ETL Systems
New technologies
in RF distribution

Model Number:
FN-U-L1F2-24205-XXXX

Falcon Series
Frequency Converter Module
IF to L-Band Agile Upconverter

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

IF to L-Band frequency converter with variable gain. 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

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

Image for indication purposes only, actual units may be differ

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 ports	Dependant upon module fitted

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

TELEPHONE
+44 (0)1981 259020

EMAIL
info@etlsystems.com

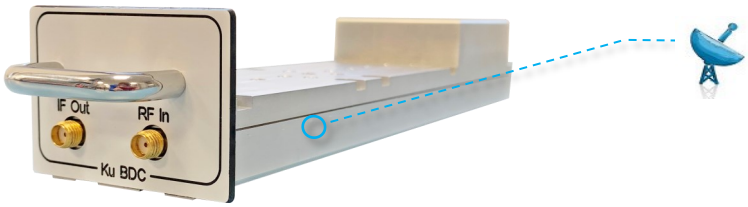
FACSIMILE
+44 (0)1981 259021

WEB
www.etlsystems.com

V 0.7 E&OE

ETL Systems
New technologies
in RF distribution

Model Number:
FN-U-L1F2-24205-XXXX



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		Redundancy Module - RF Parameters		
Model Numbers		FN-U-L1F2-24205-XXXX	SWF-G1S-CX-111A-xxxx	SWF-G1S-CX-110A-xxxx
Size		3 slots wide	4 slots wide	6 slots wide
Redundancy		Standalone Module	1+1 (**Note**. This column denotes specs for 24205 in 1+1 configuration)	2+1 (**Note**. This column denotes specs for 24205 in 2+1 configuration)
Input Frequency Range		70 ± 20 MHz or 140 ± 40 MHz user selectable		
Output Frequency Range		850-2450 MHz in 1 kHz steps		
Mean Conversion Gain		Max. 25 ± 1.5 dB / Min. -5 ± 1.5 dB	Max. 24.4 ± 1.7 dB / Min. –5.6 ± 1.7 dB	Max. 24.4 ± 1.8 dB / Min. –5.6 ± 1.8 dB
Gain steps		0.1 ± 0.1 dB		
Gain Flatness (50 Ohm)		Full IF Band Typ. ± 0.3 dB/ Max. ± 0.5 dB	Full IF Band Typ. ± 0.5 dB/ Max. ± 0.7 dB	Full IF Band Typ. ± 0.6 dB/ Max. ± 0.8 dB
Input Return Loss (RF-band, 50 Ohm)		Typ. -18 dB / Min -15 dB	Typ. -15 dB / Min. -12 dB	Typ. -15 dB / Min. -12 dB
Output Return Loss (IF-band, 50 Ohm)		Typ. -18 dB / Min. -15 dB	Typ. -15 dB / Min. -12 dB	Typ. -15 dB / Min. -12 dB
Noise Figure At max. gain		Typ. 8 dB / Max 10 dB	Typ. 8.7 dB / Max 10.9 dB	Typ. 10.7 dB / Max 13.7 dB
Maximum Operational Input level		- 30 dBm at max gain		
OP1dB At max. gain		Typ. +13 dBm / Min. +10 dBm	Typ. +12.3 dBm / Min. +9.3 dBm	Typ. +10.3 dBm / Min. +7.3 dBm
OIP3 At max. gain		Typ. +25 dBm / Min. +22 dBm	Typ. +24.3 dBm / Min. +21.3 dBm	Typ. +22.3 dBm / Min. +19.3 dBm
Internal Reference Stability		± 5 x 10^{-8} over 0 to 50°C		
Phase Noise (Typical values)	@10Hz offset	-70 dBc / Hz		
	@100Hz offset	-85 dBc / Hz		
	@1KHz offset	-95 dBc / Hz		
	@10KHz offset	-100 dBc / Hz		
	@100KHz offset	-100 dBc / Hz		
	@1MHz offset	-115 dBc / Hz		
Spurs In-band @ -5dBm output	Carrier related	< -60 dBc		
	Non-carrier related	< -75 dBm		
Spurs Out-of-band @ -5dBm output	Carrier related	< -60 dBc		
	Non-carrier related	< -75 dBm		
LO Breakthrough		< -60 dBm		
Image Rejection		> 60 dB typical		
External Reference		Input Freq. 10MHz Input Level +3 dBm ± 3dB		
Mute		60 dB		
Number of conversion stages		Dual		
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.
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

RoHS COMPLIANT
Pb-Free
nqa ISO 9001 QUALITY MANAGEMENT
UKAS MANAGEMENT SYSTEMS 015