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Type Acceptance
Operating Instructions for the
Telular TELGUARD® DataBurst Cellular Alarm Transmission System

Models T100C001, T200C001 and T300C001

0.0 Introduction

This document contains operating instructions relative to type acceptance and compliance testing of the Telguard DataBurst cellular alarm system model numbers T100C001, T200C001 and T300C001. A description of test sample setup, application of appropriate power source(s) and control means is provided herein.

The Telguard DataBurst cellular alarm transmission system is intended for operation under the following conditions:

- AC line voltage range (applied to line side of AC adapter): 102VAC – 132VAC, 60Hz
- DC voltage input range (DC to be supplied by a sealed lead acid battery and applied to either J7 pins 1(+) & 2(-) or J6 pins 3(-) & 4(+)): 12VDC, +/- 10%
- Operating temperature range: 0° to 70°C
- Humidity (operating and storage): 90% maximum, non condensing

1.0 Setup

Initial set up of the Telguard DataBurst involves the following basic steps:

1. Connection of the supplied serial communications cable to a personal computers serial port
2. Connection of the opposite end of the serial communications cable to the Telguard DataBurst circuit card at J3
3. Attaching either the supplied dipole whip antenna or (through appropriate RF cabling) any necessary measurement instruments to the Telguard's
4. Connection of the wall mount AC transformer to the Telguard DataBurst
5. Application of power to the Telguard DataBurst test sample
6. Entering specific control commands via any common terminal program on the PC

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1.1 Serial Port Connection

Control of the Telguard test sample is effected over a serial communications link between a standard PC serial port and connector J3 located on the Telguard circuit card. After control commands have been sent to the test sample the serial cable can be removed without altering the desired setup as long as power to the test sample is not interrupted. (This feature is useful during emissions testing when the emissions effects of the control cable need to be eliminated.)

The communications link allows for the following special test functions:

- Set Tx/Rx operating channel (for AMPS cellular the Rx is always 45MHz above the selected Tx frequency)
- Turn transmitter ON and OFF
- Set the transmitter output power level
- Turn transmitter modulation ON or OFF (There are three different types of modulation that can be selected. There is no external means of modulation for this transmitter.)

To connect the serial control cable:

1. Turn PC on and start Windows.
2. Plug-in the DC output cable of the AC adapter to the (black) B&B RS-232 in-line level translator.
3. Locate the supplied serial cable and plug-in the AC adapter to an available AC power line (120VAC, 60Hz).
4. Plug in the DB25 connector of the serial cable to the PC.
5. Apply power to the Telguard test sample (Attach the two red wires from J6 pins 6 and 7 to the two screw terminals on the supplied (black) 20VA transformer.)
6. Plug-in the black in-line connector of the serial cable to the in-line header J3 on the Telguard circuit card. (Please line up the white mark of the serial cable connector with the white mark on the circuit card header J3. The white mark is located towards J2.)
7. Start HyperTerminal in terminal mode. Communications parameters are 9600, 8 bits, 1 start bit, 1 stop bit and no parity.

1.2 Control Command Set

The following table lists the available control command set and description of each command (*Note: A carriage return is required after each command to send it to the Telguard unit for the command to be registered.*):

Command	Description
C[xxx]	Simultaneously programs operating channel of receiver and transmitter. Where '[xxx]' is a three digit channel number parameter. Low band - C991 Tx=824.040MHz, Rx=869.040MHz Mid band - C384 Tx=836.520MHz, Rx=881.520MHz Hi band - C799 Tx=848.970MHz, Rx=893.970MHz The default for this parameter is channel 384 (the mid-band channel). *Must be entered as three digits.*

F[zzz]	Programs the transmitter's OFF period. Where '[zzz]' is the OFF period in seconds (i.e. '[zzz]' = 004 is 4 seconds OFF time between Tx bursts.) The default value for this parameter is 7 seconds (007) OFF. *Must be entered as three digits.*
G	Alternately toggles Signaling Tone (ST) modulation ON and OFF.
M	Alternately toggles Wide Band Data modulation ON and OFF.
N[nnn]	Programs the transmitter's ON period. Where '[nnn]' is the ON period in seconds (i.e. '[nnn]' = 001 is 1 second ON time.) for the Tx burst. The default value for this parameter is 3 seconds (003) ON. *Must be entered as three digits.*
P[yyy]	Sets transmitter output power level. Where '[yyy]' is a three digit power level parameter. Max. Power = Power level 0 = P090 for test sample 1, P088 for test sample 2. *Must be entered as three digits.*
S	Alternately toggles transmitter output power ON and OFF. When power is first applied to the Telguard the transmitter is OFF (no cycling). The first time an 'S' is sent to the test sample after the initial application of system power the transmitter will turn ON (cycles ON and OFF).
T	Alternately toggles Supervisory Audio Tone (SAT) modulation ON and OFF.

2.0 Operation

2.1 Idle Mode

When power is initially applied to the Telguard DataBurst the unit is in idle mode. This is the normal idle state for the device. In this mode all circuits are active except for the transmitter. The transmitter remains OFF until commanded to turn ON by sending an 's' over the serial control link. Receiver local oscillators, the microcontroller and microcontroller circuit functions are always active in the idle state.

2.2 Transmit Mode

The transmitter is enabled and controlled by the commands listed in the table of section 1.2. Upon the initial application of power the transmitter is OFF. To turn ON the transmitter the procedure would be:

1. Attach either the supplied flexible dipole antenna or an appropriate RF cable terminating in a 50 ohm load.
2. Apply power to the Telguard DataBurst test sample.
3. Connect serial port communications cable (see section 1.1)
4. Enter the desired channel number via the PC keyboard (cxxx)
5. Enter the transmitter output power level parameter (pyyy)
6. Enter an 's' to turn the transmitter ON.
7. To turn the transmitter OFF, enter 's' again.

In transmit mode whenever the transmitter is enabled the transmitter will normally be "toggling" ON and OFF. A green LED on the Telguard's circuit board (D8) will illuminate when the transmitter is actually ON (i.e. RF power being generated). The default ON / OFF cycle for the transmitter is approximately 3 seconds ON and followed by 7 seconds OFF. This cycle will continue until an 's' command is sent over the serial port interface to terminate the transmitters ON/OFF cycling.) The cycle time can be adjusted in one-second increments.

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Note on Transmitter Duty Cycle:

The "F[zzz]" and "N[nnn]" commands can be used to adjust the transmitters duty cycle (OFF and ON periods respectively). The Telguard DataBurst transmitter is designed to operate with no more than a 30% duty cycle (worst case) and a maximum ON time of 4 seconds. Transmitter operation outside of these design limits may damage or compromise the reliability of the transmitter. Under normal operating conditions the transmitters duty cycle is on the order of only 20% with an ON time of approximately 3 seconds.

2.2.1 Modulation

All modulation supplied to the Telguard DataBurst transmitter is internally generated. That is there is no external or user access to the Telguard transmitter's modulation facility.

There are three possible modulation signals used in The Telguard DataBurst transceiver. Each are required by EIA IS-19B and TIA/EIA IS-91 AMPS compatibility standards. They are:

Modulation	Prescribed Deviation Level, Tolerance
Supervisory Audio Tone (SAT)	+/-2KHz P-P, +/- 10%
Signaling Tone (ST)	+/-8KHZ P-P, +/-10%
Wide Band Data	+/-8KHz P-P, +/-10%

Note: Test sample number 1 allows investigations into the transmitters CW characteristics only. Modulation modes are available on test sample number 2. The hardware in the radio sections of test sample 1 and test sample 2 are identical.

2.2.2 Modulation Control

The three types of modulation (SAT, ST and wide band data) can each be individually controlled by commands supplied over the serial communication cable. The available commands are described in the table of section 1.2 above.

Upon the initial application of power all modulation is set to OFF. Entering a modulation type command at this point will turn ON the selected modulation type. Modulation will be applied to the transmitter for the entire duration of the transmitters ON cycle time. Entering the same modulation control command a second time will toggle the selected modulation to OFF.