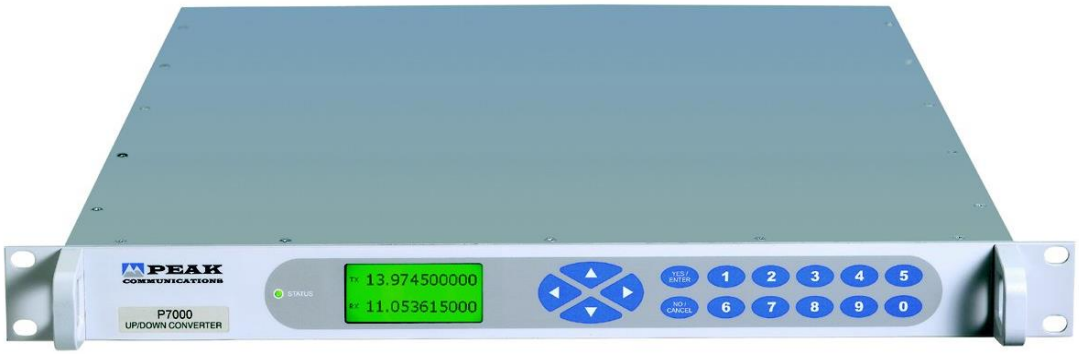
P7000

Combined, Up and Down, IF/ L-Band, Fully Synthesised, Frequency Converter



The **P7000** is a next generation fully synthesised combined L-Band up and down converter which provides a low-cost solution for systems requiring an IF interface at 70MHz±18MHz or 140MHz±36MHz.

For redundancy the **P7000** uses a simple CANBUS® interface and has an integral redundancy controller for 1+1 & 2+1 operation (for use with external **TR1000L**/ **TR2000L** switch units), for N+1 systems a separate stand-alone control and switch unit is provided (**RCU1000 series**).

Note; separate stand-alone control and switching units can also be provided for 1+1 & 2+1 systems, please consult the factory.

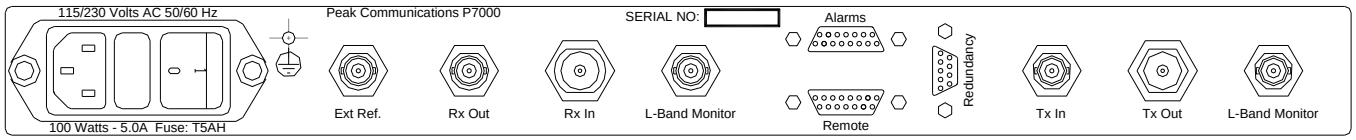
The **P7000 series** of converters are designed to meet the phase noise, spurious, level and frequency stability requirements of Intelsat IBS/ Eutelsat SMS specifications and is compliant with IESS308/ 309. The product is suitable for high order modulation schemes and both very high & low data rates associated with digital TV signals. The unit incorporates a graphics display module, membrane keyboard and features a clear and intuitive control and configuration menu fully utilising the unique graphics display.

The unit has a highly stable internal reference source and will automatically detect and lock to an external 10MHz signal, when applied.

Peak Features

- Compliant with IESS308/ 309 requirements
- Suitable for use with latest high order modulation schemes in excess of 100Mbits/sec
- Integral 1+1 & 2+1 CANBUS® redundancy control & N+1 switch system available
- Aux DC and 10MHz reference outputs for block up and down converters
- Software selectable spectrum inversion on down converter
- External alarm monitoring for block converters
- Software trimming of internal primary frequency reference
- L-Band monitoring points (optional on up converter)

Rear panel view *(sample)*



P7000 – Typical Specification

Up Converter

IF Input

Frequency	70±18MHz
Option 1a;	140±36MHz
Connection	50Ω, BNC (f)
Option 3a;	75Ω, BNC (f)

L-band Output

Frequency	950-1525MHz
Option 5;	950-1700MHz
Option 5a;	950-1750MHz
Connection	50Ω, N-type (f)

Transfer Characteristics

Conversion gain	+20dB ±1dB
Attenuation	0 to 30dB, stepped 0.1dB
1 dB GCP	Input -10dBm, output +10dBm
Gain stability	±0.5dB from 0 to 40^{0}C ±0.1dB per week (constant temp.)
Gain flatness	±1dB full band (±1.5dB for wideband options) ±0.5dB across any 36MHz in band
Synth Resolution	1Hz

RF Performance

Phase noise	-75dBc/Hz at 10Hz -85dBc/Hz at 100Hz -85dBc/Hz at 1kHz -85dBc/Hz at 10kHz -97dBc/Hz at 100kHz -108dBc/Hz at 1MHz
Harmonics	Better than -50dBc
Spurious;	
In-band, non-carrier	<-65dBm (<-60dBm for wideband options)
In-band, carrier	<-60dBc
Group delay	Linear; 0.025ns/MHz Ripple; 1ns p-p Parabolic; 0.015ns/MHz^2
Noise figure	20dB nominal at maximum gain
Mute isolation	>80dB at minimum gain setting

Down Converter

L-band Input

Frequency	950 - 1750MHz
Option 7;	950 - 2150MHz
Connection	50Ω, N-type (f)

IF Output

Frequency	70 ±18MHz
Option 1b;	140 ±36MHz
Connection	50Ω, BNC (f)
Option 3b;	75Ω, BNC (f)
Spectrum sense	Invert user selectable (via front panel & remote)

Transfer Characteristics

Conversion gain	+30dB ±1dB
Attenuation	0 to 30dB, stepped 0.1dB
1 dB GCP	Input -10dBm, output +15dBm
Gain stability	±0.5dB from 0 to 40^{0}C, ±0.1dB per week (constant temp.)
Gain flatness	±0.5dB full band (± 1.5dB for wideband options) ±0.5dB across any 36MHz in band
Synth Resolution	1Hz

RF Performance

Phase noise	-65dBc/Hz at 10Hz -75dBc/Hz at 100Hz -83dBc/Hz at 1kHz -85dBc/Hz at 10kHz -100dBc/Hz at 100kHz -115dBc/Hz at 1MHz
Harmonics	Better than -50dBc (at input -50dBm, gain 30dB)
Spurious	<-60dBm (in band, non-carrier related) <-60dBc (in band, carrier related)
Group delay	Linear; 0.025ns/MHz Ripple; 1ns p-p Parabolic; 0.015ns/MHz^2
Noise figure	20dB nominal at maximum gain

General

L-Band Monitors

Connections	50Ω, BNC (f)
Level	-20dBc ±3dB
Option 11f;	IF monitor, replacing the standard L-Band monitor

Block Up/Down Converter Drives

Output reference	10MHz at 0dBm nominal
DC supply	+22.5 volts regulated at 0.65 amps
Connection	Fed to BUC/BDC on L-band cables
Control	Switchable from front panel

External Reference Input (with automatic detection & locking)

Frequency	Factory selectable 5 or 10MHz
Connector	50Ω, BNC (f)
Level	0dBm ±5dB
Required phase noise	to be better than 50dBc/Hz of output phase noise

Internal Back-up Reference

Frequency	10MHz
Adjustment	±0.45ppm, software stepped 0.01ppm
Stability;	
Allan deviation	<5 x 10^{-12} over 1s
Ageing	<±3 x 10^{-10}/day, <±3 x 10^{-9}/month, <±3 x 10^{-8}/year
Temp stability	<±2 x 10^{-9} over operating range
High stability (Option 8)	
Allan deviation	<2 x 10^{-12} over 1s
Ageing	<±2 x 10^{-10}/day, <±2 x 10^{-9}/month, <±2 x 10^{-8}/year
Temp stability	<±1.5 x 10^{-9} over operating range

Mechanical

Width	19”, standard rack mount
Height	1U (1.75”)
Depth	534mm (21”), plus connectors
Construction	Stainless steel chassis
Weight	Approx. 9.5kgs (21lbs)

Environmental

Operating temp	-10^{0}C to +50^{0}C
EMC	ETSI EN 301 489-1: V2.2.1 & ETSI EN 300 673: V1.2.1
Safety	IEC/EN 62368-1:2014 (second edition)

Power supply

Voltage	90-264VAC
Frequency	47-63Hz
Power	100 Watts max

Control System

Remote control	RS232/ 485 port
Option 9;	Ethernet; embedded web server & SNMP network management support
Redundancy	CANBUS® interface for N+1 system In-built 1+1 & 2+1 controller
Alarms	LO lock failure PSU failure External alarm inputs Summary failure relay (form C)
Output mute	TTL input active low, front panel & remote control

Options

1a) 140MHz IF input
1b) 140MHz IF output
2) Front panel with custom logo and colours
3a) 75Ω IF input
3b) 75Ω IF output
4) Lightweight Aluminium chassis
5) Wide band up converter output 950-1700MHz
5a) Wide band up converter output 950-1750MHz
7) Wide band down converter input 950-2150MHz
8) High stability internal reference option
9) Ethernet interface with embedded web server & SNMP
11f) IF monitor instead of standard L-Band monitor port

Notes; other ‘P7000 series’ options do not apply to these products.
The addition of options can modify the typical specification, for details please consult the factory

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