Installation Instructions for the PowerCommand 3100 FT-10 Network Genset Communications Module (GCM) Kit 541–0813

PURPOSE OF KIT

A Genset Communication Module (GCM) is required for connection of a PowerCommand® 3100 Genset to an FT-10 network. The GCM (see Figure 1) provides an interface for data from the PowerCommand 3100 Genset to other modules on the network. It communicates with the genset via the engine interface board, and it monitors various circuits to determine the operating state of the control. For example, the GCM stores PCC data such as volts, current, engine speed, and oil temp; and then sends it out on the network when another network node requests the data.

Outputs from the GCM allow remote start of the PCC when needed, or to cause an emergency shutdown on command. The GCM also provides some direct local control and monitoring of the PCC. It monitors for Not-In-Auto mode and High and Low battery voltage.

GENERAL INFORMATION

This kit contains one Genset Communications Module and four stand-offs. The stand-offs are used for mounting the GCM on the analog board inside the PowerCommand Control (PCC 3100) box.

The GCM is mounted inside the PCC housing. The GCM is powered from the genset battery. It remains powered even when the PCC is "asleep," but it is recommended that the PCC S5 switch (see Figure 3) is set to "AWAKE" at all times when a GCM is used.

The instructions describe mounting the GCM inside the control box and connecting the J6 and J7 connectors to the engine interface board. The instructions describe the physical mounting and wiring of this module, and provides information for the *logical* installation and *connection* of the GCM on the network.
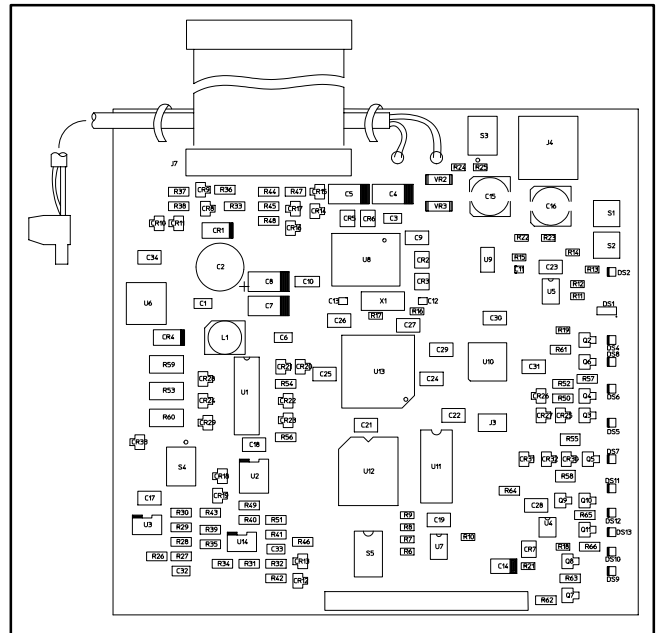
FIGURE 1. GENSET COMMUNICATIONS MODULE

In network terms, "logical installation and connection" refers to programming the various devices (or nodes) on the network so that they can communicate with one another. This communication takes the form of passing network variables from one device to another. The process of assigning connections—linking an output variable of one device to an an input variable of another device—is called "binding."

The GCM must be used with PowerCommand® operating software version 1.06 or newer for all models except DFHA, DFHB, DFHC and DFHD (these models have unique operating software and are GCM compatible with version 2.0 or newer). Before installing this kit, check the version on the display menu. Access the version by pressing the menu buttons displayed in Figure 2. If the version is earlier than the version listed above, obtain and install an EPROM upgrade kit from your distributor before installing this kit.

When installation is complete, the genset is ready for connection to an FT-10 network. Refer to the

PowerCommand Network Installation and Operation Manual (900-0529) for instructions on network wiring, network software installation and connection of the GCM to the network.


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☐< │ ENGINE        GEN │ >☐
☐< │ ADJUST         >> │ >■

■< │ VERSION        << │ >☐
☐< │ SETUP/CAL      >> │ >☐

☐    │ (kW) (model) (hz) << │ > ■ │ BACK │
☐    │ ___ ___  V:___.__ >> │ > ☐
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MUST BE VERSION
1.06 OR LATER

■ < INDICATES BUTTON SELECTED

FIGURE 2. EPROM VERSION CHECK

SAFETY PRECAUTIONS

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

⚠ **CAUTION** *Electrostatic discharge will damage circuit boards. Do not remove the circuit board from the antistatic shipping bag until you are grounded to the PCC with a wrist strap.*

Special Tools Required

• Grounding wrist strap with grounding clip

Circuit Board Handling Precautions

To help prevent circuit board damage due to electrostatic discharge (ESD), a grounding wrist strap must be worn when handling the circuit board. (The wrist strap **does not** provide a direct short to ground, it is typically rated at approximately 1 megohm to ground.)

Attach the clip to a clean unpainted surface of the control box (see Figure 3) and place the strap around your wrist before handling a circuit board.
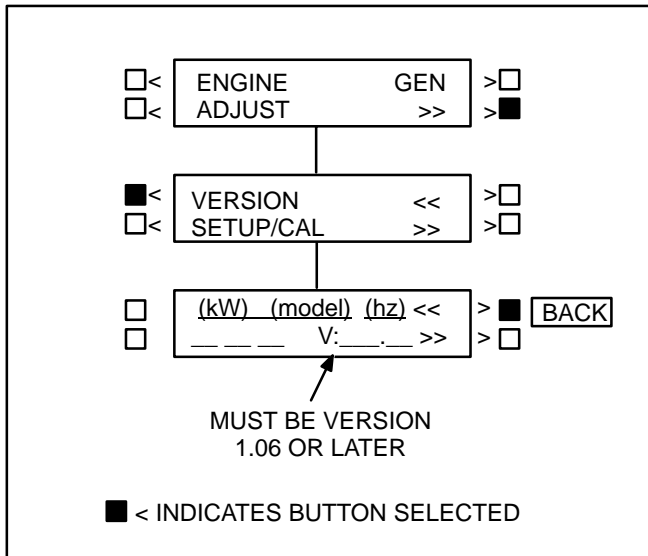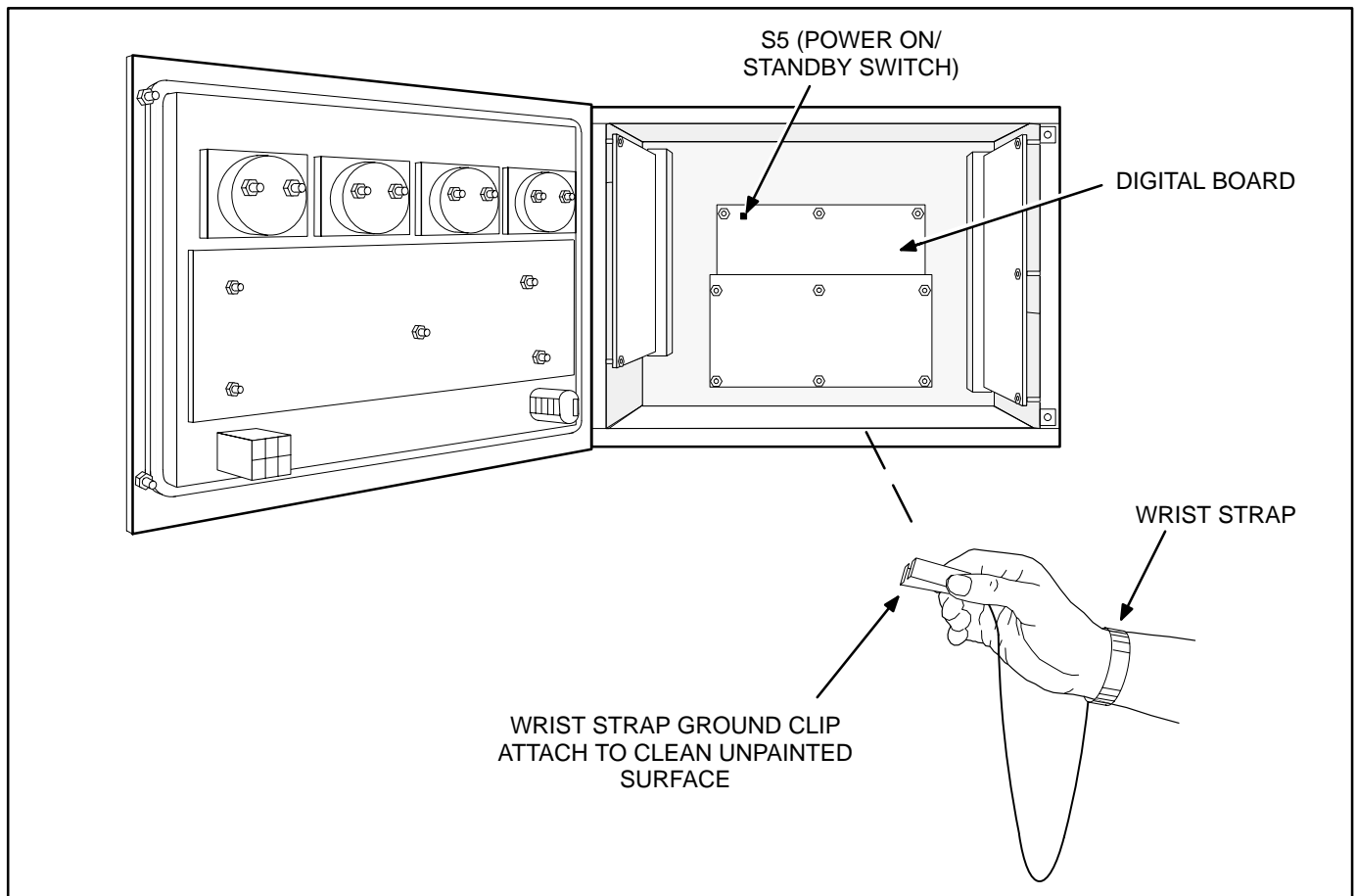

FIGURE 3. WRIST STRAP CONNECTION

PHYSICAL INSTALLATION

1. On the front control panel, place the genset Run/Off/Auto switch in the Off position.

2. Disconnect the battery charger (if applicable). Remove all electrical supply sources.

   ⚠ CAUTION *Always disconnect a battery charger from its AC source before disconnecting the battery cables. Otherwise, disconnecting the cables can result in voltage spikes high enough to damage the DC control circuits of the set.*

3. Disconnect the generator set starting battery cable(s). Disconnect the negative (–) cable(s) first to reduce the risk of arcing.

   ⚠ WARNING *Accidental starting of the genset while working on it can cause severe personal injury or death. Prevent accidental starting by disconnecting the starting battery cables. To reduce the risk of arcing, disconnect the negative (–) cable first. When reconnecting, connect the negative (–) cable last.*

   Make certain the battery area has been well-ventilated before servicing the battery. Arcing can ignite explosive hydrogen gas given off by batteries, causing severe personal injury. Make certain hydrogen gas, engine fuel, and other explosive fumes are fully dissipated. This is especially important if battery has been connected to a battery charger.

4. Open the control box door. Connect the wrist strap ground clip as shown in Figure 3.

5. Use a Phillips screwdriver to remove the four analog board mounting screws shown in Figure 4.

6. Install four new standoffs in place of the analog board mounting screws removed in step 5 (Figure 5). Tighten the standoffs securely.
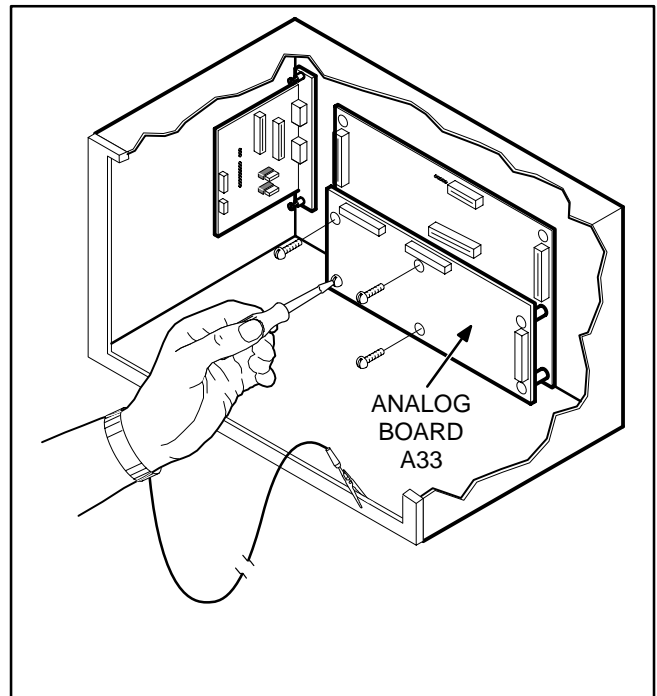

FIGURE 4. PREPARING TO MOUNT GCM
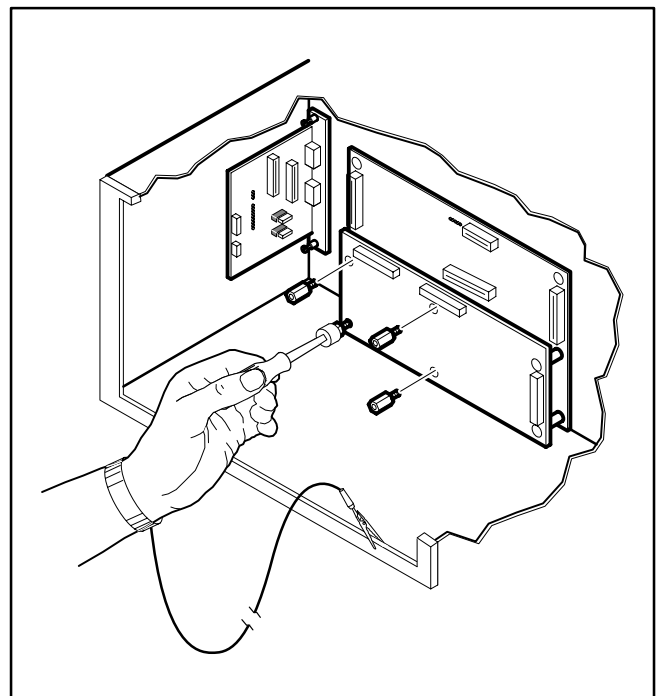
ANALOG BOARD A33


FIGURE 5. INSTALLING STANDOFFS

7. Mount the GCM as shown in Figure 6, use the screws removed from the analog board. Tighten the mounting screws securely.

8. Orient the J6 harness connector as shown in Figure 7. Push the J6 plug securely into the connector on the engine interface board.

9. Spread locking tabs apart on the J7 connector. Fold the ribbon cable, as shown in Figure 7, align key on plug with socket cutout. Insert the J7 harness plug into the J7 connector on the engine interface board. Press in the harness connector, at the location indicated by the arrow, until the locking tabs lock into place.

10. Set the S4 switch on the GCM to **24V** for a 24V battery system or **12V** for a 12V battery system (Figure 7).

11. If the GCM is to be terminated, termination switch S3 must be set. This is accomplished by moving it to the ON or TERM position.

    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, network software installation and connection of the GCM to the network.
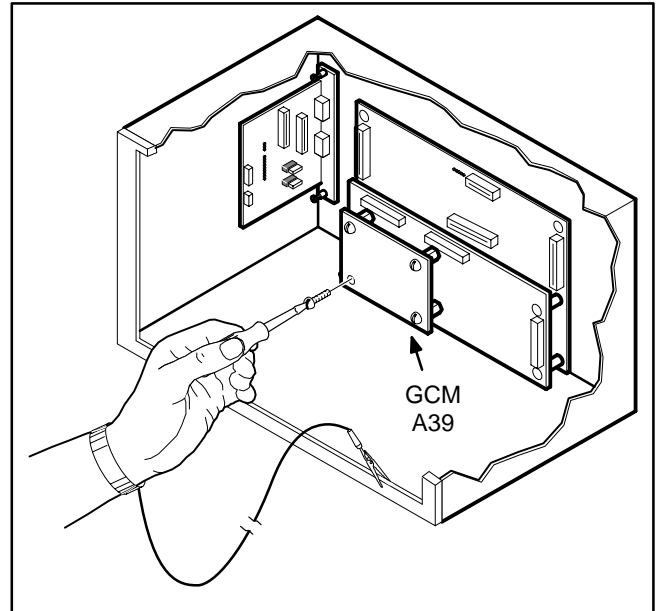
FIGURE 6. GCM MOUNTING
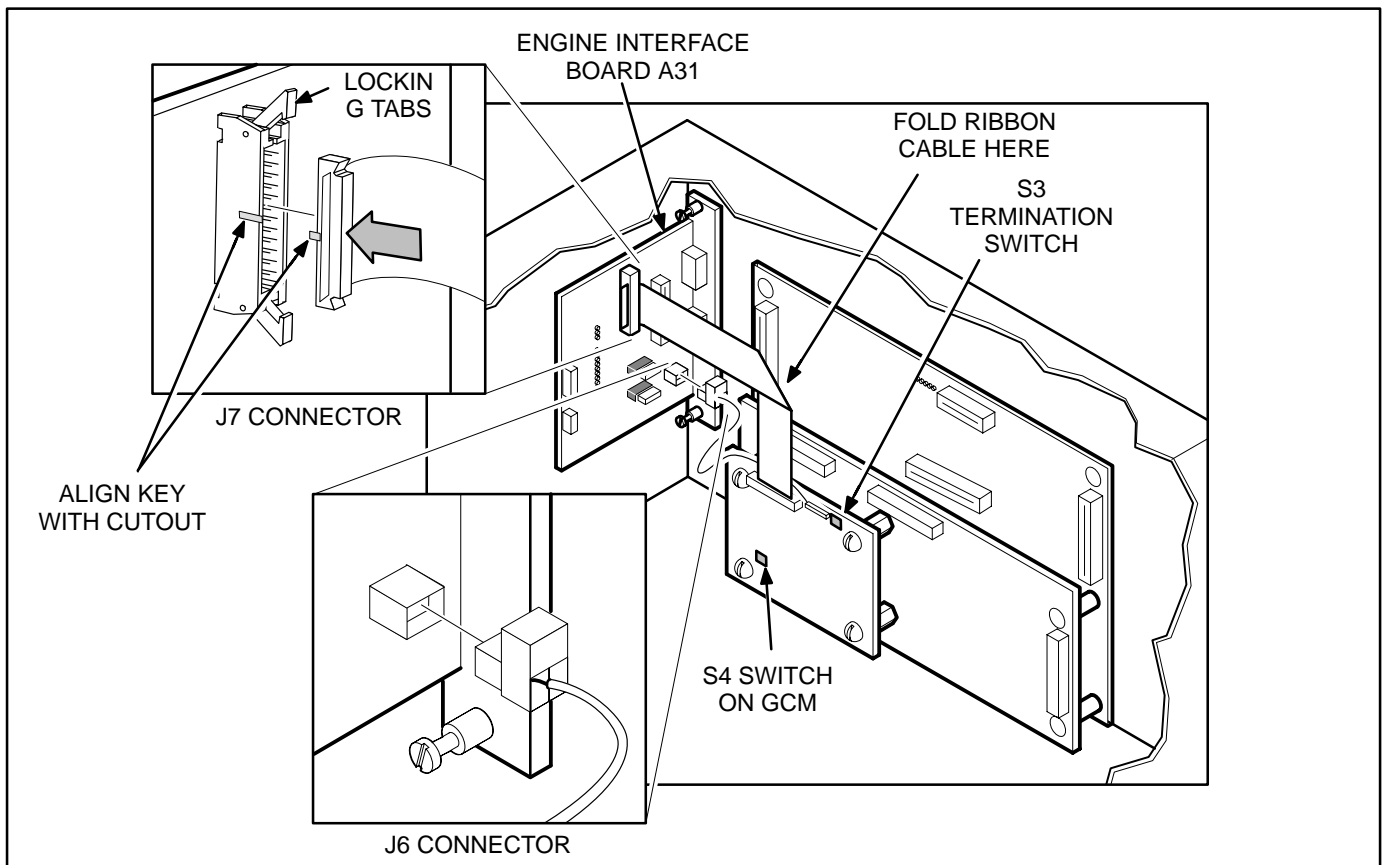
FIGURE 7. INSTALLING J6 AND J7 CONNECTORS

SELF-INSTALLATION

Requirements

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

Self-installation is limited to one PowerCommand Genset or CCM-G, one PowerCommand Automatic Transfer Switch (ATS) or CCM-T, and no more than four annunciators or five DIMs. The GCM can be autobound by an ATS and up to three annunciators and three DIMs, but by no more than a total of four annunciators and DIMs.

A transfer switch (OTPC or BTPC) must be v1.2.138, or later, to support the Genset Communication Module software. A CCM-T with an FTT-10 transceiver will also work.

The genset GCM must be logically installed before the transfer switch is logically installed and before the annunciators, DIMs, and other network accessories are logically installed.

If these requirements cannot be met, the system must be installed with LonMaker™. Refer to LonMaker Installation on Page 6.

Node Address

Each node on a self-installed network must have a unique address. Switches 1 through 4 of switch S5 are used to set the *Node Address* (see Figure 8). The default node address is 0001, which is a "STATUS" LED pulse rate of 1.

The switches are oriented so that switch S5-1 is the most significant bit (MSB) of the *Node Address.* Thus, S5-1 has a value of "8" when it is ON. S5-2 has a value of 4, S5-3 has a value of 2, and S5-4 has a value of 1. For example, to set the *Node Address* to 9, set switch S5 to 1001 (8+0+0+1=9). See Table 1.

TABLE 1. SETTING THE NODE ADDRESS (S5)

S5-1 (8)	S5-2 (4)	S5-3 (2)	S5-4 (1)	Address (binary)	Address (decimal)
OFF	OFF	OFF	OFF	0000	0[1]
OFF	OFF	OFF	ON	0001	1
OFF	OFF	ON	OFF	0010	2
				↓	↓
ON	ON	ON	ON	1111	15

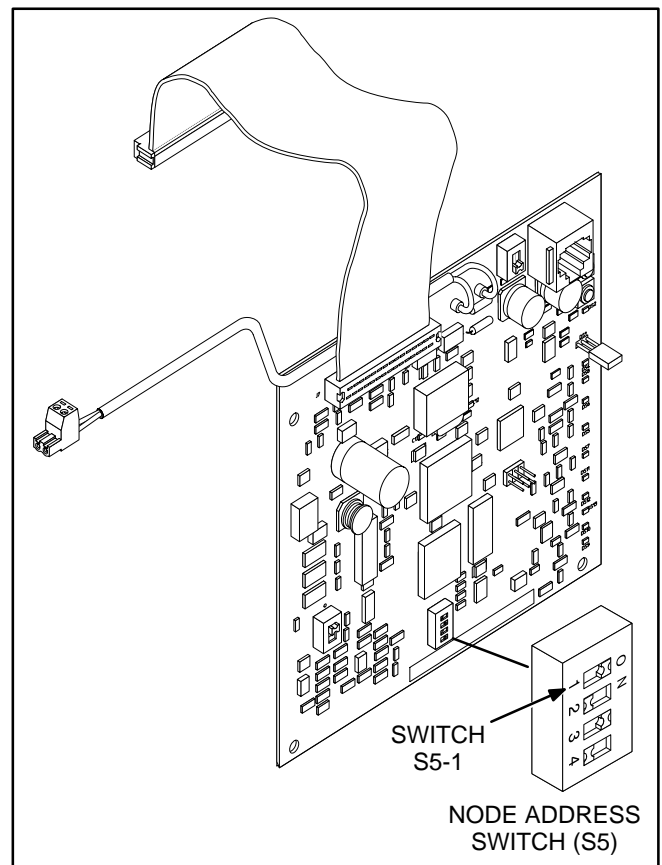NOTE 1. "0" (zero) is not a valid *Node Address.*


FIGURE 8. NODE ADDRESS SWITCH

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 "STATUS" LED (DS6) (see Figure 9). Make sure each device has a unique node address.

Logical Installation

After the GCM is *physically* connected to the network, it is ready to be *logically* installed.

1. Make sure the GCM node and other network devices are powered and connected to the twisted-pair data bus.

2. Make sure S5-1, S5-2, S5-3, and S5-4 on the GCM are configured for the desired node address. Each device on the network must have a unique address.

3. Make sure the network is terminated.

4. Press and hold the *Service* button (S1) (see Figure 9) for approximately two seconds until the *Network Status* LED (DS6) begins flashing.

5. Release the *Service* button.
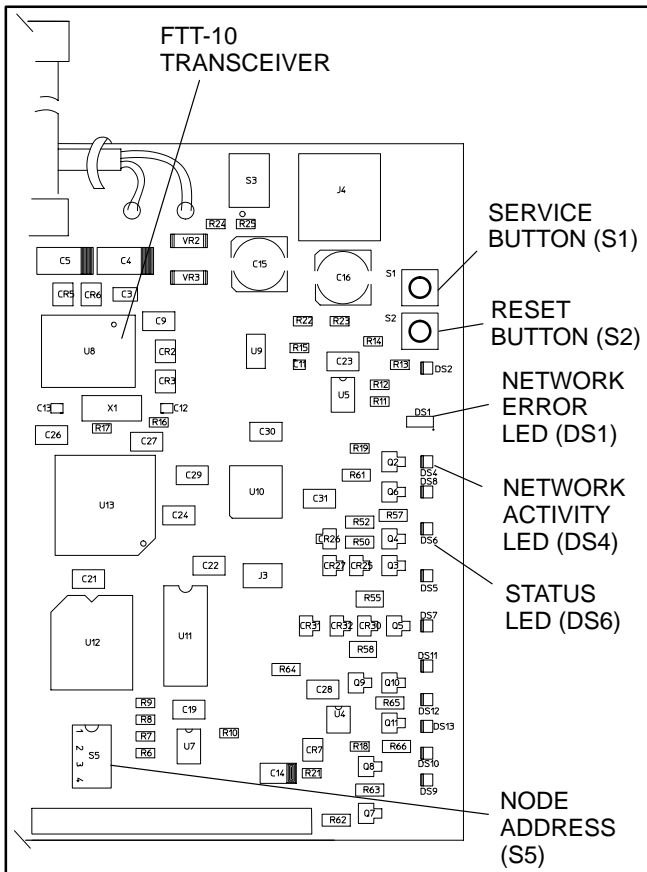
FIGURE 9. BUTTON AND LED LOCATIONS

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 (GCM) and ATS module 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.

After the genset is *physically* installed, a DIM, annunciator, or ATS may bind to the genset. Because the genset does not execute the binding function, the genset must be installed first.

Verify Binding

To verify the genset has installed itself properly and is bound to the ATS, disconnect the J6 data cable from the engine interface board. The "Network Error" LED (DS1) (see Figure 9) should turn on (red) within 10 seconds. This indicates communications have failed and that the device was properly bound.

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Reconnect the twisted pair cable and confirm that DS1 turns off within 10 seconds.

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* (S5) 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 "STATUS" 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), DIMs, and other network accessories.

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

LONMAKER INSTALLATION

The PowerCommand 3100 Genset GCM can be manually installed with LonMaker. The Device Stencil is required.

LonMaker installation is required to use Power-Command Software (PCW II). Self-installation does not require LonMaker.

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 3100 Genset is defined and installed like any other device in LonMaker.