VeriWave WaveDeploy WiFi(WF1101) / Ethernet(EF1101) Users Guide

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Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

To reduce potential radio interference to other users, only the antenna provided from Veriwave may be used so that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

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VeriWave WaveDeploy WiFi(WF1101) and Ethernet(EF1101) Users Guide

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1.0 PREFACE

1.1 Audience

This guide is for the network or computer technician responsible for installation and or monitoring of the VeriWave WaveDeploy WF1101 and EF1101 devices. We assume that you are familiar with the concepts and terminology of Ethernet, WiFi and local area networking.

1.2 Purpose

The VeriWave WaveDeploy WiFi (WF1101) / Ethernet(EF1101) Users Guide documents the hardware features of the VeriWave WaveDeploy WF1101 and EF1101 test units. It describes the physical and performance characteristics of the WaveDeploy WF1101/EF1101 units, explains how to install WaveDeploy WF1101/EF1101 units and provides troubleshooting information as well as the hardware specification for the WaveDeploy WF1101/EF1101 units.

1.3 Conventions

This guide uses the following conventions to convey instructions and information:

Command descriptions use these conventions:

- Commands and keywords are in **boldface**.
- Arguments for which you supply values are in *italic*.

Examples use these conventions:

- Terminal, GUI and system displays are in `screen` font.
- Information you enter is in **`boldface screen`** font.
- Nonprinting characters, such as passwords or tabs, are in angle brackets (< >).

Notes, tips, help, cautions and warnings use the following conventions and symbols:

Means that the reader should take note. Notes contain helpful suggestions or reference to materials not contained in this manual.

Means the following information will help you solve a problem. The tips information might not be troubleshooting or even an action, but could be useful information.

Indicates where you might find further help or support. The information may be located outside of this document.

Means that the reader should be careful. In this situation, you might do something that could result in equipment damage or loss of data.

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. The documentation must be consulted in all cases where this symbol is marked.

1.4 Related Publications

All VeriWave WaveDeploy documentation can be found at:

http://www.WaveDeploy.com

Requirements and procedures for initial configurations and software upgrades tend to change and therefore appear only in the release notes. Before installing, configuring or upgrading the VeriWave WaveDeploy WF1101 or EF1101 units refer to the release notes on WaveDeploy.com for the latest information.

1.5 Obtaining Technical Assistance

VeriWave provides WaveDeploy.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configuration from online tools. For WaveDeploy.com registered users, additional troubleshooting tools are available from the VTAC(Veriwave Technical Assistance Center). In addition you can resolve technical issues with online technical support, download and test software packages and order VeriWave learning material and merchandise.

To access WaveDeploy.com, go to the following website:

http://www.WaveDeploy.com

In addition to WaveDeploy.com, VeriWave.com is the foundation of a suite of interactive services that provide immediate open access to VeriWave information and resources at anytime from anywhere in the world. VeriWave.com provides a broad range of features and services to help customers and partners streamline business processes and improve productivity. Through VeriWave.com you can find information about VeriWave and our network test solutions, services and programs.

To access VeriWave.com, go to the following website:

http://www.VeriWave.com

1.6 VeriWave Technical Assistance Center

The VeriWave TAC (VTAC) is available to all customers who need technical assistance with a VeriWave product or technology that is under warranty or covered by a maintenance contract.

The solution to many problems can be found at www.wavedeploy.com. VeriWave strongly recommends that you consult this resource first as it will usually provide the fastest means to answer any questions.

VTAC technical assistance can be reached at:

Email: support@veriwave.com
Phone: 503-473-8341 or 1-800-457-5919

Technical support hours are from 8:30AM Pacific Time to 5:30PM Pacific Time.

For the quickest service, have the following information on hand when placing your call. If requesting help by email please include the following information:

- Your company's name
- A contact person's name, phone number and email address.
- A detailed description of the problem, including the point in the test when the problem occurred. The complete text of the error message, including the error name and number if available.
- The version number of both the software and hardware used. To obtain this information, click on the About on the Help menu of the application.
- A screen shot of the user interface if the problem leaves it in an unusual state.

To make a screen shot of an error message or a user interface element, simultaneously press the Alt key and the Print Screen key. Paste the captured image into a document by moving the cursor into the document and simultaneously pressing the Ctrl key and the V key.

2.0 UNPACKING AND TAKING INVENTORY

2.1 Inventory

Please take the time to inventory your WaveDeploy product shipment. Table 1 shows all the possible WaveDeploy EF1101 components. Table 2 shows all the possible WaveDeploy WF1101 components. Depending on your order, you may not receive all the optional components listed in the tables.

Table 1 WaveDeploy EF1101 Components

Item	Included / Optional	Description
WaveDeploy Ethernet (EF1101)	Included	WaveDeploy Ethernet (EF1101)based test point hardware unit
Ethernet Cable (VW85-0001-2000)	Included (2 each)	Cat 5e Ethernet cable, terminated with shielded RJ45 connectors to connect the WaveDeploy unit to the network and or test port.
USB Cable (VW85-1001-0000)	Included	Standard USB cable to hook the WaveDeploy unit to a host PC.
Users Guide (VW02-2022-00)	Included	This guide.
Power Supply (VW79-0022-0012)	Included	WaveDeploy unit AC to DC power supply.  Use of any other power supply not specified by VeriWave will void all warranties.
Power cord (VW85-0547-0000) US	Included	Specific power cord for your region.
Certificate of Calibration (VW01-0022-00)	Included	WaveDeploy calibration certificate.
Battery	Optional	Battery pack to power WaveDeploy unit.

Table 2 WaveDeploy WF1101 Components

Item	Included / Optional	Description
WaveDeploy WiFi (WF1101)	Included	WaveDeploy WiFi (WF1101) based test point hardware unit
Ethernet Cable (VW85-0001-2000)	Included (1 each)	Cat 5e Ethernet cable, terminated with shielded RJ45 connectors to connect the WaveDeploy unit to the network.
USB Cable (VW85-1001-0000)	Included	Standard USB cable to hook the WaveDeploy unit to a host PC.
Antenna (VW81-0614-2001)	Included	Reverse SMA 2.4/5GHz antenna[1].  Use of any other antenna not specified by VeriWave will void all warranties.
Users Guide (VW02-2022-00)	Included	This guide.
Power Supply (VW79-0022-0012)	Included	WaveDeploy unit AC to DC power supply.  Use of any other power supply not specified by VeriWave will void all warranties.
Power cord (VW85-0547-0000) US	Included	Specific power cord for your region.
Certificate of Calibration (VW01-0022-00)	Included	WaveDeploy calibration certificate.
Battery	Optional	Battery pack to power WaveDeploy unit.

[1.]Note: This device has been designed to operate with the antennas listed above which has a maximum gain of 2.6 dB. Antennas not included in the above list or having a gain greater that 2.6 dB are strictly prohibited for use with this device.

3.0 SAFETY

- The only way to shut off power completely to your WaveDeploy WiFi WF1101 or Ethernet EF1101 units is to disconnect it from the power source.

When connecting or disconnecting your WaveDeploy WiFi WF1101 or Ethernet EF1101 unit, always hold the plug by its sides. Keep fingers away from the metal part of the plug.

- Your WaveDeploy WiFi WF1101 or Ethernet EF1101 unit should not be opened for any reason, even when the WaveDeploy unit is unplugged. If your WaveDeploy WiFi WF1101 or Ethernet EF1101 unit requires service, please see Obtaining Technical Service.

- Never force a connector into the ports. If the connector and port do not join with reasonable ease, they probably don't match. Make sure the connector matches the port and that you have positioned the connector correctly in relation to the port.

- When you are using your WaveDeploy WiFi WF1101 or Ethernet EF1101 unit, it is normal for the case to get warm. The WaveDeploy unit case functions as a cooling surface that transfers heat from inside the unit to the cooler air outside.

Never block the WaveDeploy grill or fan as this will cause a lack of airflow to allow the unit to run properly.

To reduce the chance of shock or injury, do not use your WaveDeploy WiFi WF1101 or Ethernet EF1101 unit in or near wet locations.

- Keep the WaveDeploy WiFi WF1101 or Ethernet EF1101 unit away from sources of liquids, such as drinks, washbasins, bathtubs, shower stalls and so on.

- Protect the WaveDeploy WiFi WF1101 or Ethernet EF1101 unit from direct sunlight and rain or other moisture.

- Take care not to spill any food or liquid on your WaveDeploy WiFi WF1101 or Ethernet EF1101 unit. If you do, unplug the WaveDeploy unit before cleaning up the spill.

Do not attempt to open your WaveDeploy WiFi WF1101or Ethernet EF1101 units or disassemble it. You run the risk of electric shock and voiding the limited warranty. No user-serviceable parts are inside.

Your WaveDeploy WiFi WF1101 or Ethernet EF1101 unit may be damaged by improper storage or handling. Be careful not to drop your WaveDeploy unit when transporting the device.

Changes or modifications to this product not authorized by VeriWave, Inc. could void the EMC compliance and negate your authority to operate the product. This product was tested for FCC compliance under conditions that included the use of VeriWave peripheral devices and VeriWave shielded cables and connectors between system components. It is important that you use VeriWave peripheral devices and shielded cables and connectors between system components to reduce the possibility of causing interference to radios, television sets and other electronic devices. You can obtain VeriWave peripheral devices and the proper shielded cables and connectors through VeriWave.

- The equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:
    - Reorient or relocate the receiving antenna.
    - Increase the separation between the equipment and receiver.
    - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
    - Consult the dealer or an experienced radio/TV technician for help.
- Any changes or modifications not expressly approved by the party responsible for compliance could void the users authority to operate this equipment.
- The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operation instructions for satisfying RF exposure compliance. To maintain compliance with FCC RF exposure compliance requirements, please follow operation instructions as documented in this manual.
- The transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- The WaveDeploy WiFi WF1101 must be installed for use to provide a separation distance of at least 20 cm from all persons.

This symbol means that according to local laws and regulations your product should be disposed of separately from household waste. When this product reaches its end of life, take it to a collection point designated by local authorities. Some collection points accept products for free. The separate collection and recycling of your product at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

4.0 PRODUCT DESCRIPTION

4.1 WaveDeploy WiFi WF1101

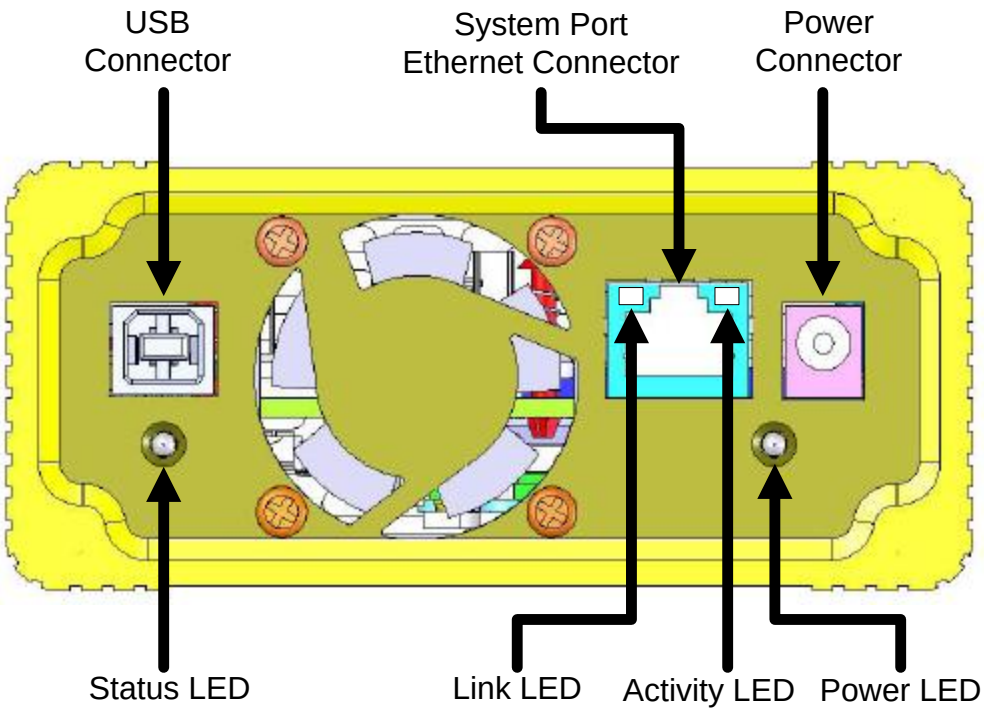
The WaveDeploy WiFi WF1101 is a protocol test point capable of supporting multi layer protocols via IEEE 802.11 single port interface. The size, weight, reliability and environmental characteristics of this product make it compatible with field use. The unit provides a single 2.4/5GHz radio reverse SMA test connection which is used for traffic generation and reception. The unit provides a single 10/100/1000 Mbps copper Ethernet control connection which is used for command and control of the unit. The unit provides a single USB Standard-B connector which is used for command and control of the unit. In combination with WaveDeploy software the WaveDeploy system becomes a powerful and easy to use network installation and deployment tool set.

4.2 WaveDeploy Ethernet EF1101

The WaveDeploy Ethernet EF1101 is a protocol test point capable of supporting multi layer protocols via IEEE 802.3 single port interface. The size, weight, reliability and environmental characteristics of this product make it compatible with field use. The unit provides a single 10/100/1000 Mbps copper Ethernet test connection which is used for traffic generation and reception. The unit provides a single 10/100/1000 Mbps copper Ethernet control connection which is used for command and control of the unit. The unit provides a single USB Standard-B connector which is used for command and control of the unit. In combination with WaveDeploy software the WaveDeploy system becomes a powerful and easy to use network installation and deployment tool set.

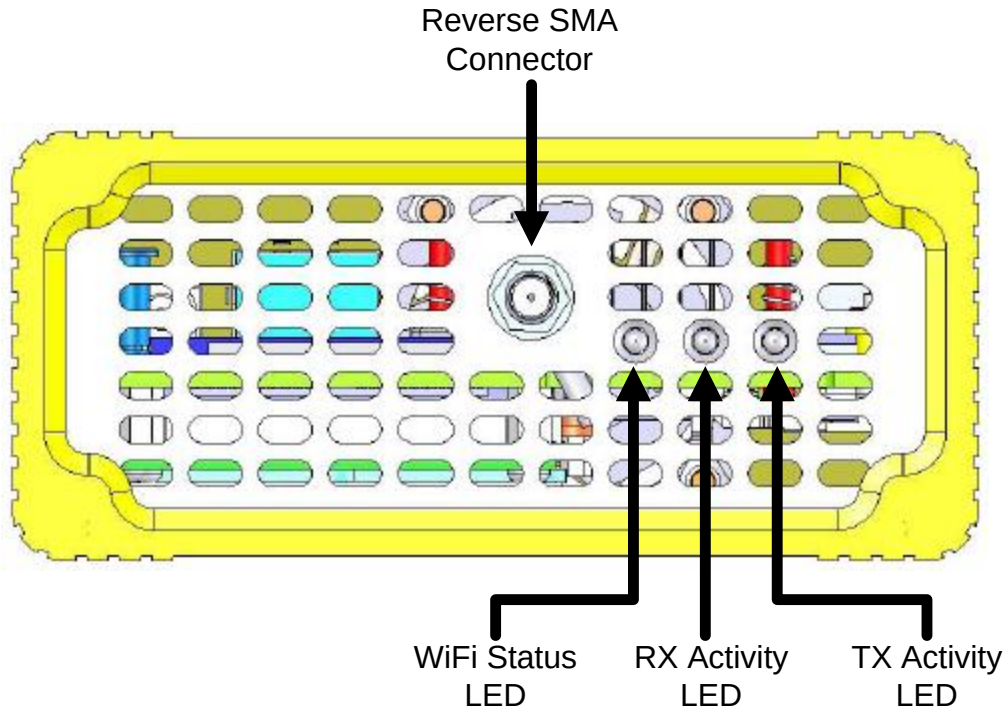
4.3 Common WF1101 and EF1101 Rear Panel Display and Connectors

Function	Description
Power LED	Off indicates no power is applied to unit. Solid green indicates normal operation. Solid red indicates unit power fault.
Status LED	Off indicates system is inoperable. Solid Orange indicates port is being initialized. Flashing Orange indicates port is in failsafe. Solid green indicates system is ready. Flashing red indicates unit fault with fault code. Solid red indicates FPGA not programmed.
USB Connector	Type B USB connector used for software upgrade and control.
System Port Ethernet Connector	RJ-45 10/100/1000Mbps copper interface to be used with CAT-5e cabling. The RJ-45 connector has two embedded LEDs. (Link and Activity)
Power Connector	



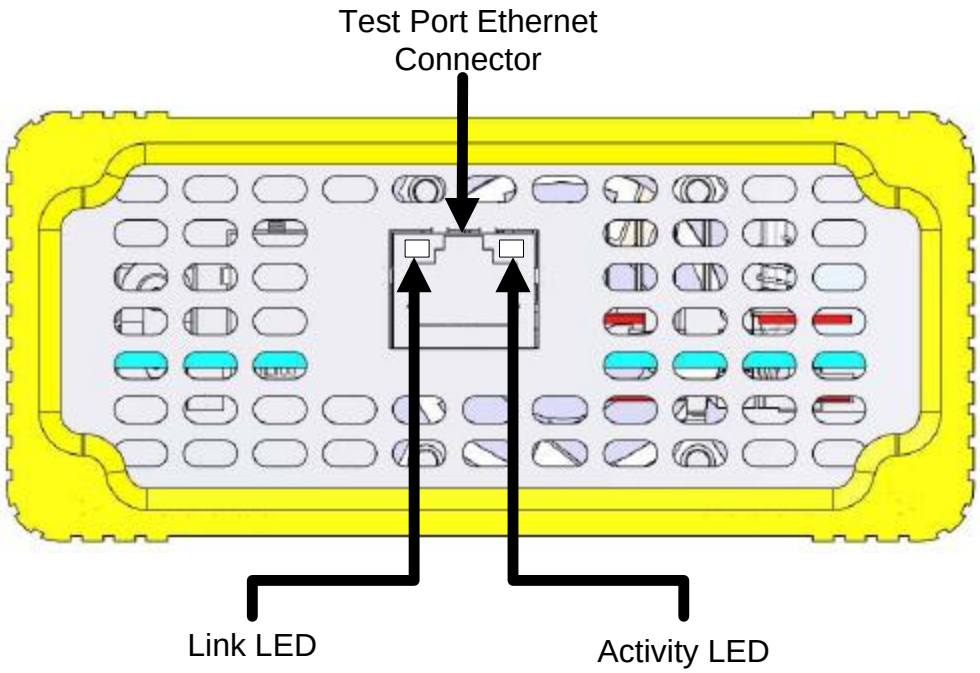
4.4 WaveDeploy WiFi WF1101 Front Panel Display and Connectors

Function	Description
Test Port SMA	Reverse SMA (Impedance 50 Ω)
RX Activity LED	Green steady or blinking LED indicates RX activity.
TX Activity LED	Green steady or blinking LED indicates TX activity.
WiFi Status LED	Off indicates no WiFi network is detected. Yellow indicates scanning WiFi network. Solid Green indicates good connection to WiFi network. Flashing Green indicates WiFi link established but a problem has been detected.



4.5 WaveDeploy Ethernet EF1101 Front Panel Display and Connectors

Function	Description
Test Port Ethernet Connector	RJ-45 10/100/1000Mbps copper interface to be used with CAT-5e cabling. The RJ-45 connector has two embedded LEDs. (Link and Activity)



5.0 HOW TO SETUP

5.1.1 Obtaining the Application Software

The WaveDeploy hardware requires the WaveDeploy Pro application for use. If you do not already have this WaveDeploy Pro application and/or you do not have a license for this version of the application then it will be necessary to contact your sales person to purchase this software.

If you already have the WaveDeploy application installed, but you are not sure which version of WaveDeploy you have then start the application. This can be accomplished using the Start menu by navigating to Start->VeriWave->WaveDeploy. Once the application starts, open the Help->About menu item and note the application name. If the application name is WaveDeploy Pro then you should proceed to the Hardware Configuration section of these instructions.

To install WaveDeploy Pro, it is necessary to download the application and to fulfill a license. To download the application, open your web browser and type the address www.wavedeploy.com into the address bar. Once on the web page, click on the "Download Now" button. Once the file has been transferred to your computer, run the setup.exe program to install WaveDeploy Basic.

To upgrade the WaveDeploy application to WaveDeploy Pro, it is necessary to install a license. You should have already received an e-mail containing a license authorization code if you have purchased WaveDeploy Pro or WaveDeploy Expert. If you do not have this code then please contact your salesperson or the VeriWave Technical Assistance Center for support. Once you have the license code, start the WaveDeploy Basic application and open the Tools->Licensing menu item. In the dialog box, enter the license authorization code from the e-mail into the text box in the "Obtain My License" section. Finally, click on the Fulfill button. In less than one minute the license is installed on your computer, upgrading you to the WaveDeploy Pro / Expert level.

Note that the license code can be lengthy, so it is often easier to simply highlight the code in the e-mail, hit the Ctrl-C key combination to copy the authorization code, switch to the WaveDeploy application and click in the Authorization Code text box and hit the Ctrl-V key combination to paste the code into WaveDeploy.

5.1.2 Connecting the WaveDeploy Hardware

Use of shielded Ethernet and USB cables such as outlined in Table 1 or Table 2 must be used with all WaveDeploy WF1101 and EF1101 devices.

Start the WaveDeploy Pro application. Connect a USB cable from this computer to the WaveDeploy hardware.

Power the WaveDeploy hardware using the associated power supply and cables. The WaveDeploy hardware has no on or off button, so simply plugging in the power supply is all that

is required to turn the unit on. The unit will automatically recognize the presence of the USB cable and will prepare itself for a firmware download.

In the WaveDeploy application, navigate to the Tools->Download Firmware section. When the dialog box opens, the application will automatically recognize that the WaveDeploy hardware is available and ready for download. This screen will display the version of the firmware currently installed in the WaveDeploy hardware as well as the version that the WaveDeploy application recommends. If the two versions are the same, then no firmware download is required, although the firmware can be downloaded again if the user wishes. If the firmware version is mismatched from the version expected by the application then the application will recommend downloading the preferred version. The user should initiate a firmware download by selecting "Download Now".

Once the download completes, the user is then given the option to configure the network parameters of the device. The dialog box allows the user to configure the hostname and IP addressing information. For WaveDeploy WF1101 hardware, the user can also configure a default WLAN network to which to connect, including the security settings. These values can be overridden during a test, but provide for a default fallback condition that should enable remote operation when the unit is being used without a directly connected laptop.

Finally, the user can specify identification info that gets stored with the unit. This data is a free-form 256 character text field which allows the user to provide their own description of the unit. Typically, users will describe the individual responsible for the unit and how to contact that person.

5.1.3 Installing the WaveDeploy Ethernet EF1101

Identify the location where the WaveDeploy Ethernet EF1101 will be located in the network. This device is typically located in a data center where there is readily available power and networking resources. To install the WaveDeploy Ethernet EF1101, simply place it in the desired location and provide power. To connect it to the network, plug an Ethernet cable into the Ethernet Test Port. The other end of the cable should be connected to the test network. Verify proper connectivity by observing the Link LED in the connector and ensuring that it lights up.

5.1.4 Installing the WaveDeploy WiFi WF1101

The WaveDeploy WiFi WF1101 will usually be used as a battery-powered mobile survey unit, but it can be used directly with a power supply as well. If the user wishes to use the WaveDeploy using the battery, simply locate the unit anywhere within the facility where there is access to the WiFi test network. Attach the supplied connecter to the WaveDeploy WF1101 and watch the WiFi status LED. The LED should turn solid green if everything is working properly.

5.1.5 Verifying Connectivity to the WaveDeploy Hardware

To verify that the WaveDeploy hardware is connected to the expected networks, connect the laptop that will run the WaveDeploy application to the same test network. At this point the laptop and the WaveDeploy hardware should all be physically connected to, or virtually connected to view WiFi, the same test network.

Open the shell prompt. Verify connectivity between the laptops and WaveDeploy hardware using the ping facility. At the command prompt, type

```
ping ipaddr
```

or

```
ping hostname
```

where ipaddr is the IP address and hostname is the hostname of the WaveDeploy hardware. A successful response from the ping indicates that connectivity exists between the laptop and the hardware. A typical positive response is shown below:

Pinging 192.168.1.23 with 32 bytes of data:

Reply from 192.168.1.23: bytes=32 time<1ms TTL=128
Reply from 192.168.1.23: bytes=32 time<1ms TTL=128
Reply from 192.168.1.23: bytes=32 time<1ms TTL=128
Reply from 192.168.1.23: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.23:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms

If a positive response is not received, then the issue is likely for one of two reasons:

- Ping is being filtered by the network – please consult with the network administrator to determine if this situation exists.
- The devices are not all connected to the test network

If ping is not being filtered, recheck the cabling and configuration of the network. One can ping various segments of the network to determine where the connectivity fault likely exists or can use a tool such as tracert. The troubleshooting of these issues is beyond the scope of this manual, but many excellent sources exist on the Internet regarding this subject.

6.0 CHARACTERISTICS

6.1 WaveDeploy WiFi WF1101 Functional Characteristics

6.1.1 WaveDeploy WiFi WF1101 Number of Clients, Flows and Capture Buffer Size

Characteristic	Typical
Number of Supported Clients	64
Number of supported Flows	500
Capture Buffer Size (Mbytes)	256

6.1.2 WaveDeploy WiFi WF1101 RF Functional Characteristics

Characteristic	Min	Typical	Max
Transmit Output Power 2.4GHz	0 dBm		14 dBm
Transmit Output Power	0 dBm		14 dBm
Transmit Output Power Accuracy		+/- 2 dBm	
Transmit Power Resolution		Settable in 1 dBm increments	
Transmit EVM		Less than 3%	

6.1.3 WaveDeploy WiFi WF1101 Supported Frequencies

The following supported frequencies and channels are supported.

Channel	Center Frequency (MHz)
1	2412 (U,E,J)
2	2417 (U,E,J)
3	2422 (U,E,J)
4	2427 (U,E,J)
5	2432 (U,E,J)
6	2437 (U,E,J)
7	2442 (U,E,J)
8	2447 (U,E,J)
9	2452 (U,E,J)
10	2457 (U,E,J)
11	2462 (U,E,J)
12	2467 (E,J)
13	2472 (E,J)
14	2484 (J)
34	5170 (J)*

36	5180 (U,E)*
38	5190 (J)*
40	5200 (U,E)*
42	5210 (J)*
44	5220 (U,E)*
46	5230 (J)*
48	5240 (U,E)*
52	5260 (U,E,J)
56	5280 (U,E,J)
60	5300 (U,E,J)
64	5320 (U,E,J)
100	5500 (U,E)
104	5520 (U,E)
108	5540 (U,E)
112	5560 (U,E)
116	5580 (U,E)
120	5600 (U,E)
124	5620 (U,E)
128	5640 (U,E)
132	5660 (U,E)
136	5680 (U,E)
140	5700 (U,E)
149	5745 (U)
153	5765 (U)
157	5785 (U)
161	5805 (U)
165	5825 (U)

U-Supported in the USA
E-Supported in Europe
J-Supported in Japan
*The WF1101 is rated for indoor use only when channels 34 thru 48 are selected to reduce potential for harmful interference to co-channel mobile satellite systems.

6.1.4 WaveDeploy WiFi WF1101 Supported Modulation Schemes

The following supported modulation schemes are supported:

DBPSK
DQPSK
CCK (4bits)
CCK (8bits)
BPSK (1/2)
BPSK (3/4)

QPSK (1/2)
QPSK (3/4)
16-QAM (1/2)
16-QAM (3/4)
64-QAM(2/3)
64-QAM (3/4)
64-QAM (5/6)

6.1.5 WaveDeploy WiFi WF1101 Supported Channel Bandwidth Modes

Support for 20 and 40MHz modes.

6.1.6 WaveDeploy WiFi WF1101 Supported CCK Preamble Types

Short and Long.

6.1.7 WaveDeploy WiFi WF1101 Supported OFDM Guard Intervals

400 and 800 ns.

6.1.8 WaveDeploy WiFi WF1101 Supported PLCP Types

Legacy and Mixed Mode.

6.1.9 WaveDeploy WiFi WF1101 RX Maximum Sensitivity

-15 dBm.

6.1.10 WaveDeploy WiFi WF1101 RX Minimum Sensitivity

:

Modulation	Minimum Sensitivity (dBm) (20 MHz channel Spacing)	Minimum sensitivity (dBM) (40 MHz channel Spacing)
DBPSK	-82 [1]	N/A
DQPSK	-82 [1]	N/A
CCK (4bits)	-82 [1]	N/A
CCK (8bits)	-76 [1]	N/A
BPSK (1/2)	-82 [2]	-79 [2]
BPSK (3/4)	-81 [2]	N/A
QPSK (1/2)	-79 [2]	-76 [2]
QPSK (3/4)	-77 [2]	-74 [2]
16-QAM (1/2)	-74 [2]	-71 [2]
16-QAM (3/4)	-70 [2]	-67 [2]
64-QAM (2/3)	-66 [2]	-63 [2]
64-QAM (3/4)	-65 [2]	-62 [2]
64-QAM (5/6)	-64 [2]	-61 [2]

1. The FER shall be less than $8x10^{-2}$ at a PSDU length of 1024 octets for an input level as defined above. The minimum input levels are measured at the antenna connector.

2. The packet error rate (PER) shall be less than 10% for a PSDU length of 4096 octets for rate-dependent input levels as above specified or less. The minimum input levels are measured at the antenna connector.

6.1.11 WaveDeploy WiFi WF1101 RX Maximum Input

0 dBm.

Caution: Exceeding this limit can cause damage to sensitive RF electronic circuitry.

6.1.12 WaveDeploy WiFi WF1101 ESD Protection, RF Input

	Model	Rating	Unit
Threshold Volt.	HBM	2000	V
	CDM	500	V

6.2 WaveDeploy Ethernet Functional Characteristics

6.2.1 WaveDeploy Ethernet EF1101 Number of Clients, Flows and Capture Buffer Size

Characteristic	**Typical**
Number of Supported Clients	256
Number of supported Flows	1000
Capture Buffer Size (Mbytes)	256

6.3 Power Characteristics (WF1101/EF1101)

Caution: VeriWave supplied power supplies must be used with all WaveDeploy WiFi and Ethernet units. The use of any other power supply will void all warranties for the WaveDeploy units and could potentially damage the WaveDeploy units.

Characteristic	Min	Typical	Max
Input Voltage	10.8VDC	12 VDC	13.2 VDC
WaveDeploy WiFi Power Consumption		24 W	36 W
WaveDeploy WiFi Steady State Input Current		2 A	3 A
WaveDeploy Ethernet Power Consumption		18 W	24 W
WaveDeploy Ethernet Steady State Input Current		1.5 A	2 A

6.4 Environmental Characteristics (WF1101/EF1101)

6.4.1 Cooling Airflow

Intake is from the front of the instrument. Exhaust to the rear of the instrument. Circulation maintained by 1 fan, 40x40x20 mm in diameter

6.4.2 Use Rating

Indoor use only when powered by AC adapter.

6.5 Atmospherics (WF1101/WF1101)

6.5.1 Temperature: Operating and Non–Operating

Operating; meeting accuracy specifications : +0° to +50°C, 30°C/hr max gradient, non–condensing (derated 1°C per 1,000ft. above 5,000 ft. altitude)

Non–operating: -20°C to +60°C, 30°C/hr max gradient, non–condensing.

6.5.2 Humidity: Operating and Non–Operating

Operating: 20% to 80% relative humidity, non–condensing. Max wet bulb temperature: +31°C (derates relative humidity to ~50% @ 50°C).

Non–operating: 8% to 80% relative humidity, non–condensing. Max wet bulb temperature: +40°C (derates relative humidity to ~55% @ 50°C).

6.5.3 Altitude: Operating and Non–Operating

Operating: to 10,000 ft.(3,040m), (derated 1°C per 1,000 ft. above 5,000 ft. altitude).

Non–Operating: 40,000 ft (12,190 m).

6.6 Pollution Degree (WF1101/WF1101)

Meets requirements for Pollution Degree 2 as defined in IEC 61010-1.

6.7 Dynamics (WF1101/EF1101)

6.7.1 Random Vibration: Operating and Non–Operating

Non–Operating and Operating: 2.28 g_{rms} total from 5 to 500 Hz, 20 minutes each axis, 3-axes, 30 minutes total.
Profile: 0.0175 g^2/Hz 5-100Hz, -3db/octave slope 100-200Hz, 0.00875 g^2/Hz 200-350Hz, -3db/octave slope 350-500Hz, 0.006132 g^2/Hz. Profile conducted half in operating and half in non-operating mode

6.7.2 Functional Shock: Operating

Three pulses per direction of ½ sine shock @ 30g, 11ms duration. Total of 18 pulses.

6.8 Transportation And Storage (WF1101/WF1101)

6.8.1 Transportation Package Material

Transportation Package material meets recycling guidelines.

6.9 Electromagnetic Compatibility (EMC) (WF1101/WF1101)

6.9.1 Emissions

Emissions shall be within the limits specified by the following requirements.

Enclosure:
EN 55011 Class A limits for radiated emissions.

AC Mains:
EN 55011 Class B limits for conducted emissions.
EN 61000-3-2 AC power line harmonic emissions.

6.9.2 Immunity, Enclosure, RF Electromagnetic Fields

No errors or other malfunctions when the instrument is subjected to a 27 MHz-1000 MHz, 10 V/m electromagnetic field 80% amplitude modulated at 1kHz.

6.9.3 Immunity, Enclosure, Electrostatic Discharge

Up to 8 kV with no change to control settings or impairment of normal operation.

6.9.4 Immunity, Fast Transients, Electrical

No loss of stored data, change to control settings, degradation of performance, or temporary loss of function will occur when the system is subjected to the transients as describe below.

Port	*Peak Voltage (kV)*	*Tr/Th(ns)*	*Rep Freq. (kHz)*
Signal & Control	0.5	5/50	5
AC Power	1	5/50	5

6.9.5 Immunity, AC Power Line Source Voltage Dips and Interruptions

Voltage Dips: 30% reduction / 10 mS, as per EN61000-4-11
Voltage Interruptions: >95% reduction / 5 Seconds, as per EN6100-4-11
Voltage Interruptions: 100% reduction/5 cycle as per EN61326

6.9.6 Immunity, AC Power Line Transients

No loss of stored data, change to control settings, degradation of performance, or temporary loss of function will occur when the system is subjected to the transients as described below.

Mode	Peak Voltage[1] (kV)
Common	*2*
Differential	*1*

[1] 2/50 us Tr/Th voltage into open circuit, 8/20 us Tr/Th current into short circuit, see specifications for additional detail.

6.9.7 Immunity, Conducted Disturbances Induced by RF Fields

No instrument failures when the instrument power leads are injected with a 150 kHz-80 MHz, 10 V_{RMS} signal 80% amplitude modulated at 1 kHz.

6.9.8 FCC

Performance is characterized and achieved against the radiated and conducted emissions requirements of FCC CFR 47, Part 15, Subpart B, Class A.

6.10 Mechanical Characteristics (WF1101/EF1101)

6.10.1 Classification

Transportable instrument intended for electronic design and manufacturing bench/lab based applications.

6.10.2 Overall Dimensions

Height	Width	Depth
1.7”	4.2”	6.3”

6.10.3 Weight

WF1101	EF1101
1.7lbs. (.8kg)	1.5lbs. (.7kg)

6.10.4 Shipping Weight

10 lb. (4.5 kg)

6.10.5 Construction Materials

Chassis parts are constructed of aluminum alloy and aluminized steel; front panel and trim pieces constructed of plastic and rubber; circuit boards constructed of glass and or ceramic-glass laminate.

Record of Revisions

Rev	Description	Originator	Doc Control	Date
A	Initial Release	**Noel Stott**		6/14/2010