ETL Systems

Excelling in RF Engineering

Model Number:
FN-U-K4L1-24142-XXK5

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

Upconverting L-band to Ka-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.

Local control & monitoring via HMI high resolution touchscreen

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

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

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 will be used for fan (if required) and 1 slot will be used for 10 MHz EXT inject module.
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) *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.
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
No. of modules per chassis	5 Max. Module 3 slots wide

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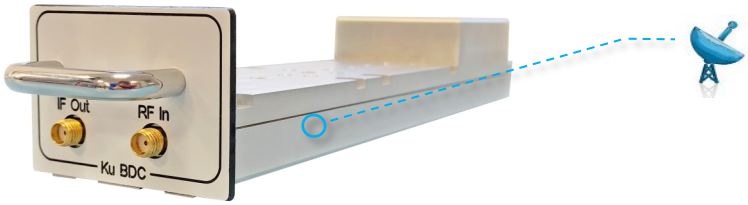

Frequency Converter Module

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

Frequency Upconverter Module - RF Parameters				
Model Numbers		FN-U-K4L1-24142-XXK5	SWF-G1S-QX-108	SWF-G1S-QX-106
Size		3 Slots wide	4 slots wide	6 slots wide
Redundancy		Standalone Module	1+1 (**Note.** This column denotes specs for 24103 in 1+1 configuration)	2+1 (**Note.** This column denotes specs for 24103 in 2+1 configuration)
Input Frequency Range		950 - 2150 MHz		
Output Frequency Range		27.5 – 28.7 GHz Mode 1 28.3 – 29.5 GHz Mode 2		
Conversion Gain		Max 18 ± 2 dB Min -10 ± 2 dB	Max 13 ± 2 dB Min -15 ± 2 dB	Max 12 ± 2 dB Min -16 ± 2 dB
Gain Step Size		0.5 ± 0.25 dB		
Gain Flatness (50 Ohm)	Full IF Band Any 40 MHz	±1.5 dB ±0.3 dB		
Input Return Loss (50 Ohm)		Typ. -18 dB / Min. -15 dB	Typ. -15 dB / Min. –13 dB	Typ. –15.0 dB / Min. –13.0 dB
Output Return Loss (50 Ohm)		Typ. –15dB / Min. –10 dB	Typ. -11 dB / Min. –7 dB	Typ. - 11 dB / Min. –8 dB
Noise Figure		Typ. 12 dB / Max 15 dB	Typ. 14 dB / Max 18.2 dB	Typ. 14.5 / Max 18.9 dB
Input Power Range		-75 to –35 dBm		
OP1dB		Typ. +3 dBm / Min. 0 dBm	Typ. -0.5 dBm / Min. –3.5 dBm	Typ. –1.0 dBm / Min. –4.0 dBm
OIP3		Typ. +13 dBm / Min. +10 dBm	Typ. 10 dBm / Min. 7 dBm	Typ. 9.5 dBm / Min. 6.5 dBm
Group Delay (max pk-pk)		5 ns		
Internal Reference Stability		± 5 x 10^{-8} over 0 to 50°C		
Phase Noise (Typical values)	@10Hz offset	-60 dBc / Hz		
	@100Hz offset	-70 dBc / Hz		
	@1KHz offset	-75 dBc / Hz		
	@10KHz offset	-80 dBc / Hz		
	@100KHz offset	-80 dBc / Hz		
	@1MHz offset	-90 dBc / Hz		
Spurs In-band	Non-carrier related	< -70 dBm		
Spurs Out-of-band	Carrier related	< -50 dBc		
	Non-carrier related	< -70 dBm		
LO Breakthrough		< -70 dBm		
Image Rejection		> 60 dB Mode 1 > 60 dB Mode 2		
External Reference		Input Freq. 10MHz Input Level +3 dBm ± 3dB		
Mute		60 dB		
Number of conversion stages		Dual		
IF Monitor		Yes. Internal RF detector monitored		
Spectral Inversion		Non-inverting		
Spec version		0.1	0.2	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.

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