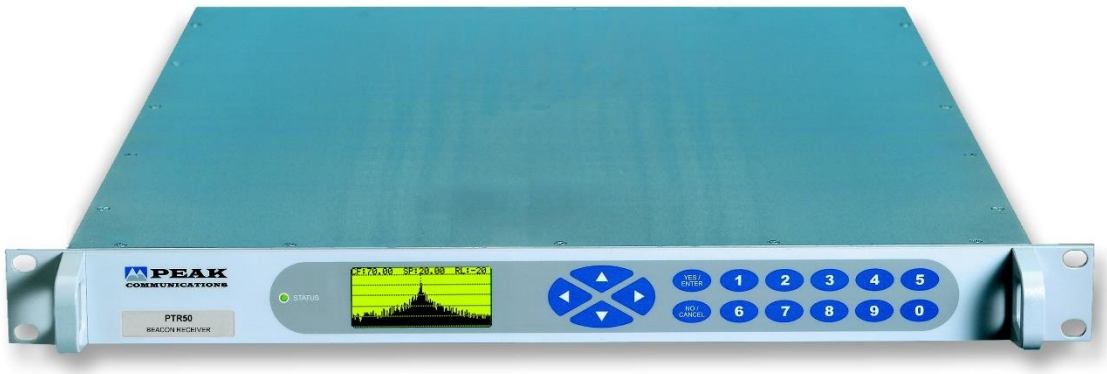
PTR50

‘CW’ Tracking Receiver



The **PTR50** is a next generation beacon tracking receiver, designed specifically to track and measure CW beacons from commercial satellites. Primarily an L-Band input receiver, the unit can be provided with a range of optional SHF input modules.

The **PTR50** is designed to be used for telemetry and control, typically in earth stations using large antennae. Outdoor compact versions with fast acquisition as standard are also available for smaller antenna & SOTM /mobile applications (see RTR50).

For satellites without beacon signals (or beacon signals that are modulated), Peak can provide a CW pilot generator option which is applied to the uplink signal (after UPC compensation) and subsequently received on the downlink instead of the normal satellite beacon signal.

The receiver is designed as a versatile and easy-to-use unit utilising a graphic display module that can display a digital representation of the received beacon spectrum. This feature provides a convenient visual display of the received signal which 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.

The tracking band center frequency can be set accurately using the 1kHz step size synthesiser system. The unit uses a 300Hz /2kHz phase locked loop (PLL) system to perform signal acquisition and level measurement through coherent detection. The search facility sweeps the frequency to locate a signal in the acquisition band and if a signal is detected the frequency is locked immediately to this beacon. A secondary search is then initiated to look for a more intense signal within the search band. If one is detected then the locked tracking frequency is modified. The process repeats until the largest signal is found in the search band and the anti-sideband device is then disabled.

A log amplifier is used to provide an output voltage representing the input power in logarithmic scale, in effect making the input power to output voltage log-conformal. The sensitivity of the logarithmic output is user selectable from the front keypad menu.

The **PTR50** unit achieves lock acquisition times of typically 6s, for combinations of lower search ranges (search bandwidths) and higher sweep rate settings. It is also offered with a fast signal acquisition option achieving lock times of typically 1s, for combinations of lower search ranges (search bandwidths) and higher sweep rate settings.

For redundancy the **PTR series** units are fully compatible with the Peak **B1000L** (1+1) system.

Peak Features

- Graphical display of beacon signal
- Fast signal acquisition and locking (6s typical, optionally <1s)
- Pilot ‘CW’ signal generation option for ‘self-test’ & use when no satellite CW beacon is present
- Sophisticated sideband rejection system
- Standard L-Band or SHF input options
- Logarithmic output range, user selectable

PTR50 – Typical Specification

L-Band Input

Option 12;	Dual polarisation inputs, with local & remote user selection
Frequency range	925-2,150MHz
Option 21a;	925-2300MHz
Option 21b;	925-2450MHz

Note: Wider ranges available (please contact factory).

Connector	N-type (f), 50Ω
Option 4;	F-Type (f), 75Ω
Option 4b;	BNC (f), 75Ω
Option 4c;	BNC (f), 50Ω
Input return loss	15dB typical
Beacon input level	-70dBm nom., -50dBm max.
Aggregate input level	-20dBm max.
User input level control;	0-30dB range, 0.5dB step attenuator, to increase the above composite L-Band input levels.

SHF-Band Input (option 1)

Input frequency options;	
Option 1a;	C-Band; 3.4-4.2GHz
Option 1b;	X-Band; 7.25-7.75GHz
Option 1d;	Full Ku-Band; 10.7-12.75GHz (unreferenced LNB)
Option 1e;	Ka-Band (consult factory for band availability).
Beacon input level	-90dBm nom., -70dBm max.
Aggregate input level	-40dBm max.
Option 16;	0-30dB range, 0.5dB step attenuator, to increase the above composite SHF input levels.

DC Output

Voltage range	±10VDC, ±5VDC, 0 to 10VDC, -10 to 0VDC, user selectable
Slope settings	Logarithmic, 0.5, 1, 2, 5 & 10dB/V, user settable
Connector	BNC (f)
Impedance	0Ω (ideal voltage source, maximum current 5mA)
Adjustment range	Output adjustable to 0V for input level between -60 & -100dBm

Auxiliary Buffered DC Output (option 13)

Connector	BNC (f), 0Ω (ideal voltage source, 5mA max)

Transfer Characteristics

Post-detection time const.	150mS
Step size	1kHz
Search range	±20, ±50, ±100, ±200 & ±500kHz, user selectable
Sweep rate	2.5 & 5kHz/s, user selectable
Option 11;	2.5, 5, 10, 20, 40, 80, 120 & 240kHz/s
Level thermal stability	-0.04dB/^{0}C

Tracking Parameters

PLL noise (IF) bandwidth	300Hz, fixed
Option 11;	2kHz, fixed
Threshold lock reacqu.	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 ranges of ≤±50kHz and sweep rates ≥80kHz/s

Video Section Display (Beacon frequency ±25MHz max.)

Resolution bandwidth	6kHz
Display	Graphical

Block Down Converter/ LNB Drive

Fed on L-Band input, user selectable (on/off);

Range select;	DC voltage level (13-15/ 18-20VDC)
Power;	500mA max. (300mA per output for option 12)

L-Band Monitor for SHF inputs (option 2)

Connection	BNC (f), 50Ω
Level	-20dBc ±3dB

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

Internal Reference

Frequency	10MHz
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 -10 to 50^{0}C

Mechanical

Width	19", standard rack mount
Height	1U (1.75")
Depth	534mm (21"), plus connectors
Construction	Stainless steel chassis
Weight	Approx. 8kg (18lbs)

Environmental

Operating temp	0^0 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	50 Watts max (configuration dependant)
Option 10;	Redundant PSU's with separate prime power inputs

Control System

Remote control	RS232/RS485 port
Option 9;	Ethernet; embedded web server & SNMP network management support
Alarms	LO lock failure PSU failure External alarm inputs Summary failure relay (form C) Out of lock alarm (form C)

Options

1a)	C-Band beacon input.
1b)	X-Band beacon input.
1d)	Full Ku-Band beacon input.
1e)	Ka-Band beacon input.
2)	L-Band monitor (for SHF input options).
4)	F-Type, 75Ω, input connection
4b)	BNC, 75Ω, input connection
4c)	BNC, 50Ω, input connection
9)	Ethernet interface with embedded web server & SNMP
10)	Redundant power supplies
11)	Fast lock acquisition to <1s
12)	Dual polarisation inputs
13)	Auxiliary buffered receiver DC output
14)	Pilot 'CW' signal output
16)	SHF input level control (only valid with option 1)
21a)	L-Band input frequency extension to 2300MHz.
21b)	L-Band input frequency extension to 2450MHz.

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

Rear panel view *(sample)*

Peak Communications reserves the right to alter the specifications of this equipment without prior notice. PTR50-170123.
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