



**DGL-1 (Dongle)
Programming Adapter
453-4010**



Description, Operation, Installation and Maintenance Manual
570-4010 Rev. H

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ARTEX PRODUCTS / ACR ELECTRONICS, INC.
DESCRIPTION, OPERATION, INSTALLATION AND MAINTENANCE MANUAL
DGL-1, DONGLE (453-4010)
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The Airworthiness limitations section is FAA approved and specifies inspections and other maintenance required under 14 CFR§ 43.16 and 91.403, unless an alternative program has been approved.

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LIST OF ACRONYMS, ABBREVIATIONS AND DEFINITIONS

<u>Term</u>	<u>Definition</u>
AC	Advisory Circular – A Federal Aviation Administration (USA) bulletin with special information. For the purposes of this document, the acronym AC does not refer to electrical alternating current.
CFR	Code of Federal Regulations – The general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government. Title 14, "Aeronautics and Space" contains the FARs.
COSPAS-SARSAT	The international search and rescue consortium that governs the international satellite-based search and rescue distress alert detection and information distribution system. For a complete description go to the official web site for the International COSPAS-SARSAT Program.
Dip Switch	A set of manual electric switches packaged in a group in a standard dual in-line package (DIP).
Drip Loop	Extra wire length used to form a U-shaped bend in a wire or cable. Water or other fluids will flow down to the bottom of the loop and drip off. Electrical connections are made at the top of the loop.
ELT	Emergency Locator Transmitter – ELTs are installed on aircraft and used to send emergency signals to the SAR satellite system. The word "Beacon" is associated with these devices.
FAA	Federal Aviation Administration – The United States government agency for aircraft safety and regulation.
FAR	Federal Aviation Regulations – The rules and regulations governing the manufacture, certification, operation, maintenance, repair, and alteration of aircraft in the United States.
Form 337	FAA Form 337 is required anytime a major repair and/or major alteration is performed on an aircraft. Refer to FAR, Part 43, Appendix A and the definitions of Major Repair/Alteration contained in FAR, Part 1 for guidance.
ID	Identification
MIL	The three-letter acronym that stands for "Military" and proceeds military specifications and standards numbers (e.g., MIL-W-XXXX would indicate a wire specification and MIL-STD-XXXX would indicate a standard).
MSB	Most Significant Bit - The bit position in a binary number having the greatest value.
P/N	Part Number – Refers to an ACR part number, unless otherwise noted. Part numbers are also indicated with parentheses (e.g., XXX-XXXX).
Plug	The term "Plug", within the context of this document, refers to the male half of an electrical connector.
Receptacle	The term "Receptacle," within the context of this document, refers to the female half of an electrical connector.
RTV	A rubbery silicon-based adhesive typically used to prevent vibration problems and water intrusion.
SAR	Search and Rescue
TSO	Technical Standard Order – A TSO is a minimum performance standard issued by the FAA for specified materials, parts, processes, and appliances used on civil aircraft.
VHF	Very High Frequency – The 30 MHz to 300 MHz radio frequency band

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RECORD OF REVISIONS

REVISION	CHANGE	DATE	REVISION	CHANGE	DATE
-	RELEASE	Nov 06/2002			
-	DCN 2124	Dec 18/2002			
-	DCN 2147	Feb 17/2003			
-	DCN 2188	Apr 21/2003			
-	DCN 2369	Apr 21/2004			
A	DCN 3144	Dec 11/2007			
B	DCA W9612	Apr 06/2010			
C	ECO 14756	Jul 28/2011			
D	ECO 15119	Jun 27/2012			
E	ECO 15487	Sept 23/2013			
F	ECO 15897	Feb 20/2015			
G	ECO 16761	Oct 9/2017			
H	ECO 16975	Oct 30/2018			

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INTRODUCTION

1. Manual Usage

A. General

- 1) This manual describes the operation, installation, and maintenance of the DGL-1 (Dongle) Programming Adapter. This information is provided to ensure initial and continued airworthiness. Information presented in this manual is accurate at time of printing, but is subject to change. Refer to the Artex products web site at www.acrartex.com for the latest information and any updates to this manual.
- 2) Web links provided in this manual were accurate at time of printing, but may be subject to change.
- 3) Regulatory references contained herein are generally confined to United States and Canadian requirements and, in any case, should not be considered all encompassing. Consult your national aviation authority for applicable requirements.

B. Application

- 1) This manual constitutes supporting data/documentation for the Dongle, including:
 - a) Description and Operation
 - b) Test and Fault Isolation (includes inspection criteria)
 - c) Removal
 - d) Installation
 - e) Registration
 - f) Illustrated Parts List
- 2) In the United States, a 406 MHz ELT must be installed and maintained in accordance with the requirements herein and 14 CFR, FAR Parts 43, and 91; and other airworthiness requirements, as applicable.
- 3) 406 MHz ELT installation and maintenance in all other countries must comply with the requirements herein and applicable national airworthiness requirements.
- 4) The accessories (i.e., remote switch) addressed in this manual are the accessories most commonly associated with a 406 MHz ELT. Other options, such as a different remote switch configuration or a navigation interface, should be installed and maintained in accordance with the written instructions specific to the accessory.

NOTE: Contact ACR Electronics, Inc., for optional accessories approved for use with a ME406 Series ELT.
- 5) To ensure proper operation, only parts listed in the Illustrated Parts List of this manual or those recommended by ACR Electronics, Inc., may be used as replacement parts for the Dongle.

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2. Model Descriptions

A. Dongle DGL-1 Programming Adapter

- 1) The Dongle is a 24-bit address programming adapter with two rows of DIP switches.
- 2) The Dongle is an optional auxiliary device attached to an ELT top cover that remains with an aircraft to allow fleet operators to transfer ELTs between aircraft.

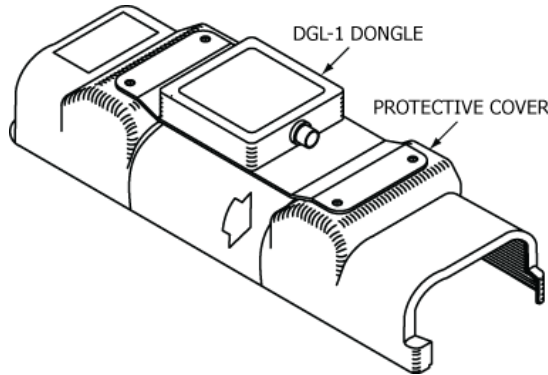


Figure 1 DGL-1 (Dongle) Programming Adapter with ELT Cover

3. Approvals

A. Dongle DGL-1

- 1) FAA TSO-C126 - System Component
- 2) ETSO 2C126 - System Component

4. References

A. Regulatory Documents

- 1) The following regulatory documents are referred to herein. When referring to such documents, it is the manual user's responsibility to ensure they are using the latest revision or release of such documents. To that end, the revision designator of specific document numbers has not been included, with the exception of the RTCA document listing, which reflects the revision level of the documents at the time of TSO testing and certification.
- 2) Except in the case of a printed manual, reference documents available on-line or source locations are linked to applicable web sites.
- 3) United States
 - a) AC 43-210, "Standardized Procedures for Requesting Field Approval of Data, Major Alterations, and Repairs"
 - b) AC 43.9-1, "Instructions for Completion of FAA Form 337"
 - c) AC 43-13-1, "Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair"
 - d) AC 43.13-2, "Acceptable Methods, Techniques, and Practices - Aircraft Alterations"
- 4) COSPAS-SARSAT
 - a) C/S G.005, "Cospas-Sarsat Guidelines on 406 MHz Beacon Coding, Registration and Type Approval"
 - b) C/S S.007, "Handbook of Beacon Regulations"

B. Other Documents

- 1) The following documents are available on-line at the Artex products web site at www.acrartex.com, or from ACR Electronics upon request.
 - a) 570-1000, "ELT Test Set (ETS) Operation Manual"

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DESCRIPTION AND OPERATION

1. Description

A. Functional Overview

- 1) The Dongle is connected to an ELT to allow the operator to easily program aircraft 24-bit address (Standard Location Protocol) into a compatible ELT.
- 2) When power is applied, the Dongle verifies the 24-bit address set locally on its DIP switches matches the 24-bit address stored in the memory of the ELT when power is applied. If the Dongle address matches the ELT address, the Dongle will shut down. If the ELT address does not match, the Dongle will program the ELT with its locally set address, and then shut down.

B. Components

- 1) The Dongle is designed to mount to a protective top cover on the ELT with four screws. See Figure 2 DGL-1 (Dongle) Programming Adapter Assembly.

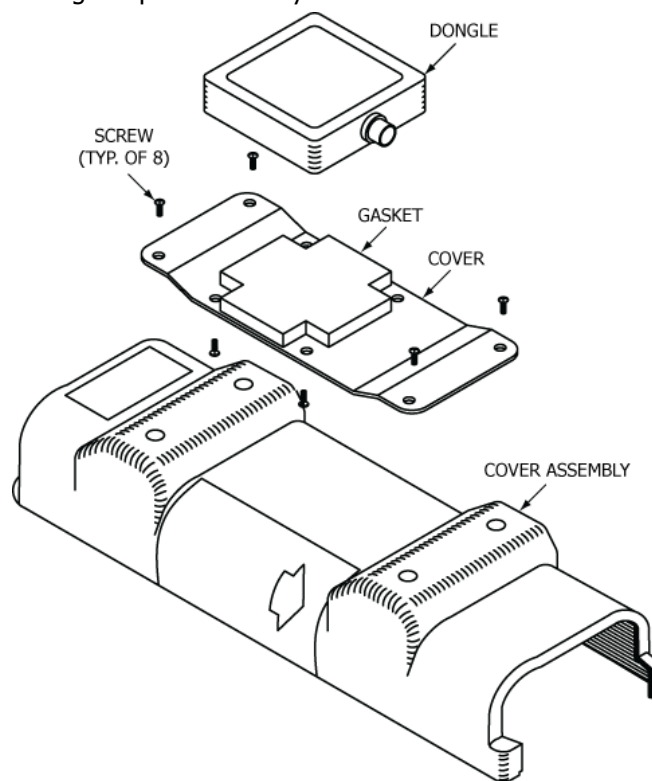


Figure 2 DGL-1 (Dongle) Programming Adapter Assembly

- 2) The Dongle can be mounted directly to the airframe within the proximity of the ELT to utilize the prefabricated cable assembly (P/N 611-4010).

C. 24-Bit Address Reprogramming Functionality

CAUTION: THE PROGRAMMING AND LABELING OF THE ELT MUST MATCH THE AIRCRAFT IN WHICH IT IS INSTALLED. RE-MARK THE ELT PRODUCT LABEL AS NECESSARY TO REFLECT NEW PROGRAMMING AND/OR COUNTRY OR REGISTRY. CONTACT THE LOCAL REGULATORY AUTHORITIES RESPONSIBLE FOR ELT REGISTRATION AND REFER TO THE APPLICABLE ELT DESCRIPTION, OPERATION, INSTALLATION AND MAINTENANCE MANUAL FOR ELT REGISTRATION REQUIREMENTS.

- 1) The Dongle provides the means to reprogram ELTs with 24-bit address location protocol programming.

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- 2) This capability facilitates swapping ELTs from one aircraft to another when performing routine maintenance, etc., without losing a significant amount of time reprogramming ELTs.
- 3) If the ELT is not programmed with a 24-bit address location protocol, the Dongle will not reprogram the ELT.

2. Operation

A. Operational Overview

- 1) Operation of the Dongle is automatic and requires no operator interface other than activating the +28 VDC power source and verifying no failure mode is present. See Fault Isolation on page 16.
- 2) The following conditions must be true for the Dongle to function:
 - a) +28 VDC aircraft power must be applied to the unit (i.e., the power source must be switched on).
 - b) The Artex ELT must be programmed with a 24-bit address long message (Standard Location Protocol).

NOTE: The Dongle is designed for use only with Artex ELTs. No other use of the Dongle is certified or approved by ACR Electronics.

- c) The ELT software version must be at least V133M, V134B, or V135C (displayed on the ELT product label).
- 3) Once the Dongle verifies or updates the ELT address, it shuts down.

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3. Specifications

A. Electrical

1) Table 1 lists the electrical specifications of the Dongle.

CRITERIA	PARAMETER	CHARACTERISTIC
Pin 1	RX Input	TTL
Pin 2	TX Output	TTL
Pin 3	5.6 VDC Output	5.6 VDC \pm 0.3 VDC
Pin 4	Power Input	+28 VDC \pm 10 VDC
Pin 5	ELT Ground	ELT Pin 11
Pin 6	DGL-1 Ground	Aircraft Ground
Artex ELT Software Compatibility	V133M, V134B, V135C	

Table 1 Electrical Specifications

B. Physical

1) Table 2 lists the physical specifications of the Dongle.

CRITERIA	PARAMETER	CHARACTERISTIC
Weight	DGL-1	4.8 oz (90 g)
	Protective Top Cover	6.7 oz. (190 g)
	DGL-1 Harness	1 oz. (28 g)
Dimensions (L x H x W)	Dongle mounted on ELT Top Cover	10.95 x 2.42 x 3.36 in. (278 x 61 x 85 mm)

Table 2 Physical Specifications

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TEST AND FAULT ISOLATION

1. General

A. Applicability

- 1) This section only covers inspection, testing, and fault isolation procedures specific to the Dongle.
- 2) Refer to the applicable ELT Description, Operation, Installation & Maintenance Manual associated with the ELT to coordinate the requirements herein with the requirements for inspection, test, and fault isolation of the ELT system as a whole.

B. Regulatory Requirements

- 1) The Dongle is considered an integral part to the ELT system, and as such is subject to the periodic inspection and testing required by the regulatory authorities governing the installation, operation, and maintenance of ELT systems.
- 2) Refer to the applicable ELT Description, Operation, Installation & Maintenance Manual associated with the ELT for references to the regulatory requirements.
- 3) Inspection and testing of the Dongle must be accomplished in conjunction with and on the same schedule as the ELT and other system components.

2. Inspection

A. Periodic Inspection

- 1) Remove the Dongle in accordance with Removal on page 17.
- 2) Perform a visual inspection of the physical integrity of the case, gasket, and DIP switches, checking for:
 - a) Damage to the finish,
 - b) Corrosion,
 - c) Excessive wear of the mounting holes, and
 - d) Cracks in the mounting flanges.

3. Test Procedures

A. General

CAUTION: ANY ELT RUNNING V133 SOFTWARE (SEE PRODUCT LABEL) TRANSMITS A FIXED TEST MESSAGE AT ELT RESET, NECESSITATING A "LIVE" BROADCAST TO READ THE ACTUAL MESSAGE. ANY ELT RUNNING V134 OR V135 SOFTWARE TRANSMITS THE ACTUAL 406 MHZ MESSAGE AT RESET. ALL MUST BE TESTED IN AN RF CONTAINER, SCREEN ROOM, OR CONNECTED TO A DUMMY LOAD VIA THE ANTENNA COAX CONNECTION.

- 1) This task consists of two subtask testing requirements:
 - a) 24-bit address programming test, which verifies ELT/Dongle 24-bit address reprogramming functionality by initiating reprogramming and checking for the address change or an error indication.
 - b) 15-digit hex ID determination, which reads the programmed hex ID, country, and country code broadcast in the 406 MHz message and provides instructions for relabeling and re-registering the ELT, as applicable.

B. 24-Bit Address Reprogramming Verification Test

- 1) This is a recommended periodic test.

NOTE: This test procedure verifies the ELT/Dongle has updated the aircraft 24-bit address ID in the ELT programming.

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- 2) The following test procedure incorporates the steps necessary to confirm operation of the Dongle into the "Installed Transmitter Test" procedure defined in the applicable ELT Description, Operation, Installation & Maintenance Manual.
- 3) Remove the Dongle in accordance with Removal on page 17.
- 4) Change the position of the most significant bit (MSB) DIP switch. Refer to Figure 10 24-Bit Address Switch Block on page 25.
- 5) Reconnect the Dongle in accordance with Installation on page 19.
- 6) Apply power to the ELT/Dongle, while the ELT remains off (i.e. inactive). Reprogramming takes place within 30 seconds of power up.
- 7) Monitor the ELT for the next 2 minutes. Refer to the troubleshooting guidelines of the applicable ELT Description, Operation, Installation & Maintenance Manual.
 - a) The LEDs on the ELT and remote switch will begin to flash rapidly if reprogramming was NOT successful.
 - b) If the LEDs remain off after two minutes, the ELT has been reprogrammed.
- 8) Verify the 24-bit address has changed as a result of changing the position of the MSB DIP switch.
- 9) Repeat Steps 3 through 8 to return and verify the original configuration of the Dongle.

C. 15-Digit Hex ID Verification

- 1) 15-digit hex ID verification should be performed any time a Dongle is installed in an aircraft to verify the ELT is properly labeled and registered.
- 2) Perform the following procedure within the first 5 minutes after the hour (UTC), as required by AC 43.13-1, Chapter 12, § 12-22, Note 3.
 - a) Notify any nearby control tower of your intentions.
 - b) Verify the ELT/Dongle is powered up and has at least 30 seconds to initialize.
 - c) Set the 453-1000 ELT Test Set (ETS) beacon reader to receive and decode the ELT digital message. Refer to the ETS operating manual (570-1000) for ETS operating instructions and additional details.

NOTE: A beacon reader equivalent to the ETS may be used, provided it is capable of receiving and decoding the 406 MHz digital message.

- d) Place the ETS within 30 feet of the aircraft 406 MHz antenna.
 - e) Activate the ELT by placing the control switch or remote switch in the "ON" position.
 - f) Allow the ELT to transmit for approximately 5 seconds.
 - g) Deactivate the ELT and read the test message broadcast at "turn-off".
- NOTE: The ELT LED will flash 5 times to indicate a navigation data failure if an Artex Nav Interface Unit is not installed with the ELT. The Dongle does not support the position data function of the ELT. If the ELT flashes other failure codes, refer to the applicable ELT manual to troubleshoot the problem.
- 3) The 15 digit hex ID (i.e., Beacon ID) displayed by the ETS is compared to the hex ID on the ELT. If identical, no further action is necessary. If different:
 - a) Enter the new hex ID on label P/N 591-0999 and affix it to the ELT over the existing hex ID on the product label.
 - b) If country and country code have changed, enter the new information on label (P/N 591-0429-01) and affix it to the ELT over the existing information on the product label.
 - c) Re-register the ELT. Refer to the applicable ELT Description, Operation, Installation & Maintenance Manual for specific ELT registration information and instructions.

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4. Fault Isolation

A. Troubleshooting Guidelines

1) Table 3 provides the Dongle troubleshooting guidelines for installation and operational issues.

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
ELT and Remote Switch flash continuously	Dongle is unable to synchronize with the ELT	Check the ELT protocol is programmed with a 24-bit address protocol
	Open or short in wiring	Check continuity between pin 1 of circular connector and pin 12
		Check continuity between pin 2 of circular connector and pin 9 of the rectangular connector
		Check wiring and connections continuity and security for short other pins

Table 3 Troubleshooting Guide

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REMOVAL

1. DGL-1 Programming Adapter

A. Dongle Removal

1) See Figure 3 Dongle Removal Sequence.

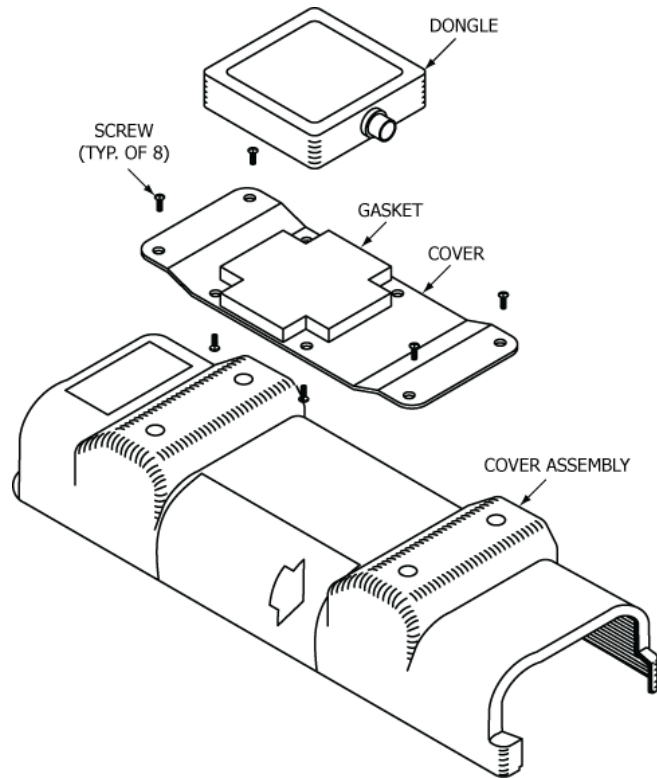


Figure 3 Dongle Removal Sequence

- 2) Remove black circular connector from the Dongle.
- 3) Remove the screws attaching the mounting plate to the top cover assembly.
- 4) Remove the screws attaching the Dongle to the mounting plate.

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2. Material or Equipment Return

A. Shipment Information

- 1) If any material or equipment is to be returned to the factory, under warranty or otherwise, ACR Electronics must be notified prior to shipment with the following information:
 - a) Model and serial number of equipment being returned,
 - b) Date purchased,
 - c) Date placed in service,
 - d) Number of hours in service,
 - e) Nature and cause of failure, and
 - f) Remarks, if any.

B. Return Material Authorization

- 2) Upon receipt of such notice, ACR Electronics, Inc. will issue a Return Material Authorization (RMA) number which then authorizes return of the material or equipment to the following address:

Repair and Overhaul

Artex Products / ACR Electronics, Inc.

5757 Ravenswood Road

Fort Lauderdale, FL 33312 USA

Phone: (954) 981-3333

Fax: (954) 983-5087

- a) Failure to obtain a RMA number and provide the details listed above may cause unnecessary delay and/or rejection of the returned material or equipment.
- b) All material or equipment returned to the factory must be freight prepaid.
- c) Acceptable methods of shipment for international return are Airborne, Burlington Air, DHL, Emery, Federal Express, UPS International, and World Wide only.

NOTE: Do not use "International Commercial Airlines", such carriers may cause a loss of returned material or equipment.

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INSTALLATION

1. Regulatory Requirements and Guidelines

A. Applicability

- 1) The regulatory requirements and guidelines for ELT installations discussed in the following subtasks are applicable to installation of the DGL-1 Dongle Programming Adapter and must be applied to the DGL-1 Dongle Programming Adapter. Where the word "ELT" is used in the following subtasks, read "DGL-1 Dongle Programming Adapter".

B. TSO C126, Paragraph D

- 1) TSO approval of the ELT does not constitute installation approval. All installations are subject to field approval for a given airframe by either an approved FAA DER or FAA FSDO. For installations outside the US, contact your local civil aviation regulatory agency for details.

C. FAA

- 1) This manual constitutes supporting data, as described in AC43.9-1, Paragraph 6.h.(2) and AC 43-210, Chapter 2, Paragraph 201(a)(6), and as such may be used as support for FAA field approval of the ELT/NAV Interface installation.
- 2) In addition to the procedures outlined herein and in accordance with FAR Part 43, the installer must adhere to the aircraft manufacturer's instructions and recommendations and the guidelines provided by FAA Advisory Circular AC 43.13-2 "Acceptable Methods, Techniques, and Practices - Aircraft Alterations", specifically Chapters 1 through 3, 11, and 13.
- 3) By signing the aircraft logbook, and FAA Form 337, the installer is stating the installation has been performed in accordance with current FAR requirements and the procedures outlined herein. The completed Form 337 is provided to the FAA and also becomes a permanent part of the aircraft maintenance records in accordance with AC43-9, Paragraph 17.

D. Canada

- 1) All installations must be performed in accordance with Canadian Aviation Regulations (CAR) Part V, Subparts 37, 51, and 71.

E. Other Countries

- 1) Installations in aircraft outside of the United States and Canada must be performed in accordance with applicable regulatory authority rules and regulations.

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F. RTCA

- 1) DO-204, § 3.1.8 guidelines for mounting a ELT:
 - a) The ELT shall be mounted to primary aircraft load carrying structures, such as trusses, bulkheads, longerons, spars, or floor beams.
 - b) The mounts shall have a maximum static local deflection no greater than 0.1 inches (2.5 mm) when a force of 100 lbs (450 newtons) is applied to the mount in the most flexible direction. Deflection measurements shall be made with reference to another part of the aircraft not less than 1 foot (0.3 meters) nor more than 3 feet (1.0 meters) from the mounting location.
- 2) DO-182, § 6.2.2.b recommends that:
 - a) To maximize the probability of the ELT transmitting a detectable signal after a crash, all ELT system components, which must survive a crash intact, e.g., transmitter and external antenna, should be attached to the airframe in such a manner that the attachment system can support a 100 g load, (ELT weight x 100, ELT antenna weight x 100, etc.) applied through the center of gravity of the component (ELT, antenna, etc.) in the plus and minus directions of the three principal axes of the aircraft.
 - b) Post-crash critical components of the ELT system, e.g., transmitter and external antenna, should be mounted as close to each other as possible.

2. Mechanical

A. Dongle Location

CAUTION: AVOID INSTALLING THE DONGLE WHERE IT MAY BE SUBJECTED TO UNPROTECTED EXPOSURE TO HARSH CHEMICAL FLUIDS, SUCH AS DEICING COMPOUNDS. THESE TYPES OF CHEMICALS MAY CAUSE DAMAGE TO FASTENERS AND ELECTRICAL COMPONENTS, AS WELL AS ELECTRICAL CONNECTOR CORROSION.

- 1) Mount the Dongle within 2 feet (610 mm) of the ELT, such that the interface harness does not exceed 3 feet (914 mm) including strain relief.
- 2) The Dongle chassis and ELT are mounted to the same support structure in most installations.

B. Dongle Installation

- 1) Coordinate the Dongle installation with the ELT installation whenever possible. If the Dongle is an add-on to an existing ELT installation, extend/modify the existing ELT support structure to accommodate the Dongle.
- 2) See Figure 4 Dongle Outline and Dimensions.

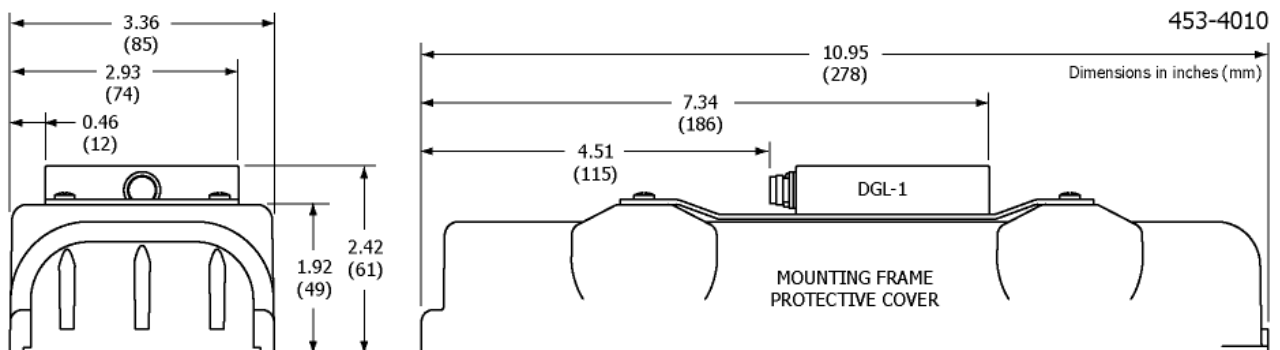


Figure 4 Dongle Outline and Dimensions

- 3) Mount the Dongle on the protective top cover on the ELT with four screws (P/N 201-6324-01)
- 4) Test the ELT installation in accordance with Test and Fault Isolation on page 14.

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3. Wiring

A. General Considerations and Recommendations

CAUTION: IF GROUND OR OTHER CONNECTIONS ARE BROKEN OR OTHERWISE DAMAGED, THE ELT IS STILL CAPABLE OF AUTOMATIC ACTIVATION; HOWEVER, THE COCKPIT REMOTE SWITCH MAY BE INCAPABLE OF RESETTING THE ELT AND OPERATION MAY NOT BE INDICATED ON THE REMOTE SWITCH LED.

CAUTION: INCORRECT TERMINATION OF THE WIRING IN THE CONNECTORS MAY DAMAGE THE DONGLE. VERIFY THE WIRING AGAINST THE WIRING DIAGRAM AND PERFORM A CONTINUITY CHECK TO CONFIRM GOOD CONNECTIONS AND PROPER PIN LOCATIONS.

- 1) The following wiring and grounding considerations and recommendations are applicable:
 - a) Minimum 22 AWG wire size.
 - b) Shielding is recommended to help prevent EMI and RF interference.
 - c) Use high quality conductor meeting MIL-W-16878, M22759, M27500, or a commercial equivalent acceptable for use in aircraft applications.
 - d) Provide a "Drip Loop" at the Dongle and the ELT receptacle to divert moisture from the connections. See LIST OF ACRONYMS, ABBREVIATIONS AND DEFINITIONS on page 5.
 - e) All grounds must be common to aircraft ground.
- 2) Minimum 24 AWG wire size for 24-bit address reprogramming ground wires.
- 3) The Dongle is provided with a preassembled wiring harness (P/N 611-4010).
- 4) If the Dongle is being installed with the ELT, refer to the ELT installation and operation manual and coordinate the wiring installation.
- 5) Refer to applicable ELT Description, Operation, Installation & Maintenance Manual for metal or composite airframe installations.

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B. Dongle Wiring

- 1) Refer to Figure 8 Dongle Wiring Diagram on page 24.
- 2) Refer to the applicable ELT Description, Operation, Installation & Maintenance Manual for pin configuration and additional wiring information.

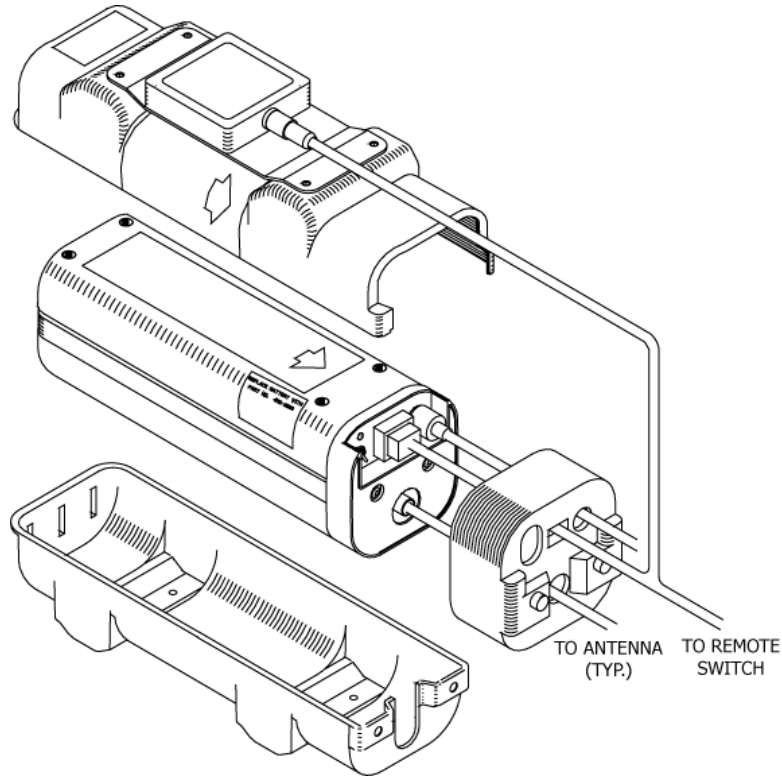


Figure 5 Dongle Wiring Harness Arrangement

- 3) A preassembled wire harness (P/N 611-4010) is provided with the Dongle.

NOTE:

Disassembly of the 12 position rectangular connector is required when installing a Dongle on an aircraft previously equipped with an ARTEX ELT to integrate the wire harness. Refer to Figure 6 Molex 12-Pin Connector Harness Arrangement on page 22. Use Molex extraction tool (Molex P/N 11-03-0002), or an equivalent tool for 0.062 in. terminal pins.

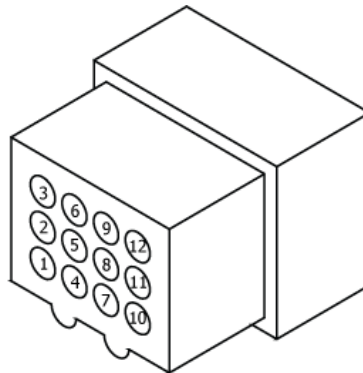


Figure 6 Molex 12-Pin Connector Harness Arrangement

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- 4) Assemble the wire harness with the Dongle wire harness (P/N 611-4010). See Figure 8 Dongle Wiring Diagram on page 24.

NOTE: Remote switch pin numbers are for an ARTEX standard remote switch (P/N 345-6196-04).

- 5) Terminate wires from the horn and remote switch with the male terminal pins provided (P/N 151-6627).
- Strip approximately 0.15 in. (3 mm) of insulation from ELT receptacle end of the wires from the horn and remote switch.
 - Dress and tin the bare wire ends to prevent the strands from fraying during terminal crimping operations.
 - Install the terminal pins with a Molex crimp tool (Molex Tool P/N 63811-330), or equivalent.
- 6) Insert the terminated wires into the applicable locations in the rectangular 12 position connector.
- 7) Fabricate a power wire of sufficient length to reach from the red, un-terminated wire on the preassembled wire harness to a suitable aircraft +28VDC, switchable power source. See Figure 7 Molex Power and Ground Wires on page 23.

CAUTION: **DO NOT WIRE DONGLE DIRECTLY TO THE AIRCRAFT BATTERY. THE 28 VOLT DC POWER SOURCE SHOULD BE PROTECTED WITH A .5A FUSE, OR CIRCUIT BREAKER, AND ON A SWITCH BUS.**

- a) A Raychem solder sleeve splice (Raychem P/N D-1744-01) is provided for this connection.

NOTE: Refer to Raychem for specific instructions on the splice use. Alternate splices may be used if installed in accordance with FAA AC 43.13.1A, Section 445, Splices in Electrical Wire.

- 8) Connect the +28VDC power source to the red wire.

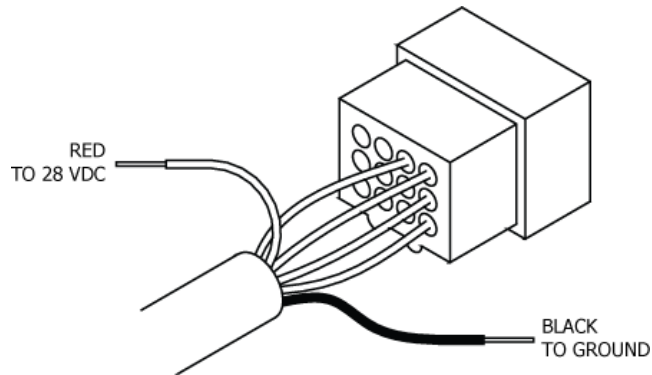


Figure 7 Molex Power and Ground Wires

- 9) Connect the ground to the black, un-terminated wire.

NOTE: Refer to Raychem for specific instructions on the splice use. Alternate splices may be used if installed in accordance with FAA AC 43.13.1A, Section 445, Splices in Electrical Wire.

- A Raychem solder sleeve splice (Raychem P/N D-1744-01) is provided for this connection.
- For installations of an ELT/Dongle, splice the black wire to an aircraft ground point near the ELT. See Figure 8 Dongle Wiring Diagram on page 24.

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NOTE: Pin 11 will not be available for remote switch grounding with the Dongle/ELT installation. Slice a ground for the remote switch.

- c) For Dongle installations on previously installed ELT, ground the un-terminated ground wire from the remote switch as described above.
- 10) Feed the black circular connector through the rectangular hole in the ELT end cap.
- 11) Connect the black circular connector to the plug on the Dongle.

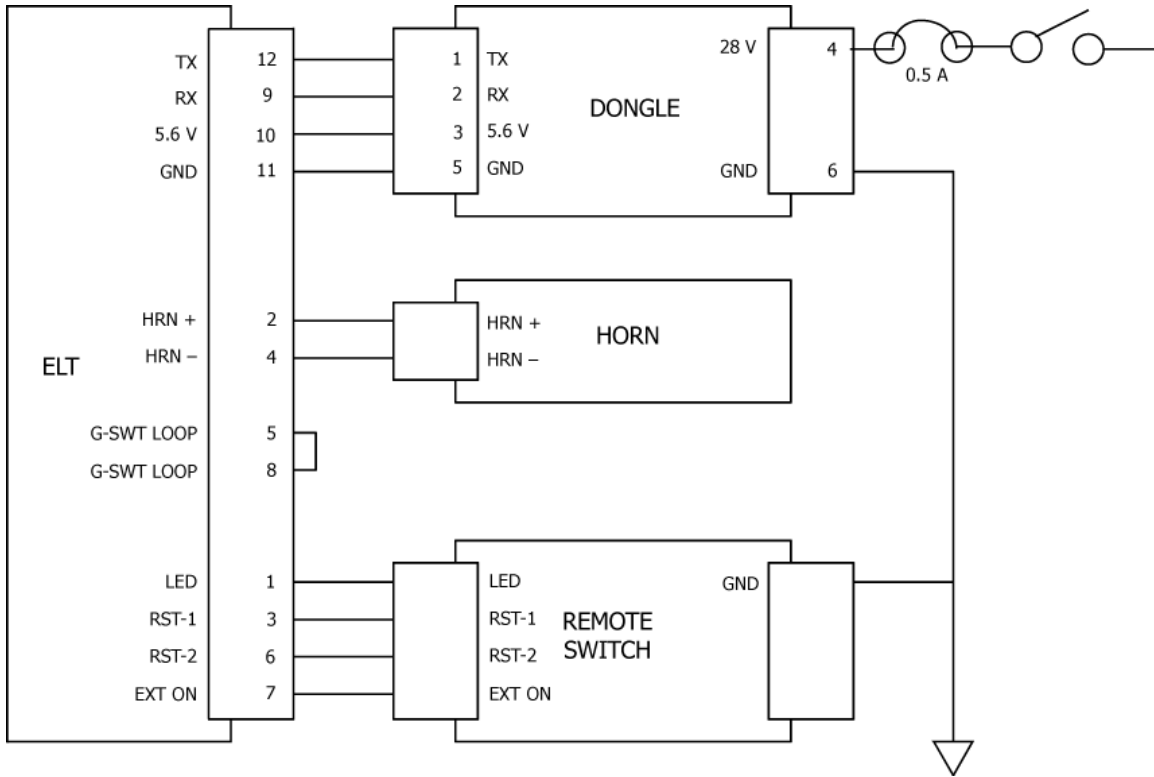


Figure 8 Dongle Wiring Diagram

C. 24-Bit Address Reprogramming

- 1) The 24-bit address is composed of binary "1s" and "0s", with a "1" electrically grounded to the airframe and "0" electrically open.
- 2) Encoding is accomplished by using a 24-bit address switch block which internally grounds selected addresses.
- 3) Remove the Dongle in accordance with Dongle Removal on page 17.
- 4) Determine the appropriate binary 24-bit address based on the octal or hexadecimal ID code assigned to the aircraft. See Figure 9 Octal/Hexadecimal to Binary Conversion on page 25.

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Example No. 1: Converting ICAO address 50134057 (octal) to binary 24-bit address

ICAO Octal Address to 24-Bit Binary																							
5			0			1			3			4			0			5			7		
1	0	1	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	1	0	1	1	1	1

MSB
ADDRESS 1

LSB
ADDRESS 24

Example No. 2: Converting ICAO address A0B82F (hexadecimal) to binary 24-bit address

ICAO Hex Address to 24-Bit Binary																							
A				0				B				8				2				F			
1	0	1	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	1	0	1	1	1	1

MSB
ADDRESS 1

LSB
ADDRESS 24

OCTAL/BINARY EQUIVALENTS

Octal	Binary
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

HEXADECIMAL/BINARY EQUIVALENTS

Hex	Binary	Hex	Binary
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111

Figure 9 Octal/Hexadecimal to Binary Conversion

- Set the 24-bit address switch block switches as appropriate for the 24-bit address binary code determined in the previous step. See Figure 10 24-Bit Address Switch Block on page 25.
- Install the Dongle in accordance with Dongle Installation on page 20.

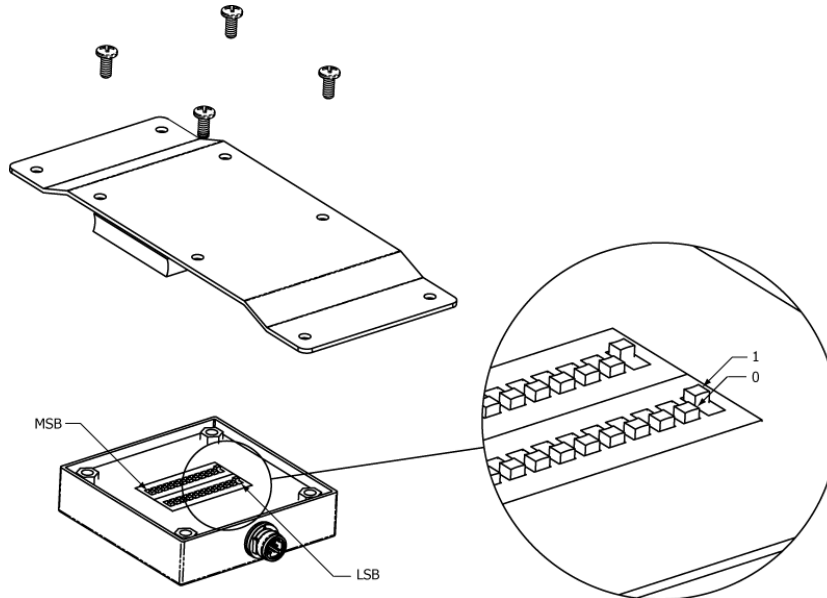


Figure 10 24-Bit Address Switch Block

- Test the installation in accordance with 24-Bit Address Reprogramming Verification Test on page 14.

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ILLUSTRATED PARTS LIST

1. Introduction

A. Purpose

- 1) This illustrated parts list (IPL) illustrates and lists the spare parts, with attaching hardware, applicable to the ME406 Series ELT.
- 2) Parts and components not listed herein, are not field replaceable and ELT repairs requiring parts outside the scope of this manual must be accomplished by the manufacturer.

B. IPL Usage Guide

- 1) If the part number is not known:
 - a) Find the part in the IPL Figure illustration.
 - b) Note the item number assigned to the part.
 - c) Refer to the associated parts list and find the item number in the "Fig # & Item" column.
- 2) If the part number is known:
 - a) Refer to the parts list and find the part in the "Part #" column.
 - b) Note the figure number and item number assigned to the part.
 - c) Refer to the illustration in the applicable IPL figure to find attaching hardware and related assembly parts.
- 3) In cases where multiple item numbers are shown on an illustration for the same item, there is more than one part number option associated with that item.

2. Manufacturer Name and Address

A. Ordering Information

- 1) Approved parts may be ordered from ACR Electronics, Inc. or any authorized dealer.

CONTACT INFORMATION

Sales, Artex Products / ACR Electronics, Inc.

5757 Ravenswood Rd

Fort Lauderdale, FL 33312-6645, USA

Phone: (954) 981-3333

Fax: (954) 983-5087

3. Explanation of Detailed Parts List Entries

A. Fig # & Item Column

- 1) The first number at the top of the column is the figure number of the corresponding illustration.
- 2) The right hand number is the item number in the associated figure.
- 3) A dash (-) in front of an item means the part is not illustrated.
- 4) Alpha-variants A through Z (except I and O) are assigned to item numbers, when necessary to identify added parts, alternate parts, and service bulletin modified parts.

B. Part # Column

- 1) This column contains the manufacturer's part number for each part.

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C. Nomenclature Column

- 1) This column contains descriptive nomenclature for each part, service bulletin numbers affecting the part, and obsolete part numbers.
- 2) The indenture system used in the "Nomenclature" column indicates the relationship of one part to another, as follows:

1 2 3

End Item or Major Assembly

ATTACHING PARTS

Attaching Parts for End Item or Major Assembly

. Detail Parts for End Item or Major Assembly

. Subassemblies

ATTACHING PARTS

. Attaching Parts for Subassemblies

. . Detail Parts for Subassemblies

ATTACHING PARTS

. . Attaching Parts for Detail Parts

- 3) Assemblies, subassemblies, and detail parts subject to modification, deletion, addition, or replacement by an issued service bulletin, are annotated to indicate both pre- and post-service bulletin configurations. The term (PRE SB XXXX) in the "Nomenclature" column designates the original configuration, and the term (POST SB XXXX) identifies assemblies and parts after the modification has been completed.
- 4) The terms defined below are used when applicable to indicate the interchangeability of parts.

Term	Abbreviation	Definition
Alternate	ALT	The listed part is alternate to, and interchangeable with, other parts within the same item number variant group or other item numbers if designated.
Superseded By	SUPSD BY	The part is replaced by and is not interchangeable with the item number designated in the notation.
Supersedes	SUPSDS	The part replaces and is not interchangeable with the item number designated in the location.
Replaced By	REPLD BY	The part is replaced by and is interchangeable with the item number designated in the notation.
Replaces	REPLS	The part replaces and is interchangeable with the

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		item number designated in the location.
--	--	---

D. UPA (Units Per Assembly) Column

- 1) The quantity shown in this column represents the units required for one next higher assembly or, when referring to attaching parts, the quantity to attach one such item.
- 2) The abbreviation RF (reference) indicates the end item assembly is listed for reference purposes.

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4. Detailed Parts List

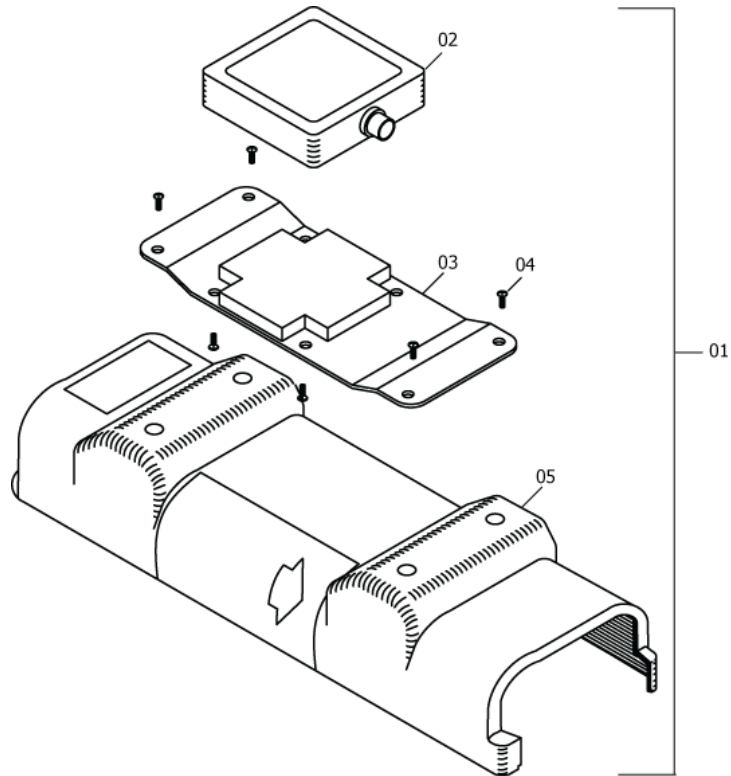


Figure 11 DGL-1 (Dongle) Programming Adapter Assembly

FIG #	ITEM	PART #	1234 NOMENCLATURE	UPA
11	01	453-4010	Programming Adapter Assembly, DGL-1, Dongle	1
	02	452-4010	DGL-1 Dongle Main Assembly	1
			ATTACHING PARTS	
	03	402-4011	. Cover, Dongle, DGL-1	1
	04	201-6324-01	. Screw, 6-32x5/16, PHIL, TRUSS, S/S	8
	05	452-3052-03	. Cover, Top, Protective w/inserts	1

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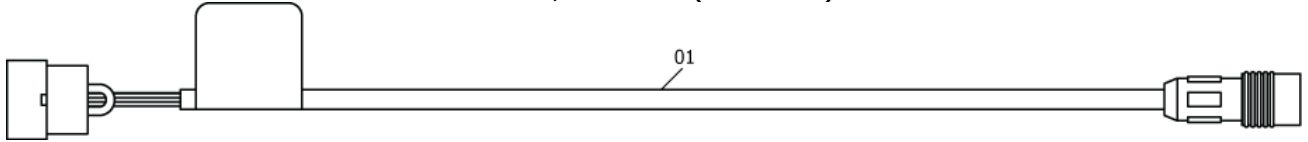


Figure 12 Wire Harness

FIG #	ITEM	PART #	1234 NOMENCLATURE	UPA
12	01	611-4010	Harness, DGL-1, Dongle	1
			ATTACHING PARTS	
	-	455-4010-01	Install Kit, DGL-1	1
	-	151-6627	Terminal, Crimp Male .062" Dia.	6
	-	591-0999	Label, Hex Code	1
	-	591-0429-01	Label, Country and Country Code	1
	-	610-1744-01	Solder sleeve Wire Splice .10 in.	2