforms to the specifications for 2.05 mm (12 AWG) stranded copper conductors. Two conductors are covered with black UV jacket insulation (600 V rating), and one with white UV jacket insulation (600 V rating).
 - The end of the cable that connects to the ECN input power connector is fitted. The other end of the cable is not fitted.

Installation Location

Typically, you install the ECN on a utility pole either in the supply space (near the service distribution transformer) or in the common area (3-½ to 4-½ meters or 12 to 15 feet above ground level).

Important: Do not install the ECN in the communication space; that space is reserved for cable, telephone, and other companies to install their equipment.

For optimal antenna performance, you should place the ECN as high on the utility pole as possible, in the supply space. However, many installations will install the ECN common area: installation in the common area is typically easier to perform, less expensive, and involves less risk for the installer.

Preparing for Installation

After you have selected the installation location on the utility pole (within the supply space or in the common area), determine the distance from the low-voltage (LV) attachment point (typically at or near the service distribution transformer) and the proposed installation point for the ECN. If the ECN input power cable is shorter than this distance, splice an additional length of cable and weather seal that splice.

When the ECN is installed in the common area, the input power cable must be shielded in a protective conduit to protect the input power cable from communications workers and other personnel who climb the pole. When the ECN is installed in the supply space, this protective conduit is not necessary. You can use a simple vertical wire guard, but generally you should use Schedule 40 conduit.¹ Leave both the top and bottom of the conduit open so that water can flow freely through the conduit. The bottom end of the conduit should terminate near the ECN, but should not be attached to it. Feed the input power cable through the conduit and connect it to an available power source.

Drill a hole through the utility pole. The diameter of this hole should be able to fit a 1.6 cm (5/8 inch) diameter bolt securely. The hole should be centered horizontally with respect to the pole diameter, and should be centered vertically with respect to the planned location of the ECN.

Performing the Installation

To install the ECN using the pole mount method, perform the following tasks:

1. Attach the Pole Mounting Bracket to the pole
2. Attach the ECN to the Pole Mounting Bracket
3. Secure the ECN to the Pole Mounting Bracket
4. Connect the ECN to power and to the network
5. Complete the installation

Each of these tasks is described in the following sections.

¹ See UL 651, NEMA TC-2, or NEC-Article 352 for Schedule 40 specifications.

Attach Pole Mounting Bracket

You connect the ECN to the utility pole using the hole that you drilled into the pole to prepare for installation; see *Preparing for Installation* on page 5. Place the bracket against the pole, insert the support bolt, and secure the bolt with a washer and nut, as shown in **Figure 1**. The Pole Mounting Bracket is designed to fit any standard utility pole.

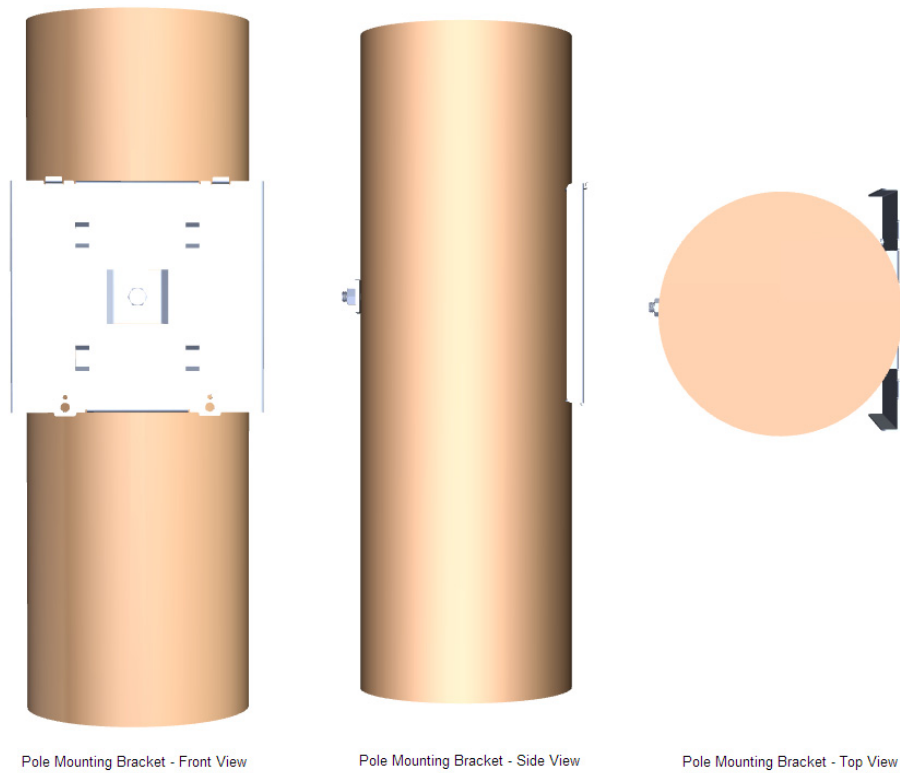


Figure 1. Attach Pole Mounting Bracket

Attach ECN to Pole Mounting Bracket

After the Pole Mounting Bracket is securely attached to the utility pole, you can attach the ECN to the Pole Mounting Bracket. The top of the back side of the ECN includes two tabs that slide into the top of the Pole Mounting Bracket. **Figure 2** on page 7 shows the ECN attached to the Pole Mounting Bracket.

Note that if you should need to replace an ECN, you need replace only the ECN and not the Pole Mounting Bracket.

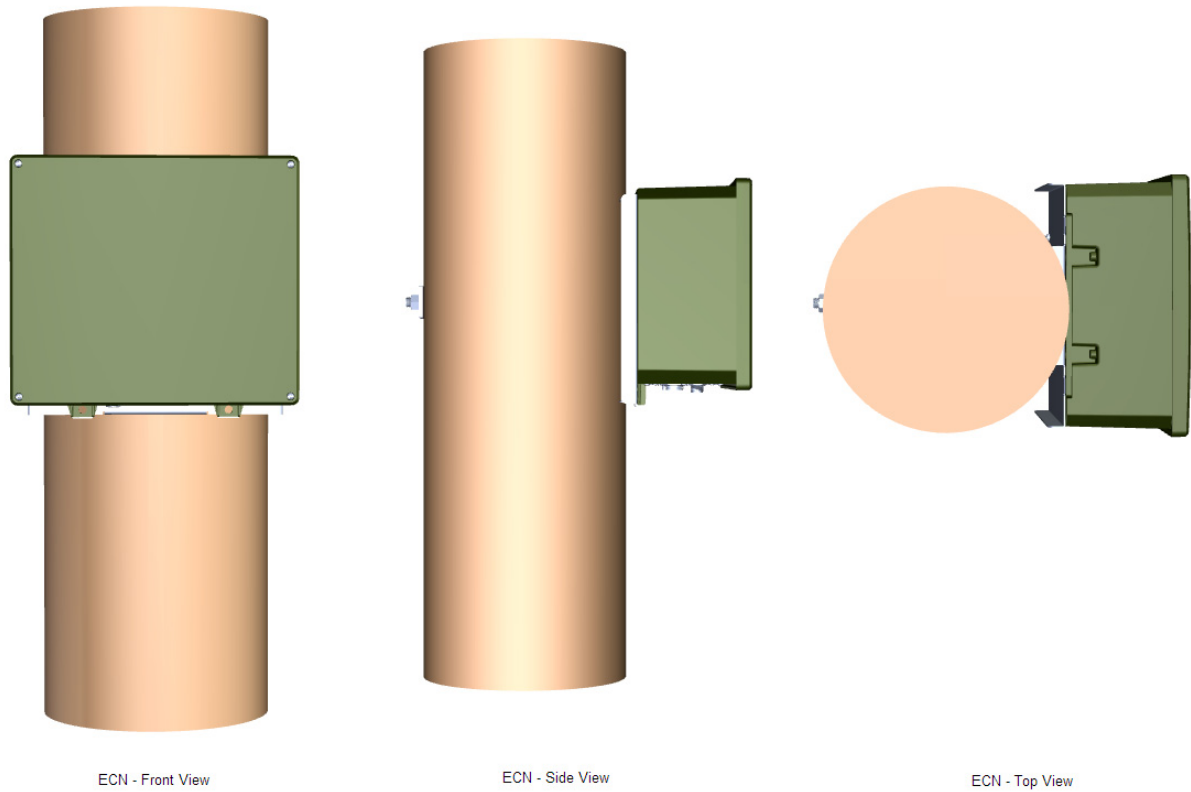


Figure 2. Attach the ECN to the Pole Mounting Bracket

Secure ECN to Pole Mounting Bracket

To secure the ECN to the Pole Mounting Bracket, insert two screws to the bottom of the ECN to attach it to the Pole Mounting Bracket. These screws are already connected to the ECN, and are designed not to make contact with the pole.

Figure 3 on page 8 shows a front view of the ECN attached to the Pole Mounting Bracket, with the bottom screws visible.

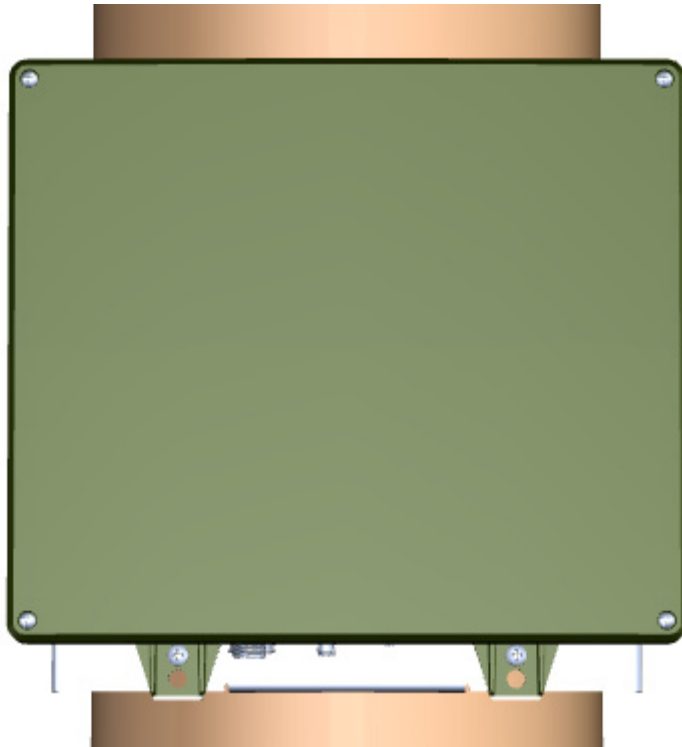


Figure 3. Secure the ECN to the Pole Mounting Bracket

Connect the ECN to Power and the Network

You make the connections to power and to the communications network at the bottom of the ECN. **Figure 4** shows the bottom of the ECN, before installation.

You can connect the ECN to either low voltage or medium voltage.

The exact configuration of the ECN bottom panel depends on the options that you have installed in the ECN, but at a minimum, the bottom panel has a connection for power and for at least one communications network. In the figure, the bottom left connection is for power.

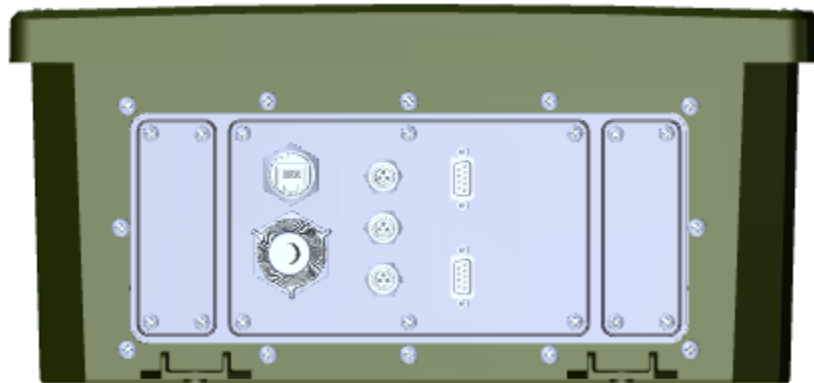


Figure 4. Connect the ECN to Power and the Network

Complete the Installation

After the installation is complete, perform the following tasks:

1. Inspect the connection of the ECN to the Pole Mounting Bracket.
2. Inspect the connection of the Pole Mounting Bracket to the utility pole.
3. Inspect the cabling connections to the ECN.

The completed installation should look similar to the views depicted in **Figure 2** on page 7. Note that the figure does not show the cabling connections to the ECN.

Verifying Successful Installation

Because the ECN has no external lights or displays, it uses an internal audio buzzer to provide indications of important installation-related states. The buzzer's audio frequency is 2.4 kHz (as a 1/2 duty cycle square wave) and outputs 85 to 92 dBA of sound pressure,² which should be audible from at least 10 m (30 ft). **Table 1** lists the sound patterns for the audio indicator. The audio indicator outputs its audio indicator patterns once only.

Table 1. Internal Audio Indicator Sound Patterns

Sound Pattern			Description
On (ms)	Off (ms)	Repeat	
1000	0	1	ECN first starts up
1000	0	1	ECN main processor starts running
1000	500	3	Successful direct WAN connection
1000	500	6	Successful indirect WAN connection
4000	500	2	No WAN connection made

As the table shows, a successful installation should include two 1 second sound bursts and at least one repeated pattern (1 s on, 0.5 s off) to indicate a successful network connection. If you receive the repeated pattern (4 s on, 0.5 s off) that indicates unsuccessful network connection, check the network cable connection and verify that the network is operational.

After installation is verified successful, use the ECoS Web page interface for the ECN to verify additional functionality. You might also want to disable the internal audio indicator so that subsequent resets or power events do not cause the audio indicator to output its audio indicator patterns.

² dBA measures sound pressure levels relative to 20 μ Pa (rms) at 1 m.

3

Pad Mount Installation

This chapter describes how to install the ECN on a service distribution transformer that is mounted on a concrete pad.

Introduction

You can install an ECN on the same concrete pad as a service distribution transformer, and secure it to the transformer without drilling holes into or otherwise damaging the transformer housing. After installation, the ECN is resistant to manual removal, and none of the electrical or communications network connections can be accessed by unauthorized personnel.

The installation includes a bracket that you attach to the transformer housing and concrete pad. You then attach the ECN to the installed bracket. Subsequent replacement or installation of an ECN can reuse the installed bracket, thus substantially reducing replacement installation time and effort. In addition, you can connect or disconnect the ECN from either power or the communications network easily, without having to uninstall the entire unit.

Required Tools

To perform the installation for the ECN and the Pad Mounting Bracket, you will need the following tools:

- A 1.6 cm (5/8 inch) wrench
- A wire stripping tool
- A fiberglass or plastic cable puller tool
- A standard Phillips® screwdriver, Point Size 2
- A shovel (hand or power) or similar digging tool
- Standard conduit sealing putty or foam

In addition to the tools listed above, you need an ECN Pad Mount Kit, which includes the following components:

- Pad Mounting Bracket
- Conduit Housing
- Connection bolt: 5 cm (2 inches) in length, 1.6 cm (5/8 inch) in diameter
- A 1.6 cm (5/8 inch) washer
- Two 1.6 cm (5/8 inch) concrete-compatible bolt kits
- Input power cable accessory:
 - The input power cable accessory is available in three lengths: 3 m, 9 m, and 12 m (10 ft, 30 ft, and 40 ft).
 - The cable type conforms to the specifications for 2.05 mm (12 AWG) stranded copper conductors. Two conductors are covered with black UV jacket insulation (600 V rating), and one with white UV jacket insulation (600 V rating).
 - The end of the cable that connects to the ECN input power connector is fitted. The other end of the cable is not fitted.

Installation Location

For optimal antenna performance, you should place the ECN as high on the distribution transformer as possible. However, most installations will require that the top of the ECN after installation extend no higher than the top of the transformer. A typical residential transformer measures between 46 cm (18 inches) and 74 cm (29 inches) in height. If you place the ECN exactly even with the top of the transformer, you have between 15 cm (6 inches) and 43 cm (17 inches) clearance from the transformer pad to the bottom of the ECN. For most installations, this clearance is sufficient to connect the installed ECN to external power and the communication network.

Installation rules also typically require that the top of the 1.9 cm or 3.2 cm ($\frac{3}{4}$ " or 1-1/4") flexible conduit should be at least 7.6 cm (3 inches) above grade level to prevent water ingress into the conduit. That is, there must be at least 7.6 cm (3 inches) of clearance from the bottom locking nut on the outside of the 1.9 cm or 3.2 cm ($\frac{3}{4}$ " or 1-1/4") flexible conduit.

Preparing the Transformer Pad

To prepare to connect the ECN to the power mains at the transformer, perform the following tasks:

1. Open the transformer cover to determine the location of an unused pre-cored hole in the transformer pad. This hole must be large enough to accommodate the 1.9 cm or 3.2 cm ($\frac{3}{4}$ " or 1-1/4") flexible conduit for the ECN.
2. Use a shovel or similar tool to dig under the transformer pad to clear space for the conduit.
3. Fit the conduit up and into the hole.
4. Position the conduit as near to the lifting nut on the side of the transformer as possible. Ideally, the conduit should be positioned vertically under the lifting nut.
5. Cut to the conduit to the approved length.
6. Replace the dirt below the transformer pad.
7. Close the transformer cover.

Preparing for Installation

After you prepare the transformer pad, you can complete installation preparation by performing the following steps:

1. Use a cable stripping tool to strip approximately 45 cm (18 inches) of the insulating jacket from all three conductors of the non-fitted end of the power cable.
2. Use a fiberglass or plastic cable puller tool to thread the power cable through the conduit that you prepared in the previous section, *Preparing the Transformer Pad*.
3. On the transformer side, attach the cables to the transformer so that they can provide power to the ECN.

4. Seal the top of the conduit inside the transformer cover with sealing putty or foam. This seal ensures that water and foreign objects cannot enter the transformer housing.
5. Seal the end of the conduit that is external to the transformer cover with sealing putty or foam.

After the conduit and cabling are ready, you can install the ECN. See the next section, *Performing the Installation*.

Performing the Installation

To install the ECN using the pad mount method, perform the following tasks:

1. Extend the Pad Mounting Bracket
2. Attach the Pad Mounting Bracket to the transformer's lifting nut
3. Attach the Conduit Housing to the Pad Mounting Bracket
4. Insert a Conduit Thread into the Conduit Housing
5. Attach the ECN to the Pad Mounting Bracket
6. Secure the ECN to the Pad Mounting Bracket
7. Connect the ECN to power and to the network
8. Close and lock the Conduit Housing
9. Complete the installation

Each of these tasks is described in the following sections.

Extend Pad Mounting Bracket

You connect the ECN to the transformer using the transformer's lifting nut, as described in *Attach Pad Mounting Bracket to Lifting Nut* on page 15. The Pad Mounting Bracket is designed to secure the ECN to the transformer's lifting nut, regardless of the location of the lifting nut.

The Pad Mounting Bracket is vertically adjustable (from approximately 46 cm [18 inches] to 92 cm [36 inches]) so that you can match the 1.9 cm (3/4 inch) horizontal slots with the position of the transformer lifting nut. **Figure 5** on page 15 shows the Pad Mounting Bracket fully extended.



Figure 5. Extend the Pad Mounting Bracket

Attach Pad Mounting Bracket to Lifting Nut

Because it is generally inadvisable to drill holes into the transformer housing, you use one of the 1.6 cm (5/8 inch) welded lifting nuts (inside the transformer cabinet and exposed through a hole in the transformer casing) as the installation point.

Locate one of the transformer's lifting nuts. There is no standard for the location of the lifting nuts, but typically one is within a few centimeters (an inch or two) of the top of the transformer.

Measure the distance from the lifting nut to the top of the transformer, and extend the Pad Mounting Bracket to ensure that after the bracket is attached to the lifting nut, the top of the bracket is as close to the top of the transformer as possible.

To secure the ECN to the transformer's lifting nut, temporarily remove the nut. Position the Pad Mounting Bracket so that one of the horizontal slots matches the position of the lifting nut. Attach the Pad Mounting Bracket to the lifting nut. **Figure 6** on page 16 shows the Pad Mounting Bracket attached to the lifting nut.

After you secure the Pad Mounting Bracket to the lifting nut, secure the bracket to the transformer pad using the two 1.6 mm (5/8 inch) slots at the bottom of the bracket.



Figure 6. Attach the Mounting Bracket to the Transformer's Lifting Nut

Attach Conduit Housing to Pad Mounting Bracket

To protect the electrical and network connections to the ECN, the Pad Mounting Bracket includes a Conduit Housing. The Conduit Housing is approximately 13 cm (5 inches) high and 30 cm (12 inches) wide. Attach the Conduit Housing to the bottom of the upper extension of the Pad Mounting Bracket, as shown in **Figure 7** on page 17. You can perform this step prior to field installation.

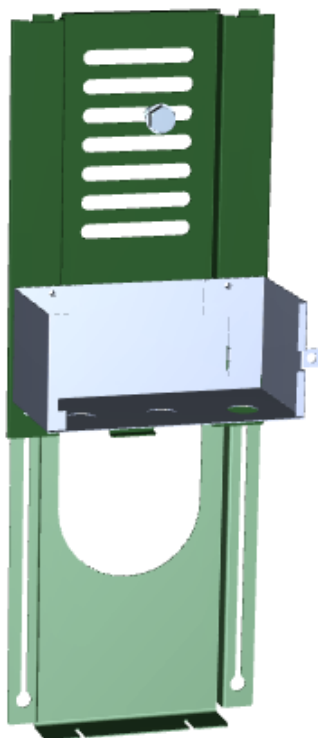


Figure 7. Attach the Conduit Housing to the Pad Mounting Bracket

Insert Conduit Thread into Conduit Housing

To protect the electrical and network cabling as it enters the Pad Mounting Bracket Conduit Housing, insert a Conduit Thread unit into one of the available holes in the bottom of the Conduit Housing. The Conduit Thread should accommodate the locking nut for the conduit and the radius of one or more cable bundles. The Conduit Housing provides three cutouts for conduits; at least one of these should be precut to allow for insertion of the electrical and network cabling.

Insert the Conduit Thread into the Conduit Housing, as shown in **Figure 8** on page 18. You can perform this step prior to field installation.

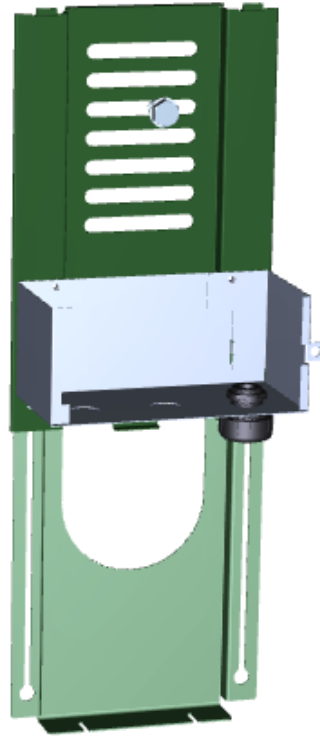


Figure 8. Insert a Conduit Thread into the Conduit Housing

Attach ECN to Pad Mounting Bracket

After the Pad Mounting Bracket is securely attached to the transformer, and the Conduit Housing is securely in place, you can attach the ECN to the Pad Mounting Bracket. The top of the back side of the ECN includes two tabs that slide into the top of the Pad Mounting Bracket. **Figure 9** on page 19 shows the ECN attached to the Pad Mounting Bracket.

Note that if you should need to replace an ECN, you need replace only the ECN and not the Pad Mounting Bracket.

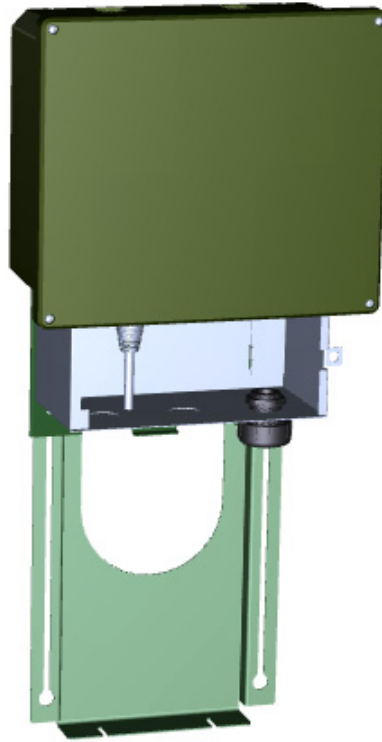


Figure 9. Attach the ECN to the Pad Mounting Bracket

Secure ECN to Pad Mounting Bracket

To secure the ECN to the Pad Mounting Bracket, insert two screws to the bottom of the ECN to attach it to the Pad Mounting Bracket. These screws are already connected to the ECN, and are designed not to make contact with the transformer. **Figure 10** on page 20 shows a front view of the ECN attached to the Pad Mounting Bracket, with the bottom screws visible.

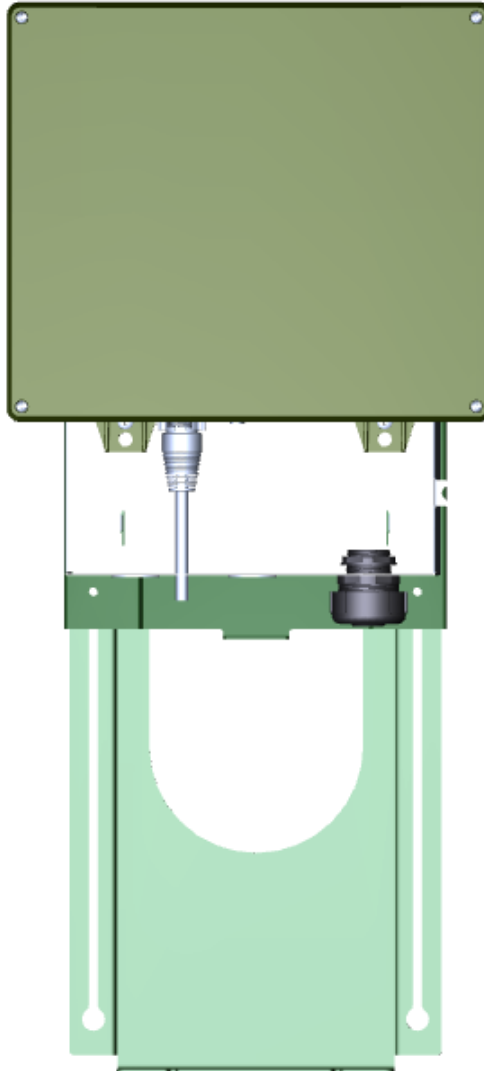


Figure 10. Secure the ECN to the Pad Mounting Bracket

Connect the ECN to Power and the Network

You make the connections to power and to the communications network at the bottom of the ECN, which is inside the Conduit Housing. **Figure 11** on page 21 shows the bottom of the ECN, before installation.

You can connect the ECN to either low voltage or medium voltage.

The exact configuration of the ECN bottom panel depends on the options that you have installed in the ECN, but at a minimum, the bottom panel has a connection for power and for at least one communications network. In the figure, the bottom left connection is for power.

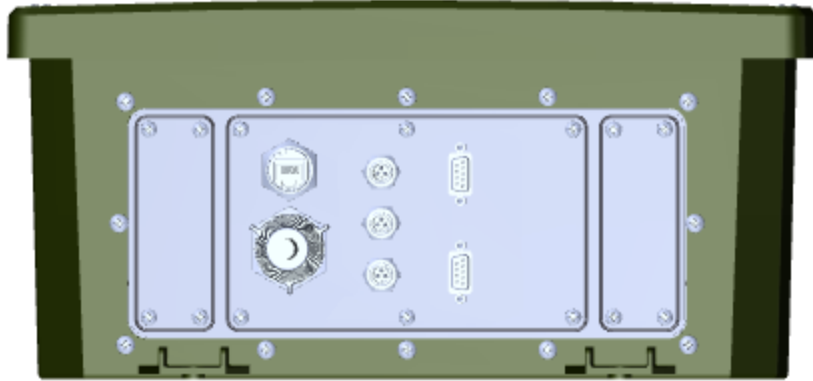


Figure 11. Connect the ECN to Power and the Network

Because the transformer's lifting nut is not necessarily centered vertically with where you placed the 1.9 cm or 3.2 cm ($\frac{3}{4}$ " or 1-1/4") flexible conduit relative to the transformer pad, ensure that the flexible conduit is long enough to reach both the Conduit Housing and the connections on the ECN.

Close and Lock the Conduit Housing

After you have completed all cabling connections and are ready to complete ECN installation, close the Conduit Housing door and secure it with a lock, as shown in **Figure 12** on page 22. The Conduit Housing includes a 1.3 cm ($\frac{1}{2}$ inch) hasp hole for the lock.

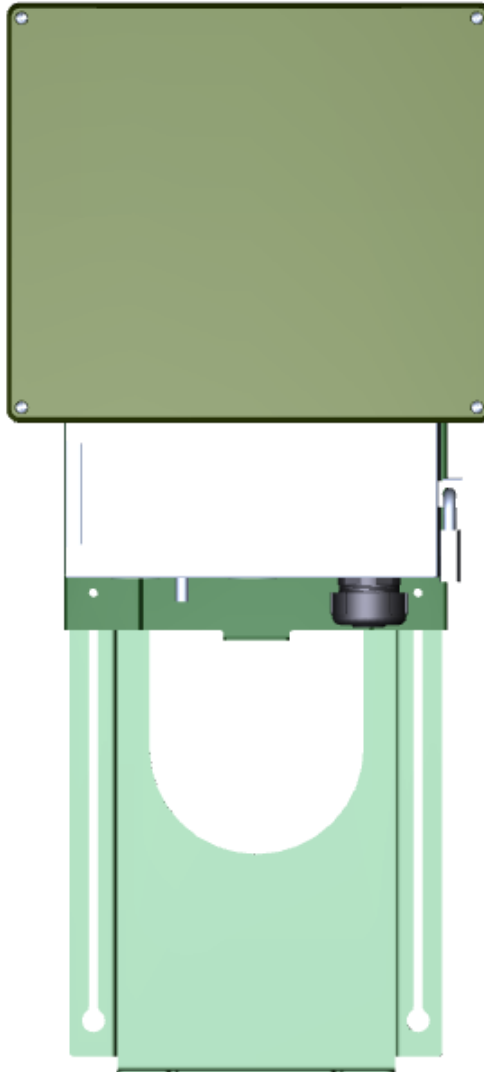


Figure 12. Close and Lock the Conduit Housing

Complete the Installation

After the installation is complete, perform the following tasks:

1. Inspect the connection of the ECN to the Pad Mounting Bracket.
2. Inspect the connection of the Pad Mounting Bracket to the transformer.
3. Inspect the cabling connections to the ECN.
4. Inspect the transformer pad.

The completed installation should look similar to the views depicted in **Figure 13** and **Figure 14** on page 23. Note that the figures do not show the cabling connections to the ECN.



Figure 13. Complete ECN Installation, Viewed from the Left

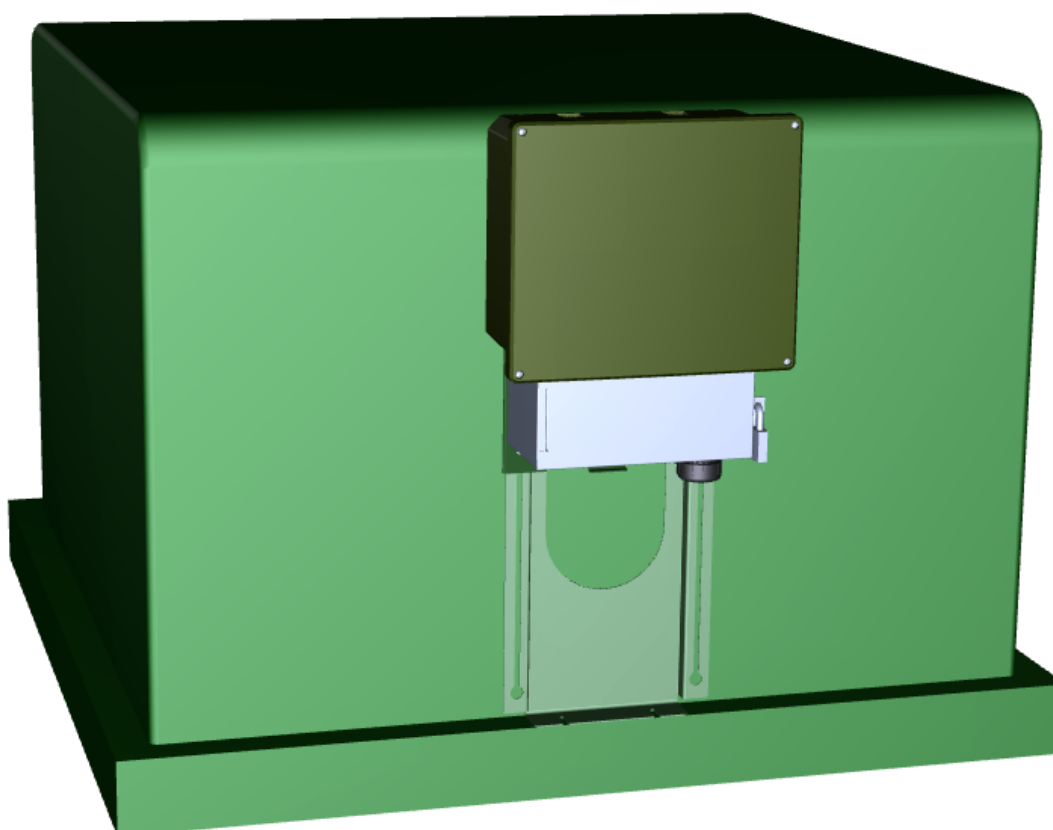


Figure 14. Complete ECN Installation, Viewed from the Front

Verifying Successful Installation

Because the ECN has no external lights or displays, it uses an internal audio buzzer to provide indications of important installation-related states. The buzzer's audio frequency is 2.4 kHz (as a 1/2 duty cycle square wave) and outputs 85 to 92 dBA of sound pressure,³ which should be audible from at least 10 m (30 ft). **Table 2** lists the sound patterns for the audio indicator. The audio indicator outputs its audio indicator patterns once only.

Table 2. Internal Audio Indicator Sound Patterns

Sound Pattern			Description
On (ms)	Off (ms)	Repeat	
1000	0	1	ECN first starts up
1000	0	1	ECN main processor starts running
1000	500	3	Successful direct WAN connection
1000	500	6	Successful indirect WAN connection
4000	500	2	No WAN connection made

As the table shows, a successful installation should include two 1 second sound bursts and at least one repeated pattern (1 s on, 0.5 s off) to indicate a successful network connection. If you receive the repeated pattern (4 s on, 0.5 s off) that indicates unsuccessful network connection, check the network cable connection and verify that the network is operational.

After installation is verified successful, use the ECoS Web page interface for the ECN to verify additional functionality. You might also want to disable the internal audio indicator so that subsequent resets or power events do not cause the audio indicator to output its audio indicator patterns.

³ dBA measures sound pressure levels relative to 20 µPa (rms) at 1 m.

4

Field Replacement for an ECN 7000 Series Device

This chapter describes how to replace an ECN or an ECN's battery pack after the ECN has been installed in the field.

Overview

The ECN 7000 Series of products is designed to allow you to easily replace an ECN unit in the field after installation. For ECN units with the backup battery option, you can also easily replace the battery in the field.

Although an ECN is designed for a 10 year operational life, because an ECN is typically installed in a location that exposes it to weather and other hazards, you might need to replace ECN units from time to time. In addition, you might want to replace a working unit with one that includes additional or different expansion cards to provide additional services for your customers.

Because the ECN's cover is not designed to be removed in the field (the cover is secured with one-way screws), you generally cannot perform in-field service for an ECN. If an ECN becomes non-operational, you should replace it in the field with a similarly equipped model to maintain operational service for your customers. You can return the non-operational ECN to your service center for maintenance; see the *Edge Control Node 7000 Series Hardware Guide* for additional information about performing service.

Replacing a Pole-Mounted ECN

Important: Before replacing an ECN in the field, visually inspect the unit and its surroundings to ensure that the unit is not damaged and that it is safe to handle.

You do not need to reinstall the Pole Mounting Bracket to replace an ECN unit.

To remove a pole-mounted ECN:

1. If possible, use the ECoS system software to shut down the unit remotely, before beginning field replacement.
2. Remove all network connections from the bottom of the unit.
3. Remove the power connection from the unit.
4. Remove the screws at the bottom of the unit. These screws will remain attached to the ECN.
5. Lift the ECN from the Pole Mounting Bracket.
6. Attach a rope to the ECN carry loop to safely transport it to the ground.

To install a replacement pole-mounted ECN:

1. Attach the ECN to the Pole Mounting Bracket, as described in *Attach ECN to Pole Mounting Bracket* on page 6.
2. Secure the ECN to the Pole Mounting Bracket using the screws at the bottom of the unit, as described in *Secure ECN to Pole Mounting Bracket* on page 7.
3. Connect the ECN to power and to the network, as described in *Connect the ECN to Power and the Network* on page 8.
4. Verify successful installation, as described in *Verifying Successful Installation* on page 9.

Replacing a Pad-Mounted ECN

Important: Before replacing an ECN in the field, visually inspect the unit and its surroundings to ensure that the unit is not damaged and that it is safe to handle.

You do not need to reinstall the Pad Mounting Bracket to replace an ECN unit.

To remove a pad-mounted ECN:

1. If possible, use the ECoS system software to shut down the unit remotely, before beginning field replacement.
2. Unlock the Conduit Housing and open the Conduit Housing door.
3. Remove all network connections from the bottom of the unit.
4. Remove the power connection from the unit.
5. Remove the screws at the bottom of the unit. These screws will remain attached to the ECN.
6. Lift the ECN from the Pad Mounting Bracket.

To install a replacement pad-mounted ECN:

1. Attach the ECN to the Pad Mounting Bracket, as described in *Attach ECN to Pad Mounting Bracket* on page 18.
2. Secure the ECN to the Pad Mounting Bracket using the screws at the bottom of the unit, as described in *Secure ECN to Pad Mounting Bracket* on page 19.
3. Connect the ECN to power and to the network, as described in *Connect the ECN to Power and the Network* on page 20.
4. Close the Conduit Housing and lock the door, as described in *Close and Lock the Conduit Housing* on page 21.
5. Verify successful installation, as described in *Verifying Successful Installation* on page 24.

Replacing the Battery Pack

To allow the ECN to run continuously, regardless of external power conditions, the ECN includes a backup battery option. If your ECN includes this option, you will occasionally need to replace the batteries.

The battery packs are located in their own dedicated compartment accessible from the outside of the ECN enclosure, as shown in **Figure 15** on page 28. Within this compartment, an electrical connector on a flying lead allows easy installation of each battery pack. This separate compartment is weather tight and provides shielding from sensitive electronics and transceivers.

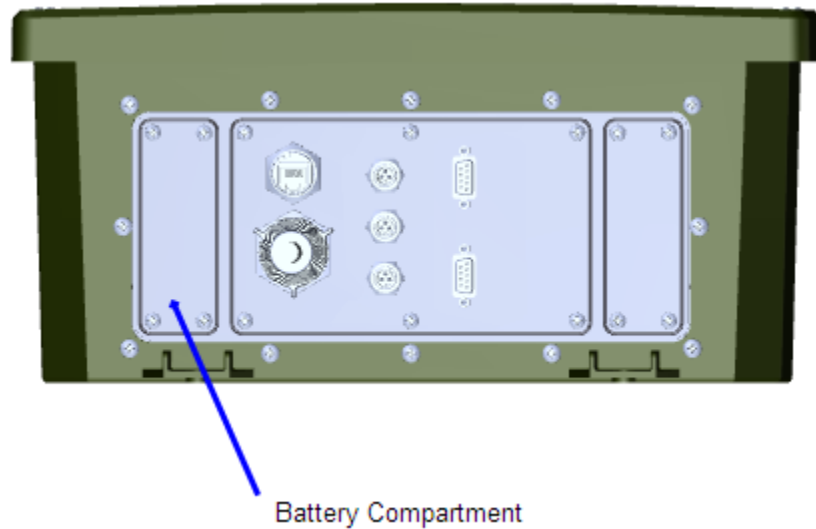


Figure 15. ECN Battery Compartment Location

The ECN uses intelligent battery charging techniques to maximize the life of the battery. That is, the ECN occasionally discharges and recharges the battery to maintain battery capacity and prolong its life. A typical discharge/charge cycle can take up to 16 hours. During this time, the ECN could be vulnerable to power loss during the discharge cycle, so you should use dual battery packs. Each pack can be independently charged on alternating cycles so that a fully charged battery pack is always available. Each battery pack has an operating life of approximately 10 years. **Figure 16** shows a typical battery pack.



Figure 16. Typical Battery Pack

Each battery pack is comprised of six AA size (IEC HR6 / ANSI 1.2H2) batteries to provide 1800 mAh or 2200 mAh at 7.2 V with 12 cm (5 inch) connection leads. **Table 3** on page 29 lists specifications for the battery pack.

Table 3. Battery Pack Specifications

Specifications	Dimensions and Weight
Size: 6 AA Cells Configuration: Side by side Capacity: 1800 mAh or 2200 mAh Chemistry: NiMH Voltage: 7.2 V	Length: 85 mm (3.38") Height: 14 mm (0.56") Weight: 226 g (8 oz)

A

ECN 7000 Series Specifications

This appendix lists the specifications for the ECN 7000 Series of products.

General Specifications

Table 4 summarizes the general specifications for ECN 7620 and 7650 devices.

Table 4. General Specifications

Category	Rating
Input Voltage: Single Phase Three Phase	3-wire 120/240 V $\pm 20\%$ 60 Hz $\pm 2\%$ 3- or 4-wire 230/277 V $\pm 20\%$ 50/60 Hz $\pm 2\%$
Battery Power Input (Optional)	Battery backup module (15 minutes) Uninterruptible Power Supply (UPS) interface module (input 12 V or 24 V)
??Maximum Devices Managed	??Up to 1024 NES electricity meters and 4096 associated M-Bus devices, depending upon the model purchased.
??Program Storage	??Non-volatile memory
Power Consumption	5 W typical 30 W maximum
??Phase Coupling	??Connections for 3 phases (L1Ø, L2Ø, L3Ø) and Neutral.
??Indicators	??Blue power LED (illuminates when both AC power mains are present on the Neutral and any phase and the power supply is functioning correctly)
Dimensions	7650 H: 305 mm – W: 356 mm – D: 178 mm (H: 12" – W: 14" – D: 7") 7620 H: 280 mm – W: 288mm – D: 141mm (H: 11" – W: 11.5" – D: 5.5")
Weight	<5.4 kg (<12 lb)
Enclosure	7650 UV stable plastic (grey or green); rated NEMA4/IP67 7620 Plastic (grey); rated IP54
Mounting	7650 Separate mounting kit 7620 DIN 43857 mount; four screw holes to accommodate 5 mm screws for direct wall mount

Category	Rating
Security	Impact- and vandal-resistant plastic High-security screws Tamper detection (operates whether powered or unpowered) Optional tilt detector
??Serial Number Indication	??Text and barcode
??Clock	??Real-time clock accurate to ± 1 minute per month; corrected by NES System Software.

Environmental Rating Specifications

Table 5 summarizes the environmental rating specifications for ECN 7620 and 7650 devices.

Table 5. Environmental Rating Specifications

Category	Rating
Operating Temperature Range	-40 °C to +70 °C (-40 °F to +158 °F) Certain options (for example, radios) could have additional limits. ANSI C12.1 2008 4.7.3.16 168hrs -40C to +70C ??IEC 62052-11: -25°C to 55°C
??Limited Operating Temperature Range	??IEC 62052-11: -40°C to 70°C
Storage Temperature Range	-40 °C to +85 °C (-40 °F to +185 °F) ANSI C12.1 2008 4.7.3.15 168hrs -40°C to +85°C ??IEC 62052-11: -40°C to 70°C
Effective Relative Humidity ??Operating Humidity (non-condensing)	0% to 95%, non-condensing As per ANSI C12.1 2008 ANSI C12.1 2008 4.7.3.22 in accordance with ASTM G155 ??IEC 62052-11: 25-90% @ 50° C
Weather Simulation Test ??Storage Humidity (non-condensing)	ANSI C12.1 2008 4.7.3.22 in accordance with ASTM G155 ??IEC 62052-11: 95% RH @ 50° C

Category	Rating
Salt Spray Test ??Dry Heat	ANSI C12.1 2008 4.7.3.23 in accordance with ASTM B117 ??IEC 60068-2-2; 70° C, 72 hours
Raintightness ??Cold	NEMA 4 and ANSI C12.1 2008 4.7.3.24 in accordance with UL 50 E ??IEC 60068-2-1; -40° C, 16 hours
??Damp Heat Cyclic	??IEC 60068-2-30: 25° C - 55° C @ 95% humidity for 6 days
??Change of Temperature	??IEC 60068-2-14: 70° C to -25° C in 6 hours
Solar Radiation	As per ANSI C12.1 2008
Salt Fog	As per ANSI C12.1 2008

Mechanical Specifications

Table 6 summarizes the mechanical specifications for ECN 7620 and 7650 devices.

Table 6. Mechanical Specifications

Category	Rating
General Mechanical Requirements	IEC 60068-2-11
Mechanical Tests:	
Mechanical Shock ??Spring Hammer	ANSI C12.1 2008 4.7.3.18 in accordance with IEC 60068-2-27 ??IEC 60068-2-75: .2 Joules kinetic energy
Transportation Drop ??Shock	ANSI C12.1 2008 4.7.3.19 in accordance with ISTA procedure 1A As per ANSI C12.1 2008 ??IEC 60068-2-27: 30g, half-sine, 18ms
Mechanical Vibration ??Vibration	ANSI C12.1 2008 4.7.3.20 in accordance with IEC 60068-2-6 As per ANSI C12.1 2008 ??IEC 60068-2-6: 10-150 Hz, 0.075mm/1g @ 1 octave per minute. 10 cycles

Category	Rating
Transportation Vibration	ANSI C12.1 2008 4.7.3.21 in accordance with ISTA procedure 1A
Resistance to Heat and Fire	IEC 60695-2-11
Mechanical Wind Shear	Can withstand a 190 Pa (4 lb/sq-ft) wind simultaneously with (12 mm) ½” thick ice

Electrical Specifications

Table 7 summarizes the electrical specifications for ECN 7620 and 7650 devices.

Table 7. Electrical Specifications

Category	Rating
Specified Operating Range	240 V _{AC} ± 20% ??IEC 62052(7.1.1): - 0.8 to 1.1 Un
Insulation Resistance	ANSI C12.1 2008 4.7.3.1 2.5kV for 1 minute ??IEC 62052(7.1.1): - 0.0 to 1.15 Un
Voltage Interruptions	ANSI C12.1 2008 4.7.3.2 ??IEC 61000-4-11: 30%, 50%, 60%, 100% and +12% to -15%
High Voltage Surge	ANSI C12.1 2008 4.7.3.3.1 100kHz Ring Wave in accordance with ANSI C62.41 (Category B) ANSI C12.1 2008 4.7.3.3.2 Combination Wave in accordance with ANSI C62.41 (Category B) ??IEC 62053-21 (7.4)
Effect of Current Surge in Ground Conductor	ANSI C12.1 2008 4.7.3.7 ??IEC 62052-11 (7.3)

Safety Specifications

Table 8 summarizes the safety specifications for ECN 7620 and 7650 devices.

Table 8. Safety Specifications

Category	Rating
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Category	Rating
Safety	UL 60950, EN 60950, CSA 60960 CE Marking RoHS-compliant
??Safety Rating	??Certified by TÜV, Semko, and KEMA-KEUR per EN-60950; CE Marked; UL60950, and CSA60950 by TÜV under NRTL

EMC Specifications

Table 9 summarizes the electromagnetic compatibility (EMC) specifications for ECN 7620 and 7650 devices.

Table 9. EMC Specifications

Category	Rating
Immunity to Electrostatic Discharge:	
Contact Discharge	IEC 62052-11 (7.5.2), IEC 61000-4-2: 8 kV
Air Discharge	IEC 62052-11 (7.5.2), IEC 61000-4-2: 15 kV
Immunity to Electromagnetic RF Fields (80MHz to 2000 MHz)	IEC 62052-11 (7.5.3), IEC 61000-4-3: 30 V/m
Fast Transient Burst	IEC 62052-11 (7.5.4), IEC 61000-4-4: 4 kV common mode
Immunity to Conducted Disturbances:	
150 kHz to 80 MHz	IEC 62052-11 (7.5.5), IEC 61000-4-6: 10 Vrms
Surge Immunity	IEC 62052-11 (7.5.6), IEC 61000-4-5: 6 kV common mode, 4 kV differential mode
Power frequency magnetic field	IEC 61000-4-8, IEC 61000-4-12, IEC-61000-4-13, IEC 61000-4-16: 1000 A/m
Radiated Emissions	EN 55022 – Class B
Conducted Emissions with PLC	EN 50065-1 – Class B

FCC Specifications

TBD

Communications Specifications

Table 10 summarizes the communications specifications for ECN 7620 and 7650 devices.

Table 10. Communications Specifications

Category	Rating
Power line Network	LV CENELEC 50065-1 Line Communication (PLC) LV 150/IEC 14908-3 PLC (CENELEC 50065 C-Band)
Wide Area Network	Ethernet Dual-band 3G CDMA (EV-DO) with main and diversity antenna (North America) Quad-band GPRS (GSM) (worldwide)
Local Networks (optional)	ISO/IEC 14908-2 Twisted Pair Communication Ethernet High-power 2.4/5GHz IEEE 802.11b/g/n access point and neighborhood-area intercommunication network (supports IEEE 802.11i and IEEE 802.11s (draft))
??Data Security	??CHAP, MS-CHAP, PAP and 128-bit application-level authentication for WAN; 96-bit authentication on power line network; 128-bit RC4 encryption for WAN and power line communication; Password protection for optical communication

External Connection Specifications

Table 11 summarizes the external connection specifications for ECN 7620 and 7650 devices.

Table 11. External Connection Specifications

Category	Rating
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Category	Rating
AC Power Mains Input	The three-phase AC input power connection serves two purposes: (a) AC input power for the Data Concentrator is provided from the Neutral and any phase. (b) LONWORKS power line channel signaling using three-phase, Line-to-Neutral coupling.
EIA-232 Serial Ports	EIA-232C serial port protocol operating up to 115.2 kbps per second when used with a Hayes-compatible cellular (CSD/CDMA/GPRS) or landline modem. Optionally, 9.6 kbps in direct serial connection (null-modem) mode. All modes operate with 8 data bits, 1 stop bit and no parity. Configured as DTE (Data Terminal Equipment).
Optional Three-Phase Current Transformer (CT) Inputs	LV or MV, 0.333 V standard, include external connectors
Optional LEDs	Indicate operational and connectivity status
Optional Digital Inputs	Include external connectors
Optional Temperature Input	Includes external connector
Optional GPS Receiver	Active antenna, 12 channel
Expansion Slot Type A	Accommodates up to four 129 mm x 91 mm (5.07" x 3.58") expansion cards. Each expansion slot includes card guides, USB data, and power interconnect with +3 VDC to +12 VDC variable voltage input determined by expansion card, 3 W average power dissipation.
Expansion Slot Type B	Accommodates one expansion card of up to 144 mm x 107 mm x 40 mm (5.67" x 4.21" x 1.57"). Designed for expansion cards that do not conform to the Type A expansion card format. USB power and data interconnect support included in the slot area; up to two antenna connections supported.
Expansion Slot Type C	Accommodates one expansion card of up to 204 mm x 151 mm x 15 mm (8.03" x 5.94" x 0.59"). Designed for expansion cards that do not conform to the Type A expansion card format. USB power and data interconnect, Ethernet, supported; up to four antenna connections supported.

Category	Rating
??Infrared Port	??EN 61107 mode C optical communications physical and electrical interface operating at direct-connect speeds up to 9.6 kbps. ??A ferrous metal ring is integrated into the optical connection socket for use with a compatible, magnetically-coupled infrared reading head.

Life Expectancy

Table 12 summarizes the life expectancy specifications for ECN 7620 and 7650 devices.

Table 12. Life Expectancy Specifications

Category	Rating
Life Expectancy	The Data Concentrator has been designed for a life expectancy of at least 10 years, at annual average ambient temperatures less than or equal to 35 °C and greater than or equal to -40 °C.
??MTBF	??The predicted mean time between failures (MTBF), based on MIL-217F Notice 2 with realistic modifications at 25°C, is approximately 2,324,908 hours for DC-1000/SL Data Concentrators and 1,785,714 hours for DC-1000/SLE Data Concentrators. ??These MIL calculations are very conservative. DC-1000/SL and DC-1000/SLE Data Concentrators have been designed such that the failure rate for 20 years at an annual average ambient temperature of up to 25°C will not exceed 0.3% failures per year.

B

Safety and High-Voltage Warnings

This appendix provides the safety and high-voltage warnings for the ECN 7000 Series of products.

Safety and High-Voltage Warning



Safety and High Voltage Warning

Ensure that the AC input power is turned OFF before removing the front cover, handling the input power wiring, or connecting any input power cabling to the ECN 7620 or 7650.

The ECN 7620 or 7650 is not equipped with a power disconnect device. When the ECN 7620 or 7650 is installed and mounted, the installer must provide a means to safely remove power and install a circuit breaker with a maximum rating of 16A.

The high-voltage terminal block has a plastic cover protecting the screw terminals used to connect the high-voltage inputs. This cover **MUST** be replaced after the power wires are connected and before the power is activated.

DO NOT under any circumstances connect the ECN 7620 or 7650 to mains voltages outside of the range 100 to 240VAC, -10% to +20%, 50/60Hz.

DO NOT under any circumstances connect the ECN 7620 or 7650 to a modem whose required operating voltage is not 14 VDC (300mA maximum).

Alerta de Seguridad y Alto Voltaje

Asegúrese que la red eléctrica de corriente alterna AC este **DESENERGIZADA** antes de: remover la cubierta, manipular los cables de alimentación o conectar cualquier cableado al dispositivo ECN 7620 o 7650.

El ECN 7620 o 7650 no esta equipado con un dispositivo de desconexión de energía. Cuando el dispositivo está instalado y montado, el instalador debe proporcionar medios para remover la energía de manera segura e instalar un interruptor de energía con un valor nominal máximo de 16 A.

Bajo **NINGUNA** circunstancia opere el dispositivo ECN 7620 o 7650 en redes eléctricas con voltajes fuera del rango 100 to 240VAC, -10% to +20%, 50/60Hz.

Bajo **NINGUNA** circunstancia conecte el dispositivo ECN 7620 o 7650 a un módem cuyo voltaje de funcionamiento esté fuera del rango 14 VDC @ 300mA.

Sécurité et Avertissement Haute Tension

Assurez vous que l'interrupteur Marche Arrêt est dans la position Arrêt avant d'enlever le capot ou de manipuler les câbles d'alimentation, ou bien quand vous branchez un cordon secteur au ECN 7620 ou 7650.

L' ECN 7620 ou 7650 ne possède pas d'interrupteur pour son alimentation. Une fois l' ECN 7620 ou 7650 monté, l'installateur doit fournir un moyen de couper cette alimentation de manière sécurisée et d'installer un interrupteur externe d'un valeur maximale de 16A.

Le bloc terminal haute tension possède un couvercle plastique pour protéger le bornier à vis recevant la puissance. Ce couvercle DOIT être remplacé correctement à son emplacement d'origine une fois les câbles vissés et avant que la puissance ne soit activée.

Il ne faut JAMAIS connecter l'ECN 7620 ou 7650 à une tension d'alimentation hors de la plage 100 to 240VAC, -10% to +20%, 50/60Hz.

L'ECN 7620 ou 7650 ne possède pas d'interrupteur pour son alimentation. Une fois l'équipement monté, l'installateur doit fournir un moyen de couper cette alimentation de manière sécurisée avec un interrupteur externe.

Sicherheitshinweis: Vorsicht Hochspannung

Schalten Sie die Stromversorgung AUS bevor Sie den Gehäusedeckel entfernen, die Stromführenden Kabel berühren, oder jegliche Netzverbindung mit dem Gerät ECN 7620 oder 7650 hergestellt wird.

Der ECN 7620 oder 7650 besitzt keinen eigenständigen Stromunterbrechungsmechanismus. Bei der Installation muss der Installateur für eine sichere Möglichkeit der Stromunterbrechung sorgen und einen Sicherungsautomaten mit einem Höchstnennstrom von 16 A anbringen.

Die Klemmenleiste besitzt eine Plastik Haube und schützt die Schrauben die zum Anschluss der Hochspannung dienen. Diese Haube MUSS wieder angebracht werden, nachdem die Stromkabel angeschlossen und bevor die Stromzuführung wieder freigeschaltet wurde.

Unter KEINEN UMSTÄNDEN darf das Gerät ECN 7620 oder 7650 mit einer Eingangsspannung außerhalb des Bereichs 100 to 240VAC, -10% to +20%, 50/60Hz betrieben werden.

Unter KEINEN UMSTÄNDEN darf das Gerät ECN 7620 oder 7650 an ein Modem angeschlossen werden, dessen vorgeschriebene Betriebsspannung außerhalb folgender Bereiche 14 VDC @ 300mA.

Säkerhets- och högspänningsvarning

Kontrollera att nätspänningen är FRÅN innan höljet tas bort, nätledningarna vidrörs eller nätkablar ansluts till ECN 7620 or 7650 -enheten.

ECN 7620 eller 7650 är inte utrustad med en fråkopplingsenhet till nätet. När datakoncentratorn installeras och monteras, måste installatören se till att det går att stänga strömmen på ett säkert sätt och montera en huvudströmbrytare med max 16A spänning.

Kopplingsplinten till högspänningen har ett plastskydd som skyddar skruvkontaktarna som används för att ansluta ingående högspänning. Detta skydd MÅSTE sättas tillbaka efter det att nätkablarna anslutits och innan nätspänningen slås på.

ECN 7620 eller 7650 enheten får under inga omständigheter anslutas till nätspänningar som inte ligger inom intervallen 100 to 240VAC, -10% to +20%, 50/60Hz.

ECN 7620 eller 7650 -enheten får under inga omständigheter anslutas till ett modem vars driftspänning ligger utanför intervallen 14 VDC @ 300mA.

Avvertenza sulla Sicurezza e sull'Alta Tensione

Assicurarsi che la rete elettrica sia SPENTA prima di rimuovere il coperchio, maneggiare i cavi di alimentazione, o connettere qualsiasi cavo al ECN 7620 o 7650.

Il ECN 7620 o 7650 non viene fornito con un dispositivo di disconnessione dell'alimentazione. Quando il concentratore viene installato e montato, l'installatore deve predisporre un sistema per poter staccare l'alimentazione in sicurezza e installare un interruttore del circuito con una potenza massima di 16A.

NON connettere mai per nessun motivo il ECN 7620 o 7650 a tensioni al di fuori del range 100 to 240VAC, -10% to +20%, 50/60Hz.

NON connettere mai per nessun motivo il ECN 7620 o 7650 ad un modem la cui alimentazione sia al di fuori del range 14 VDC @ 300mA.

Safety Warning



Safety Warning

The ECN 7620 or 7650 uses three Wickmann rated 250VAC, 10A, SLO-BLO fuses, one per each phase.

Advertencia de Seguridad

El ECN 7620 o 7650 usa un Wickmann clasificado a 250VAC, 10A, SLO-BLO.

Avertissement Sécurité

L' ECN 7620 ou 7650 utilise un Wickmann à 250VAC, 10A, fusion lente SLO-BLO.

Sicherheitshinweis

Die Sicherung (Wickmann) im ECN 7620 oder 7650 ist ausgelegt für 250VAC, 10A, SLO-BLO.

Säkerhetsvarning

Säkring i ECN 7620 eller 7650 använder en nominal Wickmann 250VAC, 10A, SLO-BLO.

C

ESD and Battery Warnings

This appendix provides the electrostatic discharge (ESD) and battery warnings for the ECN 7000 Series of products. The battery is end-user serviceable, and the ECN 7620 or 7650 device will continue to operate even if the battery fails.

ESD Warning



ESD Warning

This product contains components which are sensitive to static electricity. Before installing or removing the serial cable, touch earth ground with your hand to discharge any static electricity which may have accumulated.

Advertencia de ESD

Este producto contiene componentes que son sensibles a la electricidad estática. Antes de instalar o de quitar el cable serial, asegúrese de tocar un contacto a tierra para descargar cualquier electricidad estática que pudiera haberse acumulado.

Avertissement ESD

Ce produit contient des composants qui sont sensibles à l'électricité statique. Avant de brancher ou de débrancher le cordon série, veuillez placer la main sur la borne de terre pour évacuer toute électricité statique accumulée.

Hochspannung ESD

Dieses Produkt beinhaltet Komponenten die empfindlich für eine statische Aufladung sind. Bevor Sie serielle Kabel installieren oder entfernen, müssen Sie für eine ordnungsgemäße Entladung der statischen Aufladung sorgen, indem Sie mit der Hand eine Erdungsstelle berühren.

ESD Varning

Denna produkt innehåller komponenter som är känsliga för statisk elektricitet. Innan seriekablen ansluts eller tas bort, vidrör markjord med handen för urladdning av eventuell statisk elektricitet som kan ha uppstått.

Battery Warning



Battery Warning

The ECN 7620 or 7650 contains a backup battery for the real-time clock. There is a risk of explosion if this battery is replaced with an incorrect type. Please dispose of the used batteries in accordance with the manufacturer's instructions.

Advertencia de la Batería

El ECN 7620 o 7650 contiene una batería de reserva. Hay un riesgo de explosión si esta batería se substituye por una del tipo incorrecto. Disponga por favor de las baterías usadas de acuerdo con las instrucciones del fabricante.

Avertissement Batterie

L' ECN 7620 ou 7650 contient une batterie pour les sauvegardes. Il y a un risque d'explosion dans le cas où cette batterie est remplacée par un modèle non conforme. Mérite d'utiliser des batteries en accord avec les instructions constructeur.

Sicherheitshinweis: Vorsicht Batterie!

Der ECN 7620 oder 7650 enthält eine Batterie für die Echtzeituhr. Es besteht die Gefahr einer Explosion, falls diese Batterie durch einen falschen Batterietyp ersetzt wird. Bitte, entsorgen Sie die gebrauchten Batterien entsprechend den Herstellerhinweisen.

Avvertenza sulla Batteria

Il ECN 7620 o 7650 contiene al suo interno una batteria di back-up per il funzionamento del real time clock (RTC). Se la batteria viene sostituita con un tipo non conforme, ci potrebbe essere pericolo di esplosione. Si prega di eliminare le batterie usate in accordo con quanto specificato nelle istruzioni del costruttore.

Batterivarning

ECN 7620 eller 7650 har ett back-up-batteri. Om batteriet byts ut mot ett batteri av fel typ föreligger explosionsrisk. Se till att batteriet förstörs enligt tillverkarens anvisningar.