



LINKS 1000TM
Cellular Alarm Transmitter

INSTALLATION NOTES:

Each Cellular unit is pre-programmed in Irving TX where accurate records are kept of each installation. This alarm transmitter may not be relocated to another customer. Should it be removed from service, its number will be canceled and it will not work in another location.

Begin installation instructions on Page 4.

Note differences between V1.0 and V2.0 on page 7.

The standard LINKS 1000 uses an "A-side" cellular provider. In your location that will be the one that is not the local telephone company. The local telephone company is a "B-side" provider. Coverage areas may differ. Maps may be obtained from your local providers. If you have not done your coverage homework you will waste three service calls before finally losing the customer.

Use a hand-held "A-side" cellular phone at installation to find the best location for this unit. It must have a good signal level to be successful.

Run a full set of signals from the WSS 5010 panel at installation.
Run only one signal or zone using the Links 1000. That is sufficient to prove that the cellular system is working.



Version 2.20
WSS5010 Compatible

INTRODUCING THE LINKS1000™

The LINKS1000 Cellular Alarm Transmitter enhances the protection provided by a security system by providing a reliable back-up to the control panel's normal telephone communications with the monitoring station. The LINKS1000 works with both versions of the WSS5010.

If the control panel is unable to complete an alarm transmission through the normal telephone line, the LINKS1000 will be activated and will transmit the alarm communication over the cellular network. The LINKS1000 works automatically.

The LINKS1000 has been designed for simple and straightforward installation; wiring connections are made directly between the LINKS unit and the security control panel.

Specifications

Compatible control panels

- WSS5010 software version 1.0 or later

Communication Method

- Amps cellular telephone network

RF Power Output

- 3.0 Watts maximum

Antenna

- 3 - 5 dB gain, TNC connector

Battery

- 12 volt 4 Ah minimum rechargeable gel-cell type battery

Transformer

- 16.5 VAC, 40 VA

Dimensions

- 11" x 11.8" x 3.3" (279 mm x 300 mm x 84 mm)

Weight

- 6.5 lbs. (3 kg)

LINKS 1000 GLOSSARY OF TERMS

The following is a description of various terms used with regards to cellular technology.

Electronic Serial Number (ESN)

The ESN is the unique serial number of a cellular phone. It is used by the cellular network to track calls and increment billing. The ESN is stored at the time of manufacture and cannot be reprogrammed. This number, in either hexadecimal or decimal, must be loaded into the database of the cellular carrier before service can begin.

Cellular Phone Number and Area Code

A 10 digit number (3 digit area code and 7 digit directory number) identifying the cellular telephone. Do not enter the phone number of the central monitoring station as the cellular phone number when programming the LINKS 1000.

Initial Paging Channel

A three digit number that specifies which 'Side' carrier you have contracted for service. Each cellular service area only has two sides, A or B. The initial paging channel for Side A is '333' and for Side B is '334'.

System ID

Also called the Home Access ID, this 5 digit number identifies the customer's pre-defined 'Home System'. This number refers to a geographic area and is used by the cellular carrier to determine if the unit is 'Home' or in 'Roam'.

Access Overload Class

This is the number that specifies the level of priority of the cellular call. There is no correlation between this number and the level of cellular service unless there is a network emergency.

Group Identification Mark

This number is factory programmed and specifies how many bits of the System ID are compared when processing signals. The Group Mark ID for LINKS 1000 is set at 10. This number will make the LINKS 1000 compatible with all North American networks.

Preferred System Mark

This number is determined by the Initial Paging Channel and refers to which system, A or B, is scanned for first.

Roam/Roaming

Using cellular service outside of one 'Home' area. Usage charges are higher when Roaming.

HOW THE LINKS1000 WORKS

Cellular Communications

All cellular telephones, including the LINKS 1000, must 'register' with the cellular network. 'Registration' is simply a handshake, sending ESN and Telephone number, between the cellular switching station and the cellular telephone. This is done upon power up of the LINKS 1000 and approximately every 15 minutes afterwards. If the phone does not register the network will not complete a call. Tower signal strength, also called RSSI (receive signal strength indication) is updated approximately every 4-5 seconds. RSSI is indicated as a go/no go visible via the maintenance LED.

Sending an alarm

Before dialing the central station, the WSS5010 will perform a telephone 'line-test'. This is done via the control unit using a series of off-hook and on-hook transitions to verify dial-tone. This takes 30 seconds.

The control panel 'line-test' feature will only determine a telephone line is inoperative when it is attempting to send an alarm. With a LINKS 1000 connected, the control panel will send the central station telephone number, in a digital format, from the PGM output of the control panel to the SPGM input of the LINKS 1000. The LINKS 1000 then accesses the cellular telephone network and begins dialing. Once a suitable channel is established the LINKS 1000 switches an onboard relay and establishes a connection between the TIP and RING terminals on the control panel and the T1 and R1 terminals on the LINKS 1000.

With cellular communications now open to the central station receiver, the panel will detect 'handshake'. The alarm is sent. If the message is received, 'kiss-off' is sent, just as if it were communicating over a standard telephone line. Once the panel has completed the transmission, the control panel 'hangs up'. The LINKS 1000 then detects the loss of current across T1 and R1 and sends the END key to the cellular network.

USING THE LINKS 1000 PROGRAMMER

The LINKS 1000 Programmer is used to enter the required cellular network parameters into the LINKS 1000. If the parameters are not entered correctly, the LINKS 1000 equipment will not operate.

AC power must be applied to program the LINKS 1000.

Before a cellular service provider will give the Cellular Phone parameters, you must first give the LINKS 1000 Electronic Serial Number (ESN). The ESN is found on the outside of the box, or can be read via the Programmer.

* When using Lindsay Communications, the SID will always be programmed as [00007] and the IPC will always be [333]. These are not pre-programmed.

The following parameters must be obtained from the Cellular carrier:

- The cellular telephone number for the LINKS _____
- The System I.D. 0,0,0,0,7
- The Initial Paging Channel 3,3,3 *

FOR
GAINESVILLE TX
THIS NUMBER
IS 334

The LINKS 1000 Programmer is menu driven (see Table 1 for a list of menu messages):

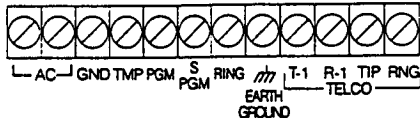
- use 'up' and 'down' arrows to scroll through the various fields
- when the desired field is displayed, use the [*] to select it
- use the [#] key to enter data

Connect the modular connector of the Programmer to the modular jack on the LINKS 1000. Press the [#] key to activate the Programmer. The LCD screen will light.

Note: If the screen does not light, check to see if 4 AA batteries were correctly installed in the back of the Programmer.

If the ESN was not found on the outside of the box, scroll to "Read LINKS" menu and press [*] to select. Scroll to "ESN" and press [*] to select. The ESN will be displayed.

WIRING CONNECTIONS



Do not connect the transformer or battery until all other wiring, including the antenna connection, has been completed and checked. Incorrect wiring connections may cause the LINKS1000 unit to operate improperly.

“AC” Power Terminals

For proper operation, the LINKS1000 requires its own transformer. **Do not use the control panel transformer to power the LINKS1000.** Do not connect the transformer or battery until all other wiring is complete. Use a 16.5 VAC transformer with a minimum 40 VA rating to supply AC power to the LINKS1000. Do not connect the transformer to an outlet that is controlled by a switch.

Ground Connection

Connect the LINKS “GND” terminal to the control panel negative common. The AUX-, keypad BLK and zone COM terminals are negative common terminals. This connection is essential for proper orientation.

Connect a ground cable from the Cabinet Ground connection to an earth ground, such as a copper cold water pipe, by the shortest and most direct route. Ensure that the cold water pipe connection provides path to ground. **Do not make the ground connection to a plastic cold water pipe!**

Tamper Terminal

The “TMP” terminal on the LINKS1000 is provided for a cabinet tamper switch. If a tamper switch is not used, then a wire jumper must be connected between the “TMP” and “GND” terminals.

LINKS PGM Terminal Trouble Reporting Output

The LINKSPGM terminal will switch to ground whenever a trouble condition is present on the LINKS unit. The terminal will remain switched to ground for as long as a trouble condition exists. This feature is used to report LINKS trouble conditions through the control panel via a zone programmed for LINKS Supervision (see programming guide for instructions). Also, when a resistor is connected across GND of the LINKS and the PGM of the LINKS, then connected to the designated LINKS supervision zone, the control panel will report an open in the connection between the LINKS and the control panel (see instructions for correct resistor value).

When using Normally Closed Loops, connect a DSC Model RM-1 Relay to the control panel and the LINKS as described below. The Alarm and Reporting Codes programmed for the zone connected to the yellow lead of the RM-1 will be used to report a general trouble and restore on the LINKS. Note that the WSS5010 always uses an end-of-line resistor regardless of how zone supervision is programmed.

RM-1 Lead	Connection
Yellow	Control Panel Zone terminal
White	Control Panel COM terminal
Red	Control Panel AUX terminal
Black	LINKS PGM terminal
Green	No connection

LINKS SPGM Terminal - Serial Input for Central Station Telephone Number

The connection between the control panel PGM and the LINKS 1000SPGM is very important. It carries the telephone number of the central station to LINKS, the LINKS then dials that number through the cellular network.

The WSS5010 requires a 5.6K ohm resistor connected between the control panel PGM1 and the AUX+. Refer to hook up diagram on page 5.

The maximum distance (wire length) the LINKS can be mounted from the control panel is 15 feet.

Telephone Terminals

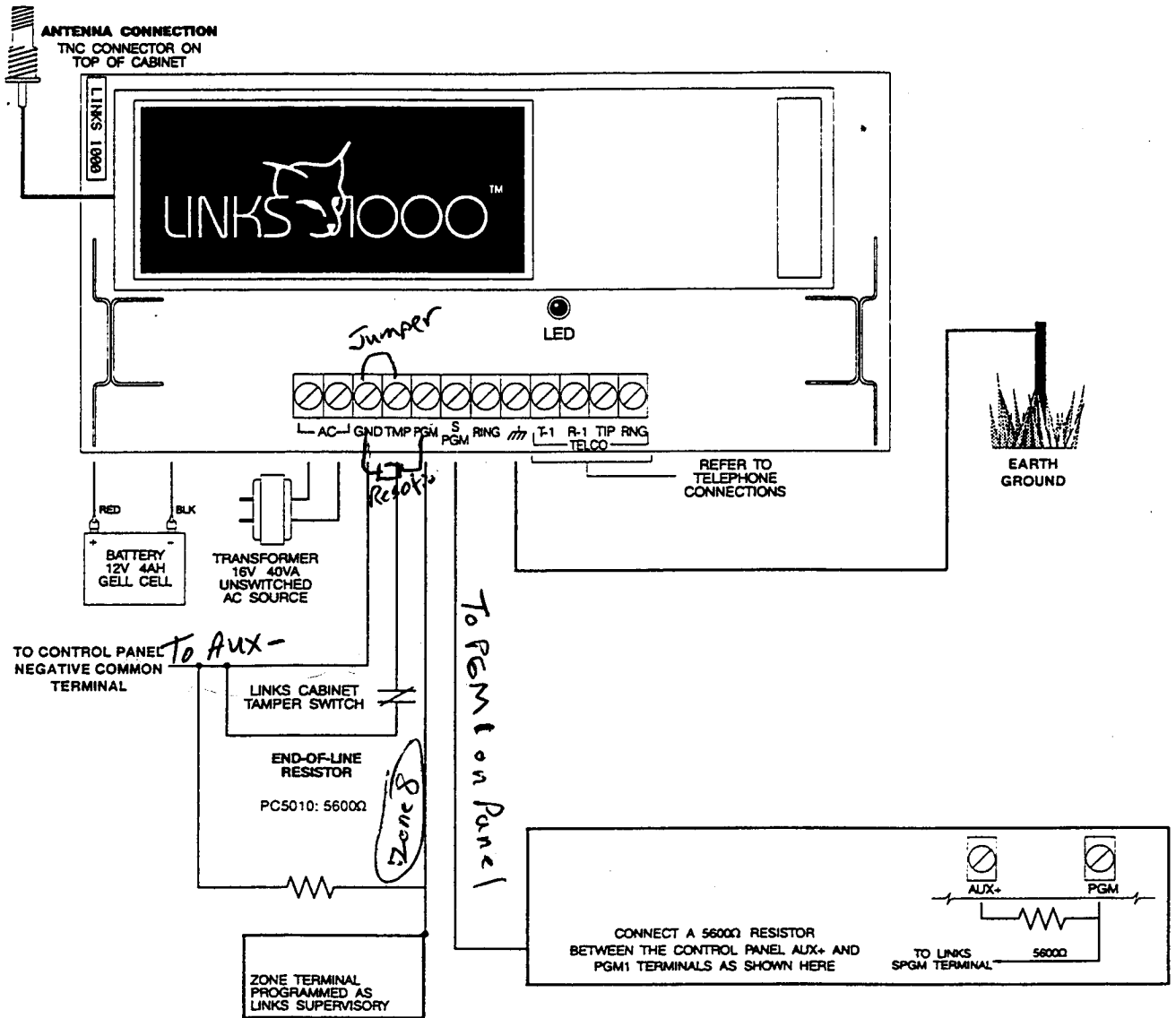
From an RJ31-X plug, make the following connections:

Conductor from RJ31-X Plug	Connection
RED	LINKS RING terminal
GRN	LINKS TIP terminal
GRY	control panel R-1 terminal
BRN	control panel T-1 terminal

Also, connect the following jumpers between the LINKS and control panel:

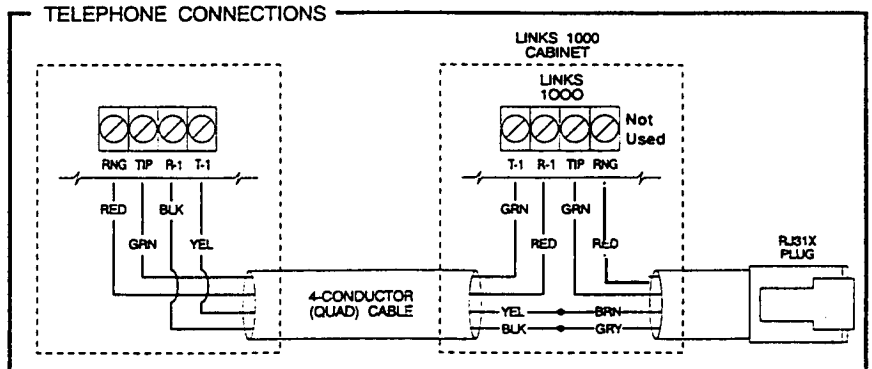
Control Panel	LINKS
TIP	T-1
RING	R-1

HOOK-UP DIAGRAM



NOTES

- 1 An AC power supply must be dedicated to the LINKS1000. Do not use the security system's transformer to power the LINKS1000.
- 2 The LINKS1000 should be mounted as close as possible to the control panel to minimize the length of the wiring between the LINKS1000 and the control panel.
- 3 Depending on the security requirements of the installation, the connections between the LINKS 1000 and the control panel may need to be protected in a damage and tamper resistant conduit. Knockout locations are provided on both the LINKS 1000 cabinet and the control panel cabinet for wiring between the cabinets and for the fitting of protective conduits.



RELOCATING THE ANTENNA

If testing of the LINKS unit showed that the unit has trouble communicating with the cellular network, relocating the antenna may solve the problem.

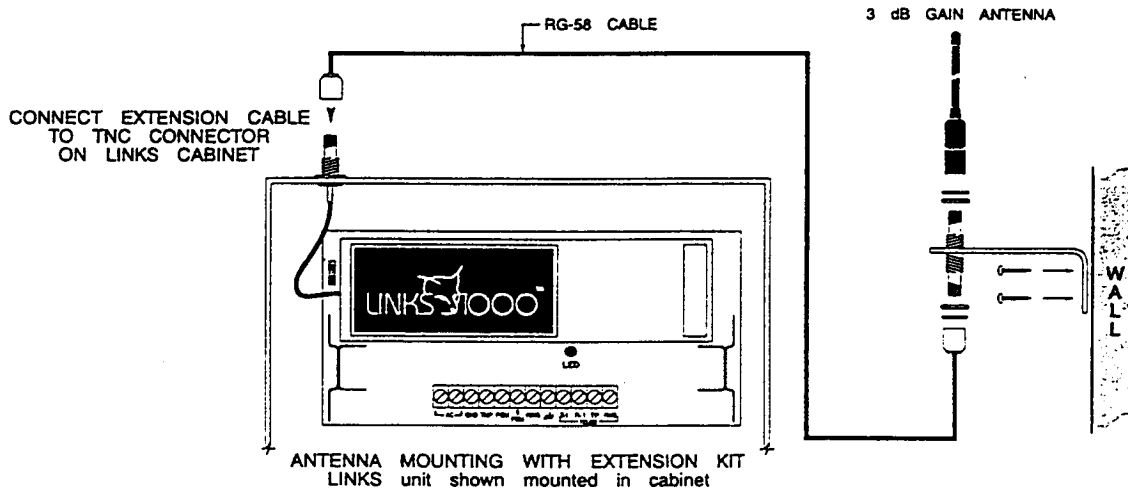
Use a LINKS Antenna Extension Bracket Kit. Each kit contains an extension cable, a mounting bracket, instructions and all required mounting hardware. Three lengths of extension cable are available:

Extension Kit	Length of Cable
LAE-3	3 feet (0.91 m)
LAE-15	15 feet (4.57 m)
LAE-25	25 feet (7.62 m)

Use only the Extension Kits to extend the mounting range of the antenna. Do not cut or splice the extension cable. The maximum distance between the LINKS and the antenna is 25 feet (7.62 m) as obtained by using the LAE-25 Extension Kit.

Secure the TNC connector from the Extension Kit to the mounting bracket, ensuring that the star washers make solid electrical contact with the mounting bracket.

Remove the antenna from the LINKS cabinet and connect the extension cable to the TNC connector on the



cabinet. Secure the antenna to the TNC connector mounted on the Extension Kit Mounting Bracket.

Locate the mounting bracket and antenna away from possible sources of electrical interference. Moving the antenna just a short distance will likely be adequate. Temporarily secure the mounting bracket in the new location and test the LINKS system as described in the "Operation" section of this manual.

If the test is successful and the cellular transmission is completed without a Loss of Cellular Communication trouble, permanently secure the mounting bracket and antenna at the new location.

If the cellular transmission is not completed successfully or there is a trouble indication, relocate the mounting bracket and test the LINKS again.

NOTE: Do not secure the mounting bracket in a way that would stretch or strain the extension cable. Rather than try to strain the cable to reach a desired location, use a longer cable. When installation is complete, secure the extension cable so that it does not dangle or hang loose from the cabinet or mounting bracket.

TESTING THE SYSTEM

Before testing the LINKS1000 unit, ensure that the control panel is correctly programmed and operating properly by performing a test transmission to the monitoring station over the normal telephone line. If problems are encountered in communicating over the normal telephone line, ensure that the communication options, telephone numbers and account numbers are programmed properly in the control panel. The control panel must be programmed properly in order for the LINKS1000 to operate.

To test the LINKS unit, apply power to the unit after all wiring connections have been made. Ten seconds after power is applied to the LINKS unit, the LED on the unit will begin to flash. Observe the LED for at least 40 seconds; if the LED flashes once every ten seconds, then the LINKS unit is operating properly. If there is a trouble condition, the LED will flash several times every ten seconds. Refer to the "Trouble Supervision" section of this manual.

Performing a LINKS Test Transmission

Contact the monitoring station to request a transmission test. Remove the telephone cord from the RJ31-X jack. Perform a Bell Test as described in the control panel's Installation Manual. When the test is complete, contact the monitoring station to confirm the transmission. Perform additional test transmissions as required by the monitoring station.

"On Air" Indication

Whenever the LINKS unit is communicating over the cellular network, the red LED on the unit's circuit board will be illuminated. When communications are successfully completed and there are no troubles to report, the LED will return to its stand-by indication of one flash every 10 seconds. If trouble conditions exist, the LED will flash 2 or more times every 10 seconds.

20-minute Transmission Cut-off

The LINKS1000 will automatically "hang up" after 20 minutes of continuous communication. This feature is designed to prevent a cellular call from lasting indefinitely. **NOTE: The 20-minute cut-off time may affect downloading performed through the LINKS1000.** While performing downloading functions, the LINKS1000 will automatically hang up the call after 20 minutes.

LINKS 1000 TROUBLE SHOOTING

If LINKS 1000 will not communicate to the central monitoring station receiver, check the following before calling Westinghouse technical support (1-800-654-6770):

1. Check all wiring

- A. Make sure T1 & R1 of the LINKS are connected to Tip & Ring of the control panel.
- B. Make sure the GND of the LINKS is connected to a zone common or Aux- of the control panel.
- C. Make sure the proper resistor is in place on control panel PGM1 (see installation instructions).

2. Check the trouble LED

- A. Check number of flashes on trouble LED. If the LED flashes more than once every ten seconds, refer to Table 2. Repair the indicated problem.
- B. Four flashes means insufficient signal strength. Add extension antenna.
- C. Eight flashes means bad SPGM connection. This means the GND for the LINKS is not connected to a panel ground or the control panel is not programmed correctly.

Be sure the control panel is properly programmed for LINKS operation. PGM outputs on WSS5010 will be set to logic low when the panel is programmed correctly.

3. If red LED flashes once every ten seconds, yet LINKS still cannot reach central station:

- A. Connect a telephone handset to TIP & RING of the control panel. Send a signal through the LINKS. Listen to the handset. If a 'network' message is heard, make note of it and follow the instructions. **Be sure the central station telephone number is not programmed as the LINKS 1000 cellular telephone number.**
- B. Check cellular activation. Call the cellular number of the LINKS 1000. If the LINKS is properly activated yet turned off, the network message should say "the cellular customer you have called is unavailable or has travel outside of the coverage area". If the LINKS cellular number is called and the LINKS is turned on (and down-loading is not enabled and connected), the message the should say "the customer you have called has left the vehicle". If the number is not activated the message will say "the number you have called is not in service". Call the cellular service provider and check the activation. Be prepared with the LINKS ESN and the telephone number.
- C. Still can't communicate...send a signal through the LINKS and listen for the black relay on the LINKS 1000 board to 'click'. That is the sound that occurs when LINKS is receiving the central station telephone number via the control panel PGM output. If after that the red trouble LED stays on steady, the LINKS is transmitting. If it doesn't, the LINKS can't find a voice channel. The panel will time-out and attempt the call again. Try using an antenna extension kit to relocate the antenna.
- D. Do not disconnect the telephone line between the LINKS and control panel when testing. Only disconnect the telephone line at the RJ31X jack when testing the LINKS 1000.

LINKS TROUBLE SUPERVISION

The LINKS1000 automatically monitors its operation and indicates trouble conditions by flashing the LED on the circuit board. The LED normally flashes once every 10 seconds when the LINKS is in stand-by (ready to transmit) mode. Troubles are indicated when the LED flashes more than once at each 10 second interval. Shown below are the number of flashes used to indicate each trouble condition. If more than one trouble is present, only the first trouble is indicated; when that trouble is cleared, the next will be indicated.

Table 2 — LED Indications

<i>Number of LED Flashes</i>	<i>Trouble</i>	<i>Time-outs for LINKS failures</i>
2 flashes	AC Trouble	30 minutes
3 flashes	Battery Trouble	3 minutes, 20 seconds
4 flashes	Loss of Cellular Communication	90 seconds
6 flashes	Tamper Trouble	80 seconds
7 flashes	Internal Trouble	80 seconds
8 flashes	SPGM Trouble	80 seconds

AC Failure: Loss of AC power to the LINKS1000 for more than 30 minutes is indicated by an AC failure.

Battery Fault: A battery fault indicates that the LINKS1000 stand-by battery voltage is below 11.5 volts or there is a problem with the battery connection.

Loss of Cellular Communication: Indicates that the LINKS1000 is not able to communicate with the cellular network. Ensure the antenna connections and cabling are secure and undamaged, and that the antenna has not been obstructed by metal objects.

Tamper Fault: Indicates that the tamper contact is open. If a tamper switch is not installed, ensure that a jumper is securely connected between the "TMP" and "GND" terminals.

Internal Fault: Indicates that an internal fault has occurred. Return the unit to your distributor for repairs.

SPGM Fault: Indicates that there is a problem with the connection between the LINKS SPGM terminal and the security system's PGM terminal. Check the following:

- Ensure that the SPGM terminal is connected to the security system's PGM terminal
- Ensure that the security system's PGM Output has been programmed for LINKS operation
- Ensure that no other connections have been made to the security system's PGM terminal
- Ensure that the LINKS GND terminal is connected to the security system's negative common terminal
- Ensure that a resistor has been added. Refer to the Hook-up Diagram.

Reading trouble conditions on the LINKS 1000 via the LINKS 1000 Programmer

The LINKS 1000 Programmer can be used to read the trouble, whether it is existing or cleared, provided the trouble was present long enough to set the supervising alarm terminal (PGM).

Only LINKS 1000 version 2.10 or higher will support this function.

- Step 1.** With power applied to the LINKS 1000, connect the modular cord on the LINKS 1000 Programmer to the modular jack on the LINKS 1000.
- Step 2.** Press the [#] key on the Programmer.
- Step 3.** Use the arrow key(s) to scroll to the "trouble" menu.
- Step 4.** Press the [*] key. The Programmer will display the trouble (see table 3 for display text).
- Step 5.** Trouble memory will be updated automatically if another failure occurs. Again, the trouble must be present long enough to set the PGM. Various delays apply (see table 2).
- Step 6.** The memory can be reset by pressing the [F] key and holding for 2 seconds. This will set the display to read "No Trouble". It is not necessary to reset the display to "No Trouble" in order to receive new trouble displays.
- Step 7.** Scroll to "Main Menu". (See disconnecting the LINKS 1000 Programmer.)

Table 3 — Messages Appearing on Programmer Trouble Screen

Message	LINKS Trouble
"No Trouble"	No problems in LINKS trouble memory
"AC Trouble"	AC failure
"Battery Trouble"	Battery trouble
"Cellular Tbl"	Loss of Cellular Signal
"IIC Trouble"	Self-Test-Internal Failure
"Tamper Tbl"	Tamper fault on LINKS
"SPGM Trouble"	Trouble with SPGM connection, control panel has not been programmed for LINKS, or trouble with the ground connection between panel & LINKS 1000.
"LINKS Version Not Compatible"	LINKS 1000 is of an older version which does not have trouble memory.