# **RAPIDCAST™**

### **DEPLOYMENT GUIDE**





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#### HOW TO CONTACT TELEDYNE RD INSTRUMENTS

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#### **Self-Service Customer Portal**

Use our online customer portal at <u>https://www.teledynemarine.com/support/RDI/technical-manuals</u> to download manuals or other Teledyne RDI documentation.

#### **Teledyne Marine Software Portal**

Teledyne RD Instruments Firmware, software, and Field Service Bulletins can be accessed only via our Teledyne Marine software portal. To register, please go to <u>https://tm-portal.force.com/TMsoftwareportal</u> to set up your customer support account. After your account is approved, you will receive an e-mail with a link to set up your log in credentials to access the portal (this can take up to 24 hours). Once you have secured an account, use the Teledyne Marine software portal to access this data with your unique username and password. If you have an urgent need, please call our Technical Support hotline at +1-858-842-2700.

# Preparing the rapidCAST

#### **P**REPARING THE RAPID**CAST** INCLUDES THE FOLLOWING STEPS:

Check you have all the rapidCAST parts

### rapidCAST Contents

Included with the rapidCAST:

| Packed in transit case:  | Part Number | Description  | Quantity |
|--------------------------|-------------|--|----------|
|                          | 6001417     | ASSY, WINCH, RAPIDCAST   | 1 each   |
| 6001752:<br>CASE.        | 7000625     | CABLE, AC POWER, RCAST, 30.5M  | 1 each   |
| TRANSIT,                 | 7000652     | CABLE, AC POWER, RCAST, 1.5M   | 1 each   |
| RCAST,<br>WINCH          | 75JK6001-00 | Documentation kit contains instructions for downloading the software and manuals | 1 each   |
| Witten                   | 9002211     | CABLE, RF, TNC STRAIGHT PLUG, LMR400, 40M  | 1 each   |
| 9002104:<br>CASE,        | 71J-5001-00 | ASSY, DAVIT, RCAST, W/PULLEY   | 1 each   |
| TRANSIT,<br>RCAST, DAVIT | 9002209     | SHOULDER STRAP, DAVIT CASE, RCAST  | 1 each   |
|                          | 6001427     | ASSY, CONTROL MODULE, RAPIDCAST  | 1 each   |
|                          | 6001432     | ASSY, INTERFACE MODULE, RAPIDCAST  | 1 each   |
|                          | 8000592     | MOUNT, PIPE FLANGE, RCAST  | 1 each   |
| 6001754:                 | 6001436     | ASSY, PROBE BRACKET, RCAST   | 2 each   |
| CASE,                    | 6001751     | KIT, TOOLS AND SPARES, RCAST   | 1 each   |
| TRANSIT,<br>RCAST.       | 7000650     | CABLE, TELEMETRY AND CONTROL, RCAST  | 1 each   |
| CONTROL                  | 6000617     | SET, TAILSPOOL W/BULKHEAD, RCAST/UCTD  | 1 each   |
| MODULE                   | 6000630     | SET, TAILSPOOL W/BULKHEAD, RCAST/UCTD, W/BUOYANCY MODULE                         | 1 each   |
|                          | 8000112     | TRAINING PROBE, RCAST/UCTD   | 1 each   |
|                          | 9002212     | CABLE, RF, TNC STRAIGHT PLUG, LMR400, 5M   | 1 each   |
|                          | 9002173     | ANTENNA, 2.4 GHz 8dBi FLAT PATCH W/ TNC CONNECTOR                                | 1 each   |





6001752: CASE, TRANSIT, RCAST, WINCH with contents



6001754: CASE, TRANSIT, RCAST, CONTROL MODULE with contents



9002104: CASE, TRANSIT, RCAST, DAVIT



The sound velocity probe (or probes) is shipped in a separate case with the options selected on the order.





#### Quick Review

| <ul> <li>Check that you have all the rapidCAST parts.</li> </ul>                                     | If you are missing parts, contact Teledyne RD<br>Instruments support <u>rdifs@teledyne.com</u> or call +1<br>(858) 842-2700.                                      |
|--|---|
| <ul> <li>Software, documentation, and<br/>training videos are available for<br/>download.</li> </ul> | You can download the documentation and videos<br>from our online customer portal at<br><u>https://www.teledynemarine.com/support/RDI/technical-<br/>manuals</u> . |
|  | RapidCAST Interface Software and the USB RS-485<br>Driver are available on<br><u>https://tm-portal.force.com/TMsoftwareportal</u>                                 |



# rapidCAST Installation Overview

#### INSTALLING THE RAPID CAST INCLUDES THE FOLLOWING STEPS:

- rapidCAST Cable Connections (Small Vessels)
- Installing the rapidCAST Interface Software
- Power up Sequence
- Lockout Procedure
- Line Routing Procedure
- Installing and Connecting the Probe



Route the cables through the pipe mount. Note that the motor cable is routed through a cutout on the back cover.

- 1. Pipe Mount
- 2. Disengage the winch spring pin by pulling and then rotating. Slide the winch on to the pipe mount and rotate the winch back and forth until it is fully seated on the pipe mount.
- 3. Install the davit and retaining pin. Block is oriented downward as shown below.
- 4. Engage the spring pin by rotating until it engages in the slot.







# rapidCAST Cable Connections (Small Vessels)



Depending on the distance between the Control Module and Interface Module, use either the Omni or Patch antenna. Use the Omni Antenna when the distance between the Interface Module and Control Module is less than 10 meters; Use the Patch Antenna when the distance between the Interface Module and Control Module is over 10 meters.

### Installing rapidCAST Interface Software

The rapidCAST documentation and software are downloaded.

- 1. Follow the instruction sheet on downloading TRDI software and manuals.
- 2. Software is available on <u>https://tm-portal.force.com/TMsoftwareportal</u>. Install *RapidCAST Interface* and *USB RS-485 Driver*.
- Use our online customer portal at <u>https://www.teledynemarine.com/sup-port/RDI/technical-manuals</u> to download manuals or other Teledyne RDI documentation. Download the rapidCAST Guide. PDF versions of all rapidCAST documentation including this deployment guide are available for download.

#### To install the drivers and software:

- 1. Install the RapidCAST Interface software by double-clicking on the *RapidCAST Interface X.xx.exe* file (where *X.xx* is the version number). Administrator access is required to properly install the software. A desktop icon is added: Double-click to run the software.
- 2. Connect the system and apply power. Connect the PC to the **Control** USB port of RapidCAST Interface Module, which should automatically install **two USB Serial Port devices on the PC.**

Make note of the serial port numbers because they will be used for:

#### Lower numbered Comm port for Telemetry

#### Higher numbered Comm port for Control

3. Use the Windows® control panel Device Manager to identify which communication ports are available. If you have many ports as shown below and are not sure of which port is **Telemetry** or **Control**, remove the cable, wait a moment, note the list of ports, reinsert the cable and note the new ports. In the example below, COM13 and COM14 are added when the PC is connected to the Control USB port.



- 4. Start the RapidCAST Interface software. On the top menu, click **Comms**. Assign COM13 for **Telemetry** and COM14 for **Control**.
- 5. Install the USB RS-485 Driver, specifically the RS-422/485 USB Adapter. This driver may also be downloaded from: <u>http://www.usconverters.com/usb-to-rs422-converter-iu110</u>. When prompted for what software to install, choose **RS-422/485 USB Adapter**. The RapidCAST Interface Module should be connected to the PC during driver installation, otherwise you may receive a "Hardware not found" error.







# Safety

### Important Safety Warnings

|   | Do not put your hands inside the frame unless the system is Locked Out.   |
|---|---|
| ^ |   |
|   | Always assume the system is live.   |
|   |   |
|   | When in doubt use Emergency Stop.   |
|   |   |
|   | Stand clear of line, do not stand in loops or wrap line around your hand. Always wear the strap cutter included in the tools and spare parts kit 6001751. |
|   |   |
|   | Wear gloves when handling the Davit. The Davit is made from carbon fiber and may cause splinters.   |
|   |   |

#### Important Deployment Warnings

| Never go past the maximum line payout.   |
|--|
|  |
| Line is taped on the spool. Never get into the bottom RED layer or you will lose a probe.  |
|  |
| If the winch cannot pull the line in or the brake is not working, STOP the vessel immediately.   |
|  |
| If the winch is run from the joystick (Local Control) for casts, the closed loop control fail safes are overridden and the user could damage the winch. Always perform casts with the winch in PC Control. |



### Power up Sequence

To power on the system:

- 1. Check that the Main Power Switch is set to OFF position (down)
- 2. Control Switch set to PC Control
- 3. Brake, Processor, and Motor Driver Switches are powered **ON** (up)
- 4. Connect and check all cable connections are secure
- 5. Turn power ON by switching the Main Power Switch to **ON** (up)



If the winch is run from the joystick (Local Control) for casts, the closed loop control fail safes are overridden and the user could damage the winch. Always perform casts with the winch in PC Control.

### Lockout Procedure

To lock out the system:

- 1. Switch Motor Driver **OFF**.
- 2. Switch Brake to **RELEASE**.
- 3. Check to ensure Activity Light is Dim/Not blinking.
- 4. Check to see if the spool rotates freely.

The system is now SAFE.





### Line Routing Procedure



IMPORTANT! Follow the lockout procedure before routing the line.

Before routing the line, remove the short section of Duct Tape that is securing the line to the spool. The spools are shipped with the line secured to the spool. Removal of the middle cover may be necessary.

Line routing procedure:

- 1. Thru LevelWind rollers.
- 2. Over tension arm rotational axis roller.
- 3. Under tension arm outer roller.
- 4. Under the two horizontal pins in block and thru.



### Installing and Connecting the Probe

- 1. Remove tailspool depress white button and rotate tailspool as shown while holding probe.
- 2. Pass end of winch line thru shackle on tailspool.
- 3. Slide tailspool thru eye of winch line.
- 4. Pull winch line tight at shackle as shown. Make sure the eye of the line is not twisted and the eye lines are evenly tensioned when the line is pulled.
- 5. Re-install tailspool rotate tailspool onto probe until white button engages and is springy when pushed. There is only one position where the tailspool will mate with the probe. If there is excessive "play" between the tailspool and probe, use a shim to tighten up the connection. Shims are included in the Tools and Spare Parts kit 6001751.



The orange buoyancy tailspool module has a maximum depth rating of 100 meters. If you are deploying deeper than 100 meters, switch to the plain tailspool.

#### **Quick Review**

| <ul> <li>Check the rapidCAST is installed properly</li> </ul> | Follow the instructions in the rapidCAST User's Guide, Installation chapter |
|---|---|



# Pre-Deployment Setup

#### **PRE-DEPLOYMENT CHECKS INCLUDES THE FOLLOWING STEPS:**

- ✓ Use the Pre-Deployment checklist before each deployment
- ✓ Use the Pre-Cast checklist before the first cast
- Use the During Operation checklist on every cast

This deployment guide is only an overview of the steps required for rapidCAST setup. Please read the rapidCAST Guide!







## Pre-Deployment Checklist

Follow the instructions in the rapidCAST User's Guide, Initial Setup chapter.

| Check      | Description   |
|------------|---|
| <b>1</b> . | <ul> <li>Connect the Winch to a PC</li> </ul>   |
|            | <ul> <li>Lower numbered Comm port for Telemetry</li> <li>Higher numbered Comm port for Control</li> </ul>   |
| 2.         | <ul> <li>Turn on Telemetry logging</li> </ul>   |
| 3.         | <ul> <li>Check the tension arm settings prior to operation</li> </ul>   |
|            | Tension Arm<br>1006<br>1921   |
| 4.         | <ul> <li>Verify Basic Motion Functionality</li> </ul>   |
|            | When the joystick is not actively being used, the toggle switch should be set to PC Con-<br>trol to properly engage the brake. Note that the rapidCAST may creep (slowly moving<br>cable in/out) in the Local Control position.<br>If the winch is run from the joystick (Local Control) for casts, the closed loop control fail<br>safes are overridden and the user could damage the winch. Always perform casts with<br>the winch in PC Control. |
| 5.         | <ul> <li>Set the Home Position</li> </ul>   |
| 6.         | <ul> <li>Define the Dock, Comm, Launch, and Recovery Positions</li> </ul>   |
| 7.         | <ul> <li>Save and Load the Workspace</li> </ul>   |



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## Pre-Cast Checklist

Follow the instructions in the rapidCAST User's Guide, Initial Setup chapter.

| Check      | Description  |
|------------|--|
| <b>1</b> . | <ul> <li>Line is routed correctly through LevelWind, tension arm, and pulley block.</li> </ul>                     |
| 2.         | <ul> <li>Line is tight on the spool and not tangled or buried below the surface layer of the<br/>spool.</li> </ul> |
| <b>3</b> . | <ul> <li>LevelWind is in sync with line.</li> </ul>  |
| 4.         | <ul> <li>Line is not damaged, and the loop splice is in good condition.</li> </ul>                                 |
| 5.         | <ul> <li>Tension arm moves smoothly when tension is applied to line.</li> </ul>                                    |
| 6.         | <ul> <li>Tension arm settings (see Pre-deployment checklist).</li> </ul>   |
| 7.         | <ul> <li>Tailspool shackle is free from defects, scratches, or anything that may damage the<br/>line.</li> </ul>   |
|            |  |



LevelWind Out of Sync

LevelWind in Sync

### **During Operation Checklist**

Follow the instructions in the rapidCAST User's Guide, Performing Your First Cast chapter.

| Check      | Description   |
|------------|---|
| <b>1</b> . | <ul> <li>During intensive surveys, the probe loop splice should be replaced daily</li> </ul>  |
| 2.         | <ul> <li>The entire line section should be replaced after 1000 casts as a preventative<br/>measure.</li> </ul>                        |
| 3.         | <ul> <li>Keep the line under tension when rotating the spool to guard against fouling.</li> </ul>                                     |
| 4.         | <ul> <li>Monitor Telemetry log file size and available disk space.</li> </ul>   |
| 5.         | <ul> <li>Every 10 to 50 casts, rinse the LevelWind assembly and Davit Block with fresh<br/>water to prevent salt build-up.</li> </ul> |

# After Operation Checklist

Follow the instructions in the rapidCAST User's Guide, Performing Your First Cast chapter.

| Check | Description |   |
|-------|-------------|---|
| 1.    | Ľ           | Rinse the LevelWind assembly and Davit Block with fresh water to prevent salt build-up. |
| 2.    | ×           | Coat the LevelWind bearings with DC111 or AquaShield to prevent cosmetic rust.          |
| 3.    | ×           | Stow the system in the cases when it is not in use for long periods.                    |
| 4.    | ×           | Cover the system with a tarp when not used for short periods.                           |



#### **Quick Review**

| <ul> <li>Use the Pre-Deployment and Pre-Cast<br/>Checklists</li> </ul>          | Follow the instructions in the rapidCAST User's Guide, Initial Setup chapter                 |
|---|--|
| <ul> <li>Use the During Operation and After<br/>Operation Checklists</li> </ul> | Follow the instructions in the rapidCAST User's<br>Guide, Performing Your First Cast chapter |

# Performing Casts

#### **D**EPLOYING THE RAPID**CAST** INCLUDES THE FOLLOWING STEPS:

- \star Setup
- Set Target Depth
- Set Parameters
- Move to Point Launch
- Tension Controlled Payout
- Move to Point Recovery
- ✓ Move to Point Comm

### Step 1 – Setup







### Step 2 – Set Target Depth





### Step 3 – Set Parameters



If you want to enter a delay between steps, enter the number of seconds in the **Hold Position** boxes.

Select Buzzer and/or Strobe to add warnings between steps as needed.

#### **T** Recommended setting:

Enter a delay of 1 to 5 seconds between steps except for the hold position between **Tension Controlled Payout** and **Move to Point Recovery**. This hold duration should be **equal to** the Tension Controlled payout duration. This will help in the initial retrieval of the probe by using the boat's forward speed.

Select the Buzzer for the first step only. Use the Strobe for the rest of the positions.

The software sequence will execute the following actions, in order. The actions have a default setting and are all user settable.

Review the settings by scrolling through:

Hold Position – time before next task begins with an audio/visional notification option.

**Move to Point: Launch** – move the probe to launch point defined in Jog and Teach tab.

Hold Position – time before next task begins with an audio/visional notification option.

**Tension Controlled Payout** – Deploy probe for XX seconds as defined in Dive Table tab.

**Hold Position** – time to hold probe using brake and bring it to surface.

This Hold duration should be **equal to** Tension Controlled payout duration.

**Move to Point: Recovery** – Recovery of probe to recovery point defined in Jog and Teach tab.

**Hold Position** - time before next task begins with an audio/visional notification option.

**Move to Point: Comm** - Recovery of probe to comm point defined in Jog and Teach tab.

**Hold Position** – option to signal cast completion with an audio/visional notification.

### Step 4 – Move to Point Launch





### Step 5 – Tension Controlled Payout



### Step 6 – Move to Point Recovery





### Step 7 – Move to Point Comm

| Hold Position<br>Duration (sec): 1<br>Buzzer V Strobe       | Once the probe returns to Recovery position the speed will drop until the probe returns to the Comm position. The probe software will open and data download over the Bluetooth connection will begin.   |
|---|--|
| Move to Point: Comm<br>Speed (RPM): 100 Tolerance (cts): 50 | <ul> <li>Observe the winch tension control arm and line</li> <li>Observe the data download and depth the probe obtained. If this depth is slightly different then the set depth in step 2, use an offset for the next cast.</li> <li>When Auto Repeat is checked, set the final Hold Position long enough for the probe to download data. The rapidCAST will start another cast until Auto Repeat is unchecked.</li> </ul> |
| Hold Position<br>Duration (sec): 1<br>Buzzer Strobe         |  |

### Complete



#### **Quick Review**

| <ul> <li>Use the Pre-Deployment checklist</li> </ul>  | This deployment guide is only an overview of<br>the steps required for rapidCAST collecting<br>data. Please read the rapidCAST User's Guide! |
|---|--|
| <ul> <li>Use the Pre-Cast checklist</li> </ul>        |  |
| <ul> <li>Use the During Casts checklist</li> </ul>    |  |
| <ul> <li>Use the After-Operation checklist</li> </ul> |  |



# Conclusion

Congratulations! You have completed the rapidCAST Deployment Guide. Read the following chapters in the rapidCAST User's Guide for more detailed information.

#### **RAPIDCAST OPERATION MANUAL**

#### rapidCAST Overview

This chapter includes the rapidCAST mechanical and electrical requirements and specifications.

#### Installation

Use this chapter to install the rapidCAST system and software.

#### Initial Setup

This chapter covers rapidCAST setup, including connecting the winch to a PC, verifying basic motion functionality, setting the positions needed for casts, and using Workspaces.

#### S Curve Fitting & Dive Table Creation

Use this chapter to set the Curve Fitting & Dive Table settings. The Dive Table is used to model the probe fall behavior during the deployment.

Performing Your First Cast

This chapter covers the steps needed to perform a cast.

- Resolving Fault Conditions This chapter covers how to recover from fault conditions.
- rapidCAST Interface Software This chapter covers details of the rapidCAST Interface Software.
- Maintenance Procedures This chapter covers how to maintain the rapidCAST.
- Appendix A Installation Drawings Use this appendix when installing the rapidCAST.



#### Quick Review

| <ul> <li>Software, documentation, and<br/>training videos are available for<br/>download.</li> </ul>                  | <ul> <li>You can download the documentation and videos from our online customer portal at <u>https://www.teledynemarine.com/support/RDI/technicalmanuals</u>.</li> <li>RapidCAST Interface Software and the USB RS-485 Driver are available on <u>https://tm-portal.force.com/TMsoftwareportal</u></li> </ul> |
|---|---|
| This deployment guide is only an overview of the steps required for rapidCAST setup. Please read the rapidCAST Guide: |   |

NOTES



NOTES