

Falcon Series Frequency Converter Module

L-Band to Ka-Band Block Upconverter

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.

Redundancy Configurations

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

Hot Swap & Replaceable

RF Frequency Converter modules

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

Resilience

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

Compact indoor & outdoor

chassis options, which can be part populated

Secure protocols

with SNMPv3 and HTTPS

Flexible Module Configurations

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

Remote control & monitoring

via RJ45 Ethernet port with SNMP & web browser interface

Field replaceable Internal reference source

and external reference inject port with auto detection



Indoor Chassis



Outdoor Unit

Frequency Upconverter Module - RF Parameters		Redundancy - RF Parameters			
Model Numbers		FN-U-K4L1-24403AA-XXK5	SWF-G1S-QX-108A-xxxx	SWF-G1S-QX-116-xxxx	
Size		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 ± 2.0 dB / Min. -3.0 ± 2.0 dB	Max. 18 ± 2.0 dB / Min -7.0 ± 2.0 dB	Max. 14.8 ± 2.0 dB / Min -10.2 ± 2.0 dB	
Gain Step Size		0.25 ± 0.15 dB			
Gain Flatness		Full IF-band: ±1.5 dB / Any 40 MHz ±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. 15 dB / Max 18 dB	Typ. 16 dB / Max 19 dB	Typ. 17.7 dB / Max 20.8 dB	
Input Power Range		-75 to -30 dBm			
OP1dB At max. gain		Typ. +5 dBm / Min. 0 dBm	Typ. +2 dBm / Min. -3 dBm	Typ. +0.5 dBm / Min. -4.5 dBm	
OIP3 At max. gain		Typ. +13 dBm / Min. +10 dBm	Typ. +10 dBm / Min. +7 dBm	Typ. +8.5 dBm / Min. +5.5 dBm	
Group Delay pk-pk		2 ns max			
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)	@10 Hz offset	-65 dBc / Hz			
	@100 Hz offset	-78 dBc / Hz			
	@1 KHz offset	-85 dBc / Hz			
	@10 KHz offset	-98 dBc / Hz			
	@100 KHz offset	-101 dBc / Hz			
	@1 MHz offset	-110 dBc / Hz			
	@10 MHz offset	-130 dBc / Hz			
Spurs In-band (Measured at -15 dBm output and max gain)	Carrier related	< -60 dBc			
	Harmonic	< -60 dBc			
	Non-carrier related	< -75 dBm			
Spurs Out-of-band (Measured at -15 dBm output and max gain)	Carrier Related	< -60 dBc			
	Harmonic	< -60 dBc			
	Non-carrier related	< -70 dBm			
LO Breakthrough		< -75 dBm			
Image Rejection		>60 dB typical			
External Reference Input Frequency		10MHz or 100MHz (auto detection)			
External Reference Input Level		0dBm ± 10dB			
Mute		60 dB			
Spectral Inversion		Non-inverting			
Number of conversion stages		Dual			
Spec version		0.4	1.0	0.1	

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. -3.0 ± 2.0 dB	
Gain Step Size	0.25 ± 0.15 dB	
Gain Flatness	Full IF-band: ±1.5 dB / Any 40 MHz ±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. 15 dB / Max 18 dB	
Input Power Range	-75 to -30 dBm	
OP1dB At max. gain	Typ. +5 dBm / Min. 0 dBm	
OIP3 At max. gain	Typ. +13 dBm / Min. +10 dBm	
Group Delay pk-pk	2 ns max	
Slope Control Range	0-6 dB, pivot point at 2150 MHz	
Slop Control Steps	1 ± 0.5 dB	
Internal Reference Stability	± 5 x 10 ⁻⁸ over 0 to 50°C	
Phase Noise (Typical Values)	@10 Hz offset	-65 dBc / Hz
	@100 Hz offset	-78 dBc / Hz
	@1 KHz offset	-85 dBc / Hz
	@10 KHz offset	-98 dBc / Hz
	@100 KHz offset	-101 dBc / Hz
	@1 MHz offset	-110 dBc / Hz
	@10 MHz offset	-130 dBc / Hz
Spurs In-band (Measured at -15 dBm output and max gain)	Carrier related	< -60 dBc
	Harmonic	< -60 dBc
	Non-carrier related	< -75 dBm
Spurs Out-of-band (Measured at -15 dBm output and max gain)	Carrier Related	< -60 dBc
	Harmonic	< -60 dBc
	Non-carrier related	< -70 dBm
LO Breakthrough	< -75 dBm	
Image Rejection	>60 dB	
External Reference Input Frequency	10MHz or 100MHz (auto detection)	
External Reference Input Level	0dBm ± 10dB	
Mute	60 dB	
Number of conversion stages	Dual	
Spectral Inversion	Non-inverting	
IF Monitor	Yes. Internal RF detector monitored	
Spec version	0.4	

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-S5K5	
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. -3.0 ± 2.0 dB	
Gain Step Size	0.25 ± 0.15 dB	
Gain Flatness	Full IF-band: ±2.0 dB / Any 40 MHz ±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. 15 dB / Max 18 dB	
Input Power Range	-75 to -30 dBm	
OP1dB At max. gain	Typ. +5 dBm / Min. 0 dBm	
OIP3 At max. gain	Typ. +13 dBm / Min. +10 dBm	
Group Delay pk-pk	2 ns max	
Slope Control Range	0-6 dB, pivot point at 2150 MHz	
Slop Control Steps	1 ± 0.5 dB	
Internal Reference Stability	± 5 x 10 ⁻⁸ over 0 to 50°C	
Phase Noise (Typical Values)	@10 Hz offset	-65 dBc / Hz
	@100 Hz offset	-78 dBc / Hz
	@1 KHz offset	-85 dBc / Hz
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	@1 MHz offset	-110 dBc / Hz
	@10 MHz offset	-130 dBc / Hz
Spurs In-band (Measured at -15 dBm output and max gain)	Carrier related	< -60 dBc
	Harmonic	< -60 dBc
	Non-carrier related	< -75 dBm
Spurs Out-of-band (Measured at -15 dBm output and max gain)	Carrier Related	< -60 dBc
	Harmonic	< -60 dBc
	Non-carrier related	< -70 dBm
LO Breakthrough	< -75 dBm	
Image Rejection	>60 dB	
External Reference Input Frequency	10MHz or 100MHz (auto detection)	
External Reference Input Level	0dBm ± 10dB	
Mute	60 dB	
Number of conversion stages	Dual	
Spectral Inversion	Non-inverting	
IF Monitor	Yes. Internal RF detector monitored	
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Frequency Upconverter Module - RF Parameters		
Model Numbers	FN-U-K4L1-24403AD-S5K5	
Size	4 slots wide	
Redundancy	Supported (based on chassis configuration)	
Input Frequency Range	Mode 1: 950 - 1950 MHz, Mode 2: 950 - 1450 MHz	
Output Frequency Range (User selectable frequency range via software command)	Mode 1: 27.50 – 28.50 GHz, Mode 2: 30.0 – 30.50 GHz	
Mean Conversion Gain	Max. 22.0 ± 2.0 dB / Min. -3.0 ± 2.0 dB	
Gain Step Size	0.25 ± 0.15 dB	
Gain Flatness	Full IF-band: ±2.0 dB / Any 40 MHz ±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. 15 dB / Max 18 dB	
Input Power Range	-75 to -30 dBm	
OP1dB At max. gain	Typ. +5 dBm / Min. 0 dBm	
OIP3 At max. gain	Typ. +13 dBm / Min. +10 dBm	
Group Delay pk-pk	2 ns max	
Slope Control Range	0-6 dB, pivot point at 2150 MHz	
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