TELGUARD® DIGITAL

TG-4

Residential Primary & Small Business Cellular Alarm Communicator

Cellular Alarm Transmission System
Using GSM Digital Cellular Technology

P/N: TG4G0001

SECURITY SIGNALING UL LISTED

INSTALLATION AND OPERATING INSTRUCTIONS

For use by **TELGUARD®** customers only. Distribution to others strictly prohibited.

COMPANY CONFIDENTIAL

TELULAR® CORPORATION

Technical Support: 800-229-2326
M-F 8:00AM – 8:00PM EST
Saturday 9:00 AM – 5:00 PM EST

The activation form must be completed before leaving for the job site to install the Telguard product.
The activation form may be completed by:

- Fax – 678-945-1651
- Email – cellservice@telular.com
- Online – www.telguardonline.com

Revised May 23, 2007

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FOREWORD

Many customers purchase the Telguard® Digital because they prefer its price and features. The Telguard model TG-4 (p/n TG4G0001) is UL Listed for Household Fire systems, Household Burglary systems and Miscellaneous Supplemental Use. This means that the TG-4 may be used in Household Burglary systems or Household Fire systems as the main or secondary communication line.

The TG-4 may not be used in applications that require UL Grade A Burglary or Fire Listings. If such UL Listings are not required, it is possible to use model TG-4. This means that the TG-4 will not enhance or degrade the grade of service if used for commercial purposes.

NOTICES

ABOUT THIS MANUAL

This manual assumes that you have basic security system installation skills such as measuring voltages, stripping wire, properly connecting wires together, connecting wires to terminals, and checking phone lines. It also assumes that you have a familiarity with the proper installation and programming tasks related to various control communicator panels.

The material and instructions covered in this manual have been carefully checked for accuracy and are presumed to be reliable. However, Telular assumes no responsibility for inaccuracies and reserves the right to modify and revise this manual without notice.

It is our goal at Telular to always supply accurate and reliable documentation. If a discrepancy is found in this documentation, please mail or fax a photocopy of the corrected material to:

Telular Security Products
Technical Services Department
420 Thornton Road, Suite 109
Lithia Springs, GA 30122
Fax: 678-945-1651

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FCC Notices

EXPOSURE TO RADIO FREQUENCY ENERGY

In 1991, the Institute of Electrical and Electronics Engineers (IEEE), and in 1992, the American National Standards Institute (ANSI), updated the 1982 ANSI Standard for safety levels with respect to human exposure to RF energy. Over 120 scientists, engineers and physicians from universities, government health agencies and industry, after reviewing the available body of research, developed this updated Standard. In March 1993, the U.S. Federal Communications Commission (FCC) proposed the adoption of this updated Standard.

The design of your Telular **Telguard** complies with this updated Standard. Of course, if you want to limit RF exposure even further than the updated ANSI Standard, you may choose to install the unit in a manner that locates its antenna at an even greater distance from the general public than is recommended as a minimum by the standard.

To insure compliance with the standard, when selecting a mounting location for your **Telguard** do not mount it (or its associated antenna) in an area where the general public could reasonably be within 8 inches (20 centimeters) of the antenna.

EFFICIENT OPERATION

Do not operate your Telular product when holding the antenna. Be sure to mount the unit such that its antenna is a minimum of eight (8) inches (20 centimeters) is maintained from the general public.

For the best service quality, keep the antenna free from obstructions and point the antenna straight up.

ANTENNA CARE AND REPLACEMENT

Do not use the unit with a damaged antenna. If a damaged antenna comes into contact with the skin, a minor burn may result. Have your antenna replaced by a qualified technician immediately. Use only a manufacturer-approved antenna. Non-approved antennas, modifications, or attachments could impair service quality, damage the Telguard and violate FCC regulations.

ELECTRONIC DEVICES

Most modern electronic equipment is shielded from RF energy. However, RF energy from cellular devices may affect inadequately shielded electronic equipment. RF energy may affect improperly installed or inadequately shielded electronic equipment operating in homes and businesses. Check with the manufacturer or its representative to determine if these systems are adequately shielded from external RF energy. Consult the manufacturer of any personal medical devices (such as pacemakers, hearing aids, etc.) to determine if they are adequately shielded from external RF energy.

BLASTING AREAS

To avoid interfering with blasting operations, turn OFF your unit when in a “blasting area” or in areas posted: “Turn off two-way radio.” Construction crews often use remote control RF devices to set off explosives.

POTENTIALLY EXPLOSIVE ATMOSPHERES

Turn OFF your unit when in any area with a potentially explosive atmosphere. It is rare, but your **Telguard Digital** or its accessories could generate sparks. Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death. Areas with a potentially explosive atmosphere are often, but not always, clearly marked. They include fueling areas such as gas stations; below deck on boats; fuel or chemical transfer or storage facilities; areas where the air contains chemicals or particles, such as grain, dust, or metal powders; and any other area where you would normally be advised to turn off your vehicle engine.

Do not transport or store flammable gas, liquid or explosives in the area of your **Telguard Digital** or accessories.

Vehicles using liquefied petroleum gas (such as propane or butane) must comply with the National Fire Protection Standard (FPA-58). For a copy of this standard, contact the National Fire Protection Association, One Batterymarch Park, Quincy, MA 02269, Attn: Publications Sales Division.

PART 68

This equipment complies with Part 68 of the FCC Rules. Located on the inside cover of the *Telguard®* model TG4G0001 is a label that contains, among other information, the FCC Registration Number and Ringer Equivalence Number (REN) for this equipment. If requested, this information must be provided to the Telephone Company.

The *Telguard - Cellular Alarm Transmission System* is registered for connection to the public telephone network using an RJ38X or RJ31X jack. When selecting a mounting location, do not mount this unit in an area where the general public could reasonably be within 20cm (8 inches) of the antenna. The ringer equivalence number (REN) is used to determine the quantity of devices, which may be connected to the telephone line. Excessive REN's on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the REN's should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total number of REN's, contact the telephone company to determine the maximum of REN for the calling area.

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REPAIR AND WARRANY

If the *Telguard® Cellular Alarm Transmission System* caused harm to the telephone network, the Telephone Company will notify you in advance that temporary discontinuance of the service may be required. But if advance notice is not practical, the Telephone Company will notify the customer as soon as possible. Also, you will be advised of your rights to file a complaint with the FCC if you believe it is necessary. The telephone company may make changes in it's facilities, equipment, operation, or procedures that could affect the operation of the equipment. If this happens, the Telephone Company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service. If trouble is experienced with the *Telguard® Cellular Alarm Transmission System* please contact Telular Tech Support in the U.S.A. for repair and (or) warranty information.

If the trouble is causing harm to the telephone network, the Telephone Company may request that you remove the equipment from the network until the problem is resolved.

The customer (user) should not attempt any repair to *the Telguard® Cellular Alarm Transmission Syste*m. Repair of this equipment should be referred to only qualified technical personnel.

Note that this equipment cannot be used on the public coin service provided by the Telephone Company. Connection to Party Line Service is subject to state tariffs. ***(Contact the state public utility commission or corporation commission for information).***

Telular will repair or replace (our option) inoperative units for up to two years from date of manufacture. This excludes damage due to lightning or installer error. Unauthorized modifications void this warranty. Not responsible for incidental or consequential damages. Liability limited to price of unit. This is the exclusive warranty and no other warranties will be honored, whether expressed or implied. **An RMA must be assigned by calling Telular Tech Support 800-229-2326 before returning product to:**

Telular Corporation
Attention: Repair Depot
1801 South Fulton Drive
Corinth, MS 38834

RMA number must be on outside of box or product will not be accepted.

FUTURE TESTING AND LIMITATIONS ON USE

Telguard® is part of an advanced design alarm-communication system. It does not offer guaranteed protection against burglary and fire. Any alarm communication system is subject to compromise or failure.

The Telguard® will not work without power. Devices powered by AC will not work if the AC power supply is off for any reason, however briefly, and at the same time, the backup battery is missing, dead or not properly installed.

The cellular radio network, needed to transmit alarm signals from a protected premises to a central monitoring station, may be inoperable or temporarily out of service. Cellular radio networks are also subject to compromise by sophisticated methods of attack.

This equipment, like any other electrical device is subject to component failure. Although this equipment is designed to be long lasting, the electrical components could fail at any time.

Due to these limitations, we recommend that if the automatic self-test feature is not enabled, other arrangements be made with the user to test the system at least once every three months. Moreover, arrangements should also be made for on-site inspection/test by a licensed alarm installer at least once each year.

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These Terms and Conditions are a legal contract between you and Telular Corporation for the title to and use of the Product. **BY RETAINING AND USING THE PRODUCT YOU AGREE TO THE TERMS AND CONDITIONS INCLUDING WARRANTY DISCLAIMERS, LIMITATIONS OF LIABILITY AND INDEMNIFICATION PROVISIONS BELOW. *IF YOU DO NOT AGREE TO THE TERMS AND CONDITIONS, DO NOT USE THE PRODUCT AND IMMEDIATELY RETURN THE UNUSED PRODUCT FOR A COMPLETE REFUND.*** You agree to accept sole responsibility for any misuse of the Product by you; and, in addition, any negligent or illegal act or omission of your or your agents, contractors, servants, employees, or other users of the Product so long as the Product was obtained from you, in the use and operation of the Product.

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TELULAR WILL REPAIR OR REPLACE (OUR OPTION) INOPERATIVE UNITS FOR UP TO TWO YEARS FROM DATE OF MANUFACTURE. EXCLUDES DAMAGE DUE TO LIGHTNING OR INSTALLER ERROR AS WELL AS UNITS THAT INCORPORATE MATERIAL, OR USED IN A MANNER OR ENVIRONMENT, NOT SPECIFICALLY AUTHORIZED IN THIS MANUAL. UNAUTHORIZED MODIFICATIONS VOID THIS WARRANTY. NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. LIABILITY LIMITED TO PRICE OF UNIT. THIS IS THE EXCLUSIVE WARRANTY, IN LIEU OF ALL OTHER WARRANTIES INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY, TITLE, DELIVERY, INFRINGEMENT OR FITNESS FOR A PARTICULAR PURPOSE AND NO OTHER WARRANTIES WILL BE HONORED, WHETHER EXPRESSED OR IMPLIED.

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TABLE OF CONTENTS

FOREWORD I

NOTICES I

ABOUT THIS MANUAL I

FCC NOTICES I

EXPOSURE TO RADIO FREQUENCY ENERGY I
EFFICIENT OPERATION I
ANTENNA CARE AND REPLACEMENT II
ELECTRONIC DEVICES II
BLASTING AREAS II
POTENTIALLY EXPLOSIVE ATMOSPHERES II
PART 68 II
REPAIR AND WARRANY III

FUTURE TESTING AND LIMITATIONS ON USE III

TERMS AND CONDITIONS FOR USE OF TELGUARD® PRODUCTS ("PRODUCT") IV
INDEMNIFICATION OF TELULAR CORPORATION ("TELULAR") IV
WARRANTY; LIMITATIONS IV

1.0 GENERAL DESCRIPTION AND OPERATION 1

2.0 FEATURES 1

2.1 OPERATING MODE 1
2.1.1 Auto Format Detection 1
2.2 C/C COMMUNICATION FORMATS 2
2.3 COMPLETE SUPERVISION OF COMMUNICATION PATHS 2
2.3.1 Line Fault Condition (LFC) 2
2.3.2 No Service Condition (NSC) 2
2.3.3 Radio Communications Failure Condition (RFC) 2
2.4 COMPLETE POWER SUPERVISION 2
2.4.1 Low/Missing Battery Condition (LBC) 2
2.4.2 AC Failure Condition (ACFC) 3
2.4.3 Dial Tone Failure (DTF) 3
2.4.4 Catastrophic Failure (CF) 3
2.5 TELGUARD AUTOMATIC SELF-TEST REPORT 3
2.5.1 Telguard Remote Query Capability 3
2.6 TELGUARD TERMINAL STRIP CONNECTIONS 3
2.6.1 Programmable Supervisory Trip Outputs (STC1 and STC2) Relays 3
2.7 DIAGNOSTIC AND STATUS LEDS 4
2.7.1 LED Signal Strength Indication 5
2.8 TELGUARD SETUP PROGRAMMING PARAMETERS 5
2.9 UL LISTINGS 5

3.0 GETTING READY 5

3.1 DEALER ACCOUNT ESTABLISHMENT 5
3.2 SUBSCRIBER ACCOUNT REGISTRATION FOR ACTIVATION 5
3.3 PRE-INSTALLATION CHECKLIST 6

4.0 INSTALLATION SUMMARY 6

4.1 REGISTER FOR CELLULAR SERVICE 6
4.2 LOCATE UNIT AND MEASURE SIGNAL STRENGTH (RSSI) 6
4.3 TRANSMIT C/C ALARMS OVER THE TELCO CONNECTION 6
4.4 PROGRAM, ACTIVATE & TRANSMIT C/C ALARMS OVER CELLULAR RADIO NETWORK 6

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4.5 CONNECT SUPERVISORY TRIP OUTPUTS 6
4.6 COMPLETE THE INSTALLATION 6

5.0 INSTALLATION STEPS 7

5.1 STEP 1: REGISTER THE TELGUARD UNIT FOR CELLULAR SERVICE 7
5.1.1 Register for Cellular Service 7
5.2 STEP 2: LOCATE UNIT AND MEASURE SIGNAL STRENGTH (RSSI) 7
5.2.1 Locate Unit 7
5.2.2 Connect Backup Battery and AC Power Transformer 7
5.2.3 Connect Antenna and Temporarily Place Unit 7
5.2.3.1 Tips for Improved Radio Signal Reception 8
5.2.4 Measure Received Signal Strength (RSSI) for Best Antenna Placement 8
5.2.4.1 Antenna Options 8
5.3 STEP 3: TRANSMIT C/C ALARMS OVER THE TELCO CONNECTION 9
5.3.1 Connect C/C to Telguard Jack J7 (BLACK Connector) 9
5.3.2 Connect telco line (RJ-31x Jack) to Telguard Jack J6 (GRAY Connector) 9
5.3.3 Verify Alarm Signal Transmissions over Telco 9
5.4 STEP 4: PROGRAM, ACTIVATE & TRANSMIT C/C ALARMS OVER CELLULAR NETWORK 9
5.4.1 Setup & Programming the Operating Parameters in the Telguard 10
5.4.1.1 Command Key Sequences for Pots Programming 10
5.4.2 Disconnect telco line (RJ-31x Jack) from Telguard Jack J6 (GRAY Connector) 11
5.4.3 Verify Alarm Signal Transmissions over Cellular 11
5.4.4 Re-connect telco line (RJ-31x Jack) to Telguard Jack J6 (GRAY Connector) 12
5.5 STEP 5: CONNECT SUPERVISORY TRIP OUTPUTS 12
5.5.1 Decide on a STC Trip Output Strategy 12
5.5.2 Check Telguard Supervisory Trip to C/C 12
5.5.2.1 Reprogram C/C to Send Proper Code 12
5.5.2.2 Check Proper Operation of Telguard Supervisory Output 12
5.6 STEP 6: COMPLETE THE TELGUARD INSTALLATION 13
5.6.1 Check Settings 13
5.6.2 Permanently Mount and Properly Ground the Telguard Chassis 13

A1.0 APPENDICES 14

A1.1 WIRING DIAGRAM 14
A1.2 JACK AND PIN ASSIGNMENTS 15
A1.3 TERMINAL STRIP PIN ASSIGNMENTS 15
A1.4 LED MODES AND FUNCTIONS 16

A2.0 OPERATIONAL QUICK REFERENCE TABLE 17

A2.1 ACTIVATION FORM 18
A2.2 COMPATIBLE CONTROL COMMUNICATORS 19

A3.0 DETAILED SPECIFICATIONS 19

A3.1 DIALER TO INTERFACE ELECTRONICS 19
A3.2 POWER 19
A3.3 DIGITAL CELLULAR RADIO 19
A3.4 TELCO INTERFACE 19

A4.0 PARTS LIST 20

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1.0 GENERAL DESCRIPTION AND OPERATION

The Telguard® model TG-4 is a digital cellular radio alarm transmission device used to provide a back-up transmission path (cellular) for control communicators (C/Cs). When transmitting alarms it will attempt to use the secondary transmission path (Cellular) when the Primary path is not available. When transmitting an alarm signal, Telguard obtains its data from the C/C by way of a telco interface. The Telguard will obtain all alarm signal information including monitoring station phone number, account number and all zones for every alarm transmission. The Telguard transmits a Link Request to the Telular Communication Center and when a link acknowledgement is received, the Telguard handshakes with the C/C and causes the C/C to transmit the alarm data. Telguard encodes the alarm data into SMS (Short Messaging System) protocol and transmits to the local digital cellular network provider. The signal is routed from the network provider to the decoding Telular Communication Center. The Telular Communication Center performs a function similar to a central station receiver and issues the transmission acknowledgement when the last message in the transmission is received. After decoding and reformatting, the alarm signal is routed over the telco line (Public Switched Telephone Network - PSTN) to the appropriate alarm company central station for action.

In a typical alarm installation, Telguard is installed in the same area as the host alarm system. The incoming telco line is connected from the premises RJ-31x jack to Telguard and then from Telguard's RJ-45 jack to the host C/C digital dialer in the normal fashion. Two programmable supervisory trip (STC) outputs are available for connection to the host control/communicator's trip zone input terminals in order to provide a Telguard trouble signal to the C/C. Additionally, automatic self-test and status-on-demand report signals are transmitted exclusively over the cellular network to the Communication Center. Telguard has its own internal power supply/battery charger. All telco line and cellular monitoring, switching and supervisory functions are built in. No extra modules are required.

The Listed equipment at the Telular Communication Center (TCC) plays a key role in the operation of every Telguard. All Telguard units are required to use the Communication Center because of the C/C alarm signal format encoding and decoding requirements used in packet-data transmissions over the digital cellular network. The Communication Center also manages the real-time databases for cellular activation and a complete history of every Telguard's operating conditions. These conditions include programming setup information, cellular alarm transmission information, supervisory trouble information, status-on-demand information, and automatic self-test information.

2.0 FEATURES

This section summarizes the key features of the Telguard. Actual installation instructions begin in Section 5.0.

2.1 OPERATING MODE

The Telguard is a digital cellular SMS transmission device that is installed at the protected premises to provide alarm transmission integrity for security systems. It is used to provide a back-up transmission path (cellular) for control communicators (C/Cs). If the primary path is not available the C/C will attempt to transmit the alarm message over the cellular network.

2.1.1 Auto Format Detection

Telguard Digital default program setting is for Auto Detection of the C/C alarm format. Auto Format Detect feature allows the Telguard to adapt to receive any listed (see section 2.2) format on every alarm transmission. If the C/C alarm format is changed for whatever reason, the Telguard will sense the new format and accept the alarm signal. Note: Auto Format Detection does not support SIA2 or DMP formats. SIA2 and DMP must be programmed manually.

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2.2 C/C COMMUNICATION FORMATS

The Telguard reads the C/C's alarm messages and converts the C/C's Ademco Contact ID, SIA2, 4x2 or 3x1 with 1400Hz or 2300Hz handshake data format into SMS packet data protocol for transmission over the cellular radio network. In order for the C/C to be compatible with the Telguard, the C/C must be programmed to transmit alarm messages to the central station using one of the following non-extended formats:

- Pulse Formats:
  - 3+1 pulse; 10pps, Double Round, 1400Hz ack
  - 3+1 pulse; 20pps, Double Round, 2300Hz ack
  - 3+1 pulse; 40pps, Double Round, 2300Hz ack
  - 4+2 pulse; 20pps, Double Round, 1400Hz ack
  - 4+2 pulse; 20pps, Double Round, 2300Hz ack
  - 4+2 pulse; 40pps, Double Round, 2300Hz ack
- Ademco Contact ID
- Radionics Modem IIe or IIIa[2]
- SIA2 (SIA-DC-03 level 2 release at 300 baud)
- DMP

Hexadecimal account numbers (001-FFF or 0001-FFFF) can be used with 3+1 or 4+2 formats, but Contact ID and Radionics requires a four digit account number using digits 0-9 (0001-9999).

2.3 COMPLETE SUPERVISION OF COMMUNICATION PATHS

The Telguard continuously supervises both the primary (telco) and the secondary (cellular) communication paths. If either path becomes inoperative, the Telguard generates a relay trip output that can be connected to a zone input of the host control communicator and/or used to activate remote sounding devices.

2.3.1 Line Fault Condition (LFC)

The Telguard monitors voltage on the incoming telco line. If an inoperative telco line is identified, (voltage below –20vdc, on hook) a telco line fault condition (LFC) is declared. The System Trouble Condition LED (STC LED) will flash 3 times and the STC relay will trip after a 30 or 60 second programmed delay. Upon telco restoral, the relay and STC LED are returned to normal.

2.3.2 No Service Condition (NSC)

Telguard declares a no service condition (NSC) when the measured "receive" cellular radio signal strength at the protected premises drops to -114 dBm or less. NSC is programmable to trip the supervisory relay output (STC2) after a 30 or 60 second delay. When STC trips, the STC LED will flash 4 times. Restoral of this condition occurs when a measurable signal strength greater than –114 dBm is maintained for the trip period of 30 or 60 seconds.

2.3.3 Radio Communications Failure Condition (RFC)

Radio communications failure condition (RFC) is declared when Telguard is unable to transmit over the cellular network even with acceptable signal strength. RFC is indicated by STC LED flashing 5 times.

2.4 COMPLETE POWER SUPERVISION

Telguard monitors its backup battery as well as its AC power source and reports power conditions from either. Telguard's integrated control and power module incorporates a battery charging circuit. This battery charger circuit is also monitored.

2.4.1 Low/Missing Battery Condition (LBC)

The Telguard checks the backup battery voltage on initial power-up and every 60 seconds thereafter. If the battery voltage changes from 'good' to 'bad' state and is less than 11.6 volts, a LBC is declared whereby the STC LED blinks twice (every 5 seconds) and the STC relay trips. When the battery voltage increases to 12.1 volts, the STC LED and STC relay restore. Telguard also indicates Low/missing Battery Condition (LBC) when battery charger fails.

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2.4.2 AC Failure Condition (ACFC)

AC failure condition (ACFC) is detected immediately (not programmable). The AC POWER LED goes out immediately, the STC LED blinks once and the STC2 trip output is activated after 2 hours. When AC power returns to normal (≥106 VAC for 60 seconds), the AC POWER LED turns on immediately and the STC trip output restores after 60 seconds.

2.4.3 Dial Tone Failure (DTF)

The Telguard continuously monitors the 30V supply circuit that provides dial tone to the C/C. A Dial Tone Failure (DTF) is declared when the 30V supply drops to 20V or less while the C/C is on-hook. The STC LED will flash 6 times and the STC relay will trip. Additionally, a TYPE 2 supervisory message is automatically transmitted to the Telular Communications Center. This condition represents a catastrophic failure and will require contacting the Telular Communications Center for resolution.

2.4.4 Catastrophic Failure (CF)

Catastrophic Failure (CF) is any condition that causes the Telguard to stop functioning at all levels. Most commonly because of AC power failure followed by a complete discharge of the backup battery. The STC1 and STC2 trip outputs are activated and visible indication is loss of all LED activity. Total loss of power to Telguard does not prevent transmission of alarm messages from the host C/C "through" the Telguard and out over an operative phone line in the normal fashion. This is a single line system.

2.5 TELGUARD AUTOMATIC SELF-TEST REPORT

The Telguard automatic self-test signal is programmed to for either daily, weekly or monthly schedule as prescribed by contract. The central station receives the automatic self-test report in the same format that the C/C normally uses for communication over the telco line. The central station provides the Telguard self-test code along with the time and frequency of transmission when the Telguard is initially activated. The Communication Center captures all current and historical data pertaining to the operation of the Telguard when it processes the automatic self-test signal on to the central station. This data contains current operational status (C.O.S.) of the Telguard such as "All OK", "AC fail condition", "low/missing battery condition", "line fault condition", or any combination of these as well as the current signal strength. In addition, the data also contains historical data for supervisory events that occurred since the last self-test signal was transmitted. This data includes the number of occurrences of AC fail conditions, low battery conditions, line fault conditions, communications failure conditions and no cellular service conditions. This additional information is available by contacting Telular Technical Support.

2.5.1 Telguard Remote Query Capability

Although Telguard has the capability for a daily, weekly, or monthly automatic self-test, a separate feature is provided for determining the current operational status of every Telguard. This feature is called Remote Query and is used to provide real-time operational status for Telguard on-demand. It is useful in resolving STC events that are reported by the C/C to the central station. Authorized personnel can initiate the Remote Query at any time by calling Customer Service. The Remote Query causes Telguard to upload current operational status data and historical data, just as the automatic self-test described above, except that the query signal is controlled by the one who initiates it. The query signal is held in the Telguard database at the Communication Center for review and is not forwarded on to the central station.

2.6 TELGUARD TERMINAL STRIP CONNECTIONS

The conveniently located terminal strips provides wiring connections for the Telguard supervisory trip outputs, battery leads for connecting to a 12 volt 4.0Ah, or 7.0AH rechargeable battery, and AC power. The terminal strip can accommodate solid or stranded wire sizes from 14 to 22 gauge.

2.6.1 Programmable Supervisory Trip Outputs (STC1 and STC2) Relays

The Telguard has two supervisory relay trip outputs (STC1 and STC2) and are energized in a powered-up state when no system troubles exist. It enables a supervisory trouble code to be transmitted to the central station when connected to a C/C's 24-hour instant input zone. The STC relays are programmable, using a standard touch-tone telephone or buttset, to meet virtually any installation requirement.

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The following supervisory features or combination of features are programmable to trip the STC relays in order to meet a variety of installation requirements:

- Trips on *AC fail condition* (ACFC)
- Trips on *low or missing battery condition* (LBC).
- Trips on *line fault condition* (LFC).
- Trips on *no service condition* (NSC).
- Trips on *radio communication failure condition* (RFC).

The following system trouble features are embedded in the Telguard for tripping the STC relay and cannot be changed:

- Tripped when unit is not registered with the Telular Communications Center (TCC)
- Trips on c*atastrophic failure* (CF) if all power is lost.
- Trips on *transmit-disable command* from the Communication Center. This radio command disables only the Telguard transmitter and would be used, for example, to shut down the Telguard due to a runaway dialer.

2.7 DIAGNOSTIC AND STATUS LEDS

Six LEDs are provided as a useful aid during installation and give installers an immediate visual indication of system status.

LED Function Table – Normal Operating Mode (J10 = OPEN)

LED Symbol	Color	Duty Cycle	Indication
LED #1 Registration	Green	Solid On	Unit is registered with the message center and enabled
		Off	Unit not registered with message center (and disabled)
		Flashing	Unit is registered but disabled
LED #2 STC (System Trouble Condition)	Red	OFF	**ALL OK**
		1 Flash*	System Trouble Condition – Low/Missing AC Power
		2 Flashes*	System Trouble Condition – Low/Missing Battery Condition AND/OR Battery Charger Failure
		3 Flashes*	System Trouble Condition – LFC
		4 Flashes*	System Trouble Condition – NSC
		5 Flashes*	System Trouble Condition – RFC
		6 Flashes*	System Trouble Condition – DTF
LED #3 MODE	Yellow	Off	Mode 2, Cell Priority
		On	Mode 1, Telco Priority
		Fast Flash	C/C off-hook to transmit signals over cellular.
LED #4 Acknowledgement	Red	Solid On	Telguard waiting for acknowledgement from Communication Center
		Off	Idle state
		Flashing	When flashing with LED #1 unit has failed registration due to the programming of the panel, CALL TECH SUPPORT
LED #5 Radio	Green	Off	TG-4 initialized
		On	TG-4 initializing & registering with cellular network or Transmitting Alarm Data
		Short Flash (1 sec)	Radio receiving message
		Long Flash (2 sec)	Radio sending message
LED #6 AC Power	Red	Solid On	AC power connected to unit

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2.7.1 LED Signal Strength Indication

The Telguard provides the installer with an easy to use LED radio signal strength indicator (RSSI) for positioning the unit or remote antenna to obtain the strongest RF signal possible. A signal strength reading can be obtained at any time there is power applied to the Telguard without affecting the operation of the unit. When the ***"RSSI"*** jumper J10 is "SHORTED", the Telguard displays the current received signal strength within 5 seconds. The signal strength is read from bottom to top using the four sequential LEDs located on the top right side of the printed circuit board with the ***Radio LED #5 = 1*** and the ***STC LED #2 = 4***. See Appendix A1.4 for RSSI table.

2.8 TELGUARD SETUP PROGRAMMING PARAMETERS

The Telguard will not operate until the unit is activated from the Telular Communication Center. Certain Telguard operating parameters may need to be changed from the factory default programming by the installer during installation in order to have the Communication Center process alarm signals to the central station. These setting include the STC supervisory trip input settings, CFC settings, and NSC/LFC trip delay time. The Communication Center responds with a radio acknowledgement to the Telguard clearing the STC condition and allowing the Telguard to operate over the cellular radio network. The programmed parameters are transmitted automatically to the Telular Communication Center when the Telguard is activated.

2.9 UL LISTINGS

Model TG-4 (p/n TG4G0001) meets the requirements for all Household Burglary, Household Fire, and Combined Household Burglary/Fire installations. It has a plastic enclosure and dipole antenna. TG-4 is UL Listed for the following:

- **UL Household Burglary**
- **UL Household Fire**
- **UL Household Burg/Fire Combination**
- **Misc. Supplemental Use**

3.0 GETTING READY

The Telguard can only be activated when all the necessary accounting information has been entered into the customer database located at the Telular Communication Center. The database includes information about the customer account, unit location, and system test plan information.

3.1 DEALER ACCOUNT ESTABLISHMENT

Prior to activation of any Telguard unit, a Dealer Account must be established. Once the Dealer Account has been established and service credit line established between the Security Dealer and Telular, a Cellular Service Activation form may be submitted. Establish your Dealer Account by completing the Telular Cellular Service Dealer Account Application that is included with every Telguard and faxing it to Telular Customer Service at 678-945-1651. Once the application has been completed you will receive an acknowledgment within 1 business day or sooner. This is a one-time event. The acknowledgment from the Telular Technical Service will include a Dealer Account Number that will be used for all Telguard Digital activations.

3.2 SUBSCRIBER ACCOUNT REGISTRATION FOR ACTIVATION

A complete Activation Form is required by Telular to register the Telguard prior to leaving for the job site.

Service registration of the Telguard can be accomplished by:

1. FAX – Fax the completed Telular Cellular Service Activation Form that is shipped with each Telguard to Telular Customer Service at 678-945-1651.
2. Email – Email the completed Activation Form to cellservice@telular.com.
3. Online – Complete the Activation Form online at www.telguardonline.com.

Service registration occurs within 30 minutes of receipt of the Activation Form. The subscriber record will be created and the Telguard will be ready for activation. Activation occurs automatically upon transmission of the first alarm signal. Telular Technical Service is open from 8:00 AM – 8:00 PM EST Monday – Friday, 9:00AM – 5:00PM EST Saturday and closed during major holidays; Activation Forms received after hours will be processed by 9:00 AM EST the next business day.

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3.3 PRE-INSTALLATION CHECKLIST

Before attempting to connect Telguard to the host C/C, please note the following:

1. Be sure you have all the proper parts before you go to the job site. The following items are shipped with each Telguard unit:
   - ✓ **Activation Form –** The activation form must be completed before leaving for the job site to install the Telguard product.
   - ✓ Basic Telguard unit in a plastic enclosure.
   - ✓ UL Listed plug-in transformer.
   - ✓ Antenna
   - ✓ 3-foot modular plug-to-plug cord for connecting Telguard to RJ31X jack.
   - ✓ Telguard Installation and Operating Instructions Manual
   - ✓ **Backup Battery must be provided by installer.**

2. You must also have certain installation test tools.
   - A standard telephone or lineman's butt-set is required at the job site for use in programming the unit.
   - Optimal signal strength is determined by placing the unit and antenna where the most LEDs (up to four) are lighted when using Telguard's on-board Signal Strength Indicator feature so that the unit can be easily placed during installation where signal strength is greatest. Upon location selection, screws and a screwdriver will be required to attach the unit and antenna to the wall.

   NOTE: Your unit may be subject to airtime charges for unintended use. Telular Cellular Service offers several cellular service rate plans. Check the Activation Form that was shipped with your unit or call us to determine what rate plan each unit is operating under.

4.0 INSTALLATION SUMMARY

There are six steps in installing Telguard properly. **IF YOU DO NOT PROCEED IN THE ORDER AND MANNER PRESCRIBED, YOU MAY NOT COMPLETE THE INSTALLATION IN THE TIME ALLOCATED.** These six steps are summarized below and then explained in detail in the remainder of this manual.

4.1 REGISTER FOR CELLULAR SERVICE

The activation form must be completed before leaving for the job site to install the Telguard product. Service registration occurs within 30 minutes of receipt of the Activation Form. The subscriber record will be created and the Telguard will be ready for activation.

4.2 LOCATE UNIT AND MEASURE SIGNAL STRENGTH (RSSI)

Second, you will be confirming that the Telguard has adequate cellular signal strength. Put J10 jumper across both pins, LEDS will now indicate signal strength, minimum recommended is 2 ½ (2 on solid and the third flashing).

4.3 TRANSMIT C/C ALARMS OVER THE TELCO CONNECTION

Connect C/C and telco line to the Telguard. Trip a simple alarm on the C/C and transmit over the telco line. This step is important to verify that the C/C is programmed with valid account code and central station information before transmitting signals through the cellular network.

4.4 PROGRAM, ACTIVATE & TRANSMIT C/C ALARMS OVER CELLULAR RADIO NETWORK

Next, you will be programming the Telguard unless the default settings are what you want. Then connect the C/C's digital dialer output to Telguard and verify that alarm signals can be reliably sent through Telguard over cellular to the central station digital receiver. The incoming Telco line is not connected to Telguard during this step. **NOTE: The first alarm is <u>not transmitted</u> to the Central Station. The first alarm will confirm registration and activate the Telguard with the Telular Communication Center. All signals after the first are sent to the Central Station.**

4.5 CONNECT SUPERVISORY TRIP OUTPUTS

Telguard's supervisory trip outputs are connected to the C/C and then tested.

4.6 COMPLETE THE INSTALLATION

Your last step will be to check the jumper setting of J10 (LED mode, open = normal), attach earth ground, and permanently mount the unit.

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* * * *

With this overview of the installation in mind, you should now proceed with the actual installation, following the steps described in the remainder of this manual.

5.0 INSTALLATION STEPS

This six-step installation approach (5.1 through 5.6) provides the alarm installer with the easiest and fastest method of properly installing Telguard. Please follow the instructions carefully and if you should need assistance or have any questions, call Telular TECHNICAL SUPPORT at 1-800-229-2326 extension 9.

NOTE: Dealer Account Establishment and Cellular Activation must be complete prior to Installation (see section 3.0)

5.1 STEP 1: REGISTER THE TELGUARD UNIT FOR CELLULAR SERVICE

Installation Tip: Activate cellular service prior to leaving for the job site to avoid a second trip.

5.1.1 Register for Cellular Service

The activation form must be completed before leaving for the job site to install the Telguard product. The activation form may be completed by:

- Fax – 678-945-1651
- Email – cellservice@telular.com
- Online – www.telguardonline.com

Registration takes place Monday-Friday from 8:00AM to 8:00PM and Saturday 9:00AM to 5:00PM EST. Service registration occurs within 30 minutes of receipt of the Activation Form. Activation occurs automatically upon transmission of the first alarm signal.

5.2 STEP 2: LOCATE UNIT AND MEASURE SIGNAL STRENGTH (RSSI)

5.2.1 Locate Unit

Pick a spot next to the C/C where you think the Telguard will be mounted and place the unit down temporarily in that spot. **Do not mount it permanently now**, since it may need to be moved to receive a better cellular radio signal or a remote high-gain antenna may be necessary.

5.2.2 Connect Backup Battery and AC Power Transformer

To apply power to Telguard, attach battery leads to battery terminals noting polarity.

Connect the Telguard AC power transformer to AC terminals using stranded copper insulated wire following wire gauge and length recommendations below:

Recommended Wire Size	Length Not to Exceed
18 ga	20 ft
16 ga	40 ft
14 ga	60 ft

5.2.3 Connect Antenna and Temporarily Place Unit

The Telguard is supplied with an antenna. In most cases the antenna may be mounted directly to the Telguard. If a stronger radio signal is required, the antenna must be moved to a better signal location using a Telular antenna cable and bracket accessory (sold separately). The characteristics of the Telguard antenna can be altered depending upon the wall material and materials contained within the wall chosen for mounting. These effects may not be clearly identified by RSSI monitoring alone. The wall materials may have a more profound affect on the antenna's transmit band performance.

When selecting a mounting location, do not mount this unit in an area where the general public could reasonably be within 20cm (8 inches) of the antenna. The supplied dipole antenna is for INDOOR USE ONLY.

Note 1: Optimum RF performance can usually be found at the highest point within a building with the fewest number of walls between the Telguard's antenna and the outside of the premises.

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Note 2: To avoid interference with other electronic devices operating in the area, avoid mounting the Telguard's antenna near other electronic devices.

Note 3: The Telguard Digital TG-4 unit with supplied dipole antenna is designed for indoor installations ONLY. The supplied dipole antenna is for indoor use only.

These considerations should be coupled with the best RSSI indication obtainable (see section 2.7.1). Care should be taken to insure that a large metal object such as a refrigerator or a metal cabinet is not located on the opposite side of the wall.

If moving the Telguard to a different location is not practical, then you may need a cable and remote the antenna in order to receive adequate radio signal strength. Pick a high, visually secure spot using the guidelines below.

5.2.3.1 Tips for Improved Radio Signal Reception

- The higher the antenna the better. So, start in the drop ceiling above the unit and proceed up from there, to the roof if necessary.
- Remember, the antenna should be as inconspicuous as possible for greatest visual security.
- Try to keep the antenna away from sources of RF interference, including pumps, compressors, ovens, etc., or where metal objects can shield it or otherwise block the cellular radio RF signal.
- Place the antenna perpendicular to the ground, either right side up or upside down. Do not mount the antenna horizontally.

5.2.4 Measure Received Signal Strength (RSSI) for Best Antenna Placement

Measure the received signal strength by putting jumper on J10 in "SHORTED" position. This switches the LEDs to signal strength mode. Now, slowly move the unit or remote antenna to achieve maximum signal strength. Pick the place where the most LEDs (up to four) are lighted.

LED Function Table – View RSSI Mode (J10 = "SHORTED")

RSSI Value	LED's Lighted	RF dBm
NO SVC	LED 5 = slow flash, LED 4-2 = off	N/A
1	LED 5 = on, LED 4-2 = off	≤ -111 dBm
1½	LED 5 = on, LED 4 = slow flash LED 3-2 = off	≥ -110 dBm
2	LED 5-4 = on, LED 3-2 = off	≥ -100 dBm
2½	LED 5-4 = on, LED 3 = slow flash LED 2 = off	≥ -90 dBm **(Minimum signal strength required)**
3	LED 5-3 = on, LED 2 = off	≥ -80 dBm
3½	LED 5-3 = on, LED 2 = slow flash	≥ -70 dBm
4	LED 5-2 = on	≥ -60 dBm
Note: LED #1 = on indicates more than one cellular tower.		

NOTE: If you can not obtain a signal strength reading of 2½ (TWO LEDS ON SOLID AND THE THIRD LED ON SLOW FLASH), you will probably need to move the unit and/or remote antenna higher, or switch to a special antenna, as described below.

5.2.4.1 Antenna Options

Antenna problems are unlikely unless the premises are located in a fringe network coverage area, in a building below ground level, or in a metal structure. If you require a higher gain antenna or a longer cable assembly please contact your Telular Sales Representative at 800-229-2326. Telular offers a variety of high quality low loss dual band antenna cables and high gain antenna.

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5.3 STEP 3: TRANSMIT C/C ALARMS OVER THE TELCO CONNECTION

Be sure the C/C will transmit a simple alarm signal over the telco line through the RJ-31x to the central station when the Telguard is disabled. In checking this, do not apply power to the Telguard.

5.3.1 Connect C/C to Telguard Jack J7 (BLACK Connector)

Plug the modular jack of the C/C-to-Telguard cable from C/C to J7 (black) on the Telguard.

5.3.2 Connect telco line (RJ-31x Jack) to Telguard Jack J6 (GRAY Connector)

Plug the modular jack of the cable (supplied) from RJ-31x jack in the premise to J6 (gray) on the Telguard.

5.3.3 Verify Alarm Signal Transmissions over Telco

Trip several alarms on the C/C and verify that the central station received them by calling the central station operator. Use a lineman's buttset in ***MONITOR MODE*** and connected to Telguard's "T" and "R" test pins to "listen" to communications between the C/C and Monitoring Station.

5.4 STEP 4: PROGRAM, ACTIVATE & TRANSMIT C/C ALARMS OVER CELLULAR NETWORK

Confirm that the Telguard enables the host C/C to transmit alarm signals over the cellular radio network. In checking this, disconnect the incoming telco line to the Telguard. The Telguard will confirm registration with the Telular Communication Center if the Activation Form was submitted prior to installation. During the processing of the first alarm signal over the cellular network the Telguard will transmit all of the programming parameters from the Telguard along with the information (central station number and account code) from the alarm panel. Once this information is received, the Telular Communication Center will transmit a message back to the Telguard indicating that the unit is registered. When this message is received the LED'S on the unit will begin operating in normal mode; Registration LED #1 will be on solid.

The first alarm is to confirm registration and activate the Telguard unit. The first alarm will NOT be transmitted to the central station.

NOTE: SPECIAL LED INDICATIONS DURING ACTIVATION

IF THE TELGUARD FAILS THE REGISTRATION PROCESS IT WILL BE DISPLAYED ON THE LEDS.

1. IF LED #1 AND LED #4 ARE FLASHING, THE TELGUARD SERIAL NUMBER IS NOT IN THE DATABASE AT THE TELULAR COMM. CENTER, CALL TECHNICAL SUPPORT TO VERIFY PROPER LINE RANGE.
2. IF ALL OF THE LEDS ARE FLASHING, THE REGISTRATION MESSAGE WAS NOT RECEIVED AT THE TELULAR COMMUNICATION CENTER. RETRY TRANSMITTING REGISTRATION MESSAGE. IF TELGUARD FAILS A SECOND TIME TO REGISTER, CHECK SIGNAL STRENGTH. IF SIGNAL STRENGTH IS OK, THEN CALL TECHNICAL SUPPORT.

ON EITHER INDICATION OF FAILED REGISTRATION, THE UNIT MUST BE RESET BY PUTTING THE J10 (RSSI JUMPER), IN "SHORTED" POSITION. THE REGISTRATION MESSAGE MUST BE RESENT OR THE TELGUARD WILL TRANSMIT ALL SIGNALS THROUGH THE TELCO CONNECTION.

SYSTEM STATUS LEDS	REGISTRATION INDICATIONS
ALL LEDS FLASHING	FAILED REGISTRATION – SIGNAL TOO WEAK
LED #1 & LED #4 FLASHING	REGISTRATION ERROR – CALL TECHNICAL SUPPORT
LED #1 ON	REGISTRATION SUCCESSFUL
LED #2 ON SOLID NOT REGISTERED	NEED TO CONNECT PANEL AND TRIP ZONE

SYSTEM TROUBLE CONDITION, STC (LED #2)

STATUS LED #2	INDICATION
1 FLASH	AC LOW/MISSING
2 FLASH	LBC LOW BATTERY
3 FLASH	LFC LINE FAULT
4 FLASH	NSC NO SERVICE
5 FLASH	RFC RADIO FAILURE
6 FLASH	DTF DIAL TONE FAIL

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5.4.1 Setup & Programming the Operating Parameters in the Telguard

When the Telguard is received from the factory and is powered up for the first time, it is immediately ready for registration, provided the default settings are what you want. The STC LED #2 will flash to indicate any failure conditions. The MODE LED #3 will be on and the STC 1 and STC 2 relays will be tripped. If changes are required to the default settings, the Telguard can be programmed using a line-mans butt-set connected to T & R Test Points or a POTS phone connected to J7 (black connector where the C/C is normally connected).

5.4.1.1 Command Key Sequences for Pots Programming

Key Sequence	Description
# *	Enters the programming Mode
*	Exits programming and stores changes

TO PROGRAM THE TELGUARD

A. Put the line-mans butt-set in talk mode or pick up the POTS phone,
B. Connect power to the Telguard, when ready for programming you will hear 2 beeps
C. Press #, *, this will put the Telguard into a Master Access programming mode, 2 beeps.
D. Enter changes required

> The syntax for programming a specific memory location is as follows:
> **MEMORY LOCATION (3-digits), will respond with 2 beeps, then VALUE, will respond with 2 beeps.**

E. Then press *, you will hear 2 beeps then hang up. This saves the change and exits the programming mode.

EXAMPLE

To change the Telguard factory default for STC 1 Trip Output reporting from only LFC to include all system trouble conditions the installer would power down the Telguard, connect a butt-set to the T & R test points, reconnect power.
*Next press #, * the unit will generate 2 beeps.*
*Then press 850, the Telguard will respond with 2 beeps, then press 31, the Telguard will respond with 2 beeps, then press *, you will hear 2 beeps then hang up. (this will change STC 1 trip output to report all system trouble conditions) The Telguard will automatically transmit a message to update the Telular Communication Center.*

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MEMORY LOCATION	FIELD	DEFAULT VALUE	SETTING
831	Mode of operation	**1**	**1 = Telco Primary/Cellular Backup** 2 = Cellular Primary/Telco Backup
833	C/C Reporting Format	**09**	01= 4x2 pulse, 40pps 2300 hz 02= 4x2 pulse, 20pps 2300 hz 03= 4x2 pulse, 20pps 1400 hz 04= 3x1 pulse, 40pps, 2300 hz 05= 3x1 pulse, 20pps, 2300 hz 06= 3x1 pulse, 10pps, 1400 hz 07= Radionics IIe or IIIa^2 08 = Contact ID **09 = Auto Format Detect** 11 = SIA2 (300 Baud) 12 = DMP
850	STC 1 Trip Output Reporting **Normally Open**	**04**	Enter the **SUM TOTAL** of the events that you wish to trip the STC relay by **ADDING** the corresponding values: 00 = STC Trip Input Not Used 01 = AC Failure **04 = LFC** 16 = RFC 02 = Low Battery 08 = NSC 31 = All
851	STC 2 Trip Output Reporting **Normally Closed**	**27**	Enter the **SUM TOTAL** of the events that you wish to trip the STC relay by **ADDING** the corresponding values: 00 = STC Trip Input Not Used **01 = AC Failure** 04 = LFC **16 = RFC** **02 = Low Battery** **08 = NSC** 31 = All
852	STC Trip Delay for LFC and NSC	**2**	1=30 seconds 6=30 minutes **2=60 seconds** 7=45 minutes 3=3 minutes 8=60 minutes 4=10 minutes 9=24 hours 5=20 mintues
861	CFC Number of Events	**0**	**0 = disabled** 2 = 4 attempts 1 = 2 attempts 3 = 8 attempts
862	CFC between Events	**1**	**1 = 30 seconds** 3 = 70 seconds 5 = 90 seconds 2 = 60 seconds 4 = 80 seconds 6 = 99 seconds
872	AC Failure Delay	**02**	0-24 hours, **default = 2 hours**
899	Factory Default Unit		

5.4.2 Disconnect telco line (RJ-31x Jack) from Telguard Jack J6 (GRAY Connector)

Disconnect the plug from J6 (gray) of the Telguard that goes to the RJ-31x Jack at the premise.

5.4.3 Verify Alarm Signal Transmissions over Cellular

Trip several alarms on the C/C and verify that the central station received them by calling the central station operator. Use a lineman's buttset in ***MONITOR MODE*** and connected to Telguard's "T" and "R" test pins to "listen" to communications between the C/C and Telguard. The ACK LED #4 will come on solid while waiting for an acknowledgement.

If you are having problems getting reliable alarm signal transmissions, additional adjustments may be necessary.

- Recheck signal strength. You need **RSSI = 2½** *(TWO LEDS ON SOLID AND THE THIRD LED FLASHING)* for adequate signal strength. Also, check antenna connector and make sure it is seated correctly.
- **Call Telular Technical Service, 1-800-229-2326 extension 9**, and request the Telular Communication Center operator to check the Telguard programming configuration for proper operation and ***proper communications format***.

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5.4.4 Re-connect telco line (RJ-31x Jack) to Telguard Jack J6 (GRAY Connector)

Plug the modular jack of the cable from RJ-31x jack in the premise to J6 (gray) on the Telguard.

5.5 STEP 5: CONNECT SUPERVISORY TRIP OUTPUTS

Connect and test the supervisory trip outputs to the C/C.

NOTE: Activation of a local alarm or strobe light may be desirable when a trip is declared. The STC trip output can be used directly to activate a local signaling device, provided that the trip output is not needed to trip the host control/communicator at the same time. If both a local signal and a control trip input are required, then external relays are needed to provide additional uncommitted contacts.

UL Listed installation of the TG-4 will at a minimum have the trip output (STC2) to the host C/C to indicate low A/C (ACFC) and low battery (LBC) conditions.

5.5.1 Decide on a STC Trip Output Strategy

The Telguard provides the host C/C with two supervisory trip outputs for reporting a Telguard system trouble code to the central station. The supervisory trip outputs are programmable via a touch-tone telephone or buttset to suit various installation requirements. The programming options for these supervisory trip outputs can be any combination of the following:

a. **Always Off:** Disables all relay supervisory functions.
b. **ACFC:** Trips 2 hours after loss of AC power. Restores 60 seconds after AC power is restored.
c. **LBC:** Trips within 60 seconds on low battery condition. Restores when battery voltage ≥ 12.1 vdc.
d. **LFC:** Trips 30/60-sec. on Telco line fault condition. Restores 30/60 seconds after Telco line restores.
e. **NSC:** Trips 30/60-sec. on no service condition due to loss of RF signal strength. Restores 30/60 seconds after RF signal strength is available.
f. **RFC:** Trips on radio failure to communicate with the Telular Communication Center.

5.5.2 Check Telguard Supervisory Trip to C/C

After you have connected the STC trip outputs, check to be sure that they operate correctly.

5.5.2.1 Reprogram C/C to Send Proper Code

Reprogram C/C, if necessary, to send proper alarm code when tripped by the Telguard's supervisory output. Program zone restoral as desired.

5.5.2.2 Check Proper Operation of Telguard Supervisory Output

Check for proper operation of each programmed supervisory output by causing it to trip the C/C and be sure the proper LED illuminates and that the proper trouble code is reported to the central station. Skip the testing of any supervisory functions that have not been enabled. Note that the yellow MODE LED #3 starts to flash when the C/C goes off-hook to report the alarm signal over cellular.

- **Low Battery Condition (LBC)**: Disconnect the battery and during the next 60 seconds check to see that the STC LED #2 flashes 2 times indicating that the battery is missing. Check to see that the C/C transmits the STC trouble code (over cellular) to the central station. Reconnect the battery and check during the next 60 seconds to see that the STC LED #2 goes off, indicating the missing battery condition has been restored.

- **Line Fault Condition (LFC):** Disconnect J/J cable at RJ-11. Check to see that the STC LED #2 flashes 3 times in 30/60 seconds and the C/C transmits the STC trouble code (over cellular) to the central station indicating the incoming telco line is disconnected. Reconnect J/J cable and check to see that the STC LED #2 goes off in 30/60-seconds indicating telco line restored.

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- **No Service Condition (NSC)**: Disconnect the antenna from the Telguard. Check to see that the STC LED #2 flashes 4 times in 30/60 seconds and the C/C transmits the STC trouble code over the telco line indicating loss of RF signal strength. Reconnect the antenna and check to see that the STC LED #2 goes off in 30/60-seconds indicating RF signal strength restored.

  Note: The Received Signal Strength (RSSI) must be less than -114 dBm in order to cause a NSC condition. If the Telguard is located in a high signal strength area (close to a cellular tower), it is possible for the signal strength to be greater than -114 dBm even with the antenna disconnected.

- **AC Fail Condition (ACFC)**: Disconnect the 12VAC, 10VA transformer and check to see that the AC POWER LED goes out and the STC LED #2 flashes once indicating that AC power is missing. Reconnect the AC transformer and check to see that the AC POWER LED goes on and the STC LED #2 goes off indicating that AC power has been restored. No transmissions will be sent to the central station. The AC power must be off, continuously, for 2 hours before the STC relay causes the C/C to send a trouble code. If the AC power is restored for 60 seconds or more, then the 2-hour timer restarts.

5.6 STEP 6: COMPLETE THE TELGUARD INSTALLATION

Last step is to verify settings and permanently mount the Telguard.

5.6.1 Check Settings

Check the jumper setting of J10 (LED mode, “OPEN” = normal, “SHORTED” = RSSI mode).

5.6.2 Permanently Mount and Properly Ground the Telguard Chassis

Attach earth ground to the green grounding screw located on lower left-hand corner of printed circuit board assembly and permanently mount the Telguard enclosure.

Install center-mounting screws (not supplied). Slide the enclosure onto this screw.

Screw in the remaining two screws in the bottom set of mounting holes.

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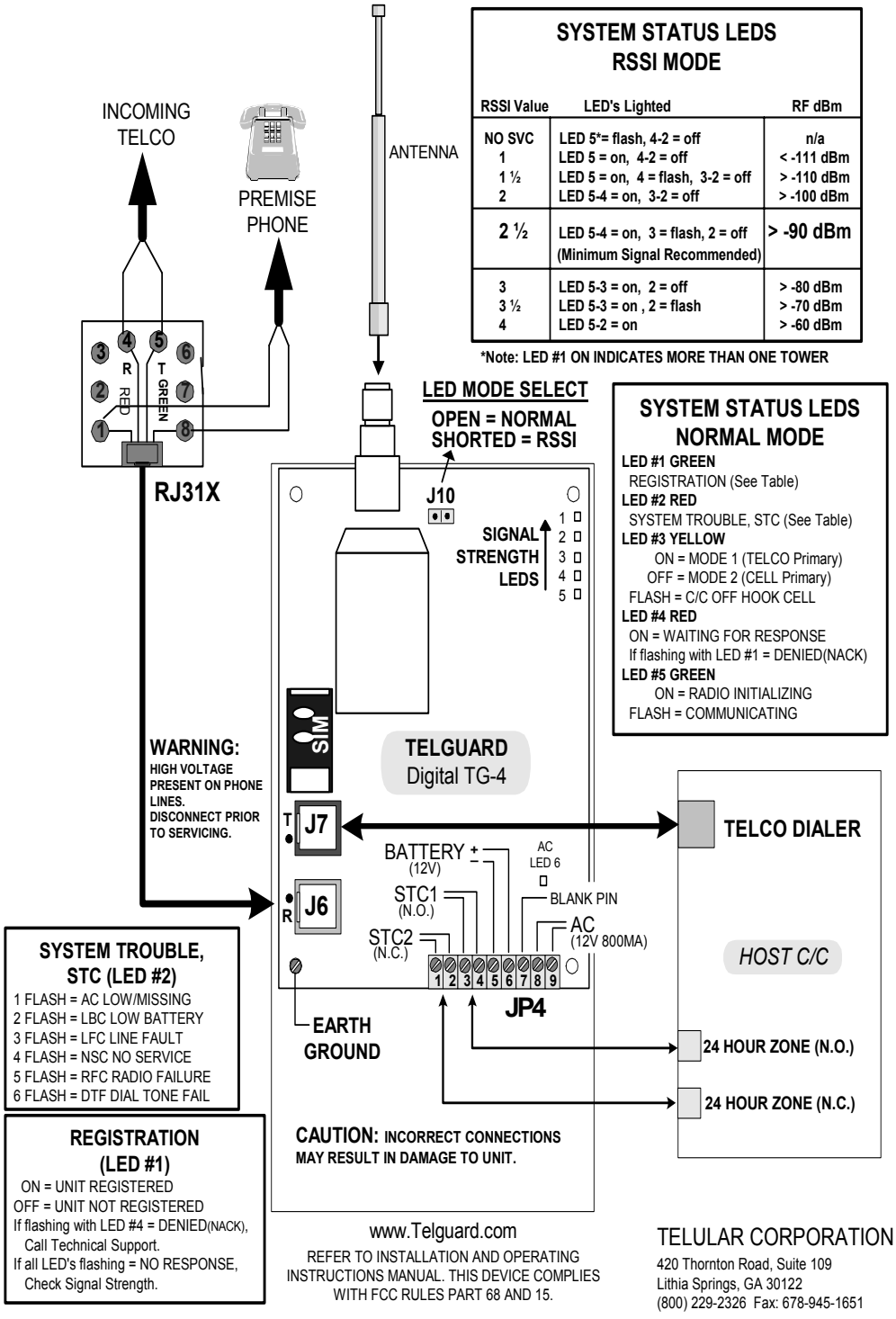
A1.0 Appendices

A1.1 WIRING DIAGRAM



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A1.2 JACK AND PIN ASSIGNMENTS

Jack Designation	Connects To	Pin Assignment	Function	Status LED Reference
J6 Telco RJ-31x. GRAY CONNECTOR	Incoming Telco RJ-45 Jack.	1 Brown R1 2. Blue 4 Green R(Ring) 5 Red T(Tip) 7. Orange 8 Gray T1	Connects telco line to Telguard.	**STC LED #2 Flashes 3 times** when telco voltage is lost.
J7 C/C Digital Dialer BLACK CONNECTOR	Digital Dialer input/output of host C/C.	1 Brown R1 2. Blue 4 Green R(Ring) 5 Red T(Tip) 7. Orange 8 Gray T1	Connects C/C digital dialer input/output through unit.	**MODE LED #3** will flash when C/C is communicating over cellular

A1.3 TERMINAL STRIP PIN ASSIGNMENTS

Terminal Strip Pin	Definition	Connects To	Function	Status LED Reference
1 STC2 **2 STC2**	Supervisory Relay2 Trip output for programmable trouble conditions. **Normally Closed**	24-hour trip zone input on host C/C.	Enables transmission of programmed supervisory trouble code: • **AC Power Fail (ACFC).** AC failure detected at 102 VAC. • **Low/Missing Battery Condition (LBC)** due to: Low Battery detected at 11.6 VDC. • **Radio Communications Failure (RFC)** due to: Failure to receive Ack after 3 attempts. • **Loss of Telguard Dial Tone Voltage (DTF)** due to: Improper dial tone voltage. ≤ 20 VDC. • **No Service Condition (NSC)** due to: Received Signal Strength ≤ -114 dBm.	When fault condition occurs: **AC Power LED OFF** **STC LED Flashes 1 time.** **STC LED #2 Flashes 2 times.** **STC LED #2 Flashes 5 times.** **STC LED #2 Flashes 6 times.** **STC LED #2 Flashes 4 times.**
3 STC1 **4 STC1**	Supervisory Relay1 Trip output for programmable trouble conditions. **Normally Open**	24-hour trip zone input on host C/C.	• **Line Fault Condition (LFC)** due to: Improper Telco voltage (LFC) ≤ 2 VDC.	**STC LED #2 Flashes 3 times.**
5 - Battery **6 +Battery**	12V Backup battery Input	12V battery	• **Low/Missing Battery Condition (LBC)** due to: Low Battery detected at 11.6 VDC.	**STC LED #2 Flashes 2 times.**
7	Not Used	Not Used	Not Used	
8 AC **9 AC**	AC power input. 12 VAC, 10VA.	120 VAC 60Hz unswitched circuit.	Provides primary operational power to Telguard and battery charging circuit.	**AC Power LED ON** when AC is normal. **AC power LED OFF And STC LED #2 Flashes 1 time** when AC is low

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A1.4 LED MODES AND FUNCTIONS

LED Function Table – Normal Operating Mode (J10 = OPEN)

LED Symbol	Color	Duty Cycle	Indication
LED #1 Registration	Green	Solid On	Unit is registered with the message center and enabled
		Off	Unit not registered with message center (and disabled)
		Flashing	Unit is registered but disabled
LED #2 STC (System Trouble Condition)	Red	OFF	**ALL OK**
		1 Flash*	System Trouble Condition – Low/Missing AC Power
		2 Flashes*	System Trouble Condition – Low/Missing Battery Condition AND/OR Battery Charger Failure
		3 Flashes*	System Trouble Condition – LFC
		4 Flashes*	System Trouble Condition – NSC
		5 Flashes*	System Trouble Condition – RFC
		6 Flashes*	System Trouble Condition – DTF
LED #3 MODE	Yellow	Off	Mode 2, Cell Priority
		On	Mode 1, Telco Priority
		Fast Flash	C/C off-hook to transmit signals over cellular.
LED #4 Acknowledgement	Red	Solid On	Telguard waiting for acknowledgement from Communication Center
		Off	Idle state
		Flashing	When flashing with LED #1 unit has failed registration due to the programming of the panel, CALL TECH SUPPORT
LED #5 Radio	Green	Off	TG-4 initialized
		On	TG-4 initializing & registering with cellular network or Transmitting Alarm Data
		Short Flash (1 sec)	Radio receiving message
		Long Flash (2 sec)	Radio sending message
LED #6 AC Power	Red	Solid On	AC power connected to unit

LED Function Table – View RSSI Mode (J10 = SHORTED)

RSSI Value	LED's Lighted	RF dBm
NO SVC	LED 5 = slow flash, LED 4-2 = off	n/a
1	LED 5 = on, LED 4-2 = off	≤ -111 dBm
1½	LED 5 = on, LED 4 = slow flash LED 3-2 = off	≥ -110 dBm
2	LED 5-4 = on, LED 3-2 = off	≥ -100 dBm
2½	LED 5-4 = on, LED 3 = slow flash LED 2 = off	≥ -90 dBm **(Minimum signal strength required)**
3	LED 5-3 = on, LED 2 = off	≥ -80 dBm
3½	LED 5-3 = on, LED 2 = slow flash	≥ -70 dBm
4	LED 5-2 = on	≥ -60 dBm
Note: LED #1 = on indicates more than one cellular tower.		

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A2.0 Operational Quick Reference Table

Telguard Event		LED Response	Relay Output	Radio Message	Internal Action
Typical C/C Alarm Cycle over Telco		None	None	None	Monitors Telco line voltage and C/C attempts
STC Telguard System Trouble Conditions	ACFC – AC Fail Condition	Yes AC Power **off** and STC **LED #2** flashes **1 time**.	If Selected	None	Switch to standby battery if present, monitor battery, monitor AC for restoral.
	LBC - Low Battery Condition	Yes STC **LED #2** flashes **2 times**.	If Selected	None	Wait for LBC restoral, charge battery.
	LFC – Telco Line Fault Condition	Yes STC **LED #2** flashes **3 times**.	If Selected	None	Transmit alarm via radio if necessary, when telco is restored, remove LFC condition
	NSC – No Service Condition (Low Signal Strength)	Yes STC **LED #2** flashes **4 times**.	If Selected	None	Continue to validate signal strength, remove NSC when signal returns
	RFC – Radio Failure to Communicate due to: *RFC1*: No Link Request ACK. OR *RFC2:* No Link Termination ACK.	Yes STC **LED #2** flashes **5 times**.	If Selected	None	Switch to Telco so that C/C can communicate directly with Central Station.
	DTF - Dial Tone Failure	Yes STC **LED #2** flashes **6 times**.	Yes	Yes	Internal 30V supply circuit failure. Return unit for repair on RMA.
	Not Active for Cellular alarm Transmission	Yes Registration **LED #1 off**.	Yes	None	Telguard will not function until operating parameters are downloaded to the Telular Communication Center Telguard remains in Telco only mode.
	CF - Catastrophic Failure	None	Yes	None	Telguard not working. Remains in Telco only mode.
Automatic Self-Test		Yes Radio **LED #5 flasher** when transmitting	None	Yes (Self-test))	Send Self-test information to central station via Communication Center, return to ready state
Telguard Remote Query – Communication Center Activated by Customer Service.		Yes Radio **LED #5 flasher** when transmitting	None	Yes (Status data)	Send Status data to Communication Center for review customer service
Telguard Enable and Configuration Upload –		Yes Radio **LED #5 flasher** when transmitting	None	Configuration Data (Setup data)	Telguard sends setup configuration to the Communication Center and switches to READY state to begin operation. MODE LED #3 turns on and STC LED #2 turns off.
Disable TX – Communication Center Activated.		Yes Radio **LED #5 flasher** when transmitting	Yes	Yes (Status data)	TX capability is disabled until further notice. Telguard can still receive radio signals from Communication Center.

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A2.1 ACTIVATION FORM

Telguard® Digital TELULAR CELLULAR SERVICE ACTIVATION FORM

To activate your Telguard, fax this form to **(678) 945-1651** or complete the web activation form at www.telguard.com.

Telular Use Only - Confirmation Number:

SUBSCRIBER INFORMATION

Subscriber's **Last Name** **First** **Middle**

Street Address **City** **State** **Zip Code**

Subscriber application: ☐ Residential ☐ Commercial

BILLING INFORMATION

In order to activate Telguard Digital systems on the Telular cellular network, you must be a registered Telguard Dealer. Enter your Dealer account number below. If you are not registered as a dealer and would like more information, contact Telular at (800) 229-2326, Sales Department.

Dealer Company Name **Dealer Account Number**

Street Address **City** **State** **Zip Code**

Contact Last Name **First**

Contact Phone Number **Contact FAX Number** **Email**

TELGUARD INFORMATION

Telguard Digital Serial Number

REMOTE SYSTEM TEST

All rate plans include options for a Telguard Self-Test signal to be sent to your Central Station. The PASS signal verifies the connection of the Telguard to your central station and logs status information at the Telular Communication Center. The FAIL signal is transmitted to the central station if the Telguard does not respond. Enter the Self-Test Code(s) that should be transmitted. You may choose to transmit PASS ONLY, FAIL ONLY, or BOTH.

Automatic Self-Test	
PASS CODE	
FAIL CODE	
Master Account Number (Partitioned Panels Only)	

RATE PLAN SELECTION (Select one of the following)

Monthly Test	10 signals (1 test & 9 alarms per month)	❑	Day of Month (1 to 28)
Weekly Test	20 signals (5 tests & 15 alarms per month)	❑	Day of Week (Mon. to Sun.)
Daily Test	46 signals (31 tests & 15 alarms per month)	❑	N/A

CENTRAL STATION REPORTING

Telguard will obtain the Central Station Receiver and Subscriber Account numbers from: (select one of the following)

❑	**Alarm Panel (C/C).** The Telguard will obtain Central Station Receiver and Account numbers from the Alarm Panel. Note, the alarm panel must dial a 10-digit number.
❑	**TCC (Telular Communications Center).** The Telguard will transmit all zone information to the Central Station Receiver and Subscriber Account number specified here: Central Station Receiver Phone Number: Primary (____)_____-_____ Secondary (____)_____-_____ C/S Reporting Format: _____ Subscriber Account Number: _____

DEALER ACCEPTANCE

Dealer acknowledges and accepts all Telular Terms and Conditions. Dealer authorizes the immediate activation of service.

Signature **Print Name** **Date**

TELULAR® CORPORATION

56031304

FAX: (678) 945-1651

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A2.2 COMPATIBLE CONTROL COMMUNICATORS

Any UL Listed Control Communicator that supports the listed formats (Contact ID, Pulse, Radionics, SIA2 and DMP) are compatible and may be used with TG-4. The installer should verify the complete compatibility at the time installation.

A3.0 Detailed Specifications

A3.1 DIALER TO INTERFACE ELECTRONICS

The patented integrated interface by Telular, Inc. allows digital dialers to dial into the cellular radio network.

- Line voltage: -26 vdc into standard telephone device when on-hook.
- Dial tone: Precision 350 + 440Hz +/- 1%. 10 digits dial out capability.
- Mode: Loop start only. 25mA +/- 10% off-hook.
- Protected by U.S. Patents: 4,658,096; 4,775,997; 4,922,517; 4,737,975; 4,868,519; 5,134,644.

A3.2 POWER

- Maximum AC current draw: 100mA
- Battery Supply:
  - Maximum full charge DC voltage = 13.8V +/- 0.2V.
  - Battery charging system: Constant current, Electronic short circuit protection
  - Maximum charging current of 240ma
- Transformer Supplied: 12 VAC 10VA, UL, plug-in; acceptable transformers:
  - Basler Electronics part number: S189480032
  - GlobTek part number: WA1E800J00-N-GTGTAB
  - Tri-Mag part number: WTD-1208-C

A3.3 DIGITAL CELLULAR RADIO

The Telguard TG-4 radio supports GSM/GPRS cellular protocol. It is equipped with an integrated radio transceiver conforming to all the requirements of the GSM Phase 2+ tests specified in GSM 11.10. The TG-4 transceiver is FCC compliant, meeting all of the requirements of Part 24 and SAR testing. It is also compliant to the PCTRB NAPRD03 requirements.

- Frequency range: GSM 850/1900MHz,
  1. 824MHz-849MHz
  2. 1850MHz-1909MHz

- Antenna Port: TNC connector (female), 50-ohm
- Receiver Sensitivity: -102 dBm
- Transmit Power: EGSM 850MHz: Class 4 (2 watts)
  GSM 1900MHz: Class 1 (1 watt)
- FCC ID: MTFTG5112597
- FCC Registration: MTFAL03BTG4G0001
- Supplied Antenna: Dipole
- Physical Size: 9.5"H x 4.5"W x 1.75"D.
- Shipping weight: 5 lbs.
- Operating Environment: 0° C to +49° C; 0 - 85% humidity (non-condensing).

A3.4 TELCO INTERFACE

- Ringer equivalence: 0.3B REN

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A4.0 Parts List

Part No.	Description
	Basic Hardware:

Model TG-4

p/n TG4G0001 Model TG-4 (p/n TG4G0001) meets the requirements for Household Burglary, Household Fire, and Combination Burglary/Fire installations. It has a plastic enclosure, and dipole antenna. TG-4 is UL Listed for the following:

- **UL Household Burglary**
- **UL Household Fire**
- **UL Household Burg/Fire Combination**
- **UL Supplemental (Commercial applications)**

General Accessories

ACD-12	12 feet of antenna cable and mounting bracket
ACD-35	35 feet of low loss high performance antenna cable and mounting bracket
ACD-50	50 feet of low loss high performance antenna cable and mounting bracket
ACD-100	100 feet of low loss high performance antenna cable and mounting bracket
HGD-0	High Gain Directional Antenna

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