ETL Systems
New technologies
in RF distribution
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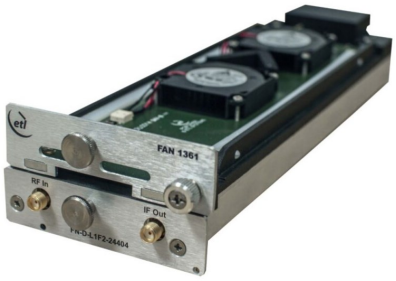
Model Number:
FN-U-K4L1-24403XX-XXXX

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

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

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Model Number:
FN-U-K4L1-24403AA-XXXX

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	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.

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Pb-Free
ISO 9001 QUALITY MANAGEMENT
UKAS MANAGEMENT SYSTEMS 015

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Model Number:
FN-U-K4L1-24403AB-XXXX

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

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