



BlueTraker[®] LRIT and LRIT Arctic

Mechanical and Electrical Installation Manual

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2 BlueTraker[®] LRIT and LRIT Arctic terminal -Technical specifications

BlueTraker[®] LRIT is a dedicated device for Long Range Identification and Tracking of vessels at sea anytime, anywhere. The BlueTraker[®] LRIT comes in two versions:

- the standard version (BlueTraker[®] LRIT; P/N: 08567),
- The Arctic version, which is capable of starting up and operation in environmental temperatures down to -50°C (BlueTraker[®] LRIT Arctic; P/N: 09204).

For all the differences between BlueTraker[®] LRIT and BlueTraker[®] LRIT Arctic, please see the tables on pages 4 and 5. In the following chapters BlueTraker[®] LRIT Arctic will be mentioned only where there are differences between the two terminals. If there are no differences, only BlueTraker[®] LRIT will be mentioned.

BlueTraker[®] LRIT Arctic is the only LRIT solution for Sea Area A4 capable of reliable operation at all times in all areas and all weather conditions. The BlueTraker[®] LRIT and BlueTraker[®] LRIT Arctic are designed for more than 10 years of reliable and maintenance-free operation.

2.1 Specifications

Functionality:

BlueTraker[®] LRIT terminal power supply protection:

- o Overcurrent protection
- Overvoltage protection
- Reverse polarity protection
- Level 3 ESD protection

Integrated Antennas:

- GPS/GLONASS
- o Iridium

Double-shell housing:

• White color outer shell, resistant to UV sun radiation.

Installation site:

- On pole
- o Rail
- Flat surface

Optional mounting accessories:

• UniMount bracketry kit

Absolute maximum ratings			
POWER SUPPLY			
PARAMETER	Minimum	Maximum	
Input voltage	-36 VDC	150 VDC	
Short circuit current (@ -25°C)	-	2,2 A	
Short circuit current (@ +55°C)	-	1 A	

Not applicable.

POWER SUPPLYPARAMETERMinimumNominal/TypicalMaximumOperating voltage range8 VDC (1)12/24 VDC36 VDC (1)Operating voltage range for Arctic kit option21,6 VDC (1)24 VDC36 VDC (1)Operating terminal power supply current0,7A(Power supply voltage = 8 VDC, Ambient Temperature = 23 °C)-0,83 AOperating terminal power supply current for Arctic kit option0,83 A(Power supply voltage = 21 VDC, Ambient Temperature = -25 °C0,83 APower supply cable outside diameter5,35 mm5,6 mm5,85 mmPower supply cable conductor diameter-0,75 mm²-IRIDIUM SBD MODEM SPECIFICATIONS-1616 HLz to 1626,5 MHz (L band)Frequency range1616 KLz to 1626,5 MHz (L band)	
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GPS/GLONASS RECEIVER SPECIFICATIONS	
Frequency 1575,42 MHz (L1 band)	
Sensitivity – Tracking -167dBm	
Sensitivity – Navigation -157dBm	
No of channels 33 Tracking / 99 Acquisition	
PART DIMENSIONS:	
BlueTraker [®] LRIT terminal (W x L x H) 200 mm x 200 mm x 70 mm	
MainCableSet11 3W 50m – when coiled (W x L x H) 250 mm x 300 mm x 70 mm	
UniMount (W x L x H) 250 mm x 150 mm x 80 mm	
Package (W x L x H) 370 mm x 270 mm x 190 mm	
WEIGHT:	
BlueTraker [®] LRIT terminal 1,1 Kg	
MainCableSet11 3W 50m 2,5 Kg	
UniMount 1,1 Kg	
Package 4,9 Kg	
ENVIRONMENTAL:	
PARAMETER Minimum Maximum	
Operational temperature range -25 °C +55 °C	
Operational temperature range for Arctic kit option -50 °C +55 °C	
Storage temperature range -25 °C +70 °C	
Humidity 10 % RH 100 % RH	
IP level of protection IP68 (to depth of 6 m, duration 1 hour), IP69K	
LEGISLATION:	
PARAMETER Document	
Type approved by Classification Society Certificate number: 60 464-09 HH	
U.S. Coast Guard Approved Certificate number: 165.207/5/0	

(1) Depending on the Main Cable Set length. For additional info please contact your nearest EMA representative.

- Not applicable.

3 Installation overview

During the installation of BlueTraker[®] LRIT, please follow the following steps:

Step 1

Install the BlueTraker[®] LRIT terminal in accordance with BlueTraker[®] LRIT Mechanical and Electrical Installation Manual. Follow the chapter 5 Installation of BlueTraker[®] LRIT terminal on page 8.

Step 2

Immediately after installation complete the attached **BlueTraker® LRIT Response Form**. Note there are two tabs, one already filled by EMA about your terminal and one for installation/vessel details. Please fill up second tab and send the BlueTraker[®] LRIT Response Form to EMA (by e-mail, fax...).

Step 3

Upon reception of the BlueTraker[®] LRIT Response Form, EMA will check that your BlueTraker[®] LRIT is working properly and run a free pre-conformance test. You will be informed about BlueTraker[®] LRIT functionality and test results.

If pre-conformance test fails, you will be advised what needs to be done to make the device start working properly. Also, re-check the installation and please notify us about the cause of the problem when it is identified.

Step 4

After the pre-conformance test passes we will release BlueTraker[®] LRIT transponder's IMEI and you will be instructed to contact the correct LRIT Conformance Testing ASP and fill up and send them the proper CTR test form request and payment. Usually you will be able to request a CTR on the internet. If you order from EMA CT Codes (for Pole Star or Fulcrum) your procedure for getting CTR (Conformance Test Report) will be much easier.

The world's major Testing ASP's are:

Pole Star: www.lrit.com

Fulcrum: <u>www.fulcrum-maritime.com</u>

CLS: <u>www.lrit.fr</u>

Information Technology Services: <u>www.sirmspa.com</u>

Transas: <u>www.lritservice.com</u>

4 Marking and identification

Markings and identification are applied to most significant parts of BlueTraker[®] LRIT. This chapter describes markings and identification of each significant part of BlueTraker[®] LRIT.

Since it is impractical to have every component marked, only significant parts of BlueTraker[®] LRIT are marked. Most of these markings are located on the BlueTraker[®] LRIT terminal (see Figure 1 and Figure 2). These identify the manufacturer, unit name, model, part number, and serial number.



Figure 1: Location of markings on the top side of BlueTraker® LRIT terminal



Figure 2: Location of markings on the bottom side of BlueTraker[®] LRIT terminal

5 Installation of BlueTraker[®] LRIT terminal

WARNING:

There are no user serviceable parts inside BlueTraker® LRIT! The installation has to be done by authorized personnel only!

5.1 Package contents

- BlueTraker[®] LRIT satellite communications terminal (PN: 08567) or BlueTraker[®] LRIT Arctic satellite communications terminal (PN: 09204)
- UniMount (PN: 08165) terminal mounting bracket with assembly components
- Main Cable Set (PN: 12257)
- BlueTraker[®] LRIT and BlueTraker[®] LRIT Arctic Mechanical and Electrical Installation Manual (this document, PN: 11953)
- BlueTraker[®] LRIT Response Form

IMPORTANT:

Verify that all listed items are included and that nothing has been damaged in transit.

5.2 Tools needed for the installation

Besides BlueTraker[®] LRIT package, you will need some additional tools and supplies (the tools listed are a recommendation – please note that you may need additional tools, depending on your particular installation):

- Ladder/elevator (to access the mounting position),
- Personal safety equipment (Safety belt and rope).

IMPORTANT:

The listed equipment covers typical installations. You may require additional equipment. Select the appropriate tools and equipment for your particular installation requirements.

5.3 Prerequisites and requirements

- Ensure that you have access to vessel power supply and grounding.
- Select the locations for installing the BlueTraker[®] LRIT terminal (for more information refer to chapter **"Select proper choice of terminal mounting position**" on page 10).
- Select the path for running the Main Cable Set. Cables must be secured and supported at regular intervals and protected against physical damage.

BlueTraker[®] LRIT terminal is designed to operate at power supply voltages down to 8 VDC (or 21 VDC in case of BlueTraker[®] LRIT Arctic). Because the terminal draws up to 0,7 ADC current there is a voltage drop present on the Main Cable Set. This voltage drop needs to be compensated with higher power supply voltage or the total length of a Main Cable Set needs to be reduced.



Figure 3: Calculation of maximum length of Main Cable Set

To calculate the maximum Main Cable Set length for a known minimum vessel power supply voltage, use the following formula:

$$l = \frac{U_{VESSEL} - U_{BT}}{I_{BT} * 2 * R_{MCS}}$$

To calculate the minimum vessel power supply voltage for a known maximum Main Cable Set length, use the following formula:

$$U_{VESSEL} = U_{BT} + 2 * R_{MCS} * I_{BT} * l$$

Where:

U_{VESSEL} = minimum vessel power supply voltage

U_{BT} = minimum BlueTraker[®] LRIT operational power supply voltage (see technical specifications)

 I_{BT} = maximum BlueTraker[®] LRIT operational current (see technical specifications)

I = maximum Main Cable Set length

 R_{MCS} = resistance of Main Cable Set's wire per meter, which is 0,028 Ω /m.

5.4 Select proper choice of terminal mounting position

IMPORTANT:

BlueTraker[®] LRIT terminal requires clear sky view.

Never place anything on top of the BlueTraker[®] LRIT terminal.

Never place the BlueTraker[®] LRIT terminal inside radiation fields of other RF equipment or other RF equipment into the BlueTraker[®] LRIT terminal's antenna radiation field.

Improper installation voids warranty!

Installation of terminal should be done with proper mounting accessories!

The good positioning of the device is the key to a successful operation – there must be no obstacles in the area which can block Radiofrequency (RF) signals in horizontal or vertical directions.

BlueTraker[®] LRIT terminal contains receiving and transmitting internal antennas. For this reason, the mounting place for the terminal is of utmost importance.

Key guidance's which must be considered when choosing the appropriate mounting spot are:

- BlueTraker[®] LRIT terminal should be mounted outside any cabin and as high as possible,
- BlueTraker[®] LRIT terminal should be mounted horizontally,
- There aren't supposed to be any obstacles near or over the device, which could block RF signals,
- There must be no overlapping of the RF radiation fields of the BlueTraker[®] LRIT terminal and other RF equipment,
- BlueTraker[®] LRIT terminal must be installed at least 0,75m away from a standard magnetic compass and 0,45m away from a steering magnetic compass,
- Mounting surface should be rigid enough to withstand mechanical vibrations try to avoid strengthening vibrations already present,
- Choose a suitable mounting position away from loading places, passages and out of reach from unauthorized personnel,
- Avoid mounting near exhausts, direct heat and steam exposure,
- Recommended spots would be a rigid object like the mast.



Proper choice of BlueTraker[®] LRIT terminal mounting position (Note: BT is short for BlueTraker):

Figure 4: Proper choice of BlueTraker® LRIT terminal mounting position

Other RF equipment Other RF equipment

Improper choice of BlueTraker[®] LRIT terminal mounting position:

Figure 5: Improper choice of BlueTraker® LRIT terminal mounting position in relation to other RF equipment



Figure 6: Improper choice of BlueTraker® LRIT terminal mounting position in relation to RADAR

5.5 UniMount bracketry kit

5.5.1 UniMount bracketry kit assembly contents

UniMount bracketry kit consists of following components:

- UniMount bracket (1) PN: 10245
- UniMount clamp (2) PN: 09982
- 4x M5x45mm screws for UniMount clamp (3) PN: 11741
- 4x M5 wide washers for UniMount clamp (4) PN: 10005
- 8x M5 self-locking nuts (5) PN: 07574
- 4x M5x40mm screws for BlueTraker[®] VMS terminal (6) PN: 07317
- 8x M5 flat washers for BlueTraker[®] VMS terminal (7) PN: 07576

5.5.2 Installation of UniMount bracketry kit

To install UniMount bracketry kit, use the following procedure:

- 1. Position the UniMount bracket (1) and UniMount clamp (2) around the rail and hold firmly in place.
- 2. Insert the top two M5x45mm screws (3) through the clamp and bracket holes and fix with the M5 wide washers (4) and M5 self-locking nuts (5).
- 3. Insert the bottom two M5x45mm screws (3) through the clamp and bracket holes and fix with the M5 wide washers (4) and M5 self-locking nuts (5).
- 4. Use a spirit level to level the UniMount bracket horizontally.
- 5. Tighten all the screws to firmly fix the UniMount bracket to the rail.



Figure 7: UniMount bracketry kit installation diagram

5.5.3 Installation of BlueTraker[®] LRIT terminal onto the UniMount bracketry kit

To install BlueTraker[®] LRIT terminal onto the UniMount bracketry kit, use the following procedure:

- 1. Place and align the BlueTraker[®] LRIT terminal (8) on the UniMount bracket (1).
- 2. Put one M5 flat washer (7) on each of the four M5x40mm screws (6).
- 3. Insert the four M5x40mm screws (6) with washers through the terminal and bracket holes and tighten with the M5 flat washers (7) and M5 self-locking nuts (5).



Figure 8: BlueTraker® LRIT installation onto the UniMount bracketry kit

6 Main Cable Set - Installation Guideline

WARNING!

Installation has to be done by authorized personnel only!

For compatibility to IMO performance standard requirements, BlueTraker® LRIT must receive power from ship's main and emergency power supply!

For installation rules please refer to relevant IEC publication and Classification Society rules.

Do not apply power to BlueTraker® LRIT until the Main Cable Set is properly wired, checked and attached.

The BlueTraker[®] LRIT terminal connects to the ship's electrical system via a Main Cable Set that plugs into BlueTraker[®] LRIT terminal's Main Connector and must be connected to ship's main and emergency power supply.

For correct wiring diagram please refer to Figure 10 on page 14.



Figure 9: Main Cable Set

Run the Main Cable Set according to the following instructions of good electrical practice:

- Use appropriate mounting/fastening material to attach the cable at least every 30 cm of cable.
- Avoid running the cable near exhausts, direct heat and steam exposure, loading places, passages and out of the reach of unauthorized personnel.
- Do not pull on the **connector** of the Main Cable Set
- Do not bend the Main Cable Set tighter than 70mm bending radius
- Sometimes it may be necessary to run cable through a pre-drilled hole. Use appropriate grommet and apply marine sealant.



Figure 10: BlueTraker® LRIT wiring diagram

7 Finalizing the installation

The last step in the BlueTraker[®] LRIT installation is to verify the operation of the terminal and to fill out and send the BlueTraker[®] LRIT Response Form.

To verify the BlueTraker[®] LRIT system installation:

1. Turn on the power supply.

- 2. After 5 minutes check the status indicators sequence on the BlueTraker[®] LRIT terminal:
 - BLUE indicator should stay lit for 2 seconds,
 - Then RED indicator should stay lit for 2 second,
 - Then GREEN indicator should stay lit for 2 second,
 - And finally, no indicator should be lit for 2 seconds.

IMPORTANT:

After first power-up the BlueTraker[®] LRIT terminal starts the initialization sequence. During this time the RED status indicator on the terminal flashes (this may take a few minutes). After successful initialization the indicator colors change according to the sequence mentioned above.

8 Status LED description

BlueTraker® LRIT has a status LED installed on its bottom side (as shown on Figure 11).



Figure 11: Status LED is marked by red arrow

It displays status of power supply to the unit, status of GPS/GLONASS signal and status of Iridium network connection. Each of these three statuses is represented by one color of the LED light. Color/Status of LED changes every 2 seconds and shows the state of the system it represents:

- RED (LIT) normal operation, powered by electrical supply of the vessel
- RED (FLASHING) initialization sequence in progress
- BLUE (LIT) Connected to IRIDIUM satellite network
- BLUE (FLASHING) IRIDIUM Satellite network not available
- GREEN (LIT) GPS/GLONASS fix acquired
- GREEN (FLASHING) No GPS/GLONASS fix

9 BlueTraker[®] LRIT Activation

BlueTraker[®] LRIT activation procedure is described in relevant document supplied by flag state ASP. In general ship operator should provide all the relevant info to flag state ASP. This includes, but is not limited to:

- Call sign and IMO number;
- Accurate Gross Tonnage figures;
- Sea area as indicated on the Ship Safety (Radio) Certificate;
- The communication system used for LRIT and the terminal number (i.e. Iridium IMEI number);
- Name of ship owner's organization and flag state authority relation number.

10 Transfer of Flag State

The ship owner shall ensure that the relevant info is provided to flag state authority upon the transfer of Flag State of a vessel. This includes, but is not limited to:

"Flag in", in addition to the basic LRIT data (ship's name, IMO number, call sign and MMSI):

- the effective date and time (UTC) of transfer;
- The State whose flag the ship was formally entitled to fly, if known.

"Flag out" or taken out of service:

- ship's name;
- IMO number;
- the effective date and time of transfer, or the time of taking out of service;
- The State to which the flag of the ship will be/has been transferred, if known.

11 User controls

There are no user controls on BlueTraker[®] LRIT. Flag state ASP has complete control over BlueTraker[®] LRIT at all times while device is connected to ships power supply.

BlueTraker[®] LRIT can be set to stop sending of position reports with remote command, sent by flag state ASP!

12 Disposal

Do not dispose any electronic equipment in the domestic household waste!



Any equipment pending disposal should be returned to the manufacturer or local representative!

13 Disclaimer

Manufacturer reserves the right to make changes without further notice to the product to improve reliability, function or design. This document and the information contained herein are the subject of copyright and intellectual property rights under the international conventions act.

For the most recent version of this document please contact your nearest EMA distributor.

All rights reserved.

No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form by any means: electronic, mechanical or optical, in whole or in part, without the prior written permission from the manufacturer.

14 Regulatory Information

This product is not designed for use in life support appliances, devices, or systems where malfunction of this product or related accessories can reasonably be expected to result in personal injury or loss of life.

15 EC Declaration of Conformity

EC DECLARATION OF CONFORMITY

Manufacturer (name, address):

EMA d.o.o. Mariborska cesta 1c 3000 Celje Slovenia

We declare under our sole responsibility that

Products:

BlueTraker LRIT and BlueTraker LRIT Arctic

Product Description: Long Range Vessel Tracking device based on Iridium satellite network

is in conformity with the provisions of the following directives and in compliance of the following standards

Directive	Specifications/Standards
LVD 2006/95/EC	EN 60950-1:2001
EMC	IEC 60945:2002 (Corrigendum 1)
2004/108/EC	ETSI EN 301 489-20 V1.2.1 (2002-11)
R&TTE	ETSI EN 301 441 V1.1.1 (2000-05)
99/5/EC	ETSI EN 301 489-20 V1.2.1 (2002-11)

Product is also in conformity with following additional standards: - ISO7637-2:2004

Place and Date of Issue (dd.mm.yyyy):

Name, surname, position and signature of Authorized Person:

Celje, 29.07.2014

Zlatko Mastnak Bsc., group CEO

parta

16 GL Type Approval

TYPE APPROVAL CERTIFICATE

This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the DNV GL Type Approval System.

Certificate No.	60 464 - 09 HH
Company	EMA d.o.o. Mariborska cesta 1c
Product Description	3000 Celje, SLOVENIA
	BlueTraker [®] PIT BlueTraker [®] PIT Arctic
Environmental Category	F; EMC 1
Technical Data / Range of Application	Long Range Identification and Tracking (LRIT) shipborne unit based on Iridium satellite system, consisting of: - Integral GPS/GLONASS receiver, - Integral GPS/GLONASS antenna, - Integral Iridium transceiver, - Integral Iridium antenna, - Integral power supply. Power supply: - BlueTraker [®] LRIT (P/N:08567): 12/24 VDC nominal (8 VDC to 36 VDC range), - BlueTraker [®] LRIT Arctic (P/N: 09204): 24 VDC nominal (21 VDC to 36 VDC range). Degree of protection: - IP68 (depth 6 m, duration 1 hour) / IP69K. Software Version: - Firmware LRIT 4.8.B7.
Test Standard	MSC.263(84); MSC.1/Circ.1296; IEC 60945:2002 / EN 60945:2002 / Corr.1:2008; GL Guidelines for the Performance of Type Approvals, Chapter 2 (VI-7-1, 2012).
Documents	Test reports: SIQ T211-0001/14, dated 2014-01-22; SIQ T251-0061/14, dated 2014-01-21; EMA TN14_001, RN: 14R00005, dated 2014-01-24; TRL EU2398/6579; RU1196/6580; BSH Certificate No. 854, dated 2014-01-23; BlueTraker [®] LRT and LRIT Arctic Mechanical and Electrical Installation Manual Rev. 1.0. Doc-ID 12134 (P/N: 11953)
Remarks	This certificate is issued on the basis of GL Guidelines for the Performance of Type Approvals, Chapter 1 - Procedure (VI-7-1), Edition 2007.

 Valid until
 2019-07-31

 Page
 1 of 1

 File No.
 I.E.03

 Hamburg,
 2014-09-25

Type Approval Symbol



Marco Rinkel

Uwe Supke

DNV·GL

DNV GL

www.dnvgl.com

17 U.S. Coast Guard Certificate of Approval

