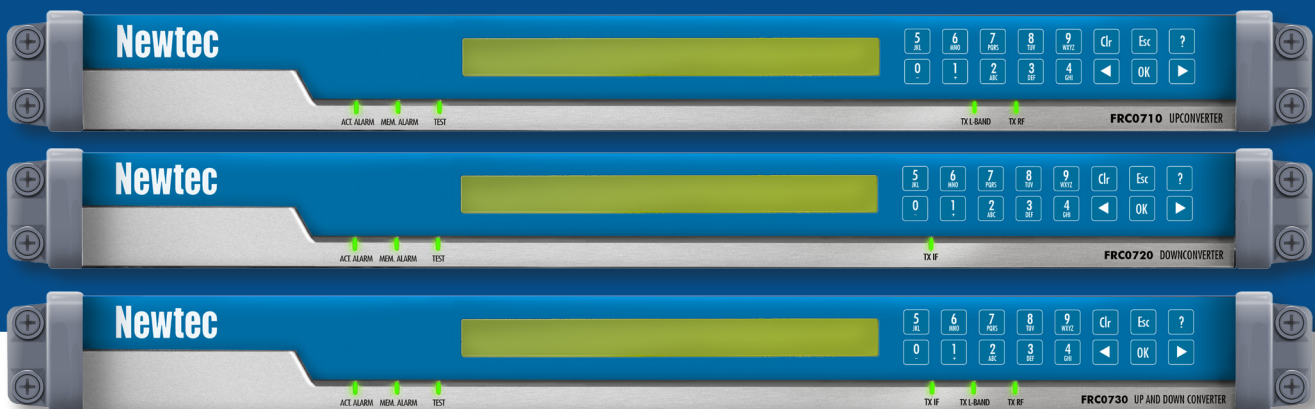


Newtec

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
- 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

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)
+13 dBm minimum (C-band)
+15 dB minimum (Ku-band)
+10 dBm minimum (DBS-band)
Selectable
- Output level (P1 dB)
- Spectrum inversion
- 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/MHz ² | 0.004ns/MHz ² |
| Residual group delay (max.) | 0.4 ns peak-to-peak | 0.4 ns peak-to-peak |



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) <-60 dBc
(@-25 dBm input and 0 dBm output)
- 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/MHz ² | 0.01 ns/MHz ² |
| 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).

The details contained in this document, including product and feature specifications, are subject to change without notice and shall not bind Newtec in any way. This brochure is provided for information purposes only.

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SHAPING THE FUTURE OF SATELLITE COMMUNICATIONS

Europe

Tel: +32 3 780 65 00
Fax: +32 3 780 65 49

North-America

Tel: +1 203 323-0042
Fax: +1 203 323-8406

South-America

Tel: +55 11 2092 6220
Fax: +55 11 2093 3756

Asia-Pacific

Tel: +65 6777 22 08
Fax: +65 6777 08 87

China

Tel: +86 10-823 18 730
Fax: +86 10-823 18 731

MENA

Tel: +971 4 443 60 58
Fax: +971 4 368 67 68