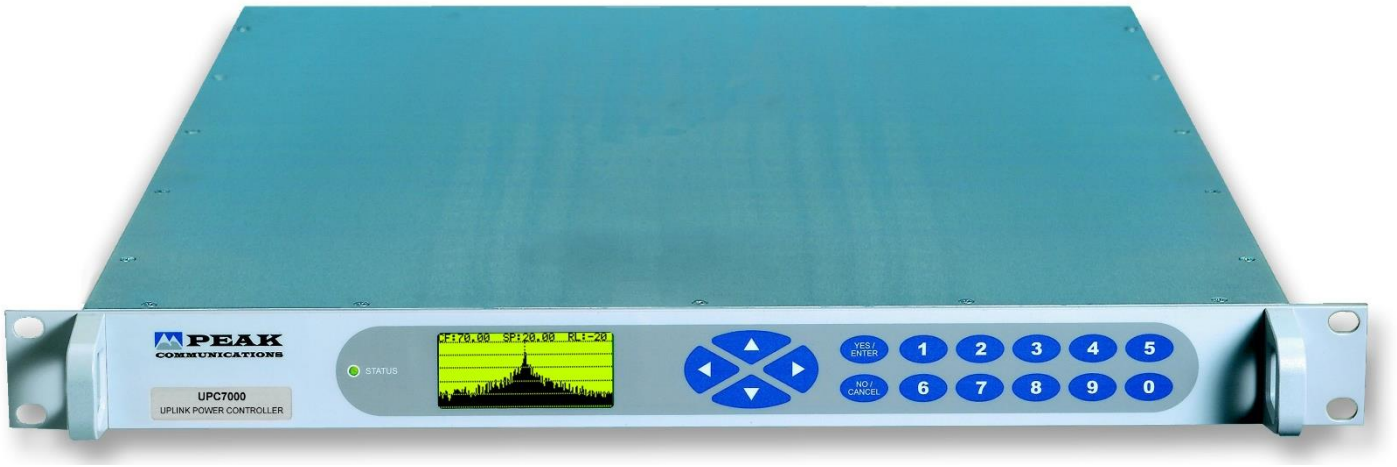
UPC7000 Series

Automatic Up-Link Power Control Unit



The **UPC7000 series** are next generation automatic uplink power control units (AUPC's) that 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.

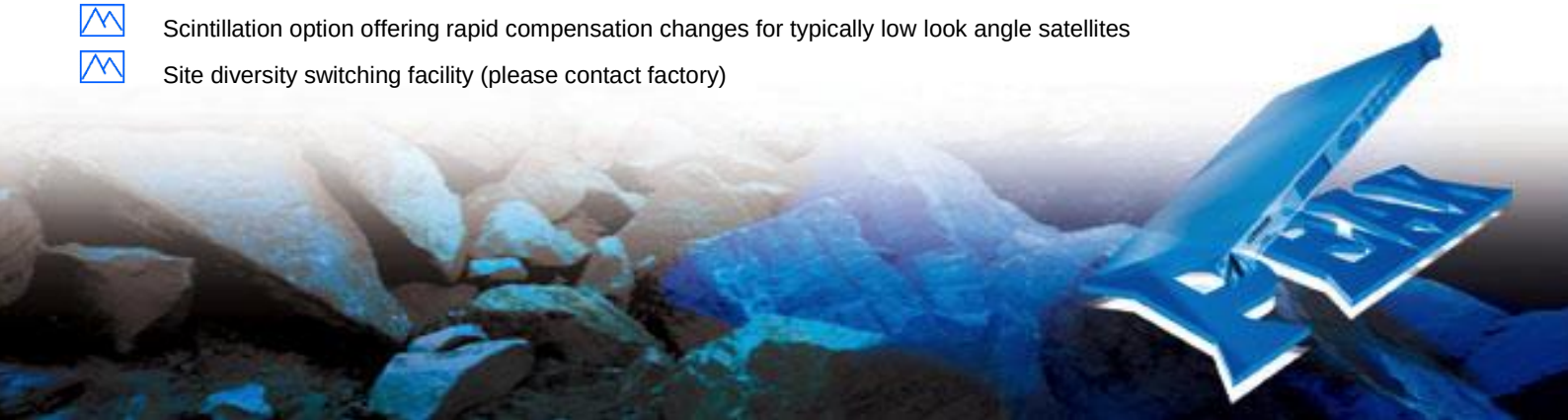
The adjustable attenuators are positioned in the uplink chain in either the IF (50-180MHz) or the L-Band (950-2150MHz) signal path (SHF solutions available) and can either be external units (the Peak range of up converters, BUC units & line amplifiers with adjustable gain/attenuation options) or internally mounted within the **UPC7000 series** units. The standard **UPC7000 series** support multiple channel operation with up to 4 adjustable 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
- Compact; 1RU solution for up to 4-channel integral AUPC control, with optional fail-safe 'bypass' mode
- Integral beacon /pilot receiver option (L-Band or SHF input), with 'graphical' spectrum display
- Expandable; 10-Channel, 2RU 'modular' expansion unit available (see EXP010)
- Controllable; 0-30dB, 0.1dB step attenuation allows up to 30dB AUPC range, plus user-settable 'offset' facility
- Flexible; directly compensates Peak devices in uplink chain (up converter, BUC, line amplifier)
- 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
- Site diversity switching facility (please contact factory)



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	±10VDC, 0-10VDC[*2]

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

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

Ext. Receiver Input (option 16)

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	BNC (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/^{0}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'	Graphical
Resolution BW	6kHz
Internal Reference	10MHz
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^{0}C

Pilot 'CW' Generator Output (option 14)

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

UPC Section

Compensation ranges	1, 2, 5, 10 or 30dB, user selectable

Note; 30dB range has no surplus 'user offset' attenuation facility.

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

Scintillation setting (Option 7)

Faster response and optimised settings to overcome the effects of scintillation with typically low look angle satellites. Only offered with internal beacon receiver (Option 2) & only available on single and dual-channel UPC system (UPC7001 /UPC7002[*3]).

[*3] Note; for use with dual-channel UPC7002 unit, uplink channel configuration and attenuator settings must be identical.

Output Section

Compensation via External Peak up converter, BUC or Line Amplifier

Signal type	Data over CANBUS®
Connection	D-Type (f), 9-way

Compensation via Internal Adjustable Attenuators

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 (950-2150MHz), SMA (f), 50Ω
Option 3;	IF 70±18MHz/ 140±36MHz (50-180MHz), SMA (f), 50Ω
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 & 10MHz signals on the L-Band input to be passed through to the output
1dB GCP	Input +10dBm, output +8dBm (TOIP +18dBm)
Option 15[*4];	Output +22dBm (TOIP +32dBm)

[*4] Note; increases insertion losses to 4dB nom.

Return loss[*5]	14dB nominal (input and output)
Attenuation control	0-30dB, stepped 0.1dB
Insertion loss[*4,5]	1dB nom. (L-Band), at min attenuation

Note; gain options are available to overcome external system & cable losses.

Gain stability	±0.1dB per week (constant temp.)
Gain flatness[*5]	±1.5dB 950 – 2150MHz full band (±0.2dB IF option 3) ±0.5dB across any 36MHz in band
Compensation coefficient	-0.015dB/^{0}C
Bypass mode (option 5)	Fail-safe switching to external user selectable pad
Bypass connection	SMA (f), 50Ω (2 connections per channel)
Bypass insertion loss[*4]	1dB nom (plus external pad attenuation value)

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

Other

Mechanical

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

Environmental

Operating temp	0^{0}C to +50^{0}C
EMC	EN55022, part B & EN50082-1
Safety	EN60950

Power supply

Voltage	90-264VAC
Frequency	47-63Hz
Power	80 Watts max (configuration dependant)
Option 10[*6];	Redundant PSU; provides a 1+1 redundant power supply configuration with separate prime power inputs

[*6] Note; provides rear panel visual indication of individual PSU condition only

Control System

Remote control	RS232/ 485 port
Option 9;	Ethernet; embedded web server & SNMP network management support.
Alarms	PSU fail, external 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
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 or 140MHz 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
5)	Fail safe by-pass switching for uplink channels
5b)	External fixed attenuator & connection link for fail safe bypass option
6)	Higher beacon receiver input power level
7)	Rapid compensation setting to overcome scintillation effects
9)	Ethernet interface with embedded web server & SNMP
10)	Redundant power supplies
11)	Fast lock acquisition to <1s
12a)	Output voltage range pre-configured for 0-10VDC
12b)	Output voltage range ±5VDC
14)	Pilot 'CW' signal output (only valid with option 2)
15)	Higher uplink channel output P1dB GCP to +22dBm nom. (TOIP +32dBm)
16)	External receiver auxiliary input (only valid with option 2)

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)*