



# Falcon Series

## Frequency Converter Module

### Ku-Band Agile Upconverter

**Typical applications:**

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

The 1U chassis has the capacity for up to four 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 four 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 1 slot may be used for fan (if required) and 1 slot may be used for 10 MHz EXT inject module (if required). Note actual modules may require >1 slot. Refer to required module spec table.
Temperature	Operating: 0°C 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) Above Mean Sea Level
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. Each module independently monitored and reported.
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





**Frequency Converter Module**  
Compact form factor allowing multiple modules to be housed in 1U chassis. Each module uses 4 slots in the chassis.

Frequency Upconverter Module - RF Parameters			
Model Numbers	FN-U-K3F2-24153-XXS5	SWF-G1S-KX-109	SWF-G1S-KX-115
Size	4 slots wide	4 slots wide	4 slots wide
Redundancy	Standalone module	1 + 1 (Note: This column denotes specs for 24153 in 1 + 1 configuration)	2 + 1 (Note: This column denotes specs for 24153 in 2+ 1 configuration)
Input Frequency Range (User Selectable)	70 ± 20 MHz / 140 ± 40 MHz		
Output Frequency Range	12750 - 14800 MHz in 1 kHz steps		
Conversion Gain	Max. 35 ± 2 dB / Min. 5 ± 2 dB	Max. 33.9 ± 2.2 dB / Min. 3.9 ± 2.2 dB	Max. 34 ± 2.5 dB / Min. 4 ± 2.5 dB
Gain steps	0.25 ± 0.15 dB		
Gain Flatness	Typ. ±0.4 dB (full IF band) Max. ±0.6 dB (full IF band)	Typ. ±0.6 dB (full IF band) Max. ±0.8 dB (full IF band)	Typ. ±0.9 dB (full IF band) Max. ±1.1 dB (full IF band)
Input Return Loss (50 Ohm)	Typ. -18 dB / Min. -15 dB	Typ. -15 dB / Min. -12 dB	Typ. -15 dB / Min. -13 dB
Output Return Loss (50 Ohm)	Typ. -15dB / Min. -10 dB	Typ. -11 dB / Min. -8 dB	Typ. -11 dB / Min. -8 dB
Noise Figure At max. gain	Typ. 10 dB / Max 12 dB	Typ. 11.5 dB / Max 13.5 dB	Typ. 11.5 dB / Max 13.5 dB
Maximum Operational Input Level At max. gain	-30 dBm		
OP1dB At max. gain	Typ. +10 dBm / Min. +8 dBm	Typ. +7.5 dBm / Min. +5.5 dBm	Typ. +7.5 dBm / Min. +5.5 dBm
OIP3 At max. gain	Typ. +22 dBm / Min. +20 dBm	Typ. +19.5 dBm / Min. +17.5 dBm	Typ. +19.5 dBm / Min. +17.5 dBm
Internal Reference Stability	± 5 x 10 <sup>-8</sup> over 0 to 50°C		
Phase Noise (Typical values)	@10Hz offset	-70 dBc / Hz	
	@100Hz offset	-80 dBc / Hz	
	@1KHz offset	-85 dBc / Hz	
	@10KHz offset	-85 dBc / Hz	
	@100KHz offset	-90 dBc / Hz	
	@1MHz offset	-110 dBc / Hz	
Spurs In-band (@ -5dBm output)	Carrier related	< -50 dBc	
	Non-carrier related	< -70 dBm	
Spurs Out-of-band (@ -5dBm output)	Carrier related	< -50 dBc	
	Non-carrier related	< -70 dBm	
LO Breakthrough	< -70 dBm		
Image Rejection	> 60 dB typical		
External Reference	Input Freq. 10MHz Input Level +3 dBm ± 3dB		
Mute	60 dB		
Number of conversion stages	Dual		
Spectral Inversion	Non-inverting		
Redundancy	Supported. Based on module configuration		
Spec version	0.5	1.1	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.

