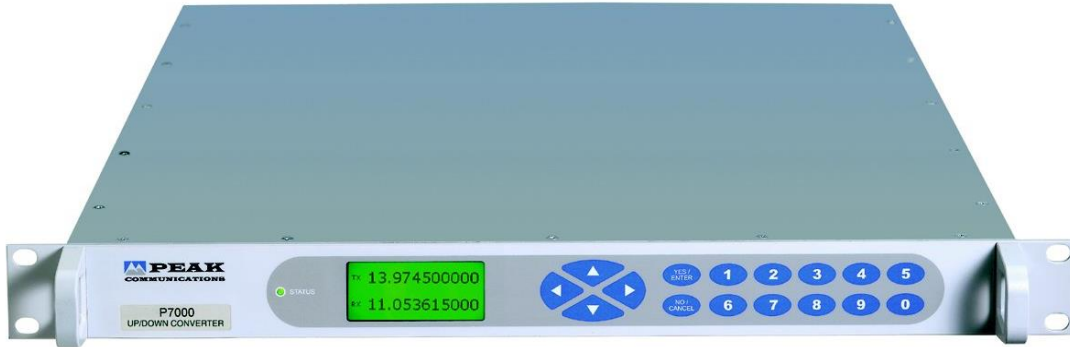


P7000

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 $70\text{MHz} \pm 18\text{MHz}$ or $140\text{MHz} \pm 36\text{MHz}$.









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.

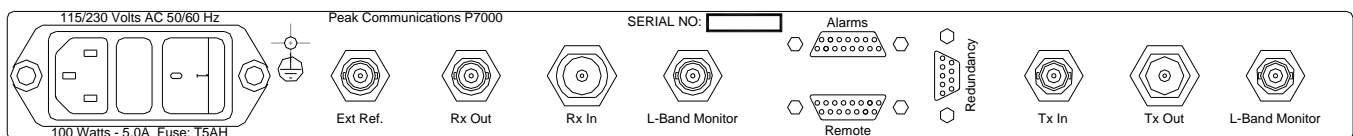
The **P7000 series** of converters are designed to meet the phase noise, spurious, level and frequency stability requirements of Intelsat IBS/ Eutelsat SMS specifications and is compliant with IESS308/ 309. The product is suitable for high order modulation schemes and both very high & low data rates 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°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	-68dBc/Hz at 10Hz
	-80dBc/Hz at 100Hz
	-84dBc/Hz at 1kHz
	-86dBc/Hz at 10kHz
	-99dBc/Hz at 100kHz
	-110dBc/Hz at 1MHz
	Better than -50dBc
Harmonics	
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°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
	Better than -50dBc (at input -50dBm, gain 30dB)
Harmonics	
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°C to +50°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

