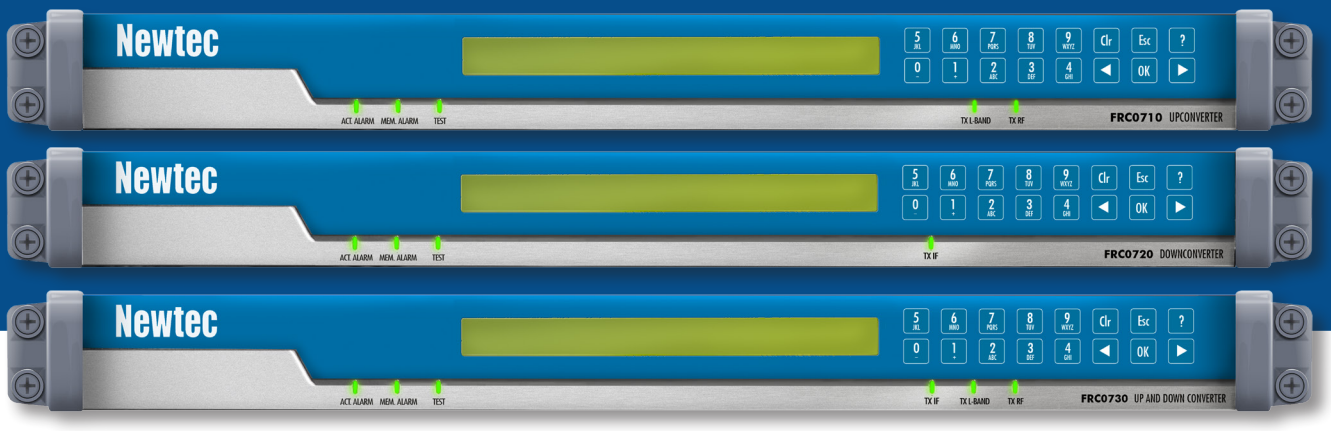
Newtec

FRC0710
UPCONVERTER
FRC0720
DOWNCONVERTER
FRC0730
UP AND DOWN CONVERTER



Description

The FRC0730 is a high performance synthesized Up & Down Frequency Converter 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 10MHz 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).

Newtec'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 & Down-converters, L-band Upconverters and Combiners.

These Up & 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).

SPECIFICATIONS

Key Features

- Agile IF to extended L-band Up & Down Converter
- 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
- Optional10 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

Professional Equipment

Care Pack Basic and Care Pack Enhanced are the Newtec service and support packages protecting your Newtec equipment over a three-year period.

UPCONVERTER

Interfaces

INPUT INTERFACE (IF):

Connector	BNC (F), 50 ohms
Return loss	19 dB minimum (70±20 MHz) 17 dB minimum (140±40 MHz)
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 ohms N(F), 50 ohms with option (FA-09 and FA-10)
Return loss	>15dB
Frequency range	950 to 2150 MHz
Frequency step size	48 Hz
Output level	-30 to +10 dBm

OUTPUT INTERFACE (RF) (OPTIONAL)

Connector RF-band out	SMA (F), 50 ohms
Return loss	18 dB minimum (C- and Ku-band) 12 dB minimum (DBS-band)
Output level (P1 dB)	+13 dBm minimum (C-band) +15 dB 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 A
Voltage	24V, 48V
Frequency	10MHz
Stability	±5x10-8 over 0°C to 65°C

Channel characteristics

GAIN

Programmable IF gain	-15 to 20dB
Programmable L-band gain	-20 to +20dB
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)	0.7dB/40MHz 1.5dB/80MHz 2.0dB/80MHz (14.5-14.8GHz)
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)	>+10dBm
Output 1dB compression (RF)	> +10dBm
Third order intermod @ 0 dBm output	<-54 dBc (C-band) <-50 dBc (Ku- & DBS-band)
Third order intercept (L-band)	>+26 dBm
Third order interception (RF-band)	> +20dBm
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.)	0.0004ns/MHz²	0.004ns/MHz²
Residual group delay (max.)	0.4 ns peak-to-peak	0.4 ns peak-to-peak

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DOWNCONVERTER

Interfaces

INPUT INTERFACE DOWNCONVERTER (L-BAND)

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

OUTPUT INTERFACE DOWNCONVERTER (IF)

• Connector	BNC (F), 50 ohms
• Return loss	>15dB
• Frequency range	70 ± 20MHz,140 ± 40MHz
• 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 +/- 4KHz (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	+10dBm
• 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	<-70dBm
• Image rejection	-60dBc
• 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/MHz2	0.01 ns/MHz2
Residual group delay	1 ns peak-to-peak	1 ns peak-to-peak

UP & DOWN CONVERTER

Internal Reference frequency

High Stability	Stability	±5x10-8 over 0°C to 70°C
	Ageing:	± 15 ppb/day
		± 300 ppb/year
Very High Stability (optional)		
	Stability	±2x10-9 over 0°C to 65°C
	Ageing:	± 0.5 ppb/day
		± 500 ppb/10 year

Generic

10 MHZ REFERENCE INPUT / OUTPUT (OPTIONAL)

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

MONITOR 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

- 10 MHz alarm
- Power supply alarm
- Temperature alarm
- Synthesizer out-of-lock
- Input overload warning (adjustable threshold)
- Input underload alarm (adjustable threshold)

Physical

- 1RU, width: 19", depth 51 cm, 6 kg
- Power supply: 90-130 & 180-260 Vac, 105 VA, 47-63 Hz
- Consumption (RF upconverter): 47W
- Temperature
  - Operational: 0°C to 40°C
  - Storage: -40 to +70°C
- Humidity: 5% to 85% non-condensing
- CE label

Newtec FRC0710 Upconverter		Ordering n°
Default configuration		
IF 70MHz or 140MHz to L-band Upconverter, SNMP Upconverter output: L-band (950 - 2150MHz) 10MHz reference In/Out: High stability		FRC0710
Configuration Options Category		
		Select 1 option
Output interface	L-band (950 - 2150 MHz)	Default
	L-band + 10MHz for BUC	FA-02
	L-band + 10MHz + 24Vdc for BUC	FA-09
	L-band + 10MHz + 48Vdc for BUC	FA-10
	L+C-band (5,85 - 7,05 GHz)	FA-11
	L+Ku-band (12,75 - 13,25 GHz)	FA-13
	L+Ku-band (13,75 - 14,80 GHz)	FA-14
	L+DBS-band (17,30-18,10 GHz)	FA-07
	L+DBS-band (17,60-18,40 GHz)	FA-08
		Select 1 option
10MHz reference In/Out	High stability	Default
	Very high stability	GR-02
Services Category		
		Max. 1 option per category
Support	Care Pack 3 Basic	GA-08
	Care Pack 3 Enhanced	GA-09

Newtec FRC0720 Downconverter		Ordering n°
Default configuration		
L-band (950 - 2150MHz) to IF downconverter, SNMP 10MHz reference In/Out: High stability		FRC0720
Configuration Options Category		
		Select 1 option
10MHz reference In/Out	High stability	Default
	Very high stability	GR-02
Additional Options Category		
		Max. 1 option per category
Input interface	LNB power supply	FC-01
	LNB power supply + 10 MHz	FC-02
Services Category		
		Max. 1 option per category
Support	Care Pack 3 Basic	GA-08
	Care Pack 3 Enhanced	GA-09

Newtec FRC0730 Up and Down Converter		Ordering n°
Default configuration		
Upconverter input and Downconverter output IF: 70 MHz or 140MHz, SNMP Downconverter input: L-band (950 - 2150 MHz) Upconverter output : L-band (950 - 2150MHz)		FRC0730
Configuration Options Category		
		Select 1 option
Upconverter output	L-band (950 - 2150 MHz)	Default
	L-band + 10MHz for BUC	FA-02
	L-band + 10MHz + 24Vdc for BUC	FA-09
	L-band + 10MHz + 48Vdc for BUC	FA-10
	L+C-band (5,85 - 7,05 GHz)	FA-11
	L+Ku-band (12,75 - 13,25 GHz)	FA-13
	L+Ku-band (13,75 - 14,80 GHz)	FA-14
	L+DBS-band (17,30-18,10 GHz)	FA-07
	L+DBS-band (17,60-18,40 GHz)	FA-08
		Select 1 option
10MHz reference In/Out	High stability	Default
	Very high stability	GR-02
Additional Options Category		
		Max. 1 option per category
Downconverter input	LNB power supply	FC-01
	LNB power supply + 10 MHz reference	FC-02
Services Category		
		Max. 1 option per category
Support	Care Pack 3 Basic	GA-08
	Care Pack 3 Enhanced	GA-09

Contact your sales representative
for details (sales@newtec.eu).

Europe	North-America	South-America	Asia-Pacific	China	MENA
Tel: +32 3 780 65 00	Tel: +1 203 323-0042	Tel: +55 11 2092 6220	Tel: +65 6777 22 08	Tel: +86 10-823 18 730	Tel: +971 4 443 60 58
Fax: +32 3 780 65 49	Fax: +1 203 323-8406	Fax: +55 11 2093 3756	Fax: +65 6777 08 87	Fax: +86 10-823 18 731	Fax: +971 4 368 67 68