

UPC7000 Series

Automatic Up-Link Power Control Unit



The **UPC7000 series** automatic uplink power control units (AUPC's) measure the 'link loss' 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 & 16, 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', both the optional internal beacon receiver plus an external beacon receiver are required.

The adjustable attenuators are positioned in the uplink chain in either the IF (50-180MHz) or the L-Band (950-2150MHz) signal path (SHF solutions available) which can either be supplied internally mounted, or the unit can directly control attenuators mounted in other Peak products (indoor & outdoor up converters, BUC's, line amplifiers etc.). 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 options 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) systems.

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 optional fail-safe 'bypass' 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
-  Flexible; directly compensates Peak devices in the uplink chain (up converter, BUC, line amplifier etc.)
-  High performance; low insertion loss, high gain stability & flatness
-  Beacon receiver output and key parameter 24hr 'history' recording facility
-  Pre-set & user settable 'smoothing' routines to prevent beacon signal noise related response problems
-  Scintillation option 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
DC input damage level	±16VDC max
Connection	BNC (f), 270kΩ

Internal Beacon Receiver (Option 2)

Input

Frequency	L-Band (945-2150MHz) 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 ¹

¹ Note; please consult factory for band availability.

LNB supply	Fed on L-Band input, user switchable
Power	(+22.5VDC @ 0.5A), 10MHz ref (0dBm nom)

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
Option 6;	Increases the above input power levels by 20dB

Aux. Receiver Output

² Note; user configurable via internal links, as standard.

Option 12a;	0-10VDC (internally pre-configured)
Option 12b;	±5VDC
Slope settings	Logarithmic, 0.5, 1, 2, 5 & 10dB/V
Connector	BNC (f)

Ext. Receiver Input

For comparison mode (requiring second external receiver DC input), or for situations where an external receiver may be used in place of the internal receiver.

DC input ranges	±10VDC, ±5VDC, 0 to 10VDC, -10 to 0VDC
DC input damage level	±16VDC max
Connection	SMA (f), 270kΩ

Transfer Characteristics

Synth step size	1Hz
Search ranges	±20, ±50, ±100, ±200 & ±500kHz
Sweep rates	2.5 & 5kHz/s
Option 11;	2.5, 5, 10, 20, 40, 80, 120 & 240kHz/s
Level thermal stability	-0.02dB/°C

Tracking Parameters

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

Beacon 'display'

Resolution BW	6kHz
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Internal Reference

Adjustment	±0.45ppm, stepped 0.01ppm
Stability	<5 x 10 ⁻¹⁰ over 1s, <5 x 10 ⁻⁹ per 12 hrs
Ageing	<5 x 10 ⁻⁷ per year
Temp stability	<5 x 10 ⁻⁸ over 0 to 40°C

Other

Mechanical

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

Operating temp	0°C to +50°C
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EMC	EN55022, part B & EN50082-1
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Safety	EN60950
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Power supply

Voltage	90-264VAC
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Frequency	47-63Hz
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Power	80 Watts max (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 failure & summary failure (relay, form C)
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UPC Section

Compensation ranges	1, 2, 5, 10 or 30dB, user selectable
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Note; 30dB range has no surplus 'user offset' attenuation facility.

Step sizes	0.1, 0.2, 0.5, 1 or 2dB
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Compensation ratio	0.1 to 10dB (for every 1dB drop in beacon level, attenuation is reduced according to the above value)
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Slew rate	0.01 to 0.1dB/s (can be disabled)
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Sample period	0.2 to 10s
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Scintillation setting (option 7)

User selectable offering faster response and optimised settings to overcome the effects of scintillation with typically low look angle satellites.

Notes; only offered with internal beacon receiver (option 2). Only available on single and dual-channel units. For use with dual-channel UPC7002 units the uplink channel configuration and attenuator settings must be identical.

Output Section

Compensation of external Peak up converter, BUC or Line Amplifiers

Signal type	Data over CANBUS®
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Connection	D-Type (f), 9-way
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Compensation via Internal Adjustable Attenuators

Number of channels	1 to 4 (single channel order UPC7001, dual channel order UPC7002 etc).
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Note; expansion units are available for additional channels, please see EXP010 datasheet.

Uplink signal type	L-Band (950-2150MHz), SMA (f), 50Ω
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Option 3;	IF 70±18MHz/ 140±36MHz (50-180MHz), SMA (f), 50Ω
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Option 3b;	F-Type (f), 75Ω
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Option 3c;	BNC (f), 75Ω
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Option 3f;	L-Band, N-Type (f), 50Ω (UPC7001, UPC7002 only)
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DC & 10MHz pass (Option 4)	Allows DC & 10MHz signals on the L-Band input to be passed through to the output.
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Output 1dB GCP	+8dBm (TOIP +18dBm)
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Option 15 ³ ;	+22dBm (TOIP +32dBm)
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Return loss ⁴	14dB nominal (input and output)
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Attenuation control	0-30dB, stepped 0.1dB
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Insertion loss ^{3,4}	1dB nominal (L-Band), at min attenuation
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Gain stability	±0.1dB per week (constant temp.)
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Gain flatness ⁴	±0.5dB 950-2150MHz full band (±0.2dB IF option 3)
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±0.2dB across any 36MHz in band

Compensation coefficient	+0.01dB/°C
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Bypass mode (option 5)	Fail-safe switching to external user selectable pad
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Bypass connection	SMA (f), 50Ω (2 connections per channel)
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Bypass insertion loss ³	1dB nom (plus external pad attenuation value)
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³ Note; increases insertion losses to 4dB nom.

⁴ Note; options 4 & 5 may modify the typical performance (for details please contact the factory).

Pilot 'CW' Generator Output (option 14)

Frequency range	850-2,150MHz, user settable
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Connector	SMA (f), 50Ω
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Level	-50 to -80dBm
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Step size	125kHz
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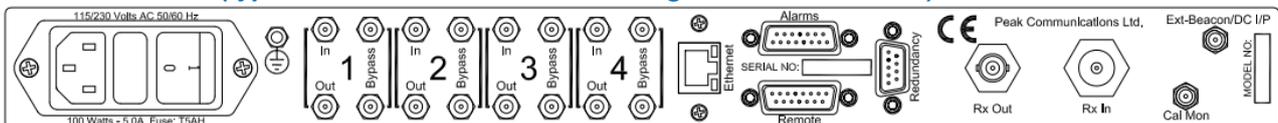
Options

- 1) F-Type, 75Ω, 'internal beacon receiver' input connection
- 2) BNC, 75Ω, 'internal beacon receiver' input connection
- 3) BNC, 50Ω, 'internal beacon receiver' input connection
- 4) Internal beacon receiver with L-Band beacon input
- 5) Internal beacon receiver with C-Band beacon input
- 6) Internal beacon receiver with X-Band beacon input
- 7) Internal beacon receiver with full Ku-Band beacon input
- 8) Internal beacon receiver with Ka-Band beacon input
- 9) 70MHz or 140MHz internal uplink interface
- 10) F-Type, 75Ω internal uplink interface
- 11) BNC, 75Ω internal uplink interface
- 12) N-Type, 50Ω internal uplink interface
- 13) DC & 10MHz pass-through for L-Band uplink channels
- 14) Fail safe by-pass switching for uplink channels
- 15) External fixed attenuator & connection link for fail safe bypass option
- 16) Higher beacon receiver input power level
- 17) Rapid compensation setting to overcome scintillation effects
- 18) Ethernet interface with embedded web server & SNMP
- 19) Redundant power supplies
- 20) Fast lock acquisition to <1s
- 21) Output voltage range pre-configured for 0-10VDC
- 22) Output voltage range ±5VDC
- 23) Pilot 'CW' signal output
- 24) Higher uplink channel output P1dB GCP to +22dBm nom. (TOIP +32dBm)

Note; the addition of options can modify the typical specification, for details please consult the factory



Rear Panel View (typical for 4-Channel unit with integral beacon receiver)



Peak Communications reserves the right to alter the specifications of this equipment without prior notice. UPC7000series-181018.

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