



JCU-STRAP Digital Beacon Receiver at the Bukit Timah Earth Station, Singapore

# JCU-STRAP

## Digital Beacon Receiver and Radiometer



### Features

- ✓ Measurement of L band, C band, Ku band or Ka band satellite beacon signal strength, even for modulated beacons.
- ✓ Digital Down-conversion and Decimation Filtering for very high frequency resolution.
- ✓ Digital Signal Processing and Fast Fourier Transform (FFT) analysis result in:
  - 1 Rapid search and highly reliable acquisition of signal, faster than 3 seconds, for a beacon anywhere inside a 1 MHz search range and at levels  $> 3$  dB above the noise.
  - 2 Digital tracking of signal to compensate for drift in satellite frequency.
  - 3  $>48$  dB dynamic range at 9.6 Hz output rate for typical Ku band beacons, using a 3 m dish. (Compared with  $<30$  dB dynamic range for conventional receivers.)
  - 4 Beacon Signal and Noise Level output simultaneously. Measurements along the same path and at the same frequency. A Radiometer and Beacon Receiver in one instrument.
  - 5 Digital filtering of output data to enhance the required signal accuracy.
- ✓ Simultaneous Beacon Signal and Radiometer outputs permit the accurate calculation of the transmission medium temperature, thus improving the accuracy of co-sited radiometers, which operate at frequencies where satellite beacons do not exist.
- ✓ JCU-STRAP has been producing and operating state of the art beacon receivers for more than 11 years.

For further information contact

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# Specifications

## Indoor Unit

RF Input Frequency	One specified beacon frequency in the 950 to 1750 MHz band.
Search range	$\pm 500$ kHz around specified frequency. (Any beacon within this band will be found).
RF Input Amplitude.	-60 dBm to - 80 dBm for full scale (0 dB) output, BNC connector.
Absolute Maximum Input	0 dBm.
Optional Extra Beacons	More than one beacon signal can be received. Each beacon signal has its own low noise local oscillator and filter.
Outputs	Beacon Signal and Sky Noise, both available as digital and analogue outputs. (The Sky noise signal is the Radiometer output.)
Output Connectors	RS232 digital data stream, 9 pin D type connector.  Analogue output of Beacon Signal and Sky Noise for chart recorder, BNC connectors.
RS232 data format	SSSS<space>NNNN<cr><lf> where SSSS is a 4 Hex digit for the Beacon Signal and NNNN is a 4 Hex digit for the Sky Noise at 9600 baud.
Data Rate	9.5 Beacon and Noise output values per second.
Digital Range	+6 to -108 dB output data and display range.
Analogue Range	0-10 Volt. 2Volt per 10 dB, (-50 dB to 0 dB) with 0.5 V overrange.
ADC	5.5 MHz final analogue IF frequency, sampled at 20 MSPS, 10 bit ADC.
DDC	Digital down conversion to Zero Frequency IF using Decimation Filtering and FIR Digital Filtering. 9.5 Hz/Bin resolution and a 95 dB SNR for the DSP.
DSP	1024 bin FFT at 38 FFT's per second. Measurement bandwidth 47.7 Hz.  Special signal detection and tracking techniques permit aquisition of the beacon signal if it is > 3 dB above the noise, typically within 3 seconds.  Digital Video filtering with a bandwidth of 1.5 Hz is applied to both the signal and noise output.
Display	LCD front panel display of both beacon signal and sky noise. Resolution 0.1 dB.
Dimensions	437 mm wide, 329 mm deep and 178 mm high (standard 19 inch rack wide). Rack fitting handles included as standard.
DC power output	25 V DC for supplying DC power to Outdoor Unit and LNC.

## Outdoor Unit

DC input	22 V to 30 V DC input for 18V low noise regulated supply for LNC.
DC output	18 V DC 0-1 A, on centre of RF input BNC connector for LNC supply.
RF input	-50 dBm to -70 dBm nominal, 0 dBm absolute maximum.
Gain	10 dB.