



Falcon Series Frequency Converter Module L-Band to Ka-Band Block Upconverter

Typical applications:

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

L-Band to Ka-Band block upconverter module with variable gain and slope.

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.

Frequency Converter Module



Frequency Converter Module

Compact form factor allowing multiple modules to be housed in the Genus chassis. Each module occupies 4 slots in the chassis.



Hot Swap & replaceable RF

Frequency Converter modules



Redundancy configurations

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



Variable Gain & Slope

For balancing input signals.



Frequency Conversion Up

conversion from L-Band to Ka-Band.

Chassis Options



Local control & monitoring via HMI high resolution touchscreen



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



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



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



Compact indoor & outdoor chassis options, which can be part populated



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



Secure protocols with SNMPv3 and HTTPS



Indoor Chassis



Outdoor Unit





Frequency Upconverter Module - RF Parameters		Redundancy - RF Parameters	
Model Numbers	FN-U-K4L1-24403AA-XXX5	SWF-G1S-QX-108A-xxxx	SWF-G1S-QX-116-xxxx
Size	4 slots wide	4 slots wide	4 slots wide
Redundancy	Supported (based on chassis configuration)	1+1 (Note: This column denotes specs for 24403 in 1+1 configuration).	2+1 (Note: This column denotes specs for 24403 in 2+1 configuration).
Input Frequency Range	1150 - 2150 MHz		
Output Frequency Range (User selectable frequency range via software command)	Mode 1 : 27.0—28.00, Mode 2 : 27.50—28.50, Mode 3 : 28.00—29.00, Mode 4 : 28.50—29.50 GHz, Mode 5 : 29.00—30.00 GHz, Mode 6 : 29.50—30.50 GHz Mode 7 : 30.00—31.00 GHz		
Mean Conversion Gain	Max. 22.0 ± 2.0 dB / Min. -13.0 ± 2.0 dB	Max. 18.0 ± 2.0 dB / Min -17.0 ± 2.0 dB	Max. 14.8 ± 2.0 dB / Min -20.2 ± 2.0 dB
Gain Step Size	0.25 ± 0.15 dB		
Gain Flatness	Full IF band: ±1.5 dB Any 40MHz: ±0.3 dB		
Input Return Loss (L-band)	Typ. -20 dB / Min. -18 dB	Typ. -13 dB / Min. -11 dB	Typ. -13 dB / Min. -11 dB
Output Return Loss (Ka-band)	Typ. -18 dB / Min. -14 dB	Typ. -9 dB / Min. -8 dB	Typ. -9 dB / Min. -8 dB
Noise Figure At max. gain	Typ. 20 dB / Max 23 dB	Typ. 21 dB / Max 24 dB	Typ. 22.7 dB / Max 25.8 dB
Input Power Range	-75 to -30 dBm		
OP1dB At max. gain	Typ. +3 dBm / Min. 0 dBm	Typ. 0 dBm / Min. -3.0 dBm	Typ. -1.5 dBm / Min. -4.5 dBm
OIP3 At max. gain	Typ. +13 dBm / Min. +10 dBm	Typ. +10.0 dBm / Min. +7.0 dBm	Typ. +8.5 dBm / Min. +5.5 dBm
Slope Control Range	0-6 dB, pivot point at 2150 MHz		
Slope Control Steps	1 ± 0.5 dB		
Internal Reference Stability	± 5 x 10 ⁻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	-98 dBc / Hz	
	@100KHz offset	-101 dBc / Hz	
	@1MHz offset	-107 dBc / Hz	
	@10MHz offset	-130 dBc / Hz	
Spurs In-band (Measured at -15 dBm output and max gain)	Carrier related	< -60 dBc	
	Non-carrier related	< -70 dBm	
Spurs Out-of-band (Measured at -15 dBm output and max gain)	Carrier related	< -60 dBc	
	Non-carrier related	< -70 dBm	
LO Breakthrough	< -70 dBm		
Image Rejection	> 60 dB typical		
External Reference Input Frequency	10MHz or 100MHz (auto detection)		
External Ref Input Level	0 dBm ± 10 dB		
Mute	60 dB		
IF Monitor	Yes. Internal RF detector monitored.		
Spectral Inversion	Non-inverting		
Number of conversion stages	Dual		
Spec version	0.1	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.





Frequency Upconverter Module - RF Parameters

Model Numbers	FN-U-K4L1-24403AB-XXK5	
Size	4 slots wide	
Redundancy	Supported (based on chassis configuration)	
Input Frequency Range	1150 - 2150 MHz	
Output Frequency Range (User selectable frequency range via software command)	Mode 1 : 27.00—28.00 GHz, Mode 2 : 28.00—29.00 GHz, Mode 3 : 29.00—30.00 GHz, Mode 4 : 30.00—31.00 GHz	
Mean Conversion Gain	Max. 22.0 ± 2.0 dB / Min. -13.0 ± 2.0 dB	
Gain Step Size	0.25 ± 0.15 dB	
Gain Flatness	Full IF band: ±1.5 dB Any 40MHz: ±0.3 dB	
Input Return Loss (L-band)	Typ. -20 dB / Min. -18 dB	
Output Return Loss (Ka-band)	Typ. -18 dB / Min. -14 dB	
Noise Figure At max. gain	Typ. 20 dB / Max 23 dB	
Input Power Range	-75 to -30 dBm	
OP1dB At max. gain	Typ. +3 dBm / Min. 0 dBm	
OIP3 At max. gain	Typ. +13 dBm / Min. +10 dBm	
Slope Control Range	0-6 dB, pivot point at 2150 MHz	
Slope Control Steps	1 ± 0.5 dB	
Internal Reference Stability	± 5 x 10 ⁻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	-98 dBc / Hz
	@100KHz offset	-101 dBc / Hz
	@1MHz offset	-107 dBc / Hz
	@10MHz offset	-130 dBc / Hz
Spurs In-band (Measured at -15 dBm output and max gain)	Carrier related	< -60 dBc
	Non-carrier related	< -70 dBm
Spurs Out-of-band (Measured at -15 dBm output and max gain)	Carrier related	< -60 dBc
	Non-carrier related	< -70 dBm
LO Breakthrough	< -70 dBm	
Image Rejection	> 60 dB typical	
External Reference Input Frequency	10MHz or 100MHz (auto detection)	
External Ref Input Level	0 dBm ± 10 dB	
Mute	60 dB	
IF Monitor	Yes. Internal RF detector monitored.	
Spectral Inversion	Non-inverting	
Number of conversion stages	Dual	
Spec version	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.





Frequency Upconverter Module - RF Parameters		
Model Numbers	FN-U-K4L1-24403AC-XXK5	
Size	4 slots wide	
Redundancy	Supported (based on chassis configuration)	
Input Frequency Range	950 - 2050 MHz	
Output Frequency Range (User selectable frequency range via software command)	Mode 1 : 27.50—28.60 GHz, Mode 2 : 28.10—29.20 GHz, Mode 3 : 28.70—29.80 GHz, Mode 4 : 29.30—30.40 GHz, Mode 5 : 29.90—31.00 GHz	
Mean Conversion Gain	Max. 22.0 ± 2.0 dB / Min. -13.0 ± 2.0 dB	
Gain Step Size	0.25 ± 0.15 dB	
Gain Flatness	Full IF band: ±2.0 dB Any 40MHz: ±0.3 dB	
Input Return Loss (L-band)	Typ. -20 dB / Min. -18 dB	
Output Return Loss (Ka-band)	Typ. -18 dB / Min. -14 dB	
Noise Figure At max. gain	Typ. 20 dB / Max 23 dB	
Input Power Range	-75 to -30 dBm	
OP1dB At max. gain	Typ. +3 dBm / Min. 0 dBm	
OIP3 At max. gain	Typ. +13 dBm / Min. +10 dBm	
Slope Control Range	0-6 dB, pivot point at 2150 MHz	
Slope Control Steps	1 ± 0.5 dB	
Internal Reference Stability	± 5 x 10 ⁻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	-98 dBc / Hz
	@100KHz offset	-101 dBc / Hz
	@1MHz offset	-107 dBc / Hz
	@10MHz offset	-130 dBc / Hz
Spurs In-band (Measured at -15 dBm output and max gain)	Carrier related	< -60 dBc
	Non-carrier related	< -70 dBm
Spurs Out-of-band (Measured at -15 dBm output and max gain)	Carrier related	< -60 dBc
	Non-carrier related	< -70 dBm
LO Breakthrough	< -70 dBm	
Image Rejection	> 60 dB typical	
External Reference Input Frequency	10MHz or 100MHz (auto detection)	
External Ref Input Level	0 dBm ± 10 dB	
Mute	60 dB	
IF Monitor	Yes. Internal RF detector monitored.	
Spectral Inversion	Non-inverting	
Number of conversion stages	Dual	
Spec version	0.2	

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.

