ST Engineering

FRC0710
UPCONVERTER
FRC0720
DOWNCONVERTER
FRC0730
UP AND DOWNCONVERTER

Description

The FRC0730 is a high performance synthesized up- and downconverter designed for a wide range of broadcast, telco and IP satellite applications. In its default configuration, the FRC0730 upconverts IF signals (70 or 140 MHz) to L-band (950–2150 MHz) and simultaneously downconverts L-band signals (950–2150 MHz) to IF. Optionally, the FRC0730 can upconvert IF signals to C, Ku or DBS-band.

The FRC0730 offers some advanced and unique features such as a calibrated high linearity over the entire bandwidth combined with a very high frequency stability. These features make the FRC0730 the perfect solution for a wide range of transmissions ranging from very small carriers to full transponder applications. The IF frequency is switchable from 70 MHz to 140 MHz and the L-band frequency is adjustable in steps of 48 Hz.

The high output frequency stability is provided by an internal 10 MHz reference clock. For applications requiring a very high frequency stability, such as very low data rate carriers, an optional 0.01 ppm stability reference clock can be ordered separately.

A switchable DC power supply and a reference frequency on the L-band output are also available as options, providing a compact and cost effective solution when the FRC0730 is used in combination with an outdoor RF Upconverter and/or amplifier.

Optionally, an LNB power supply, a frequency band selection signal and a 10 MHz reference frequency can be delivered to an LNB via the L-band input.

The FRC0730 is easy to operate and monitor. All control and monitoring parameters are available locally on the front panel and remotely through a web interface. It is also possible to control or monitor the FRC0730 via RMCP or SNMP.

The FRC0730 is also available as a stand-alone upconverter (model number FRC0710) or as a stand-alone downconverter (model number FRC0720).

DIALOG

powered by Newtec iDirect

ST Engineering iDirect's range of frequency converters consists of a complete portfolio for broadcast, telco and IP satellite applications. It contains easy to operate and monitor upconverters, downconverters, up- and downconverters, L-band upconverters and combiners.

These up- and downconverters offer the highest signal quality, thanks to the high frequency stability, very low spurious characteristics and high linearity over the entire bandwidth; as well as extensive coverage of all transponder frequencies (IF-, L-, C-, Ku- and DBS-band).

Key Features

- Agile IF to extended L-band up- and downconverter
- Optional up-conversion to C, Ku or DBS-band
- Ultra fine frequency resolution
- IF frequency switchable between 70 MHz & 140 MHz
- Switchable spectrum inversion
- Excellent flatness over 40/80 MHz bandwidth
- Very high frequency stability
- Very low spurious characteristics
- Phase noise compliant to Intelsat IBS/ Eutelsat SMS
- Phase noise @ L-band compliant to Intelsat IESS-316
- High linearity over the entire bandwidth
- Optional 10 MHz + DC power for BUC
- Optional LNB power supply + 10 MHz

Applications

- Earth Stations
- Broadcast Direct-to-home (DTH) uplinks
- Digital Satellite News Gathering (DSNG)
- Telco and trunking satellite infrastructures
- VSAT hubs
- Generic satcom applications

Related Products

FRC0740	L-band Block Upconverter
FRC0750	Active L-band Combiner and Upconverter
USS0202	Universal Redundancy Switch

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Interfaces

Upconverter

Input Interface (IF):

Connector	BNC (F), 75 Ohm optional (FRC0710)
Return loss	19 dB minimum (70 ± 20 MHz)
	17 dB minimum (140 ± 40 MHz)
	20 dB minimum (70 Ohm)
Frequency range	70 MHz +/- 20 MHz
	140 MHz +/- 40 MHz (selectable)
Input level IF (typical)	-35 to +5 dBm
Input level IF (non-damage)	+15 dBm maximum

Output Interface (L-band):

Connector	SMA (F), 50 Ohm N(F), 50 Ohm with option (FA-09 and FA-10)
Return loss	>15 dB
Frequency range	950-2150 MHz
Frequency step size	48 Hz
Output level	-30 to +10 dBm

Output Interface (RF)(Optional):

Connector RF-band out	SMA (F), 50 Ohm
Return loss	18 dB minimum (C- and Ku-band)
	12 dB minimum (DBS-band)
Output level (P1 dB)	+13 dBm minimum (C-band)
	+15 dBm minimum (Ku-band)
	+10 dBm minimum (DBS-band)
Spectrum inversion	Selectable
Frequency range RF-band	
C-band	5.85 – 7.05 GHz
Ku-band	12.75 – 13.25 GHz
Ku-band	13.75 – 14.80 GHz
DBS-band	17.30 – 18.10 GHz
DBS-band	17.60 – 18.4 GHz
LO leakage	-72 dBm maximum (C-band)
	-75 dBm maximum (Ku- and DBS-band)

BUC Power and Reference Frequency (Optional):

Max. current	3 Amps
Voltage	24V, 48V
Frequency	10 MHz
Stability	± 5 x 10 - 8 over 0°C to 65°C

Channel Characteristics

Gain:

Programmable IF gain	-15 to 20 dB
Programmable L-band gain	-20 to +20 dB
Programmable L-band+RF gain	-10 to +30 dB
Gain step size	0.1dB
Amplitude response over 40/80 MHz BW (L-band)	0.5 dB peak-to-peak
Amplitude response over 40/80 MHz BW (RF)	0.7 dB/40 MHz 1.5 dB/80 MHz 2.0 dB/80 MHz (14.5 - 14.8 GHz)
Level stability (typ.)	±1.0 dB over 0 to 50°C ±0.5 dB over 20 to 40°C
Gain slope (over 10 MHz minimum)	0.03 dB/MHz maximum

Linearity:

Output 1dB compression (L-band)	>+10 dBm
Output 1dB compression (RF)	>+10 dBm
Third order intermod @ 0 dBm output	<-54 dBc (C-band) <-50 dBc (Ku- and DBS-band)
Third order intercept (L-band)	>+26 dBm
Third order interception (RF-band)	>+20 dBm
AM/PM conversion	0.1°/dB maximum @ 0 dBm out

Switching:

Output switching suppression	<-80 dBm

Noise & Spurious:

Noise figure at minimum attenuation	15 dB maximum
Noise power density	- 129 dBm/Hz maximum
Spurious outputs	
Signal related (in-band)	- 65 dBc up to 0 dBm output
Signal independent	- 80 dBm maximum (C-band) - 72 dBm max. (Ku- & DBS-band)

Phase noise

	L-band	C-band/Ku-band/ DBS-band	External reference
@ 10 Hz	<-50 dBc/Hz	<-35/50/50 dBc/Hz	-120 dBc/Hz
@ 100 Hz	<-72 dBc/Hz	<-70/72/60 dBc/Hz	-150 dBc/Hz
@ 1KHz	<-81 dBc/Hz	<-80/86/75 dBc/Hz	-160 dBc/Hz
@ 10 KHz	<-90 dBc/Hz	<-90/99/85 dBc/Hz	-160 dBc/Hz
@ 100 KHz	<-95 dBc/Hz	<-100/102/95 dBc/Hz	-160 dBc/Hz

Group Delay:

	@ 80 MHz BW	@ 40 MHz BW
Linear group delay (max.)	0.02 ns/MHz	0.03 ns/MHz
Parabolic group delay (max.)	0.0004 ns/MHz^2	0.004 ns/MHz^2
Residual group delay (max.)	0.4 ns peak-to-peak	0.4 ns peak-to-peak

For more information please contact your Sales Representative at **sales@idirect.net.**

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Interfaces

Downconverter

Input Interface Downconverter (L-band):

Connector	SMA (F), 50 Ohm
Return loss	>15 dB
Frequency range	950 to 2150 MHz
Input level	Max composite -20 dBm

Output INterface Downconverter (IF):

Connector	BNC (F), 50 Ohm
Return loss	>15 dB
Frequency range	70 ± 20 MHz,140 ± 40 MHz
Output level	<=0 dBm typical
Spectrum inversion	Selectable

LNB Power and Control (Optional):

Max. current	350 mA (on L-band input)
Voltage	11.5 -14 V (Vertical polarization)
	16 -19 V (Horizontal polarization)
	additional 22 kHz +/- 4 kHz (band selection according to universal LNB)
10 MHz reference	

Channel Characteristics

Gain:

Programmable Gain	0 to 50 dB
Gain step size	0.1 dB
Gain variation over 36/72 MHz BW	1.2 dB peak-to-peak
Gain variation over T° (+20 to +40°C)	± 0.5 dB

Linearity:

Output 1dB compression IF	+10 dBm
AM/PM conversion	0.1°/dB max@0dBm

Switching:

Output switching suppression	<-80 dBm

Noise:

Noise figure	<15 dB at max gain
In band spurious (signal related) (@-25 dBm input and 0 dBm output)	<-60 dBc
Non signal related spurious	<-70 dBm
Image rejection	-60 dBc
Phase noise:	
@ 10 Hz	<-50 dBc/Hz
@ 100 Hz	<-70 dBc/Hz
@ 1KHz	<-80 dBc/Hz
@ 10 KHz	<-85 dBc/Hz
@ 100 KHz	<-95 dBc/Hz

Group Delay:

	@ 80 MHz BW	@ 40 MHz BW
Linear group delay	0.05 ns/MHz	0.03 ns/MHz
Parabolic group delay	0.0035 ns/MHz^2	0.01 ns/MHz^2
Residual group delay	1 ns peak-to-peak	1 ns peak-to-peak

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Internal Reference Frequency

Up & Down Converter

High Stabiliity:

Stability	± 5 x 10-8 over 0°C to 70°C
Ageing	± 15 ppb/day
	± 300 ppb/day

Very High Stability (optional)

Stability	± 2 x 10-9 over 0°C to 65°C
Ageing	± 0.5 ppb/day
	± 500 ppb/10 year

Physical

Size

Dimensions	19", depth 51 cm
Weight	< 6 kg

Tempurature

Operational	0°C to 40°C
Storage	-40 to +70°C

Humidity

Operational	5% to 85% non-condensing

Power Supply

90-130 & 180-260 VAC, 105 VA, 47-63 Hz

Power Consumption

RF Upconverter	47W

Generic

10 MHz Reference Input / Output (Optional):

Input level	-3 dBm up to 7dBm
Output level	+7 dBm ± 2 dB
Connector	BNC (F), 50 Ohm

Monitoring and Control Interfaces:

Web based GUI (password protected)

Diagnostics report, alarm log

RMCP over TCP-IP/UDP and RS232/RS485

SNMP v2c

Connector: 9-pin sub-D (F) and RJ-45 for Ethernet

Alarm Interface

Electrical dual contact closure alarm contacts

Connector 9-pin sub-D (F)

Logical interface and general device alarm

Ethernet: Alarm reporting via SNMP traps

Available Alarms (FRC0740)

10 MHz alarm

Power supply alarm

Temperature alarm

Synthesizer out-of-lock

Input overload warning (adjustable threshold)

Input underload alarm (adjustable threshold)

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