GPS-04 GLOBAL POSITIONING TRAINING SYSTEM

GPS-04 is an effective means of teaching Global Positioning System technology. This system tracks up to twelve satellites simultaneously, using the antenna provided with the system. All GPS Antennas operate on the line-of-sight principle; the antenna must have line-of-sight visibility with at least three GPS satellites for fairly accurate tracking of location and for better analysis & understanding of GPS. Mounting the trainer's antenna outside a classroom window would provide the necessary visibility. Students can perform various experiments using this system.

FEATURES

- Simultaneously tracks up to twelve satellites
- Receiver and satellite status indicator
- Position, Velocity and GMT indication
- Land navigation
- Digital base band processing
- Navigation updates every second
- User initialization is not required
- One PPS output for timing measurements
- LED indicators with Beeper for receiver section
- Software interface with signal strength indication and survey window
- Trace window for NMEA received sentences analysis
- Fully shielded construction for maximum EMI and RFI protection.
- Mains supply/battery operated
- Study of satellite Azimuth & Elevation window using Sky plot
- Measurement of geographical location with GMT/IST using Navigation window

TECHNICAL SPECIFICATIONS

GPS RECEIVER BOARD

Frequency	: 1.575 GHz
Channels	: 12 no.s
Onboard clock and System processor	
Receiver sensitivity	: -165dBW minimum
Update rate	: 1 second
Acquisition time	: 15 seconds warm (all data known) 45 seconds cold (initial position, time and almanac known, ephemeris unknown) 1.5 minutes AutoLocate™ (almanac known, initial position and time unknown) 5 minutes search the sky (no data known)

POSITION ACCURACY

Non-differential GPS	: 15 meters RMS (100 meters with Selective Availability on)
Velocity accuracy	: 0.2 m/s RMS steady state (subject to Selective Availability)
one-pulse-per-sec	: ±1 microsecond at rising edge of accuracy PPS pulse (subject to selective availability)

ELECTRICAL CHARACTERISTICS

Input voltage	: +3.6VDC to 6.0VDC regulated 150mVp-p ripple
Input current	: 120 mA typical, 140 mA max, 20 mA while in power down

SOFTWARE INTERFACE

Dual channel CMOS/TTL level with user selectable baud rate (300, 600,1200, 2400, 4800)
NMEA0183 Version2.0

ASCII output	: (GPALM, GPGGA, GPGSA, GPGSV, GPRMC, GPVTG, PGRME, PGRMT, PGRMV, PGRMF, LCGLL, LCVTG)
Inputs	: Initial position, date and time (not required) Earth datum and differential mode configuration command, almanac
Outputs	: Position, velocity and time Receiver and satellite status Geometry and error estimates

Binary TTL output data format
Binary format phase data
LED and Beeper indication for self check cycle.
LED indication for active RS-232 interface.
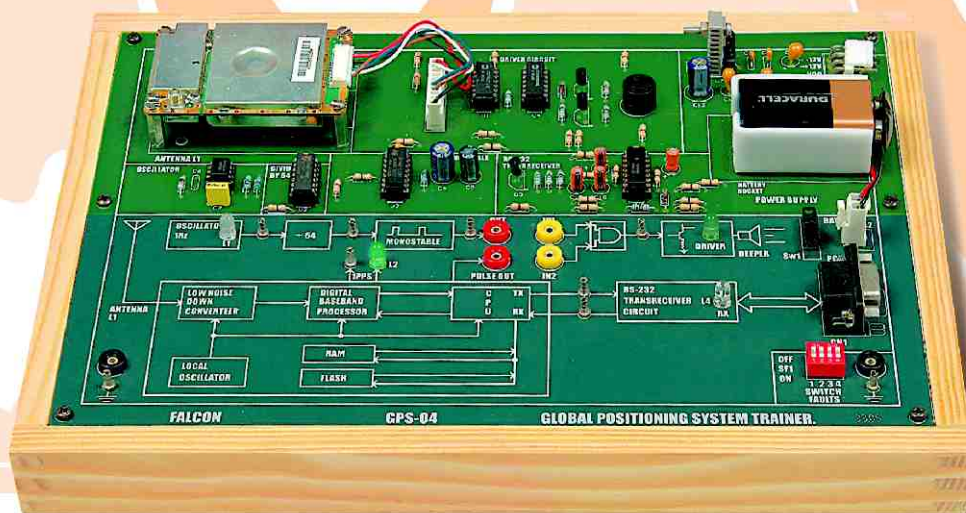
GPS ANTENNA

MCX style connector

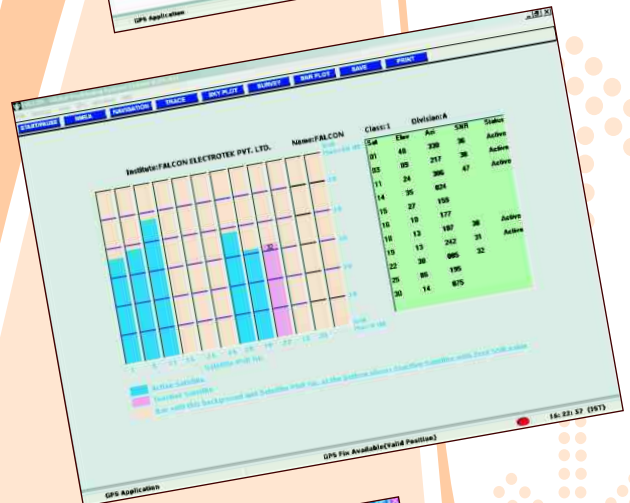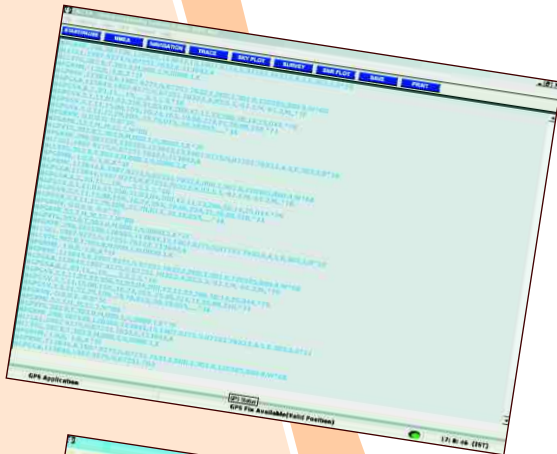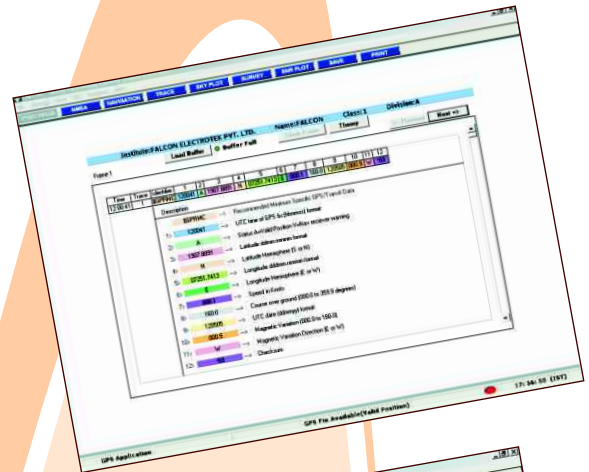|	
Typical Attenuation	: 30dB/100'@1GHz (RG-174 cable)
Operating Frequency	: L1 1575.42 ±1.023 MHz (typ.)
Input Impedance	: 50 Ohm
VSWR	: 1.5(typ.)
Polarization	: Right hand circular
Azimuth Coverage	: 360 Degree
Elevation Coverage	: 0 Degree to 90 Degree
Gain characteristics of Antenna Element	: Gain: 3.0 dBi (typ.) -10 dBi min. at 0 Degree elevation
Axial ratio	: 3 dB (typ.)
Filtering	: -40 dB (1670MHz) (typ.) -40 dB (1480MHz) (typ.)
Total Gain	: 24 dBi (typ.) w/6m. cable
Noise Figure	: 1.0 dBi (typ.), 1.5 dB (max)
Power Requirements	: 5 ± VDC
Power Consumption	: 20 mA (typ.)
Dimensions	: 46L x 39W x 12.5H mm
Weight	: 35 g. w/o Cable
Cable Length	: 6000 ±70 mm
Mounting Method	: Magnet

LIST OF EXPERIMENTS

- Getting started with GPS training system.
- Satellite signal strength indication using SNR plot.
- Study of Satellite Azimuth & Elevation window using Sky plot.
- Measurement of geographical location with GMT/IST using navigation window.
- To study graphical representation of geographical position using survey plotting.
- Study of NMEA received sentences using trace window.
- To study GPS applications.

FALCON