

## Installation Instructions for FT-10 Network PowerCommand ATS Communication Module (NCM) Kits 541-0812 and 541-0868

### PURPOSE OF KIT

A Network Communication Module (NCM) is required for connection of a PowerCommand® OTPC, BTPC, OHPC, or CHPC Automatic Transfer Switch (ATS) to a LONWORKS® FT-10 network. The NCM provides an interface for data from the transfer switch to other modules on the network. It communicates with the digital board providing complete monitoring and control of the transfer switch.

This instruction sheet covers the installation of the following kits:

- 541-0812 – 40-1000 Amp Transfer Switches
- 541-0868 – 1200-3000 Amp Transfer Switches

### GENERAL INFORMATION

#### Requirements

- NEMA Level IV, 22 AWG Stranded Twisted-Pair Cable
- CPG Device Stencil (LonMaker installed only)
- LonMaker™ Software (Manual Installation)
- PowerCommand® Transfer Switch Software v1.08.204 or later
- Self-Installation with a genset requires a genset with an FT-10 network interface device.\*  
\*NOTE: PCC 3100 with GCM (327-1301), PCC 3200 with GLC (327-1299), PCC 2100 with NCM (327-1275), or CCM-G (327-1280).
- InPower® Service Software (Use to enable the network feature. See the ATS Service section in the *InPower User's Guide* 3397101.)

Network installation must be performed by trained network personnel. When installation is complete, the transfer switch is ready for connection to a net-

work. Refer to the *PowerCommand Network Installation and Operation Manual (900-0529)* for instructions on network wiring and network software installation.

### KIT PARTS

Prior to installation, verify receipt of the proper parts from the table below.

Part Description	Quantity	
	541-0812	541-0868
Battery Bracket	1	1
Battery	2	2
Network Harness	1	1
Standoff, Hex Threaded (M3)	4	4
Screw, Pan, Cross Head (M3 x 8)	4	4
PCB Assembly, Network Communication Module	1	1
Washer, Flat	2	-
Screw, Phillips Hex, (M4 x 10)	2	-
Tag, Terminal	2	2
Terminal Block Sectional	2	2
End Bracket, Terminal	2	2
End Plate, Terminal	1	1
Rail, Terminal Block	1	1
Nut, Self Locking (1/4-20)	4	-
Screw, Hex Cap Head (1/4-20 x 3/4")	4	-
Plate, Mounting	1	-
Ties, Cable	8	2
Mount, Cable Tie	2	-
Nut, Hex (M4)	-	2
Lead	1	1

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InPower is a trademarks of Onan Corporation.  
LONWORKS IS a registered trademark of Echelon Corp.  
LonMaker is a trademark of Echelon Corporation.

## SAFETY PRECAUTIONS

Read these instructions completely and become familiar with safety warnings, cautions, and procedures before starting the installation.

**⚠WARNING** *AC power within the cabinet and the inside of the cabinet door presents a shock hazard that can cause severe personal injury or death. Always wear eye protection and use extreme caution to avoid touching electrical contacts when the cabinet door is open. Remove power to the door by disconnecting connectors J1/P1 (OTPC, OHPC, CHPC) or J10/P10 (BTPC) located on the cabinet door or on the control plate near the motor disconnect switch. The following procedures are to be performed only by technically trained and experienced personnel.*

**⚠WARNING** *Accidental starting of the generator set while working on it can cause severe injury or death. Disconnect the battery cables to prevent accidental starting. Always disconnect the negative (-) cable first, and connect it last, to prevent arcing if a tool accidentally touches the frame or other grounded metal parts of the set while connecting or disconnecting the positive (+) cable. Arcing can ignite explosive hydrogen gas given off by the battery and cause severe injury. Ventilate the battery compartment before removing cables.*

## PHYSICAL INSTALLATION

### Network Module Installation

1. Turn the operation selector switch to Off/Stop. (The selector switch is located on the generator set control panel on two-wire start systems.)
2. If possible, remove all sources of AC power to the transfer switch.
3. If there is an external battery charger, disconnect it from its AC power source. Then disconnect the set starting battery (negative [-] lead first).

**⚠WARNING** *Ignition of explosive battery gases can cause severe personal injury. Do not smoke or cause any spark, arc, or flame while servicing batteries.*

4. Open the transfer switch door and disconnect power to the door by disconnecting connector P1 on the OTPCs, OHPCs, and CHPCs, or P10 on the BTPCs.
5. Use a wrist strap or touch a grounded surface to discharge any static charge before handling circuit boards.

6. Locate the digital module on the cabinet door. Remove one of the batteries from the Digital Module. Remove the four mounting screws on the left side of the board.
7. Attach the four standoffs to the digital module (see Figure 1).

**⚠CAUTION** *Ribbon cables are fragile. Do not fold or bend sharply or pull on the end connectors. Cable damage can degrade signal performance.*

8. Attach the ribbon cable to connector J20, on the digital module.
9. Use two M3 x 8 pan head screws to mount the network module on the top two standoffs.
10. Attach one end of the network harness to the Data 1 and Data 2 terminals of the two-position terminal block (J30), (polarity insensitive, see Figure 2).
11. Install the battery lead (see Figure 3):
  - a. Remove the P27 connector from the J27 connector on the digital module.
  - b. Insert the lead terminal into pin 21 of the P27 connector.
  - c. Fasten the stripped end of the lead to terminal 3 (B+) of TB2 on the transfer switch.
  - d. Reconnect the P27 connector on the digital module.
  - e. Use cable ties to secure the lead to the ATS harness.

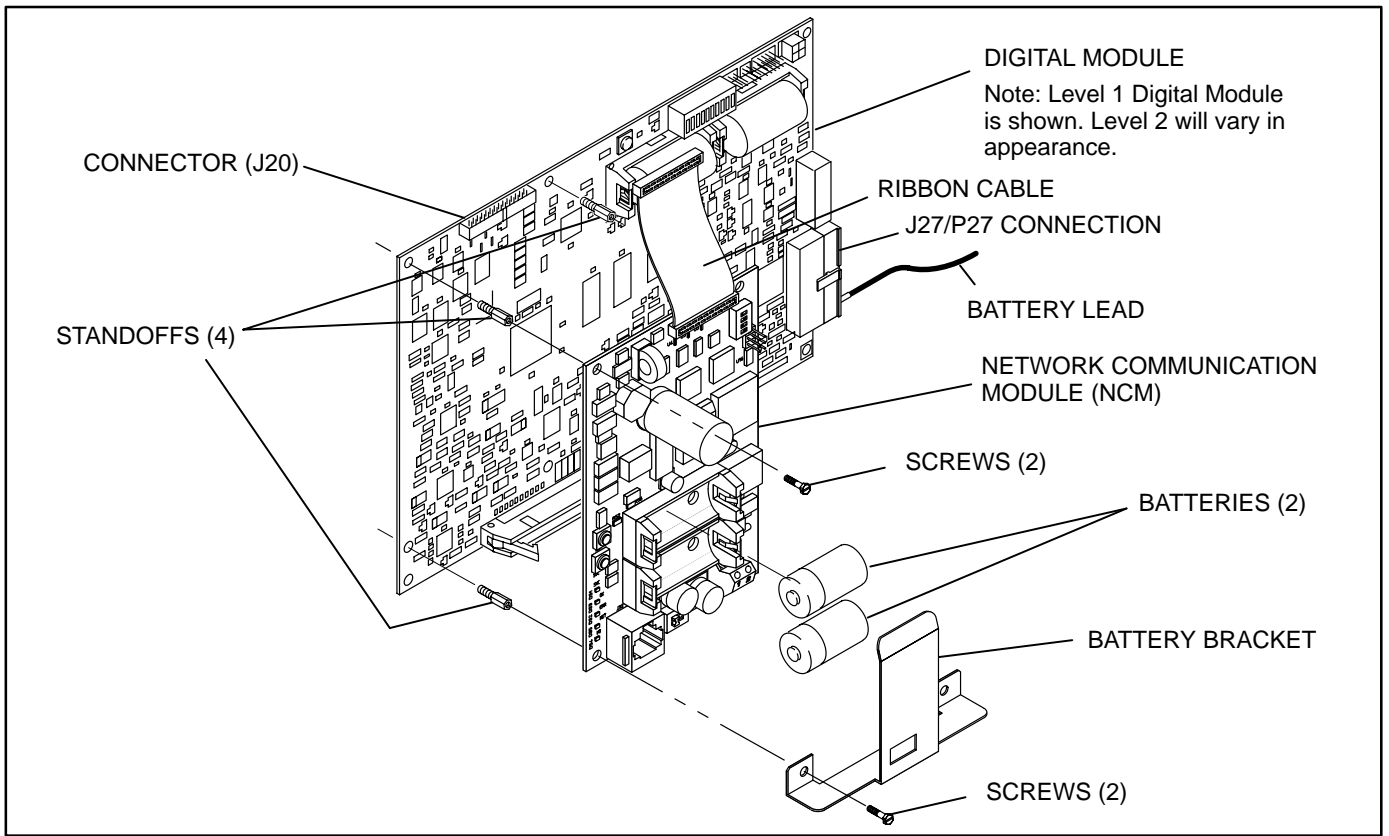
12. Install the two Lithium batteries.
13. Use two M3 x 8 pan head screws to install the battery bracket and secure the network module on the lower two standoffs.
14. Reinstall the battery on the Digital Module.

### Termination

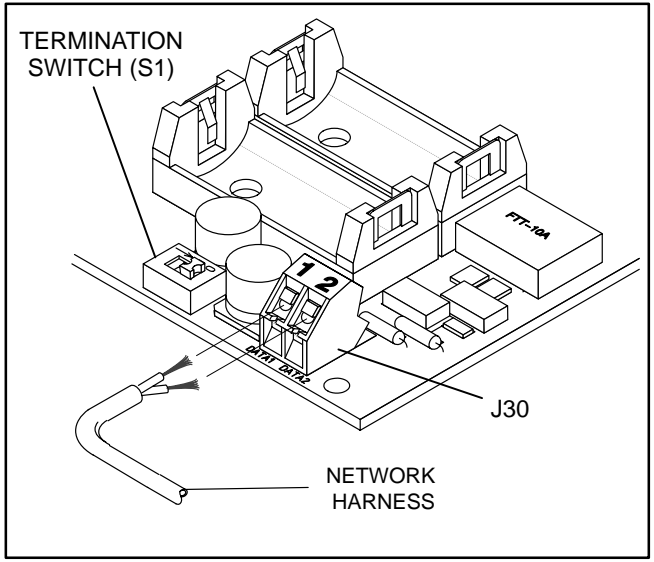
15. If the device is to be terminated, set the S1 switch to the ON position (see Figure 2).

**NOTE:** For free topology, only one device on each segment must be terminated. Multidrop bus topology requires termination at each end of the bus using multidrop bus terminators (Echelon P/N 44101) or the device terminator switch.

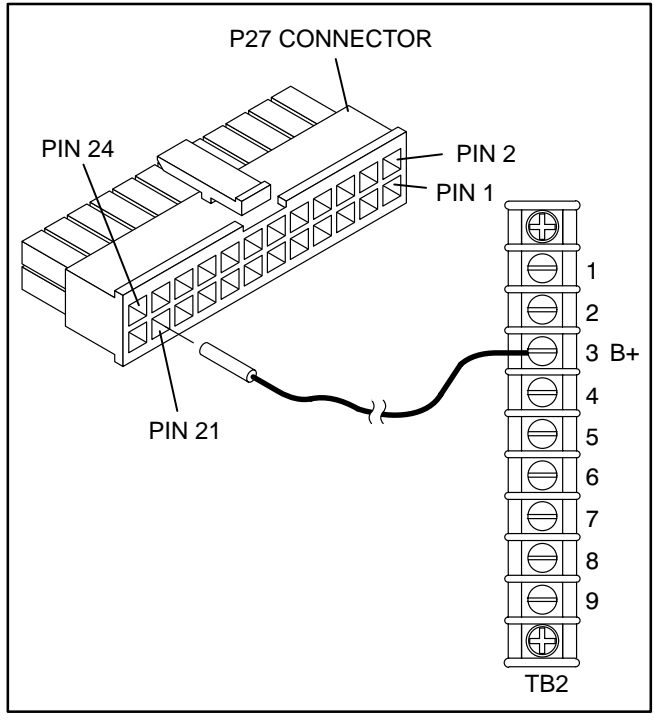
Refer to the *PowerCommand Network Installation and Operation Manual (900-0529)* for instructions on network wiring and network software installation.



**FIGURE 1. NETWORK COMMUNICATION MODULE INSTALLATION**



**FIGURE 2. NETWORK HARNESS CONNECTION**



**FIGURE 3. BATTERY LEAD INSTALLATION**

## Din Rail Installation

Figure 4 shows the installation of the din rail for kit 541-0812. Figure 5 shows the installation for kit 541-0868.

1. Assemble together the two-position terminal block, rail, end plate and end brackets for TB3.

**NOTE:** If the transfer switch is already equipped with TB3, loosen the lower end bracket and slide it down the rail. Attach the two new terminals to the rail and slide the end bracket back up. Tighten against the two new terminal blocks. The end brackets, end plate, rail, and hardware are not required.

2. Apply the terminal tag labels (51 and 52) to the terminals.
3. For kit 541-0868, use the two M4 hex nuts to secure the rail on the transfer switch cabinet according to the size and type of cabinet listed in Table 1. Go to step 6.
4. For kit 541-0812, install TB3 to the mounting plate using the two hex nuts and round head screws provided.
5. Secure the mounting plate to the cabinet according to the size and type of cabinet listed in Table 1.
6. Attach the free end of the network harness (from J30) to terminals 51 and 52.
7. Secure the network harness to the existing harness(es), using cable ties provided.
8. Reconnect power to the door by connecting plugs P1 on the OTPCs, OHPCs, and CHPCs, or P10 on the BTPCs.
9. Reconnect the set starting battery (negative [-] lead first). If there is an external battery charger, connect it to its AC power source.
10. Reconnect the transfer switch to the AC power source (if removed).
11. Return the operation selector switch on the genset to Auto/Remote position.

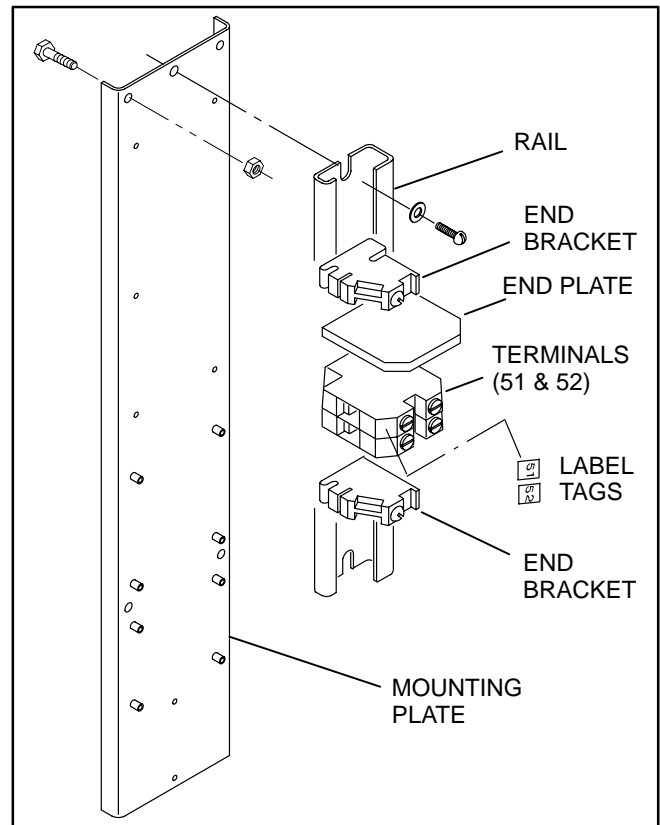


FIGURE 4. DIN RAIL ASSEMBLY (KIT 541-0812)

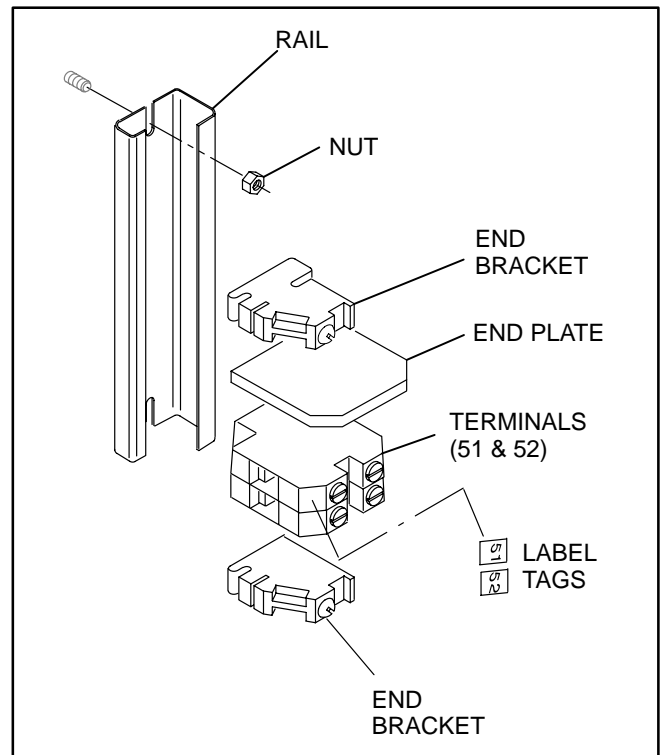


FIGURE 5. DIN RAIL ASSEMBLY (KIT 541-0868)

**TABLE 1. DIN RAIL LOCATIONS**

Model (Amps)	Cabinet Type	Location
OTPC 40–1000 Amps	All Types	Inside, upper left wall
OTPC 1200 Amps	All Types	Inside, upper left wall
OTPC 1600–3000 Amps	Type 1	Left side of cabinet
OTPC 1600–3000 Amps	Type 3R, 4, 12	Right side of cabinet
BTPC 150–1000 Amps	All Types	Inside, upper left wall
BTPC 1200 Amps	Type 1	Inside cabinet, below TB2
BTPC 1200–3000 Amps	All Types	Right side of cabinet
OHPC and CHPC 125–800 Amps	All Types	Inside, upper left wall

**SELF-INSTALLATION**

**Requirements**

This procedure can be used to logically install the NCM when the following requirements are met.

The transfer switch operating software version must be v1.08.204, or later, to support the Network Communication Module software. The software version can be viewed using the digital display in the “About” menu (if equipped) or with InPower.

InPower™ software is required to download software to the PowerCommand ATS and to enable the LonWORKS feature.

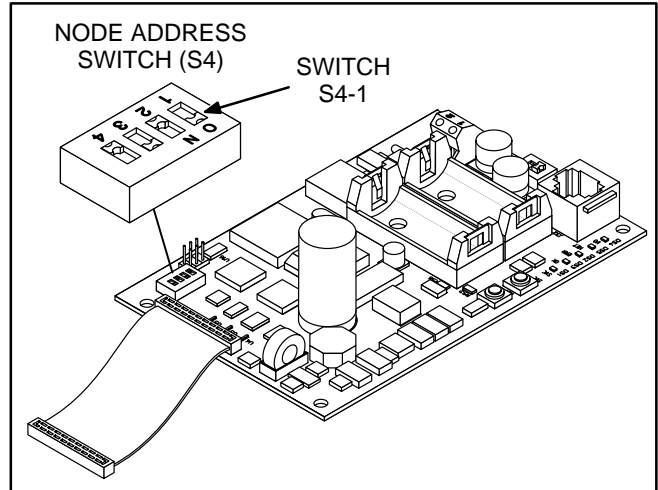
Self-installation is limited to one PowerCommand ATS or CCM-T, one PowerCommand Genset or CCM-G and no more than four annunciators or five DIMs. The PowerCommand ATS can autobind to a genset and can be autobound by up to two annunciators and two DIMs but by no more than a total of three annunciators and DIMs.

With networks containing a genset, the transfer switch NCM must be logically installed after the genset is logically installed and before the annunciator(s) and DIM(s) are logically installed.

If these requirements cannot be met, the system must be installed with LonMaker. Refer to “LonMaker Installation,” following this section.

**Node Address**

Each node on a self-installed network must have a unique address. Switches 1 through 4 of switch S4 are used to set the *Node Address* (Figure 6). The default node address is 0010, which is an “OK” LED pulse rate of 2.



**FIGURE 6. NODE ADDRESS SWITCH**

The switches are oriented so that switch S4-1 is the most significant bit (MSB) of the *Node Address*. Thus, S4-1 has a value of “8” when it is ON. S4-2 has a value of 4, S4-3 has a value of 2, and S4-4 has a value of 1. For example, to set the *Node Address* to 9, set switch S4 to 1001 (8+0+0+1=9). See Table 2 below.

**TABLE 2. SETTING THE NODE ADDRESS (S4)**

S4-1 (8)	S4-2 (4)	S4-3 (2)	S4-4 (1)	Address (binary)	Address (decimal)
OFF	OFF	OFF	OFF	0000	0 <sup>1</sup>
OFF	OFF	OFF	ON	0001	1
OFF	OFF	ON	OFF	0010	2
				↓	↓
ON	ON	ON	ON	1111	15

NOTE1. “0” (zero) is not a valid *Node Address*.

Be sure to assign each node in the network a unique address.

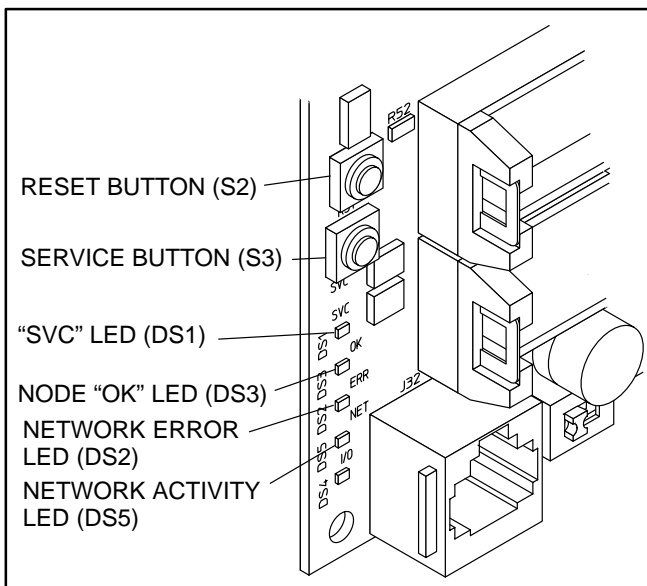
After the device has been installed, the *Node Address* can be verified by counting the number of pulses of the “OK” LED (DS3). See Figure 7. Make sure each device has a unique node address.

## Logical Installation

After the ATS is *physically* connected to the genset, the NCM is ready to be *logically* connected to the genset. Logically connecting to another device is referred to as *binding*. *Binding* may be done at any time once all nodes are installed, connected, and powered.

**NOTE:** The genset and ATS must be FT-10 devices which are able to self-install in the network. Each device on the network must have a unique address.

1. Make sure the genset node is powered, connected to the twisted-pair data bus, and that it has been logically installed **first**.
2. Make sure the PC ATS NCM node is powered and connected to the twisted-pair data bus.
3. Make sure S4-1, S4-2, S4-3, and S4-4 on the NCM are configured for the desired address. Each device on the network must have a unique address.
4. Make sure the network is terminated.
5. Press and hold the *Service* button (S3) (see Figure 7) for approximately two seconds until the *Node "OK"* lamp (DS3) begins flashing.
6. Release the *Service* button to bind to the genset.



**FIGURE 7. BUTTON AND LED LOCATIONS**

The NCM will install itself and search for a CPG FT-10 genset device. If found, the NCM will update its node address and bind to the genset *Start Inputs* and *Status*. An FT-10 annunciator or DIM may now install itself and bind to the ATS.

## Binding Sequence

Logically connecting to another device is referred to as *binding*. *Binding* may be done when all the nodes are installed, connected, and powered.

*Binding* the node must occur in the proper sequence. Logically install the genset first, followed by the transfer switch, and then the annunciator(s) and other network accessories.

**NOTE:** The genset module and ATS (NCM) must be Cummins Power Generation (CPG) devices which are able to self-install in the network. Each device on the network must have a unique address.

## Verify Binding

To verify the ATS has installed itself properly and is bound to the genset, disconnect the twisted-pair data cable at J30. The "Network Error" LED (DS2) (Figure 5) should turn on (red) within 10 seconds. This indicates communications have failed and that the device was properly bound.

Reconnect the twisted pair cable and confirm that DS2 turns off within 10 seconds.

If no error is produced, use InPower to verify the *Test Interval* (located in the LONWORKS folder from the Adjustments directory) is set for 10.0 seconds. Also check the wiring and Address of each node. Repeat the Self-Installation steps to re-initiate *binding*.

## Remove Bindings

If unresolved system errors occur, the bindings can be removed and then re-installed to reset the system. The bindings can also be removed if the network is being changed or the device is being moved to another network.

To remove all bindings from the device, change the *Node Address* (S4) to 0 (zero) and logically re-install the device.

The node will remove all bindings at this time, including the genset and annunciator bindings. The "OK" LED will not flash when the *Node Address* is 0, nor will it attempt to bind to a genset.

## Re-Binding

*Re-Binding* the node must occur in the proper sequence. Logically install the genset first, followed by the transfer switch, and then the annunciator(s) and DIMs.

To re-bind an annunciator or DIM to the transfer switch node, press and hold the Service pin for 2 seconds.

## LONMAKER INSTALLATION

The PowerCommand Transfer Switch NCM can be installed with LonMaker. The Device Stencil is re-

quired. To install using LonMaker:

1. Run LonMaker. Refer to the *PowerCommand Network Installation and Operation Manual (900-0529)*.
2. Open the Device Stencil.
3. Create a new site (or update an existing site).
4. Define, install and bind devices.
5. Verify system operation.

The PowerCommand Transfer Switch is defined and installed like any other device in LonMaker.