ETL Systems

Excelling in RF Engineering

Model Number:
FN-D-X3L1-24137-S5XX

Falcon Series
Frequency Converter Module
X-Band Agile 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 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

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 Downconverter Module - RF Parameters			Redundancy Module - RF Parameters	
Model Numbers		FN-D-X3L1-24137-S5XX	SWF-G1S-KX-109	SWF-G1S-KX-107
Size		3 slots wide	6 slots wide	6 slots wide
Redundancy		Standalone module	1+1 (Note: This column denotes specs for 24137 in 1+1 configuration)	2+1 (Note: This column denotes specs for 24137 in 2+1 configuration)
Input Frequency Range		7250—8400 MHz		
Output Frequency Range		950 –2100 MHz		
LO		6300—6900 MHz		
Conversion Gain		Max 35 ± 2 dB / Min 5 ± 2 dB	Max 32 ± 2 dB / Min 2 ± 2 dB	Max 29.5 ± 2 dB / Min -0.5 ± 2 dB
Gain Steps		0.25 ± 0.15 dB		
Gain Flatness (50 Ohm)		Full band: ±1.25 dB		
Input Return Loss (RF-Band, 50 Ohm)		Typ -16 dB / Min.-12 dB	Typ -11 dB / Min.-9 dB	Typ -11 dB / Min.-9 dB
Output Return Loss (IF-Band, 50 Ohm)		Typ. -18 dB / Min.-14 dB	Typ -15 dB / Min.-11 dB	Typ -15 dB / Min.-12 dB
Noise Figure		Typ. 10 dB / Max. 12 dB	Typ. 11.5 dB / Max. 13.5 dB	Typ. 13 dB / Max. 15.1 dB
Maximum Operational Input Level		–35 dBm (At max gain)		
OP1dB		Typ. +13 dBm / Min.+10 dBm	Typ. +11 dBm / Min.+8 dBm	Typ. +10 dBm / Min.+7 dBm
OIP3		Typ. +25 dBm / Min.+22 dBm	Typ. +23.5 dBm / Min.+20.5 dBm	Typ. +22.5 dBm / Min.+19.5 dBm
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	-70 dBc / Hz		
	@100Hz offset	-80 dBc / Hz		
	@1KHz offset	-90 dBc / Hz		
	@10KHz offset	-93 dBc / Hz		
	@100KHz offset	-100 dBc / Hz		
	@1MHz offset	-115 dBc / Hz		
Spurs In-band	Non-carrier related	<-75 dBm		
Spurs Out-of-band	Carrier related	<-60 dBc		
	Non-carrier related	<-75 dBm		
LO Breakthrough		<-60 dBm (TBC)		
Image Rejection		> 60 dB typ		
External Reference		Input Freq. 10 MHz. Auto detection. 1 required per chassis		
External Ref. Input Level		+3 dBm ± 3dB		
Mute		60 dB		
Number of conversion stages		Single		
Spectral Inversion		Non-inverting		
Spec version		0.1	0.1	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.

ETL SYSTEMS LIMITED
Coldwell Radio Station
Madley
Hereford
England HR2 9NE

TELEPHONE
+44 (0)1981 259020

EMAIL
info@etlsystems.com

FACSIMILE
+44 (0)1981 259021

WEB
www.etlsystems.com