ETL Systems

Excelling in RF Engineering

Model Number:
FN-D-K4L1-24201-K5XX

Falcon Series
Frequency Converter Module

Ka-Band Block Downconverter

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.

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.

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 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 Connectors	Dependant upon module fitted

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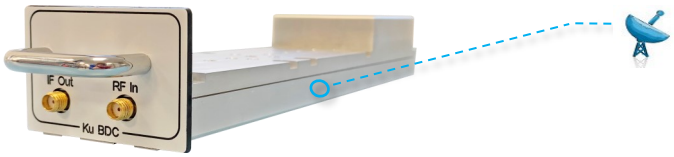

Frequency Converter Module

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

Frequency Downconverter Module - RF Parameters		Redundancy Module - RF Parameters		
Model Numbers		FN-D-K4L1-24201-K5XX	SWF-G1S-QX-108	SWF-G1S-QX-116
Size		4 slots wide	4 slots wide	4 slots wide
Redundancy		Standalone module	1+1 (Note: This column denotes specs for 24201 in 1+1 configuration)	2+1 (Note: This column denotes specs for 24201 in 2+1 configuration)
Input Frequency Range (User Selectable)		Mode 1: 29.25 – 30.00, Mode 2: 30.25 – 31.0 GHz		
Output Frequency Range		950 –1950 MHz		
Mean Conversion Gain		Max 35 ±1.5 dBm Min 5 ± 1.5 dB	Max 31 ±1.5 dBm Min 1 ± 1.5 dB	Max 27.8 ±1.5 dBm Min 1 ± -2.2 dB
Gain Flatness (50 Ohm)		Full band: ±1.5 dB Any 40MHz: ±0.3 dB		
Gain Steps		0.25 ± 0.15 dB		
Input Return Loss (50 Ohm)		Typ.-14 dB / Min.-10 dB	Typ.-11 dB / Min.-8 dB	Typ.-11 dB / Min.-8 dB
Output Return Loss (50 Ohm)		Typ.-18 dB / Min.-14 dB	Typ.-15 dB / Min.-12 dB	Typ.-15 dB / Min.-12 dB
Attenuator Step Size		0.5 ± 0.25 dB		
Noise Figure (@ max gain)		Max 10 dB	Max 13 dB	Max 14.6 dB
Input Power Range		-75 to –30 dBm		
OP1dB (@ max gain)		+15 dBm	+14 dBm	+12.3 dBm
OIP3 (@ max gain)		+27 dBm	+26 dBm	+24.3 dBm
Slope Compensation		0-8 dB in 1dB steps		
Group Delay (max pk-pk)		2 ns		
Internal Reference Stability		$\pm 5 \times 10^{-8}$ over 0 to 50°C		
Phase Noise (Typical values)	@10Hz offset	-55 dBc / Hz		
	@100Hz offset	-65 dBc / Hz		
	@1KHz offset	-75 dBc / Hz		
	@10KHz offset	-80 dBc / Hz		
	@100KHz offset	-83 dBc / Hz		
	@1MHz offset	-95 dBc / Hz		
Spurs In-band Measured at -5dBm output power (> 1MHz offset from carrier)	Carrier related	<-50 dBc		
	Non-carrier related	<-75 dBm		
Spurs Out-of-band Measured at -5dBm output power	Carrier related	<-50 dBc		
	Non-carrier related	<-80 dBm		
LO Breakthrough		<-80 dBm		
Image Rejection		Mode 1 : >60 dB, Mode 2 : >50 dB		
External Reference		Input Freq. 10 MHz Input Level +3 dBm ± 3 dB		
Mute		60 dB		
Number of conversion stages		Single		
IF Monitor		Yes. Internal RF detector monitored		
Spectral Inversion		Non-inverting		
Spec version		1.2	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.

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