



ELT Programming Training

The Global Leader in Resilient PNT
Providing the world's most critical applications real-time, accurate,
reliable positioning, navigation, and timing data.

Safety, Security and Reliability



*DOC21053A
Ed. October 2021*



HIGHLIGHT OF REVISIONS

This document DOC21053 "ELT PROGRAMMING TRAINING" supersedes the "programming" related sections of the obsolete DOC100060 "ELT COMMISSIONING TRAINING".

The full ELT COMMISSIONING TRAINING is now referenced as DOC21052, used for On-Site training only.

Rev A, October 2021, original document

INTRODUCTION TO PROGRAMMING TRAINING

Thank you for reading this documentation and for your confidence in Kannad ELT products.

You are kindly requested to notify Orolia of any discrepancy, omission or error found in this manual. Please report to our [Customer Support](#)

Objectives of the Kannad ELT programming online training

- Understand the ELT and Dongles concept
- Understand the programming protocols
- Be able to install e-Prog and the PR600
- Be able to program an ELT and a dongle
- Be able to check the programming of ELT/dongle
- Be able to produce the associated paperwork



GENERAL PRESENTATION OF OROLIA SAS

OROLIA PROFILE



EU Headquarters
in Paris France

US Headquarters
in Washington DC



Global Employee
Base

Focus on Internal
self-funded R&D
and Innovation



A commercial presence
in more than 100
countries



Built through
Worldwide-
renowned
brands
in target segments

spectracom

spectratime

mcmurdo

kannad

SARBE

netwave

skydel

TALEN-X





A PRESENCE IN MORE THAN 100 COUNTRIES



WHO WE ARE

Part of Orolia Group, Orolia SAS is a world leader with more than 20 years of experience in the supply of Search and Rescue distress beacons for the Aviation and Military industry.



History

- SERPE-IESM created in 1976 (1986 Mobile Safety department)
- Joined the MARTEC group in Feb 2002
- In 2007, creation of KANNAD SAS
- In 2009, KANNAD SAS joins the Orolia Group
- In 2011, KANNAD SAS acquires SARBE
- In 2012, KANNAD SAS becomes Orolia SAS
- EN 9100 - ISO9000 - PART 21, subpart G, subpart O
- EASA / FAA / TCCA Part 145 Repair Centre





THE KANNAD ELT SYSTEM

KANNAD ELT HISTORY

ELT = Emergency Locator Transmitter

Transmit on 2 or 3 frequencies :

121.5 MHz

243 MHz (not on Compact/Integra)

406.0xx MHz

121.5/243MHz are called "Homing" frequencies.

Analogue audio signal

406 MHz burst

Digital message containing identification data

Can contain position data with optional NAV-ELT interface or integral GPS

More than 80 000 ELTs delivered

1995
Kannad 406 ATP



1998-2005
406 AF



2002-2006
406 AS /
Survival



2008
Compact



2010
Integra
AF / AP



Helicopter versions
AF-H / AP-H



2015
Integra
e-Nav



Ultima-S



Ultima-DT



2022

Next generation ELT

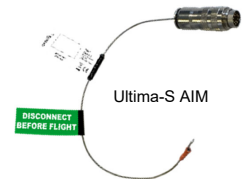
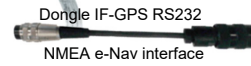
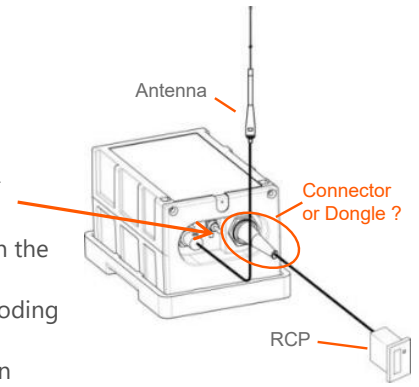
2022

Helicopter versions
406 AF-H, 406 AP-H

General Aviation

DIN12 CONNECTOR AND DONGLES

- A DIN12 connector is used to connect the ELT to the RCP.
- This connector can include a memory module containing the coding information of the ELT. It is called a "Programming Dongle".
- In fixed installation (AF, AP...) the dongle is permanently attached to the ELT side of the RCP* cable.
- In survival installation (AS, Survival...) the dongle can be stored in the mounting bracket or in the carry-off bag.
- To program an ELT from a dongle, connect the dongle to the ELT, then switch to ARM. The coding information is transferred from the dongle to the ELT.
- Once the ELT is programmed, if the dongle is removed, the ELT keeps the coding information previously downloaded from the dongle.
- To restore an ELT back to factory programming (test protocol), use a maintenance dongle.
- If you are not sure whether you have a dongle or a simple DIN12 connector, look at the P/N of the connector : S1820514-03 is a connector, other P/Ns are dongles.
- For more information about dongle identification, you can refer to the FAQ "How to reprogram my ELT/Dongle ?" online decision tree on our [Kannad ELT Support](#) page.



* RCP = Remote Control Panel

ELT-NAV INTERFACE KIT (KANNAD 406 ELT ONLY)

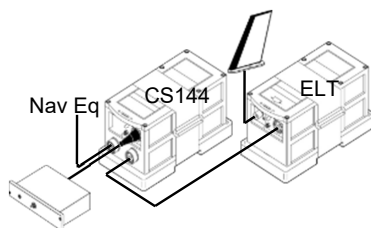
A programming dongle is mandatory when using the CS144.

The CS144 gets the identification of the aircraft from the dongle (short message).

The CS144 gets the position of the aircraft from the aircraft navigation equipment.

The CS144 combines the identification and the position to build a long message.

The long message is transmitted to the ELT via the ELT DIN12 connector.



A Programming Dongle for CS144 must be programmed in short message format. (like a standard ELT)
 Recommended protocol is « 24-bit address » for best position accuracy.
 Refer to CS144 documentation for more information.

COSPAS-SARSAT

COSPAS-SARSAT

- Identification of the Aircraft
- Precise positioning
- Global coverage

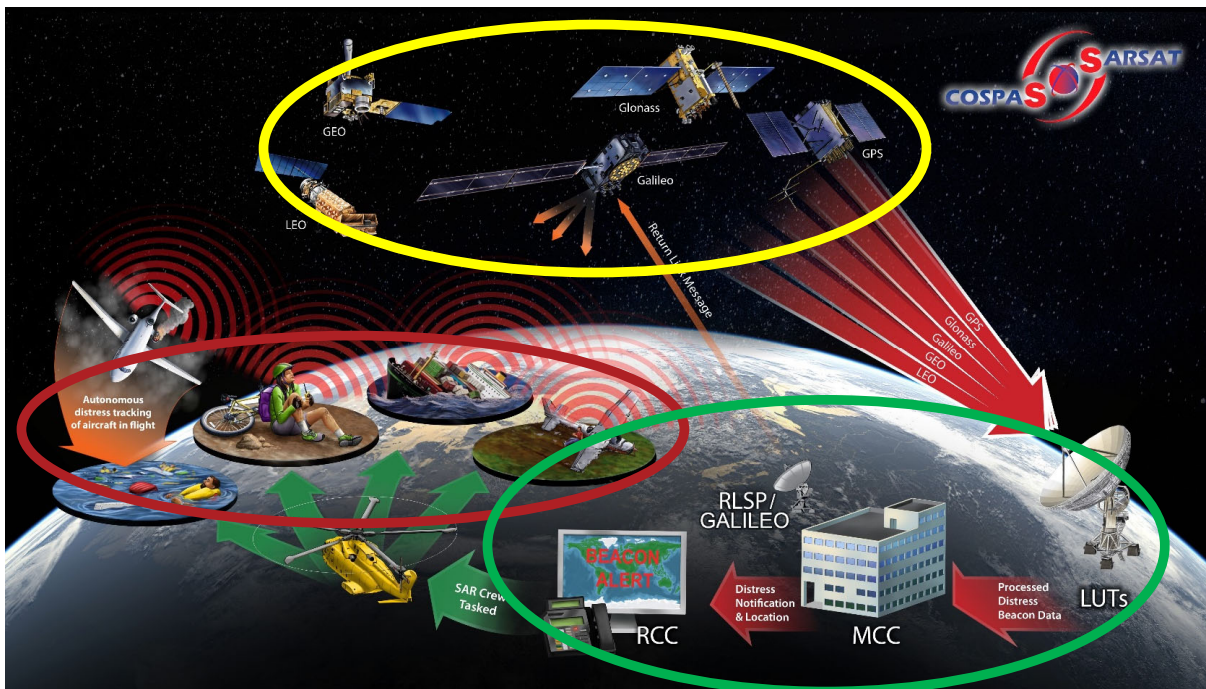


Distress Beacons :

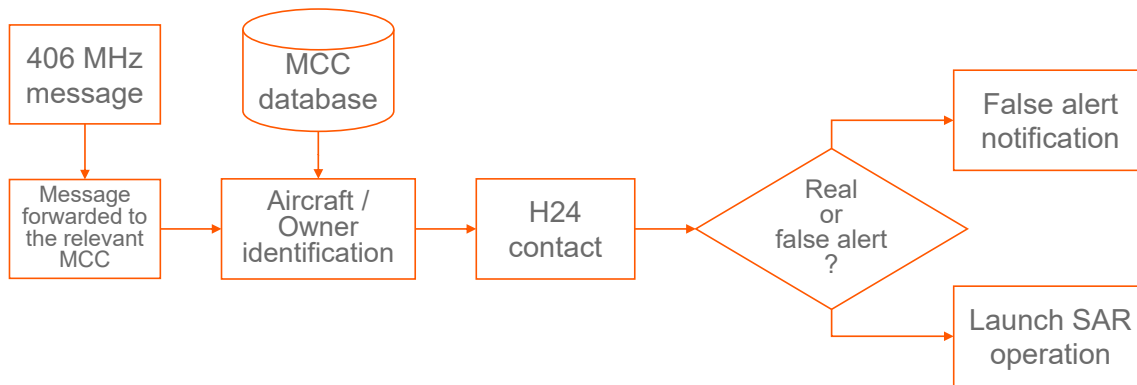
- Aircraft (ELTs)
- Marine (EPIRBs)
- Outdoor (PLB)

Space segment

Ground stations (LUT, MCC & RCC)



DISTRESS MESSAGE PROCESSING



Thanks to a shared database, SAR headquarters know the type of aircraft in distress as well as the color of the fuselage, the number of passengers...

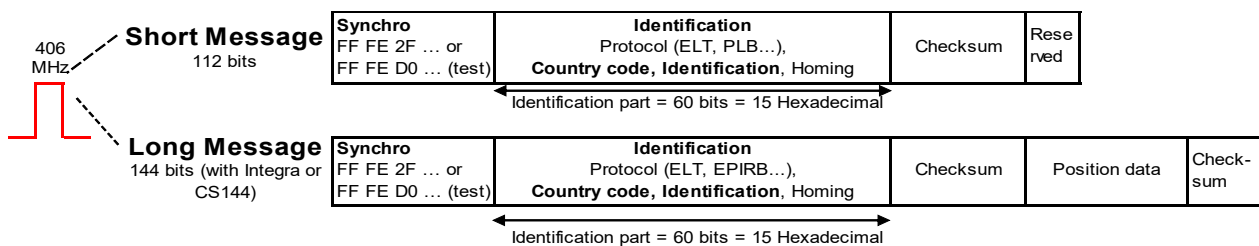
Knowing who is transmitting brings an efficient solution to false alarms

Orolia SAS holds its own database of Kannad beacons that can be used as a backup of the "official" database.

CODING PROTOCOLS

STRUCTURE OF THE DIGITAL MESSAGE (406MHZ BURST)

Once activated, the ELT transmits a 406 MHz data burst every 50 seconds



Short message (No ELT-NAV) = 112 bits = 28 hexadecimal chars.

Example of short message : FF FE 2F 4C 93 24 97 38 0B A6 06 F1 25 90

Long message (with Integra or CS144) = 144 bits = 36 hexadecimal chars.

Example of long message : FF FE 2F CC 93 24 97 38 0B A6 05 09 86 80 23 01 1E D3

In short or long message, the 60 identification bits can be noted as 15 hexadecimal characters called 15 Hex ID.

Example of 15 Hex ID : 9926492E70174C0 ← **This is a unique identifier for every single ELT in the world.**

INFORMATION ENCODED IN THE ELT "CODING PROTOCOL"

The coding protocol defines the type of information encoded in the "Identification" field of the digital message

An installed ELT must be coded (programmed) with one of these four protocols :

Protocols which identify the aircraft

- Tail number (T/N)
- 24bit address (ICAO)

Protocols which identify the ELT itself

- ELT Serial(S/N)
- Aircraft Operator Designator + serialised number (AOD)
- RLS

A non-installed ELT can be encoded with a test protocol ("Maintenance Code") to identify it as "ELTs not on board"

Details in document C/S G.005

<https://cospas-sarsat.int/en/documents-pro/system-documents>

COSPAS-SARSAT PROTOCOL SELECTION IN E-PROG

Many protocols exist in Cospas-Sarsat. e-Prog software proposes a limited choice, and will automatically select the best protocol according to the ELT or Dongle selected.

Example :

- If you select "ICAO" with a Compact ELT, it will generate a Serial User Protocol, Aircraft 24-Address
- If you select "ICAO" with an Integra ELT, it will generate a Standard Location Protocol, Aircraft 24-Address

If a customer requires an unusual protocol which doesn't natively exists in e-Prog, please contact Orolia for support using the feature "Import the code from an Orolia e-mail".

| Cospas-Sarsat protocols | USER PROTOCOLS | | | | LOCATION PROTOCOLS | | | | | | | | | |
|------------------------------------|--|--|-------------------------|---|---|--|-------------------------|---|---------------------|--|-------------------------|---|---------------------------|---------------------|
| | Serial User | | | Aviation User | User Location | | | | Standard Location | | | National Location | RLS (Return Link Service) | |
| | TAC & Serial Number or National S/N | Aircraft Operator Designator and Serial Number | Aircraft 24-bit Address | Aircraft Nationality and Registration Marking | TAC & Serial Number or National S/N | Aircraft Operator Designator and Serial Number | Aircraft 24-bit Address | Aircraft Nationality and Registration Marking | TAC & Serial Number | Aircraft Operator Designator and Serial Number | Aircraft 24-bit Address | Serial Number Assigned by Administration (National S/N) | National RLS Number | TAC & Serial Number |
| ELT version or dongle for such ELT | Kannad 406 ATP Kannad 406 AF[-H], AP[-H], AS, Survival Compact CS144* | | | | Integra / Ultima-S (not recommended) | | | | Integra Ultima-S | | | Integra Ultima-S | Ultima-S (RLS) | |
| Kannad e-Prog menus | S/N | AOD | ICAO | T/N | Contact Orolia | | | T/N | S/N | AOD | ICAO | Contact Orolia | Contact Orolia | S/N |

* CS144 converts a User Protocol into the equivalent Location Protocol.

CODING PROTOCOL : AIRCRAFT REGISTRATION MARKING

- also called T/N (tail number) protocol -

The ELT will transmit the Aircraft Registration marking (or Tail Number, T/N) "in clear"

The dash (-) can be omitted when programming the tail number.

It is possible to code up to 4 ELTs in the same aircraft with this protocol.

This coding protocol will also include the country code

This Protocol is **NOT RECOMMENDED for Integra and Ultima-S ELTs** and ELTs with CS144 NAV Interface : the transmitted position will be rounded to 4 minutes of LAT/LONG instead of 4 seconds of LAT/LONG in other protocols.

24bit address or Serial Number protocol should be preferred when using an Integra or a NAV interface

Example of identifier : F-BXRV, HBA6D, GCGAB, N86173

CODING PROTOCOL : AIRCRAFT 24 BIT ADDRESS

- also called ICAO 24 bit address protocol -

Unique number issued by the relevant Civil Aviation Authority

Also used to encode Mode S transponders or TCAS systems

International aircraft registry based on this number (ICAO)

Coded on 24 bits, noted in Hexadecimal notation

This coding protocol will also include the country code, the TAC*, and the rank on board (ELT number from 0 to 63)

Example of identifier : A379B1

ELT with NAV interface or ELT with integral GPS (Integra / Ultima-S) : Due to better accuracy of the GPS position, this protocol should be preferred to Tail Number protocol. However, the rank on board cannot be selected so only one GPS ELT per aircraft can be identified using this protocol

*TAC = Type Approval Certificate from Cospas-Sarsat,
selected from a drop down menu in the programming software

CODING PROTOCOL : SERIAL NUMBER

An ELT coded with Serial Number protocol will transmit a Serial Number which doesn't identify the aircraft.

Advantages:

- The ELT can be pre-programmed by the manufacturer or the distributor, as long as the country code is known, even if the aircraft identity is unknown yet.
- If the ELT is moved from one aircraft to another, no reprogramming needed. (but registration update with the relevant SPOC* is required.)

Note: If there is a dongle in the installation, the Serial Number protocol is not so interesting, because most of above advantages are covered by the dongle.

The serial number is assigned by the manufacturer (TAC** + Serial Number), it's either a CSN or an Automatic Serial Number.

- For ELTs/dongle without GPS and dongle for CS144 (User Protocols), the CSN of the ELT/Dongle will be used
- For Integra or Ultima-S (or their dongles), an Automatic Serial Number will be dynamically assigned by the e-Prog database.

Exceptionally, a few countries provide the S/N instead of the manufacturer "National Serial Number" (National Protocol)

- The programmer shall contact Orolia SAS or the local authorities to obtain a number before programming
- This number is issued only if "registration form" is duly completed (to ensure registration)

Example of identifier : 327634, 31, 453720

THE CSN

The CSN is a 6-digit number found on any Kannad ELT or Dongle label. It is a permanent identifier in e-Prog database. Over years the range of CSN has been as follows :

1995 – 2008 :
CSN from 300 000 to 399 999
2008 – 2012 :
CSN from 250 000 to 299 999
2012 – now :
CSN over 400 000

*SPOC = Sarsat Point Of Contact

**TAC = Type Approval Certificate from Cospas-Sarsat

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CODING PROTOCOL : RLS

Return Link Service (RLS) allows the RLS enabled beacon to receive an acknowledgment that the distress message has been received.

The RLS protocol is the only one to be used with RLS enabled ELTs.

- KANNAD ULTIMA-S-04
- KANNAD ULTIMA-S-14

Like others Serial Number protocols, the RLS protocol will encode the ELT with a Serial Number dynamically assigned by the e-Prog database.

National S/N - Exceptionally, a few countries provide the S/N instead of the manufacturer : NRN = National RLS Number



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CODING PROTOCOL : AIRCRAFT OPERATOR DESIGNATOR

Enables an airline to manage its fleet with a database to link the S/N with the aircraft.

As this database is handled by the airline:

- no need to update registration with SPOC
- no need to re-program ELT
- but H24 contact required

Note : this protocol is used by a very small number of operators. Page given for information only.

Identifier composed of the "three letter aircraft operator designator" + serial number from 0001 to 4096 (issued by airline)

NB : when using a CS144 ELT-NAV interface, Integra or Ultima-S, the serial number must be from 001 to 511

This coding protocol will also include the country code and the TAC*

Example of identifier : AFR 0027, AAL0153

*TAC = Type Approval Certificate from Cospas-Sarsat, selected from a drop down menu in the programming software

MAINTENANCE CODE (TEST PROTOCOL)

COSPAS-SARSAT has defined a protocol to identify an ELT as "ELT not on board"

Used as default factory coding for Kannad ELTs

New ELTs coded with

- Country code "France" 227
- Protocol : Test
- Identifier = "SI" plus the 5 last digits of the CSN or "K" plus the 6 digits of the CSN

New Programming Dongles programmed as "Maintenance Dongle"

- Will reset the ELT to Maintenance Code.

To program an ELT with a Maintenance code with e-Prog, use menu "Programming & Reading" → "Deprogram an ELT" or connect a "Maintenance Dongle" and switch ELT to "ARM".

When ELT programmed with a "Maintenance code", ELT self-test result is 3+4 flashes.

WHICH PROTOCOL TO SELECT ?

Depends on the country of registration of the aircraft. To determine the authorized protocol(s) and registration requirement, refer to :

- C/S S.007 [Handbook of regulations](#) on Cospas-Sarsat website
- Local administration (SPOC): list of [SAR Point of Contact](#) on Cospas-Sarsat website
- List of Beacon Registration Contacts on www.406registration.com

Once you have determined which protocol is authorized, select the protocol of your choice keeping in mind a few key informations:

- Avoid User Location Protocol (Tail Number protocol) for Integra and Ultima-S : it reduces the resolution of the transmitted GPS position to 4 minutes (4 Nautical Miles) instead of 4 seconds (≈ 120 m).
- A dongle for CS144 must be programmed like for the 406AF. The CS144 will convert it to a location protocol
- Integra and Ultima-S : aboard the same aircraft, only one GPS ELT can have the 24-bit address protocol. Use S/N protocol for the others ELTs.

Orolia Aviation Customer Support is also an unofficial but reliable source of information.

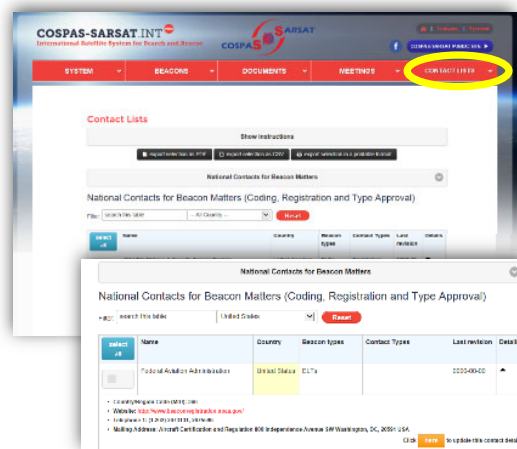
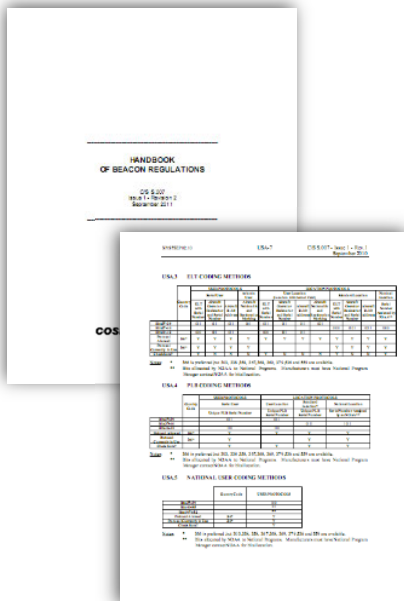
In case of doubt or for advice, do not hesitate to [contact us](#).

REGISTRATION INFORMATION AND POINTS OF CONTACT

C/S S.007 [Handbook of regulations](#)

list of [SAR Point of Contact](#) on Cospas-Sarsat website

List of Beacon Registration Contacts on www.406registration.com



PROGRAMMING DATA SHEET (PDS)

HOW TO GET THE INFORMATION FROM THE OPERATOR ?

Do I need to use a PDS ?

If you are providing Programming Service to other customers, you shall use the PDS to exchange information between the customer and the programmer.

If you are programming for your own fleet, you may not need to use the PDS and skip this step.

Various data must be collected together in the same form.

- AIRCRAFT (Type of aircraft, Tail Number, 24 bit address...)
- OPERATOR (Name, Point of contact...)
- ELT (Type of ELT, installation with dongle or not , coding information....)

A Programming Data Sheet (PDS) must be filled in for each programming of an ELT or a Dongle.

If the ELT will be programmed by a dongle, the PDS apply to the Dongle.

The yellow part of the PDS must be completed by the operator to get the relevant information on the aircraft registration and operational point of contact.

The blue part is to be completed by the programmer.

Make sure you're using the latest version of the PDS : it is available online from the Programmer Library on <https://aviationpartners.orolia.com/> and from the "Miscellaneous" menu of Kannad e-Prog software, in PDF or Word format.

The image shows a 'kannad aviation Programming Data Sheet' form. It is divided into two main color-coded sections: a yellow section for operator completion and a blue section for programmer completion. The yellow section includes fields for aircraft type, registration, and operator contact information. The blue section includes fields for coding information and programmer details. There are also checkboxes for various options like 'Dongle' and 'ELT programming'.



PROGRAMMING DATA SHEET – OPERATOR PART 1/4

- First Installation: for ELT or DONGLE installation on board A/C. Typically for installation of a new Dongle / New ELT in the aircraft.
- Re-coding: in case of change of country of registration or in case of re-affectation of an ELT.

The PDS apply to any device, either Dongle or ELT, which is programmed by the PR600
When programming a Dongle, the PDS must be filled in the same way as for an ELT.

kannad

Programming Data Sheet

See reverse for instructions

Purpose

First Installation

Re-coding

PROGRAMMING DATA SHEET – OPERATOR PART 2/4

Aircraft identification

- Type of Aircraft: use ICAO aircraft type designator or Manufacturer/Model
- MSN (Mainframe Serial Number) is optional
- 24 bit address : this is the transponder code, must be converted in Hexadecimal format

1101 1111 0010 1100 0011 0001 = DF2C31

Aircraft operator :

Before programming the ELT/Dongle, the programmer may have to contact the operator if some necessary information is erroneous or missing.

Aircraft identification

Type of aircraft:

Country:
Country of registration of the aircraft

Tail Number:
Aircraft registration marking

MSN:
if forward fit

24-bit address:
hexadecimal format

Tail Number Repeated in Radio Alphabet (ex: Foxtrot Bravo Romeo Zulu Echo):

Aircraft operator

Airline / Name (if private): Three letter airline designator (AOD):

Address: Phone:

E-mail:

Country:

TIP : the Windows calculator can easily convert BIN to HEX and vice-versa. (Scientific mode)

PROGRAMMING DATA SHEET – OPERATOR PART 3/4

ELT system configuration

- Model of ELT to program: Complete the exact type of ELT to be installed. Eg: KANNAD 406 AF, 406 AF-Compact, Integra AF... Even if a dongle is used, it is mandatory to indicate which type of ELT will be connected to it.
- Will it be the only ELT onboard this aircraft? : This information is mandatory to avoid duplicate coding in case of multiple ELTs.
- Other ELT(s): if more than one ELT will be carried by the same aircraft, it is mandatory to indicate as much information as possible including: Type of ELT, coding protocol, rank, 15Hex id etc... This will avoid eventual duplicate coding, which is not accepted by the Cospas-Sarsat system. This does not apply to an existing ELT which is going to be removed and replaced by this one.
- IS THERE A PROGRAMMING DONGLE IN THIS INSTALLATION? : If there is a programming dongle, the dongle must be programmed, not the ELT.

| ELT system configuration | |
|---|---|
| Model of ELT to program <input type="text"/> | Will it be the only ELT onboard this aircraft? <input type="checkbox"/> No <input type="checkbox"/> Yes |
| Other ELT(s) <input type="text"/> | <small>If there are other ELTs onboard this aircraft, please indicate type, coding, rank, etc, see reverse for more information</small> |
| Is there a programming dongle in this installation? <input type="checkbox"/> No (ELT programming) <input type="checkbox"/> Yes (DONGLE programming) | ← This information is crucial. In case of doubt, ask your programmer for help. |

PROGRAMMING DATA SHEET – OPERATOR PART 4/4

Coding preferences

The choice of the coding protocol depends on technical and regulatory parameters. This part shall be filled in by the operator only if he knows which protocol is acceptable for them. In case of doubt, the programmer shall decide of the proper coding protocol.

Signature

The signature engages the responsibility of the operator.

| Coding preferences | |
|--|--|
| <small>Note: If you leave this part blank (recommended), the programmer will select the most appropriate protocol for you. However, if you require a specific protocol, or if your local authority has already delivered a Serial Number or a 15 HEX ID, you can indicate it below. If you indicate a preferred coding, the programmer will not be held responsible for any refusal of registration of your ELT by your country authorities.</small> | |
| Preferred coding: (leave this blank unless you are sure to know which coding protocol is accepted in your country) | |
| <input type="checkbox"/> T/N (tail number) | <input type="checkbox"/> S/N (issued by manufacturer) |
| <input type="checkbox"/> 24 bit address (ICAO) | <input type="checkbox"/> AOD <input type="text"/> |
| <small>T/N coding restrictions : see note on reverse</small> | |
| <input type="checkbox"/> National S/N <input type="text"/> | <input type="checkbox"/> National 15HEX <input type="text"/> |
| <small>S/N issued by country authorities</small> | |
| <small>15 HEX ID issued by country authorities</small> | |
| Date: <input type="text"/> | Signature (the operator) <input type="text"/> |

PROGRAMMING KIT AND PROGRAMMING SOFTWARE

ELT OR DONGLE PROGRAMMING

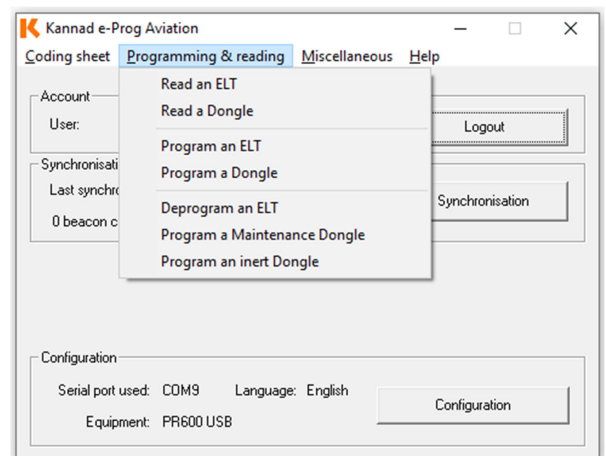
Requirements

- Computer (Windows XP minimum)
- Hardware: PR600 programming kit
- Software: Kannad e-Prog latest version

The PR600 equipment is designed to program either the ELT or a Programming Dongle.



PR600



E-PROG SOFTWARE DOWNLOAD

Make sure you have followed those steps:

1. Kannad Partner Portal Account creation →
<https://aviationpartners.rolia.com/>
2. PR600 registration form
 - Once logged in the partner portal, go to FORMS and fill in the PR600 registration form
3. e-Prog account creation by Orolia
 - Within 48 hours Orolia staff will upgrade your partner portal account to "Programmer" and will create your e-Prog account.
4. e-Prog software download
 - The Partner Portal "Programmer Library" gives access to programming documents and e-Prog software setup file.



The screenshot shows the Orolia partner portal interface. At the top, there is a navigation bar with 'HOME', 'AVIATION LIBRARY', and 'FORMS'. Below the navigation bar, there is a home icon. The main content area displays three items in the 'AVIATION LIBRARY' section:

- Programming Data Sheet** (PDF icon)
 - Date: January 1, 2013
 - Revision: W
 - Permalink
- DOC100060G Commissioning Training** (PDF icon)
 - Date: May 1, 2018
 - Revision: G
 - Permalink
- Kannad e-Prog Setup** (EXE icon)
 - Date: January 13, 2021
 - Revision: V1.3.5
 - Programming Software
 - Permalink

E-PROG INSTALLATION

Pre-requisites:

- Internet connection required. If your Internet access is through a proxy, you must ask for the proxy address to your network administrator.
- Login as administrator is required to install e-Prog. For any questions, contact your network administrator.

Software installation

- Run the « Kannad e-Prog Setup xxx» setup file already downloaded in the previous step.



Note for Windows 7/8/10 users: even if you have administrator rights, you must right click on the file and select "Run as administrator"

- Follow the instructions displayed on the screen and accept the different displayed messages (« I agree », « Continue », etc...). The installation can take a few minutes.

PR600 installation

- Connect your PR600 to the USB port of your PC before opening the software.
- If the new hardware wizard is displayed, select « Automatically install the software » and follow the instruction displayed on the screen.
- If a message is displayed indicating that the driver is not certified to obtain Windows logo, click «Continue» to install anyway.

GETTING STARTED

Connect your PR600 to USB port of the PC
Launch Kannad e-Prog

Always connect the PR600 BEFORE launching e-Prog

Type your e-Prog login and password

Note : you need to be connected to internet :

- the first time you launch e-Prog
- when creating a coding sheet in Serial number protocol for an Integra, Ultima-S or associated dongle.

All others operations can be performed offline. However it is recommended to work online to avoid the "Connection to webservice failed" error message.



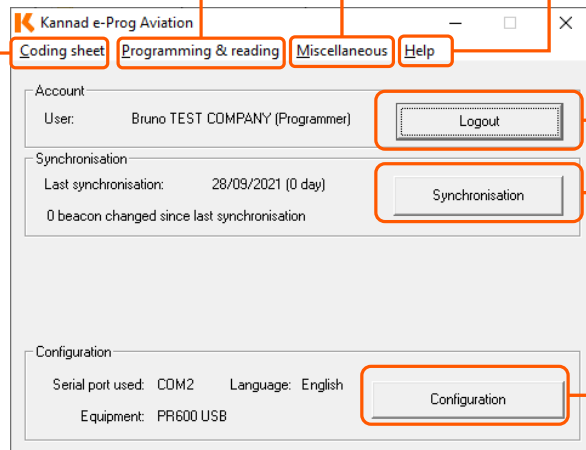
E-PROG MAIN WINDOW

Programming & Reading
Use this menu to Program/Read an ELT/Dongle.
It is also used to update the e-Prog database with additional information.

Miscellaneous
This menu gives access to various documents and tools.

Help
Download the latest version of the Programming Training here

Coding sheet
The coding sheet is a set of data coming to/from the ELT/Dongle and to/from the e-Prog database.
Before programming an ELT/Dongle, a coding sheet must be created.
Use this menu to Create and Organize your coding sheets.

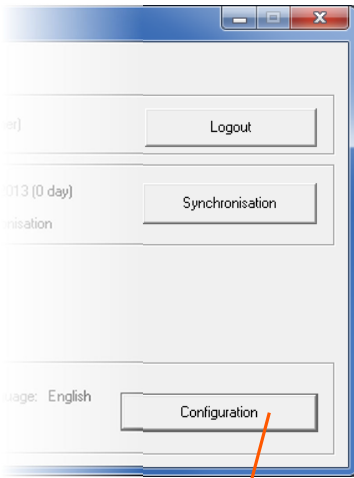


Logout
Back to the login window.

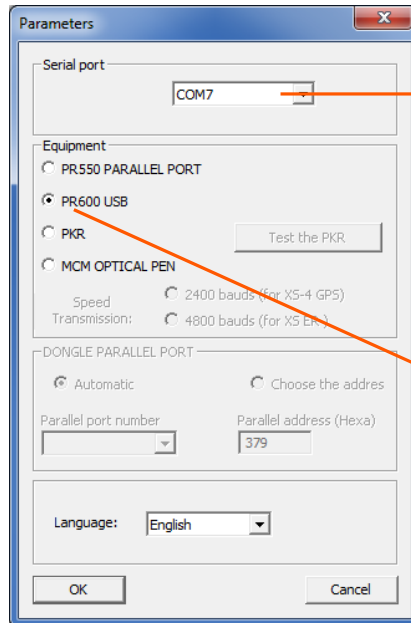
Synchronisation
Update e-Prog database with the latest changes made to your ELT/Dongle

Configuration
Select the COM Port and the language

PORT SETUP



Click "Configuration"



Select the virtual serial port associated to your PR600.

Choose PR600 USB

READY TO READ AND PROGRAM A KANNAD ELT / DONGLE ?

Make sure e-Prog is started, the PR600 connected to the PC and the proper COM port selected

Click on "Menu" → "Aviation - ELT"

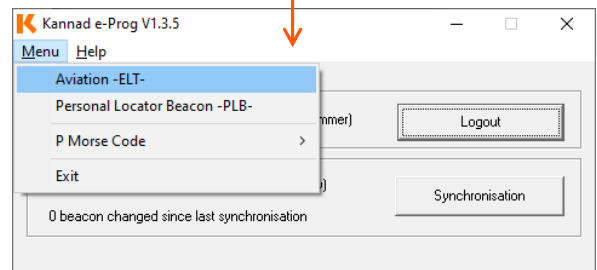
Before reading/programming an ELT:

- Make sure to connect the PR600 DIN12 male connector to the ELT DIN12 socket
- Make sure the ELT switch is set to OFF
- Make sure a 50 ohms load (or antenna) is connected to the ELT



Before reading/programming a dongle:

- Make sure to plug the dongle to the PR600 DIN12 socket



ELT/DONGLE READING

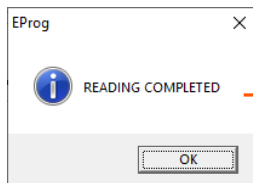
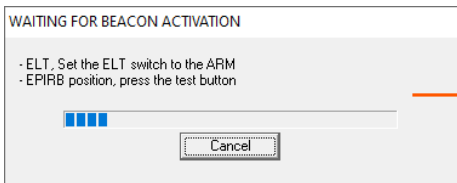
ELT OR DONGLE READING

DONGLE READING

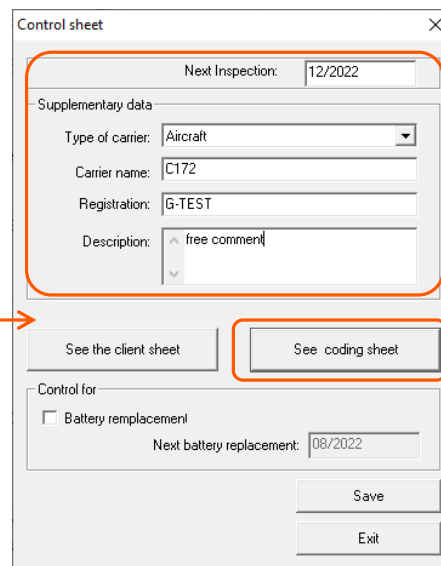
- Click "Programming & reading" → "Read a Dongle"

ELT READING

- Click "Programming & reading" → "Read an ELT"



- Set the ELT switch to "ARM"
- For ULTIMA-S, also hold the Self-Test switch for 2 seconds
- Wait for the "READING COMPLETED" message
- Switch the ELT to "OFF"



Verify the additional information coming from e-Prop database. If necessary, update and press "Save"

Then press "See coding sheet" to display it.

If the message "No ACK From BEACON!!!, Err=-1" appear, check the COM port as shown on the FAQ of the e-Prop installation guide.

CODING SHEET

The Coding Sheet displays a mix of

information read from the ELT/Dongle

and information read from e-Prog database (additional information).

Bit-by-bit details of the coding, stored in the ELT / Dongle, extracted from the Full Message

Full Message stored in the ELT / Dongle
15 Hex ID / Checksum extracted from the full message
The checksum validates the 15 Hex ID on some registration databases

Calculated / Extracted from the 15 Hex ID

Additional information added by the programmer and synchronized with e-Prog database

CSN : assigned in factory. Never changes.
CSN date = Date Of Manufacturing of the ELT/Dongle

Kannad e-Prog V1.3.1, ELT/DONGLE Coding Sheet
<Prog TEST>

OROLIA S.A.S
Z.I DES CINQ CHEMINS
56520 GUIDEL
FRANCE
FAX : +33 2 97 65 06 42
TEL. : +33 2 97 02 49 00
E-MAIL: manageyourbeacon@kannad.com

Format Flag:Short |25 |0
Protocol Flag:.....User|26 |11
Country code:.....232 UNITED KINGDOM|27-36|0011101000
Protocol Code:.....User Aviation|37-39|001
Aircraft Registration Marking: G-TEST|40-81|100100101011011000.
ELT Number:.....0|82-83|00
Aux. Radio Device:.....121.5 MHz|84-85|01
Emergency Code Flag:.....National Use|107 |0
Activation code:.....Automatic|108 |11

Full Message:
FF FE 2F 4E 83 25 6C 43 86 90 8D BB 7E D0
15 Hex ID:
9D064AD8870D211
15 Hex ID Checksum:DD21B

Identification protocol:T/N
Identification number: G-TEST

Carrier type:Aircraft
Registration:G-TEST
Carrier's name:C172
Description:free comment
Model:COMPACT
Version:AF_COMPACT

Cospas Sarsat Number (CSN):387461
CSN number date :27/08/2008
Last programming date:29/03/2013

ELT/DONGLE PROGRAMMING

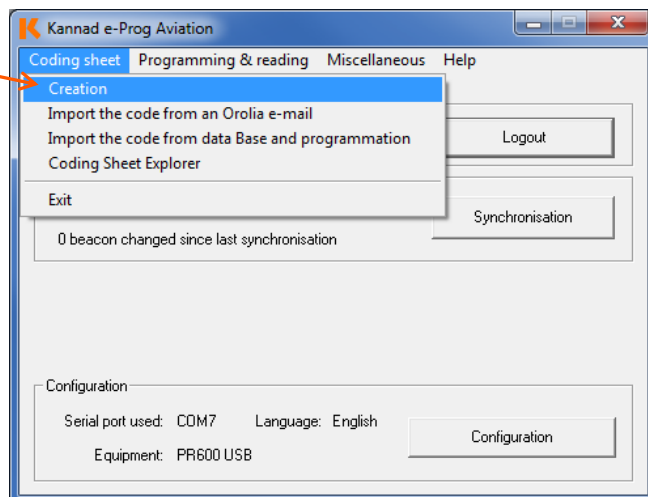
ELT OR DONGLE PROGRAMMING

2 steps to program an ELT or a Dongle :

- Create a coding sheet
- Program the ELT/Dongle = transfer the coding sheet to the ELT/Dongle

"Coding Sheet" → "Creation"

To program an "unusual" protocol, contact Orolia to receive the code by e-mail and use the menu "Import the code from an Orolia e-mail". Refer to [Cospas-SARSAT protocol selection in e-Prog](#)



CODING SHEET – MAIN DATA (FOR INTEGRA SEE ALSO NEXT PAGE)

Select country code

Select beacon model and version

Select the coding protocol (see chapter "Coding protocols") and enter the identifier according to the protocol. Number the ELT starting from 0.

Reminder about protocols :

- ICAO : 24bit address in hexadecimal format. ex: *C0AB1F*
- AOD : 3 letters + serial number. ex: *UAL999*
- T/N : the tail number. ex: *G-ABCD*
- S/N (CSN) : the CSN written on the ELT. ex: *276457*

Only Survival ELTs must be set as Manual
Homing must remain checked



If several country codes exist for the same country, refer to your Sarsat Point Of Contact (SPOC) to determine which one to select

For dongle selection refer to next 2 pages

CODING SHEET – MAIN DATA – INTEGRA TIPS

To program a dongle for Integra, make sure to select Dongle for Integra, even if it's a dongle assembly. It will be programmed in long message format. Refer to next page for more information

Dongle IF GPS and Attachable Dongle for INTEGRA ER-N are programmed the same way as a Dongle for Integra

24 bit address protocol or Serialized protocol shall be preferred to T/N, due to better accuracy of the GPS positioning.

When Serialized number is selected, an AUTOMATIC SERIAL number will be issued by the system. Please disregard (ignore) the checkbox "Serialized number issued by the Country authorities".

Activation mode is not used with GPS beacons. Even if it appears "Manual" in grey, it will be ignored by the system.

DONGLE SELECTION IN E-PROG MENUS

| Dongle to be programmed | Dongle to be connected to | In e-Prog, select this dongle version |
|--|--|---------------------------------------|
| S1820514-01 Programming dongle | Kannad 406 ATP | DONGLE for ATP |
| | Kannad 406 AF[-H], AP[-H], AS, Survival, CS144 | DONGLE for ELTs |
| | Compact | DONGLE for COMPACT |
| | Integra | DONGLE for INTEGRA |
| S1820514-04 Programming dongle A320 | Kannad 406 ATP | DONGLE A320 for ATP |
| | Kannad 406 AF[-H], AP[-H], CS144 | DONGLE A320 for ELTs |
| | All others ELTs | N/A* |
| S1820514-05 Programming dongle A330 & A340 | Kannad 406 ATP | DONGLE A330 for ATP |
| | Kannad 406 AF[-H], AP[-H], CS144 | DONGLE A330 for ELTs |
| | All others ELTs | N/A* |
| S1820514-06 Programming Dongle Assy | Kannad 406 ATP | DONGLE for ATP |
| | Kannad 406 AF[-H], AP[-H], CS144 | DONGLE ASSY FOR ELTs |
| | Compact | DONGLE for COMPACT |
| | Integra | DONGLE for INTEGRA |
| S1820514-07 Programming Dongle Integra LR | All others ELTs | N/A* |
| | Integra | DONGLE INTEGRA LR |
| S1820514-08 Dongle IF-GPS RS232 | Integra (not ER-N) | DONGLE IF-GPS RS232 |
| | All others ELTs, CS144 | N/A* |
| S1820514-11 Programming Dongle Integra SA | Integra | DONGLE INTEGRA SA |
| | All others ELTs, CS144 | N/A* |
| S1820514-12 Attachable Programming Dongle | Integra ER-N | DONGLE Attach. ER-N |
| | All others ELTs, CS144 | N/A* |
| S1820514-17 Kannad Ultima-S AIM | Ultima-S no RLS | Ultima-S AIM Non RLS |
| | Ultima-S with RLS | Ultima-S AIM RLS |
| | All others ELTs, CS144 | N/A* |

* If version is N/A, please contact Orolia Customer Support for compatibility and advice.

Creating coding sheet for ELT

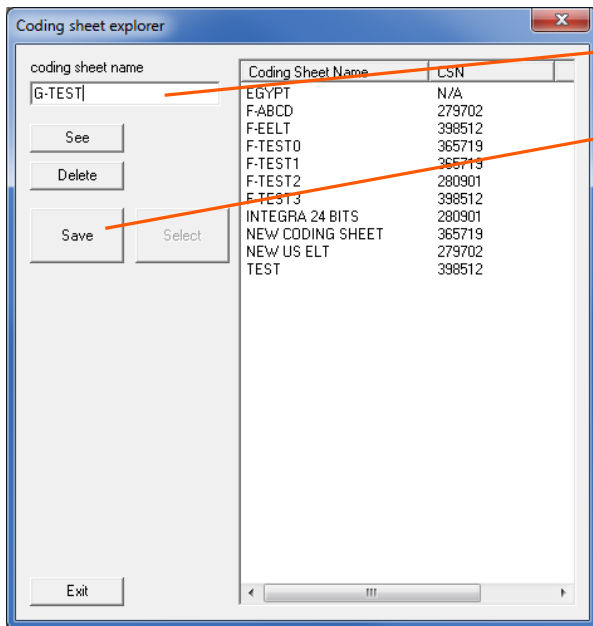
CODING SHEET – ADDITIONAL DATA

Type of carrier: "Aircraft"
 Carrier name: put the aircraft type
 Registration: Put the real tail number

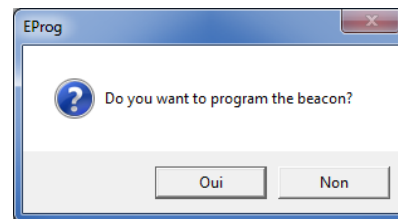
Note : if the Carrier Name (Aircraft Type) or Registration is unknown, just put a dash (-).

Note : this additional data is filled for information only. It will not be stored in the ELT/Dongle and it will not affect the coding of the ELT/dongle.

CODING SHEET – SAVE AND PROGRAM



Type a coding sheet name (for example the tail number, or the serial number)
 Click "Save"
 You'll be prompted to program the beacon now. You can choose "Yes" or program it later from the "Programming & Reading" → "Program" menu.



ELT OR DONGLE PROGRAMMING

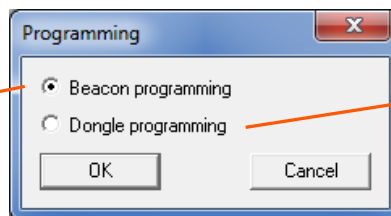
ELT PROGRAMMING

- Make sure to connect the PR600 to the ELT
- Make sure the ELT switch is set to OFF
- Make sure a 50 ohms load (or antenna) is connected to the ELT
- Select "Beacon Programming"
- Click "OK"
- Switch the ELT to "ARM" (For ULTIMA-S also do a self-test)
- Wait for the "Programming Finished" message
- Switch the ELT to "OFF"



DONGLE PROGRAMMING

- Make sure the PR600 was connected to the PC before the start of e-Prog. If not quit and restart e-Prog
- Connect the Dongle to the PR600
- Select "Dongle Programming"
- Click "OK"
- Wait for the "Programming Finished" message



The programming can be done later using the menu "Programming & Reading" → "Program an ELT" (or a dongle) and select the Coding sheet that has been created previously

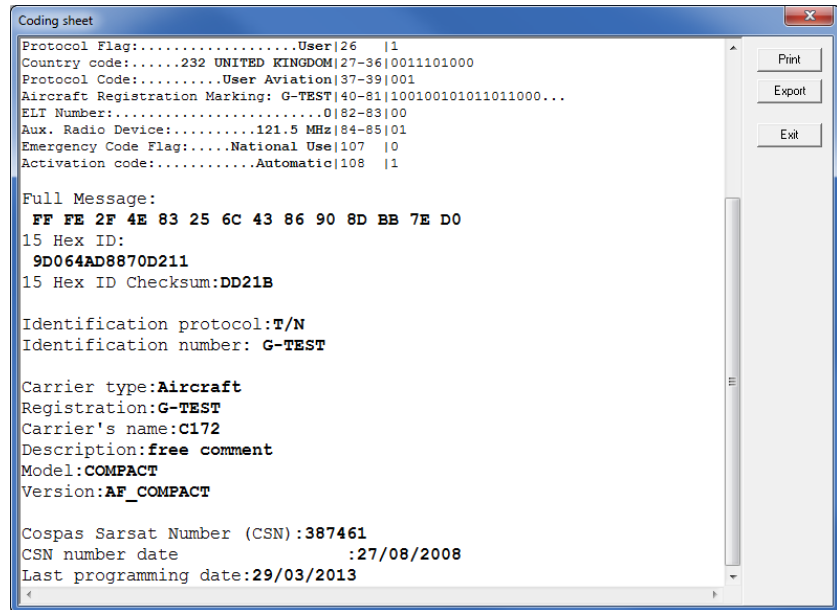
If the message "No ACK From BEACON!!!, Err=-1" appear, check the COM port as shown on the FAQ of the e-Prog installation guide.

CODING SHEET – PROGRAMMATION COMPLETE

Print and/or Export the coding sheet

One for the programmer

One for the Customer

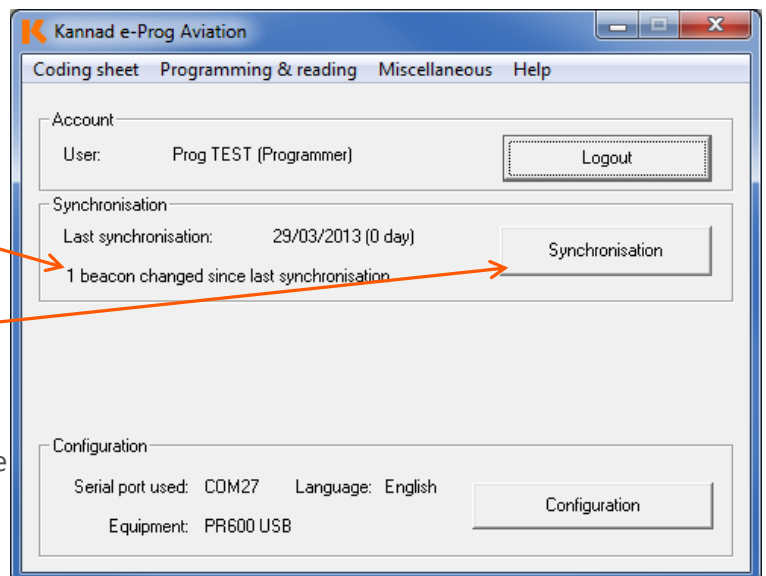


SYNCHRONISATION

Once the programming is complete, the Synchronisation status shows the number of beacons changed since last synchronisation.

Click Synchronisation to update the e-Prog database

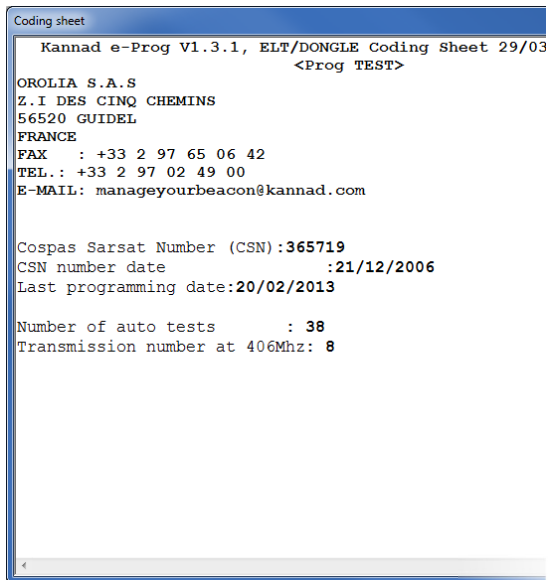
After the synchronisation is successful, you must have "0 beacon changed since last synchronisation"



E-PROG ADDITIONAL FEATURES (MISCELLANEOUS MENU)

Read ELT counters

Decoding Cospas-Sarsat code



PROGRAMMING DATA SHEET – PROGRAMMER PART 1/2

After the programming is complete, fill in the blue part of the PDS to record the 15Hex and other informations.

ELT or Dongle information

If the equipment to program is a dongle, provide the CSN and S/N of the dongle.

- CSN / S/N: This information is available on the equipment name plate.
- The CSN is also software encoded in the PCB board in factory (Read-Only)
- The CSN is a 6-digit number found on any ELT or Dongle.
- Over years the range of CSN has been as follow :
 - 1995 – 2008 : CSN from 300 000 to 399 999
 - 2008 – 2012 : CSN from 250 000 to 299 999
 - 2012 – now : CSN over 400 000

The CSN is a permanent identifier of a Kannad ELT or Dongle in e-Prog database.

Part to be completed by authorized programmer after programming

| | |
|---------------------------------------|---|
| ELT or DONGLE information | |
| CSN (ex: 284147) <input type="text"/> | S/N (ex: LX1100001234) <input type="text"/> |

PROGRAMMING DATA SHEET – PROGRAMMER PART 2/2

Coding information : added by the programmer after programming the ELT/Dongle

- Refer to coding information printed on the coding sheet to fill in the Coding Information fields
- Identification (15 HEX ID): computed by the KANNAD e-Prog software. It is a “key information” within the COSPAS-SARSAT system. This number is required to complete any “registration form”.
- Checksum: computed by e-Prog. May be required by some administrations.
- Programmer details : the signature of the programmer engages its responsibility

Coding information

Protocol T/N (tail number) S/N (serialized number) ICAO (24 bit address) AOD (Op. Designator)

Identification number ELT number Country Code (MID)

Identification (15 HEX ID) Checksum
Checksum : see note on reverse

Programmer details

Company name Date

Programmer name Signature (the programmer)

ELT LABEL (NOT APPLICABLE IF DONGLE INSTALLED)

If a dongle is used, just write “On Dongle” in the Identification field

```

Coding sheet
Protocol Flag:.....User|26 |1
Country code:.....232 UNITED KINGDOM|27-36|0011101000
Protocol Code:.....User Aviation|37-39|001
Aircraft Registration Marking: G-TEST|40-81|100100101011011000...
ELT Number:.....0|82-83|00
Aux. Radio Device:.....121.5 MHz|84-85|01
Emergency Code Flag:.....National Use|107 |0
Activation code:.....Automatic|108 |1


Full Message:
FF FE 2F 4E 83 25 6C 43 86 90 8D BB 7E D0
15 Hex ID:
9D064AD8870D211
15 Hex ID Checksum:DD21B

Identification protocol:T/N
Identification number:G-TEST

Carrier type:Aircraft
RegistrationG-TEST
Carrier's name:C172
Description:free comment
Model:COMPACT
Version:AF_COMPACT

Cospas Sarsat Number (CSN)387461
CSN number date:27/08/2008
Last programming date:29/03/2013
    
```

TIP : the use of a label printer is highly recommended



Inspection Date: MM/YYYY Next Control: MM/YYYY

Battery type: Sxxxxxxx-xx

Battery Expiry Date: MM/YYYY

Identification Protocol: TN ICAO AOD S/N TEST

Identification Number: G-TEST Cospas Sarsat Number (CSN): 387461

Beacon Identification code (15 HEX ID): 9D064AD8870D211

Tail Number: G-TEST MSN:

DONGLE LABEL

```

Coding sheet
Protocol Code:.....Serial User|37-39|011
Beacon Type:Aviation, ELT Aircraft 24-bit address|40-42|011
C/S Certificate Number in bits 74-83:.....Yes|43 |1
24-bit Address:.....AF0F0F|44-67|101011110000111100...
Additional ELT Number:.....0|68-73|000000
C/S Cert. No. or Nat. Use (bit 43 refers):.....167|74-83|0010100111
Aux. Radio Device:.....121.5 MHz|84-85|01
Emergency Code Flag:.....National Use|107 |0
Activation code:.....Automatic|108 |1

Full Message:
FF FE 2F 4E 36 F5 E1 E1 E0 14 EB 3A E9 90
15 Hex ID:
9C6DEBC3C3C029D
15 Hex ID Checksum:8BAF3

Identification protocol: ICAO
Identification number: AF0F0F

Carrier type:Aircraft
Registration:F-ABCD
Carrier's name:R44
Description:this is a dongle for Compact coded in 24 bit address
Model:DONGLE
Version:DONGLE for COMPACT

Cospas Sarsat Number (CSN): 395178
CSN number date :26/03/2013
  
```

| | |
|---|-----------------------------|
| Inspection Date: MM/YYYY | Next Control: MM/YYYY |
| Battery type: Sxxxxxxx-xx | |
| Battery Expiry Date: MM/YYYY | |
| Identification Protocol: | |
| <input type="checkbox"/> TN <input type="checkbox"/> ICAO <input type="checkbox"/> AOD <input type="checkbox"/> S/N <input type="checkbox"/> TEST | |
| Identification Number: | Cospas Sarsat Number (CSN): |
| | 387461 |
| Beacon Identification code (15 HEX ID): | |
| ON DONGLE | |
| Tail Number: | MSN: |
| | |

| | | |
|----------------------------------|--------|---|
| Identification Number | CSN | <input type="checkbox"/> TN <input type="checkbox"/> AOD <input checked="" type="checkbox"/> ICAO <input type="checkbox"/> S/N <input type="checkbox"/> MSN |
| AF0F0F | 395178 | |
| Beacon Identification code (Hex) | | |
| 9C6DEBC3C3C029D | | |
| Registration Marking | MSN | |
| F-ABCD | | |

DELIVERABLES

Deliverables to the Operator

- One "Coding Sheet"
- "Registration form" (if applicable, otherwise PDS)
- Many countries now accept online registration
 - Examples :
 - USA : www.beaconregistration.noaa.gov
 - Canada : https://www.cbr-rcb.ca/cbr/presentation/other_autre/index.php
 - France : registre406.cnes.fr
 - Australia : beacons.amsa.gov.au
 - See complete list on <http://www.cospas-sarsat.int/en/contacts-pro/contacts-details-all>

The "Synchronisation" feature will automatically update the e-Prog database.
No need to send anything to Orolia.

REGISTRATION OF THE ELTS

Some countries authorize ELT registration in the International Beacon Registration Database (IBRD). Other countries require registration in a national database.

All information can be found from the IBRD "Beacon registration contacts"
<https://www.406registration.com/countriesupported.aspx>

Beacon Registration Contact Information

| COUNTRY/REGION | COUNTRY CODE (MID) | CONTACT INFORMATION |
|------------------|--------------------|---------------------------------|
| ADELIE LAND-FR | 501 | Contact Details |
| AFGHANISTAN | 401 | Contact Details |
| ALASKA-USA | 303 | Contact Details |
| ALBANIA | 201 | Contact Details |
| ALGERIA | 605 | Contact Details |
| AMERIC SAMOA-USA | 559 | Contact Details |
| ANDORRA | 202 | Contact Details |
| ANGOLA | 603 | Contact Details |
| ANGUILLA-UK | 301 | Contact Details |

Contact Details: ITDC (TAIWAN) (MID #416)

PLB | **ELT** | EPIRB

The registration for this type of beacon for ITDC (TAIWAN) (MID #416) is permitted in the IBRD only via a National Data Provider. Owners of this type of Beacon wishing to register or modify existing details, must contact the agency below. If this agency has uploaded beacon-registration records from its database to the IBRD, SAR services may retrieve those records by logging into their SAR-service account on IBRD. This information is not available for access by beacon owners or the general public.

Chunghwa Telecom Co., Ltd.
 Mobile Business Group
 9F, No.35, Aiguo East Road

City: Taipei, Chinese Taipei
 Fax: +886 2 3316 6622
 +886 2 3316 6590
 Phone: +886 2 3316 6191
 +886 2 3316 6196
 Email: shen3199@cht.com.tw
 Handbook: [National Beacon Regulation \(S.007\)](#)

Ok

NATIONAL REGISTRATION FORM

FORMULAIRE D'ENREGISTREMENT DES BALISES DE DETRESSE 406 MHZ AERONAUTIQUE
 Fiche à transmettre au FMCC COSPASSESAT TOULOUSE:
 DGAC/BP1583
 CNES
 18, avenue Edouard Belin
 31401 TOULOUSE CEDEX 04
 Fax: +33(0)571 48 73

406 MHz EMERGENCY LOCATOR TRANSMITTER (ELT) REGISTRATION FORM
 UNITED KINGDOM
 Please email, fax or post the completed form to:
 UK ELT Database, UKMCC, ARCC, EADS Systems, Farnborough, UK36 3UH, United Kingdom.
 Telephone: +44 (0) 1309 676304 Fax: +44 (0) 690717 E-mail: ukmcc@eas.com

Official 406 MHz ELT Registration Form
 Save a life! Register your beacon online at www.406registration.com

STEP-BY-STEP PROGRAMMING PROCEDURE

- Verify that PDS is complete



**Double-check if the aircraft is equipped with a programming dongle.
If so, the Dongle must be programmed, not the ELT.**



- According to country of registration, check Country Code and protocol to be used Create Coding Sheet
- Program ELT or DONGLE (transfer data from PC to ELT or DONGLE)
- Print two "Coding Sheets" (one for you and one for the Operator)
- Complete label (ELT or DONGLE)
- Complete lower part of the PDS
- Download, print and prefill the relevant "Registration Form" (if applicable)
- Deliver the relevant documents to the Operator (see Deliverables)
- Inform the Operator that the ELT must be registered before first flight with the relevant authority (if applicable).
- Any change (ELT replacement, change of ownership, change of A/C registration...) must be declared to the relevant authority.

ELT REPROGRAMMING (WITH PROGRAMMING DONGLE)

- Connect the outside antenna or a 50 Ohms load to the BNC socket
- Switch the ELT from OFF to ARM,
- Check that the Self-Test fails (3+4 flashes). → Why ?
- If not, connect a maintenance dongle to the DIN12 socket:
 - Switch the ELT from OFF to ARM,
 - Check that the Self-Test fails (3+4 flashes),
 - Remove the maintenance dongle from J1.
- Connect the "Programming Dongle" to the DIN12 socket
- Switch the ELT from OFF to ARM:
 - The buzzer operates during the whole self-test procedure, after a few seconds the LED displays the result.
- Check that the Self-Test result is OK (one long flash).
- Do not switch the ELT to "ON" position at any time, unless a real emergency case.

Note : before programming an ELT from a dongle, it's mandatory to ensure that the ELT is not programmed yet (maintenance code = 3+4 flashes).

This is to ensure that the dongle is OK :

1. If the dongle is defective, the ELT will keep its previous coding :
 - If the ELT was not programmed (3+4 flashes) it will continue to display 3+4 flashes → Self-Test Failed = dongle failure detected
 - If the ELT was programmed from a previous aircraft (One long flash) it will continue to display one long flash. → Self test OK = dongle failure NOT detected.
2. If the dongle is correct, the ELT will get the new coding from the dongle.
 - If the ELT was not programmed (3+4 flashes) it will then display one long flash → Self-Test OK = programming done.

HOW TO CONTACT US ?

Your local distributor is your best source of information on Kannad products. For more enquiries, contact :

Worldwide Kannad Aviation Customer Service & Support: support.sar@orolia.com ; +33 2 97 02 49 00

[Orolia website](#) contains public documentation:

Orolia Aviation Portal contains Kannad ELT private documentation : <https://aviationpartners.orolia.com/>

