EL3VT2 (Vehicle Tracker)

EL3VT2 is a heavy duty Sigfox tracking sensor for vehicle applications. Its ultra low power design allows battery life of many years from internal batteries and full tracking applications when external supply is present. EL3VT2 has a built in GPS / GLONASS / GALILEO system to locate vehicles in the field complemented by a Temperature sensor and an operating hours counter. External supply voltage and up to 3 additional voltage inputs can be measured periodically and sent to Cloud. With its integrated operating hours meter the EL3VT2 can count the vehicles operating hours while external supply is present. While at rest the behavior of EL3VT2 is controlled by an internal timer to send periodic messages and sensor values. With its wide Temperature range and rugged design EL3VT2 is built for heavy duty applications in logistics, construction and agriculture. The device behavior can be controlled via Cloud configuration setup which will be requested by the device once per day.

Features

- Built in Sigfox Radio at 868,13 MHz with integrated antenna
  RZ1 radio zone support

- Hardware timer to activate the device for periodic radio messages at 30nA

- periodic radio messages when external supply is present and an additional message when external power is removed

- built in temperature sensor

- internal 5 years industrial battery with battery voltage monitor

- IP69 rugged housing

- -20 .. +60°C outdoor temperature range

- external supply input from 8 – 28V for vehicle operation.

- 3 voltage inputs for external sensors

- Multi-GNSS engine for GPS, GLONASS and GALILEO

- Built-in LNA for better sensitivity
  165dBm@Tracking
  148dBm@Acquisition

- EASY™, advanced AGPS technology allows ultra fast acquisition

- down to 2,5 m resolution

- Anti-Jamming, Multi-tone active interference canceler

- integrated patch antenna

- quick position fix even at indoor signal levels with low power consumption

Functional description

EL3VT2 will be activated by an external supply voltage and send its position data and temperature periodically via the Sigfox radio connection. When external supply is removed, an additional telegram is send containing position and operating hours of the device. Without external supply, the device is activated once per day by an internal timer and it will send position, temperature and orientation data to the Cloud. Once per day the device will request a configuration data packet from the Cloud to adjust configuration settings of the device. Motion sensitivity and timing can be adjusted over the Cloud once every 28 hours.

Specifications

Absolute maximum ratings

Description	Min	Max	Unit
Storage Temperature	-40	70	°C
Maximum Shock		200	g
Humidity	5	100	%
External supply voltage	-150	32	V
Input Voltages	-32	32	V

Operational ratings

Description	Value
Sigfox radio zone	RZ1
Radio output power	+14 dB m
External supply voltage	8 – 32 V
External supply current	30 mA at 12V typ
External voltage measurement range	0..25,5 V
Input resistance (Inpu1..3)	> 110 kOhm
Operating hours counter	6 min resolution
Operating Temperature	-20..55 °C
Battery life at 25 °C	5 years
IP code	IP69 (EN60529)
mounting	M4 screw or cable tie
External cable connections	1 mm² / 100 mm
weight	180g
Dimensions (Length, Width, Height)	101x51x33 mm

Timing Specification
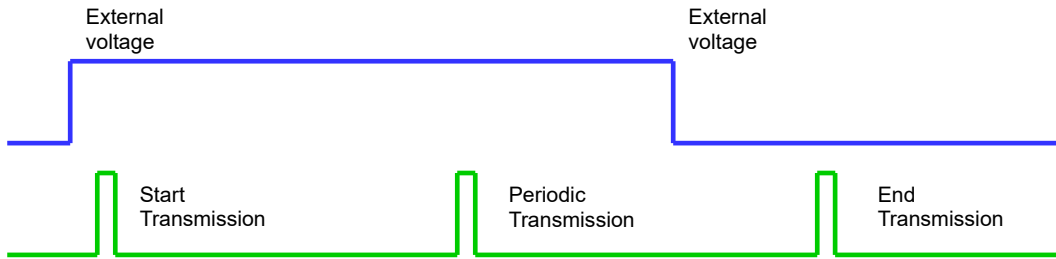
External supply is detected when the voltage is minimum 8 volts. The device will start sending its first data packet immediately after external voltage is supplied and will then send periodic data packets with a default timing of 15 minutes. When the external supply is removed, a special end of external supply packed is sent to ensure that the last position of the device is captured. All setup configurations can be changes once per day when the device checks for a configuration change with a special protocol packet. While operating under external supply, the device will send position data every 15 mins and external input voltages and operating hours approximately every 45 minutes.

While not in external supply mode, the device will be controlled by an internal timer which will turn the device on every 2 hours and will check configurations to send keep alive messages every 6 hours. The behavior is set by default to transmit Temperature, Operating hours and Battery voltage every 3 times which equals to 6 hours. Once per Day the device will also send its location data and request a new configuration from the Cloud server. Timing of these messages can also be changed with the cloud configuration. Operating hours are sent every 15 minutes when external supply is present and at when external supply is removed.

	Operating mode		
Sensor	Timer	External power	Ext power off
timing	12 h (*1)	15 min	
GPS	24 h	Every 7,5 min (*2)	Last location
Temperature	28 h	-	
Battery voltage	28h		
Operating hours	12 h (*1)	Every hour	total hours
External voltage	-	Every hour	-
Input 1	12 h (*1)	Every hour	-
Input 2	12 h (*1)	Every hour	-
Input 3	12 h (*1)	Every hour	-
Config. request	28h		

(*1) timing can be changed by user

(*2) GPS Data is sent every 15 Minutes containing actual coordinates and relative position at (-7,5) minutes resulting in a tracking resolution of one data point every 7,5 minutes.

Datasheet ELOC3 VT2 Rev 1.6

Mounting Specification

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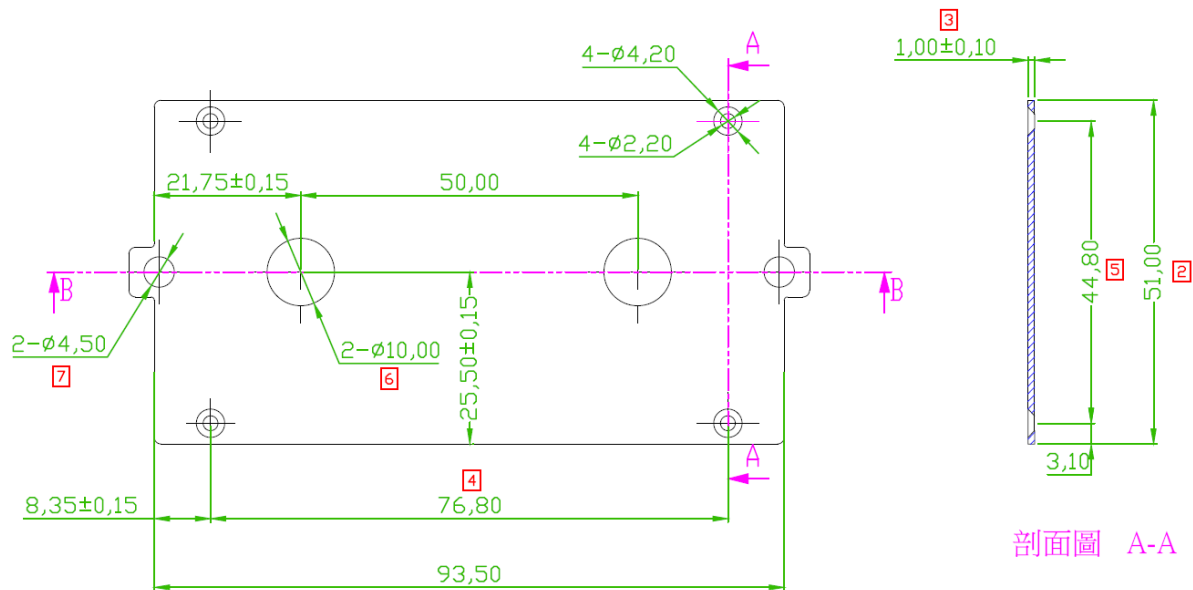
Sensor Specifications

Temperature Sensor

The device contains a temperature sensor that measures the device internal temperature. Quick external temperature changes will not be detected internally.

Temperature Range: -40 .. 85 °C

Resolution: 0,5 °C

Accuracy: +/- 2 °C

Battery Voltage

The internal battery voltage is measured to monitor the battery's condition and early detect low battery conditions. The battery voltage depends on the battery temperature and can vary from 2,5V to 3.1V over the full temperature range from -20 to 60 °C. To determine battery health, voltage and temperature has to be considered.

Resolution 0,1 V

GPS / GLONASS / GALILEO Sensor

The location Sensor detects Geo-location using GPS or other standard Systems. For good and fast Acquisition of the Sensor the device should be mounted flat so that the top of the device has a clear view to the sky. Indoor location may work but the acquisition times are high and therefore battery life will be lower. Geo-location is detected in -180 to +180 Degrees East – West and -90 to +90 Degrees from Equator to Pole. The device location data do not contain height information.

Datasheet ELOC3 VT2 Rev 1.6

External inputs

The Device can connect 3 external sensors with voltage outputs or measure battery voltages up to 25,5 Volts.
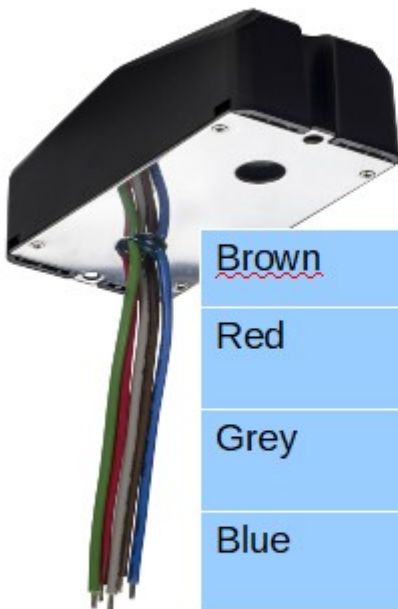
Resolution 0,1 V

Accuracy + / - 0,15 V

Operating hours counter

The Device has a built in operating hours counter to determine operating hours of the vehicle. The Oph counter increments the total operating hours with an internal 5 seconds resolution when external supply voltage is present.

Cable connection

Brown	GND	Ground
Red	Power	8..28V
Grey	Input 1	0..25V
Blue	Input 2	0..25V
Green	Input 3	0..25V

Device Activation

The device is not powered while shipped to avoid radio transmissions during shipping and especially on airplanes. The device will be activated and stay activated for the whole lifetime when first time external power is supplied.

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