A TRIMBLE COMPANY

Telog® iLR-32A

Current Loop Recorder
User Guide

Version 1
October 2020

P/N: iLR-32_A-UG-V1 October 2020

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Revision History

Date	Version	Content
10/2020	V1	Initial publication of document

Legal Notices

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Release Notice
This is the October 2020 release of the iLR-32A Current Loop 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 Certification

iLR-32A is environmentally rated to: NEMA 6P (IP68)

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Glossary of Terms

Term	Definition
Communication/Tamper Switch Cable	A cable that connects to the 5-pin Communication port on the RTU to initiate a remote wireless call or direct local communications.
Current Loop Recorder	Single channel Remote Telemetry Unit (RTU) used to collect data from an input device.
Bluetooth (BLE) Dongle	Bluetooth Low Energy device that plugs into a USB port on a PC to facilitate a local wireless connection to the RTU.
Flow	The direction water is moving.
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).
RTU	Remote Telemetry Unit
Tamper a Call	The act of forcing the Telog iLR-32A to initiate a wireless call, also referred to as a “Tamper Call”.
Telog iLR-32A	Telog Current Loop Recorder model iLR-32A.
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.
Telogers for Windows	Allows the user to configure and program RTU operating parameters and data collection options with a PC.
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.

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, such as a radio button.
Tap	Touching a mobile device screen to make a selection.

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About the Device

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

Introduction

The Telog® Current Loop Recorder model iLR-32A is a wireless, battery-powered single channel 4-20 mA Current Loop recorder that continuously monitors the data from an input device, such as a meter or process instrument. The Current Loop Recorder collects data in user-defined time increments, then transfers the data automatically using an integrated antenna over a cellular network.

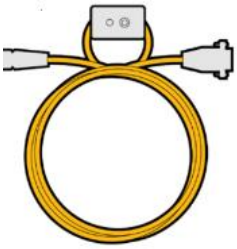
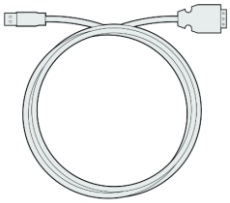
The Trimble Unity application provides the capability to view and analyze Current Loop data, configure and manage the iLR-32A, as well as manage monitoring sites.

The iLR-32A:

- Collects data from an input device
- 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 iLR-32A hardware and related equipment includes:

Hardware	Description	Diagram
iLR-32A	The iLR-32A includes a cellular modem, antenna, 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 **NOTE:** the device is Bluetooth enabled when it is shipped.	
Cu-CTS	Communication/Tamper Switch cable (yellow) is used to Tamper a Call or connect the iLR-32A to a PC. Length: 8’ *Optional - Ordered separately* **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.	
C-USB-RS232	Serial to USB Adapter cable is used to connect the Communication/Tamper Switch cable to a USB port on a PC. *Optional - Ordered separately*	
C-BLE-D	Bluetooth Low Energy (BLE) Dongle is used to make a local wireless connection between the iLR-32A and a PC running Telogers for Windows. Max range is 20’ is an open field, line-of-site setting. *Optional - Ordered separately*	
Tools	**Description**	**Diagram**
Wrench	24mm wrench	

Screwdriver	⅛” Flat head screwdriver	

Ports and Connections

The iLR-32A provides the following access ports and connection locations:

Ports and Connections	Function
Communication Port	Used to connect the Communication/Tamper Switch Cable to the RTU (not shown)
Flanges	Used to mount the iLR-32A onsite
Hydrophobic vent	Equalizes the pressure inside the RTU housing relative to the outside pressure while preventing water from entering the housing (not shown)
Sensor Port	Water-tight fitting used to feed the cable from the input device to the iLR-32A

Software Applications

This document focuses on the Current Loop RTU being connected to the Trimble Unity applications. However, the iLR-32A can interface with the following Trimble applications.

Application	Devices Supported	Description
Trimble Unity Online	PC Laptop Tablet	Cloud-based software application that is accessed online with a PC/tablet and used to configure and view the data for iLR-32A. The link to access the online application is provided in your welcome email. Ensure you have a Trimble Unity account set up and can log in to the online account before beginning the installation process.
Unity RM	Mobile Device Tablet	Downloaded onto a mobile device or tablet, the software application is used to install, configure, and view data for iLR-32A. The mobile application can be downloaded from the App Store on Android/iOS devices. Ensure you have a Trimble Unity account set up and can log into the mobile app before beginning the installation process.
Telogers for Windows® 6.77 or later	PC	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. **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. ● 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 *Telogers Field Guide - Telogers 101* for more in-depth information.
Telog® Enterprise 6.77 or later	PC Laptop	Optional legacy software application that provides remote access to the installed RTU using a PC/laptop to communicate with the RTU, receives data and alarms from the RTU, and configures the RTU. ● 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 *Enterprise Software Installation Manual* for more in-depth information.

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 on how to use the application. Access the Help link from the submenu on the 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

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Getting Started

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

Trimble Water recommends that before the RTU 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:

- Bluetooth Scan - the Unity application scans for RTUs and RTUs in the immediate vicinity to initiate a Tamper Call.
- Application menu option - Using the “Tamper a Call” app 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 B - Tamper a Call for specifics.
- 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 B - Tamper a Call for specifics.
- 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 Troubleshooting for specifics.

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

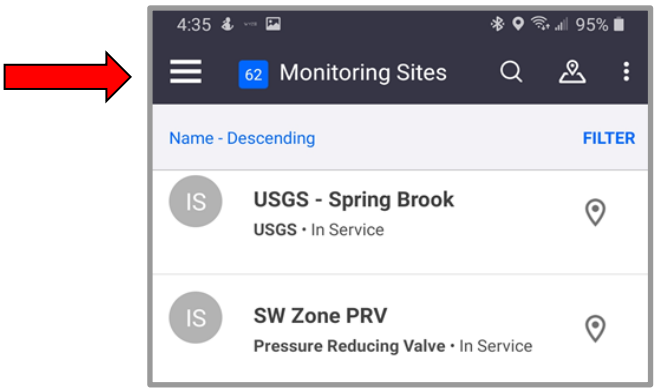
Add a device to the Unity application to have the app identify and manage the device.

Before starting, have on hand the:

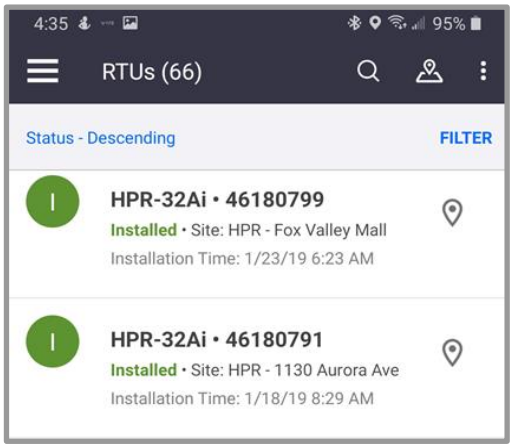
- RTU
- Mobile device

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.

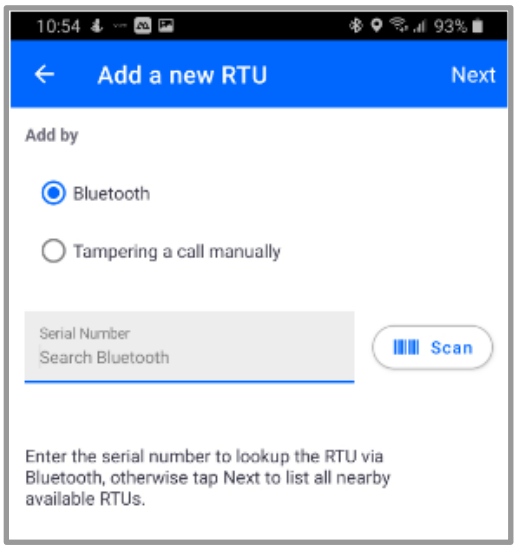


5. Under **Remote Monitoring**, tap on **RTUs** to display the **RTUs** list. (For a customer with their first device, there may be nothing listed.)



6. Tap on the plus sign  (bottom of the screen) to display the **Add a new RTU** screen.

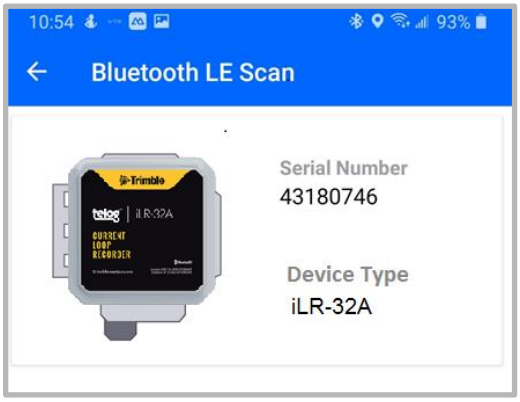
   NOTE: For current customers, if your account has exceeded the maximum number of subscriptions, a message will direct the user to contact Professional Services at Trimble Water to resolve the issue.



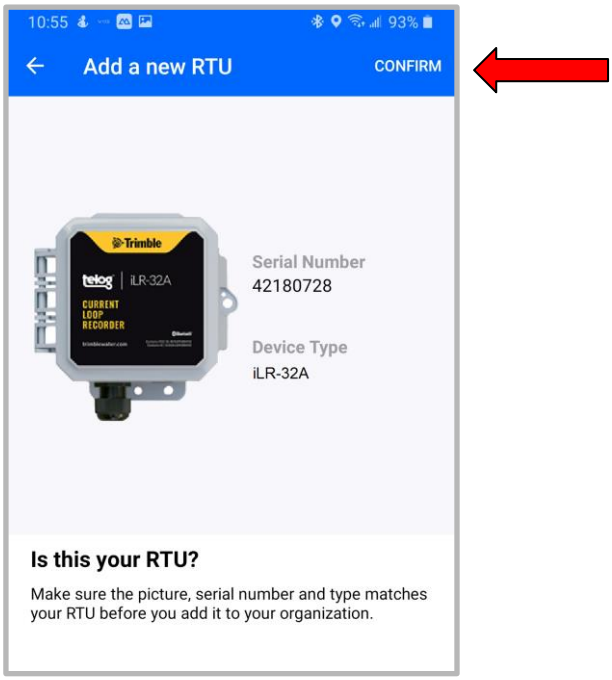
7. Ensure **Bluetooth** is selected.
8. Select one of the three ways to have the app recognize the device:
   - **Scan Bluetooth**: Tap on **Next** in the upper right corner of the screen to initiate a **Bluetooth scan** of Bluetooth enabled devices within 20’ of the immediate area; Or
   - **Serial 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:

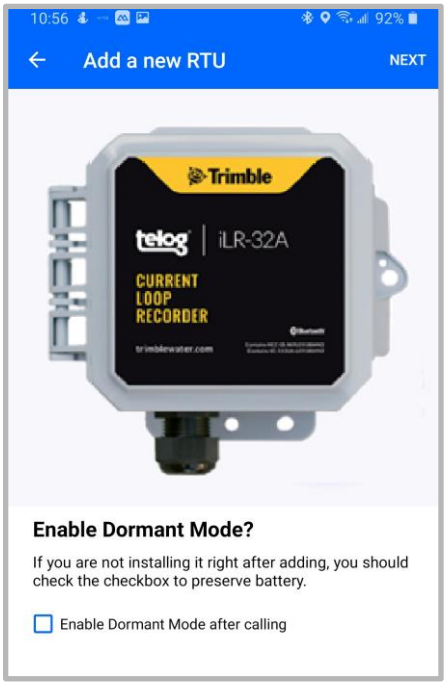


- If the **correct RTU** is displayed, tap on the **RTU picture**. The **Is this your RTU?** message is displayed. Review the info to ensure it is the correct **RTU** being added, if so, go to step 10.
- If the **correct device** is not displayed, tap on the left arrow in the header to return to the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



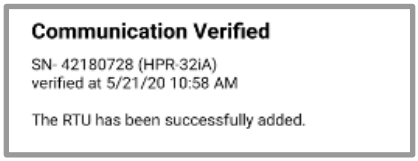
10. Tap on **Confirm**. The **Add a new RTU** screen with Serial Number and Device Type is displayed.

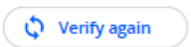
11. Determine whether to **Enable Dormant Mode?** on the **Add a new RTU** screen:



- 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 

. 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.

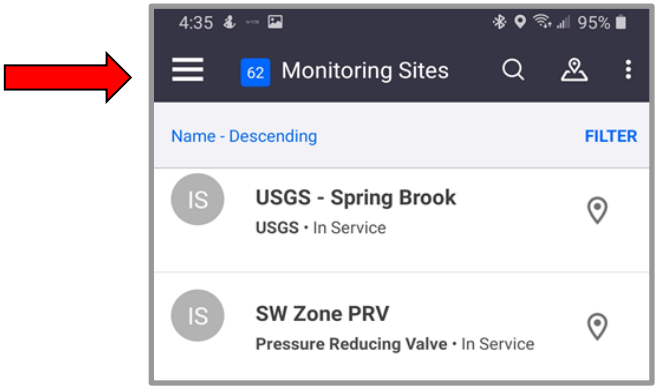
Add a Device Using a Manual Tamper

Before starting, have on hand the:

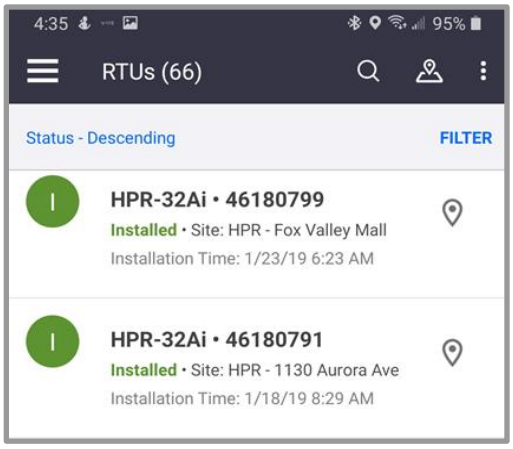
- RTU
- Mobile device or tablet
- Tamper cable

To add a device using a manual Tamper:

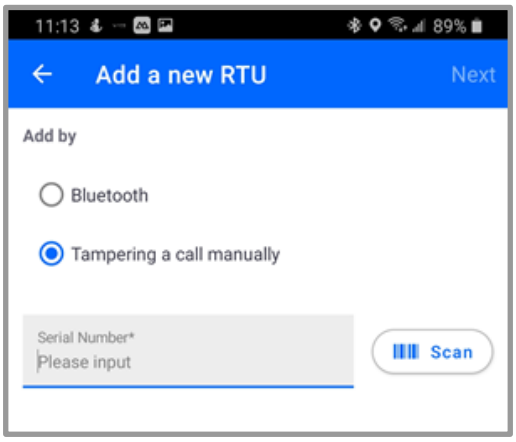
1. Launch the **Unity Android** or **iOS mobile app** from your phone or tablet.
2. Enter your **organization** and tap on **Next**.
3. Enter your **username** and **password**, tap on **Sign In**. The **Monitoring Sites** screen is displayed.
4. Tap on the **menu icon** ( ) in the upper left corner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

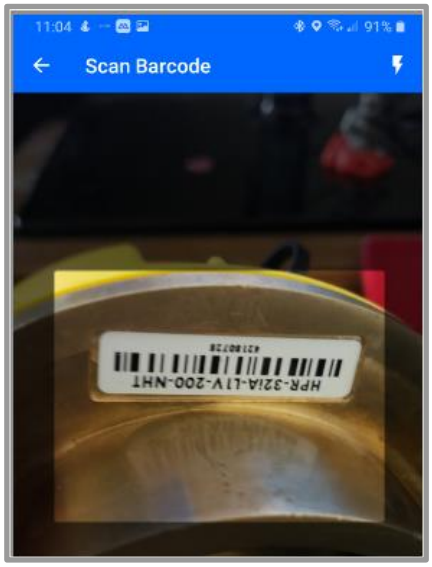


6. Tap on the plus sign  on the bottom right on the screen, the **Add a new RTU** screen is displayed.



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.

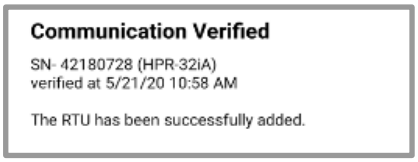
7. Under **Add by,** select **Tampering a call manually**. The **Scan Barcode** screen appears.



8. 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**.
9. Tap on the **RTU picture** to select it and display the **Add a new RTU** screen.
10. 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.

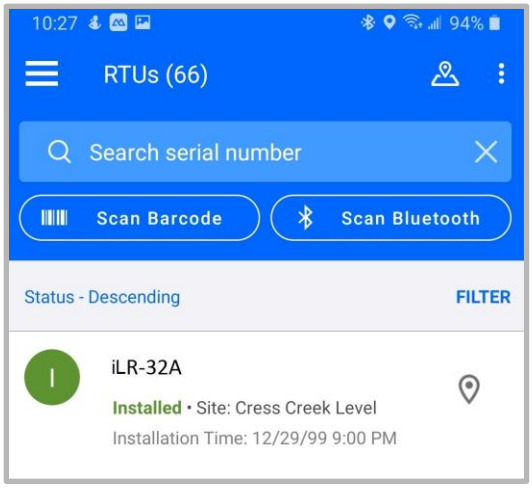
11. Tap on **Next.**
12. On the **Add a new RTU** screen, the **Tamper RTU to call** message is displayed.
13. Perform the Communication/Tamper Switch Cable - Tamper a Call procedure using a **Tamper Cable**.
14. Once the **Tamper call** has connected, the app displays the **Verifying communication CALL 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 header:

    I. **Search serial number:**

    II. Tap on **Search serial number.**

    III. Enter the device serial number in the text box.

    IV. Tap on **Next to** scan for the device**.**

    - If the search is successful, the **RTU Details** screen is displayed.
    - If unsuccessful, try again.

    V. **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 **RTU Details** screen is displayed.
    - 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 RTU Details screen is displayed.
- 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

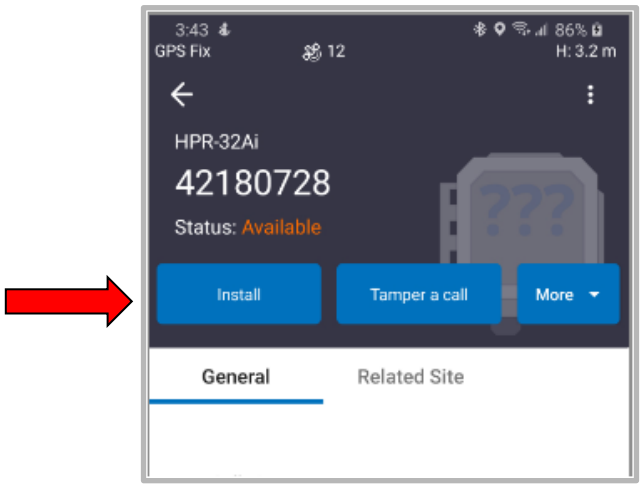
NOTE: the screen captures are provided as examples of the interface, your data and device will be different.

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. Devices can also be uninstalled and reassigned to other sites.

Install a Device on a New Site

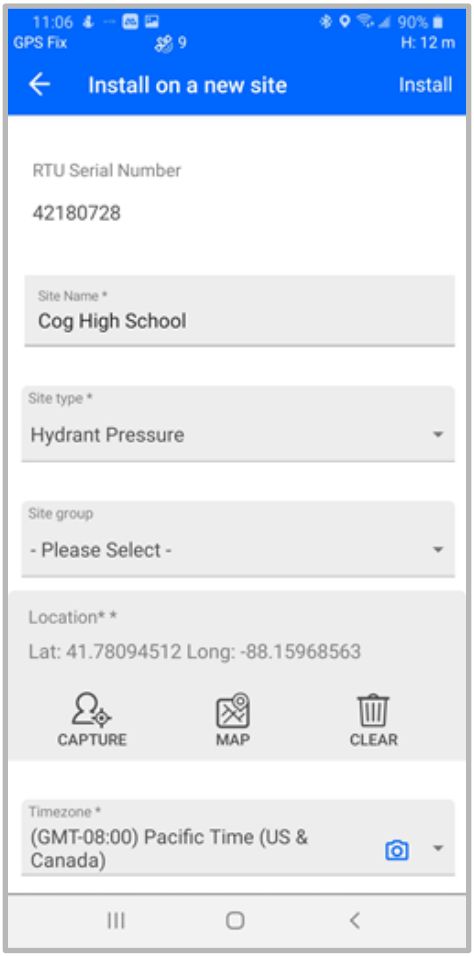
To install the RTU on a new remote monitoring site using a mobile device:

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 the Current Loop 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.

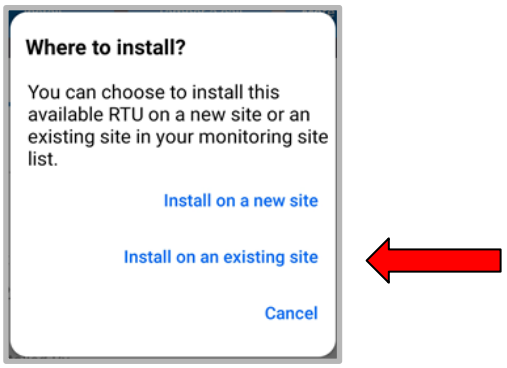
4. Tap on **Install**. The **RTUs** screen is displayed with the site added.
5. Tap on the **left arrow** in the header to return to the **home screen**.
6. Tap on **Tamper a call** in the header.

7. Use a **tamper method** (**Bluetooth** or **scan**) provided in Add a Device Using Bluetooth **(Step 8)** or the **Tamper cable** method provided in Appendix B - Tamper a Call.

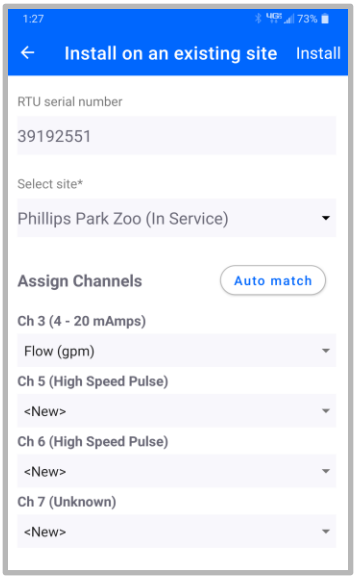
Install a Device on an Existing Site Without an RTU

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

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.



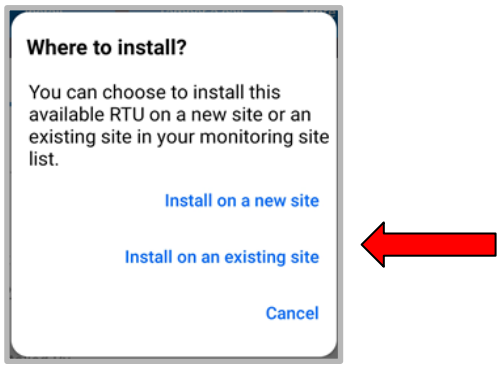
5. Tap on **Assign Channels**  to display a list of **Channels**.

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.

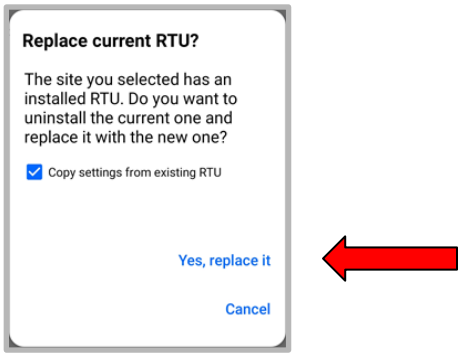
Replace a Device on an Existing Site

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

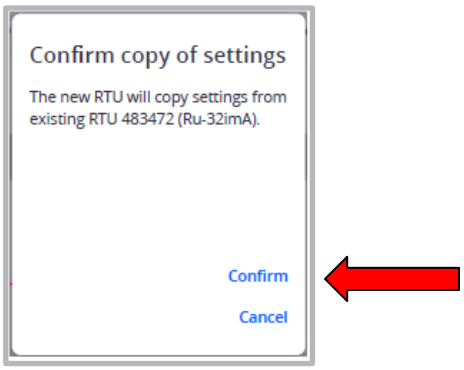
1. On the **RTU details** screen for the newly added **RTU**, tap on **Install**. The **Where to Install?** message is displayed.
2. Tap on **Install on an existing site**.



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 RTU?** message is displayed with an option to select **Copy settings from existing RTU**.
5. Tap on **Copy settings from existing RTU** to assign 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:

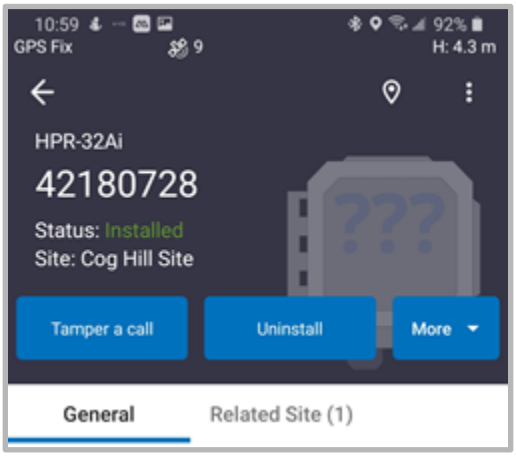


- If the system can copy the settings, the **Assign Channels** will display the settings.
  - If the settings are correct, go to step 8.
  - If the settings are not correct, tap on the **down arrow** for each **Channel (Ch #)** and select the appropriate setting until all Channels to be used are assigned. 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.

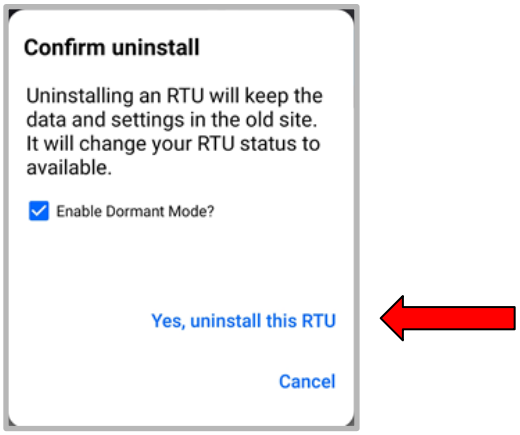
8. Tap on **Install**. A confirmation message is displayed.
9. Tap on **Tamper a Call** in the header.
10. Use a **tamper method** (**Bluetooth** or **scan**) provided in Add a Device using Bluetooth **step 8** or the **Tamper cable** method provided in Communication/Tamper Switch Cable.
    This will 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 physically 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
➢	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

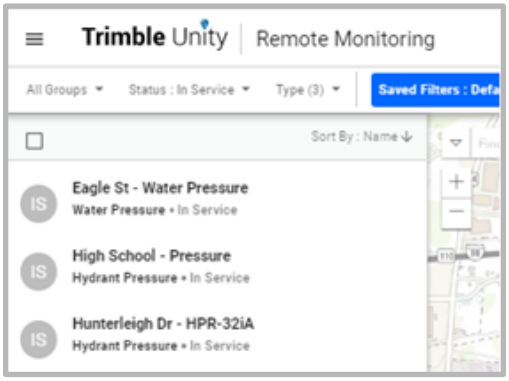
Recommendation	Daily calls are recommended
Battery Life	Call Schedule and Sampling Rate may significantly impact battery life. High call frequency may be mitigated by using the alarm call feature to call when the data exceeds the alarm thresholds. See battery life estimates in the Battery section of the Specifications: Appendix A - iLR-32A Specifications.

Before starting:

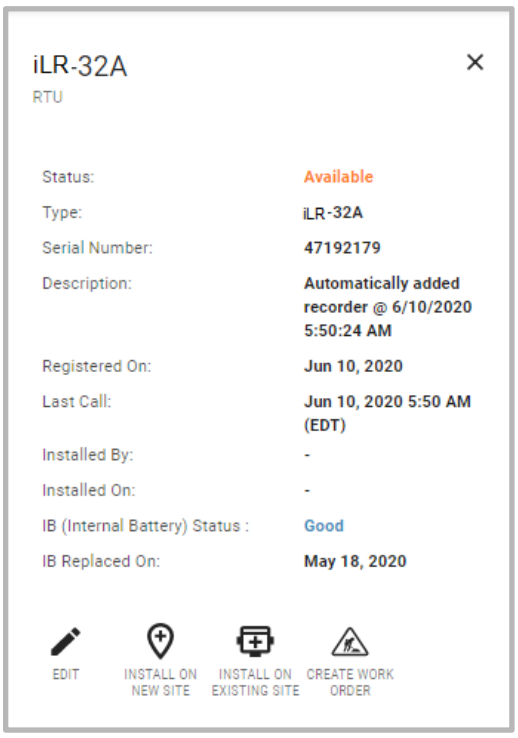
- Be able to access your Trimble Unity Monitoring Web app account
- Have on hand a Tamper Switch Cable or BLE Dongle (requires Telogers for Windows)
- Have on hand the connecting device: PC/laptop/tablet

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 on the right.

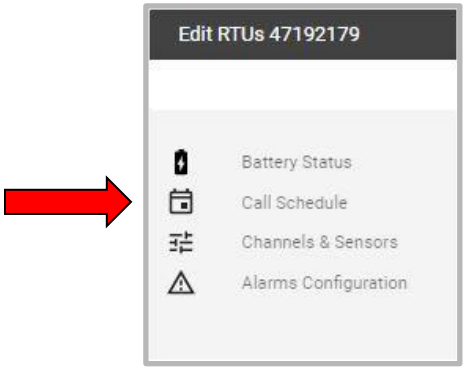


3. Search for the desired **Monitoring Site** then click on the **RTU**. The system displays the **RTU details** screen.

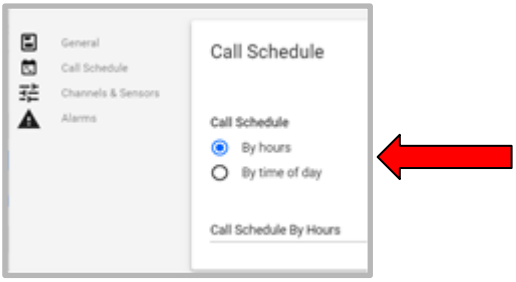


4. Click on **Edit** on the bottom of the **RTU details** screen.

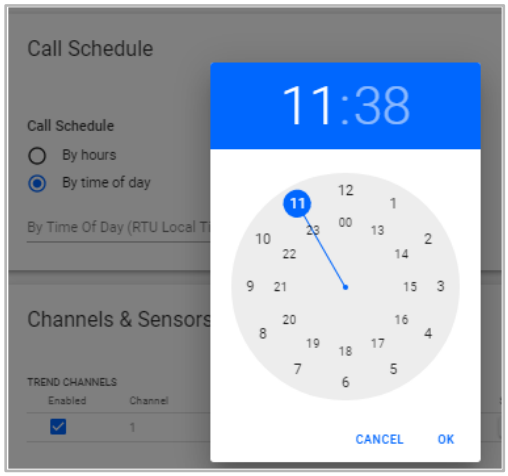
5. Click on **Call Schedule** to update the hours or time of day.



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**, 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**, displayed 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 not visible.)

Configure Sensor Channel

Current loop (4-20mA) data from an input device can be collected in user-configured time increments. The iLR-32A memory size is 128 Kbytes. The storage method of the data is wrap-around, meaning first in - first out, and the capacity is 82,000 data values.

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 - iLR-32A Specifications. High call frequency may be mitigated by using the alarm call feature to call when the data exceeds the alarm threshold.

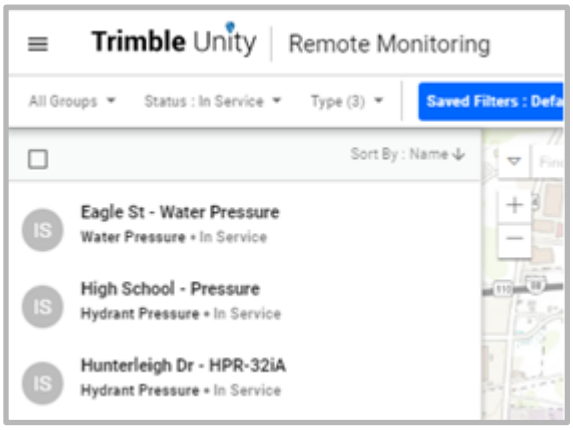
- Sampling Rate - how often data is being read by the RTU
- Recording Interval - how often the statistical sample data is recorded, any combination of minimum, maximum or average value of each interval may be stored

Before starting:

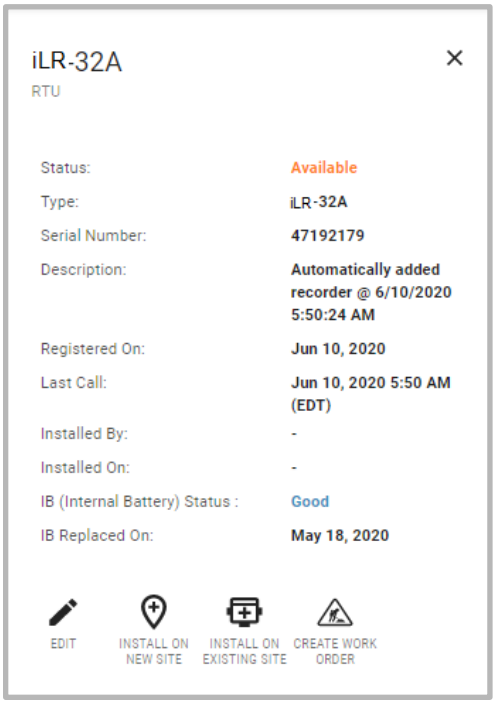
- Be able to access your Trimble Unity application account
- Have on hand the connecting device: PC/laptop/tablet

To configure the sampling rate and recording interval:

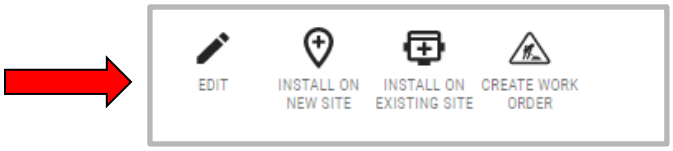
1. Access your **Trimble Unity Remote Monitoring** web app and login.
2. Click on the **Remote Monitoring** menu option. The **Monitoring Sites list** is displayed on the left side of the screen with the site map to the right.



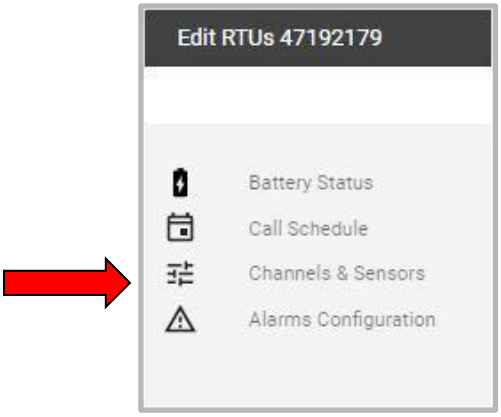
3. Search for the desired **Monitoring Site** then click on the **RTU**. The system displays the **RTU details** screen.



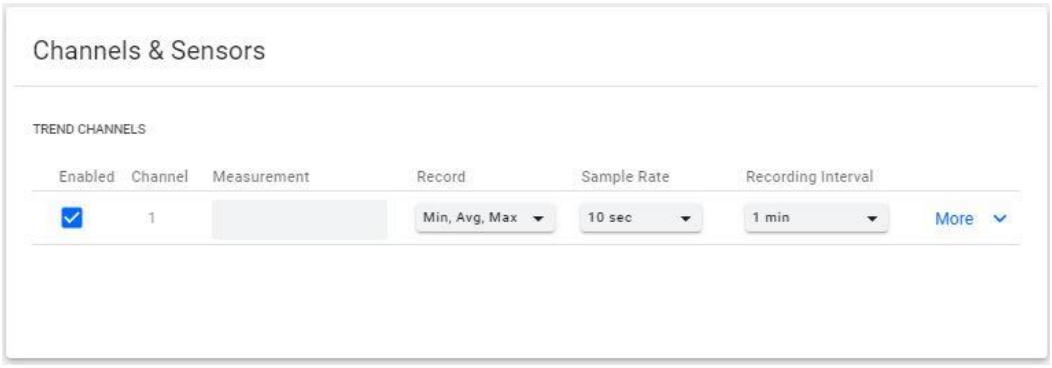
4. Click on **Edit** on the bottom of the **RTU details** screen.



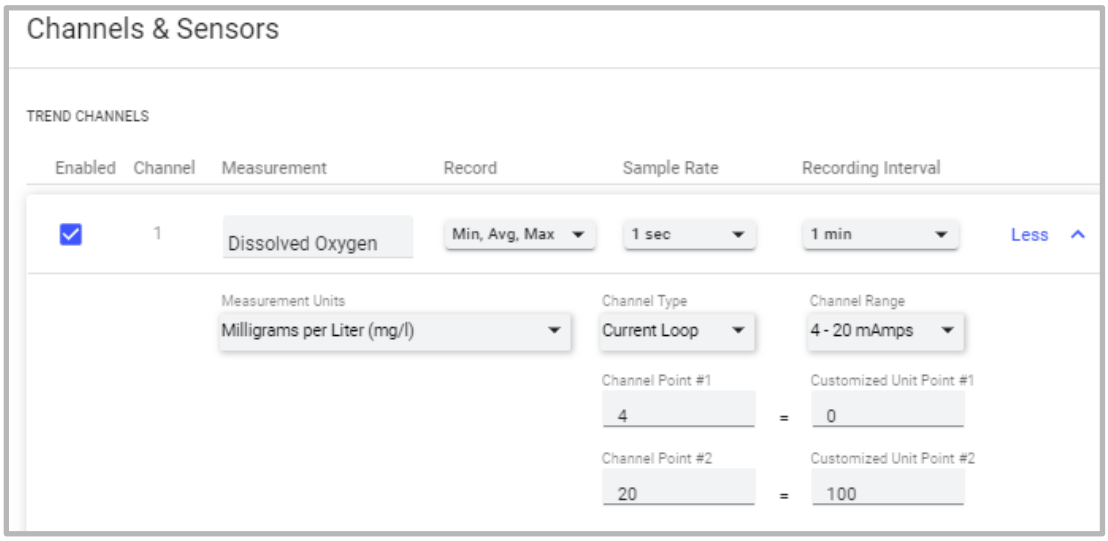
5. Click on **Channels & Sensors** on the menu.



6. Update the **Channels & Sensors** (Current Loop Channel) that controls the data to be configured. Use the down arrow to select values.



7. 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 Unity Help option to access the online *Trimble Unity User Guide*.

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

Alarm Management

- Configure Notification Groups
- Configure Alarms

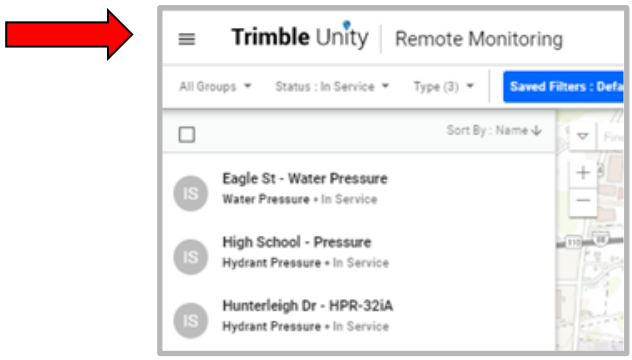
The Unity application creates and sends Alarms to report on data that has breached user-configured parameters. Trimble recommends that the user collect data for a period of time before activating the alarm feature to determine what parameters will be effective and to avoid being overwhelmed with unnecessary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

Configure Notification Groups

Before configuring alarms, configure the Notification Groups or recipients to have the alarm notifications sent to them.

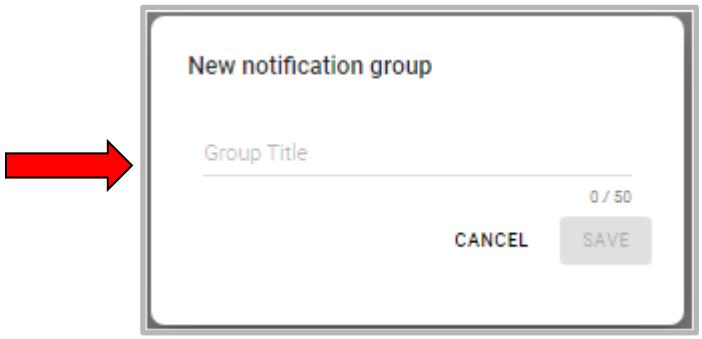
To configure the alarm Notification Groups:

1. Access your **Trimble Unity Remote Monitoring** web application and login.
2. Click on the **Remote Monitoring** menu option.
3. Click on the menu icon ( ) in the upper left corner of the screen to display the submenu.

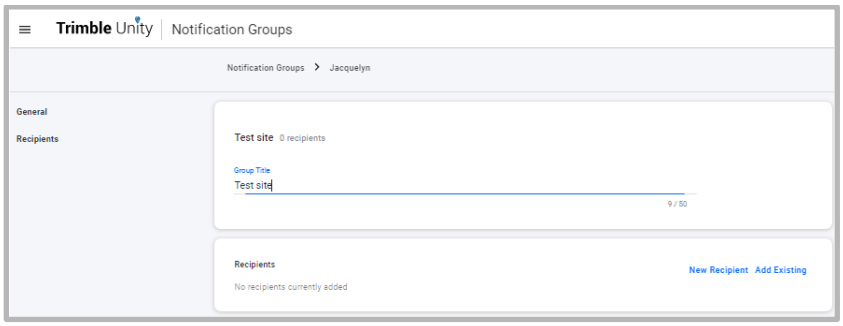


4. Click on **Notification Groups**.

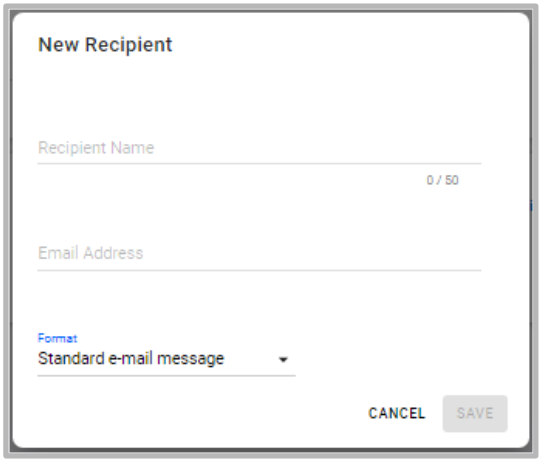
5. Click on the **New notification group l**ink in the **Manage Notification Groups** section of the screen.
6. On the **New notification group** screen, enter a group name on the **Group Title** line.



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, be 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:

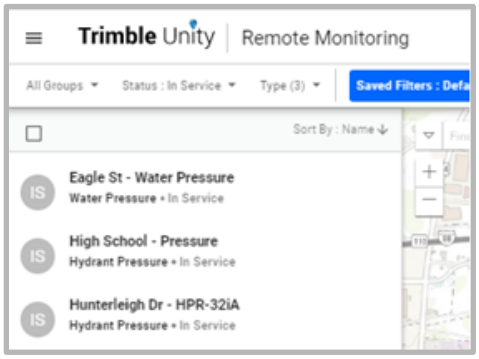
- Enable the alarm
- Set the alarm threshold
- Specify how long the alarm condition will have to persist before the alarm is triggered
- Assign the group of users who will receive alarm notifications via email or text

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

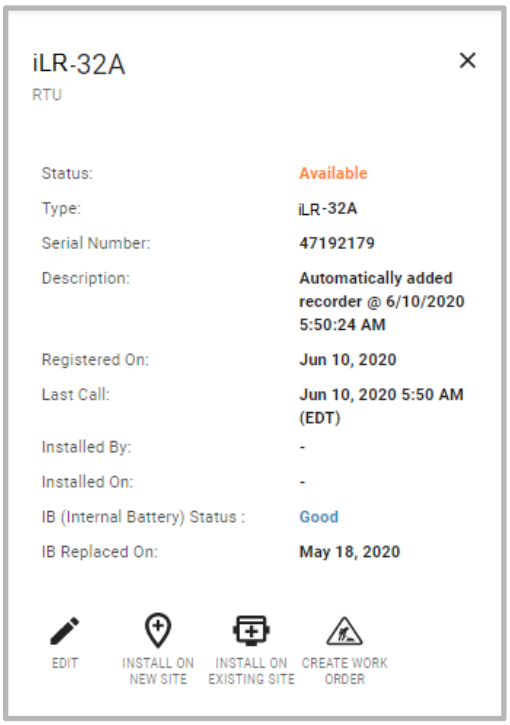
Alarm Types	Definition
LoLo	The sampled input value is less than the low alarm.
Lo	The sampled input value is at the low alarm.
Hi	The maximum sampled input value is at the high alarm value.
HiHi	The maximum sampled input value is greater than the high alarm values.
Dwell Time	The alarm dwell time determines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

To configure the alarms:

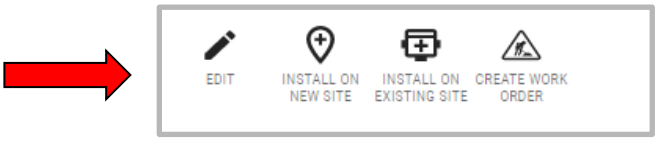
1. Access your **Trimble Unity Remote Monitoring** web application and login.
2. Click on the **Remote Monitoring** menu option. The **Monitoring Sites** list is displayed on the left side of the screen with the site map to the right.



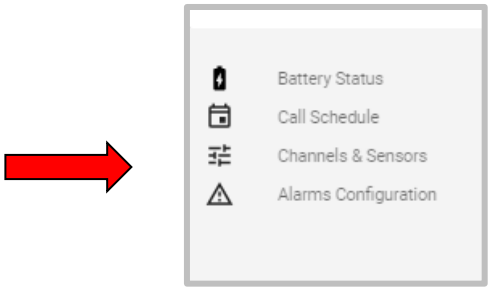
3. Click on **RTUs** in the header. Scroll down to find the desired **RTU**.
4. Click on the **RTU**. The **iLR-32A details screen** is displayed.



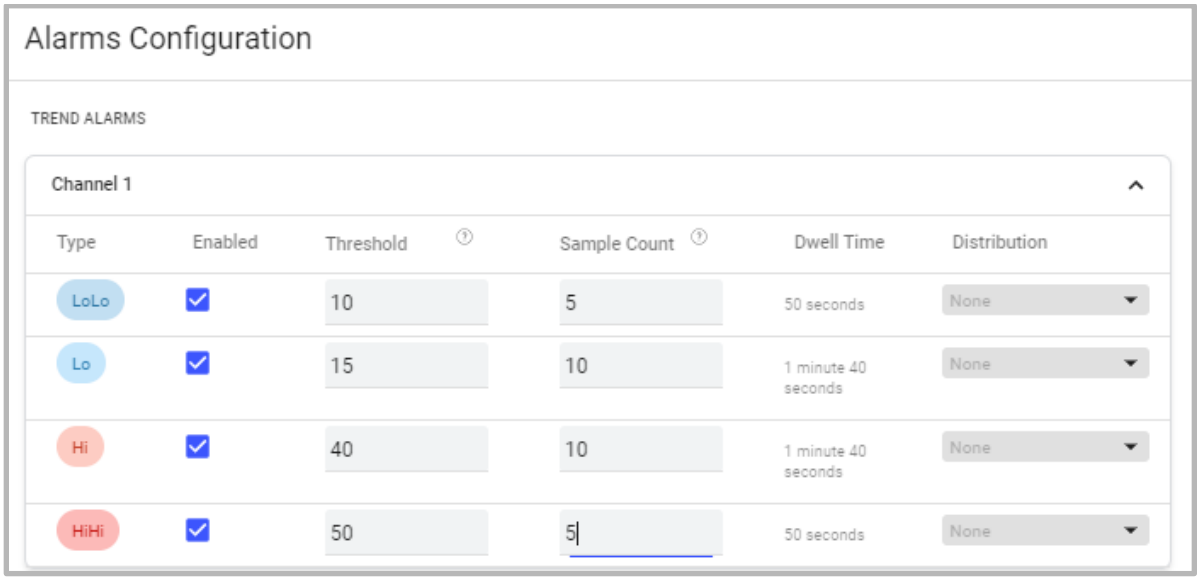
5. Click on **Edit** on the **RTUs details** screen.



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



7. Click on **More** to expand the screen for configuration.



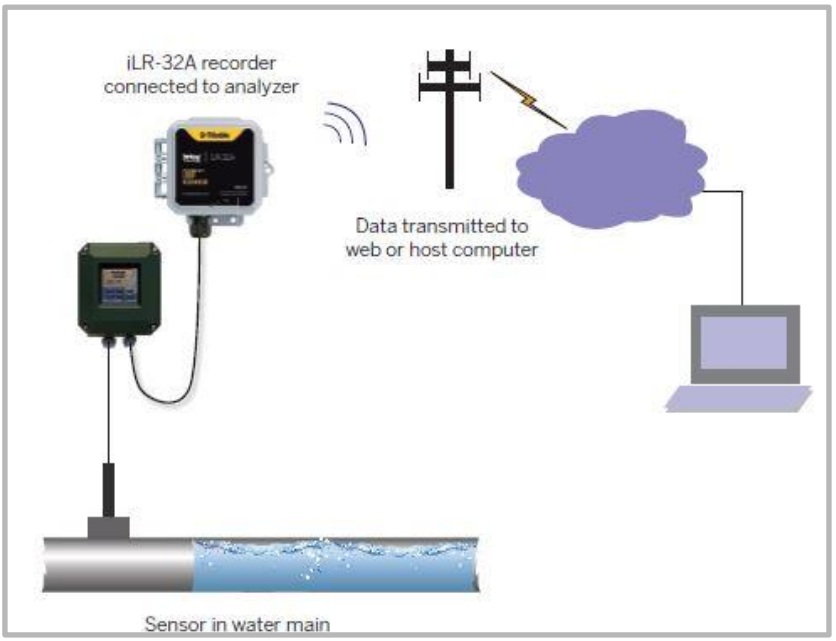
8. To configure alarms, enter the values:
    a. **Enable** or **Disable** the alarm for each alarm **Type**.
    b. Set the **Threshold** values.
    c. Enter the **number of consecutive samples** under the **Sample Count** (Dwell Time) required before the alarm is triggered.
    d. Select the **group**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

8

Connect and Configure the Device

➢	Secure Sensor Cable to the RTU
➢	Terminate Sensor Connection Wires in the RTU

The RTU continuously monitors data from an input device (such as an analyzer/meter/process instrument/sensor). A cable provides the physical connection between the RTU and the device.



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

Secure Sensor Cable to the RTU

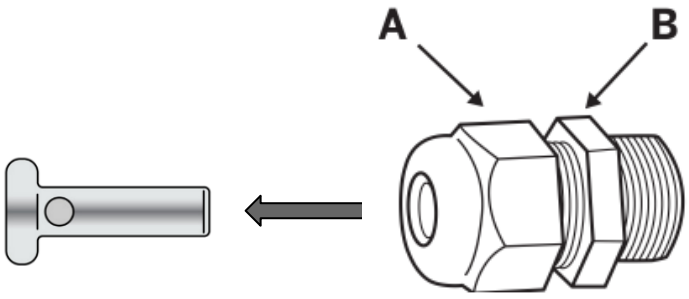
Have on hand:

- RTU
- Input Device

To secure the Input Device cable:

1. Open the cover of the **iLR-32A** housing to connect the **Input Device** cable.

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 **device cable** through the **cord grip**; allow only 1/4” or less of the cable sheath to protrude inside the iLR-32A housing.

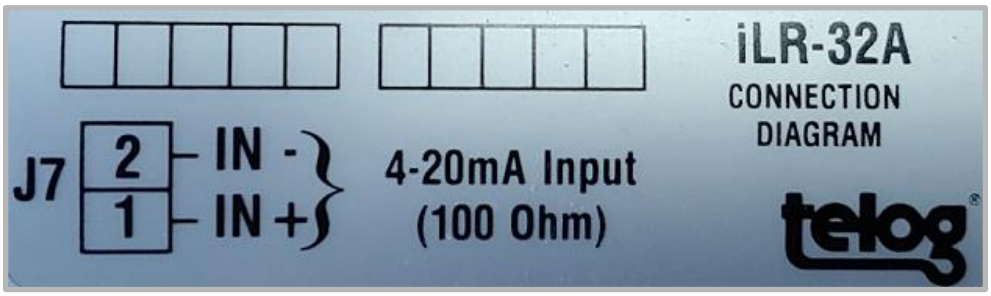
   NOTE: The cable diameter size range is 0.069" to 0.260"
5. Tighten the **cord grip (A)** using a 24mm wrench on the outside of the housing and another wrench to hold the **nut (B)**. Use a max torque of 35 LBF-IN. Overtightening could damage the cord grip.

Terminate Sensor Connection Wires in the RTU

The iLR-32A uses a 2-position terminal block for flying leads by means of a water-tight fitting.

To terminate wires in the iLR-32A:

1. Terminate **wires** using the guidelines provided on the **iLR-32A Connection Diagram** inside the cover of the housing.



2. Secure the **wire leads** by tightening the terminals with a 1/8" flat head screwdriver.

   Refer to the circuit board for the location of terminal position J7.

3. Once wire attachment is completed, close the housing cover securely, ensure the cover snaps shut.

Mount the Device Onsite

Mount the iLR-32A onsite securely using the slots in the mounting flanges on the top and bottom of the RTU. The iLR-32A is a rugged unit suited to harsh environments. The iLR-32A can be installed below or above ground. Because the antenna is integrated within the iLR-32A, the only connection required is to the Input Device. Once installed, data is immediately available using the Trimble Unity application.

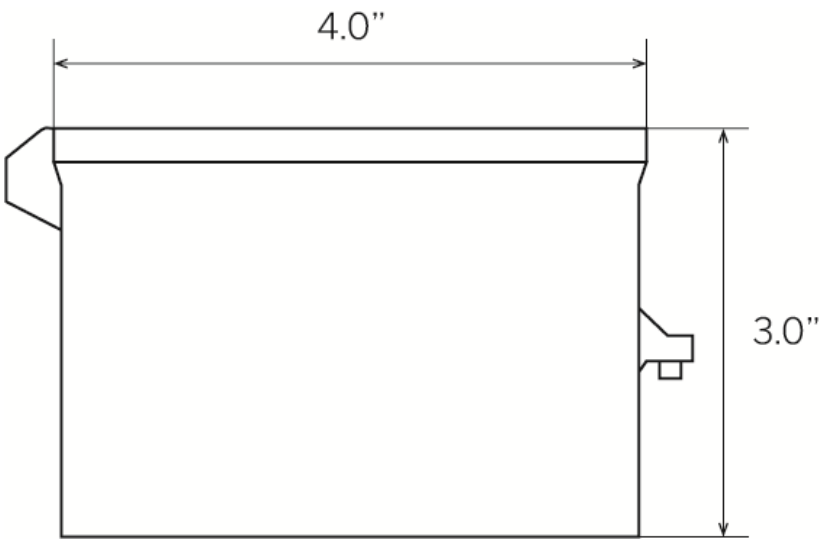
The RTU specifications are:

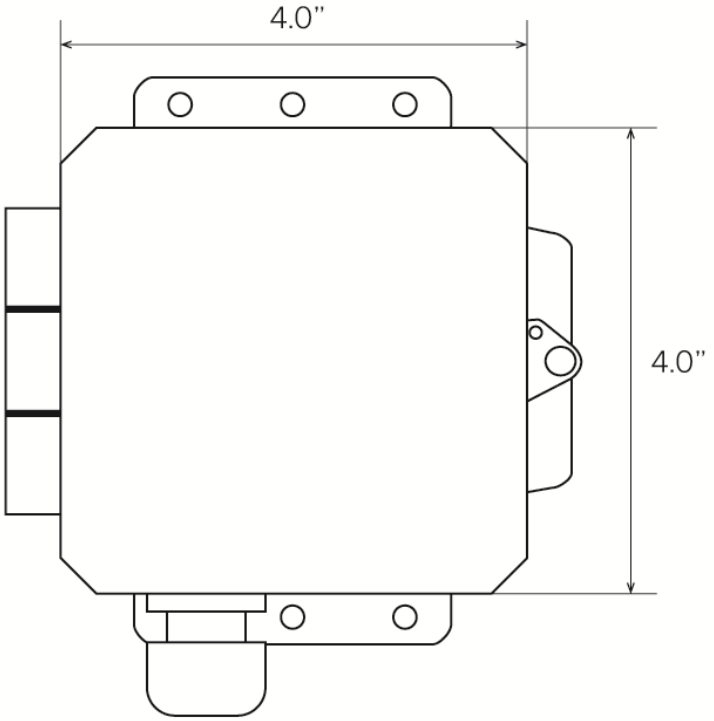
- Environmentally rated NEMA 6P (IP68)
- Enclosure weighs 2.5 pounds
- Enclosure measures 4”L x 4”W x 3”H [102mm L x 102mm W x 76mm H]
- All connectors and fittings are watertight

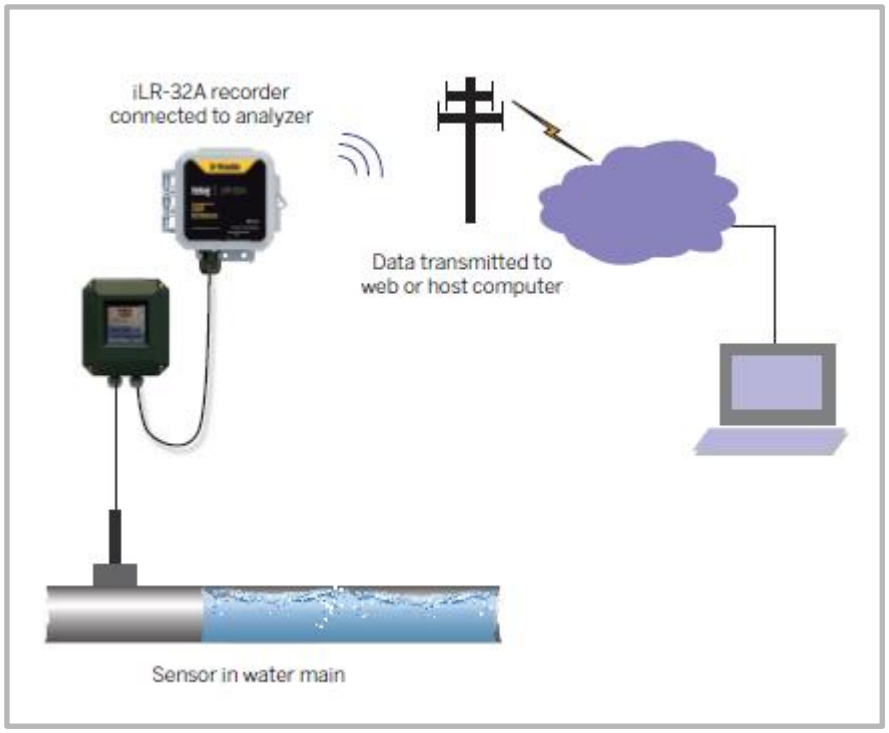
iLR-32A onsite mounting preparation:

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

Refer to Appendix A - iLR-32A Specifications for datasheet specifications.




4.0"
4.0"


iLR-32A recorder
connected to analyzer
Data transmitted to
web or host computer
Sensor in water main

10

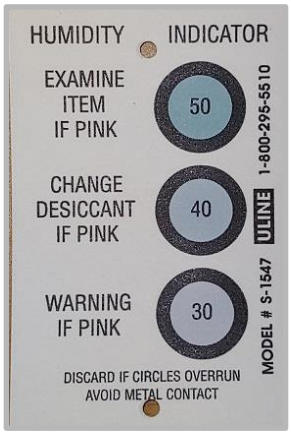
Maintenance

➢	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 Pack

Shipping and Handling

The iLR-32A is shipped in a dormant state and requires the user to Tamper a Call to activate the data capture and recording functionality of the iLR-32A. Unpack the iLR-32A from the protective material used during shipping.

Desiccant packs are attached inside the RTU 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 iLR-32A can operate reliably in temperatures ranging from -40° to 158°F [-40° 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 RTU 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 iLR-32A 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 in case the device cannot call the server

To replace the battery:

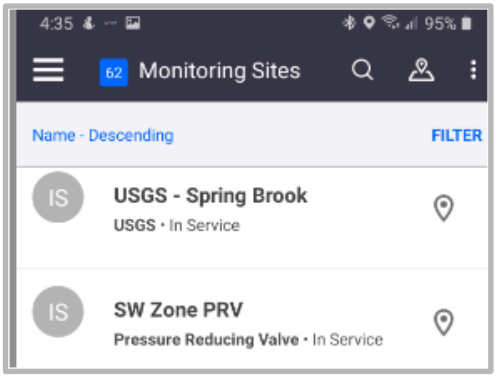
1. Before removing the battery, **collect data from the RTU** via wireless network or locally using a Tamper Switch cable or BLE Dongle (requires Telogers for Windows).
2. Open the **RTU** housing.

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.

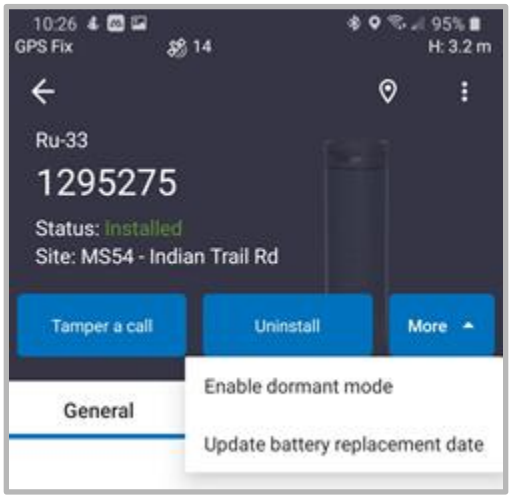
Updating the Battery Replacement Date in the App

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

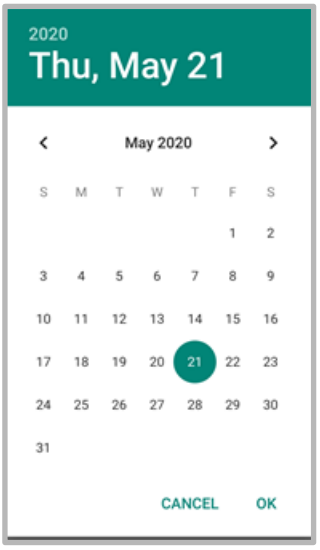
1. Launch the **Unity Android or iOS mobile app** from your phone or tablet.
2. Enter your **organization** and click on **Next**.
3. Enter your **username** and **password** and click on **Sign In**. The **Monitoring Sites** screen is displayed.



4. Scroll to 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. RTU internal humidity levels can be used to assess the status of the desiccant packs to minimize the risk of condensation. Humidity levels can be displayed as Measurements on Trimble Unity when viewing the data. The table and instructions below provide guidelines on any action that may be needed at different humidity levels.

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 RTU 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**.

11

Troubleshooting

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

Problem	Potential Cause	Solution
No data recorded	RTU still in Dormant mode	Use the 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-RS22 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.
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 iLR-32A by removing the battery	The battery can be used to Tamper the iLR-32A by interrupting the power cycle. Remove the battery for 5 minutes then reconnect. Refer to the Replacing the BP-4 Lithium Battery Pack for details.
No data in channel or measurement	Channel wiring	Check that the iLR-32A is wired properly into the correct Channel and that it is secure. Refer to the Terminate Sensor Connection Wires in the RTU 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 - iLR-32A Specifications

Type	Single channel current loop recorder with integrated cellular modem and antenna
Input	
Range	4-20 mA standard
Resolution	0.025% of full scale (12 bits)
Accuracy	±0.1% of full scale (32 to 140°F) ±0.15% of full scale (-13 to 140°F)
Loop resistance	105 ohms
Maximum input	5 VDC across input; auto-resettable fuse protected
Connection	2 position terminal block for flying leads via water-tight fitting
Recording	
Sample rate	4 per second to 1 per 8 hours; programmable
Clock accuracy	0.01%
Memory size	128 kbytes; 82,000 data values
Storage method	Wrap around (first-in; first-out)
Communication	
Local RS-232	5-pin circular connector rated IP-68 Auto-selected baud rate to 19.2kbaud
Cellular	Internal Telog WM2/L1 cellular modem LTE Category 1 certified Verizon Wireless
Bluetooth	Local Bluetooth BLE 4.1
Battery	Factory installed, field replaceable Telog BP-4 lithium battery pack
Battery Life	5 years nominal 2 data calls/day (@ very good 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]
Material	Polycarbonate
Environmental	
Temperature	-40 to 158ºF [-40 to 70ºC]
Rating	NEMA 6P (IP68)
Support Softwares	
TW-UNITY	Trimble Unity
S-3PC	Telogers for Windows®6.77 or later
S-3EP	Telog® Enterprise 6.77 or later

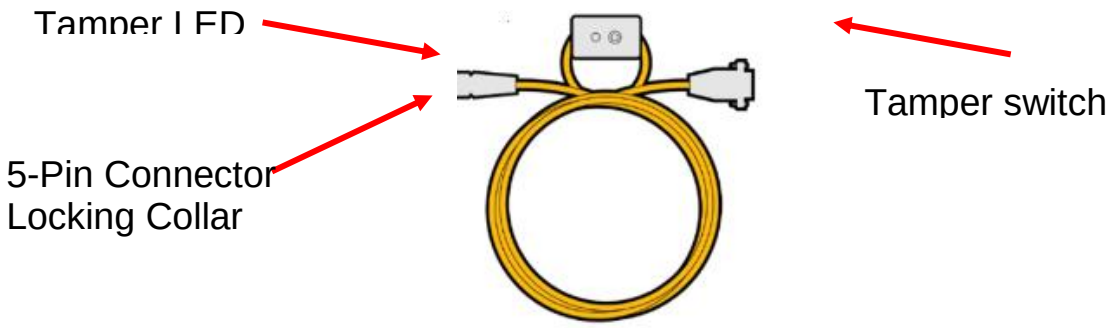
Appendix B - Tamper a Call

➢	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 HPR 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 **HPR** 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 HPR, and hand-tighten.

BLE Dongle - Tamper a Call

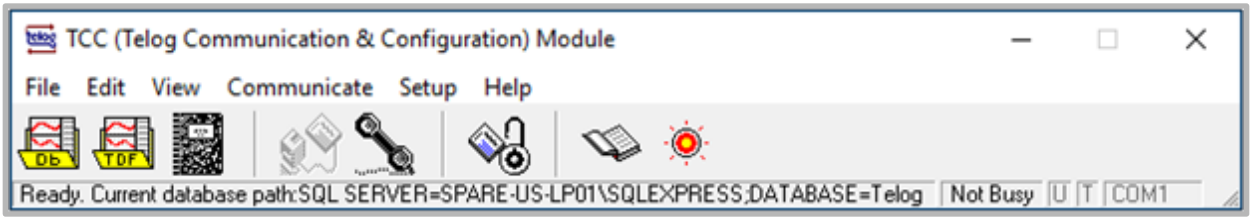
Tamper a Call using a BLE Dongle and the Telogers for Windows (Telog TCC) application.

Before starting, have on hand the:

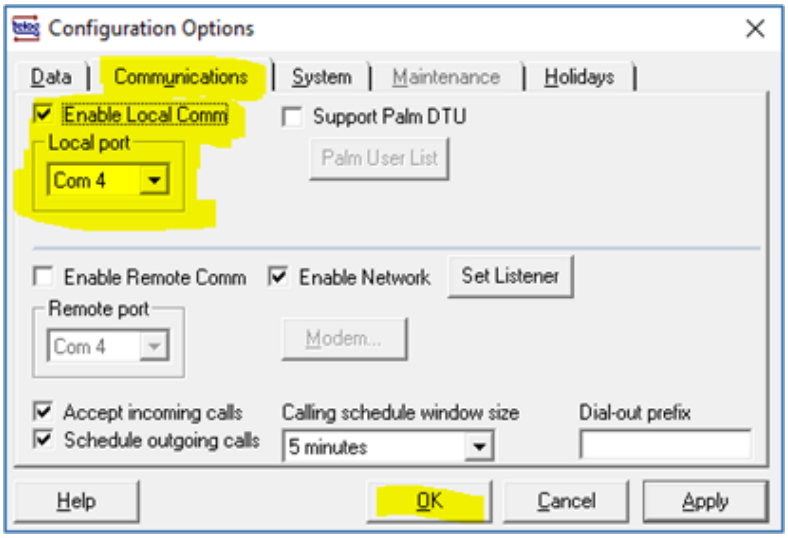
- RTU
- BLE Dongle
- PC with Telogers for Windows application installed. Refer to the Software Applications for information on how to acquire and use Telogers for Windows.
- Locate the PC within 10’ of the RTU

To Tamper a Call using the BLE Dongle:

1. Insert the **BLE Dongle** into the PC being used to make the wake-up call.

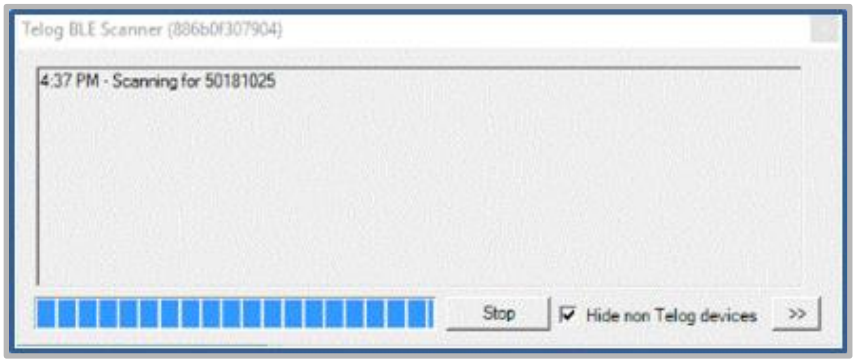


2. Open the **Telog TCC** application. The system displays the following main menu screen.
3. Click on **Setup-> Options**. The system displays the Configuration Options window.
4. Click on the **Communications** tab.
5. Select **Enable Local Comm** (click on the check box to select it).
6. Click on 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 RTU**.
10. Select **Force a call-out** for the attached RTU.
11. Select **RTU for BLE Communication**.
12. Enter the **ID of the RTU**.
13. Click on **Start**. The system displays two screens:
    - The Telog 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 C - Scaling Current Loop Channel Using Telogers for Windows

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. Enter the desired **scaling values**.
5. Click on **OK** in the **Define Scaling** window.
6. 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.
7. Close the **Setup Recorders** window.
8. Ensure the Telogers menu **Padlock** is **unlocked**, if not, click the lock to unlock. This allows configuration changes to be applied to the RTU.
9. To change the RTU, click on **Communicate** > **with Local recorder** > **Collect Data** > **Start**

The following example shows the Current Loop channel scaled for a maximum output of 200 Gallons Per Minute (GPM). The Define Scaling window has these entries for Channel Point #1 and Channel Point #2, where 4mA = 0 and 20mA = 200.