

Giga LongHaul

All Indoor Ultra High Power FDD Point to Point Microwave System
Model: HPL1-XX-YY-Z



Installation Guide

Revision History

Revision	Revision Date	Description
1.0	24 APR 2014	DRAFT

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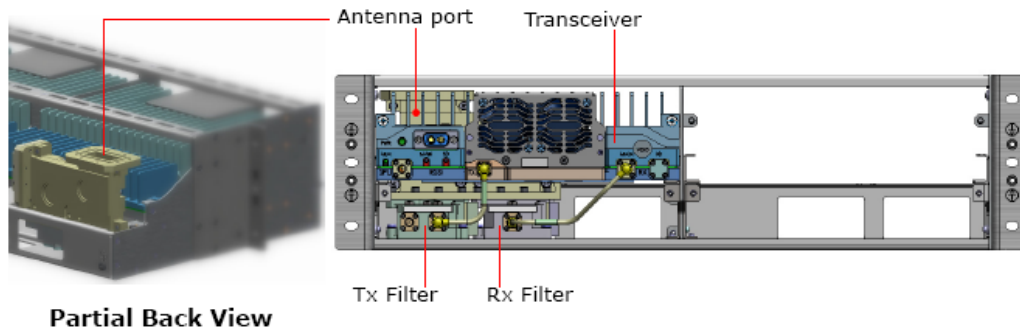
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Introduction

This installation guide covers the installation of the HPL1 family of Indoor RF Unit (IRFU). The IRFU is used in conjunction with the Giga Orion IDU under the product name Giga Longhaul. For detail on the operation of the equipment after installation, please consult the Giga Orion/Lynx User Manual.

In the text below, IDU and SPU are used interchangeably.



Mechanical

Rack mounting space, (RMS)	Less than 3 RMS (2.77 U) in a NEBS standard 19" rack, for an IRFU with 2 transceivers and associated BU	
Dimensions compliant to NEBS Rack-mounting	W x D x H (in.)	W x D x H (mm), approx.
	17 x 11 x 4.843	432 x 280 x 123
Weight, approx.	8.1 Kg for 1+0 configuration, including the BU	
	11.8 Kg for 1+1 MHSB configuration, including the BU	

Environmental

Operational temperature range	<ul style="list-style-type: none">-5 to +50 °C
Storage	<ul style="list-style-type: none">-45 to + 80 °C
Humidity	<ul style="list-style-type: none">Up to 95%, non-condensing
Altitude	<ul style="list-style-type: none">0 to 5000 m AMSL
Vibration	<ul style="list-style-type: none">EN 300 019-2-3, class 3.2
Transit vibration (packaged equipment)	<ul style="list-style-type: none">EN 300 019-2-2, class 2.3
Transit shock (packaged equipment)	<ul style="list-style-type: none">EN 300 019-2-2, class 2.3
Earthquake	<ul style="list-style-type: none">EN 300 019-2-3

EMI / EMC and Safety Compliance

Radiated and Conducted Susceptibility	
RF Magnetic field	<ul style="list-style-type: none">IEC 61000-4-3
Electrical Fast Transient/Burst	<ul style="list-style-type: none">IEC 61000-4-4
ESD	<ul style="list-style-type: none">IEC 61000-4-2
Radiated Emission and Conducted Emission	<ul style="list-style-type: none">CISPR 22, Class BFCC 47 CFR Part 15, subpart B, Class BCanada ICES-003, Class B
Safety Requirements	<ul style="list-style-type: none">IEC 60950-1 2006, Second Edition

Hardware Installation

Before installing the IRFU, ensure providing the following:

- a coaxial cable (SMA connector), for connecting the IRFU to the Customer's SPU;
- a 48 V_{DC} or 24 V_{DC} power source; and
- access to the building's ground terminal.



CAUTION. We strongly recommend that the technical personnel installing this IRFU possesses the knowledge and skills appropriate for making such installations.

Power connections to the IRFU must be made in compliance with Local and National Electrical Codes. RBW disclaims any liability deriving from improper or unsafe installation practices.

Required Tools and Equipment

Tool / Equipment	Required specifications	Where used
Screwdriver	Phillips #2, medium tip	• Throughout
Allen key	For #10-32 socket-head screws	• Connect the flexible waveguides — BU to Antenna, on page 25
Multimeter	With ohm meter	
Miscellaneous tools for installing connectors on the SPU to IRFU coaxial cable	Refer to the manufacturer documentation provided with the connector	• Connect the coaxial cable — IRFU to SPU, on page 26
Torque wrench for SMA connectors	5/16, set to 0.1 kg•m (9.0 lb-inch)	

Installation Procedure

1 Install the IRFU in the Rack



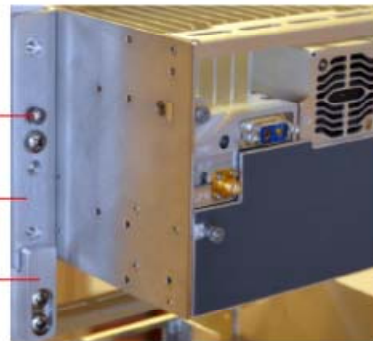
NOTE. Allocate a free space of at least **0.4 RMS** between the bottom of the IRFU's bracket and the SPU's top and, **1.3 RMS** between two IRFU shelves.

NOTE. Mounting brackets can be assembled for either ETSI or NEBS (ANSI) rack-mounting.

Grounding
Terminals (4)

Mounting Bracket
Screws (6)

Shelf Mounting Lugs
(to be left in place for holding the
shelf before fastening)



NEBS Rack-mounting

- 1 Install the [Shelf Mounting Lugs](#) (2) using the machine screws provided. Leave these lugs in place for holding the IRFU during installation.



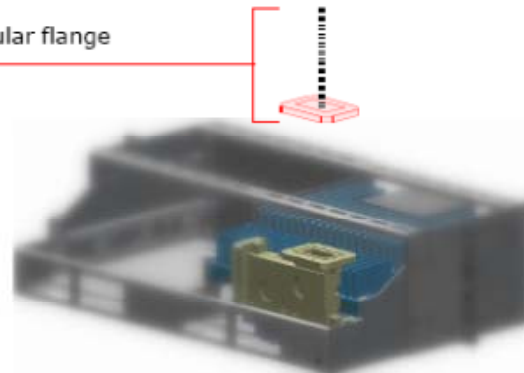
CAUTION. For greater safety, placing a fully assembled IRFU (approx. 12 kg) in the rack may require the assistance of two persons.

- 2 Starting with the 2 top screws, secure the 6 [Mounting Bracket](#) screws to the rack.

2 Connect the flexible waveguides – BU to Antenna

Figure 11: Connecting the Waveguide(s)

Flexible waveguide w/ rectangular flange
from antenna (by Customer)



Back View of the IRFU



NOTE. Assumptions regarding materials and equipment provided by the Customer to the waveguide(s) connection point(s):

- Enough length of waveguide to go from the rack to the antenna.
 - Waveguides are pressurized with dry air (using appropriate dehydrators), sealed by the antenna at one end, and a pressure window supplies the seal at the other end (radio equipment).
 - Other waveguide accessories (supports, waterproof entry, etc.).
- 1 Remove the protection cap from the BU mating flange.
 - 2 Connect the flanged end of a length of flexible waveguide to its mating flange on the BU, using the 8 socket-head screws provided. Refer to [Table 5](#) below, for the waveguide/flange specifications.
 - 3 Install flange gasket according to Customer's mating flange (not supplied).

Table 5: Waveguide/Flange Specifications

Frequency, GHz	Waveguide	Flange	
		Type	Holes
L6 and U6	WR-137	CPR-137G	
7 and 8	WR-112	CPR-112G	Tapped for #10-32 screws
11	WR-90	CPR-90G	

3 Connect the coaxial cable — IRFU to SPU



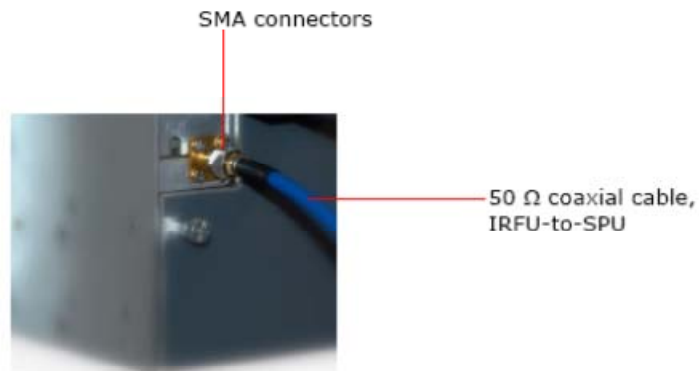
NOTE. This step assumes the presence of a 50 Ω coaxial cable, preferably with angled SMA connectors. If that is not the case, proceed with the instructions below.

- 1 Cut the coaxial cable to a length which will leave enough slack after it has been connected to the SPU.
- 2 Following the instructions accompanying the connector, install an angled SMA connector at each cable end (not supplied).
- 3 Using the [Multimeter](#), check that the resistance between the coaxial cable's center (wire) and the shield is open circuit, with cable disconnected at both ends.



CAUTION. A lower resistance value indicates that there is a short in the coaxial cable. If this is the case, replace the cable.

Figure 12: Connecting the coaxial cable



4 Connect the grounding cable

- 1 Ground the IRFU by connecting a 4.11 mm (6 AWG) copper cable from any of the [Grounding points](#) of the IRFU shelf to the radio system's [Master ground bar](#), per [Figure 15](#).



NOTE. Each IRFU terminal includes a grounding kit (020-60066-0001). Parts per [Figure 13](#).

Installing a grounding kit

- 1 Insert the copper cable end in the [Ring terminal](#).
- 2 Insert the [Button head machine screw](#) through the [Spring lock washer](#) and [Flat washer 1](#).
- 3 Insert the screw with above-mentioned washers through the [Ring terminal](#) eyelet, then add [Flat washer 2](#) before attaching the whole assembly to any of the [Grounding points](#).

Figure 13: Grounding Kit

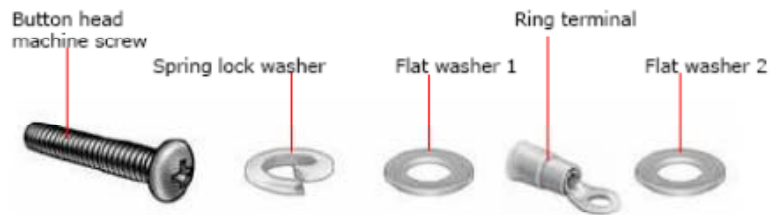
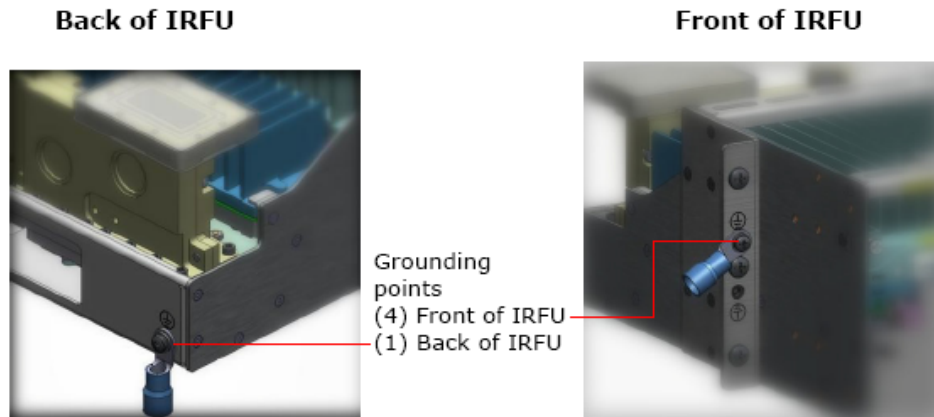


Figure 14: Grounding Connection Points



Safety requirements for grounding

- 1 The IRFU can also be grounded to the rack ground bar or rack, provided that the rack is grounded to the [Master ground bar](#). When grounding to the rack itself, ensure removing any paint or powder coating from the rack before attaching the ground conductor.
- 2 Ground conductor impedance to be less than 0.5 Ω .
IMPORTANT. Ensure connecting the path of lowest impedance directly to the [Master ground bar](#).
- 3 Do not connect other equipment to the same grounding cable as the IRFU. Each piece of equipment at the site should have a separate grounding cable to a common very low impedance [Master ground bar](#).
- 4 Connect the equipment directly to the D.C. supply system grounding electrode conductor or to a bonding jumper from a grounding terminal bar, or bus to which the D.C. supply grounding electrode is connected.



CAUTION. Provide fusing according to Local and National Electrical Codes. Fuse ratings must be: 4 A for 48 V operations, and 8 A for 24 V operations.

5 Connect power to the IRFU

Connect the power supply as shown in Figure 15. Check that the junction-block screws are tight enough to hold the power wire securely in place.

Figure 15: Power and Grounding Connections

