INSTRUCTION MANUAL

cPAP 30 and cPAP 10
Portable Transceiver
Updated information regarding test transducer and added part number for cPAP 10 in Spare parts section.
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1 ABOUT THIS MANUAL

This is the Instruction manual for the cPAP® Portable transceiver unit.

Registered Trademark

cPAP® and cNODE® are registered trademarks, or trademarks of Kongsberg Maritime in Norway and/or other countries.

Manual content

The manual contains descriptions, specifications, procedures, spare parts, outline drawings and illustrations on how to operate and maintain the cPAP Portable transceiver unit.

Abbreviations

APOS  Acoustic Position Operator Station
IP     Ingress Protection
KM     Kongsberg Maritime
LF     Low frequency
MF     Medium frequency
TP     Transponder
2 SYSTEM DESCRIPTION

This chapter gives an overall description of the cPAP Portable transceiver unit.

Topics

→ cPAP Portable transceiver unit on page 2
→ Dunking transducers on page 3
→ Transponder configuration (on-deck) on page 5
→ Power supply on page 5

cPAP Portable transceiver units

The cPAP Portable transceiver unit is designed to fully operate subsea transponders from a vessel. The cPAP Portable transceiver is used together with a dunking transducer.

• The cPAP Portable transceiver is compatible with both Cymbal and acoustic protocol for positioning and data link and HPR 400 channels and telemetry.
• Acoustic link for command and data transfer.
• SSBL Range measurement positioning.
• LBL Positioning (optional).
• The cPAP Portable transceiver use full APOS menu.

The cPAP Portable transceiver unit is also used for on-deck acoustic testing and configuration of the cNODE and MPT/SPT/MST transponders.

The cPAP Portable transceiver unit is a touch screen/trackball operated transceiver set in a splash proof portable case with a carrying handle and shoulder strap. It has an internal rechargeable battery.

→ See the outline dimensions of the cPAP Portable transceiver unit in Drawing file on page 23.
cPAP 30
The cPAP 30 is designed to operate, test and configure all medium frequency (MF) transponders
cPAP 30 P/N: 367651

Figure 1  cPAP Portable transceiver unit

→ See chapter Operation on page 9 for more information about how to operate the cPAP unit.

The unit comes with:
• Serial Line Cable
• Mains cable

Dunking transducers

The Dunking transducer consists of a cable drum with cable and a dunking transducer.
The cable drum holds 70 m of transducer cable with a transducer connected to the “outer” end. The other end of the cable must be connected to the front of the cPAP 30 Portable transceiver unit.
The cable drum is fitted with a handle for cable roll-out/roll-up on one side and a cable locking-pin on the other side.

TDD30V Medium Frequency
• For use in water depths of 1000 m - 4000 m and with a 30 degree beam width transducer.
• It has a connector for interface with cPAP 30, ACC 401, ACU 30, TTC400 and TTC 30.
• P/N: 320680
**TDD303 Medium Frequency**
- For use in water depths of 1500 m and with a 50 degree beam width transducer.
- It has a connector for interface with cPAP 30, ACC 401, ACU 30, TTC400 and TTC 30.
- P/N: 301518

**TDD180 Medium Frequency**
- For use in water depths of 500 m and with a 180 degree beam width transducer.
- It has a connector for interface with cPAP 30, ACC 401, ACU 30, TTC400 and TTC 30.
- P/N: 320822

**TDD30H Medium Frequency**
- For use in shallow water.
- Beam width is 30 degrees horizontal, medium frequency transducer on 70 m armoured cable.
- It has a connector for interface with cPAP 30, ACC 401, ACU 30 and TTC 30.
- P/N: 377463

**TDD103 Low Frequency**
- A ± 30 degree beam width and low frequency transducer.
- It has a connector for interface with cPAP 10, ACC 401, TTC400 and TTC 10.
- P/N: 023-220879

→ See Dunking transducer outline dimensions in Drawing file on page 23.
Transponder configuration (on-deck)

The serial line cable connects a transponder to the cPAP and is used for transponder configuration such as changing acoustic mode and default channels and SW download.

P/N: 355047

Power supply

Mains power cable is used to connect the cPAP to a standard 115/230 Vac mains supply to recharge the internal battery.

P/N: 375781
3  TECHNICAL SPECIFICATIONS

This chapter lists the main technical specification for the TTC.

Topics

→  cPAP Portable transceiver on page 7
→  Dunking Transducer on page 7
→  Serial Line cable on page 8
→  Mains Power cable on page 8
cPAP Portable transceiver

Common specifications for cPAP Portable transceiver

Case information

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<th>Case dimensions:</th>
<th>386 mm x 488 mm x 185 mm</th>
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<tr>
<td>Weight:</td>
<td>approximately 19.5 kg</td>
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<td>Degree of protection:</td>
<td>IP54</td>
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→ Outline dimensions - see drawing in the Drawing file chapter on page 23.

Electrical details

| Input voltage: | 100 to 240 Vac (47 to 63 Hz) |

Environmental conditions

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<th>Operation (in water) temperature:</th>
<th>-5 °C to + 55 °C</th>
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Batteries

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<tr>
<td>Type of cells:</td>
<td>Lead/Acid</td>
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<td>Battery output:</td>
<td>14 Vdc</td>
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<tr>
<td>Transmission power (max):</td>
<td>300 W</td>
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<tr>
<td>Continual use:</td>
<td>approximately 10 hours</td>
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</table>

cPAP 30

| Operating frequency: | Medium frequency (MF) |

cPAP 10

| Operating frequency: | Low frequency (LF) |

Dunking Transducer Unit

| Length of cable: | 70 m |
cPAP® Portable transceiver

→ Outline dimensions/weight - see drawing in the Drawing file chapter on page 23

### Serial Line cable

| Length: | 5 m |

→ Outline dimensions - see drawing in the Drawing file chapter on page 23.

### Mains Power cable

| Length: | Approx. 2 m |
4 OPERATION

This chapter describes how to start using the cPAP unit

**Topics**

→ cPAP Front panel on page 9
→ Turning unit ON and OFF on page 10
→ Setting up the cable drum with the dunking transducer on page 12
→ cPAP APOS Menu on page 13
→ Operation of subsea transponders on page 14
→ Transponder test and configuration on page 17

**cPAP Front panel**

*Figure 2 cPAP Front panel*

The touch screen is mostly used when performing Acoustic test and Transponder configuration. All other connections and buttons are explained below:

A **Connector** (with protection cap) for Serial line. For service personnel only. (For program downloads and configuration purposes).

B **Connector** (with protection cap) for Dunking transducer cable.
cPAP® Portable transceiver

C Connectors for USB and LAN. For service personnel only. (Connection to network and possible APOS/PC program download via USB.)

- Placed behind a waterproofed cover. Turn the pegs to lift cover.

D Power ON/OFF switch.

G Trackball - used to position the cursor on the screen.
   Left button: Used to click on buttons, operate menus and select displayed symbols.
   Right button: Used to display menus and pop-up windows.

H Stand-by wake up, with two LEDs indicating status.

I Display light (-/+ ) adjustment.

J Power connector - male 3-pins connector for the mains cable.
   - This cable (see L) is used to connect the TTC to a standard 230 Vac mains supply, to recharge the internal battery.

K Gas lift springs.

L Battery charge cable in lid folder - supplied with the unit.

M Battery status indicator. The battery should last for approx. 3 hours of continual use.

Turning unit ON and OFF

Turning unit ON

1 Disconnect the cPAP power cable from charging station.
2 Place the cPAP Portable unit in a suitable location and open the lid by pressing the handle knobs and pull the handles towards you.

![Figure 3 Opening the cPAP portable case](image)

3 Place the cable drum close to the cPAP.

4 Prepare the cable drum for operation.
   - See description in Figure 6.

5 Pull out the transducer cable and lower the dunking transducer into the sea to a depth at least 10 m below the lowest part of the platform's/vessel's keel or thrusters.
   - If required - use the handle to reel out the cable.

6 Connect the transducer cable to the connector marked TD on the top right hand side of the screen of the cPAP.

7 Turn on the cPAP Portable transceiver unit by turning on the main power switch ON in order to start the PC program (starting up the system will take approx. 1.5 minutes).

The system is now ready for use!

**Turning unit OFF**

1 Switch ON/OFF button (D) to OFF position (see cPAP Front panel on page 9).

→ See APOS Menu on page 13 for more information
Setting up the cable drum with the dunking transducer

How to open the cable drum

1. Pull the locking clip (A) towards you to open the unit.
2. Fold out the handle (F).
3. Lift up the cover (D).
   - The cable for cPAP connection is placed inside the drum - behind the cover (D).
4. Pull out the cable (E).
5. To unlock the transducer cable, unlock the locking-pin, by turning the locking-knob (G) into vertical position.

Figure 4 Cable drum with transducer
How to close the cable drum

Note

Wash the unit, cable and transducer before storage.

1. Use the handle to reel in the transducer cable.
2. Place the transducer in the basket.
3. Push the cable locking-pin into position and lock the cable by turning the locking-knob (G) into horizontal position.
4. Fold the handle (F) into position.
5. Press the two bars (B) together and push the locking clip (C) into position.
6. Roll-up the cable (E), and place it inside the drum.
7. Close the cover (D).

cPAP APOS Menu

Figure 5 cPAP APOS Menu
The main APOS menu is shown in Figure 7 with an on-the-screen keyboard make the operation easier.

→ See APOS Online Help on page 14 for more information about APOS operation.

APOS Online help

![APOS Online help button](image)

*Figure 6 APOS Online help*

The APOS Online help button is located on the right hand side toolbar on the top of the page.

1. Select Help on the toolbar.
2. Select Help from the dropdown menu.
3. APOS Online help will appear on the screen.

Operation of subsea transponders

→ Refer to APOS Online help for more information.
Transponder test and configuration

TTC Menu

Figure 7 TTC Menu

TCC Menu is used for on-deck transponder test and configuration.

The main menu (see Figure 9) contains the following sub menus:

- Acoustic Test
- Transponder Configuration
- Software Download
- Sensor Configuration
- Options
**TTC Menu help button**

![Help button](image)

*Figure 8 Help button*

This Help button is located on every page in the TTC menu. The Help menu will provide relevant information about the current operation.

**APOS/TTC Switch button**

![Switch](image)

*Figure 9 APOS/TTC Switch button*

The APOS/TTC button is located in the top right corner of the TTC screen.

Select this button to switch between the APOS menu and the TTC menu.

**Transponder acoustic test (on-deck)**

1. Select TTC Menu.
2. Place the Dunking transducer or (Test transducer (T)) face to face with the transponder.
3. Communication between the cPAP and the transponder may easily be tested by selecting the ACOUSTIC TEST tab → enter S/N → Transponder channel No. → INTERROGATE.
4. A green lamp will blink on the display if there is acoustic contact with transponder.
5. Press INTERROGATE button again to stop ACOUSTIC TEST.
6. To set cPAP POWER use left/right arrows to choose power level → press SET to confirm your selection.
Transponder configuration (on-deck)

Establish connection with TP
1. Select TTC Menu.
2. Connect the Serial line cable to the upper left connector (A) on cPAP (Figure 4 cPAP Front panel on page 9) and the other connector to the bottom of the transponder (S).
3. Select TRANSPONDER CONFIGURATION tab.
4. The cPAP will automatically update TP information when connected.
5. The cPAP is ready for configuration when GREEN line is visible.
   - If the line is red and no contact is made with the TP → check all cables and try again.

New configuration
1. Press buttons on the right hand side of the screen to change TP info.
2. Press DOWNLOAD NEW CONFIGURATION to update transponder.
3. New transponder info will appear on left hand side of screen.
   - If DOWNLOAD NEW CONFIGURATION is unsuccessful a red box will appear on right hand side with message 'Download config failed' → check all cables and try again.

T: Test Transducer connected to communication in air.

S: Serial line connection

Figure 10 Transponder test and configuration
5 MAINTENANCE

Warning

Kongsberg Maritime accepts no responsibility for any damage or injury to the system or personnel caused by drawings, instructions and procedures not prepared by Kongsberg Maritime.

Neither Kongsberg Maritime nor our dealers will accept responsibility for damage or injury to the system or personnel resulting from incorrect maintenance performed on the system.

Topics

→ cPAP unit on page 18
→ Charging the battery on page 19
→ Service/repairs on page 20

cPAP unit

Maintenance will primarily be keeping the unit clean and charging the battery.

- Clean the unit and charge the battery at least every 12 months.

To keep the unit clean, use:

- Soft lint-free cloth
- Bucket
- Mild liquid detergent

Wet the cloth, then wring as much of the water out as possible.

Note

Use only a damp cloth - so there is no possibility of water dripping into the unit.
Charging the battery

**During operation:**
If the cPAP battery indicator indicates LOW power → connect the charging cable.

**Charging options:**
A. Switch the unit off during charging and then switch it on again when you are going to use it.
B. Leave the cPAP switched on during charging.

**To start charging:**
Mains cable is stored in the lid folder.
1. Connect the cable to the Power connector at the front of the cPAP.

*Figure 11 Mains power connector is located at the front of the unit on the left hand side.*
Note  
Use the mains cable supplied with the system.

2 Connect the other end of the cable into a 115/230 Vac mains supply.
   - It is important that the battery is fully charged when the cPAP is stored. It must be recharged at least every 12 months.

Service/Repairs

If the unit for some reason should stop working, then DO NOT try to repair the unit yourself. Service/Repairs must ONLY be performed by qualified KM Service personnel. The unit must be sent back to KM office for service/repairs.
6 SPARE PARTS

This chapter lists the parts and modules defined by Kongsberg Maritime as Line Replaceable Units (LRUs).

Topics
→ Units on page 21
→ Dunking transducers on page 21
→ Cables on page 21
→ Test transducer on page 21

Units

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<th>Units</th>
<th>Type</th>
<th>Comments</th>
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<td>367651</td>
<td>cPAP 30</td>
<td>cPAP Portable transceiver</td>
<td>Medium Frequency</td>
</tr>
<tr>
<td>377913</td>
<td>cPAP 10</td>
<td>cPAP Portable transceiver</td>
<td>Low frequency</td>
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Note The unit comes with Serial Line Cable and Mains cable.

Dunking transducers

<table>
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<th>Units</th>
<th>Type</th>
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<td>320680</td>
<td>TDD30V</td>
<td>1000 – 4000 m, 30° vertical beam width</td>
<td>Medium Frequency</td>
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<td>301518</td>
<td>TDD303</td>
<td>1500 m, 50° beam width</td>
<td>Medium Frequency</td>
</tr>
<tr>
<td>320822</td>
<td>TDD180</td>
<td>500 m, 180° beam width</td>
<td>Medium Frequency</td>
</tr>
<tr>
<td>TBI</td>
<td>TDD30H</td>
<td>30° horizontal beam width</td>
<td>Medium Frequency</td>
</tr>
<tr>
<td>023-220879</td>
<td>TDD103</td>
<td>± 30° beam width</td>
<td>Low frequency</td>
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Cables

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<td>Test cable TTC</td>
<td>Serial line cable</td>
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<tr>
<td>375781</td>
<td>Mains cable</td>
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Test transducer

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<th>Units</th>
<th>Type</th>
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<td>312-219822</td>
<td>Test Transducer</td>
<td>On-deck test transducer</td>
<td>Supplied with the cPAP unit</td>
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7 DRAWING FILE

This chapter holds illustrations referred to in various sections in this manual. The illustrations are based on the original system drawings and wiring diagrams.

- The original drawings are available in electronic format on request.

Drawings

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<td>B</td>
<td>Outline drawing – Dunking transducer unit</td>
<td>on page 25</td>
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<tr>
<td>301714</td>
<td>B</td>
<td>Outline drawing – Dunking transducer with TDD303 MF</td>
<td>on page 26</td>
</tr>
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</table>
Outline drawing – cPAP unit

Note:
All measurements are in mm.
The drawing is not in scale.
Outline drawing – Dunking transducer unit

Weight: Approx 25 kg depending on type of TD

Note:
All measurements are in mm.
The drawing is not in scale.
Outline drawing – Dunking transducers with TDD303 MF

Note:
All measurements are in mm.
The drawing is not in scale.

Weight: Approx 20Kg
8 INDEX

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