

PTR50

'CW' Tracking Receiver



The **PTR50** is a next generation 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.

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 analyzer, which may not be necessary for these tasks.

The tracking band center frequency can be set accurately using the 1kHz step size Direct Digital Synthesiser (DDS) system. The unit uses a 2kHz Phase Locked Loop (PLL) system to perform signal acquisition and level measurement through coherent detection. The digital 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 side-band 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)
-  Sophisticated digital sideband rejection system
-  Standard L-Band or SHF input options
-  Pilot 'CW' signal generation option for use when no satellite CW beacon is present
-  Logarithmic output range, user selectable



PTR50 – Typical Specification

L-Band Input

Frequency range	945-2,150MHz
Connector	N-type (f), 50Ω
Option 4;	F-Type (f), 75Ω
Option 4b;	BNC (f), 75Ω
Option 4c;	BNC (f), 50Ω
Option 12;	Dual polarisation inputs, with local & remote control of switching
Input return loss	15dB typical
Beacon input level	-70dBm nom -60dBm max
Aggregate power level	-20dBm max
Option 6;	Increases the above levels by 20dB

SHF-Band Input (Option 1)

Input frequency options;	
Option 1a;	C-Band; 3.4-4.2GHz (unreferenced LNB)
Option 1b;	X-Band; 7.25-7.75GHz
Option 1d;	Full Ku-Band; 10.7-12.75GHz (unreferenced LNB)
Option 1e;	Ka-Band*
*Note; please consult factory for band availability.	
Beacon input level	-90dBm nom -80dBm max
Aggregate power level	-40dBm max
Option 6;	Increases the above power levels by 20dB

DC Output

Voltage range	±10VDC, 0-10VDC**
**Note; user configurable via internal links, as standard.	
Option 3a;	0-10VDC (internally pre-configured)
Option 3b;	±5VDC
Slope settings	Logarithmic, 0.5, 1, 2, 5 & 10dB/V
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)
Impedance	0Ω (ideal voltage source, maximum current 5mA)

Transfer Characteristics

Post-detection time constant	150mS
Step size	1kHz
Search range	±20, ±50, ±100, ±200 & ±500kHz
Sweep rate	2.5 & 5kHz/s
Option 11;	2.5, 5, 10, 20, 40, 80, 120 & 240kHz/s

Tracking Parameters

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

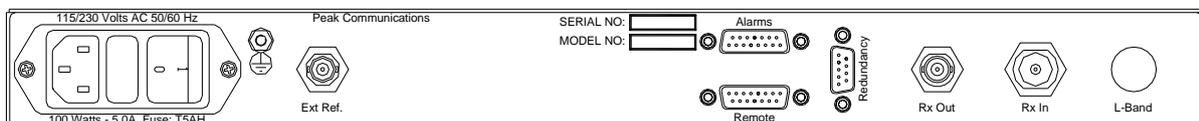
Video section display (Beacon frequency ±25MHz max.)

Resolution bandwidth	6kHz
Display	Graphical

Block DownConverter/ LNB Drive

Output reference	10MHz at 0dBm nominal
DC supply	+22.5 volts regulated at 0.5A
Connection	Fed on L-band cable
Control	Switchable from front panel

Rear Panel View



L-Band Monitor for SHF inputs (Option 2)

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

Pilot 'CW' Generator Output (option 14)

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

External Reference Input

Frequency	Factory selectable 5 or 10MHz
Connector	BNC (f), 50Ω
Level	0dBm ±3dB

Internal Reference

Frequency	10MHz
Adjustment	±1.0ppm, stepped 0.02ppm

Stability

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

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° to +50°C
EMC	EN55022 part B & EN50082-1
Safety	EN60950

Power Supply

Voltage	90-264VAC
Frequency	47-63Hz
Power	50 Watts max (configuration dependant)

Control System

Remote control	RS232/RS485 port
Option 9 ;	Ethernet; embedded web server & SNMP network management support
Alarms	LO lock fail PSU fail 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).
- 3a) Output voltage range pre-configured for 0-10VDC
- 3b) Output voltage range ±5VDC
- 4) F-Type, 75Ω, input connection
- 4b) BNC, 75Ω, input connection
- 4c) BNC, 50Ω, input connection
- 6) Higher input power level
- 9) Ethernet interface with embedded web server & SNMP
- 11) Fast lock acquisition to <1s
- 12) Dual polarisation inputs
- 13) Auxiliary buffered output
- 14) Pilot 'CW' signal output

Note; some of the above options have an impact on the general performance specifications, factory guidance should be sought if this is thought to be critical.

Peak Communications reserves the right to alter the specifications of this equipment without prior notice. PTR50-140716.

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