



Proudly Designed and Manufactured in Spokane Valley, WA - USA



# **CLEARRF**

**TM**

---

## **WRE2710-S Operator's Manual and Installation Guide:**

### **M2M –Machine to Machine**

#### **Overview**

The WRE2710 Wireless Network Range Extender 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 tethered (direct connect) unit within a cellular system, for maximum performance in weak signal coverage areas. The input power requirements for the amplifier are positive 8.0 to 36.0 volts DC (negative ground). This M2M kit includes an AC power adapter for use with typical household 120 volt AC power.

#### **Passive Bypass Technology – Patent Pending**

The WRE2710 amplifier is equipped with ClearRF's Passive Bypass technology. This feature allows the amplifier to passively bypass itself and become merely a pass through cable when amplification is not needed, during loss of power or when a fault is detected.

Passive Bypass technology is useful in applications where the amplifier is mobile, moving in and out of poor signal areas. The amplifier will bypass itself when close to cell towers, completely eliminating any potential for network disrupting noise power caused by too much amplification near a cell tower. The technology is also extremely useful in fire and security system installations where a connection with the antenna must always be maintained, even with loss of power.



Proudly Designed and Manufactured in Spokane Valley, WA - USA

## Contents

Overview .....	1
Passive Bypass Technology – Patent Pending .....	1
Parts List .....	3
Installation Guide .....	3
Installation with an SMA Device- Fixed Location .....	4
Installation with an MMCX Device- Fixed Location .....	6
Installation with an SMA Device- Mobile Location.....	7
LED Diagnostics .....	8
Diagnostic LED definitions .....	9
Optional Accessories .....	9
WRE-2710 Specifications .....	10
Safeguard Features.....	12
Antennas.....	12
Warranty Information .....	12



Proudly Designed and Manufactured in Spokane Valley, WA - USA

## Parts List

Depending upon the connector type of the cellular device, ClearRF can customize the M2M 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.

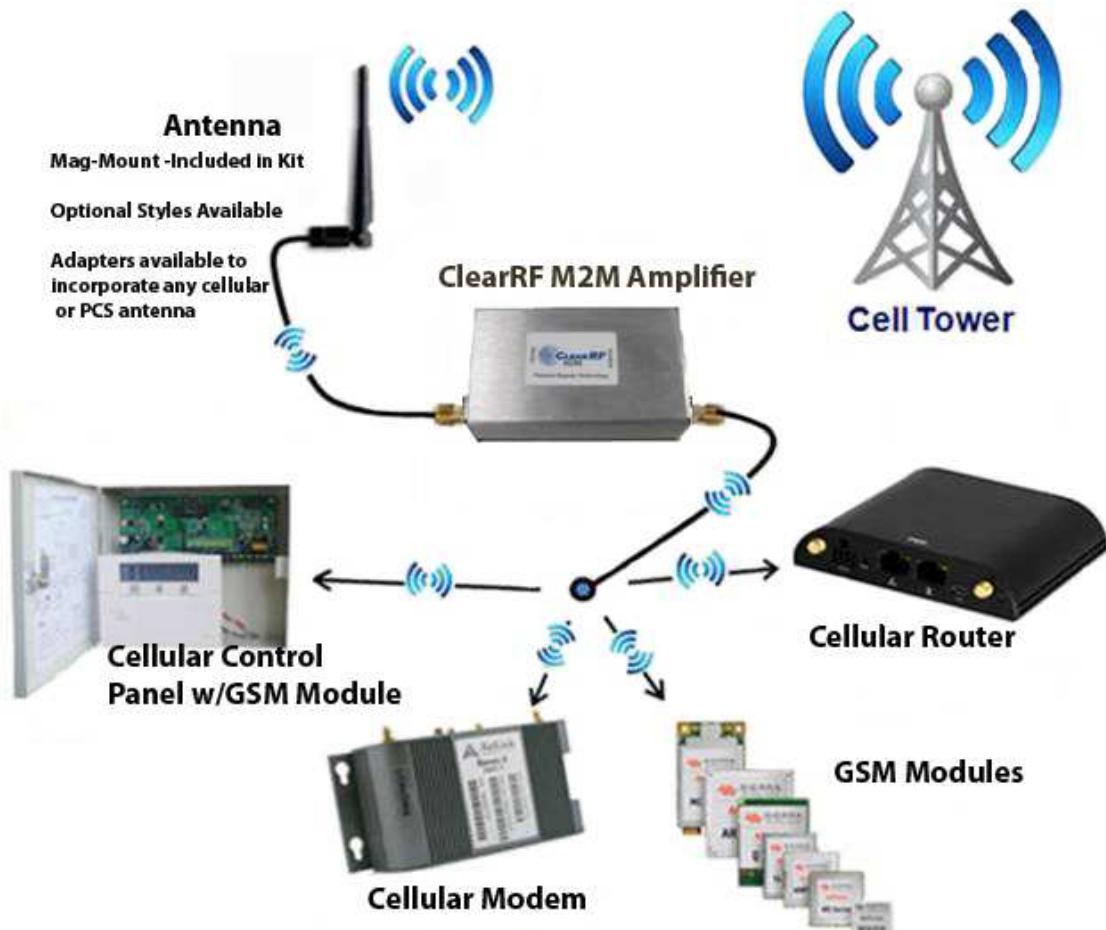
1. WRE2710 Amplifier Unit	2. AC/DC Power Adapter
	
3. Hardwire DC Power Cable	4. Magnetic-Mount Outdoor Signal Antenna
	
5. SMA-to-SMA Device Cable –If connecting to an SMA device	6. Optional –SMA-to-MMCX Device Cable – If connecting to an MMCX device.
	

## Installation Guide

**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. ClearRF, LLC assumes no responsibility for the installation or improper operation of this device. Contact your dealer or [CustomerService@ClearRF.com](mailto:CustomerService@ClearRF.com) with “Installation Help” in the subject line for assistance.**



Proudly Designed and Manufactured in Spokane Valley, WA - USA



### Installation with an SMA Device- Fixed Location

1. If connecting to a Cellular Modem (e.g. Raven X, CradlePoint), connect the TNC to SMA device cable (#5 on Parts List) to the ClearRF Amplifier connector marked "Device".





Proudly Designed and Manufactured in Spokane Valley, WA - USA

2. Connect the SMA end of the TNC to SMA device cable to the Cellular Modem antenna connection.



3. Mount the Outdoor Signal Antenna (#4 on Parts List) vertically on any metal surface.



- a. Connect the Outdoor Signal Antenna connector to the ClearRF amplifier TNC connector marked "Antenna".



4. Plug the AC Adapter (#2 on Parts List) into a nearby wall outlet.
5. Insert the AC Adapter connector plug into the amplifier and watch the LED indicators.





Proudly Designed and Manufactured in Spokane Valley, WA - USA

### Installation with an MMCX Device- Fixed Location

1. If connecting to a Cellular Module (e.g. Motorola, Sierra Wireless), connect the SMA-to-MMCX device cable (#6 on Parts List) to the ClearRF Amplifier connector marked "Device."



2. Connect the MMCX end of the SMA to MMCX device cable to the Cellular Module.



3. Mount the Outdoor Signal Antenna (#4 on Parts List) vertically on any metal surface.



4. Connect the Outdoor Signal Antenna connector to the ClearRF amplifier SMA connector marked "Antenna".



5. Plug the AC Adapter (#2 on Parts List) into a nearby wall outlet.



Proudly Designed and Manufactured in Spokane Valley, WA - USA

6. Insert the AC Adapter connector plug into the amplifier and watch the LED indicators.



### Installation with an SMA Device- Mobile Location

1. If connecting to a Cellular Modem or Mobile Data Terminal (e.g. Raven X, etc) in a vehicle or mobile application, connect the SMA to SMA device cable (#5 on Parts List) to the ClearRF Amplifier connector marked "Device".



2. Connect the SMA end of the SMA-to-SMA device cable to the Cellular Modem or MDT antenna connection.





Proudly Designed and Manufactured in Spokane Valley, WA - USA

3. Mount the Outdoor Signal Antenna (#4 on Parts List) vertically on any metal surface on the roof, hood or trunk of the vehicle.



- b. Connect the Outdoor Signal Antenna connector to the ClearRF amplifier SMA connector marked "Antenna".



- 
- 
4. Plug the 12V Hardwire DC Cable (#3 on Parts List) into the vehicle fuse block. You must connect the red wire to a positive terminal from the fuse panel with a 3 ampere fuse rating. The black wire should be attached to a ground of the vehicle. Power may also be provided to the amplifier using a 12V cigarette lighter adaptor. (not included, available at [www.clearrf.com](http://www.clearrf.com))
5. Insert the Hard Wire DC Cable connector plug into the amplifier and watch the LED indicators.



## LED Diagnostics

Once the amplifier is installed properly and power is applied, the LEDs 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



Proudly Designed and Manufactured in Spokane Valley, WA - USA

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 and prevent overloading the wireless phone, as well as keeping RF signal levels at a minimum for a healthy environment. **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.

## Diagnostic LED definitions

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

## Optional Accessories

Contact us at [www.clearrf.com](http://www.clearrf.com) for pricing and availability or see your Clear RF™ dealer. Replacement parts and additional accessories may also be available.



Proudly Designed and Manufactured in Spokane Valley, WA - USA

## WRE2710 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 @ 12VDC: Idle: 250 milliamperes; Max: 1 amperes
- Power Requirement: 8.0 to 36.0 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

**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:** ClearRF's WRE2710-S 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.



Proudly Designed and Manufactured in Spokane Valley, WA - USA

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.



Proudly Designed and Manufactured in Spokane Valley, WA - USA

## Safeguard Features

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 tethered (direct connect) unit within a cellular system, for maximum performance in weak signal coverage areas.

## 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: MSE-5721-001 Mag Mount Antenna

Included Cable: CBL-SMA-SMA or CBL-SMA-MMCX

## Warranty Information

### Limited Warranty

ClearRF L.L.C. warrants that this product is free from defects in materials or workmanship for one year from the date of purchase. Within this period, ClearRF, will, at its sole option, repair or replace any components which fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost. 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.

ClearRF 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. ClearRF 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 ClearRF via email to receive authorization (RMA) number at [warranty@clearrf.com](mailto:warranty@clearrf.com)
2. Once you have obtained an RMA #, ship the unit, copy of the sales receipt, along with the RMA number to:

ClearRF

RMA #: {insert RMA number}

12825 E. Mirabeau Parkway, Suite 104

Spokane Valley, WA 99216

855-321-9527