ETL Systems
New technologies
in RF distribution
www.etlsystems.com

Model Number:
FN-U-C2L1-24440XX-XXXX

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

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

L-Band to C-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 C-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-C2L1-24440AA-XXXX

Frequency Upconverter Module - RF Parameters				
Model Numbers		FN-U-C2L1-24440AA-XXXX	SWF-G1S-KX-109A-xxxx	SWF-G1S-KX-115-xxxx
Size		4 slots wide	4 slots wide	4 slots wide
Redundancy		Standalone module	1+1 (**Note:** This column denotes specs for 24440 in 1+1 configuration)	2+1 (**Note:** This column denotes specs for 24440 in 2+1 configuration)
Input Frequency Range		1150 - 2150 MHz		
Output Frequency Range		**Mode 1** 5725—6725 MHz **Mode 2** 5850—6850 MHz		
Fixed LO		**Mode 1** 4575 MHz **Mode 2** 4700 MHz		
Conversion Gain		Max. 35 ± 1.5 dB / Min 5 ± 1.5 dB	Max. 33.9 ± 1.8 dB / Min 3.9 ± 1.8 dB	Max. 34 ± 2.1 dB / Min 4 ± 2.1 dB
Gain steps		0.25 ± 0.15 dB		
Gain Flatness (50 Ohm)		Full IF band: ±1.5 dB Any 40MHz: ±0.25 dB	Full IF band: ±1.8 dB Any 40MHz: ±0.55 dB	Full IF band: ±2.1 dB Any 40MHz: ±0.85 dB
Input Return Loss (50 Ohm)		Typ. -18 dB / Min. -14 dB	Typ. -15 dB / Min. -11 dB	Typ. -15 dB / Min. –12 dB
Output Return Loss (50 Ohm)		Typ. –18 dB / Min. –14 dB	Typ. -15 dB / Min. –11 dB	Typ. -15 dB / Min. –12 dB
Noise Figure At max. gain		Typ. 8 dB / Max 10 dB	Typ. 9.5 dB / Max 11.5dB	Typ. 9.5 dB / Max 11.5 dB
Input Power Range		-75 to –30 dBm		
OP1dB At max. gain		Typ. +12 dBm / Min. +10 dBm	Typ. +9.5 dBm / Min. +7.5 dBm	Typ. +9.5 dBm / Min. 7.5 dBm
OIP3 At max. gain		Typ. +22 dBm / Min. +20 dBm	Typ. +19.5 dBm / Min. +17.5 dBm	Typ. +19.5 dBm / Min. +17.5 dBm
Slope Compensation		0-6 dB, at L-band		
Slope Control Steps		1 dB		
Internal Reference Stability		± 5 x 10^{-8} over 0 to 50°C		
Phase Noise (Typical values)	@10Hz offset	-68 dBc / Hz		
	@100Hz offset	-80 dBc / Hz		
	@1KHz offset	-90 dBc / Hz		
	@10KHz offset	-106 dBc / Hz		
	@100KHz offset	-107 dBc / Hz		
	@1MHz offset	-115 dBc / Hz		
Spurs In-band	Non-carrier related	< -70 dBm		
	Carrier related (@ -5 dBm output)	< -50 dBc		
Spurs Out-of-band	Carrier related (@ -5 dBm output)	< -50 dBc		
	Non-carrier related	< -70 dBm		
LO Breakthrough		< -60 dBm		
Image Rejection		> 60 dB typical		
External Reference Input Frequency		10 MHz or 100 MHz		
External Reference Input Level		0 dBm ± 10 dB		
Mute		60 dB		
IF Monitor		Yes. Internal RF detector monitored		
Spectral Inversion		Non-inverting		
Number of conversion stages		Single		
Redundancy		Supported. Based on module configuration		
Spec version		0.2	1.1	1.1

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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UKAS MANAGEMENT SYSTEMS 015

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Model Number:
FN-U-C2L1-24440AB-XXXX

Frequency Upconverter Module - RF Parameters				
Model Numbers		FN-U-C2L1-24440AB-XXXX	SWF-G1S-KX-109A-xxxx	SWF-G1S-KX-115-xxxx
Size		4 slots wide	4 slots wide	4 slots wide
Redundancy		Standalone module	1+1 (**Note:** This column denotes specs for 24440 in 1+1 configuration)	2+1 (**Note:** This column denotes specs for 24440 in 2+1 configuration)
Input Frequency Range		950 - 1525 MHz		
Output Frequency Range		5850—6425 MHz		
Fixed LO		4900 MHz		
Conversion Gain		Max. 35 ± 1.5 dB / Min 5 ± 1.5 dB	Max. 33.9 ± 1.8 dB / Min 3.9 ± 1.8 dB	Max. 34 ± 2.1 dB / Min 4 ± 2.1 dB
Gain steps		0.25 ± 0.15 dB		
Gain Flatness (50 Ohm)		Full IF band: ±1.5 dB Any 40MHz: ±0.25 dB	Full IF band: ±1.8 dB Any 40MHz: ±0.55 dB	Full IF band: ±2.1 dB Any 40MHz: ±0.85 dB
Input Return Loss (50 Ohm)		Typ. -18 dB / Min. -14 dB	Typ. -15 dB / Min. -11 dB	Typ. -15 dB / Min. –12 dB
Output Return Loss (50 Ohm)		Typ. –18 dB / Min. –14 dB	Typ. -15 dB / Min. –11 dB	Typ. -15 dB / Min. –12 dB
Noise Figure At max. gain		Typ. 8 dB / Max 10 dB	Typ. 9.5 dB / Max 11.5dB	Typ. 9.5 dB / Max 11.5 dB
Input Power Range		-75 to –30 dBm		
OP1dB At max. gain		Typ. +12 dBm / Min. +10 dBm	Typ. +9.5 dBm / Min. +7.5 dBm	Typ. +9.5 dBm / Min. 7.5 dBm
OIP3 At max. gain		Typ. +22 dBm / Min. +20 dBm	Typ. +19.5 dBm / Min. +17.5 dBm	Typ. +19.5 dBm / Min. +17.5 dBm
Slope Compensation		N/A		
Slope Control Steps		N/A		
Internal Reference Stability		± 5 x 10^{-8} over 0 to 50°C		
Phase Noise (Typical values)	@10Hz offset	-68 dBc / Hz		
	@100Hz offset	-80 dBc / Hz		
	@1KHz offset	-90 dBc / Hz		
	@10KHz offset	-106 dBc / Hz		
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LO Breakthrough		< -60 dBm		
Image Rejection		> 60 dB typical		
External Reference Input Frequency		10 MHz or 100 MHz		
External Reference Input Level		0 dBm ± 10 dB		
Mute		60 dB		
IF Monitor		Yes. Internal RF detector monitored		
Spectral Inversion		Non-inverting		
Number of conversion stages		Single		
Redundancy		Supported. Based on module configuration		
Spec version		0.1	1.1	1.1

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