



A TRIMBLE COMPANY



Telog[®] PR-32A/iA

Pressure Recorder User Guide



Version 1
September 2020

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Revision History

Date	Version	Content
9/2020	V1	Initial publication of document

Legal Notices

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Release Notice

This is the September 2020 release of the PR-32A/iA Pressure Recorder User Guide.

Limited Warranty Terms and Conditions

Product Limited Warranty. Subject to the terms and conditions set forth herein, Trimble Inc. (“Trimble”) warrants that for a period of twelve (12) months from date of purchase this Trimble product (the “Product”) will substantially conform to our publicly available specifications for the Product and that the hardware and any storage media components of the Product will be substantially free from defects in materials and workmanship.

Warranty Remedies. If the Product fails during the warranty period for reasons covered by this limited warranty and you notify us of such failure during the warranty period, we will repair OR replace the nonconforming Product with new, equivalent to new, or reconditioned parts or Product, OR refund the Product purchase price paid by you, at our option, upon your return of the Product in accordance with our product return procedures then in effect.

Official Language

THE OFFICIAL LANGUAGE OF THESE TERMS AND CONDITIONS IS ENGLISH. IN THE EVENT OF A CONFLICT BETWEEN ENGLISH AND OTHER LANGUAGE VERSIONS, THE ENGLISH LANGUAGE SHALL APPLY.

Supplier’s Declaration of Environmental Rating

PR-32A/iA is environmentally rated: NEMA 6P (IP68)

Contents

Pressure Recorder User Guide	1
Glossary of Terms	6
Text Conventions	7
About the Device	8
Introduction	8
Hardware	9
Ports and Connections	10
Software Applications	12
Application Training Options	13
Getting Started	14
Create Unity Application Accounts	14
Out of the Box	14
Tamper a Call	14
Initial Wake-Up Tamper Call	14
In-Service Tamper Call	15
How to Tamper a Call	15
Integrate a Device	16
Add a Device using Bluetooth	16
Add a Device Using a Manual Tamper	20
Search Function	23
Assign a Device to an App Site	25
Install a Device on a New Site	25
Install a Device on an Existing Site Without an RTU	27
Replace a Device on an Existing Site	28
Uninstall a Device from a Site	30
Configure the Device	31
Call Schedule	31
Configure Sensor Channels	35
Pressure Impulse Settings	38
Alarm Management	40
Configure Notification Groups	40
Configure Alarms	42
Connect and Configure the Sensor	45
Secure Sensor Cable to the RTU	45
Wire the Connection Channel	46
Terminate Sensor Connection Wires in the RTU	47

Mount the Device Onsite	48
Maintenance	50
Shipping and Handling	50
Use and Care	50
Cleaning	50
Replacing the BP-4 Lithium Battery Pack	51
Battery Safety	51
Battery Replacement	51
Updating the Battery Replacement Date in the App	52
Controlling Humidity in the RTU	54
Replacing the Desiccant Packs	55
Troubleshooting	56
Appendix A - Telog PR-32A/iA Specifications	57
Appendix B - Sensor Specifications	59
PR-32A Sensor - Model PT-DS	59
PR-32iA Sensor - Model PT-30b	59
Appendix C - Tamper a Call	60
Communication/Tamper Switch Cable - Tamper a Call	60
BLE Dongle - Tamper a Call	61
Appendix D - Scaling Pressure Channel for Level Values	63

Glossary of Terms

Term	Definition
Communication/Tamper Switch Cable	A cable that connects to the Communication port on the RTU and is used to initiate a remote wireless call or local direct communication.
Bluetooth (BLE) Dongle	Bluetooth device that plugs into a USB port on a PC to allow a local wireless connection to the RTU.
Flow	The direction water is moving.
Groundwater Level	The status of how high or low the water table is in a specified area.
Level	The status of how high or low the water is in a contained area.
Metering	The tracking of data related to the flow of liquid.
Pressure	Water under force that is measured in pounds per square inch (PSI).
PRV Monitoring	Tracking Pressure Reducing Valve (PRV) operations and flow.
Tamper a Call	The act of forcing the RTU to initiate a wireless call, also referred to as a "Tamper Call".
Telog Enterprise	Provides remote access to the RTU using a PC to communicate with the RTU, configure the RTU, and view data and alarms from the RTU.
Telogs for Windows	Lets the user configure and program RTU operating parameters and data collection options with a PC.
Telog PR-32A/iA	Telog Pressure Recorder Remote Telemetry Unit (RTU) model PR-32A/iA.
Trimble Unity	Provides remote access to the RTU using a PC/tablet/laptop/mobile device to configure the RTU, and view data and alarms from the RTU.
Velocity	The speed with which water is traveling; also referred to as flow rate.
Water Quality	The identification of pre-configured values that combine to form a measure of water quality.

Text Conventions

Term	Definition
Click	Using a computer interface (such as a mouse cursor) to select an online application button or menu option.
Select	Choosing between multiple menu options on the screen or a radio button.
Tap	Touching a mobile device screen to make a selection.

About the Device

➤	Introduction
➤	Hardware
➤	Ports and Connections
➤	Software Applications
➤	Application Training Options

Introduction

The Telog® Pressure Recorder Remote Telemetry Unit (RTU) models PR-32A and PR-32iA are battery-powered, single-channel RTUs that use a wireless cellular-based modem to communicate with a Trimble® application to view and analyze pressure and water level data. The RTU collects, stores, and wirelessly transmits data to a Trimble application that provides reporting and analysis tools, workflows used to monitor sites, and generates alarm notifications. PR-32iA also measures and records high-resolution impulse data.

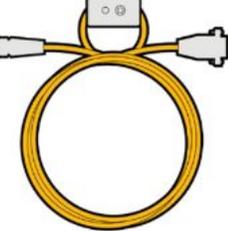
The PR-32A/iA RTU:

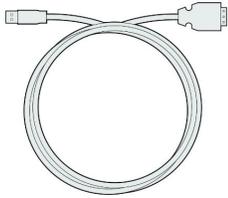
- Collects data from an external sensor
- Stores data to internal memory
- Transfers the data to an application based on a user-configured schedule and alarm triggers
- Receives configuration updates from the application after transferring the data

Hardware

The PR-32A/iA RTUs are used to monitor water system pressures or water levels; PR-32iA also monitors high-resolution impulse data.

The RTU hardware and related equipment includes:

Hardware	Description	Diagram
PR-32A	<p>The PR-32A data logger includes a cellular modem, process signal conditioning, data recorder and battery contained in a small IP68 rated Nema 6P enclosure. Size: 4" L x 4" W x 3" H Weight: 2.5 pounds</p>	
PR-32iA	<p>The PR-32iA data logger also collects impulse data and includes a cellular modem, process signal conditioning, data recorder and battery contained in a small IP68 rated Nema 6P enclosure. Size: 4" L x 4" W x 3" H Weight: 2.5 pounds</p>	
Cu-CTS	<p>Communication/Tamper Switch cable (yellow) is used to Tamper a Call or connect PR-32A/iA to a PC. Length: 8' <i>Optional - Ordered separately</i></p> <p>NOTE - A C-USB-RS232 adapter cable may be necessary to complete the physical connection to a PC depending on the ports on the PC.</p>	

C-USB-RS232	Serial to USB Adapter cable is used to connect the Communication/Tamper Switch cable to a USB port on a PC. <i>Optional - Ordered separately</i>	
C-BLE-D	Bluetooth Low Energy (BLE) Dongle is used to make a local wireless connection between the RTU and a PC running Telogers for Windows. Max range is 20' in an open field, line-of-site setting. <i>Optional - Ordered separately</i>	
PT-DS Sensor	I2C serial communications smart pressure sensor used to deliver data to the PR-32A. Maximum cable length of 100ft (30.5m). <i>Field replaceable.</i> <i>Ordered separately</i>	
PT-30b Sensor	Analog strain gauge pressure sensor used to deliver impulse data to the PR-32iA. Maximum cable length up to 1000ft (305m). <i>Not replaceable in the field, only factory replaceable.</i> <i>Ordered separately</i>	
Tools	Description	Diagram
Wrench	24mm wrench	
Screwdriver	1/8" Flat head screwdriver	

Ports and Connections

The PR-32mA/iA provides the following access ports and connection locations.

Ports and Connections	Function
Communication Port	Used to connect the Tamper Switch Cable to the RTU (not shown)
Flanges	Used to mount the RTU onsite

Hydrophobic vent	Equalizes the pressure inside the RTU housing relative to the outside pressure while preventing water from entering the housing
Sensor Ports	Water-tight fittings used to feed cable from the sensor into the RTU



Software Applications

This document focuses on the RTU interfacing with the Trimble Unity application. However, the RTU can interface with the following Trimble applications.

Applications	Devices Supported	Description
Trimble Unity	PC laptop Tablet	<p>Cloud-based software application that is accessed online with a PC/tablet and used to configure and view the data for PR-32A/iA.</p> <p>The link to access the online application is provided in your welcome email.</p> <p>Ensure you have a Trimble Unity account set up and can log in to the online account before beginning the installation process.</p>
Unity RM	Mobile Device Tablet	<p>Downloaded onto a mobile device or tablet, the software application is used to install, configure, and view data for PR-32A/iA.</p> <p>The mobile application can be downloaded from the App Store on Android/iOS devices.</p> <p>Ensure you have a Trimble Unity account set up and can log into the mobile app before beginning the installation process.</p>
Telogers for Windows® 6.77 or later	PC	<p>Optional legacy software application that provides local access using a PC to communicate with the RTU to receive data and alarms from the RTU, and configure the RTU. Use the Tamper Switch Cable or BLE Dongle (to connect wirelessly) to Tamper a Call and configure the RTU.</p> <p>NOTE - For reliable connectivity using a BLE Dongle, the PC must be within 20' of the RTU in an open field, line-of-site setting.</p> <ul style="list-style-type: none"> The latest version of Telogers for Windows® software is available at: https://www.trimblewater.com/download Login to your Trimble Water Community account to access the <i>Telogers Field Guide - Telogers 101</i> for more in-depth information.
Telog® Enterprise 6.77 or later	PC laptop	<p>Optional legacy software application that provides remote access to the installed RTU using a PC/laptop to communicate with the RTU, receive data and alarms from the RTU, and configure the RTU.</p>

		<ul style="list-style-type: none">● The latest version of Telog® Enterprise software is available at: https://www.trimblewater.com/download● Login to your Trimble Water Community account to access the <i>Telogs Enterprise Software Installation Manual</i> for more in depth information.
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Application Training Options

For detailed information and training about how to use the Trimble Unity applications:

- The Help link in the application provides access to in-depth instructions and information about how to use the application. Access the Help link from a submenu on the app Remote Monitoring screen.
- Trimble Water offers a number of training options including web-based and onsite delivery
- Email requests to Trimblewater_sales@trimblewater.com or call +1 888-835-6437 for Trimble Water Support

The information in this guide supplements the information in the Trimble® PR-32A/iA Quick Start Guide that is available online at: [PR-32A/iA Quick Start Guide](#)

Getting Started

➤	Create Unity Application Accounts
➤	Out of the Box
➤	Tamper a Call

Trimble Water recommends that before PR-32A/iA is installed onsite, the user should complete the categories in this document in the order they are presented, especially in the event of inclement weather conditions or locations that are difficult to access.

Create Unity Application Accounts

1. Using a PC/tablet/laptop, access the Unity online application to create an account at the following URL using a Chrome web browser: **<https://app.trimbleunity.com/>**
2. Using a mobile device/tablet, download the Unity application onto your mobile device from the App Store on Android/iOS devices
3. Create both accounts and log in using the information provided in your Welcome email

Out of the Box

- Unpack the RTU, as well as any equipment that was ordered and is included with the RTU
- Have on hand a mobile device and PC/tablet/laptop

Tamper a Call

Tamper a Call refers to activating the wireless modem functionality that forces the RTU to make a wireless cellular call to connect to and communicate with the Unity application.

Initial Wake-Up Tamper Call

Because the RTU is shipped in a dormant state, the user has to Tamper a Call to:

- Make a wireless cellular connection to the Unity application
- Wake-up the RTU to exit the dormant state
- Deliver configuration information to the RTU

- Initiate data delivery
- Register the RTU with the Unity application

In-Service Tamper Call

- Force a wireless cellular connection to the Unity application
- Deliver configuration changes to the RTU outside of the call schedule
- Connect to the RTU for troubleshooting purposes

How to Tamper a Call

Tamper a Call using any of the following methods:

Tamper Method	Function
Bluetooth Scan	<ul style="list-style-type: none"> ● Scan for RTUs in the immediate vicinity ● Search by serial number ● Scan barcode
Application menu option	Using the “Tamper a Call” menu option on the Unity RTU Details screen (once the device has been added to the Unity application).
Tamper Switch Cable	A Tamper Switch cable is attached to the RTU to initiate the Tamper Call. Refer to Appendix C - Tamper a Call for details.
BLE Dongle	Uses a small USB device that plugs into a PC to initiate a Bluetooth Tamper call using Telogers for Windows software. Refer to Appendix C - Tamper a Call for details.
Battery removal	Removing the battery for at least 5 minutes generates a Tamper Call when the battery is reinstalled. This method is reserved for emergencies only. Refer to Replacing the BP-4 Lithium Battery Pack for details.

Integrate a Device

➤	Add a Device using Bluetooth
➤	Add a Device Using a Manual Tamper
➤	Search Function

NOTE: the screen captures are provided as examples of the interface, your data and device will be different.

Add a Device using Bluetooth

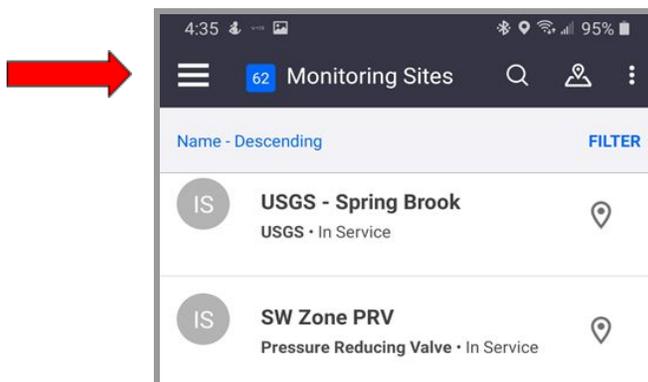
Add a device to the Unity application to have the app identify and manage the device.

Before starting, have on hand the:

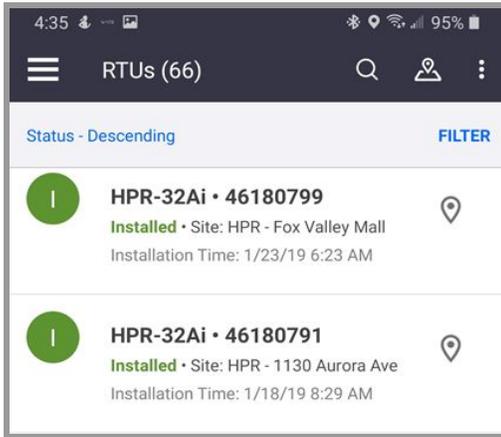
- RTU
- Mobile device

To add a device using Bluetooth:

1. Launch the **Unity Android or iOS mobile app** from your mobile device.
2. Enter your **organization** and tap on **Next**.
3. Enter your **username** and **password**, tap on **Sign In**. The **Monitoring Sites** screen is displayed.
4. Tap on the **menu icon** (☰) in the upper left corner of the screen to display a submenu.

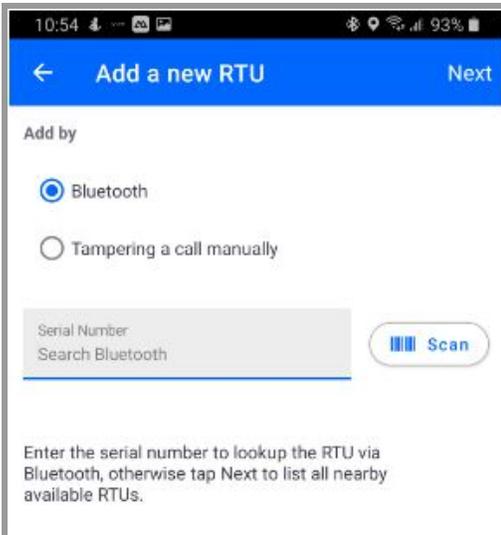


5. Under **Remote Monitoring**, tap on **RTUs** to display the **RTUs** list. (For a customer with their first device, there may be nothing listed.)



6. Tap on the plus sign  (bottom of the screen) to display the **Add a new RTU** screen.
- NOTE:** For current customers, if your account has exceeded the maximum number of subscriptions, a message will direct the user to contact Professional Services at Trimble Water to resolve the issue.

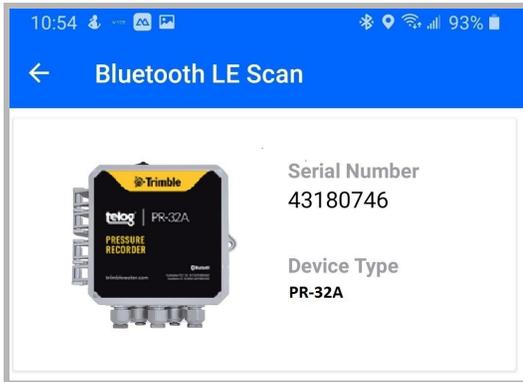
7. Ensure **Bluetooth** is selected.



8. Select one of the three ways to have the app recognize the device:
- **Scan Bluetooth:** Tap on **Next** in the upper right corner of the screen to initiate a **Bluetooth scan** of Bluetooth enabled devices within 20' of the immediate area; Or
 - **Serial Number:** Enter the **device serial number** in the **Serial Number** text box and tap on **Next** to scan for the device; Or

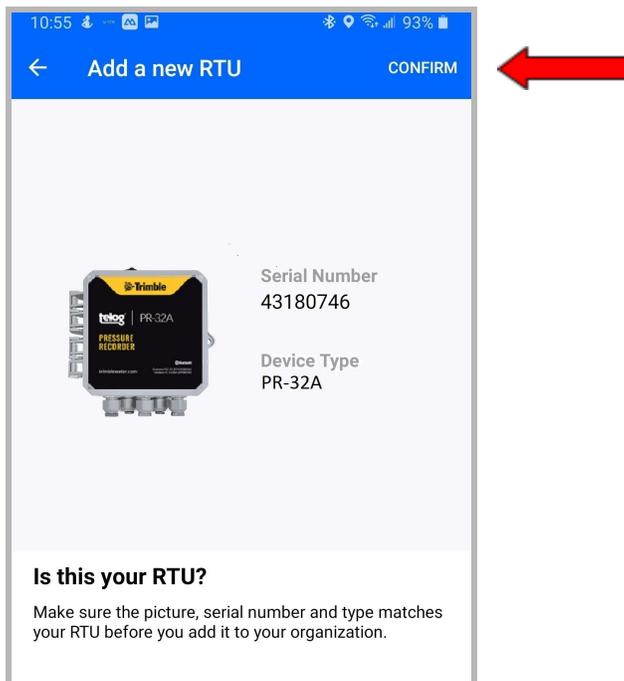
- **Scan Barcode:** Tap on **Scan** with the serial number text box empty. The app displays the **Scan Barcode** screen. Hold the **Scan Barcode** screen facing the **barcode** of the device, ensure the barcode is inside the viewfinder rectangle and scan for up to 30 seconds until the app populates the text box with the **serial number**.

9. The **Bluetooth LE Scan** screen displays a picture of the device and ID information:



- If the **correct RTU** is displayed, tap on the **RTU picture**. The **Is this your RTU?** message is displayed. Review the info to ensure it is the correct **RTU** being added, if so, go to step 10.
- If the **correct device** is not displayed, tap on the left arrow in the header to return to the **Add a new RTU** screen and begin the process again. Consider using a different method to have the app recognize the device.

10. Tap on **Confirm**. The **Add a new RTU** screen with Serial Number and Device Type is displayed.



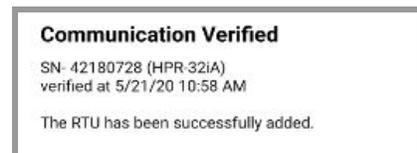
11. Determine whether to **Enable Dormant Mode?** on the **Add a new RTU** screen:



- If the **RTU** is being installed immediately, do not select **Enable Dormant Mode after calling**, go to step 12.
- If the **RTU** is not being installed immediately, select **Enable Dormant Mode after calling** to preserve the battery after the initial wake-up call activates the device.

12. Tap on **Next**. The **RTU Added!** screen is displayed with a **Verifying communication** message and a progress status bar. The device is calling to connect to the app, performing a Tamper via Bluetooth, and registering the device to add to the list of RTUs.

- If the verification is successful, a **Communication Verified** message will be displayed. In the event that **Enable Dormant Mode after Calling** was selected, dormant mode will be applied to the device after the call has completed. Go to step 13.



- If the verification is unsuccessful, a **Communication failed** message will be displayed and the option to try again will be displayed.

Tap on . If repeated attempts fail, contact Trimble Unity Support.

13. Tap on **Done**. The **Retrieving Remote Monitoring Sites** message is displayed. The device will synchronize with the cloud to retrieve any updates and add the device to the **RTU** list. Once the system has completed these updates, the **RTU Details** screen appears with a confirmation message.

- If the device is in **Dormant mode**, the status will be displayed on the screen.
- If the device is not in **Dormant mode** and you want it to be, a **More** menu will be displayed.
Tap on **More** -> **Enable dormant mode** to save the battery.

14. Go to [Assign a Device to an App Site](#).

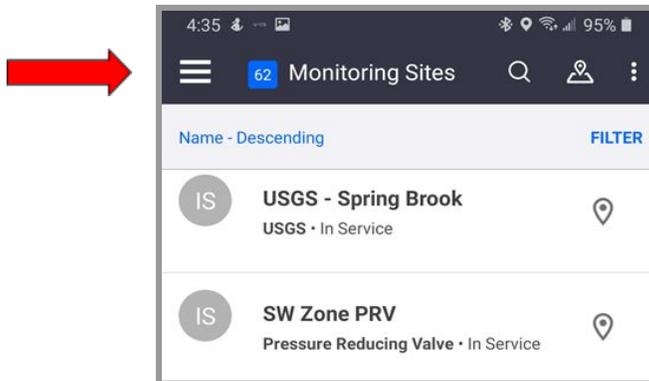
Add a Device Using a Manual Tamper

Before starting, have on hand the:

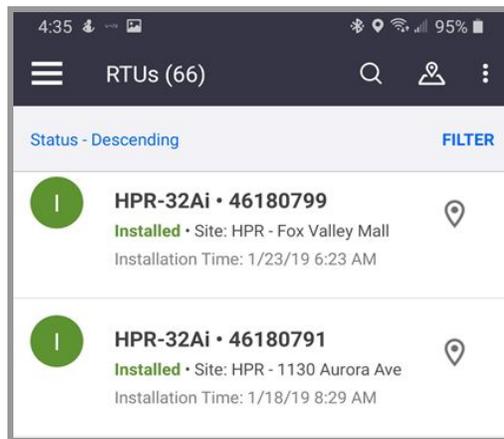
- RTU
- Mobile device or tablet
- Tamper cable

To add a device using a manual Tamper:

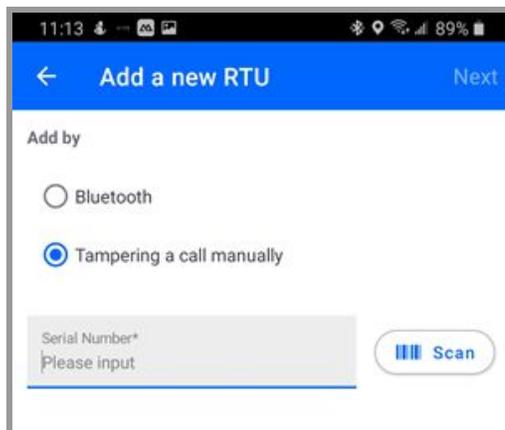
1. Launch the **Unity Android** or **iOS mobile app** from your phone or tablet.
2. Enter your **organization** and tap on **Next**.
3. Enter your **username** and **password**, tap on **Sign In**. The **Monitoring Sites** screen is displayed.
4. Tap on the **menu icon** (☰) in the upper left corner of the main screen to display a submenu.



5. Under **Remote Monitoring**, tap on **RTUs** to display the **RTUs** list. (For a customer with their first device, there may be nothing listed.)

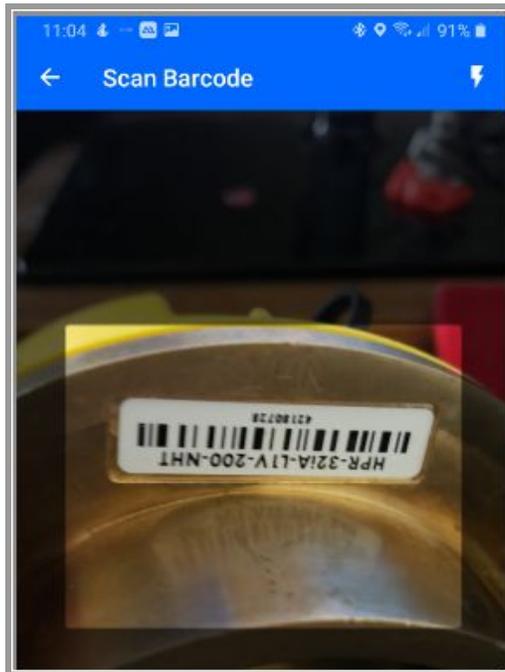


6. Tap on the plus sign  on the bottom right on the screen, the **Add a new RTU** screen is displayed.



NOTE: For current customers, if your account has exceeded the maximum number of subscriptions, a message will direct you to contact Professional Services at Trimble Water to resolve the issue.

- Under **Add by**, select **Tampering a call manually**. The **Scan Barcode** screen appears.



- Hold the **Scan Barcode** screen facing the **barcode** on the device, ensure the **barcode** is inside the **viewfinder rectangle** and scan for up to 30 seconds until the app populates the text box with the **serial number**.
- Tap on the **RTU picture** to select it and display the **Add a new RTU** screen.
- Determine whether to **Enable Dormant Mode after Calling?**
 - If the **RTU** is being installed immediately, go to step 11.
 - If the **RTU** is not being installed immediately, select the **Enable Dormant Mode after Calling** checkbox to preserve the battery after the initial wake-up call.
- Tap on **Next**.
- On the **Add a new RTU** screen, the **Tamper RTU to call** message is displayed.
- Perform the [Communication/Tamper Switch Cable - Tamper a Call](#) procedure using a **Tamper Cable**.
- Once the **Tamper call** has connected, the app displays the **Verifying communication CALL STATUS: IN_PROGRESS** message and automatically attempts to verify the data connection; progress is displayed on a status bar.
 - If the **verification** is successful, a **Communication Verified** message will be displayed. Go to step 15.

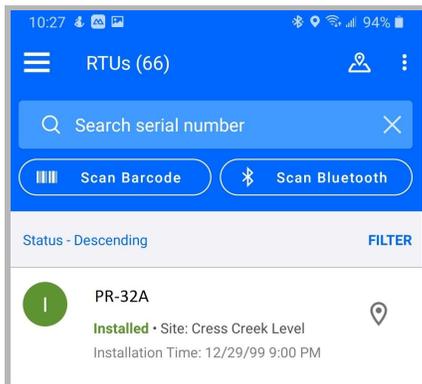


- If the **verification** is unsuccessful, a **Communication failed** message will be displayed. Tap on the **left arrow** in the header to go back to the **Add new RTU** screen and begin the verification again. If subsequent attempts fail, contact Trimble Unity Support.
15. Tap on **Done**. The **Retrieving Remote Monitoring Sites** message is displayed. The device will synchronize with the cloud to retrieve any updates and be added to the **RTU** list. Once the system has completed these updates, the **RTU Details** screen appears with a confirmation message.
 - If the device is in **Dormant mode**, the status will be displayed on the screen.
 - If the device is not in **Dormant mode** and you want it to be, a **More** menu will be displayed. Tap on **More -> Enable dormant mode** to save the battery.
 16. Go to [Assign a Device to an App Site](#).

Search Function

To find an RTU that has been installed on the app:

1. On the **RTUs** list screen, tap on the **Magnifying Glass**.



2. Select one of the following **scan** methods on the RTUs screen:
 - **Search serial number:**
 - I. Tap on **Search serial number**.
 - II. Enter the device serial number in the text box.
 - III. Tap on **Next** to scan for the device.
 - If the search is successful, the system displays the **RTU Details** screen.
 - If unsuccessful, try again.

- **Scan Barcode:**
 - i. Tap on **Scan Barcode**, the **Scan Barcode** screen is displayed.
 - ii. Hold the **Scan Barcode** screen facing the **barcode** of the device, ensure the **barcode** is inside the viewfinder rectangle and scan for up to 30 seconds until the app populates the text box with the **serial number**.
 - If the search is successful, the system displays the **RTU Details** screen.
 - If unsuccessful, try again.
- **Scan Bluetooth:**
 - i. Tap on **Scan Bluetooth**, to initiate a **Bluetooth scan** of devices in the immediate area (within 20'). The **Bluetooth LE Scan** screen displays a picture of the device(s) and relevant data.
 - If the **correct RTU** is displayed (scroll down if necessary), tap on the **RTU picture** to select it. The system displays the **RTU Details** screen.
 - If unsuccessful, try again.

Assign a Device to an App Site

➤	Install a Device on a New Site
➤	Install a Device on an Existing Site Without an RTU
➤	Replace a Device on an Existing Site
➤	Uninstall a Device from a Site

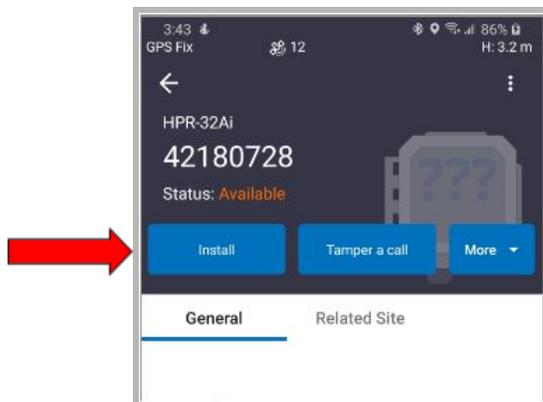
NOTE: the screen captures are provided as examples of the interface, your data and device will be different.

Now that the device has been added to the Unity app, use a mobile device to assign (install) the device to the remote monitoring site it will be associated with, which can be a new or existing remote monitoring site.

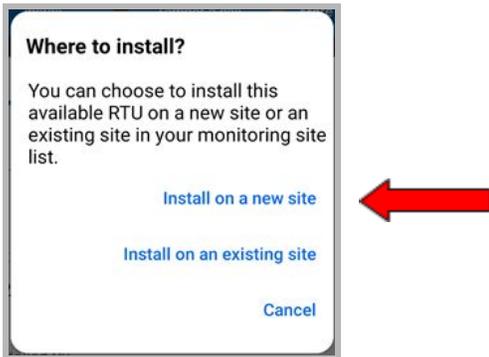
Install a Device on a New Site

To install the RTU on a new remote monitoring site using a mobile device:

1. On the **RTU details** screen for the newly added **RTU**, tap on **Install**. The **Where to Install?** message is displayed.



2. Tap on **Install on a new site**.



3. On the **Install on a new site** screen, the **Serial Number** will be displayed, enter:

- **Site Name***: the name of the site.
- **Site Type***: tap on the **down arrow** and select the correct site type for an **RTU**.
- **Site Group**: tap on the **down arrow** and select the **Group** to associate the **RTU**; this is used if you want to associate your site to a specific site group.
- **Location* ***:
 - Tap on **Capture** to enable the **GPS** location, or tap on **Map** to select a location on the map.
 - Tap the **check mark** in the header to **save** the selections.
- **Timezone***: tap on the **down arrow** and select the **timezone** where the **RTU** is being installed.
- **Custom fields and notes**: optional and can be added later.

11:06 GPS Fix 90% H: 12 m

← Install on a new site Install

RTU Serial Number
42180728

Site Name *
Cog High School

Site type *
Hydrant Pressure

Site group
- Please Select -

Location* *
Lat: 41.78094512 Long: -88.15968563

CAPTURE MAP CLEAR

Timezone *
(GMT-08:00) Pacific Time (US & Canada)

4. Tap on **Install**. The **RTUs** screen is displayed with the site added.
5. Tap on the **left arrow** in the header to return to the **home screen**.
6. Tap on **Tamper a call** in the header.

7. Use a **tamper method (Bluetooth or scan)** provided in [Add a Device using Bluetooth](#) **step 8** or the **Tamper cable** method provided in [Communication/Tamper Switch Cable](#).

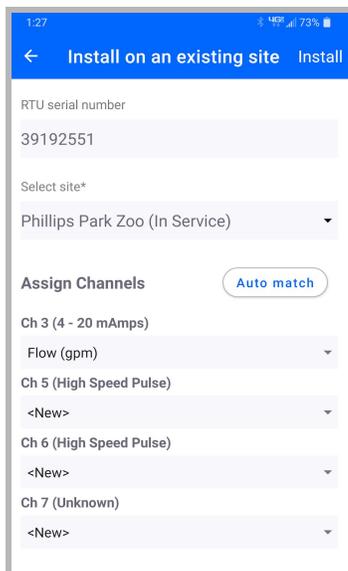
Install a Device on an Existing Site Without an RTU

To install the RTU on an existing site that was previously used to monitor pressure:

1. On the **RTU details** screen for the newly added **RTU**, tap on **Install**. The **Where to Install?** message is displayed.
2. Tap on **Install on an existing site**.



3. Under **Select site*/Please select**, tap on the down arrow to display the list of sites. The **Select Site** screen is displayed with the sites listed alphabetically.
4. Tap on the **site** where you want to install the **RTU**. The **Install on an existing site** screen is displayed.

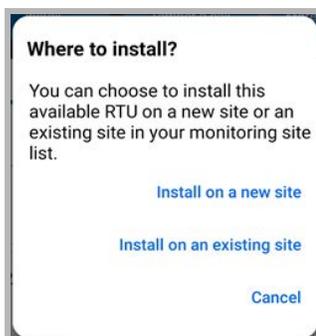


5. Tap on **Assign Channels**  to display a list of **Channels**.
6. Tap on the **down arrow** for each **Channel (Ch #)** and select the appropriate value (if not already displayed) until all **Channels** to be used are assigned.
7. Tap on **Install**. A **confirmation message** is displayed on the **Home** screen.
8. Tap on **Tamper a Call** in the header.
9. Use a **tamper method (Bluetooth or scan)** provided in [Add a Device using Bluetooth step 8](#) or the **Tamper cable** method provided in [Communication/Tamper Switch Cable](#).
This will prompt the device to deliver the data and measurements collected since the initial tamper.

Replace a Device on an Existing Site

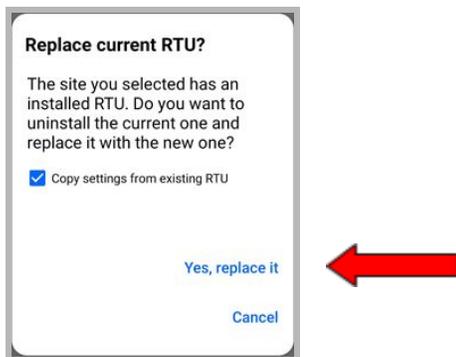
To install the RTU on an existing site where it will replace an RTU:

1. On the **RTU details** screen for the newly added **RTU**, tap on **Install**. The **Where to Install?** message is displayed.
2. Tap on **Install on an existing site**.

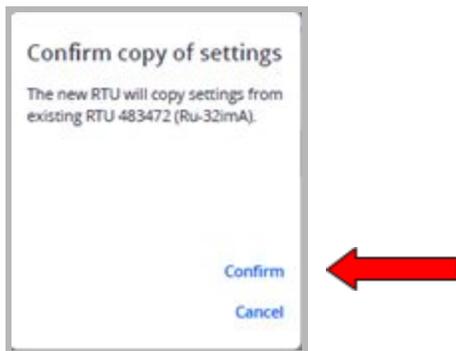


3. Under **Select site*/Please select**, tap on the down arrow to display the list of sites. The **Select Site** screen is displayed with the sites listed alphabetically.
4. Tap on the **site** where you want to install the **RTU**. The **Replace current Recorder?** message is displayed with an option to select **Copy settings from existing Recorder**.
5. Tap on **Copy settings from existing RTU** to assign the settings for the existing **RTU** to the new **RTU**.

6. Tap on **Yes, replace it**. The **Confirm copy of settings** message is displayed.



7. Tap on **Confirm**. Depending on the response:



- If the system can copy the settings, the **Assign Channels** will display the assigned settings.
 - If the settings are correct, go to step 8.
 - If the settings are not correct, tap on the **down arrow** for each **Channel (Ch #)** and select the appropriate setting until all **Channels** to be used are assigned. Go to step 8.
- If the system cannot copy the settings, an **Unable to copy** message will be displayed.
 - Tap on **Still replace it**. The **Assign Channels** section of the screen is displayed.
 - Select **Auto Match**.
 - Review the **settings**:
 - If the settings are correct, go to step 8.
 - If the settings are not correct, tap on the **down arrow** for each **Channel (Ch #)** and select the appropriate setting until all Channels to be used are assigned.

8. Tap on **Install**. A **confirmation message** is displayed.

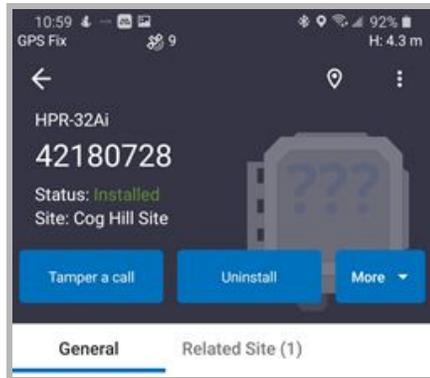
9. Tap on **Tamper A Call** in the header.

10. Use a **tamper method (Bluetooth or scan)** provided in [Add a Device using Bluetooth step 8](#) or the **Tamper cable** method provided in [Communication/Tamper Switch Cable](#). This will prompt the device to deliver the data and measurements collected since the initial tamper.

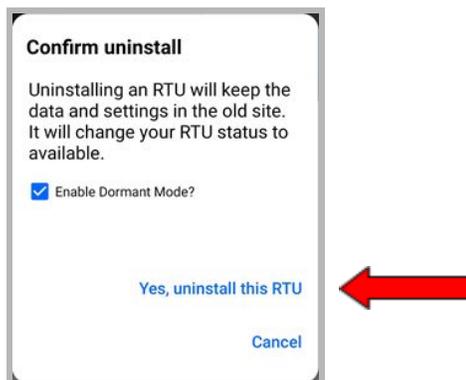
Uninstall a Device from a Site

Use this procedure to uninstall an RTU from a remote monitoring site; the RTU will still be registered with the application but no longer associated with a particular site. This functionality can be used to uninstall, and then reinstall the RTU at a different site to coincide with moving the RTU to a new physical location.

1. On the app **Details** screen for that **RTU**, tap on **Uninstall**.



2. The **Confirm uninstall** message is displayed. Determine whether to select **Enable Dormant Mode** (saves the battery if the RTU is not being put into immediate use).
3. Tap on **Yes, uninstall this RTU**. The **home screen** is displayed. The **RTU** is still registered in the app, just no longer assigned to a site.



Configure the Device

➤	Call Schedule
➤	Configure Sensor Channels
➤	Pressure Impulse Settings
➤	Alarm Management

Configure the RTU using a PC/laptop/tablet to call the Unity application on a user-configured schedule to deliver data and receive configuration updates, such as call schedule settings. Alarms are delivered on a separate, configured schedule. After the RTU calls the app and delivers the data, the app downloads configuration changes to the RTU.

NOTE: the tasks in this section are making configuration changes to the RTU.

For additional configuration information, refer to [Application Training Options](#) for information about access to Unity application training.

Prerequisites for this section

NOTE: the RTU Management role must be assigned to the user to edit any of the settings in this section.

NOTE: the screen captures are provided as examples of the interface, your data and device will be different.

Call Schedule

NOTE: Before starting, ensure you have access to the Trimble Unity Remote Monitoring Web application.

Schedule the RTU to call the application and deliver data by scheduling the number of hours between calls or the time of day.

Schedule	Parameters
By hours	Calls can be scheduled from 1 - 96 hours between calls

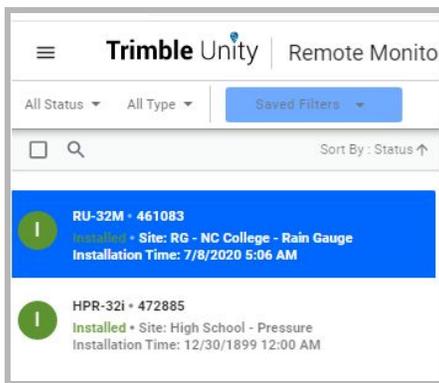
By time of day (RTU local time)	Calls can be scheduled to a specific time of day during any 24 hour period
Recommendation	Daily calls are recommended
Battery Life	Call schedule and sampling rate may significantly impact battery life. High call frequency may be mitigated by using the alarm call feature to call when the pressure exceeds the alarm thresholds. See battery life estimates in the Battery section of the Specifications: Appendix A - PR-32A/iA Specifications.

Before starting:

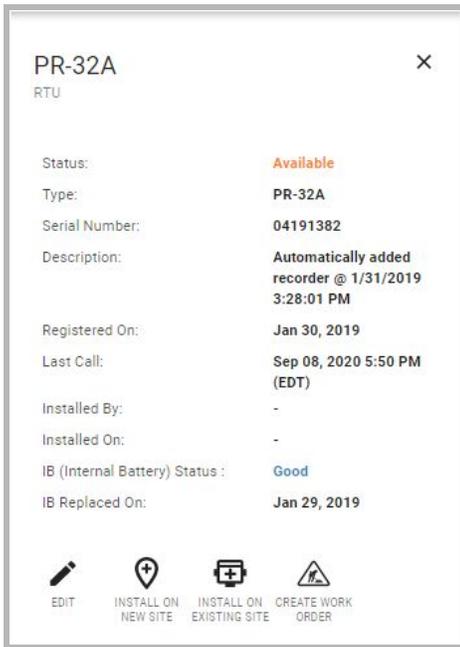
- Be able to access your Trimble Unity Remote Monitoring Web app account
- Have on hand a Tamper Switch Cable or BLE Dongle (requires Teloger for Windows)
- Have on hand the connecting device: PC/laptop/tablet

To configure the RTU call schedule:

1. Access your **Trimble Unity Remote Monitoring** web application using a PC/laptop/tablet and login.
2. Click on the **Remote Monitoring** menu option. The **Monitoring Sites list** is displayed on the left side of the screen with the site map to the right.



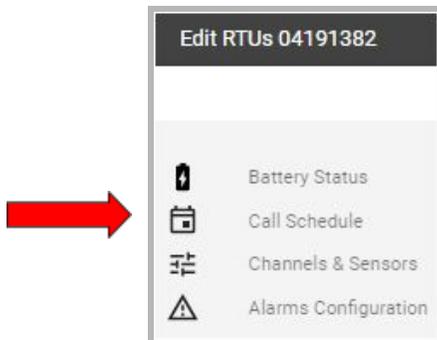
3. Search for the desired **Monitoring Site** then click on the **RTU**. The system displays the **RTU details** screen.



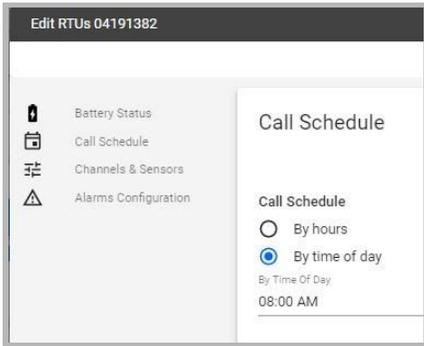
4. Click on **Edit** on the bottom of the **RTU details** screen.



5. Click on **Call Schedule** to update the hours or time of day.



6. Make the desired changes to the **Call Schedule** using the **By hours** or **By time of day** schedule:

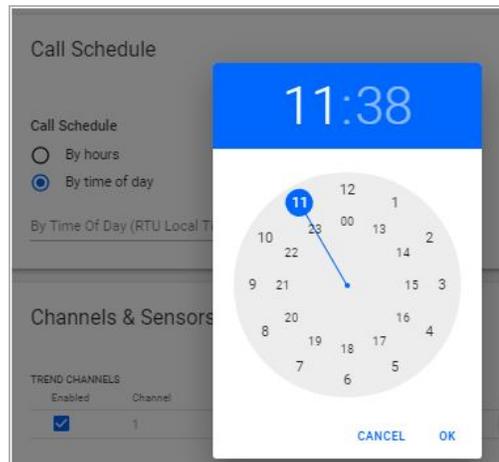


- **By hours:**

1. Click on **By hours**. The **Call Schedule By Hours** is displayed at the bottom of the **Call Schedule** screen.
2. Click on **Call Schedule By Hours**.
3. Click on the **number of hours** (1 to 96 hours) to be scheduled between calls (scroll down if necessary).

- **By time of day:**

1. Click on **By Time Of Day**. The system displays **By Time Of Day (RTU Local Time)** at the bottom of the **Call Schedule** screen.
2. Click on **By Time Of Day (RTU Local Time)**. The system displays a clock.
3. Click on the **hours** on the **clock dial** to select the **time of day**. The minutes in an hour are displayed.
4. Click on the **minutes** on the **clock dial** to set the **minutes of the hour**.
5. Click on **OK**.



7. Click on **Update** to save the configuration changes. (Scroll down if it isn't visible.)

Configure Sensor Channels

The PR-32A recorder measures water pressure at user-configured rates up to 4 samples per second using a PT-DS pressure transducer. The memory size for the PR-32A is 31,000 data values.

The PR-32iA recorder measures water pressure at user-configured rates up to 256 samples per second using a PT-30b pressure transducer and a transient trigger pressure rate-of-change that is either positive or negative and user-configurable.

In addition to monitoring the pressure on the pressure channel, the impulse recording option feature of the PR-32iA unit stores the waveform of captured pressure transient (impulse) waves detected on the monitored network. The PR-32iA Impulse memory can store up to 100 transient events to a maximum of 37,000 samples after which new data will overwrite the oldest data.

NOTE: Sampling rate and call schedule may significantly impact battery life, see battery life estimates in the Battery section of the Specifications in [Appendix A - PR-32A/iA Specifications](#). High call frequency may be mitigated by using the alarm call feature to call when the pressure exceeds the alarm threshold.

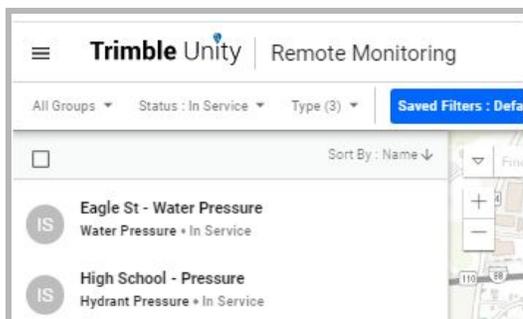
- Sampling Rate - how often the pressure sensor input is being read by the RTU
- Recording Interval - how often the statistical sample data is recorded, any combination of minimum, maximum or average value of each interval may be stored

Before starting:

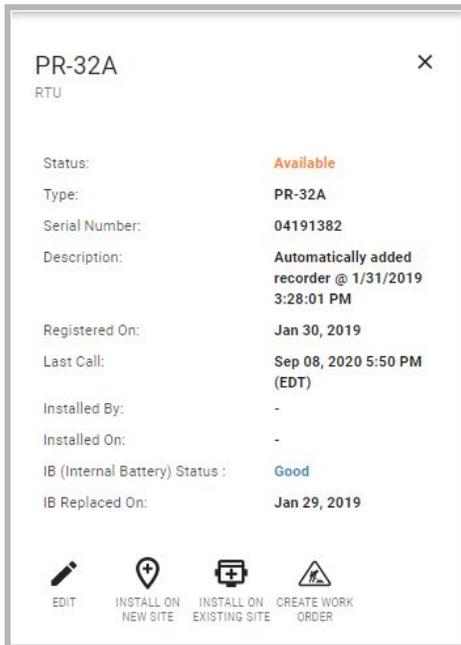
- Be able to access your Trimble Unity app account
- Have on hand the connecting device: PC/laptop/tablet

To configure the sampling rate and recording interval:

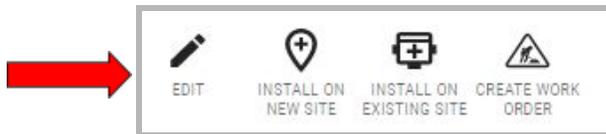
1. Access your **Trimble Unity Remote Monitoring** web app and login.
2. Click on the **Remote Monitoring** menu option. The **Monitoring Sites** list is displayed on the left side of the screen with the site map to the right.



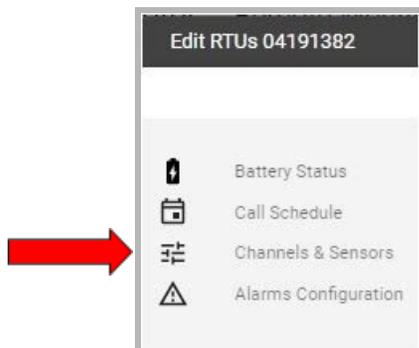
3. Search for the desired **Monitoring Site** then click on the **RTU** site. The system displays the **RTU details** screen.



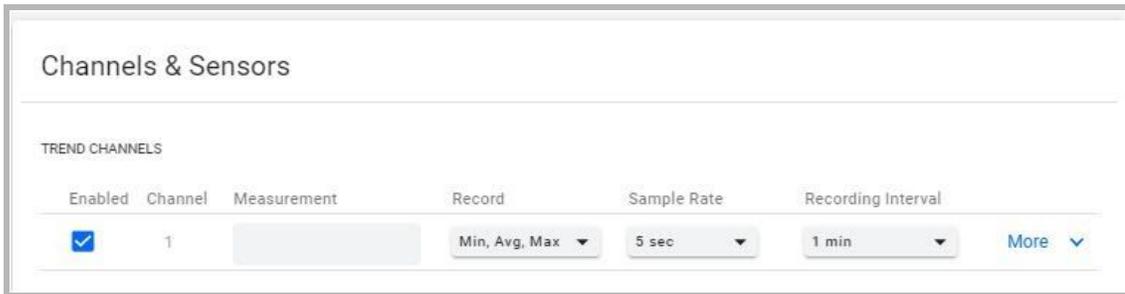
4. Click on **Edit** on the bottom of the **RTU details** screen.



5. Click on **Channels & Sensors** on the menu to change how often the RTU samples and records, and what data is being recorded.

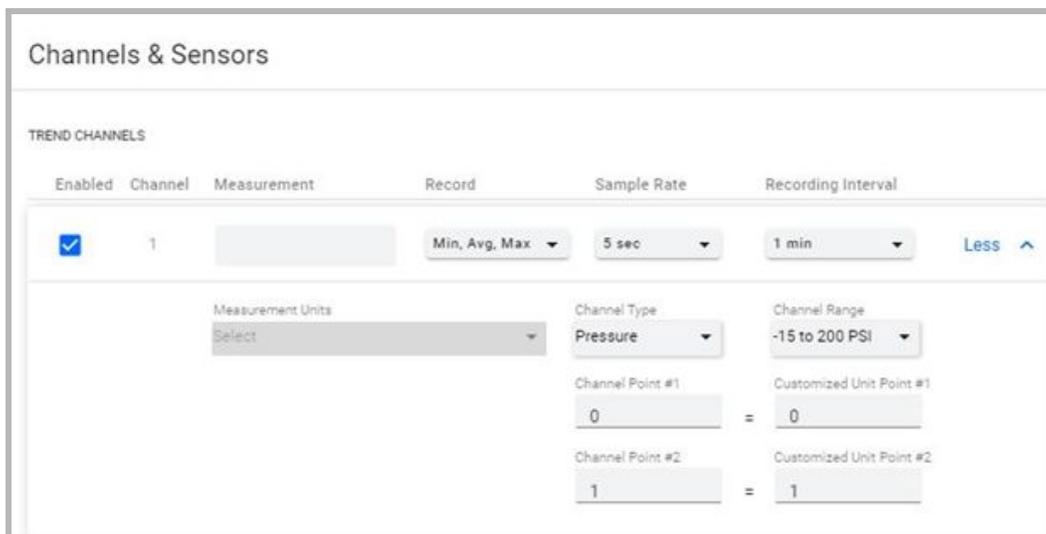


- Update the **Channels & Sensors** (Trend Channel) that control the data to be configured. Use the down arrows to select values.



- Trend Channels:** these channels sample electric current or voltage from the connected sensors, and translate into meaningful data and measurements such as water level, pressure, and flow.

- Click on **More** to display a submenu used to configure **Channel Type** and **Channel Range**.



NOTE: Verify that Channel Scaling is correct, for more detailed information, refer to the online *Trimble Unity User Guide* using the Help link in the software

- Click on **Update** to save the configuration changes.

Pressure Impulse Settings

A pressure impulse is a rapid change in pressure that can be captured as an event on the RTU.

NOTE - This section only applies to the PR-32iA.

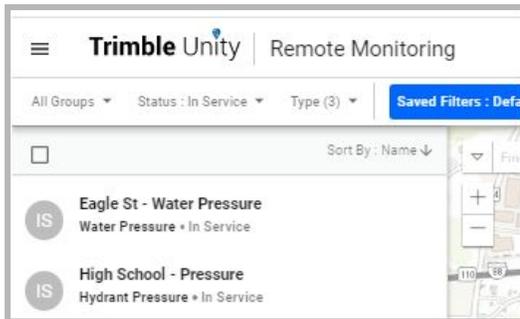
NOTE: Frequent calls to report pressure impulse settings will shorten battery life.

Before starting:

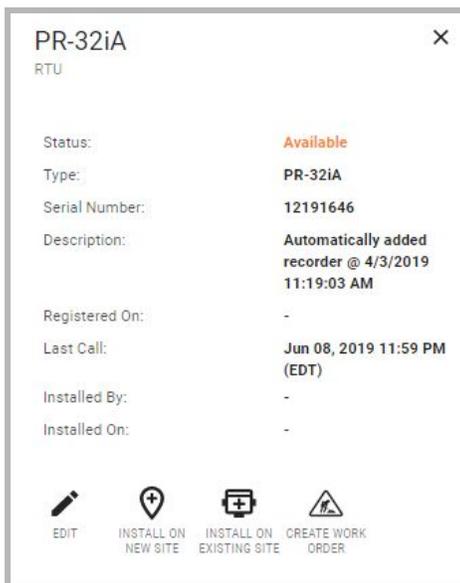
- Have the connecting device on hand: PC/laptop/tablet
- Be able to access your Trimble Unity application account

To configure the PR-32iA Pressure Impulse settings:

1. Access your **Trimble Unity Remote Monitoring** web application and login.
2. Click on the **Remote Monitoring** menu option. The **Monitoring Sites** list is displayed on the left side of the screen with the site map to the right.



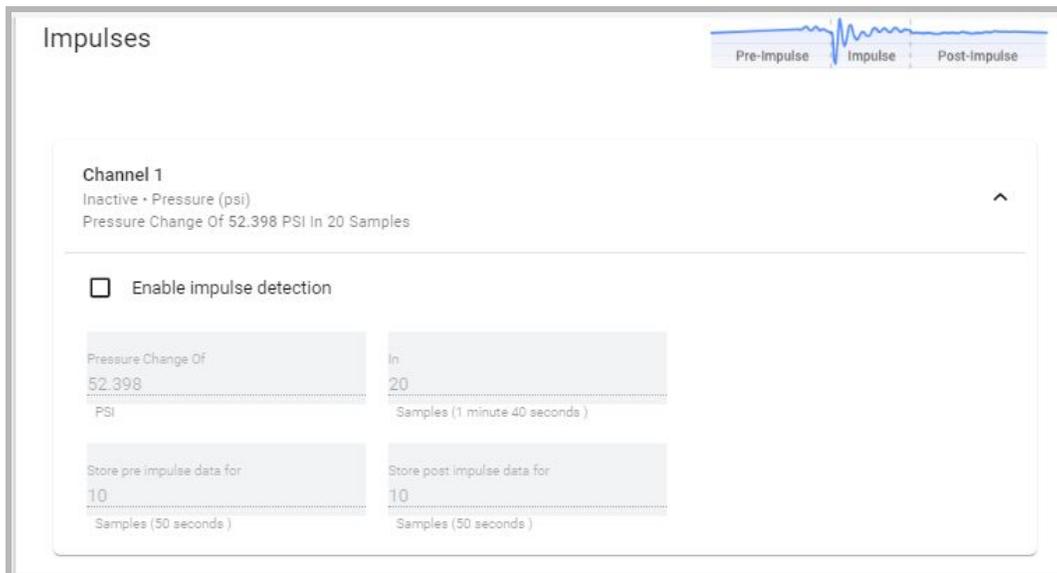
3. Search for the desired **Monitoring Site** then click on the **RTU** site. The **RTU site details** screen is displayed.



- Click on **Edit** on the bottom of the **RTU details** screen.



- Click on **Impulse** on the menu to display the **Impulses** section.



- Select **Enable impulse detection** (check the box) or **Disable** (uncheck the box).

If **Enabled**, configure the 4 required Impulse detection parameters.

- **Pressure Change Of**: the minimum pressure change required to trigger an impulse capture.
- **In**: the trigger window or the maximum number of samples considered when detecting an impulse.
- **Store Pre Impulse Data For**: the number of samples saved before the impulse trigger.
- **Store Post Impulse Data For**: the number of samples saved after the impulse trigger is no longer active.

- Click on **Update**.

Alarm Management

- [Configure Notification Groups](#)
- [Configure Alarms](#)

The Unity application creates and sends Alarms to report on data that has breached user-configured parameters. Trimble recommends that the user collect data for a period of time before activating the alarm feature to determine what parameters will be effective and to avoid being overwhelmed with unnecessary alarms.

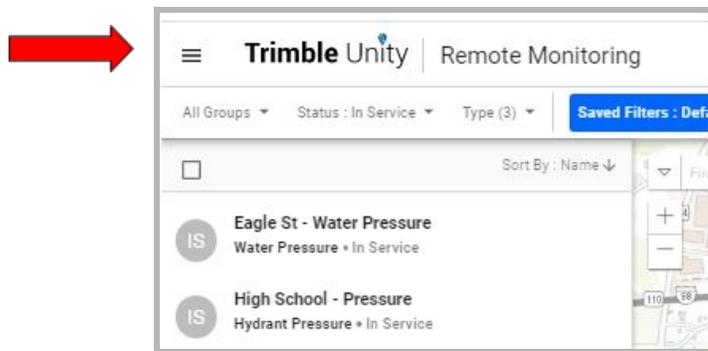
NOTE - a site with an alarm condition appears on the map as a red dot.

Configure Notification Groups

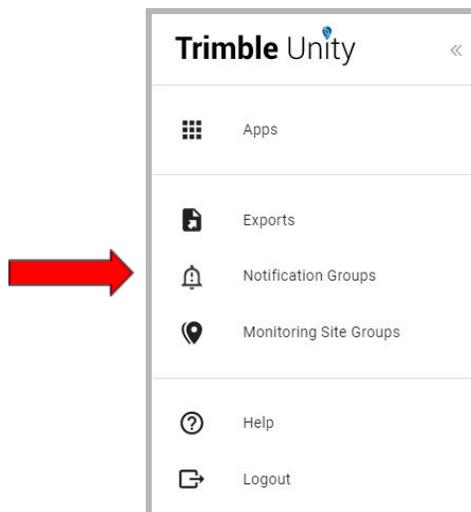
Before configuring alarms, the Notification Groups or recipients must be configured so the app knows where to send the alarm.

To configure the alarm Notification Groups:

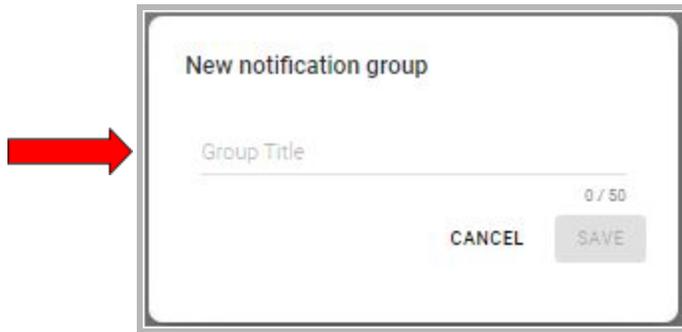
1. Access your **Trimble Unity Remote Monitoring** web application and login.
2. Click on the **Remote Monitoring** menu option. The **Monitoring Sites** list is displayed on the left side of the screen with the site map to the right.
3. Click on the menu icon (☰) in the upper left corner of the main screen to display a sub-menu.



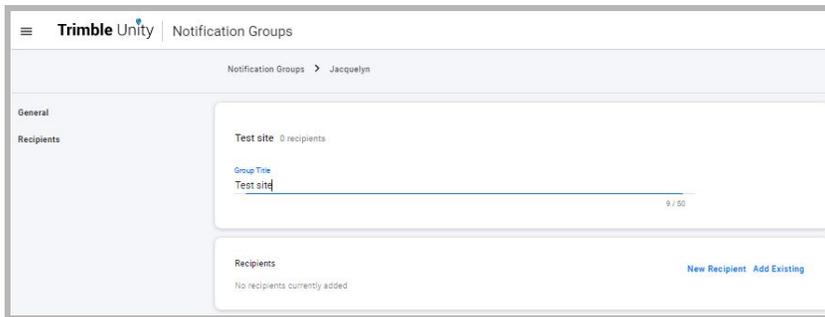
4. Click on **Notification Groups**.



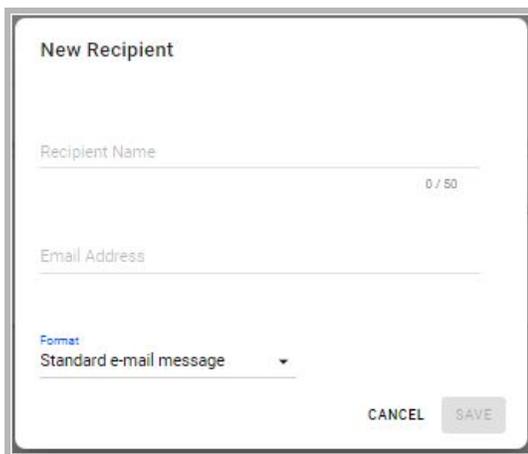
5. Click on the **New notification group** link in the **Manage Notification Groups** section of the screen.
6. On the **New notification group** screen, enter a group name on the **Group Title** line.



7. Click on **Save**. Now that the **Notification Group** has been created, populate it with individuals.
8. On the **Manage Notification Groups** screen, click on the **overflow symbol (:)** to populate the **Notification Group**.



9. Click on **Edit**. The **Notification Groups** screen is displayed.
10. Click on **New Recipient** in the **Recipients** section of the screen.



11. Enter a **recipient's name**, **email address**, and **email format** (such as standard email message).
NOTE - To send a text message to a phone instead of an email, make sure to choose the Short email Message format type, and use the following format for the email address:
[phonenumber@mobilecarrierSMSGateway]
12. Click on **Save**.
13. Add all of the **intended recipients** to the **Notification Group**.
14. Once all the **recipients** are added to the group, click on **Save**.

Configure Alarms

To enable, disable or configure alarms on an RTU, use the following procedure to configure alarms. The system default is to send email messages; however, the system can be configured to send text messages instead of an email.

NOTE - frequent alarm calls will shorten battery life.

NOTE - a site with an alarm condition appears on the map as a red dot.

For each alarm:

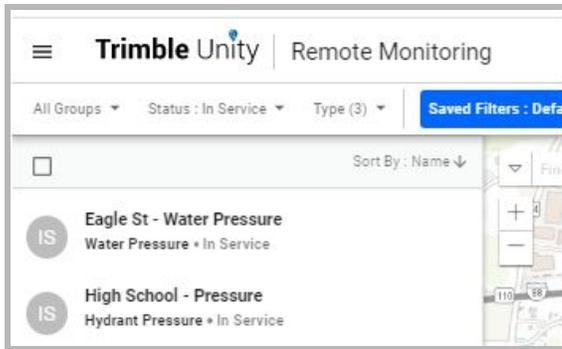
- Enable the alarm
- Set the alarm threshold
- Specify how long the alarm condition will have to persist before the alarm is triggered
- Assign the group of users who will receive alarm notifications via email (or text)

The alarm function allows the user to configure the following parameters that prompt the system to generate a message:

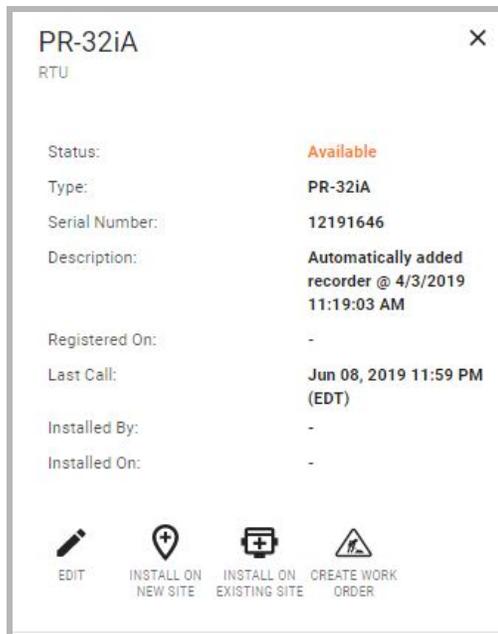
Alarm Types	Definition
Lo	The sampled input value is at the low alarm.
LoLo	The sampled input value is less than the low alarm.
Hi	The maximum sampled input value is at the high alarm value.
HiHi	The maximum sampled input value is greater than the high alarm values.
Dwell Time	The alarm dwell time determines how many seconds the alarm condition must persist in order to trigger an alarm.

To configure the alarms:

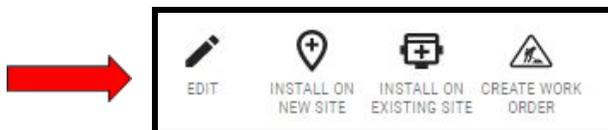
1. Access your **Trimble Unity Remote Monitoring** web application and login.
2. Click on the **Remote Monitoring** menu option. The **Monitoring Sites** list is displayed on the left side of the screen with the site map to the right.



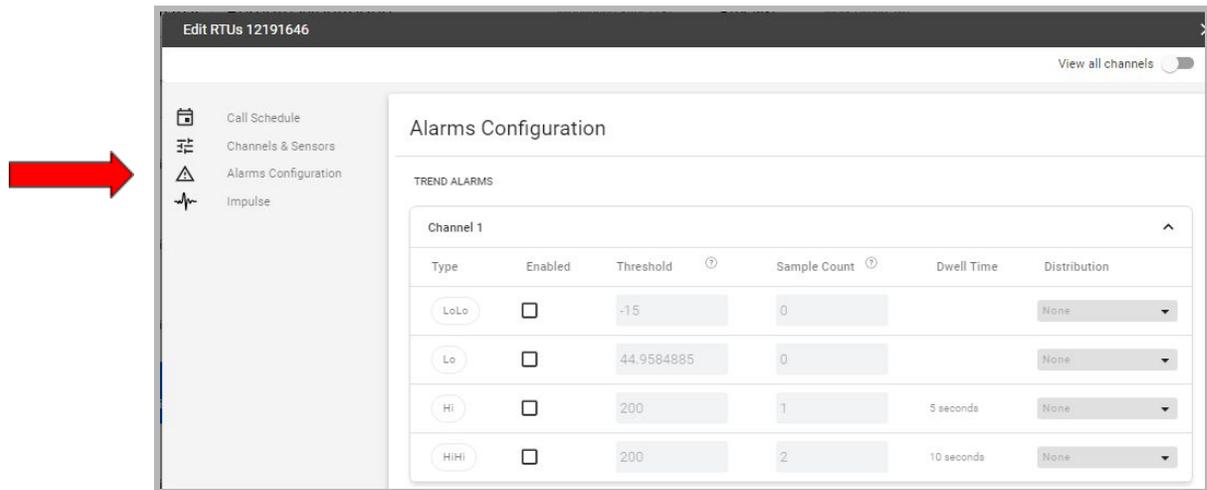
3. Click on **RTUs** in the header. Scroll down to find the desired **RTU**.
4. Click on the **RTU**. The **PR-32A details screen** is displayed.



5. Click on **Edit** on the **RTU details** screen.



6. Click on **Alarms Configuration** on the menu. The screen scrolls to the **Alarms Configuration** section.



7. To configure alarms, enter the values:
 - a. **Enable** or **Disable** the alarm for each alarm **Type**.
 - b. Set the **Threshold** values.
 - c. Enter the **number of consecutive samples** under the **Sample Count** (Dwell Time) required before the alarm is triggered.
 - d. Select the **group** under **Distribution** that will receive the alarm **Notifications** using the drop down menu.
8. Click **Update** to save the changes.

Connect and Configure the Sensor

➤	Secure Sensor Cable to the RTU
➤	Wire the Connection Channel
➤	Terminate Sensor Connection Wires in the RTU

A sensor provides the physical connection between the RTU and real time monitoring of pressure and water levels for water infrastructure systems, such as underground aquifers, surface reservoirs or water tower levels.

The PR-32A/iA devices each support one pressure sensor:

- PR-32A uses sensor PT-DS
- PR-32iA uses sensor PT-30b

NOTE: Trimble Water recommends that the procedures in this section be performed in the order presented.

NOTE: The procedures in this section apply to the PT-DS sensor. The PT-30b is installed and calibrated at the factory; this procedure would only apply to the PT-30b in the event the PT-30b needed to be reinstalled.

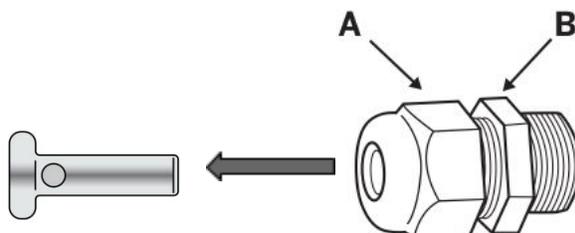
Secure Sensor Cable to the RTU

Have on hand:

- RTU
- Sensor

To secure the Sensor cable:

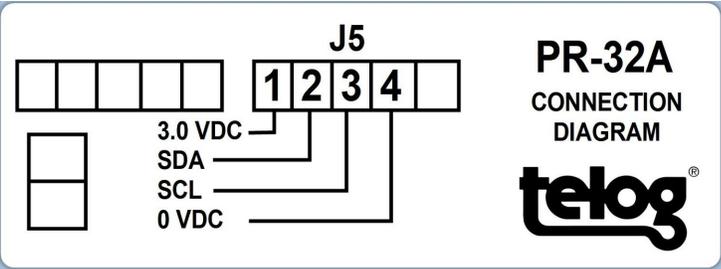
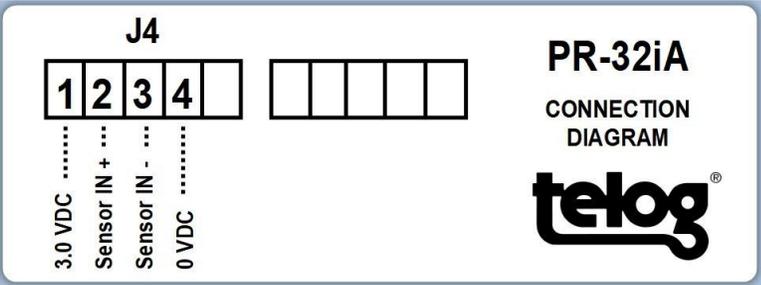
1. Open the cover of the **RTU** housing to connect the **Sensor**.
2. Unscrew the **cord grip (A)** from the sensor port.



3. Remove the waterproof **plug** from the cord grip. Set aside for future use.
4. Feed the **sensor cable** through the cord grip; allow only 1/4" or less of the cable sheath to protrude inside the RTU housing.
5. Terminate the **RTU** wires using the guidelines provided in [Wire the Connection Channel](#) in the next section

Wire the Connection Channel

Use this section to determine the breakdown of which wires to connect to the terminal. The Connection Diagram found inside the housing cover for each RTU provides guidelines for connectivity.

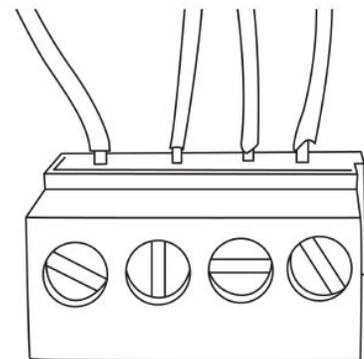
Pressure Recorder	Connection Diagram
PR-32A	 <p>The diagram for the PR-32A shows a 5-pin connector labeled J5. The pins are numbered 1 through 4. Wires are connected as follows: Pin 1 to 3.0 VDC, Pin 2 to SDA, Pin 3 to SCL, and Pin 4 to 0 VDC. There are also two empty pins shown to the left of the connector. The Telog logo is present in the bottom right corner of the diagram area.</p>
PR-32iA	 <p>The diagram for the PR-32iA shows a 5-pin connector labeled J4. The pins are numbered 1 through 4. Wires are connected as follows: Pin 1 to 3.0 VDC, Pin 2 to Sensor IN +, Pin 3 to Sensor IN -, and Pin 4 to 0 VDC. There are also two empty pins shown to the right of the connector. The Telog logo is present in the bottom right corner of the diagram area.</p>



Terminate Sensor Connection Wires in the RTU

To terminate sensor connection wires in the RTU:

1. Terminate **wires** using the guidelines provided on the **Connection Diagram** inside the cover.
2. Secure the **wire leads** by tightening the **terminals** with a 1/8" flat head screwdriver.
3. Secure the **cable** and provide a water-tight enclosure seal by tightening the **cord grip (A)** around the **cable**. Use a 24mm wrench on the outside of the housing on the **cord grip (A)** and another wrench to hold the **nut (B)**. Use a max torque of 35 LBF-IN. Overtightening could damage the **cord grip**.



Mount the Device Onsite

The PR-32A/iA is a rugged unit that is intended to monitor water system pressures or water levels of underground aquifers. Once installed, data is immediately available using the Trimble Unity application.

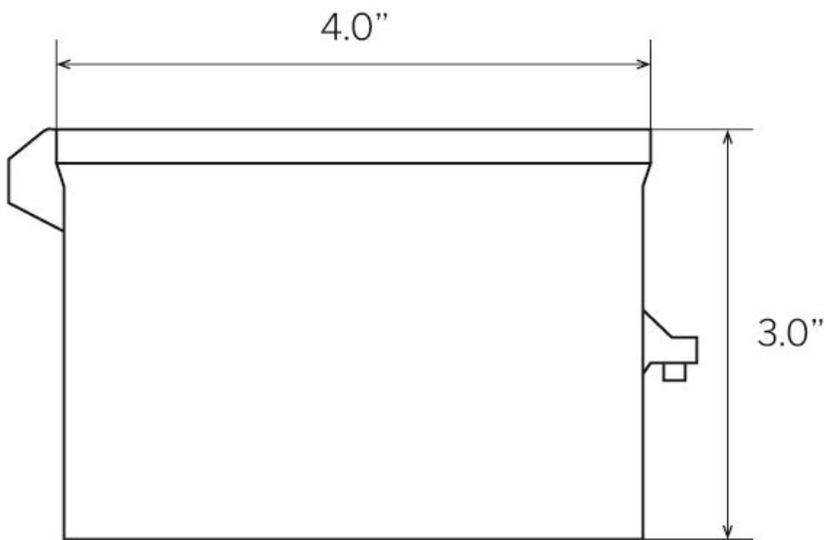
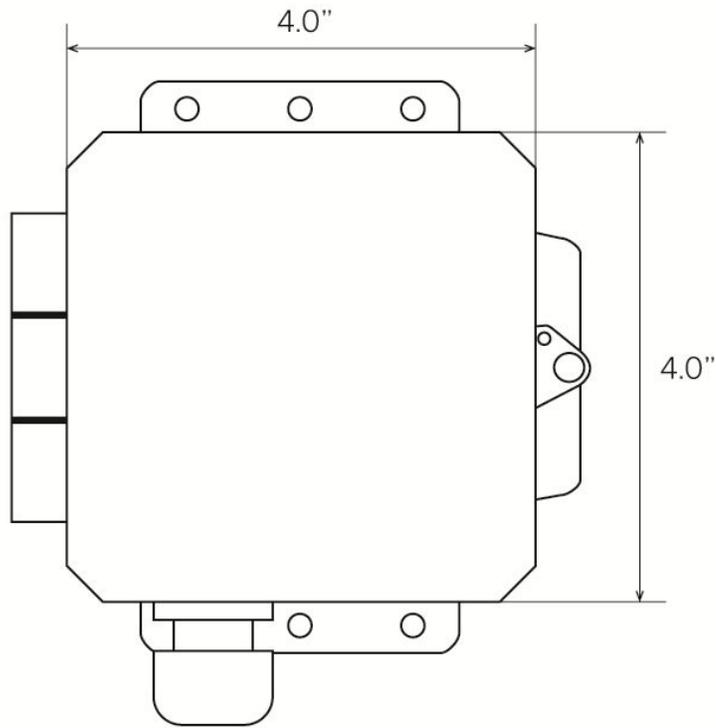
The RTU specifications are:

- Environmentally rated NEMA 6P (IP68)
- Enclosure weighs 2 or 2.5 pounds (depending on the unit)
- Enclosure measures 4”L x 4”W x 3”H [102mm L x 102mm W x 76mm H]
- All connectors and fittings are watertight

RTU onsite mounting preparation:

1. Ensure the **RTU housing lid** is securely closed and the latches have snapped shut.
2. Ensure the **sensor connection** is tight.
3. Ensure the **RTU** is in a typically dry place.
4. Verify that **data** is being logged by the PR-32A/iA from the sensor.
5. Verify that **calls** are being completed.
6. Mount the **RTU** onsite using your company’s standard installation procedure for RTUs.

Refer to [Appendix A - Telog PR-32A/iA Specifications](#) for datasheet specifications.



Maintenance

➤	Shipping and Handling
➤	Use and Care
➤	Replacing the BP-4 Lithium Battery Pack
➤	Updating the Battery Replacement Date in the App
➤	Controlling Humidity in the RTU
➤	Replacing the Desiccant Packs

Shipping and Handling

The PR-32A/iA is shipped in a dormant state and requires the user to [Tamper a Call](#) to activate the data capture and recording functionality of the RTU. Unpack the PR-32A/iA from the protective material used during shipping.

Desiccant packs are attached inside the Recorder housing to control the level of humidity. A Humidity Indicator card placed in the RTU housing provides an indication of the status of the desiccant packs upon arrival to determine whether they were exhausted during the shipping process and need to be replaced immediately.

The PR-32A/iA can operate reliably in temperatures ranging from -40° to 158°F [4° to 70°C]



Use and Care

This product is designed to withstand the rough treatment and tough environment that typically occurs when installed above or below ground in harsh environments and exposed to the elements. However, the recorder is an electronic instrument and should be treated with reasonable care.

Cleaning

Typically the RTU does not require cleaning but in the rare case it does, refrain from direct high pressure into ports, openings or gaskets.

Replacing the BP-4 Lithium Battery Pack

The PR-32A/iA utilizes a field replaceable BP-4 lithium battery pack that is installed in the RTU before shipping.

Battery Safety

Lithium batteries are classified by the U. S. Federal Government as non-hazardous waste and are safe for disposal in the normal municipal waste stream except where prohibited by local or regional regulations. These batteries contain recyclable materials and are accepted for recycling.

WARNING - Use only the battery intended for the product. Using any other battery can damage the device and may void your warranty. If the battery becomes damaged or stops working, replace it with a new battery.

WARNING - Avoid contact with the Lithium battery if it appears to be leaking. Battery fluid is corrosive, and contact with it can result in personal injury and or property damage.

To prevent injury or damage:

- If the battery leaks, avoid contact with the battery fluid.
- If battery fluid gets into your eyes, immediately rinse your eyes with clean water and seek medical attention. Do not rub your eyes!
- If battery fluid gets onto your skin or clothing, immediately use clean water to wash off the battery fluid.

Battery Replacement

To order a replacement battery, contact Trimble Sales.

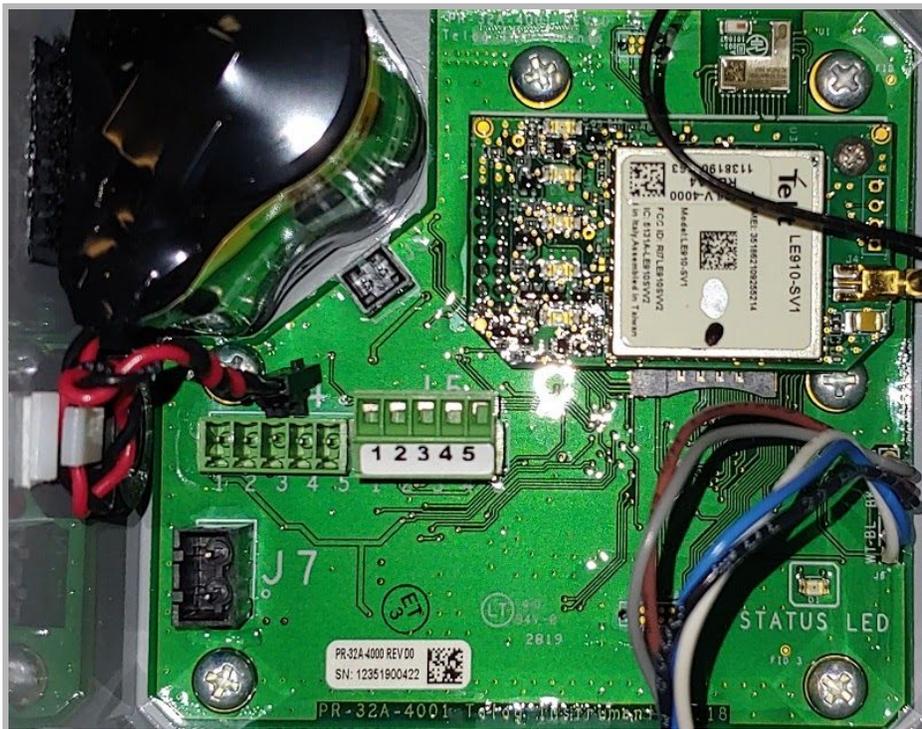
Have on hand:

- Replacement battery
- Tamper Switch Cable or BLE Dongle (requires Telogers for Windows) and a connection device to retrieve data if the device cannot call the server

To replace the battery:

1. Before removing the battery, **collect data from the recorder** via wireless network or locally using a Tamper Switch cable or BLE Dongle (requires Telogers for Windows).

2. Open the **RTU housing**.
3. Remove the **battery connector** from the terminal by pressing the release tab and pulling upward to detach the connector from the PCB terminal.
4. Release the **battery wire** from the nylon clip on the side of the enclosure wall.
5. Detach the **velcro** that is securing the battery to the side of the RTU.
6. Connect the new **battery** by inserting the connector into the PCB terminal until it is seated.
7. Attach the **velcro** on the battery to the velcro on the side of the RTU wall.
8. Slide the **battery wire** into the nylon clip on the side of the RTU wall.
9. Close the **RTU housing** and press down on the cover until both **latches snap shut**.
10. Check that the **cover** is securely closed to ensure a waterproof seal.
11. **Tamper a call** to the device immediately to confirm that communication has been reestablished.

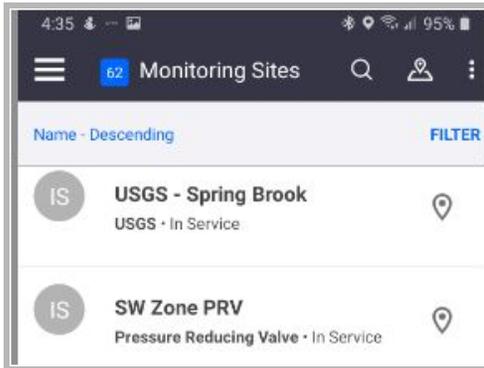


Updating the Battery Replacement Date in the App

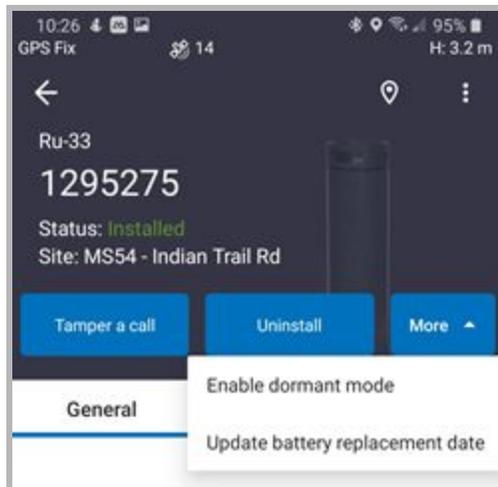
Changing the battery in the RTU needs to be documented in the app for recordkeeping purposes.

1. Launch the **Unity Android or iOS mobile app** from your phone or tablet.
2. Enter your **organization** and click on **Next**.

3. Enter your **username** and **password** and click on **Sign In**. The **Monitoring Sites** screen is displayed.

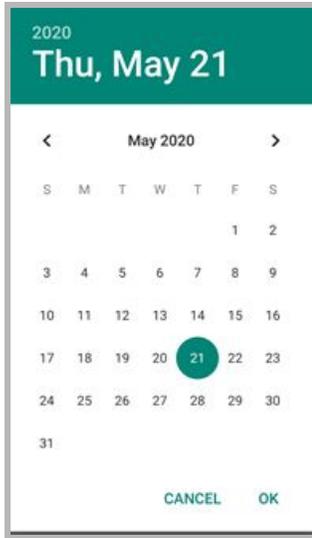


4. Scroll for the desired **Monitoring Site**, then tap on it.
5. Tap on the desired **RTU site**.
6. On the app **Details** screen, tap on **More** to display a submenu:



- **Enable dormant mode**
- **Update battery replacement date**

7. Tap on **Update battery replacement date**. A calendar is displayed.



8. Select the **date the battery was replaced**.
9. Tap on **OK** to save the change.

Controlling Humidity in the RTU

Desiccant packs are placed inside the RTU housing to control the level of humidity. The following information provides guidelines and recommendations regarding the impact of humidity on the RTU.

Humidity Level (%)	Status	Recommendation
< 35	Desiccant Active	No Action Required
36-75	Desiccant Saturated, Humidity Level OK	Continue to monitor - Humidity will stabilize to ambient humidity
76-90	Desiccant Saturated, Humidity High, Low Condensation Risk	Replace desiccant and inspect enclosure on next site visit
91-100	Desiccant Saturated, Humidity High, High Condensation Risk	Schedule a visit to replace desiccant and inspect enclosure

Humidity below 75% is generally good, there is no need to replace the desiccant packs unless the humidity continues to rise.

- Desiccant will hold the humidity below 20% until it is saturated, at the time of saturation the humidity inside the enclosure will regulate to the ambient humidity.
- After initial deployment, the humidity will rise over time and will stabilize to the outside/ambient humidity once the desiccant is fully saturated. If the ambient humidity (outside the enclosure) is continuously high, >90% the humidity inside the enclosure will rise to this value. Temperature also plays a role in the humidity reading as well as the rate at which the humidity increases.
- Humidity greater than 75% should be flagged for desiccant replacement.
- Once humidity reaches levels above 85% it may start condensing on the internal circuitry, which could lead to corrosion.
- It is normal for the humidity to fluctuate during temperature changes, as the temperature rises, the humidity will typically drop since warm air holds more water vapor than cold air.
- Sudden spikes in humidity may indicate a breach in the enclosure sealing.

Replacing the Desiccant Packs

When the desiccant packs are exhausted, they are no longer able to control the level of moisture in the Recorder and should be replaced.

NOTE: The desiccant packs can be sourced through Trimble Sales.

To replace the desiccant packs:

1. Remove the **exhausted desiccant packs**.
2. Insert **new desiccant packs**.



Troubleshooting

This section describes the troubleshooting steps used to assess and potentially resolve performance issues with the PR-32A/iA. The RTU automatically generates system status data, event logs and error messages. This information can be used to identify and troubleshoot potential issues with the recorder.

Problem	Potential Cause	Solution
No data recorded	Recorder still in Dormant mode	Use the Appendix C - Tamper a Call procedure to force a wake-up call.
No RTU response	Battery Flat	Replace the battery. Refer to the Replacing the BP-4 Lithium Battery Pack procedure for details.
No local Communication	Software version	Check for an application version update. Upgrade if a newer version is available.
	Cabling	Verify the Cu-CTS Tamper Cable and C-USB-RS232 cable (if required) are connected between the PCB USB port and the RTU 5 pin communication port. Status LED on the cable should be flashing on once every five seconds.
	Check the Connection Port	Verify the Connection port selected is correct in the application.
No Communication	Wrong sensor type	Check that the correct model is selected.
No available Tamper cable or BLE Dongle to Tamper a Call	Tamper the RTU by removing the battery	Remove the battery to interrupt the power cycle. Wait 5 minutes, then reconnect the battery to Tamper a Call to the RTU. Verify that the RTU is receiving data. Refer to Replacing the BP-4 Lithium Battery Pack for details.
No data in channel or measurement	Channel wiring	Check that the RTU is wired properly into the correct Channel and that it is secure. Refer to the Wire the Connection Channel procedure to confirm the wiring configuration.
Call Fails	External Antenna Connection	Check that the antenna is secure, if there is an external antenna.

Appendix A - Telog PR-32A/iA Specifications

Type	Single-channel pressure recorder
Measurement	
Resolution	12 bits (0.025%)
Accuracy	±0.075% of full scale at 73°F ±40 ppm/°F
Temperature Range	40°F to +158°F [4° to 70°C] Note: For applications below this operating range please contact your Trimble Telog support team.
Recording with PR-32A (No Impulse option included)	
Sample Rate	4 per second to 1 per 8 hours; programmable
Clock Accuracy	0.01%
Memory Size	31,000 data values
Storage Method	Wrap around (first-in; first-out)
Recording with PR-32iA (with impulse option included and on)	
Note: When using PR-32iA, which includes the impulse option, the normal mode specified above will operate whether the impulse mode is on or off.	
Sample Rate	Measures water pressure at user-configured rates up to 256 samples per second
Data Recorded	Normal mode interval data plus transient event waveforms
Transient Trigger	Pressure rate-of-change; either positive or negative; user configurable
Impulse Memory	Up to 100 transient events to a maximum of 37,000 samples after which new data will overwrite older data.
Communication	
Local RS-232	5-pin circular connector rated IP-67 Auto-selected baud rate to 19.2K
Cellular	Internal Telog WM2/L1 cellular modem LTE Category 1 certified Verizon Wireless

Battery			
Battery	Factory installed, field replaceable Telog BP-4 lithium battery pack		
Battery Life	Up to 2800 data calls to host computer		
Examples:	Call Frequency	Sampling Frequency	Battery Life
PR-32A	1/day	1/second	5 years
PR-32iA	1/day	4/seconds	5 years
PR-32iA	1/day	128/seconds	2 years
PR-32iA	1/day	256/seconds	1 year
	(@ medium to excellent signal strength)		
Enclosure			
Size	4"L x 4"W x 3"H [102mm L x 102mm W x 76mm H]		
Weight	2.5 lbs. [1.2Kg] 2 lbs [.9 kg]		
Material	Polycarbonate		
Environmental			
Temperature	40 to 158°F [4° to 70°C] Note: For applications below this operating range please contact your Trimble Telog support team.		
Rating	NEMA 6P (IP68)		
Support Application			
TW-UNITY	Trimble Unity		
S-3PC	Telogers for Windows®6.77 or later		
S-3EP	Telog® Enterprise 6.77 or later		

Appendix B - Sensor Specifications

PR-32A Sensor - Model PT-DS

Type	Strain gauge pressure sensor
Range	Selectable 5,10,30,100,300 PSIG and 1000 PSI Accuracy over the calibrated temperature range including zero and span setting and the effects of non-linearity, hysteresis and repeatability 0.25% FS
Cable	Vented Polyurethane 0.225" diameter [5.715mm]
Pressure Over Range	2x full scale with negligible calibration change 4x containment pressure up to 2900psi max
Temperature	Range: 25°F to 140°F [-3.8° to 60°C] Temperature Effect: ±0.01%/°F (32 to 90°F)

PR-32iA Sensor - Model PT-30b

Type	Strain gauge pressure sensor
Range	Accuracy Non-linearity ±0.15% of span; BFSL Repeatability ±0.03% of span; BFSL Hysteresis ±0.03% of span; BFSL
Cable	Vented Polyurethane 0.310" diameter [7.87mm]
Pressure Over Range	4x full scale with negligible calibration change 6x containment pressure up to 2900psi max
Temperature	Range 25°F to 140°F [-3.8° to 60°C] Temperature Effect ±0.01%/°F (32 to 90°F)
Physical	Pressure Fitting; 1/4" NPT female Environmental: Submersible to NEMA 6P (IP-68) Sensor Length: 4.5" [114mm] Sensor Diameter (max): 1.0" [25.5mm] Sensor Body Material: 316 stainless steel Cable Weight: 0.027 lbs./ft

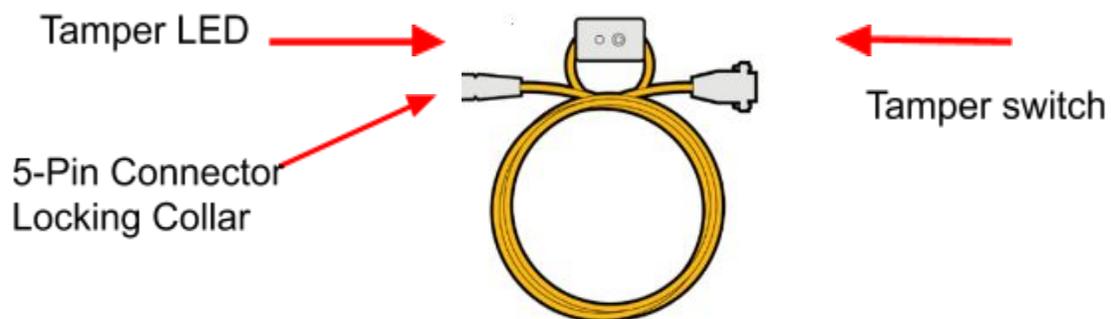
Appendix C - Tamper a Call

➤	Communication/Tamper Switch Cable - Tamper a Call
➤	BLE Dongle - Tamper a Call

Communication/Tamper Switch Cable - Tamper a Call

To tamper a call using a Tamper Switch Cable:

1. Unscrew the **black waterproof cap** on the **RTU** and connect the **Communication/Tamper Switch Cable** using the **5-pin circular connector** end. Rotate to align the groove with the notch. Tighten the locking collar to ensure a secure connection.



2. Press and hold the **Tamper Switch** on the cable for 5 seconds until the **LED** turns solid red (a call has been initiated). During the call, the **LED** will flash off once per second. When the call is finished, the **LED** will blink once every five seconds.
The **RTU** has exited dormant mode and begun normal operations.
3. Once the call has completed, remove the **Tamper Switch** cable, replace the waterproof cap on the **RTU**, and hand-tighten.

BLE Dongle - Tamper a Call

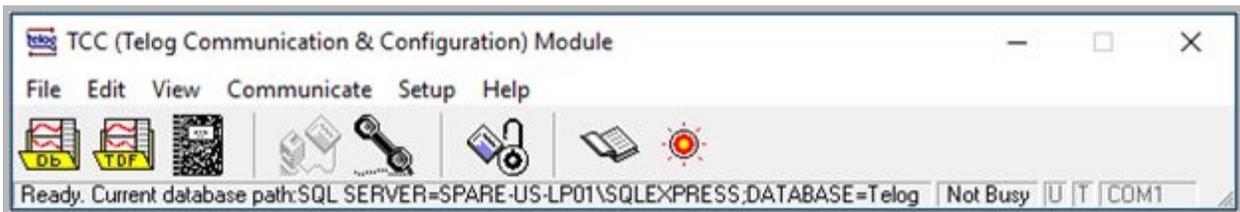
Tamper a Call using a BLE Dongle and the Telogers for Windows (Telog TCC) application.

Before starting, have on hand the:

- RTU
- BLE Dongle
- PC with Telogers for Windows application installed. Refer to the [Software Applications](#) for information on how to acquire and use Telogers for Windows.
- Locate the PC within 10' of the RTU

To Tamper a Call using the BLE Dongle:

1. Insert the **BLE Dongle** into the **PC** being used to make the wake up call.
2. Open the **Tellog TCC** application. The main menu screen is displayed.

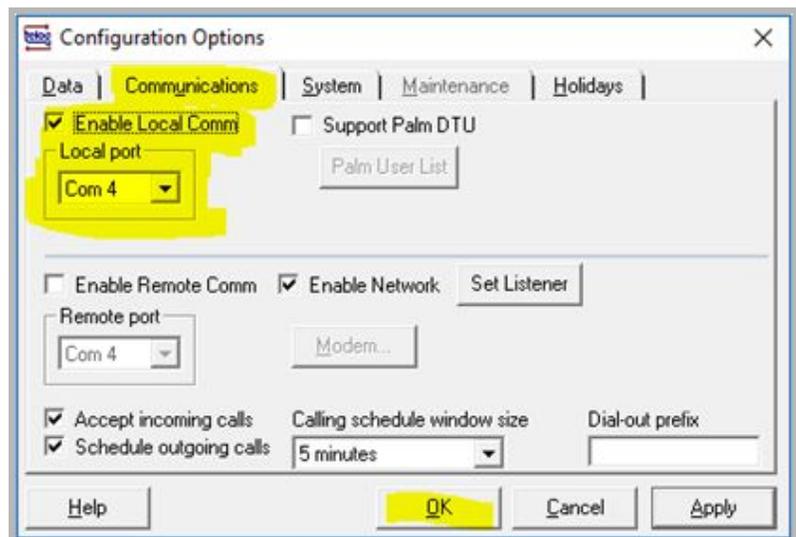


3. Click on **Setup-> Options**. The Configuration Options screen is displayed.

4. Click on the **Communications** tab.

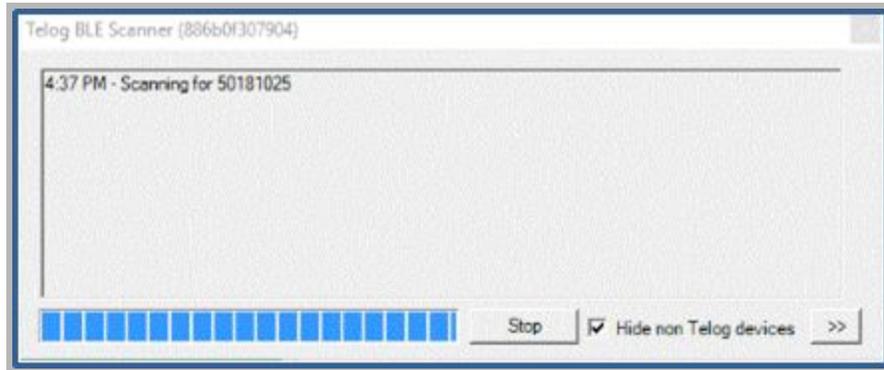
5. Select **Enable Local Comm** (click on the check box to select it).

6. Click on the drop down menu for **Local port** and select the **PC port** the BLE Dongle is plugged into.



7. Click on **OK**. The Configuration Options screen is closed.
8. Click on **Communicate** in the main menu.
9. Select **with Local recorder**.
10. Select **Force a call-out** for the attached recorder.

11. Select **RTU for BLE Communication**.
12. Enter the **ID of the RTU**.
13. Click on **Start**. The system displays two screens:
 - The **Tellog BLE Scanner** screen displays the status of the **BLE Dongle** scanning for the **RTU** and the connection status.



- The **Local Communications** screen displays the communication status once the **RTU** and the **PC** are connected.



You are now connected to and communicating with the RTU.

Appendix D - Scaling Pressure Channel for Level Values

Scaling refers to converting raw data the RTU gathers into unit values that have meaning and relevance. Different Channels record different types of data and ranges. Both analog and digital Channels are scalable. In the event you do not have Unity Remote Monitoring, the Channel Scaling can be changed using Telogers for Windows.

Prerequisite: Download the latest version of Telogers for Windows® software at: <https://www.trimblewater.com/download>

Configuring the recorder with Telogers for Windows requires the recorder ID (serial number) to be loaded into the local Telogers database. This is accomplished by Collecting data from the recorder.

1. Select **Setup > Recorders > select Recorder ID > Modify**
2. Navigate to the **Channels** tab > **Configuration** tab.
3. Click on the **Scaling** button to open the **Define Scaling** window.
4. Click on **OK** in the **Define Scaling** window.
5. Click on **OK** in the **Modifying Recorder** screen. Any changes made in the **Modifying Recorder** screen can be sent to the recorder by collecting data locally with Telogers for Windows.
6. Close the **Setup Recorders** window.
7. Ensure the Telogers menu **Padlock** is **unlocked**, if necessary, click the lock to unlock. This allows configuration changes to be applied to the RTU.
8. To push the changes to the RTU, click on **Communicate > with Local recorder > Collect Data > Start**

The following example shows a Pressure Channel scaled for Feet, where Channel Point # 2 shows 1 psi = 2.31 feet.

