



ELT with Tracing

General description:

This ELT501 ELT/Tracer is a very compact satellite receiver/transmitter that is designed to be used in any airplane (or vehicle) to protect it and to log its location all over the world.

Standard (GPRS/4G) tracers only operate when in reach of their network. The ELT501 will work at any location, on any land, on oceans, in deserts or on the highest mountains.

Other ELT systems in the market all use an external antenna to communicate with the satellite system, so when an accident would happen, most of the time the antenna cable will be broken and thus the antenna disconnected. That is the main reason why ELTs don't do their job in case of a serious accident. The ELT501 has build-in antennas for GPS reception, RF modem communication AND satellite communications! There are no external devices that can be destroyed. The only connection to the airplane are the external power supply and a push-button with build-in LED for the pilot to operate the ELT501. In case of a disruption in the external power, internal battery will take over the operation of the device for days to weeks.

The ELT501 can be configured into several modes of operation. As soon as the external power supply is available, the ELT will start it's configured trace functions. By default it will transmit the airplane's actual location/speed/moving up-down-straight, battery voltage and if the external voltage is available, 3 times per hour. Also 2 digital inputs will be monitored (can be used to monitor 2 signals of the airplane).

When an alarm occurs, a special alarm message will be send.

During parking of the airplane, the ELT501 is OFF but can be configured to transmit a location message 1 to 3 times per 24 hours.

Applications:

- > ELT functions for airplanes (not certified).
- > Location logging.
- > Registration of airplane rental (with positioning).
- > General tracing of airplanes (and vehicles).
- > Automatic operation time registration
- > Protection against theft.

Features:

- > Small size of only: 160 * 80 * 32 mm
- > External power supply 9V to 28V
- > Low power active consumption of about 15mA
- > Satellite transmitter with build-in antenna
- > Internal GPS receiver with build-in antenna
- > Internal RF modem 868MHz with build-in antenna
- > 3-axis angle/G-force sensor with FALL detection
- > Internal rechargeable battery with charger
- > Push button with build-in LED (separate)
- > RS485 multi-drop interface (bus system with other Rextron-Aviation modules and master controller)
- > 2 digital inputs to monitor 2 signals of the airplane
- > 99 messages can be send per month. This number can be increased on demand (for a small amount).

Detection of:

- > Overspeed (but based on GPS speed, not airspeed)
- > Angle too big (roll and pitch)
- > G-forces too high.
- > Falling (usually leading to a crash)
- > 2 digital inputs (could be used to monitor 2 signals of the airplane, fe temperature, oil level, fuel level...)

Ordering information:

- 65001001 ELT501 with RS485 interface.
- 65001003 as 65001001 & internal battery.
- 65001005 as 65001003 & black box functions.

Power supply:

The ELT501 works on an external voltage supply of 9 to 28V and consumes less than 15mA during standard operation. When the internal battery is charged, the current consumption goes up to 120mA (at 12V external supply). As soon as the battery is fully charged, the consumption goes down again to idle consumption. When the external power is disconnected, the power consumption is 0.

When the external power would be lost in an alarm or trace operation, the internal battery takes over the operation from a few days (in alarm mode) to a few months in parked trace mode.

Interfaces:

The ELT501 comes with a build-in RF modem that operates at 868MHz. This RF modem can be used to configure the ELT501 via a PC with a host RF modem connected (separate device can be ordered from Rextron-Aviation).

When the ELT501 is in alarm mode, the RF modem will continuously transmit a data message containing important information of the airplane in trouble. These transmissions can be used to find the airplane's location in a range of about 10 to 25 kilometers.

Besides this RF modem, there is a RS485 multi-drop interface available so the ELT501 can be connected to RS485 busses that are often used to connect electronic devices in (small) airplanes.

The RS485 port uses a default Rextron protocol, but on request Rextron-Aviation can implement any protocol provided by others.

From Rextron-Aviation a "master controller" can be obtained that allows the ELT501 (and all other Rextron-Aviation products with a RS485 interface) to be connected to a PC.

The RS485 interface can be used as a single line connecting to a host over up to 1200 meter (!) or up to 30 products from Rextron with a RS485 interface can be connected on 1 RS485 interface line in a so-called "multi-drop" way.

In order to communicate with the right device, each Rextron_Aviation product has its own "UAC address" consisting of 1 byte, send as 2 ASCII characters.

For this ELT501 it is set to 51 by default but can be changed to 52, 53, 54 or 55 too, so even 5 pcs of this product could be connected to 1 RS485 line and they can be addressed by sending the correct UAC in the protocol used on the RS485 line. (See: Multi-drop protocol for details).

If the RF modem is used to configure the ELT501, a host RF modem will be needed (available from Rextron-Aviation) that can be connected to a PC.

On the PC any terminal-emulation program can be used to configure the ELT501.

The host RF modem needs to be connected to a COMport of the PC (or use a USB to RS232 conversion cable) and the included 12V power supply connected to a 90V to 220V outlet.

The PC terminal emulation program must be configured for a port speed of 19200 Baud, 8 bits, No parity and 1 Stopbit. Hardware handshaking off.

Then the ELT501 internal RF modem needs to be turned on by simply push the push-button shortly.

If the ELT501 was not on yet, it will be turned on and the LED in the push button will then start to blink at a 1 sec interval.

If the airplane is outside and GPS signals are available, after some time the LED will be ON steady, showing that the GPS has a fix.

Now the internal RF modem will be on and ready to receive commands and settings from the PC.

See "RF modem commands & settings" below for details.

Push button:

A push-button with build-in LED will usually be installed together with the ELT501. Depending on the active mode of the ELT501, the LED will operate as following:

Blink in a 1 second interval	: the ELT501 is waiting for a valid GPS fix.
Steady ON	: the ELT501 has a GPS fix so it knows the location, speed, altitude and course.
Blink fast	: the ELT501 is in alarm mode.
Flash	: the ELT501 is in calibration mode (set the home/base GPS location).