

# GreenLake Engineering Srl

**GreenLake-Engineering** offers the capability to design, develop, manufacture and support **TEST, MEASUREMENTS & CONTROL SOLUTIONS** able to satisfy specific applications.

- We aim to deliver to our customers high quality solutions, making the best of a long-standing know-how and experience in measurement electronics and continuously being focused on innovation.
- Moreover we offer our expertise as a partner in special projects, developing **customized solutions** to meet even the most particular applications and technical requirements thanks to the most advanced technologies, like DSPs, FPGAs, microProcessors and various data communication interfaces as RS 232/422, CAN bus, USB and Ethernet.



# Time and Position Products

## GLE/GNSS-IRIG-ENC-100-OEM Time Code IRIG B/G Encoder, GNSS synchronized

### Features

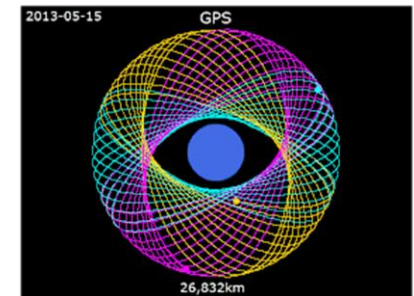
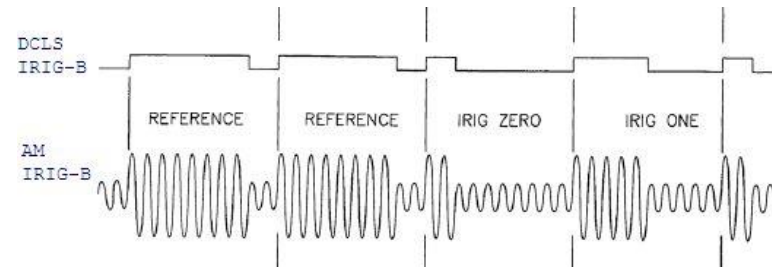
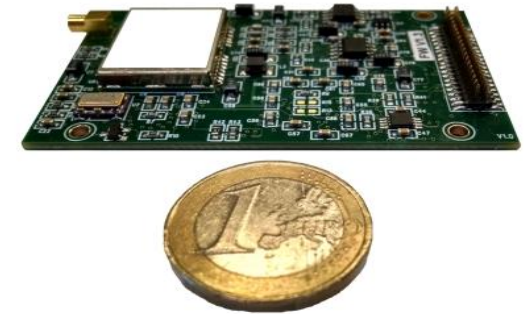
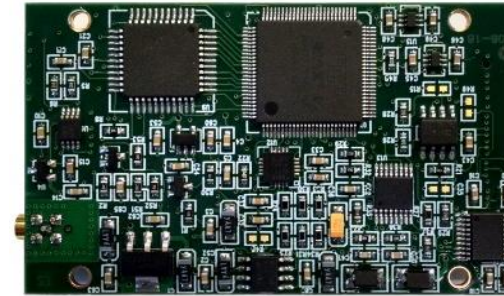
- Small footprint PCB
- 72 Channels GPS L1, GLONASS L10F, BeiDou B1 receiver
- High accuracy VCTXO oscillator disciplined to GNSS receiver
- Selectable IRIG-B or IRIG-G time code generator
- Amplitude modulated and non modulated DCLS timecode output
- 1 PPS output
- Serial NMEA 0183 output, including GPS/UTC Time & Position
- UTC time synchronization
- HH:MM, adjustable IRIG timecode offset
- Adjustable modulated IRIG signal level
- Selectable 1 PPS rising/falling edge
- Leap second determination based on GPS/GLONASS integration
- RS232 configuration port

### Benefits

- Highly integrated: antenna to IRIG output solution
- Low power consumption
- Multiple output interfaces, provide great flexibility

### Applications

- OEM solution, easily integrable in demanding systems



# GLE/HGIG-100v2 Handheld GNSS Synchronized, IRIG B/G Time Code Generator

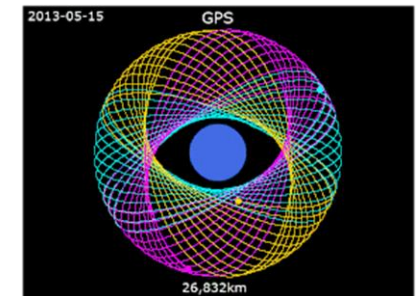
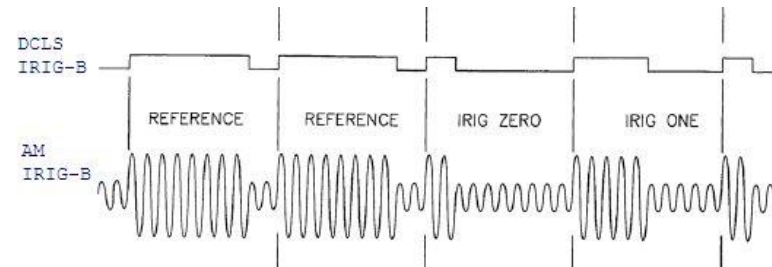
## Features

- Small form-factor enclosure
- Internal rechargeable LiPo battery
- High brightness display
- 72 Channels GPS L1, GLONASS L10F, BeiDou B1 receiver
- High accuracy VCTXO oscillator disciplined to GNSS receiver
- Selectable IRIG-B or IRIG-G time code generator
- Amplitude modulated or non modulated TTL timecode output (DCLS)
- 1 PPS output
- Serial NMEA 0183 output, including GPS/UTC Time & Position
- UTC time synchronization
- HH:MM, adjustable IRIG timecode offset
- Adjustable modulated IRIG signal level
- Selectable 1 PPS rising/falling edge
- Leap second determination based on GPS/GLONASS integration



## Applications

- Time synchronization of stand-alone data acquisition equipment, installed on off-road, armored, heavy-duty and railway vehicles, manned and unmanned aerial platforms, boats and vessels.....



## GLE/RGU/GXX/001 Rugged Multi Constellation GNSS Receiver

### Features

- Single or triple frequency: GPS L1/L2/L2C/L5, GLONASS L1/L2, Galileo E1/E5A + WASS/EGNOS; 864 Rx channels in total.
- Update rate up to 100Hz for high dynamic applications.
- Code differential Base and code differential Rover.
- Real time DGPS and RTK correction up to 100Hz.
- In-band interference rejection for better immunity to RF spurious.
- Advanced Multi-path Reduction
- Removable CF card data storage device.
- IRIG-B time code + 1 PPS output / IEEE-1588 grand master time source.
- Multiple RS-232/422 interfaces, Ethernet, CAN or USB 2.0, for setup and data I/O.
- Integrated NMEA-183 to binary data converter for easy PCM transmission.
- Event Marker / External frequency I/O.

### Physical Characteristics

- Designed to meet MIL-STD environmental specifications.
- EMI shielded, milled aluminum enclosure: 140x146x65 mm (WxDxH).
- 16-40 VDC; insulated DC/DC converter + EMI filter, per MIL-STD-704 /-461.
- Wide temperature range.

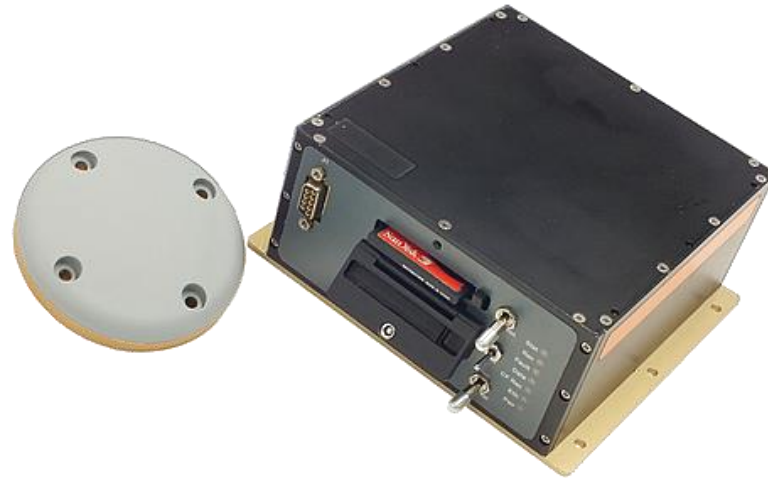


### Applications

On-board instrumentation for testing applications in harsh environments; armored and heavy-duty military and civil vehicles testing, Flight Testing and certification of manned and unmanned aerial platforms.

### Benefits

- Tracking of multiple constellations provides better availability of GNSS signals.
- Tracking of L1/L2/L2C and L5 signals provides better accuracy.
- Multiple data interfaces for extended flexibility.
- Data recording on removable CF allows quick data extraction.



## GLE/RMG-SD

# Compact Multi Constellation GNSS Receiver

### Features

- Small form factor and rugged construction
- Single or triple frequency: GPS L1/L2/L2C/L5, GLONASS L1/L2, Galileo E1/E5A + WASS/EGNOS; 864 Rx channels in total.
- Update rate up to 100Hz for high dynamic applications.
- Code differential Base and code differential Rover.
- Real time DGPS and RTK correction up to 100Hz.
- Advanced Multi-path Reduction
- Heading determination
- Removable SD card data storage device.
- IRIG-B time code + 1 PPS
- Multiple high speed RS-232/422 interfaces, CAN or USB 2.0, for setup and data I/O.
- Integrated NMEA-183 to binary data converter for easy PCM transmission.
- Event Marker

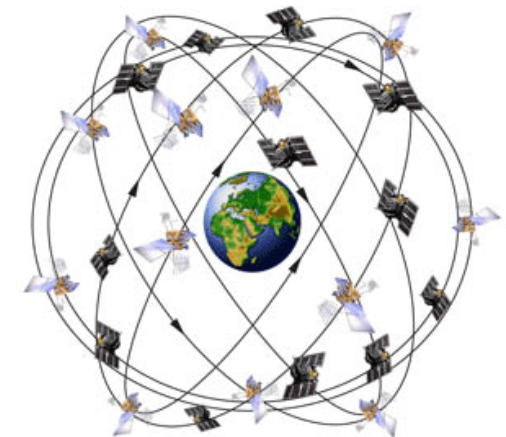
### Physical Characteristics

- Designed to meet MIL-STD environmental specifications.
- EMI shielded, milled aluminum enclosure.
- 16-40 VDC; insulated DC/DC converter + EMI filter, per MIL-STD-704 /-461.
- Wide temperature range.

### Benefits

- Tracking of multiple constellations provides better availability of GNSS signals.
- Tracking of L1/L2/L2C and L5 signals provides better accuracy.
- Multiple I/O interfaces provide great flexibility

**Applications:** on-board instrumentation for testing in harsh environments: armored and heavy-duty military and civil vehicles testing, flight-testing and certification of manned and unmanned aerial platforms, ship and vessel trials ...



## GLE/RGM/G2T/HDA/MB1 Space-Proven GNSS Receiver with Mil Bus 1553 interface

GLE/RGU/G2T/HDA/MB1 is a cost-effective, high-performance, compact and rugged GNSS receiver specifically designed and environmentally qualified according to ESA standards for space launchers applications.

### Main Characteristics

- GPS L1/L2/L2C/L5 (GALILEO as option), SBAS.
- Update rate up to 100Hz for high dynamic applications.
- High dynamic satellite tracking & position computation.
- GNSS data update rate of 20Hz (up to 100Hz as option).
- Receiver Autonomous Integrity Monitoring (RAIM).
- Advanced multi-path reduction.
- MIL-BUS-1553 data output (RT peripheral).
- High speed RS 232 / USB setup and service I/O ports.
- Fully configurable receiver parameters.
- Qualified for: high level sine & random vibration, Pyroshock, humidity, thermo-vacuum, EMI / EMC.

### Application

- Currently in service on the 4th stage of each VEGA launcher
- VEGA is jointly developed by the Italian Space Agency (ASI) and the European Space Agency (ESA).
- It allow accurate trajectory verification during the launch.
- Altitude up to 1500 km, velocity up to 8000 m/sec, acceleration in excess of 5Gs, extreme vibration and shock conditions.



## GLE/TCD-100 Miniature on-board Time Code Display

GLE/TCD-100 **decodes** and **displays** the **input time as Hours, Minutes and Seconds** on a six digits LED display as **HH : MM : SS**.

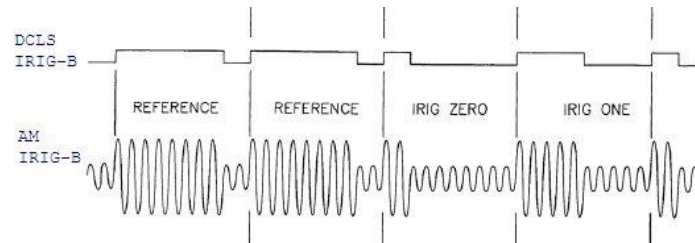
### Features

- IRIG-B / NMEA Time Decoder / Reader
- Available Time inputs:
  - IRIG B122, 1 kHz modulated;
  - IRIG B002, digital unmodulated (DCLS);
  - NMEA 0183, RS 232.
- Miniature size (90x25x50 mm / LxHxD)
- Solid & Rugged construction
- User adjustable display intensity
- High stability internal clock
- Wide DC voltage supply range

### Applications

- Instrumentation and testing, on-board & in harsh environments
- armored and heavy-duty military and civil vehicles
- Aircraft's flight testing & certification
- Railway vehicles testing
- Ship and vessel trials ...

GLE/TCD-100 is housed in a robust flange mountable milled aluminium enclosure, designed to meet "Safety of Flight" requirements or it is available as **OEM Board**.





## Overview of some products developed over time



### Video

- Rugged **High Definition SDI Video Cameras**
- Rugged Miniature, **Standard Definition, Video Cameras**
- Compact and robust **SMPTE 292M HD-SDI Video Coupler Splitters**
- **CVBS Video Buffers / T-Couplers**
- **VGA Video Splitter / T-Buffers**

### Protocol Converters

- **ARINC 573 / 717 Compact & Rugged Decoder / RS 232/422 Converter** for airborne or test-rig applications.
- Rugged & Customizable **RS 232 / 422 Interface Controllers / Protocol Converters**
- Customizable Standalone **Serial to CAN Bus Converters**. It is programmable for different asynchronous protocols from GPS receivers, Inertial Systems, Transducers, ...



### Data Acquisition & Onboard Testing

- **Current transducers**
- **PT100 Air Temperature Sensors**
- **USB / RS 232/422 acquisition units for RTD and Pressure Scanners**
- **Serial Data Recorders**: standalone, solid-state devices for RS 232 data streams
- **Telemetry Buffer Modules** to decouple amplify / attenuate and split PCM signals
- **1553 Bus Insulation Modules** to split and buffer a dual redundant Mil-Bus

### Position & Time

- Rugged **multi constellation GNSS receivers** for on-board testing instrumentation
- High performance, **GNSS receivers qualified for space launchers** and other high dynamics conditions
- Battery powered, **handheld GPS/UTC synchronized IRIG B/G time-code generators**
- Miniature **Onboard Time Code Display** for amplitude modulated IRIG-B, DCLS IRIG-B and GPS-NMEA codes



### Ground Telemetry

- **USB 2.0 Based IRIG-106 PCM Decoder**
- **PCM & IENA QuickLook Telemetry software**
- **GPS Tracking Antenna System** to control the angular position of one or more ground telemetry tracking antennas
- **Integrated Telemetry Ground Station solutions**

# Thank You



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