

NCH-1000 Installation Instructions



Regulatory Compliance

Safety

This device has been tested and found to be in compliance with the requirements set forth in UL 916, Energy Management Equipment, and is listed by Underwriters Laboratories, Inc., for installations in the United States.

This device has been tested and found to be in compliance with the requirements set forth in C22.2, No. 205-M1983, Signal Equipment, and is Certified by Underwriters Laboratories, Inc., for installations in Canada.

Electromagnetic Compatibility (EMC)

Federal Communications Commission (FCC)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE! This device has been tested and found to comply with the limits established for Class A digital devices. It is intended to be used in a commercial environment. Operation of this equipment in residential environments may cause harmful interference, in which case the user may be required to correct the interference at his own expense.

CAUTION! Any changes or modifications not expressly approved by Novar Controls Corporation could void your authority to operate this equipment.

Industry Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled *Digital Apparatus*, ICES-003, of Industry Canada.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouiller: *Appareils Numériques*, NMB-003, édictée par l'Industrie Canada.

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Description

These instructions are intended for those installing the NCH-1000 in a Novar Controls epiLoad[®] solenoid-operated circuit breaker panel.

The NCH-1000 is a digital control module that is part of Novar Controls Corporation's Energy Infosystem. When properly installed in the Novar Controls epiLoad Panelboard System, the NCH-1000 is connected to the module communications line of an EP/2 or Savvy[®] master control module. It is used to turn the solenoid-operated circuit breakers on and off in groups according to time-of-day schedules and other programmable parameters (see list below).

Each NCH-1000 can be programmed for up to eight control groups (loads). Any of the circuit breakers can be programmed to respond to any of the groups. If more than one NCH-1000 is installed on a Novar Controls network, the circuit breakers of one installed NCH-1000 can be linked via software to the control groups of another.

Through the Novar Controls ESS32 software, each control group of the NCH-1000 can be programmed to respond to:

- Schedules
- Outdoor light level
- Demand (kW)
- Phase loss
- Site emergency
- Schedule timed override
- Sequence to another output

In addition, each load can be programmed for:

- The time delay (in 1/4-second increments) that occurs between switching of the circuit breakers.
- The circuit breakers (up to 48) to be switched.
- A presence alarm that occurs if the circuit breaker is not physically there.
- A programmable time delay that puts the circuit breakers back into automatic operation after they have been manually forced on.

NOTE! If a breaker has been manually overridden to the off position, it can only be returned to automatic operation manually.

- A confirmation fault alarm that occurs if the circuit breaker does not properly switch when it is commanded to do so.
 - Future capabilities of interfacing with the Eaton Cutler-Hammer INCOM[™] Network.
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Specifications

Agency Approvals

Listed device:	CUL/UL E90949
Standards used:	UL 916, Energy Management Equipment CSA C22.2, No. 205-M1983, Signal Equipment

Power Requirements

Voltage:	28-VAC, internally provided by the circuit breaker panel
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Novar Controls Module Network Communications

RS-485:	Two-wire shielded cable (Belden 8761, Novar Controls WIR-1010 or equivalent)
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INCOM Network Communications

Future use (not currently available). Refer to Eaton Cutler-Hammer Spec IL 17513 (available at www.ch.cutler-hammer.com).

Operating Environment

Temperature:	-40° to 158°F (-40° to 70°C)
Humidity:	0–95% relative humidity, noncondensing

Inputs/Outputs

Timed overrides:	Momentary push buttons (8; not included)
Schedule Status:	Light-Emitting Diodes (LEDs) (8; not included)

Physical Dimensions

Height:	3.5 inches
Width:	9.25 inches
Depth:	1.125 inches
Weight:	0.5 lb

Precautions

Take the following precautions during installation:

NOTE! Remove the NCH-1000 from the panel until all circuits have been tested and verified.

- Observe all national and local electrical codes.
 - Do not route the low voltage control wires through a line voltage section of the circuit breaker panel. If the wires *must* be run through a line voltage section of the panel, use suitable wire with the proper insulation ratings.
 - Check to make sure that no more than 28–30 volts AC power is available at the 28-VAC Secondary Power switch (inside the enclosure where the NCH-1000 is to be installed; see Figure 1).
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Checking Breaker Count and Jumper Placement

The NCH-1000 will be mounted in an enclosure in the Novar Controls epiLoad Controller Chassis, located below the circuit breaker panels of the Novar Controls panel board.

Before the NCH-1000 is installed in this enclosure, the breaker count and jumper placement must be checked. The jumper can be found in one of seven positions located on the back wall of the inside of the enclosure. The positions are divided into two rows:

- The top row contains (left to right) positions labeled 24, 30, 36, and 42.
- The bottom row contains (left to right) positions labeled 6, 12, and 18.

The jumper should be plugged into the position that corresponds to the number of circuit breakers on the panel board or into the next higher position if none of the positions corresponds to the number of breakers.

Examples:

- The jumper for a board with 18 circuit breakers should be in the position labeled 18.
- The jumper for a board with 28 circuit breakers should be in the position labeled 30.

Use the following procedure to check the number of circuit breakers and jumper position and adjust the position, if necessary.

Step	Procedure
1	Count the total number of circuit breakers on the panel board.
2	<p>Check the position of the jumper to determine if it is in the correct position.</p> <ul style="list-style-type: none"> ■ If the jumper is not in the position that corresponds to the number of circuit breakers on the panel board or in the next higher position, <i>gently</i> pull it from its current position and insert it in the correct position. Be careful not to bend the pins on the jumper.

Mounting the NCH-1000

The enclosure contains the transformer that will power the NCH-1000 after it is installed. It also contains mounting posts and sockets for installing it. The back of the NCH-1000 contains connecting pins that must enter the Novar Controls epiLoad sockets.

Use the following procedure to mount the NCH-1000 in its enclosure.

Step	Procedure
1	Make sure that power to the epiLoad Controller Chassis is off.
2	Loosen the four screws in the corners of the epiLoad 's Controller Chassis cover and remove it.
3	Align the NCH-1000 <i>carefully</i> with the Novar Controls mounting posts and sockets.
4	Push the NCH-1000 <i>gently</i> against the epiLoad panel so that the pins on the back of the module enter the Novar Controls sockets.
5	Insert a screw into each of the two mounting holes on the NCH-1000 (see Figure 1) and tighten to secure the module to the panel.

Optional Circuit Boards

The NCH-1000 can be ordered with two optional circuit boards:

- Remote timed override

This circuit board contains a terminal strip to which momentary push-button switches and LEDs can be wired. These push buttons are used to initiate timed override periods as they are defined in the Novar Controls software. The LEDs indicate schedule status. There is a one-to-one relationship between the buttons and the control groups (override button #1 is for control group #1, etc.). Between panels, if circuit breakers of several panels are linked via the software, they follow the same timed override commands.

- INCOM Network Communications

This is an Eaton Cutler-Hammer proprietary communications network that is used to communicate with various smart metering devices (e.g., the Eaton Cutler-Hammer IQ 200 Electrical Distribution System Meter). INCOM Network Communications is currently not available on the NCH-1000. When it is, the information that is available from these energy monitoring devices will be available remotely via the Novar Controls remote communications network.

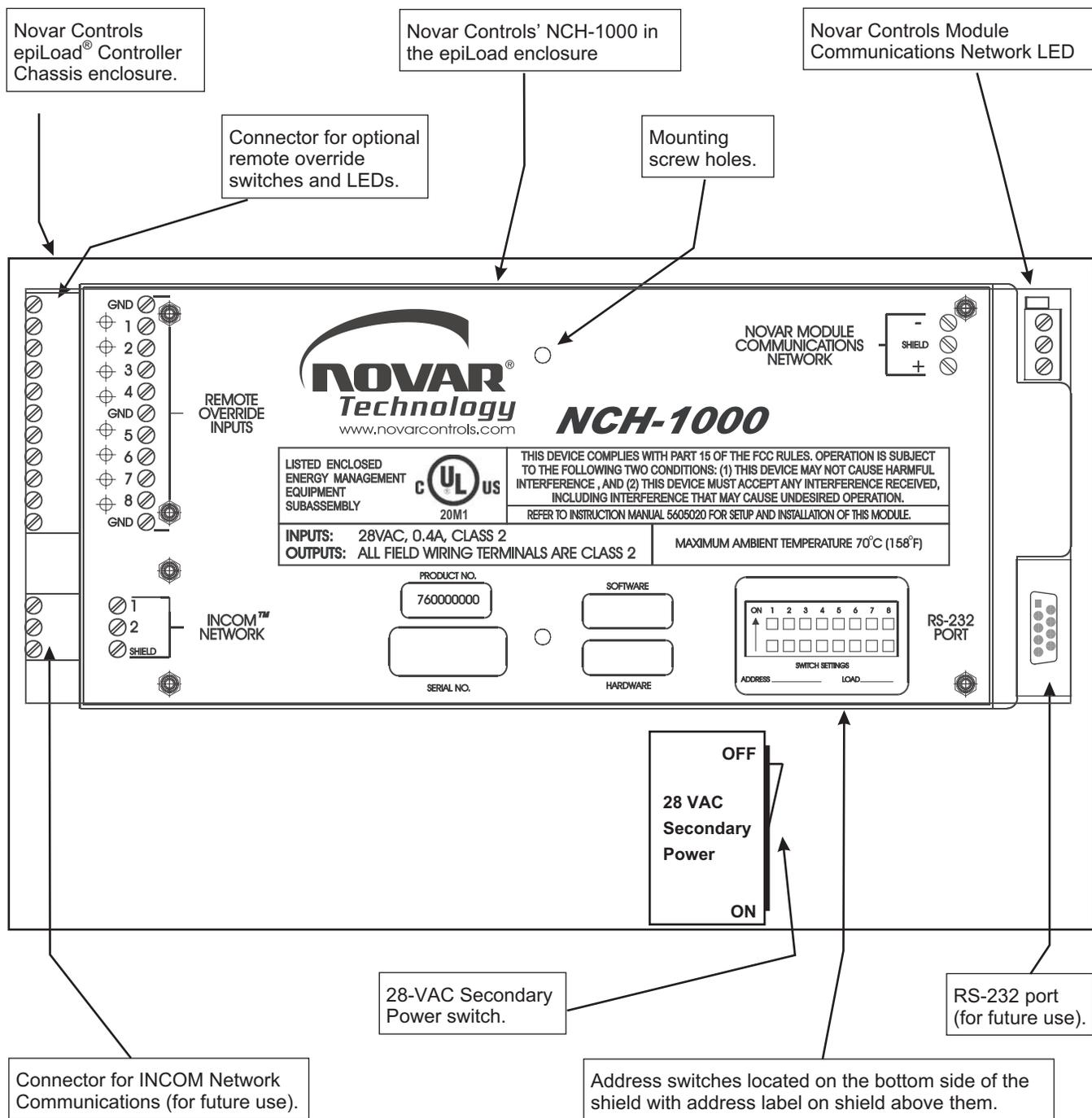


Figure 1. Novar Controls epiLoad Controller Chassis with NCH-1000 installed

Wiring the NCH-1000

CAUTION! When wiring the NCH-1000, be sure to take the precautions specified in these instructions.

The internal control compartment that houses the NCH-1000 has two knockouts for routing the control wires.

- Route wires for the two communication networks and remote timed overrides through the knockouts to the appropriate connections on the board.
- Connect the Novar Controls Module Communications Network positive (+), negative (-), and shield wires to the positive (+), negative (-), and shield designations (respectively) on the board. The removable terminal strip can be temporarily pulled out to assist in making the wiring connections.

Wiring Procedures for the Remote Timed Override Board

The remote timed override option consists of a circuit board and a removable terminal strip.

NOTE! The terminal strip can be removed during installation, if desired.

Use the following procedure to wire the remote timed override option.

Step	Procedure
1	Make sure that power to the epiLoad Controller Chassis is turned off.
2	Remove the epiLoad Controller Chassis cover if it has not already been removed.
3	Assemble the remote override switch assemblies (consisting of a momentary contact switch and a red light-emitting diode [LED]). <ul style="list-style-type: none">■ The LED is used to provide schedule status and override feedback.■ The LED is in parallel with the switch.
4	Use a two-conductor wire to make the following connections: <ul style="list-style-type: none">■ Connect one wire from the side of the switch that has the anode (longer leg of the LED) tied to it to the appropriate input (1–8) on the terminal strip.■ Connect the second wire to any of the GND terminals.
5	<i>(Optional)</i> Common the ground connections from several switches (remotely, if desired) with one wire returning to the terminal strip.

continued

6	Set the address switches (see “Setting the Module Address” below).
7	Restore the power to the epiLoad panel.

NOTE! When the LED is on, the schedule status is on and the remote override cannot be activated. Pressing the remote override switch causes the LED to flash once but has no effect on the override condition. If the LED is off, the schedule status is off and the remote override can be activated. The LED flashes continuously during remote timed override.

NOTE! Remote switches must be momentary dry contact only, not a held contact. A spring-return keylock switch is acceptable. The contact resistance must be less than 20 ohms.

Setting the Module Address

Every Novar Controls module must have a unique address for the Savvy or EP/2 to identify it. Addresses are assigned in the software during system programming. Use the system printout to find the address of the NCH-1000 being installed.

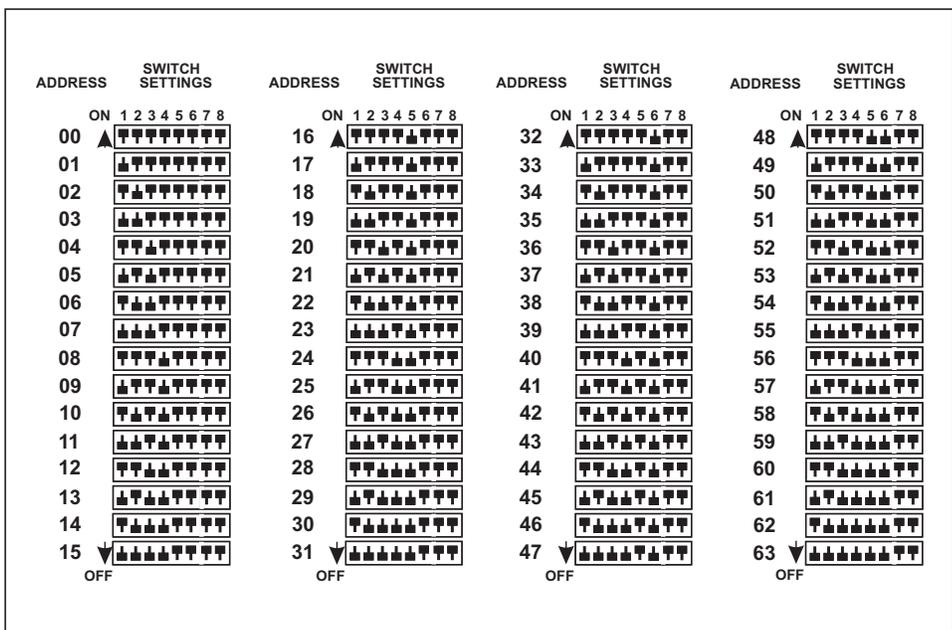


Figure 2. NCH-1000 address settings

Set the switches with the correct address from 00 to 63 (see Figure 2). Address settings 64 through 127 duplicate the sequence of settings shown in Figure 2 (address setting 64 is the same as address setting 00, etc.).

NOTE! Switches 7 and 8 are reserved. Leave them in the on position.

Once the address has been set, write the address on the address label on the NCH-1000 shield.

Power for the NCH-1000

Power is provided internally from the epiLoad panel. No supplemental external power needs to be provided. The enclosure that houses the NCH-1000 contains a fuse and power switch that is supplied by Novar Controls.

Manually Overriding the Circuit Breakers

When the circuit breaker is on, it can be automatically switched by the solenoid and the NCH-1000. There is a red/green indicator on each circuit breaker. The indicator should display the true status of the circuit.

- Red is on.
 - Green is off.
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Override Off

When a circuit breaker is manually overridden to the off position, the software cannot automatically switch it back to the on or automatic position. This can only be done manually. When the circuit breaker is manually overridden to off, the indicator will be green.

Override On

To override the automatic operation and put the circuit breaker in the on position, push the breaker to the off position first and then to the on position. This will force the breaker on, and the indicator will be red. The Novar Controls software will detect this and start a (programmable) timer. When the timer expires, the circuit breaker will be returned to automatic control, and the indicator's color will show the true status of the circuit.

Model and Part Numbers

Use the part numbers provided in Table 1 to order the appropriate Novar Controls parts.

Table 1. Novar Controls Part Numbers		
PRODUCT	MODEL NO.	PART NO.
NCH-1000 Lighting Controller	NCH-1000 LC	760000000
NCH-1000 with remote override	NCH-1000 OVR	760001000
NCH-1000 with INCOM	NCH-1000 INCOM	760002000
NCH-1000 with INCOM and Override	NCH-1000 INCOM & OVR	760003000

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