

MAXI[®] Remote Location Kit MRLK 900

Installation Manual

Introduction

The MAXI® Remote Location Kit 900 utilizes two 900 MHz radios to position a central control interface device (e.g. MIM 2-Wire, MIM LINK, TWI, TWI-LINK, LDI, SDI, or ICI) at a remote location from the central computer. The MRLK 900 includes power supplies, data cables, antennas, antenna cables, and polyphaser surge protectors for both radios. These installation instructions assume that the user is already familiar with the installation instructions and physical layout of the central control interface products. If further information is needed regarding these products, please refer to their appropriate manuals.

Materials Included

Number Find	Description	Quantity		
1	FreeWave 902-928 MHz, 115 Kbaud Spread Spectrum Radio in a ruggedized enclosure with a TNC type female RF connector (12 Volts)			
2	Transformer Input: 120VAC 12W Output: 12VDC 500mA	2		
3A	RS232 Interface Cable DB9 Male to DB9 Female	2		
3B	RS232 Interface Cable – Null Modem DB9 Male to DB9 Male	1		
4	20 Foot Coaxial Cable with male N type connectors (0.24" diameter, 2dB loss)	4		
5	890-960 MHz 8dBi 4 element Yagi directional antenna	2		
6	PolyPhaser - Throughput Energy $\leq 220\mu$ J (typical) Frequency Range: 125MHz to 1000MHz Max. Power: VHF 375W, UHF _{Low} 125W 800MHz to 1GHz 50W, N Female/N Female connectors	2		
7	N Female to TNC Male adapter	2		
8	Radio programming cable	1		

The MRLK 900 contains the following materials:

Setup

Figure 1 depicts a typical installation of the MRLK 900.



Figure 1: Typical MRLK 900 Installation

Radio Configuration

Prior to the installation of the MRLK 900, the FreeWave 900 MHz Spread Spectrum radios require configuration. All adjustments are done through the FreeWave Tool Suite program. The FreeWave radios operate in a Master/Slave configuration. The radio used at the central computer location will be setup as a Master using the steps below, and the radio used at the remote interface location will be setup as a Slave.

Use the following steps to configure the radios:

- Download and install the FreeWave Tool Suite from http://www.freewave.com/products/software.aspx
- 2. Connect the FreeWave radio to a Windows computer using the programming cable. The 9pin DB9 serial connector on the programming cable connects to the computer, and the other end of the programming cable connects to the radio. Please note that if the computer does not have a serial port, a USB-to-Serial adapter (not included) may be used.

3. Launch the FreeWave Tool Suite.



4. Click on Configuration



5. Click on Setup Terminal



6. Select the COM port the programming cable is connected to and click connect



Note: When using a USB-to-serial adapter (not included), the COM port assigned to the adapter must be selected. See the Appendix section for help.

7. Select "0" to Set Operation Mode

```
MAIN MENU
                      D2 AES Version v10.6.8
                                                  08-21-2013
                           902 - 928 MHz
                        Modem Serial Number 937-0704
                          Model Code DG2C
(0)
    Set Operation Mode
(1)
    Set Baud Rate
    Edit Call Book
(2)
     Edit Radio Transmission Characteristics
(3)
(4)
     Show Radio Statistics
(5)
     Edit MultiPoint Parameters
     TDMA Menu
(6)
    Chg Password
(8)
(Esc) Exit Setup
Enter Choice
```

8. Select "0" to configure the radio as the Master

```
Enter Choice
                                SET MODEM MODE
                        Modem Mode is
                                      0
>(0)
     Point to Point Master
     Point to Point Slave
(1)
     Point to MultiPoint Master
(2)
(3)
     Point to MultiPoint Slave
(4)
     Point to Point Slave/Repeater
(5) Point to Point Repeater
(6) Point to Point Slave/Master Switchable
(7)
    Point to MultiPoint Repeater
(A)
     Mirrorbit Master
     Mirrorbit Slave
(B)
(F)
     Ethernet Options
(Esc) Exit to Main Menu
Enter Choice
```

9. Press the "ESC" key to return to the main menu

10. Select "1" to set the Baud Rate



11. Select the appropriate baud rate according to the type of interface:

Interface	Baud Rate	Selection Choice
MIM 2-Wire, MIM LINK, TWI, TWI-LINK	1200	9
SDI, LDI, ICI	9600	6

Enter	Choice						
				SET	BAU	JD	RATE
		Mo	odem	Baud	is	00	9600
(0)	230,400						
(1)	115,200						
(2)	76,800						
(3)	57,600						
(4)	38,400						
(5)	19,200						
(6)	9,600						
(7)	4,800						
(8)	2,400						
(9)	1,200						
(A)	Data, Parity	0					
(B)	MODBus RTU	0					
(C)	RS232/485	0					
(D)	Setup Port	3					
(E)	TurnOffDelay	0	Tui	nOnDe	lay		0
(F)	FlowControl	0					
(G)	Use break to	access	seti	ıp			0
(Esc)	Exit to Main	Menu					
Dates	Chaire						

12. Press the "ESC" key to return to the main menu

13. Select "2" to enter the serial number of the Slave radio into the Call Book

```
MAIN MENU
                     D2 AES Version v10.6.8
                                                08-21-2013
                          902 - 928 MHz
                       Modem Serial Number 937-0704
                         Model Code DG2C
(0)
     Set Operation Mode
(1)
    Set Baud Rate
     Edit Call Book
(2)
     Edit Radio Transmission Characteristics
(3)
(4)
     Show Radio Statistics
(5)
     Edit MultiPoint Parameters
(6)
     TDMA Menu
    Chg Password
(8)
(Esc) Exit Setup
```

14. Type in the serial number of the Slave radio. Also enter any Repeater 1 or Repeater 2 addresses if you are using repeaters in your system.

Enter	Choice				
			MODEM	CALL BOO	OK
			Entry	to Call	is (ALL)
Entry	Number	Repeater1	Repea	ater2	
(0)	873-8634				
(1)	000-0000				
(2)	000-0000				
(3)	000-0000				
(4)	000-0000				
(5)	000-0000				
(6)	000-0000				
(7)	000-0000				
(8)	000-0000				
(9)	000-0000				
(C)	Change Entr	y to Use (0-9) or A	A(ALL)	
(Esc)	Exit to Mai	n Menu			
Enter	all zeros (00	0-0000) as	your las	st number	r in list

Now repeat the above setup steps on the other radio, except select "1" in Step 8 to configure the radio as the Slave, and enter the Master radio's serial number into the Slave radio's Call Book in Step 14.

Yagi Antenna Installation

Prior to the installation of the radios and the antennas, disconnect the power to the interface to prevent communication until the installation is complete. It is highly desirable to obtain a line of sight when mounting the Yagi directional antennas to increase the strength and reliability of the communication signal.

PolyPhaser Installation

A PolyPhaser surge protector must be installed at each radio location to provide in-line protection against lightning. Each of the PolyPhaser surge protectors must be grounded using a dedicated external grounding rod (not included).

Appendix

COM Port Assigned to a USB-to-Serial Adapter

When a USB-to-Serial adapter is initially connected, Windows will assign a COM port to it. To find out what COM port has been assigned, go to Device Manager (type "device" in the Start Menu search field, then click on Device Manager).



If needed, the COM port number may be changed using the following steps:

1. Right click on the USB-to-Serial adapter device in Device Manager and select Properties.



4. Click the "COM Port Number" drop down menu and choose the desired COM port number (e.g. COM1). Click OK to confirm your choice.

- 5. Click OK to close the Device Properties window.
- 6. Close Device Manager.