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Orolia S.A.S. - A Company of the Orolia Group

DONGLE IF-GPS RS232

Description, Installation, Operation Manual

P/N S1820514-08

Users are kindly requested to notify Orolia S.A.S. of any discrepancy, omission or error found in this manual.
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1. INTRODUCTION

1.1. General

The Dongle IF GPS RS232 is designed to be connected between an INTEGRA ELT and an on board GPS equipment (For Compatible GPS and specifications, refer to § 7.3.2 GPS and to § 7.4. Specifications). It permanently receives the on board GPS data and stores them until an eventual ELT activation. These data are included in the 406 MHz message being transmitted to COSPAS-SARSAT satellite system to accurately identify the ELT position in the event of ELT activation.

The Dongle IF GPS RS232 is also designed to be connected to a Remote Control Panel installed in the cockpit of the aircraft.

This equipment is independent of the aircraft power.

This manual contains information to install the Dongle IF GPS RS232, Part Number S1820514-08.

1.2. Specific functions

The Dongle IF GPS RS232 is an on board GPS interface adapter cable also fitted with an integrated programming dongle.

As Programming Dongle and on board GPS interface, it is intended to fulfill:

- The function of a programming dongle:
  - to download the COSPAS-SARSAT ID code and the aircraft information into the ELT on board.
- The function of an interface between the ELT and the on board GPS equipment:
  - to interconnect the ELT with the on board GPS equipment;
  - to store the External Navigation Device data.
- The function of an ELT / RCP cable:
  - to interconnect the ELT with the Remote Control Panel for testing and activating the ELT from the cockpit.

2. SYSTEM PRESENTATION

2.1. Dongle IF GPS RS232

The Dongle IF GPS RS232 is composed of:

1. A MD Series 680 DIN-12 male connector on the ELT side.
2. A circular 12 ways PS female connector on the other side.

Figure 1: Dongle IF GPS RS232

The DIN-12 connector is used to connect the Dongle IF GPS RS232 to the ELT via its DIN-12 socket.

The circular 12 ways PS female connector is fitted with a PCB. The functions fulfilled by this PCB are:

- Programming the ELT with COSPAS-SARSAT ID code and the aircraft information in order to transmit the aircraft identification in the ELT 406 MHz long message.
- Memorizing the GPS data from the aircraft GPS NAV equipment in order to transmit the aircraft position in the ELT 406 MHz long message.
- Links between ELT and RCP.

2.2. Concept

The DIN-12 male connector (1 of Figure 1) is connected to the DIN-12 female socket of the ELT.

The circular 12 ways PS female connector (2 of Figure 1) is connected to an RCP/GPS NAV Interface cable through a standard MD Series 680 DIN-12 male connector.

The relevant wires of the cable RCP/GPS NAV Interface cable are then connected in the aircraft cockpit to the Remote Control Panel of the ELT and to the aircraft GPS NAV equipment.

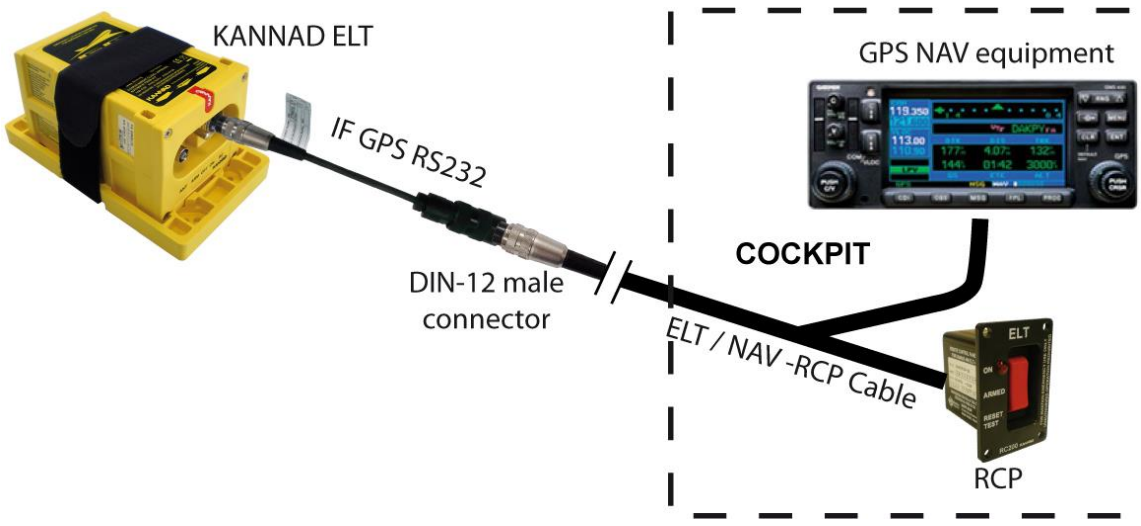


Figure 2: ELT / NAV-RCP Interface Concept

3. IF GPS RS232 INSTALLATION

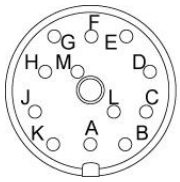
Note: maximum wiring length estimated from GPS on board and the Nav Interface = 20 meters.

3.1. Programming

Prior to installation, the dongle shall be programmed according to usual programming procedures (refer to the ELT commissioning guide)

3.2. ELT / NAV-RCP Cable connection

1. Fabricate a 6-wire AWG24 shielded bundle long enough to reach between the ELT installation location and the cockpit panel RCP and GPS equipment location.
   Note: for a connection with a RC102 RCP, only 4 wires are required.
2. Slide heat-shrinkable sleeves on both sides of each wire.
3. Solder the wires to pins A, C, G, H, J and L. to a MD Series 680 DIN-12 male connector, except when connecting a RC102 RCP. In this case solder the wires to C, K, L and M.
   Note: refer to Figure 3 for pin out of DIN-12 male connector.
4. Put heat-shrinkable sleeves to protect the pins.
5. On the RCP and GPS equipment side, solder the wires according to Section 5 Connecting Diagrams.
6. Put heat-shrinkable sleeves to protect the pins.



Ref. BINDER
09-329-00-12

Figure 3: DIN-12 Connector, View from Back Face of Insert

3.3. IF GPS RS232 connection

Connect the circular 12 ways PS female connector (1) of IF GPS RS232 to the DIN-12 male connector (2) of the ELT/NAV-RCP cable.

Connect the DIN-12 male connector (3) to the DIN-12 female socket of the ELT.

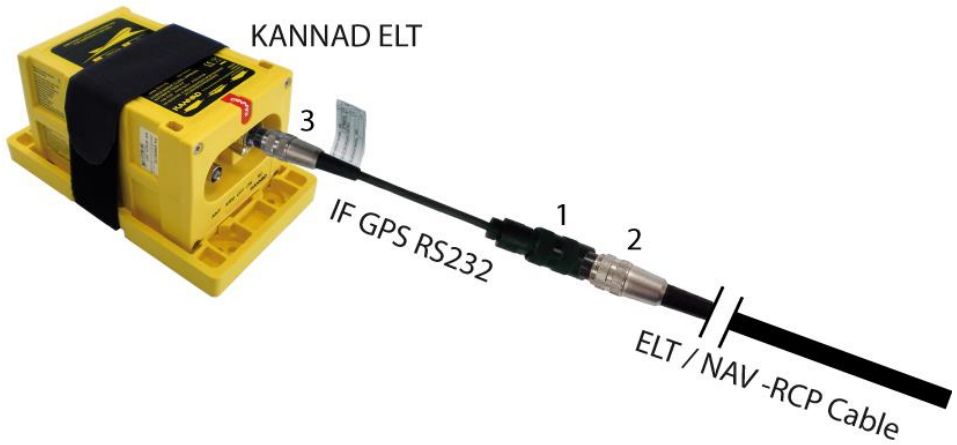


Figure 4: IF GPS – ELT NAV-RCP Cable connection

CAUTION: The Dongle IF GPS RS232 already includes a programming dongle function. In case of retrofitting an existing installation already connected to a programming dongle, the use of 2 dongles together is forbidden. Remove the former programming dongle, program the Dongle IF GPS RS232 with the programming data of the former programming dongle, then connect the Dongle IF GPS RS232

4. First Power Up Procedure

This procedure can only be performed by the installer, as it requires specific equipment such as a WS TECHNOLOGY BT100 or any equivalent COSPAS-SARSAT beacon decoder (AEROFLEX IFR 4000 opt1 for example) capable to be connected to the BNC connector of the ELT in order to decode a COSPAS-SARSAT digital message at 406.037 MHz.

4.1. Check of on board GPS equipment

- Check that the RS232 link of aircraft GPS equipment is activated (refer to the GPS equipment relevant manual).
- Switch the GPS equipment to ON.
- Wait for the acquisition of a GPS valid position on the GPS equipment.

4.2. Position Data Verification

CAUTION: Position data verification can only be checked if the ELT is activated. Never perform position data verification by checking the position data with the external antenna connected; in this case the 406 MHz would be received by the Cospas-Sarsat Satellites and interpreted as a real distress message. To avoid that, connect your beacon decoder to the external antenna output connector.

4.2.1. Tester Connection

- Disconnect the antenna cable from the ELT antenna connector
- Connect a Cospas-Sarsat tester to the antenna connector of the ELT as shown figure below:

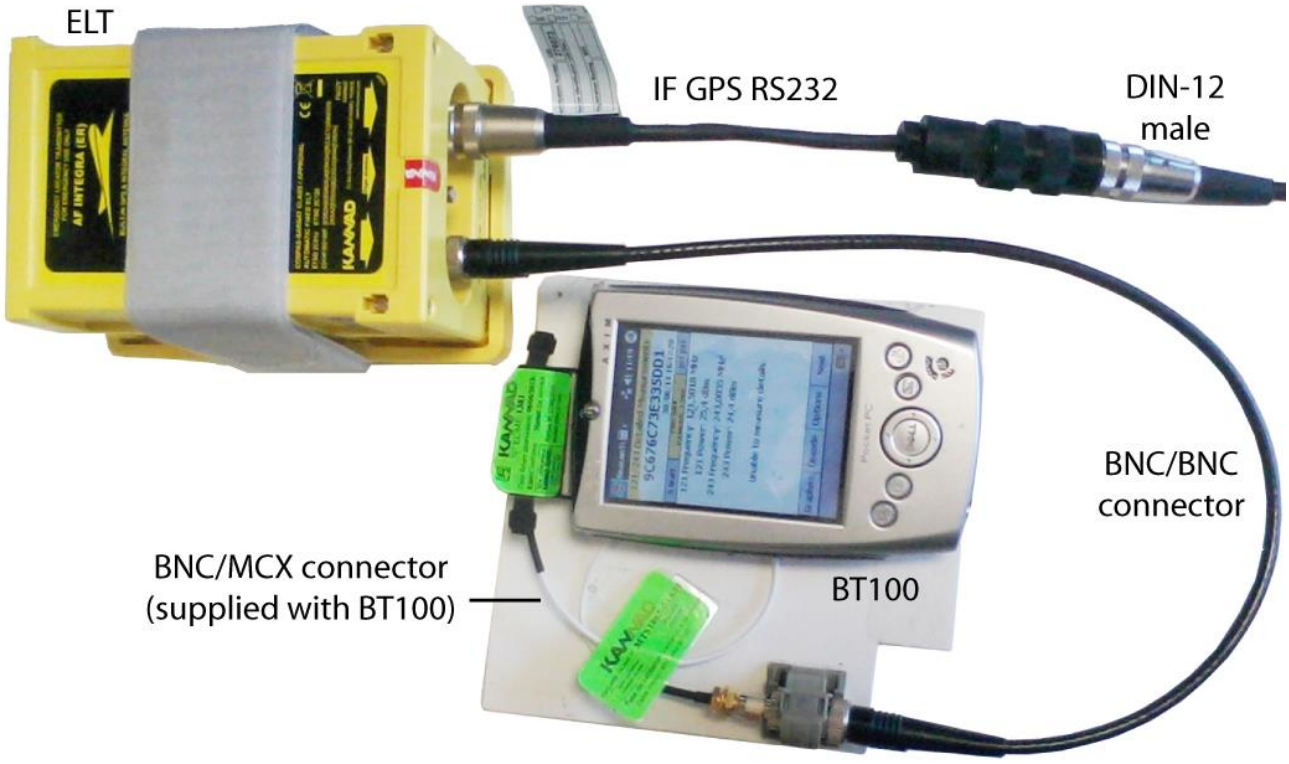


Figure 5: Example of BT100 Connection with ELT

4.2.2. Test preparation

CAUTION: If both internal and external GPS sources are available, the internal source is used.

To check the external GPS, make sure that the internal GPS is not locked. Depending on the sky view, the internal GPS sometimes locks even before the first burst at 50 seconds.

To make sure that the internal GPS will not lock, obstruct the top of the ELT to make sure it doesn't face the sky.

NOTE: The best way is to wrap the ELT in aluminium or copper foil.

4.2.3. Validation Procedure

Note: For ELT operation, refer to the relevant ELT Operation Manual.

- Connect the GPS equipment to the IF GPS RS232 and wait 60 seconds.
- Switch the ELT to ON.
- Wait for the result of Self-Test.
- Wait at least 50 seconds until the first 406 MHz burst be transmitted by the ELT.
- Read the position data on the Cospas-Sarsat tester.
- Make sure it comes from the external GPS
  NOTE: Some beacon testers clearly display the Position Source: (Internal or External GPS).
  If your beacon tester is not able to display the position source, you can check the position source as follows :
  - ***Go to http://www.cospas-sarsat.org***
  - ***Select Beacons → Beacon message decode program***
  - ***Type the 30 last characters of the full message transmitted by the ELT, tick the 30 Hexadecimal box and click "Process":***
    - ***The bit 111 (bit 107 in user Loc. Protocol) will indicate position data source.***
- Check that this position matches with the GPS equipment's position (**see CAUTION below**).
- Switch the ELT to ARM.
- Disconnect the Cospas-Sarsat tester.
- Connect the antenna cable to the antenna connector of the ELT.

CAUTION: according to the protocol used, the position transmitted by the ELT is rounded off to 4 seconds or 4 minutes (see table below extracted from CS G005 standard):

Identification data	Location Data	Protocols
Unique ELT Serial Number	4 minutes	User Location(1)
	4 seconds	Standard Location
Aircraft Operator Designator & Serial Number	4 minutes	User Location(1)
	4 seconds	Standard Location
Aircraft 24-bit Address	4 minutes	User Location(1)
	4 seconds	Standard Location
Aircraft Registration Marking	4 minutes	User Location
Serial Number Assigned by Administration	4 seconds	National Location(1)

Note (1): These protocols are not available by default in Kannad e-Prog Software

5. OPERATION

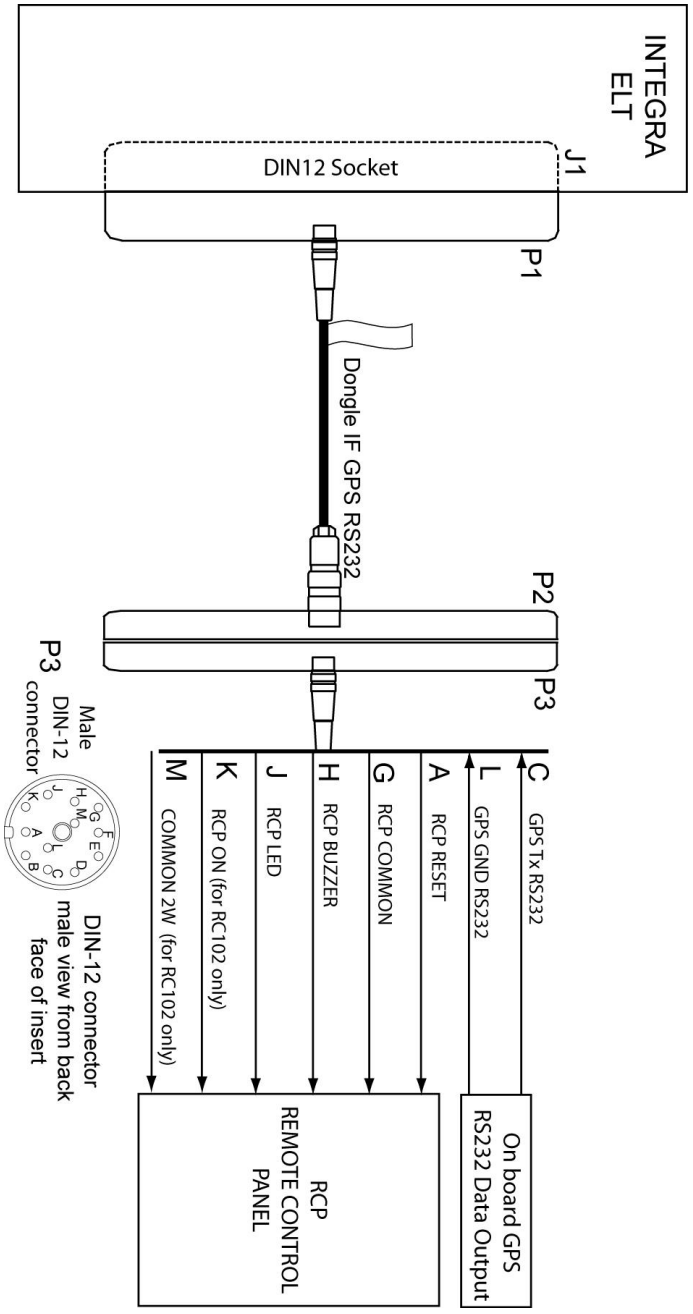
Note: For ELT operation, refer to the relevant ELT Operation Manual.

- Switch the ELT to ARM (refer to the relevant ELT Operation Manual).
- The ELT performs a Self Test.
- Check that the result of Self Test is not faulty.
- This position will be transmitted 50 seconds after ELT activation (manually by switching to ON position or automatically if a crash occurs). The current position will be transmitted 50 seconds after ELT activation.

6. CONNECTING DIAGRAM

NOTE: RCP mating connectors and relevant RCP pin-out inputs are defined in the INTEGRA ELT initial installation Manual supplied with the ELT.

For complete instructions and specifications, this manual can be found on Kannad Aviation download area.



7. TECHNICAL CHARACTERISTICS

7.1. Weight and Dimensions

- Dimensions: 350 x 20.7 (13.778 x 0.815 in.)
- Weight: 78 g. (0.167 lbs) typical

7.2. Environmental Characteristics

Storage temperature: -50°C to +85°C

DO-160F ENV. Cat. [[ED62]XBA[ED62]RXRXXXXZXXX[ZC]LH[XXG33]XXAX

.ENVIRONMENTAL CATEGORIES FORM FOR Dongle IF GPS RS232		
TESTS	DO-160	CATEGORY
Temperature and altitude	4	§ 4.4.1 / ED62A
Low Temperature	4.5.1	§ 4.4.1 / ED62A
High Temperature	4.5.2 &	§ 4.4.1 / ED62A
In-Flight loss cooling	4.5.5	X
Altitude	4.6.1	ED62A (Class 1) 50,000 ft.
Decompression	4.6.2	X
Overpressure	4.6.1	X
Temperature variation	5	B
Humidity	6	A
Operational shocks and crash safety	7	ED62A Special 500g-4ms / 100g-
Vibrations	8	R(1)
Explosion	9	X
Waterproofness	10	R
Fluids Susceptibility	11	X
Sand and Dust	12	X
Fungus	13	X
Salt Spray	14	X
Magnetic Effect	15	Z
Power Input	16	X
Voltage Spike	17	X
Audio Frequency Susceptibility	18	X
Induced Signal Susceptibility	19	ZC
Radio Frequency Susceptibility	20	L
Emission of RF Energy	21	H
Lightning	22	XXG33
Lightning Direct effects	23	X
Icing	24	X
Electrostatic Discharge	25	A
Fire, Flammability	26	X

Note (1): According to SPX902A0002E01 Issue E Section 5.1 Group 1, 2, 3, Zone B

7.3. Compatibility List

7.3.1. ELT

- INTEGRA AP (ER) : P/N S1850501-01
- INTEGRA AP : P/N S1850501-02
- INTEGRA AF (ER) : P/N S1851501-01
- INTEGRA AF : P/N S1851501-02
- INTEGRA AF-H (ER), : P/N S1852501-01
- INTEGRA AF-H : P/N S1852501-02
- INTEGRA AP-H (ER) : P/N S1854501-01
- INTEGRA AP-H : P/N S1854501-02

7.3.2. GPS

- GARMIN GNS 430.
- All GPS compatible with NMEA 0183 based on RS232 standard (see § 7.4 Specifications).

7.4. Specifications

- Interface via RS232 data bus format.
- GPS data output: NMEA-0183 Protocol compatible:
  - Speed: 4800 / 9600 bauds.
  - Parity: None.
  - Data bits: 8.
  - Stop bits: 1.
  - Sentence format: GPGGA, GPRMC, GPGLL.
  - RS232 output voltage: [± 9 V … ± 12 V].

8. SERVICING

Maintenance on demand only. No periodic inspection is required.

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