SELEX GALILEO

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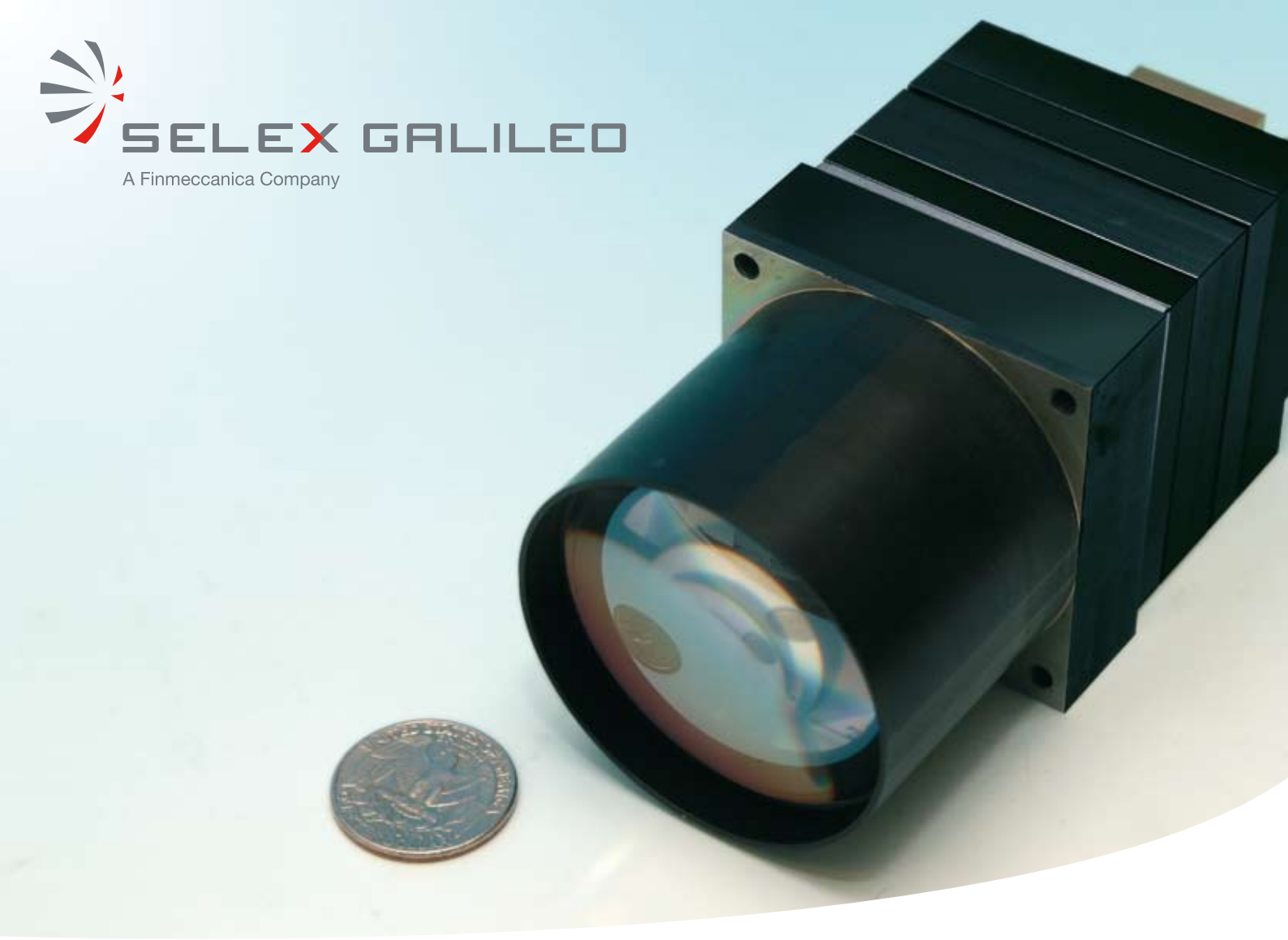


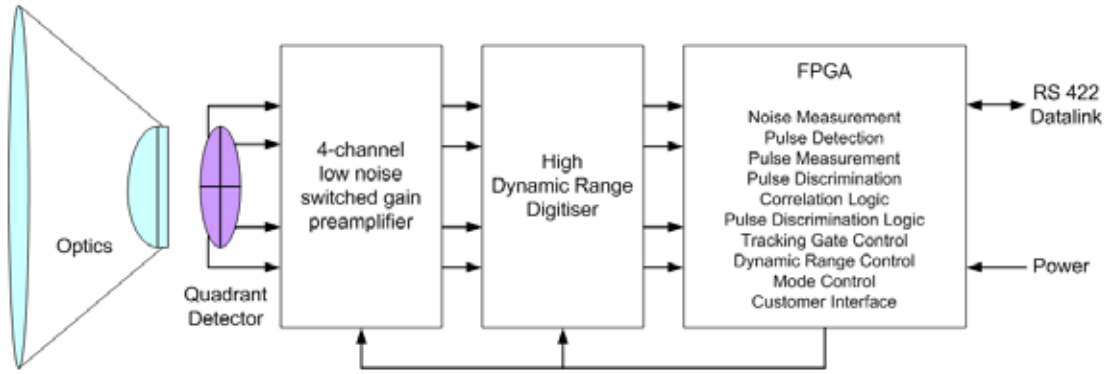
LASER SPOT TRACKER 2ND GENERATION

The 2nd Generation Laser Spot Tracker (LST) is a gimbal mounted sensor designed for airborne detection & tracking of STANAG 3733 Band I & II as well as user-programmable Pulse Interval Modulation encoded 1064 nm pulsed laser designated targets.

Laser energy enters the system through an optical telescope which focuses the laser energy on a silicon quadrant PIN photodiode. The target is detected by correlation of the incoming pulse stream. The laser energy falling on each quadrant of the detector is reported via the interface.
Typically this information is used to calculate the angular position of the target relative to the mechanical mounting interface and generates a target detection symbol overlaid and harmonised with a form of situational awareness system, for example FLIR. This can be made available to the pilot on the HUD or other display as a representation of the target position.

The LST is provided in a standard small outline package, however as it is designed around a flexible 2nd generation chipset, it can be configured to suit various applications and space envelopes by appropriate design of the optical system, detector, and chipset packaging (electrical & mechanical).
Standard communication with the unit is via an RS 422 link which provides a moding, setup, test and reporting interface. The Message structure provides comprehensive control of signal acquisition & tracking characteristics.

Alternative interface designs are available.



Functional Diagram

TECHNICAL SPECIFICATIONS

Standard small outline package

Sensor Type	
	Silicon quadrant PIN photodiode.
Encoding	
	STANAG 3733 Bands I & II plus. user-programmable PIM, 15 ns – 25 ns pulse width.
Spectral Response	
	1064 nm, with 40 nm narrowband optical filtering.
Optical Clear Aperture	
	50mm
Field-of-View	
	9˚ +/-0.25˚
Boresight Accuracy	
1.0mRad per axis at 10 x Minimum Detectable Signal (MDS).	
The optical system is accurately aligned to the mechanical mounts, which are in turn used to accurately align the sensor within its host environment.	
The sensor does not require any inertial navigation data, as it has no moving parts. Space stabilisation is left to the host sightline controller	
The LST must be mechanically harmonised with other sensors.	
Communications	
	Full duplex 1 Mbps RS 422 communications link
Dynamic Range	
Full Specification	MDS to 32,000 x MDS
False Acquisition	
	1 per hour (no laser energy)
	4 per hour (4 unselected valid laser codes within FOV)
Sensitivity	
Minimum Detectable Signal (MDS)	typically < 35nW/cm2 (dependant on available aperture)
Minimum Trackable Signal (MTS)	typically around 2.5 x MDS.
Bang-Bang tracking data is available between MDS and MTS, providing a course tracking mode.	
System Electrical Requirements	
+12V Analogue	+12 Vdc +/- 5%, 350 mA maximum low noise and ripple
+5V Analogue	+5 Vdc +/- 5%, 700 mA maximum low noise and ripple
-5V Analogue	-5 Vdc +/- 5%, 300 mA maximum low noise and ripple
+5V Digital	+5 Vdc +/- 5%, 350 mA maximum low noise and ripple
Power Dissipation	7 Watts typical

Environment

Operating temperature range	-40°C to +71°C
Storage temperature range	-55°C to +85°C

Thermal Interface

Cooling is conductive via a thermal path through the mounting interface

Mass

350 grams

Size

95 x 55 x 55 (mm)

Built in test

On-board BIT

Last Pulse Logic

The LST chipset incorporates a Last Pulse Logic processing scheme to ensure that the reported target position is the true target and not a ground designator or ground clutter. Returned pulses can be discriminated if they are separated by more than 120 ns.

Moding

The system has Power Save, BIT, Standby and Operate modes. In Power Save mode, the system implements a partial shutdown and draws minimal power. In BIT mode the system performs a self test including an end-to-end test, using front end test pulse injection, and reports the results over the serial link. In Operate mode the system searches for the specified PRF and reports the angular position of the first such target found. The target is then tracked and the angular position reported until either the target is lost, or the system is commanded to either go to Standby or search for a new target.

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