DTS-100-SLR

Slant Range Unit

DTS-100-SLR is a Slant Range equipment able to measure the radial distance between the rocket and the telemetry station.

The distance is calculated based on the delay of the telemetry signal reception from the rocket, which is proportional to the position of the rocket related to the ground telemetry antenna. So, the radial distance is measured by a one-way ranging system, instead of radar two-way ranging system.

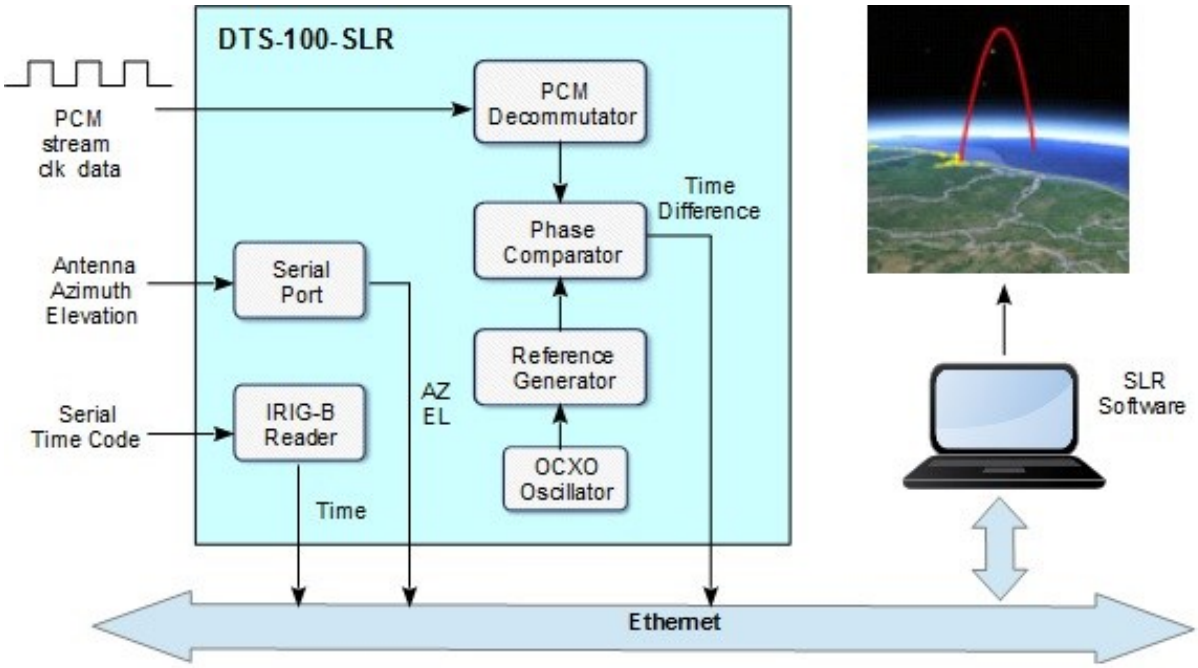
DTS-100-SLR has an internal PCM Decommutator witch decodes and synchronizes (locks) the received telemetry data, identifying a sync code according the IRIG-106 standard. An ultra high stable time reference consisting of a oven controlled crystal oscillator OCXO is provided for a reference generator.

The internal reference generator is kept synchronized with a pre-defined region of the PCM stream before launch (word, minor frame or major frame). After launch, the unit measures the time difference between the internal reference and the PCM stream, which is subject to a propagation delay due to the radial distance. The time difference is a direct indication of payload position with respect to the tracking antenna.

When a tracking antenna azimuth and elevation angles are incorporated, a payload trajectory can be generated and plotted in real time over Google Earth.

Key Features

- Alternative to radar systems when receiving angular position from a tracking antenna
- IRIG 106 Class II Compliance
- High speed operation up to 10 Mbps
- Miniature rugged construction (115 x 135 x 33 mm)
- IRIG-B time acquisition
- Ethernet Gigabit
- Serial Async USB port
- One PCM and trajectory simulator
- Programmable data stored in non-volatile memory
- Ultra high stable OCXO time reference



Technical Specifications

PCM Decommutator

Standard	IRIG 106 Class II
Input Data Rates	10 bps to 10 Mbps
No. of channels	One
Input Format	NRZ-L, NRZ-M, NRZ-S, BiØ-L, BiØ-M , BiØ-S
Input Levels	TTL and RS-422
Data Polarity	Normal or Inverted
Data Alignment	MSB first or LSB first
Major Frame Length	1 to 1024 Minor Frames per Major Frame
Minor Frame Length	2 to 16.384 bits per Minor Frame
Word Length	6 to 16 bits
Frame Sync Pattern	Up to 33 bits
Frame Sync Location	Leading or trailing the frame
Frame Sync Strategy	Adaptive mode (search-lock-verify) & burst mode (search lock)
Sync Error Tolerance	0 - 7 bits
Sub-Frame Sync	SFID, FCC & URC

IRIG-B Time Code Reader

Input Signal:	1 KHz ASK (Amplitude Shifting Key) amplitude modulated
Time frame	1 second
Counter Indice	10 ms (100 pps)
Year time	BCD (Binary Coded Decimal).
Day seconds	SBS (Straight Binary Seconds).
30 bits (BCD)	days (10), hours (6), minutes (7) and seconds (7).
17 bits (BCD)	Day seconds
9 bits (BCD)	year
18 bits	control

Synthetized Generator

Type	OCXO (Oven Controlled Crystal Oscillator)
Thermal Stability	2.0E-10
Resolution	3 m
Temperature Range	-30 °C to +70 °C
Aging	Per Day 5.0E-10 Per Year 5.0E-08

Connections

IRIG-B	BNC (F)
PCM DATA SIMUL	BNC (F)
PCM CLOCK SIMUL	BNC (F)
PCM DATA IN	BNC (F)
PCM CLOCK IN	BNC (F)
Test Points	Miniature Push-Pull Circular Connector HR25A
Ethernet	RJ-45
USB Serial Com	USB connector type B
Power	DC Power Connector

PCM Simulator

Standard	IRIG 106 Class II
Output Data Rates	10 bps to 10 Mbps
No. of channels	One
Output Format	NRZ-L, NRZ-M, NRZ-S, BiØ-L, BiØ-M , BiØ-S
Output Levels	TTL or RS-422
Data Polarity	Normal or Inverted
Data Alignment	MSB first or LSB first
Major Frame Length	1 to 1024 Minor Frames per Major Frame
Minor Frame Length	2 to 16.384 bits per Minor Frame
Word Length	6 to 16 bits
Frame Sync Pattern	Up to 33 bits
Sub-Frame Sync	SFID, FCC & URC

UART To USB

Description	USB to asynchronous serial data transfer interface
Data Rates	300 baud to 3 Mbaud

ENVIRONMENTAL

Temperature	Operation: 0 °C to +50 °C Storage: 0 °C to +70 °C
Humidity	0% to 90% Relative

Physical and Power

Size	115 x 135 x 33 length, width, height (mm)
Weight	0.9 Kg
Chassis Material	Aluminum
Power Supply	15 VDC to 20 VDC 15 W

Test Points Connector

Pin	Signal
1	PCM DATA IN
2	PCM CLOCK IN
3	PCM DATA SIMULATOR
4	PCM CLOCK SIMULATOR
5	IRIG-B
7	Frame / Sub-Frame / Word selection
12	+12V
13	+5V
14	+3.3V
15	GND