



ETL Systems

New technologies
in RF distribution

Model Number:
FN-U-L1L1-24115-XXXX

Falcon Series Frequency Converter Module L-Band Block Upconverter

Typical applications:

- Teleports & Earth Stations
- Satellite Operations
- Government & Defence applications
- Telemetry, Tracking & Command
- High Resilience applications

Converting L-band to L-band. The 1U chassis has the capacity for up to five hot-swap frequency converter modules. These can be all upconverters, all downconverters or a mix of both.

Resilience from dual redundant hot-swap power supplies & field replaceable CPU & HMI

Local control & monitoring via HMI high resolution touchscreen

Compact housed in a 1U high chassis with capacity for up to Frequency Converter five modules

Flexible Module Configurations choose from a mixture of up and down converters with different operating frequencies.

Hot Swap & replaceable RF Frequency Converter modules

Redundancy configurations Field-replaceable 2+1 or 1+1 redundant configuration

Field replaceable Internal 10MHz reference source and external reference inject port with auto detection

Secure protocols with SNMPv3 and HTTPS

Remote control & monitoring via RJ45 Ethernet port with SNMP & web browser interface

Chassis - Specification

Dimensions / Weight / Colour	1U high x 550mm deep x 19" wide / <10 kg / RAL9003—White (Semi-matte)
Capacity	Total of 17 module slots. Note that up to 2 slots may be used for fans (if required) and 1 slot may be used for 10 MHz EXT inject module (if required). Modules may require >1 slot. Refer to required module spec table.
Temperature	Operating: 0 to 45°C / Storage: -20°C to +75°C
Location / Humidity / Altitude	Indoor use only / 20 to 90% non-condensing / 10,000 feet AMSL (Operational) 30,000 feet AMSL (Storage) <i>Above Mean Sea Level</i>
Control & Monitoring	Local: HMI touch screen Remote: Ethernet via RJ45, 10BaseT/100 BaseTx. TCP/IP, SNMP V3 & HTTPS & Web browser interface HMI and CPU field replaceable.
MTTR	20 minutes (15 minutes to retrieve spare part and 5 mins to replace) Applies to LRUs only and assumed in house stock
AC Input / Consumption	85-264Vac 50/60Hz / 150W
PSU Redundancy	Dual redundant and alarmed Diode OR. Hot swappable
Input & Output ports	Dependant upon module fitted



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Frequency Converter Module

Compact form factor allowing multiple modules to be housed in 1U chassis. Each module uses 3 slots in the chassis.

Frequency Downconverter Module - RF Parameters		Redundancy Module - RF Parameters	
Model Numbers	FN-U-L1L1-24115-XXXX	SWF-G1S-CX-111	SWF-G1S-CX-110
Size	3 slots wide	4 slots wide	6 slots wide
Redundancy	Standalone Module	1+1 (Note. This column denotes specs for 24115 in 1+1 configuration)	2+1 (Note. This column denotes specs for 24115 in 2+1 configuration)
Input Frequency Range	950—1450 MHz		
Output Frequency Range	1950—2450 MHz		
Conversion Gain	0 ± 2 dB	-1.4 ± 2 dB	-5.4 ± 2 dB
Gain Steps	N/A		
Gain Flatness (50 Ohm)	Full IF-band: ±1.0 dB		
Input Return Loss (RF-Band, 50 Ohm)	Typ -18 dB / Min.-15 dB	Typ -15dB / Min -12.0 dB	Typ -13 dB / Min -11.0 dB
Output Return Loss (IF-Band, 50 Ohm)	Typ. -18 dB / Min.-15 dB	Typ -15dB / Min -12.0 dB	Typ -13 dB / Min -11.0 dB
Noise Figure	Typ. 18 dB / Max. 22 dB	Typ 18.7dB / Max 22.7 dB	Typ 20.8 dB / Max 24.7 dB
Maximum Operational Input Level	0 dBm		
OP1dB	Typ. +5 dBm / Min.+3 dBm	Typ. +4.3dBm / Min. +2.3 dBm	Typ. +2.3 dBm / Min. +0.3 dBm
OIP3	Typ. +15 dBm / Min.+12 dBm	Typ. +14.3 dBm / Min. +11.3 dBm	Typ. +12.3 dBm / Min. +9.3 dBm
Group Delay (max pk-pk)	2 ns		
Internal Reference Stability	±5x10 ⁻⁸ over 0 to 50°C		
Phase Noise (Typical values)	@10Hz offset	-70 dBc / Hz	
	@100Hz offset	-80 dBc / Hz	
	@1KHz offset	-90 dBc / Hz	
	@10KHz offset	-95 dBc / Hz	
	@100KHz offset	-100 dBc / Hz	
	@1MHz offset	-110 dBc / Hz	
Spurs In-band	Carrier related	<-60 dBc Measured at -15dBm input level	
	Non-carrier related	<-70 dBm Measured at -15dBm input level	
Spurs Out-of-band	Carrier related	<-60 dBc Measured at -15dBm input level	
	Non-carrier related	<-75 dBm Measured at -15dBm input level	
LO Breakthrough	<-60 dBm		
Image Rejection	50 dB		
External Reference	Input Freq. 10 MHz. Auto detection. 1 required per chassis		
External Ref. Input Level	+3 dBm ± 3dB (Subject to change)		
Mute	60 dB		
Number of conversion stages	Dual		
Spectral Inversion	Non-inverting		
Spec version	1.0	1.0	0.1

Note 1: The specification is subject to regular reviews and will be updated from time to time as part of our continuing product development and improved spec accuracy.

Note 2: Operation beyond the quoted limits stated above may cause instantaneous and permanent damage.

Note 3: All specs are for 50 Ohm connectors unless detailed otherwise.



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