



KONGSBERG

Instruction Manual

TTC

Transponder test and configuration unit





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Instruction Manual

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Document information

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Warning

The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. You must be familiar with the contents of the appropriate manuals before attempting to operate or work on the equipment.

Kongsberg Discovery disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

Disclaimer

Kongsberg Discovery AS endeavours to ensure that all information in this document is correct and fairly stated, but does not accept liability for any errors or omissions.

Support information

If you require maintenance or repair, contact Kongsberg Discovery's support organisation. You can also contact us at the following email address: support.hpr@kd.kongsberg.com. If you need information about our other products, visit <https://www.kongsberg.com/discovery/>.

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About this manual

This manual includes all necessary documentation to safely install, operate and maintain the system.

Target audience

This manual is intended for all users of the system.

Online information

All end-user documentation can be downloaded from our website.

<https://www.kongsberg.com/discovery/>

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System description

The transponder test and configuration unit is designed for on deck testing and configuration of transponders.

The TTC unit can test all Kongsberg transponder channels, Cymbal and FSK. It can also test telemetry transponders with internal and external sensors. The TTC 30 unit is for testing and configuration of medium frequency transponders. The TTC 10 unit is for testing and configuration of low frequency transponders.



Transponder test and configuration unit (TTC)

The transponder test and configuration unit is designed for on deck testing and configuration of transponders.

The TTC unit is delivered with a test transducer, a serial line cable and a power cable.



Test transducer

Before using the transponder, it is recommended that you do an acoustic test to ensure that the transponder is in full working order. The test transducer must be connected to the TTC unit and set up correctly before an acoustic test can be carried out.



Serial line cable

The serial line cable connects a transponder to the TTC unit. When the connection is set up, the TTC unit can configure or reconfigure the transponder.

Power cable

The power cable connects the TTC unit to a 110/230 VAC power supply. Only use the power cable supplied with the unit. Do not use if damaged or excessively worn. Contact Kongsberg for a replacement.

Note

Do not use the control panel as a storage space when the unit is not in use. Do not place the cable organizer bag and/or the cables on top of the touch screen and close the lid. Doing so may damage the touch screen and the control panel.

Support information

Should you need technical support for your TTC system you must contact a Kongsberg Discovery office. A list of all our offices is available on our website. You can also contact our main support office in Norway.

Manuals and technical information can be downloaded from our support website.

Company name	Kongsberg Discovery AS
Address	Strandpromenaden 50, 3183 Horten, Norway
Telephone 24hr Support	+47 33 03 24 07
Website	https://www.kongsberg.com/discovery/
Support website	Product support A to Z
E-mail address	support.hpr@kd.kongsberg.com

Kongsberg Discovery support is also available in the KM-Support App. Our support application is available for free in the App Store and Google Play. Search for KM-Support. The use of our support application is free of charge. Your mobile phone provider may charge you the cost of the communication.

Operating procedures

Topics

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Opening and closing the case

The case latches are fitted with a safety mechanism preventing unintentional opening.

Context

Place the unit on a steady and level surface. Secure the unit to minimize the risk of harm to personnel and equipment.

Procedure

- 1 Opening the case.
Press and hold the square buttons on the latch handles to release the safety mechanism and pull the latch handles towards you to open the case.
- 2 Closing the case.
Close the lid and push the latch handles inwards to latch the lid. After latching the lid check that the latches' safety mechanism is engaged.



Note

Do not place the cable organizer bag and/or the cables on top of the touch screen and close the lid. Doing so may damage the touch screen and the control panel.

Connecting to AC power and charging the unit's battery

The unit has a rechargeable battery that lasts approximately 3 hours when fully charged. Start charging when the LED battery level indicator turns red. The battery is fully charged when the the LED battery level indicator is all green. The LED battery level indicator is next to the **ON/OFF** switch.

Context

Only use the power cable supplied with the unit. Do not use if damaged or excessively worn. Contact Kongsberg for a replacement.

Procedure

- 1 Connect and secure the power cable to the unit's power connector.
The power connector is located below the left latch.
- 2 Connect the power cable to a 110/230 VAC power supply.
Check the LED battery level indicator from time to time during charging and stop charging when it is all green.



Note

Always connect and secure the power cable to the unit's power connector before connecting the power cable to an external power supply.

Switching the unit on and off

The **ON/OFF** switch is located on the right, labelled ON OFF.

Context

When switched on, the unit can either run on power from an external 110/230 VAC power supply or on power from the internal battery. It is not necessary to disconnect the unit from the external power supply during use.

Procedure

1 Switching the unit on

Press down the side labelled **ON** on the **ON/OFF** switch to switch on the unit. An audible click confirms the **ON/OFF** switch is in the on position and that the unit is switched on, and its PC will boot.

Booting up takes approx. 1.5 minutes.

2 Switching the unit off

Press down the side labelled **OFF** on the **ON/OFF** switch to switch off the unit. An audible click confirms the **ON/OFF** switch is in the off position and that the unit is switched off, and its PC is shut down.



Standby mode

The unit's PC will automatically go into standby mode if no input has been detected for 5 minutes.

Context

In standby mode, the screen will go to sleep and turn black. Wake the screen to return to operational mode.

Procedure

- Touch the screen or move the trackball to wake the screen and to return to operational mode.



Doing an acoustic test

Before using the transponder, it is recommended that you do an acoustic test to ensure that the transponder is in full working order.

Context

Secure the transponder to minimize the risk of harm to personnel and equipment. The test transducer is for communication in air only so always set the TTC unit's power level to either minimum or low prior to testing.

Procedure

- 1 Open the case.
- 2 Switch on the unit.
- 3 Connect the test transducer cable to the **TRANSDUCER** port in the upper right corner.
- 4 Place the test transducer face to face with the transponder transducer.
- 5 Use the left and right arrows to set the power level of the test transducer. The power level is displayed in the field. The power level has two settings, minimum (Min.) and low. The default setting is minimum but either setting is safe to use. Select **SET** to confirm.
- 6 Enter the transducer's serial number, if necessary.
- 7 Enter the transponder channel number, if necessary.
- 8 Select **INTERROGATE** to start the acoustic test. An on-screen green indicator will flash on and off confirming an acoustic contact with transponder and a successful test. The transponder is in full working order.
- 9 Select **INTERROGATE** again to end the acoustic test.



Configure or reconfigure a transponder

Follow this procedure if the transponder has to be configured or reconfigured.

Context

Secure the transponder to minimize the risk of harm to personnel and equipment.

Procedure

- 1 Open the case.
- 2 Switch on the unit.
- 3 Connect the serial line cable to the **SERIAL** port in the upper right corner and to the port at the bottom of the transponder. Connect the serial cable to the port labelled **Signal** or **TP** if there are two or more ports at the bottom of the transponder. If in doubt, consult the transponder manual.
- 4 Select the on-screen **Transponder Configuration** tab. The **Transponder Configuration** tab contains on-screen buttons that allow the user to configure or reconfigure a transponder via the serial line.
- 5 Select **Get config from TP** to view the current transponder configuration. A green horizontal bar at the bottom of the tab, superimposed with the last contact time, confirms that a data transaction can take place between the unit and the transponder. The unit is ready to configure the transponder. A red horizontal bar confirms data transaction failure between the unit and the transponder. In the event of a data transaction failure, check the cable connections and select **Get config from TP** again to check that a data transaction can take place between the unit and the transponder.
- 6 Select **Download new configuration** to update the transponder. The transponder's configuration data will be updated. A green "Reload successful" message in the bottom right corner of the tab confirms that the transponder configuration was successful. A red "Download config failed" message in the lower right corner of the tab confirms the transponder configuration failed. In the event of a transponder configuration failure, check cable connections and select **Download new configuration** again to update the transponder.
- 7 Do an acoustic test to verify that the transponder is in full working order.



Control panel

Topics

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[Controls, page 17](#)

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Control panel

The unit's control panel allows you to view and control the settings of a connected device, as well as test, configure and update a connected device. The unit's PC is an integral part of the control panel and is located on the underside of the control panel. The control panel consists of a set of controls and a touch screen with a graphical user interface (GUI). The touch screen GUI is a tabbed display with either three or four tabs, depending on the type of device connected.

Controls

The controls allow you, among other things, to connect the unit to an external power source, to switch the unit on and off, and to connect it to other devices.

The unit has a power connector for connection to a 110/230 VAC power supply. The power connector is located below the left latch. Only use the power cable supplied with the unit.



On top, in the upper right corner there are two ports with protection caps labelled **SERIAL** and **TRANSDUCER**. The serial port is used during transponder configuration and the transducer port is used during acoustic testing. Below these two ports there is a small, latched lid labelled **USB LAN**. Under the lid there are three ports for authorized service personnel only.



The **ON/OFF** switch is located on the right, labelled ON OFF. The LED battery level indicator is next to the **ON/OFF** switch.



In the lower right corner is a trackball with two buttons. The trackball controls the on-screen pointer. The left button is used for selecting and clicking on-screen objects such as buttons and menu options. The right button is used for presenting on-screen menus and pop-up windows.



Touch screen

In addition to the aforementioned controls, the unit's control panel includes a touch screen with a graphical user interface (GUI). The touch screen contains interactive elements that allow you to interact with the unit, view and control the settings of a connected device, as well as test, configure and update a connected device. The touch screen GUI is a tabbed display with either three or four tabs, depending on the type of device connected.

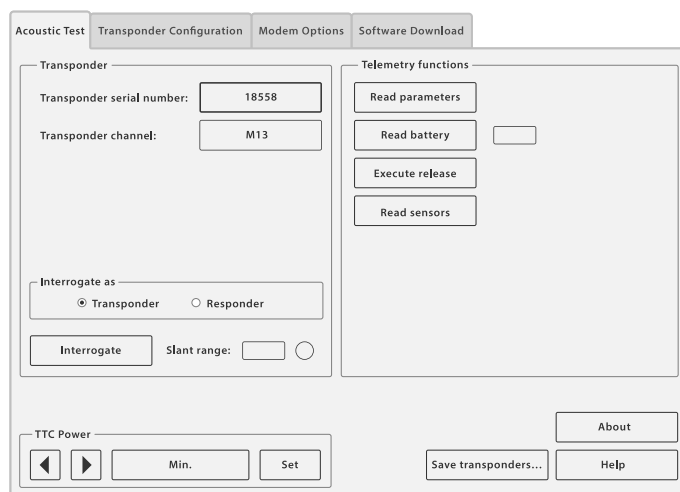
Acoustic Test tab

The **Acoustic Test** tab contains alphanumeric fields to view the settings of the connected transponder/modem and interactive alphanumeric fields and buttons. The interactive elements allow you to interact with the transponder/modem and do an acoustic test to ensure the device is in full working order.

Description

After entering the transponder/modem serial number and channel, you can check that the transponder/modem is in full working order, read parameters, check battery status, read sensor values and test the release mechanism.

Details



The tab contains the following interactive alphanumeric fields and buttons for interacting with the device connected to the unit:

Transponder serial number

The transponder/modem serial number is entered in this field.

Transponder channel

The transponder/modem channel number is entered in this field.

Interrogate

Select **Interrogate** to start an acoustic test. A green indicator to the right of the **Slant range** field will flash on and off for every interrogation confirming an acoustic contact with the transponder. Select **Interrogate** again to end an acoustic test.

TTC Power

Use the left and right arrows to set the power level of the test transducer. The power level is displayed in the field. The power level has two settings, minimum (Min.) and low. The default setting is minimum but either setting is safe to use. Select **Set** to confirm.

Read parameters

Select **Read parameters** to send an acoustic telegram. While waiting for the response, a dialog box will open showing the status and progress. The acoustic telegram will be re-sent up to 2 times if the first attempt fails. Parameters and values are displayed as soon as the response is received.

Read battery

Select **Read battery** to view the transponder's spent battery capacity.

Execute release

Select **Execute release** to test the transponder/modem release mechanism. Check that the mechanism opens as intended. Please note that if the release mechanism is tested while the transponder/modem is deployed on the seabed and fitted with a floating collar, the device *will* float to the surface.

Read sensors

Select **Read sensors** to select and view the status of the transponder/modem sensors. A dialog box opens and displays a list of the transponder/modem sensors. Select a sensor and select **Read selected sensor** to view its status. Select **Close** to close the dialog box.

About

Select **About** to view the ID and data of the transponder/modem.

Help

Select **Help** to view online help.

Save transponders...

Select **Save transponders...** to save the transponder/modem ID and data to an XML file.

The tab contains the following alphanumeric fields for viewing the settings of the device connected to the unit:

Slant range

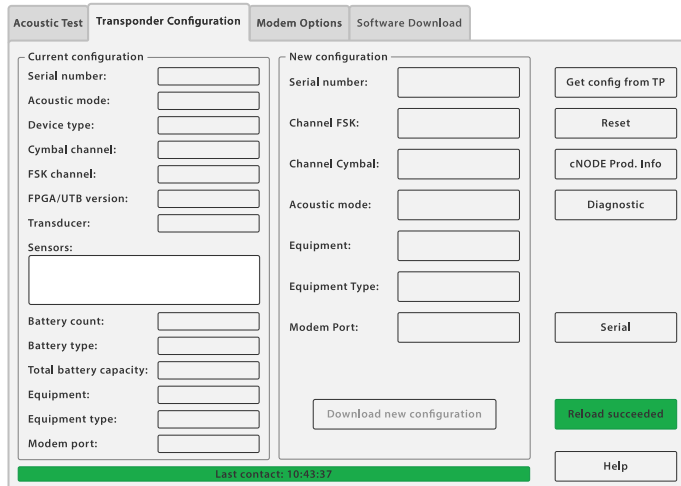
The slant range is displayed in the field during an acoustic test.

Transponder Configuration tab

The **Transponder Configuration** tab contains alphanumeric fields to view the settings of the connected transponder, and interactive alphanumeric fields and buttons. The interactive elements allow you to interact with the transponder and to configure or reconfigure the transponder.

Description

The **Transponder Configuration** tab contains interactive elements that allow the user to configure or reconfigure a transponder via the serial line. The transponder must be in contact with the unit before it can be configured or reconfigured. A green horizontal bar at the bottom of the tab, superimposed with the last contact time, confirms that a data transaction can take place between the unit and the transponder. The unit is ready to configure the transponder.



Details

The tab contains the following interactive alphanumeric fields and buttons for interacting with the device connected to the unit:

Get config from TP

Select **Get config from TP** to view the current transponder configuration. The configuration data is displayed in the “Current configuration” section. A green horizontal bar at the bottom of the tab, superimposed with the last contact time, confirms that a data transaction can take place between the unit and the transponder.

Download new configuration

The button becomes active when the green horizontal bar at the bottom of the tab confirms that communication has been established with the transponder. Select **Download new configuration** to configure the connected transponder or to reconfigure it. The transponder's configuration data will be updated. A green "Reload successful" message in the bottom right corner of the tab confirms that the transponder configuration was successful.

Acoustic mode

Select **Acoustic mode** to toggle between Cymbal mode or FSK mode. Select **Download new configuration** to confirm.

Reset

Select **Reset** to reset and reboot the transponder. A dialog box opens confirming that the transducer has been successfully reset.

cNODE Prod. Info

Select **cNODE Prod. Info** to view the product information of the transponder.

Diagnostic

Select **Diagnostic** to view selected parameters and values of the transponder.

Help

Select **Help** to view online help.

The tab contains the following alphanumeric fields for viewing the settings of the device connected to the unit:

Serial

The **Serial** field is visible when the transponder is connected to the unit via the serial cable.

Serial number

Indicates the transponder serial number.

Acoustic mode

Indicates the type of mode being used to communicate with the transponder. This is either Cymbal or FSK. Communication with the transponder can be made using either Cymbal frequencies (L or M channels) or FSK frequencies (A or B channels). Only one acoustic mode can be active at a time.

Device type

Indicates the type of device currently in contact with the unit. The device can be a transponder, an SCU as part of an ACS system, or a subsea transceiver.

Cymbal channel

Indicates the ID (Lxx/Mxx) of the active cymbal channel used to communicate with the connected device. The field is greyed out if the acoustic mode is set to FSK.

FSK channel

Indicates the ID (Axx/Bxx) of the active FSK channel used to communicate with the connected device. The field is greyed out if the acoustic mode is set to Cymbal.

UTB/FPGA version

Indicates the version number of the UTB software and FPGA (Field Programmable Gate Array) in the transponder. The UTB software can be upgraded in the field. This is done via the unit's serial line cable. To upgrade the FPGA, the transponder must be returned to a Kongsberg service centre.

Transducer

Indicates the type of mode being used to communicate with the transponder.

Sensors

Indicates the type of sensors the transducer is equipped with.

Battery count

Indicates the number of batteries connected to the transponder.

Battery type

Indicates the type of battery the transponder is equipped with.

Total battery capacity

Indicates the total battery capacity in ampere-hours (Ah).

Equipment

Indicates the type of equipment connected to the unit, typically a transponder.

Modem Options tab

The **Modem Options** tab contains alphanumeric fields to view the settings of the connected modem, and interactive alphanumeric fields and buttons. The interactive elements allow you to interact with the modem and to configure or reconfigure the modem. A modem is a transponder with a built-in modem.

Description

The tab will be visible if there is a modem connected to the unit. For more information, please refer to Kongsberg's user manual "Modem Configuration". Contact Kongsberg Discovery for a copy.

The screenshot displays the 'Modem Options' tab within a control panel. The interface is organized into several sections:

- Current configuration:** Includes input fields for 'Addressing mode', 'Remote serial', 'Remote channel', 'Tx power', and 'Profile'.
- Port configuration:** Includes input fields for 'Tx power' and 'Profile'.
- New configuration:** Features a radio button selection for 'Addressing mode' (HIPAP-cNODE or cNODE-cNODE), and input fields for 'Remote serial', 'Remote channel', 'Tx power', and 'Profile'.

At the bottom of the panel, there are four buttons: 'Get port config.', 'Set port config.', 'Download new configuration', and 'Help'. A 'Get config from TP' button is also present in the top right area of the configuration section.

Software Download tab

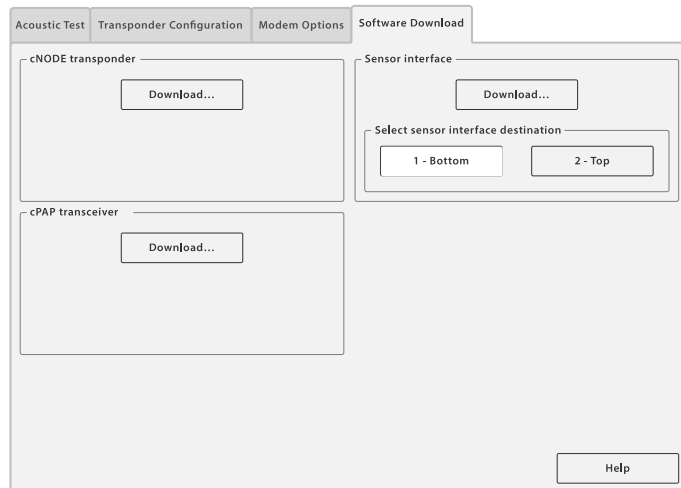
The **Software Download** tab contains buttons that allow you to update the software on a transponder or a transceiver.

Description

Only qualified Kongsberg personnel should access the tab and its download options.

Details

The tab contains the following buttons for updating the software on the connected device:



cNODE transponder

The **cNODE transponder** section includes a download button. Select **Download...** to update the software on a cNODE transponder.

cPAP transceiver

The **cPAP transceiver** section includes a download button. Select **Download...** to update the software on a cPAP transceiver.

Sensor interface

The **Sensor interface** section includes a download button. Select **Download...** to update the sensor interface on the connected device. The default destination for the sensor interface is **1-Bottom**. Select **2-Top** to set the destination to 2-Top.

Help

Select **Help** to view online help.

Maintenance

Topics

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[Replacing the unit's control panel, page 27](#)

[Preventive maintenance schedule, page 28](#)

[Cleaning the unit, page 28](#)

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Replacing the unit's battery

The unit's battery is expected to last 10 years when used as intended and maintained as recommended. However, this may vary with use. Follow this procedure if you need to replace the unit's battery.

Prerequisites

Place the unit on a steady and level surface. Secure the unit to minimize the risk of harm to personnel and equipment.

Procedure

- 1 Check that the unit is switched off and disconnected from an external power supply.
- 2 Open the case.
- 3 Loosen and remove the screws securing the lid supports to the lid.

- 4 Loosen and remove the screws securing the control panel to the case.
- 5 Carefully lift off the control panel to access the inside of the unit.



- 6 Disconnect all cables leading to the battery.
- 7 Loosen and remove the screws securing the battery.
- 8 Pull the battery towards the front of the suitcase and lift it up. The battery is held in place by metal clips in the bottom of the case.
- 9 Insert the new battery.
- 10 Follow the instructions in the reverse order.



Replacing the unit's control panel

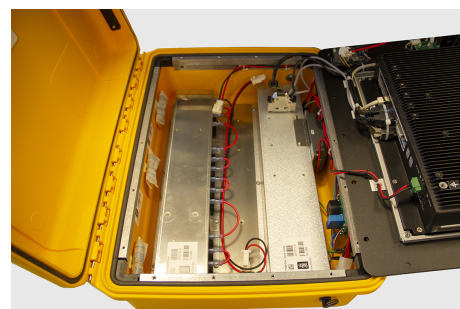
Follow this procedure if you need to replace the unit's control panel. The unit's PC is an integral part of the control panel and is located on the underside of the control panel.

Prerequisites

Place the unit on a steady and level surface. Secure the unit to minimize the risk of harm to personnel and equipment.

Procedure

- 1 Check that the unit is switched off and disconnected from an external power supply.
- 2 Open the case.
- 3 Loosen and remove the screws securing the lid supports to the lid.
- 4 Loosen and remove the screws securing the control panel to the case.
- 5 Carefully lift off the control panel to access the inside of the unit.
- 6 Disconnect all cables leading to the control panel.
- 7 Replace the defective control panel with a new one.
- 8 Follow the instructions in the reverse order.



Preventive maintenance schedule

Preventive maintenance must be carried out periodically in order to preserve reliability and ensure safe operation during the unit's service life. The preventive maintenance activity is broken down into specific tasks and the tasks are organized periodically in a *preventive maintenance schedule*.

The following preventive maintenance tasks must be carried out annually:

- Clean the unit.
- Charge the unit's battery.

Cleaning the unit

Cleaning the unit is one of the two preventive maintenance tasks that must be carried out once every year during storage.

Context

Kongsberg recommends that the unit is switched off during cleaning. Use a lint-free, non-abrasive cleaning cloth and a neutral non-abrasive cleaner.

Procedure

- 1 Place the unit on a steady and level surface. Secure the unit to minimize the risk of harm to personnel and equipment.
- 2 Lightly dampen the cleaning cloth and wipe down the unit's exterior. Make sure the fabric is not soaked but merely damp.
- 3 Open the case.
- 4 Lightly dampen the cleaning cloth and gently wipe down the unit's interior. Make sure the fabric is not soaked but merely damp. Take care not to get moisture into any of the ports or openings.



Charging the unit's battery

Charging the unit's battery is one of the two preventive maintenance tasks that must be carried out once every year during storage. The unit has a rechargeable battery that lasts approximately 3 hours when fully charged. Start charging when the LED battery level indicator turns red. The battery is fully charged when the the LED battery level indicator is all green. The LED battery level indicator is next to the **ON/OFF** switch.

Context

Charging a battery is a process with an inherent risk so check applicable procedure(s) prior to charging in order to first assess the level of the inherent risk; and then, if necessary, apply suitable controls to mitigate the inherent risk before charging. Follow the charging procedure carefully. Never charge batteries unattended. Only use the power cable supplied with the unit. Do not use if damaged or excessively worn. Contact Kongsberg for a replacement.

Procedure

- 1 Place the unit on a steady and level surface. Secure the unit to minimize the risk of harm to personnel and equipment.
- 2 Connect and secure the power cable to the unit's power connector. The power connector is located below the left latch.
- 3 Connect the power cable to a 110/230 VAC power supply. Check the LED battery level indicator from time to time during charging and stop charging when it is all green.



Note

The battery must be fully charged when the unit is put in storage. (Place the unit on a steady and level surface. Secure the unit to minimize the risk of harm to personnel and equipment.) Charge the battery once every year during storage. Charge the battery more frequently if the storage temperature regularly exceeds 25 °C.

Spare parts

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[Battery spare part, page 32](#)

[Control panel spare part, page 33](#)

TTC 30 spare part

- **Part name:** TTC 30 (Transponder Test and Configuration unit)
- **Part number:** 458541



TTC 10 spare part

- **Part name:** TTC 10 (Transponder Test and Configuration unit)
- **Part number:** 463018



Test transducer and cables - spare parts

Test transducer

- **Part name:** Test transducer TTD 309
- **Part number:** 312-219822



Serial line cable

- **Part name:** TTC Serial line cable
- **Part number:** 355047

Power cable

- **Part name:** TTC Power cable
- **Part number:** 375781

Battery spare part

- **Part name:** TTC Battery
- **Part number:** 455752



Control panel spare part

- **Part name:** Front panel TTC30
- **Part number:** 454044



Technical specifications

Topics

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Environmental requirements

These environmental specifications summarize the temperature and humidity requirements for the TTC.

- **Operating temperature:** –5 to +55 °C
- **Storage temperature:** –30 to +70 °C
- **Ingress protection rating:** IP 54

Note

An ingress protection rating of IP 54 is achieved when the case is closed and the power connector protection cap is securely fastened in place.

Performance specification

These performance specifications summarize the main functional and operational characteristics of the TTC.

TTC30

- **Operating frequency:** Medium frequency

TTC10

- **Operating frequency:** Low frequency

Power requirements

These power characteristics summarize the supply power requirements for the TTC.

- **Input voltage:** 100-240 VAC, 47-63 Hz
- **Battery cell type:** Lead-acid
- **Battery runtime (State of Charge 100%):** Approximately 3 hours

Weight and outline dimensions

These weights and outline dimension characteristics summarize the physical properties of the TTC.

TTC30 and TTC10

- **Case dimensions:** Width: 488 mm; Depth: 386 mm; Height: 185 mm
- **Weight:** 19.5 kg

Test transducer

- **Cable length:** 2.5 m

Serial line cable

- **Cable length:** 5 m

Mains power cable

- **Cable length:** 2 m

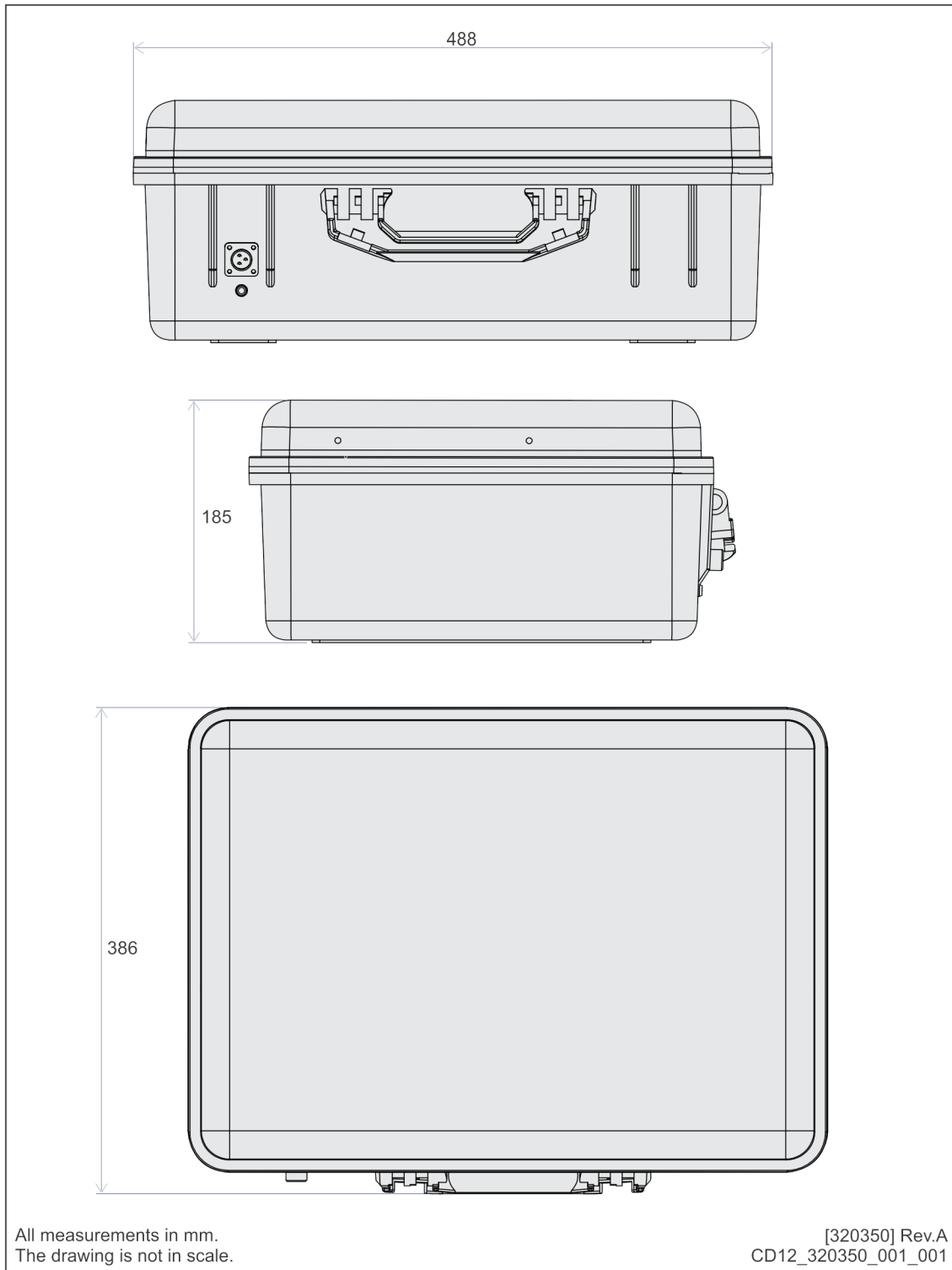
Drawing file

Topics

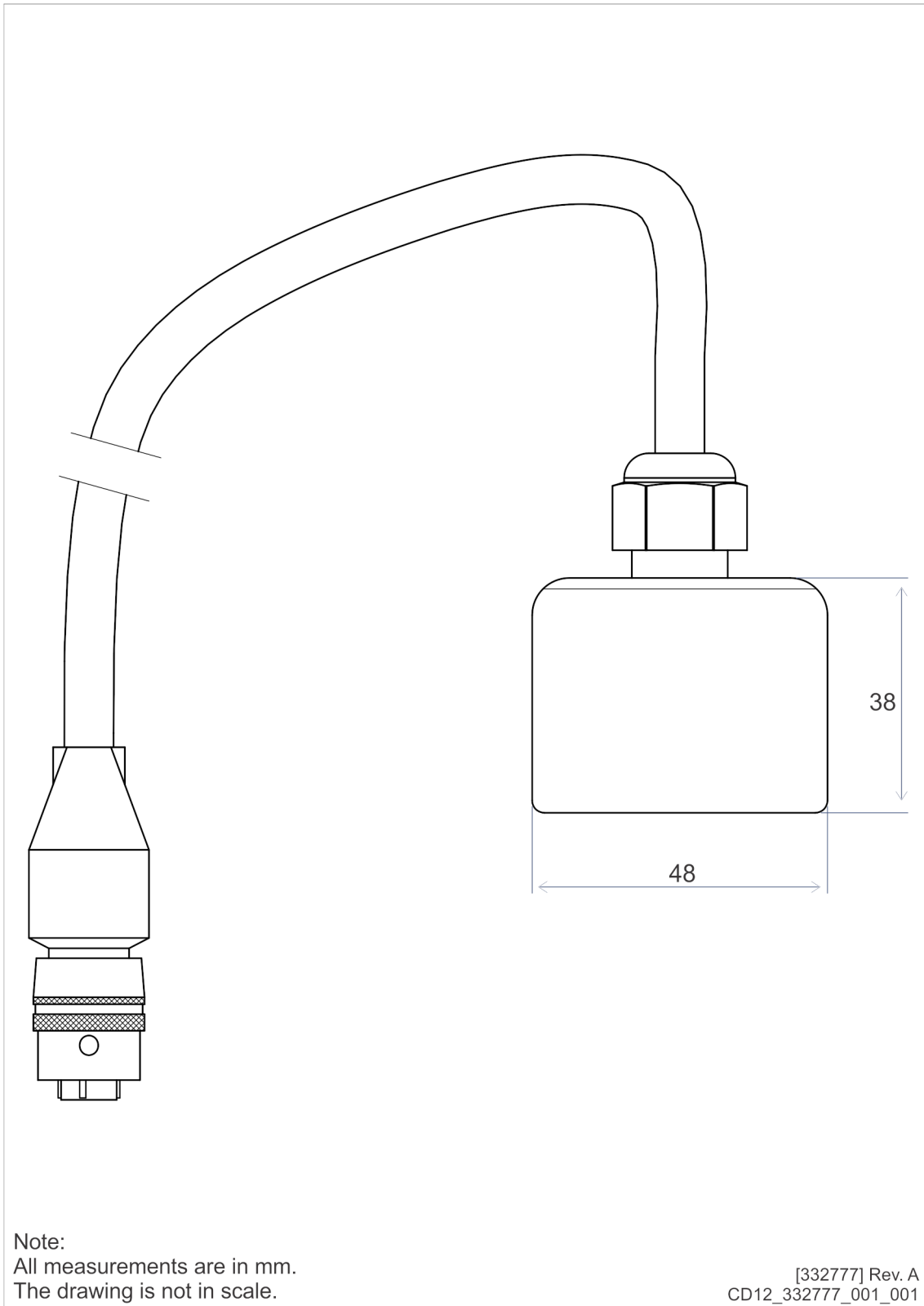
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TTC outline drawing



Test transducer outline drawing



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