



ML-CSA 3550 UL 3G Cell Signal Amplifier
*with Patented Passive Bypass Technology
and Auto Gain & Oscillation Control*

User Guide v.4

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1. Overview

The ML-CSA 3550 UL 3G Cell Signal Amplifier is a high performance, microprocessor controlled, bidirectional RF amplifier for the entire North American 850 MHz cellular and 1900 MHz PCS frequency bands. The amplifier has an automatic gain and oscillation control system that will automatically adjust the gain and the output power if a signal anomaly occurs. This amplifier is designed to operate as a direct connect unit within a cellular system, for maximum performance in weak signal coverage areas. The input power requirements for the amplifier are positive 9.5 to 29.0 volts DC (negative ground).

In addition, this equipment is certified and in compliance with the UL 1610 Standard. UL 1610 is the UL Standard for Central Station Burglar Alarm Units.



2. Parts List

Depending upon the connector type of the cellular device, Multi-Link can customize the M2M cell amplifier kit to include the appropriate adapters to ensure a seamless and quick installation. Adapter types include, but are not limited to SMA, RP-SMA, MMCX, MCX, FME, and TNC.

| | |
|---|--|
| <p>1. ML-CSA 3550 UL Amplifier Unit</p>  <p>The image shows a rectangular, black and silver amplifier unit. The front panel features the Multi-Link logo and the text "M2M CELL SIGNAL AMPLIFIER with Passive Bypass Technology". There are two SMA connectors on the front and a DC power input on the side.</p> | <p>2. Hardwire DC Power Cable- Part# CBL-5214-001</p>  <p>The image shows a black, coiled DC power cable with a standard DC power connector on one end and a red and black wire on the other.</p> |
| <p>3. Required (Not Included): UL-listed Locking Enclosure – Part# ML-ENCL-UL (7"x 12"x 3.5" Min. dimensions)</p>  <p>The image shows a white, rectangular locking enclosure. A UL logo is visible in the bottom right corner, indicating it is UL-listed.</p> | <p>4. Mag-Mount 2dBi Outdoor Antenna Part# ML-ANT-MM01</p>  <p>The image shows a black, mag-mount outdoor antenna with a circular base and a vertical antenna element.</p> |
| <p>5. SMA-to-SMA Device Cable (For SMA device) Part# CBL-SMA</p>  <p>The image shows a black, coiled SMA-to-SMA device cable with SMA connectors on both ends.</p> | <p>6. Optional: SMA-to-MMCX Device Cable (For MMCX device) Part# CBL-MMCX</p>  <p>The image shows a black, coiled SMA-to-MMCX device cable with an SMA connector on one end and an MMCX connector on the other.</p> |

3. Standard Installation



Disclaimer: Installation of this device requires knowledge of basic electrical and experience with installing electronic devices. We recommend seeking a professional installer if you are not accustomed to installing electronics or high tech devices. Installation of this device is at your own risk. Multi-Link, Inc. assumes no responsibility for the installation or improper operation of this device. Got questions? Contact Multi-Link Tech Support: 800-535-4651 or techsupport@multi-link.net, Monday through Friday; 9 am - 5 pm Eastern Time.

Basic Connectivity Diagram (UL cabinet not shown)



1. When installing the ML-CSA 3550 UL Kit, the Amplifier **MUST be mounted in a Type 1 UL-Listed Metal Cabinet with MINIMUM dimensions of 7" x 12" x 3.5"** with no ventilation openings and no other devices.
2. Mount the ML-CSA 3550 Amplifier into a UL-Listed Locking Enclosure (required) in an inside dry location using appropriate nuts and bolts. Mount the Amplifier flush to the rear of the enclosure with a minimum 0.5 inch clearance from any keyhole slots. For Burglary installations, installation of the enclosure **must be within the protected area.**



Important: In order to be compliant, the ML-CSA 3550 UL Amplifier **MUST** be installed in a Type 1 UL-Listed Metal Cabinet. (Minimum 7" x 12" x 3.5")

3. Run the Antenna Cable through the top of the enclosure knockout. Install UL-Listed Grommet in knockout hole to prevent wire abrasion.



4. Connect the SMA end of the Antenna cable to the ML-CSA 3550 UL connection marked "Antenna".



5. Mount the Outdoor Signal Antenna vertically on the enclosure metal surface. Antenna must be located in the same room as the amplifier and the cellular communicator.



6. Connect the SMA-to-SMA cable to the Device connector on the ML-CSA 3550 UL connection marked "Device".



7. Connect the SMA-to-SMA device cable to "Listed Compatible" cellular device.



8. Plug the Hardware Power Cable into the ML-CSA 3550 UL power connector.



9. a) For installation in a commercial UL 1610 application – Connect the hardwire power cable to a listed compatible UL 1610 Panel, Dialer or Power Supply listed for Fire with limited power regulated outputs.
b) For installation in a non-commercial UL 1610 Connect the hardwire power cable to an acceptable Listed UPS.



4. LED Diagnostics

Once the amplifier is installed properly and power is applied, the LEDs on DEVICE side of unit will both turn on followed by the green LED flashing. The green LED will flash while the amplifier increases its gain to the optimum level. The red LED may also flash during this stage while the gain (power) is properly set on the amplifier. When power control is established, the green LED will remain constantly on. You may see the green and red LEDs flash back and forth, THIS IS NORMAL. In areas where the cellular network is adequate, the amplifier will maintain a maximum power level acceptable for normal operation. **If the red LED is constantly on and the green LED is off, the amplifier has detected a fault.** The amplifier will shut down automatically and restart. If the fault persists, reposition the antenna until normal operation is achieved. Once normal operation is established, you may permanently mount the antennas in the locations you chose in the prior steps.

5. Diagnostic LED definitions

Red Green

-   Solid Green and Red – LED test, the unit is initializing
-   Solid Green – Normal operation
-   Flashing Green – Normal operation, increasing gain setting
-   Solid Green and Flashing Red – Normal operation, decreasing gain setting
-   Solid Red and no Green – Fault detected (Unit will shut down until power is cycled.)

6. PATENTED Passive Bypass Technology

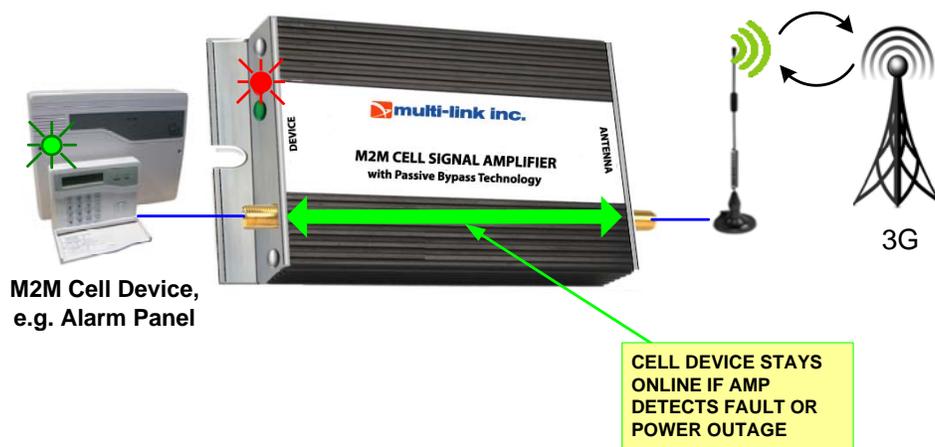
The ML-CSA 3550 UL amplifier is equipped with Patented Passive Bypass technology. This feature allows the amplifier to passively bypass itself and become merely a "pass through" cable during these occurrences:

- **When amplification is not necessary, e.g. existing cell signal strength is adequate**
- **When connected cell device goes into "Stand-By" Mode**
- **When there is a power loss to amplifier**
- **When a fault is detected**

Passive Bypass technology is useful in applications when the amplifier is mobile, moving in and out of poor signal areas. The amplifier will bypass itself when in close proximity to cell towers. This serves as a safeguard feature, completely eliminating any potential for disruption to the cell network.

This unique feature is also extremely useful in security system installations where a connection with the antenna must always be maintained, even with loss of power.

Passive Bypass Fail Safe = Connected



7. ML-CSA 3550 UL Specifications

- Frequency Range: Cellular 850 (824MHz – 894MHz), PCS 1900 (1850MHz – 1990MHz)
- 20dB BW: 850 UL: 39MHz, 1900 UL: 115MHz
- Rated Uplink Maximum Output Power: Cellular 850; 27dBm, PCS 1900; 27dBm
- Rated Downlink Maximum Output Power: Cellular 850; -20dBm, PCS 1900; -20dBm
- Current Draw at idle 9.5 -29 at VDC: - 277.5 milliampres
- Power Requirement: 9.5 to 29.0 volts DC (negative ground), Connector is center positive
- Nominal Gain: Cellular 850: 15dB, PCS 1900: 15dB
- Input/output Impedance: 50 Ohms
- Rated Mean Output Power: 27dBm
- UL Listed: UL 1610

FCC ID: XS7-WRE2710

IC ID: 8918A-WRE2710

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The term "IC:" before the radio certification number only signifies that Industry of Canada technical specifications were met. The Manufacturer's rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent band users. This

power reduction is to be by means of input power or gain reduction and not by an attenuator at the output of the device.

La puissance de sortie nominale indiquée par le fabricant pour cet appareil concerne son fonctionnement avec porteuse unique. Pour des appareils avec porteuses multiples, on doit réduire la valeur nominale de 3,5 dB, surtout si le signal de sortie est retransmis et qu'il peut causer du brouillage aux utilisateurs de bandes adjacentes. Une telle réduction doit porter sur la puissance d'entrée ou sur le gain, et ne doit pas se faire au moyen d'un atténuateur raccordé à la sortie du dispositif.

FCC Regulatory Guidance: Multi-Link's ML-CSA 3550 UL operates under the rules and regulations as provided by the Federal Communications Commission (FCC). For more information on these rules and regulations, please contact the FCC directly at (888)-225-5322.

This is a CONSUMER device.

BEFORE USE, you **MUST REGISTER THIS DEVICE** with your wireless provider and have your provider's consent. Most wireless providers consent to the use of signal boosters. Some providers may not consent to the use of this device on their network. If you are unsure, contact your provider.

You **MUST** operate this device with approved antennas and cables as specified by the manufacturer. Antennas **MUST** be installed at least 20 cm (8 inches) from any person.

You **MUST** cease operating this device immediately if requested by the FCC or a licensed wireless service provider.

WARNING: E911 location information may not be provided or may be inaccurate for calls served by using this device.

8. Antennas



You **MUST** operate this device with approved antennas and cables as specified by the manufacturer. Antennas **MUST** be installed as least 20 cm (8 inches) from any person.

Included Antenna: *ML-ANT-MM01 Mag Mount Antenna to be installed in same room with amplifier and cellular communicator*

Included Cable: *CBL-SMA (SMA-to-SMA device cable)*

9. Optional Accessories

In addition to the parts listed on page 3, Multi-Link can provide cables and accessories for a variety of applications and installations. Visit www.multi-link.net or call 800-535-4651 for more information.

Accessories include, but not limited to, the following:

| Cable & Adaptor Accessories | Vendor Part # |
|--|----------------------|
| Jumper Connector Cable – SMA to SMA | CBL-SMA |
| Jumper Connector Cable – SMA to TNC | CBL-TNC |
| Jumper Connector Cable – SMA to MMCX | CBL-MMCX |
| Jumper Connector Cable – SMA to U.FL | CBL-U.FL |
| Adaptor connectors – SMA(M) to TNC(M) | SMA(M)-TNC |
| Adaptor connectors – SMA(F) to TNC(M) | SMA(F)-TNC |
| Adaptor connectors – TNC(M) to N(M) | TNC-N |
| Adaptor connectors – TNC(M) to TNC(M) | TNC-TNC |

11. Warranty Information

Multi-Link, Inc. warrants that this product is free from defects in materials and workmanship for two years from the date of purchase. Within this period, Multi-link, Inc. will, at its sole option, repair or replace any components which fail during normal use. Multi-Link, Inc. will provide, without charge, the parts and labor necessary to rectify any such defect. Multi-Link, Inc. will not be responsible for transportation costs. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alterations or repairs.

Repairs have a 90 day warranty. If the unit sent in is still under its original warranty, then the new warranty is 90 days or to the end of the original one year warranty, depending upon which is longer.

Multi-Link, Inc. retains the exclusive right to repair or replace the product or offer a full refund of the purchase price at its sole discretion. Such remedy shall be your sole and exclusive remedy for any breach of warranty. Multi-Link, Inc. shall not be liable for any incidental or consequential damages for breach.

Procedure for Claims under Limited Warranties

To obtain warranty service, an original or copy of the sales receipt from the original retailer is required. To obtain warranty service, follow these two steps:

1. Contact Multi-Link, Inc. Tech Support at 800-535-4651 to request a return authorization number (RMA).
2. Once you have obtained an RMA#, ship the unit and a copy of the sales receipt, along with the RMA number, to:

Multi-Link, Inc.
RMA# (List RMA# provided to you)
122 Dewey Drive
Nicholasville, KY 40356
800-535-4651