

## **Falcon Series Frequency Converter Module**

# IF-Band to L-Band Agile Upconverter

IF-Band to L-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



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Compact form factor allowing multiple modules to be housed in the Genus chassis. Each module occupies 4 slots in the chassis.

## **Redundancy Configurations**

Field-replaceable 2+1 or 1+1 redundant configuration

# Hot Swap & Replaceable

RF Frequency Converter modules

# Variable Gain & Slope For balancing input signals.

Frequency Conversion
Up conversion from IF-Band to
L-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** 



Model Numbers   FN-U-LIF2-24405AA-XXXX   SWF-GIS-CX-111A-XXXX   SWF-GIS-CX-117-XXXX   Size	Freguen	cv Upconverter Mo	dule - RF Parameters Redundancy - RF Parameters			
Size						
Standalone Module						
Max				1+1 ( <b>Note:</b> This column denotes specs for 24405 in 1+1	2+1 ( <b>Note:</b> This column denotes specs for 24405 in 2+1	
Max. 25 ± 1.5 dB / Min5 ± 1.5 dB / Min5 ± 1.5 dB / Min5.6 ± 1.8 dB / Min5.6 dB / Min5.6 ± 1.8 dB / Min5.6 dB / Min5.6 dB / Min5.6	Input Frequency Range					
Gain Step Size   Gain Step Size   Gain Step Size   Gain Step Size   Gain Flatness (Full Instantaneous   Max. ± 0.5 dB   Typ. ± 0.3 dB   Typ. ± 0.5 dB   Typ. ± 0.5 dB   Typ. ± 0.5 dB   Typ. ± 0.5 dB   Typ. ± 15 dB / Max. ± 0.7 dB   Typ. ± 15 dB / Max. ± 13 dB   Typ. ± 15 dB / Max. ± 13 dB   Typ. ± 15 dB / Max. ± 13 dB   Typ. ± 15 dB / Max. ± 13 dB   Typ. ± 15 dB / Max. ± 13 dB   Typ. ± 15 dB / Max. ± 12 dB / Max. ± 12 dB   Typ. ± 15 dB / Max. ± 12 dB   Typ. ± 15 dB / Max. ± 12 dB   Typ. ± 15 dB / Max. ± 12 dB / Max. ± 12 dB   Typ. ± 15 dB / Max. ± 12 dB / Max. ±						
Gain Flatness (Full Instantaneous Band) ± dB	Mean Conversion Gain					
Band  ± dB	Gain Step Size		0.1 ± 0.1 dB			
Output Return Loss (IF-band, 50 Ohm)         Typ20 dB / Max18 dB         Typ14 dB / Max12 dB         Typ14 dB / Max12 dB           Noise Figure At max, gain         Typ. 8 dB / Max 10 dB         Typ. 8 dB / Max 10 dB         Typ. 8 dB / Max 10.9 dB         Typ. 10.7 dB / Max 13.7 dB           Maximum Operational Input level         Typ. +13 dBm / Min. +10 dBm         Typ. +12.3 dBm / Min. +9.3 dBm         Typ. +10.3 dBm / Min. +7.3 dBm           OP1dB At max, gain         Typ. +35 dBm / Min. +10 dBm         Typ. +12.3 dBm / Min. +9.3 dBm         Typ. +10.3 dBm / Min. +7.3 dBm           OIP2 At max, gain         Typ. +25 dBm / Min. +32 dBm         TBD         TBD           OIP3 At max, gain         Typ. +25 dBm / Min. +22 dBm         Typ. +24.3 dBm / Min. +21.3 dBm / Min. +21.3 dBm         Typ. +22.3 dBm / Min. +19.3 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           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           OIP4 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           OIP4 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           OIP4 At max, gain         Typ. +25 dBm	-		N 10000 110 110 110 110 110 110 110 110	70MHz input: Max. ± 0.7 dB	70MHz input: Max. ± 0.8 dB	
Ohm)         Typ20 d8 / Max18 d8         Typ14 d8 / Max12 d8         Typ10 d8 / Max12 d8         Typ. +10 d8 / Max12	Input Return Loss (RF-band, 50 Ohm)		Typ20 dB / Max18 dB	Typ15 dB / Max13 dB	Typ15 dB / Max13 dB	
Maximum Operational Input level			Typ. –20 dB / Max18 dB	Typ14 dB / Max12 dB	Typ14 dB / Max12 dB	
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           OIP2 At max. gain         Typ. +35 dBm / Min. +32 dBm         TBD         TBD           OIP3 At max. gain         Typ. +25 dBm / Min. +22 dBm         Typ. +24.3 dBm / Min. +21.3 dBm / Min. +21.3 dBm / Min. +19.3 dBm / Min. +19.3 dBm / Min. +21.3 dBm / Min. +19.3 dBm / Min. +21.3 dBm / Min. +19.3 dBm / Min. +19.3 dBm / Min. +21.3 dBm / Min. +21.3 dBm / Min. +19.3 dBm / Min. +21.3 dBm / Min. +19.3 dBm / Min. +21.3 dBm / Min. +19.3 dBm / Min. +21.3 dBm / Min. +21	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	
OP   10	Maximum Operational Input level		- 30 dBm at max gain			
Typ. +25 dBm / Min. +22 dBm   Typ. +24.3 dBm / Min. +21.3 dBm   Min. +21.3 dBm / Min. +19.3 dBm   Min. +19	OP1dB At max. gain		Typ. +13 dBm / Min. +10 dBm		,	
Internal Reference Stability    ## Stability	OIP2 At max. gain		Typ. +35 dBm / Min. +32 dBm	TBD	TBD	
@10 Hz offset   -70 dBc / Hz     @100 Hz offset   -84 dBc / Hz     @100 Hz offset   -98 dBc / Hz     @10 KHz offset   -104 dBc / Hz     @100 KHz offset   -104 dBc / Hz     @100 KHz offset   -107 dBc / Hz     @100 KHz offset   -104 dBc / Hz     &100 KHz offset   -104 dBc / Hz	OIP3 At max. gain		Typ. +25 dBm / Min. +22 dBm			
Phase Noise (Typical Values)  Phase Noise (Typical Value)  Ph	Internal Reference Stability		±5 x 10-8 over 0 to 50°C			
Phase Noise (Typical Values)  @1 KHz offset @100 KHz offset @1		@10 Hz offset	-70 dBc / Hz			
(Typical Values)  @ 10 KHz offset		@100 Hz offset	-84 dBc / Hz			
@100 KHz offset	Phase Noise	@1 KHz offset	-98 dBc / Hz			
@1 MHz offset	(Typical Values)	@10 KHz offset	-104 dBc / Hz			
Spurs In-band @ -5dBm output  Non-carrier related		@100 KHz offset	-107 dBc / Hz			
Spurs In-band @ -5dBm output  Non-carrier related >1MHz Offset  Spurs Out-of- band @ -5dBm output  Carrier Related Non-carrier related		@1 MHz offset	-112 dBc / Hz			
⊚ -5dBm output       Non-carrier related >1MHz Offset       < -75 dBm	Snurs In-hand	Carrier related	<-60 dBm			
band			< -75 dBm			
@ -5dBm output       related       <-75 dBm		Carrier Related	<-60 dBc			
Image Rejection >60 dB typical  External Reference Input Frequency 10MHz or 100MHz (auto detection)  External Reference Input Level 0dBm ± 10dB  Mute 60 dB  Spectral Inversion Non-inverting  Number of conversion stages Dual  IF Power Monitor Yes  Number of Modules per Chassis 4 max (Module 4-slots wide, 16-slots per chassis)			<-75 dBm			
External Reference Input Frequency  External Reference Input Level  OdBm ± 10dB  Mute  60 dB  Spectral Inversion  Number of conversion stages  IF Power Monitor  Number of Modules per Chassis  10MHz or 100MHz (auto detection)  OdBm ± 10dB  Non-inverting  Non-inverting  Pes  A max (Module 4-slots wide, 16-slots per chassis)	LO Breakthrough		< -75 dBm			
External Reference Input Level  Mute  60 dB  Spectral Inversion  Non-inverting  Number of conversion stages  Dual  IF Power Monitor  Yes  Number of Modules per Chassis  4 max (Module 4-slots wide, 16-slots per chassis)	Image Rejection		>60 dB typical			
Mute 60 dB  Spectral Inversion Non-inverting  Number of conversion stages Dual  IF Power Monitor Yes  Number of Modules per Chassis 4 max (Module 4-slots wide, 16-slots per chassis)	External Reference Input Frequency		10MHz or 100MHz (auto detection)			
Spectral Inversion     Non-inverting       Number of conversion stages     Dual       IF Power Monitor     Yes       Number of Modules per Chassis     4 max (Module 4-slots wide, 16-slots per chassis)	External Reference Input Level		0dBm ± 10dB			
Number of conversion stages  Dual  IF Power Monitor  Yes  Number of Modules per Chassis  4 max (Module 4-slots wide, 16-slots per chassis)	Mute		60 dB			
IF Power Monitor  Yes  Number of Modules per Chassis  4 max (Module 4-slots wide, 16-slots per chassis)	Spectral Inversion		Non-inverting			
Number of Modules per Chassis 4 max (Module 4-slots wide, 16-slots per chassis)	Number of conversion stages		Dual			
	IF Power Monitor		Yes			
Spec version 0.3 1.0 0.1	Number of Modul	es per Chassis	4 max (I	Module 4-slots wide, 16-slots per	chassis)	
5,50 T.0 U.1	Spec version		0.3	1.0	0.1	

V1.1 E&OE



Frequency Upconverter Module - Physical and Environmental Specs				
Model Numbers	FN-U-L1F2-24405AA-XXXX			
Control method	Via chassis (Local and remote as provided by chassis)			
LNB Power	No			
Operating Temperature	0°C to 50°C			
Storage Temperature	-20°C to +75°C			
Location	Indoor use only			
Humidity	20 to 90% non-condensing			
Altitude	Operational: 10,000ft/3000m AMSL Transport: 30,000ft/10000m AMSL			
Weight	0.5 kg typ			

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.