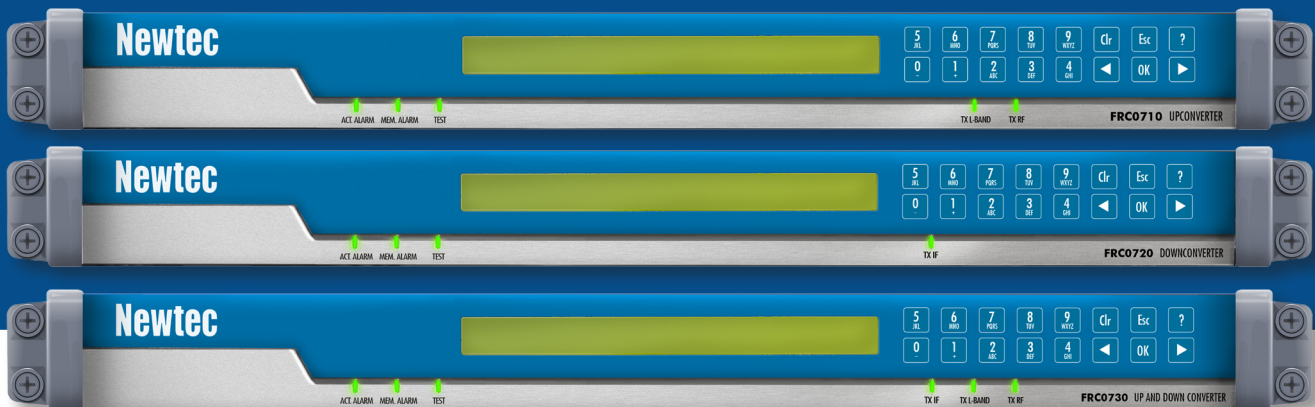


# Newtec

## 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<sup>-8</sup> 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 <sup>2</sup> | 0.004ns/MHz <sup>2</sup> |
| 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 <sup>2</sup> | 0.01 ns/MHz <sup>2</sup> |
| Residual group delay  | 1 ns peak-to-peak          | 1 ns peak-to-peak        |

## UP & DOWN CONVERTER

### Internal Reference frequency

- |                                |           |                                      |
|--------------------------------|-----------|--------------------------------------|
| High Stability                 | Stability | ±5x10 <sup>-8</sup> over 0°C to 70°C |
|                                | Ageing:   | ± 15 ppb/day<br>± 300 ppb/year       |
| Very High Stability (optional) | Stability | ±2x10 <sup>-9</sup> over 0°C to 65°C |
|                                | Ageing:   | ± 0.5 ppb/day<br>± 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°
<b>Default configuration</b>		
IF 70MHz or 140MHz to L-band Upconverter, SNMP Upconverter output: L-band (950 - 2150MHz) 10MHz reference In/Out: High stability		FRC0710
<b>Configuration Options Category</b>		
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
<b>Services Category</b>		
Max. 1 option per category		
Support	Care Pack 3 Basic	GA-08
	Care Pack 3 Enhanced	GA-09

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

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