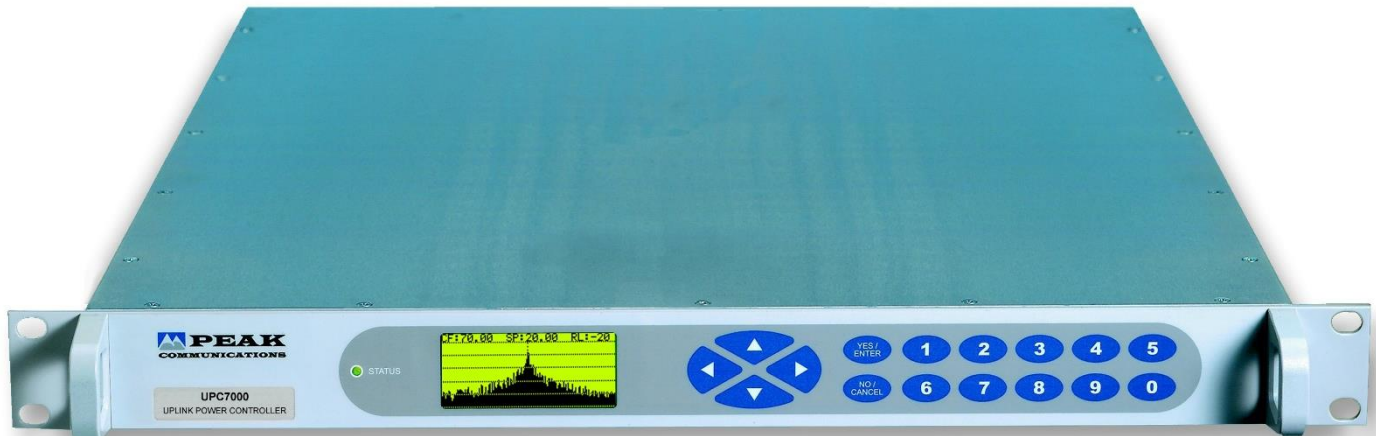


UPC7000 Series

Automatic Uplink Power Control Unit



The **UPC7000 series** are the next generation automatic uplink power control units (AUPC's) that measure the 'link losses' from a satellite beacon signal and subsequently automatically control the uplink power via a number of adjustable IF or L-Band channels. The system can operate in '**open-loop mode**' based on a single beacon signal, or in the slightly more accurate '**comparison mode**' when a beacon signal plus a looped-back carrier or pilot signal is available (requires options 2, plus an additional external beacon receiver).

The beacon receiver can either be a separate external unit providing a DC signal to the unit or the **UPC7000 series** can be supplied with an optional internal beacon receiver based upon the popular Peak **PTR50** 'CW' beacon receiver unit with L-band or SHF input options, providing a compact 'total solution' in only 1RU of rack space. The beacon receiver is offered with a spectral display facility which offers a convenient visual display of the received signal. The display can be used for system fault location, routine maintenance and can be an effective alternative to a fully functional spectrum analyser, which may not be necessary for these tasks.











Note; for use in the 'comparison mode', configuration requires both the optional internal beacon receiver plus an external beacon receiver.

Internal adjustable attenuators are positioned in the uplink chain in either the IF(70/140MHz) or the L-Band signal path. The standard **UPC7000 series** supports up to 4 adjustable internal attenuator channels within the standard 1RU chassis ('expansion' units are available for additional channels).

The **UPC7000 series** provide easy to use and comprehensive configuration & control features, fault monitoring protection, safe-start routines, failsafe bypass and in-built redundancy to ensure minimum disruption of uplink signals. It incorporates a graphics display module, membrane keyboard and features a clear and intuitive control and configuration menu, fully utilising the unique graphics display.

For redundancy the **UPC series** units are fully compatible with the Peak **P1000L** (1+1) switching systems. Units support low-cost passive concatenated backup/ redundancy configurations utilising the failsafe bypass interfaces of the primary unit (please contact the factory for details).

Peak Features

-  Supports open-loop or comparison modes (with additional external beacon receiver)
-  Compact; 1RU solution for up to 4-channel integral AUPC control, with integral fail-safe 'bypass' switching mode
-  Expandable; 10-Channel, 2RU 'modular' expansion unit available (see EXP010)
-  Integral beacon /pilot receiver option (L-Band or SHF input), with 'graphical' spectrum display
-  Controllable; 0-30dB, 0.1dB step attenuation allows up to 30dB AUPC range, plus user-settable 'offset' facility
-  High performance; low insertion loss, high gain stability & flat frequency response
-  Optional dual beacon receiver automatic source selection redundancy facility
-  Pre-set & user settable 'smoothing' routines to prevent beacon signal noise related response problems
-  Scintillation facility offering rapid compensation changes for typically low look angle satellites
-  Supports site diversity switching (please contact factory for details)



UPC7000 series – Typical Specification

Input Section

External Beacon Receiver Input

DC input ranges	±10VDC, ±5VDC, 0 to 10VDC, -10 to 0VDC, user selectable
DC input damage level	±16VDC max
Slope settings	Logarithmic, 0.5, 1, 2, 5 & 10dB/V, user selectable
Connection	SMA (f), 8MΩ
Option 1d;	BNC (f), 8MΩ
Control	External receiver 'alarm' monitor to freeze response, via discrete connection
Option 17c;	Dual external receiver DC inputs, with redundancy control.
Option 17d;	Dual receiver (one internal & one external) redundancy control.

Internal Beacon Receiver (Option 2)

Note: An external receiver input is still provided.

Input

Option 17;	Dual polarisation inputs, with local & remote user selection
Frequency	L-Band (925-2,150MHz) input
Option 21a;	L-Band (925-2,300MHz) input
Option 21b;	L-Band (925-2,450MHz) input
Option 2a;	C-Band; 3.4-4.2GHz
Option 2b;	X-Band; 7.25-7.75GHz
Option 2d;	Full Ku-Band; 10.7-12.75GHz (unreferenced LNB)
Option 2e;	Ka-Band (contact factory for band availability)
L-Band monitor for SHF input options 2a-2e (option 18)	
Connection	SMA (f), 50Ω
Level	-20dBc ±3dB
LNB supply	Fed on L-Band input, user selectable (on/off);
Range select;	DC voltage level (13-15V/ 18-20VDC)
Power;	500mA max. (300mA per output for option 17)
Connector	N-type (f), 50Ω
Option 1;	F-Type (f), 75Ω
Option 1b;	BNC (f), 75Ω
Option 1c;	BNC (f), 50Ω
Return loss	15dB typical
Level	-70dBm nom, -50dBm max, -20dBm max aggregate
Options 2a-2e;	-90dBm nom, -70dBm max, -40dBm max aggregate
Level control	L-Band user input level control; 0-30dB range, 0.5dB step attenuator, to increase the above composite input levels
Option 16;	SHF input level control (for options 2a-2e); 0-30dB range, 0.5dB step attenuator, to increase the above composite levels

Receiver Aux. Output

	±10VDC, ±5VDC, 0 to 10VDC, -10 to 0VDC, user selectable
Slope settings	Logarithmic, 0.5, 1, 2, 5 & 10dB/V, user selectable
Connector	BNC (f), 0Ω (ideal voltage source, 5mA max)

Transfer Characteristics

Synth step size	1kHz
Search ranges	±20, ±50, ±100, ±200 & ±500kHz, user selectable
Sweep rates	2.5 & 5kHz/s, user selectable
Option 11;	2.5, 5, 10, 20, 40, 80, 120 & 240kHz/s
Level thermal stability	-0.04dB/°C

Tracking Parameters

PLL noise (IF) BW	300Hz, fixed
Option 11;	2kHz, fixed
Threshold lock reacq.	35dBHz, for sweep rates ≤10kHz/s
Average search time	6s, for search range ±20kHz and sweep rate 5kHz/s (see application note AN0025)
Option 11;	<1s, for search range ≤±50kHz and sweep rate ≥80kHz/s

Beacon 'display'

Resolution BW	6kHz
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Internal Reference

Adjustment	±0.45ppm, stepped 0.01ppm
Stability;	
Allan deviation	<5 x 10 ⁻¹² over 1s
Ageing	<3 x 10 ⁻¹⁰ per day, <3 x 10 ⁻⁸ per year
Temp stability	<2 x 10 ⁻⁹ over 0 to 50°C

Pilot 'CW' Generator Output (option 14)

For 'self-test' & for use when satellite has no useable beacon signal	
Frequency range	850-2,150MHz, user settable
Step size	125kHz
Level	-50 to -80dBm
Control range	30dB, stepped 0.5dB
Connector	SMA (f), 50Ω

UPC Section

Compensation ranges	1 to 30dB, user settable
Note: 30dB range has no surplus 'user offset' attenuation facility.	
Step sizes	0.1, 0.2, 0.5, 1 or 2dB, user selectable
Compensation ratio	0.1 to 10dB, user settable (for 1dB drop in beacon level, attenuation is reduced according to the above value)
Slew rate	0.01 to 0.1dB/s, user settable (can be disabled)
Sample period	0.2 to 10s, user settable
Scintillation setting	User selectable offering faster response and optimised settings to overcome the effects of scintillation with typically low look angle satellites (only applicable with option 2).

Output Section

Number of channels	1 to 4 (single channel order UPC7001, dual channel order UPC7002 etc).
Note: Expansion units are available for additional channels, please see EXP010 datasheet.	
Uplink signal type	L-Band (950-2,150MHz)
Option 20;	L-Band (950-2,450MHz), only available with option 15
Option 3;	IF 70±18MHz/ 140±36MHz (50-180MHz)
Connections	SMA (f), 50Ω (input & output)
Option 3b;	F-Type (f), 75Ω
Option 3c;	BNC (f), 75Ω
Option 3f;	L-Band, N-Type (f), 50Ω (UPC7001, UPC7002 only)
DC & 10MHz pass (Option 4)	Allows DC (27VDCmax@1A) & 10MHz signals on the L-Band input to be passed through to the output.
10MHz injection (Option 4b)	External reference input injected onto L-Band up-link channel outputs, BNC(f).
Output 1dB GCP	+8dBm (TOIP +18dBm)
Option 15;	+22dBm (TOIP +32dBm)
Note: Increases insertion loss to 4dB nominal	
Return loss	15dB nominal (input and output)
Attenuation control	0-30dB, stepped 0.1dB
Insertion loss	1dB nominal (L-Band), at min attenuation
Gain stability	±0.1dB per week (constant temp.)
Gain flatness	±0.5dB 950-2150MHz full band (±0.2dB IF option 3) ±0.2dB across any 36MHz in band
Compensation coeff.	+0.01dB/°C
Bypass mode	Fail-safe switching to external user selectable pad
Bypass connection	SMA (f), 50Ω (2 connections per channel)
Bypass insertion loss	2dB nom (plus external pad attenuation value)

Other

Mechanical

Size 19" standard rack mount, 1U (1.75"), depth 534mm (21"), plus connectors
Construction Stainless steel chassis
Weight Approx. 9kgs (20lbs)

Environmental

Operating temp 0°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 30 Watts (configuration dependent)
Option 10; Redundant PSU; provides a 1+1 redundant power supply configuration with separate prime power inputs

Control System

Remote control RS232/ 485 port
Option 9; Ethernet; embedded web server & SNMP network management support.
Alarms PSU fault, ext. alarm inputs & summary failure relay (form C)

Options

- 1) F-Type, 75Ω, 'internal beacon receiver' input connection
- 1b) BNC, 75Ω, 'internal beacon receiver' input connection
- 1c) BNC, 50Ω, 'internal beacon receiver' input connection
- 1d) BNC, 8MΩ, 'external beacon receiver' input connection
- 2) Internal beacon receiver with L-Band beacon input
- 2a) Internal beacon receiver with C-Band beacon input
- 2b) Internal beacon receiver with X-Band beacon input
- 2d) Internal beacon receiver with full Ku-Band beacon input
- 2e) Internal beacon receiver with Ka-Band beacon input
- 3) 70MHz & 140MHz (50-180MHz) internal uplink interface
- 3b) F-Type, 75Ω internal uplink interface
- 3c) BNC, 75Ω internal uplink interface
- 3f) N-Type, 50Ω internal uplink interface
- 4) DC & 10MHz pass-through for L-Band uplink channels
- 4b) 10MHz input for injection onto uplink channel outputs
- 5b) Bypass external fixed attenuator & loop-back co-axial connection link
- 9) Ethernet interface with embedded web server & SNMP
- 10) Redundant power supplies
- 11) Fast lock acquisition to <1s
- 14) Pilot 'CW' signal output (only valid with option 2)
- 15) Higher uplink channel output P1dB GCP to +22dBm nom. (TOIP +32dBm)
- 16) SHF input level control (only valid with options 2a-2e)
- 17) Dual polarisation inputs, user selectable.
- 17c) Dual external receiver DC inputs, with redundancy control.
- 17d) Dual receiver (one internal & one external) redundancy control (only valid with option 2).
- 18) L-Band monitor for SHF inputs (only valid with options 2a-2e)
- 20) L-Band uplink extended to 2450MHz (only valid with option 15)
- 21a) L-Band beacon receiver input range extended to 2300MHz (only valid with option 2)
- 21b) L-Band beacon receiver input range extended to 2450MHz (only valid with option 2)

Note: The addition of options can modify the typical performance & rear panel layout, for details please consult the factory

Rear panel view (sample 4-Channel unit with integral beacon receiver)

