

Operator's Manual



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Symbols

Important Symbols in This Manual



The exclamation point calls your attention to a requirement, safety issue, or important action that should not be overlooked.



A check mark highlights a tip or feature.

Important Symbols on the Product



Caution

This symbol indicates critical safety information. Ignoring text that accompanies this symbol could result in injury or death due to improper handling.



WEEE Directive: Disposing of VuLink at the end of its useful life

In accordance with the EU Waste Electrical and Electronic Equipment Directive of 2005 and later Directives, VuLink should not be discarded with regular household waste. Check local electronic/electrical waste regulations before disposing of a VuLink device.

Required Components

1 Cable



Rugged Twist-Lock Cable

Connects VuLink to an Aqua TROLL, Baro TROLL, Level TROLL, or Rugged TROLL instrument.

Vented or non-vented.

2 Instrument

Aqua TROLL



Baro TROLL



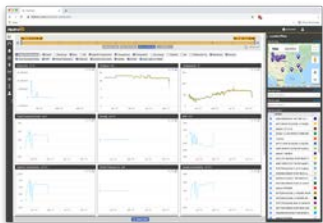
Level TROLL



Rugged TROLL



3 Software



HydroVu Software

View data, manage instruments, create alarms, and modify VuLink settings in your browser.



VuSitu Mobile App

Communicate with VuLink on any Bluetooth-enabled mobile device and the VuSitu mobile app.

4 Batteries



In-Situ recommends Saft LS 33600 batteries for your VuLink. Find them at www.in-situ.com.

See battery details at <https://bit.ly/38FLUhl>

How it Works



Using VuLink in any manner not specified by the manufacturer (In-Situ) may impair the device's built-in protections.



1

Carabiner

VuLink hangs from the top of a well with the detachable carabiner.

2

VuLink Telemetry Device

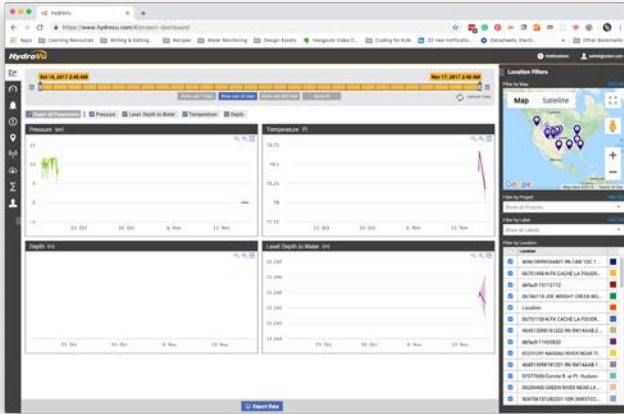
VuLink provides power to monitoring instruments, transmits data to the cloud, and notifies you when maintenance is required.

3

Instrument

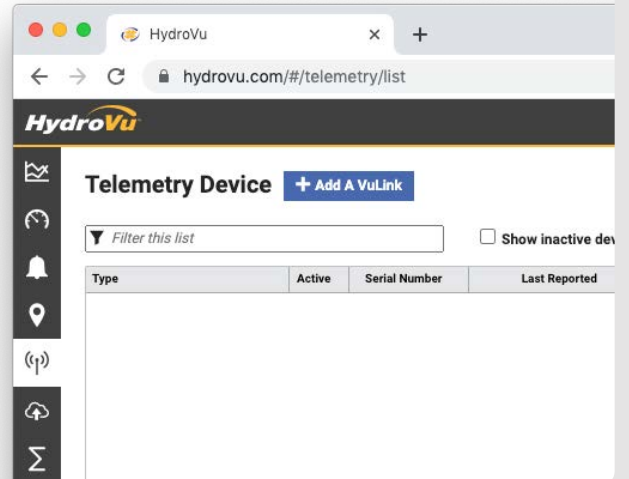
An In-Situ instrument measures water quality and/or water level.

1 Create a HydroVu account.



Visit hydrovu.com and create an account.

2 Go to the telemetry page.



Click the telemetry page link in the menu on the left side of the page. Then click **Add a VuLink**.

3 Scan the QR code on your VuLink.



or



Open your web camera and scan the QR code on your device, or type the registration code into the provided field.

4 Attach the antenna and connect an instrument.



After connecting the antenna and instrument, follow the instructions on the next pages of this quickstart guide.

Setting Up Vulink



VuLink works with Aqua TROLL, Level TROLL, Baro TROLL, and Rugged TROLL instruments. Follow the steps below to start transmitting data.

5 Remove the battery pull-tab and press the button.



Make sure the antenna is properly attached before proceeding.



Remove the battery cover by twisting it counter-clockwise and pulling down.



Remove the yellow pull tab to allow current to flow through the batteries. Replace the cover.



Press the button. All LEDs turn on. Then each LED changes color according to device status.



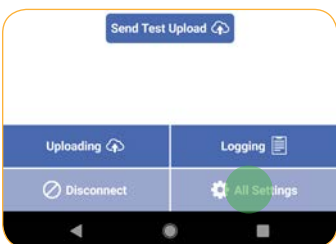
Never mix old and new batteries, or Lithium and alkaline batteries. Make sure all three batteries are installed in the same orientation.



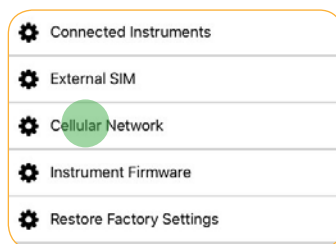
Troubleshooting Network Connectivity



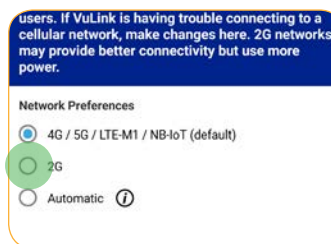
If VuLink has trouble connecting to a 4G network, switching to 2G may help. Launch VuSitu and follow the instructions below. Contact your cellular provider for coverage details.



Press the **All Settings** button at the bottom of the screen.



Tap **Cellular Network** on the Settings screen.



Tap **2G** to change VuLink's network settings. Press **Save**.



VuLink should now be able to connect to a network and sync with HydroVu.



Connecting to a cellular network can take up to 10 minutes in the following situations:

- The first time VuLink powers up
- When VuLink hasn't been powered up in several weeks or months

7 Add another instrument and press the button. (Optional)



Add as many as 8 instruments to VuLink, repeating the steps below for each one. When you're ready to deploy, use one or more Rugged Cable Splitters to connect multiple instruments.



Disconnect the instrument from VuLink. Attach another. Press the button.



VuLink connects to the new instrument and the data network.



VuLink connects to HydroVu or an FTP site.



All LEDs indicate current device status. See the section below for details.

Understanding the LEDs



All five LEDs illuminate when VuLink when is powered on. The color of an LED indicates status. See the details below.

Battery status



Solid green

Battery power is at least 75%.

Blinking green

Battery power is between 50% and 75%.



Blinking red

Battery power is between 25% and 50%.

Solid red

Battery power is less than 25%



Blinking red and green



A blinking red and green LED indicates a problem with the batteries. Do not deploy the VuLink in this condition. Check batteries and reinstall as necessary.

Instrument connection status



Blinking green

Searching for an instrument

Solid green

Connected to instrument



Blinking red

New instrument not found

Solid red

No instruments connected to VuLink

Network connection status



Blinking green

Attempting to connect to network

Solid green

Connected to network



Solid red

Unable to connect to network

Blinking red

VuLink's antenna is disconnected or VuLink can't locate a cellular network.

Cloud connection status



Blinking green

Connecting and uploading data to HydroVu

Solid green

Upload successful



Blinking red

Unclaimed device

Solid red

Failed to connect to HydroVu.com

Bluetooth connection status



Blinking blue

Ready to connect

Solid blue

Bluetooth connected

Logging With VuLink

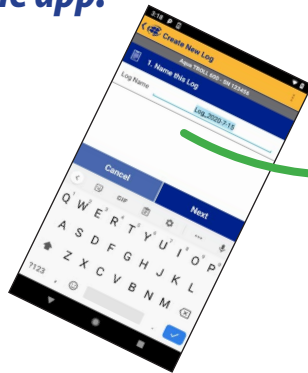


VuLink logs get uploaded to the cloud; instrument logs do not. Be sure to understand the differences between these log types before deploying VuLink.

VuLink Logs

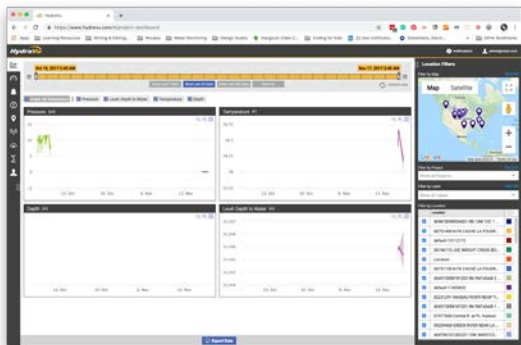
1

Program a log into VuLink with the VuSitu mobile app.



2

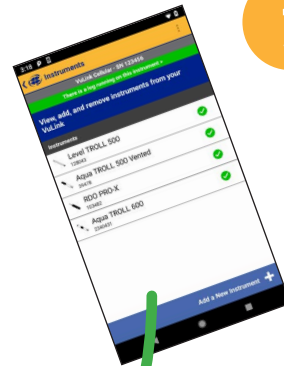
See your data in HydroVu.



Instrument Logs

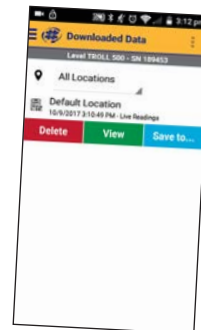
1

Program a log into the instrument with VuSitu.



2

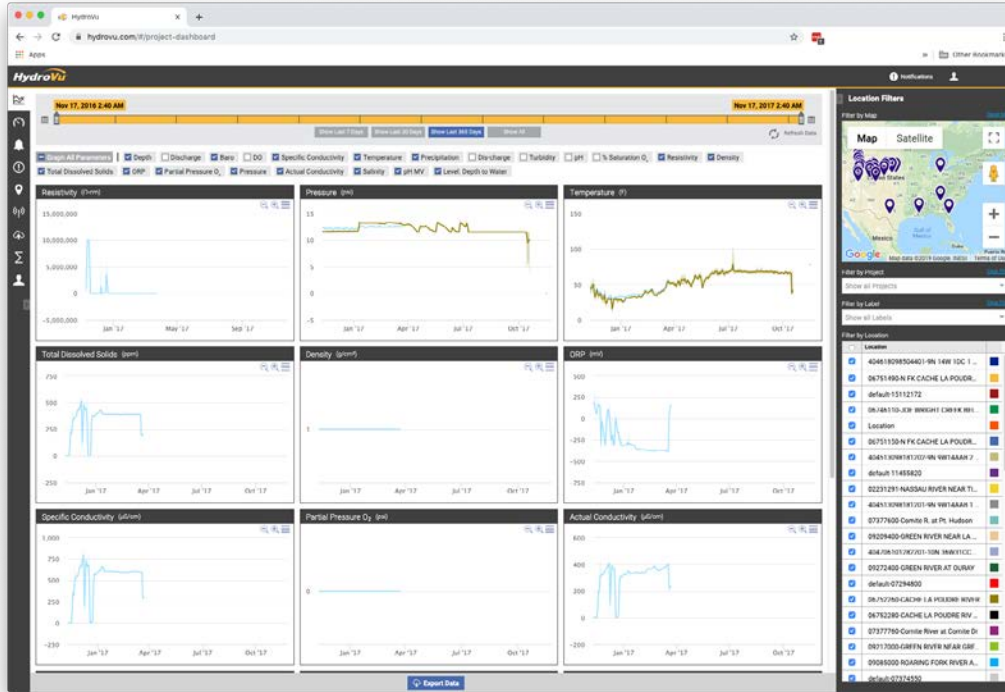
Download log files with VuSitu.



Using HydroVu



Use HydroVu to create logs, configure alarms, and modify VuLink's settings.



Sidebar Menu Options/HydroVu Pages



View your data



See Locations



Create and edit dashboards



Configure telemetry devices



Manage alarms



Upload data



Set up notifications



Edit calculated parameters



Manage users

Using VuLink With VuSitu



After connecting to your VuLink with VuSitu, the app always displays the Connected Telemetry Device screen at launch. You can access all features of the app from this screen.

Connected Telemetry Device Screen

The screenshot shows the 'Connected Instrument' screen of the VuLink Cellular app. The interface includes a top status bar with the time 2:51 and various system icons. Below this is a yellow header with the VuLink logo and the text 'Connected Instrument'. A blue bar below the header displays 'VuLink Cellular', the serial number 'SN 123456', the version 'v0.01', and a gear icon for settings. A central circular area contains several icons representing different functions: a signal tower, a VuLink logo, a cloud upload, a battery, a signal strength indicator, and a power button. Below this circle is the text 'Tap icons for more information.' A white bar shows the time '14:51' and the date '09/16/2020' with a gear icon. Below this are two expandable sections: 'Battery Life' and 'Connected Instruments'. A blue button labeled 'Send Test Upload' with a cloud icon is positioned below these sections. At the bottom, there is a grid of four buttons: 'Uploading' with a cloud icon, 'Logging' with a document icon, 'Disconnect' with a power icon, and 'All Settings' with a gear icon.

Access menu.

Access help information.

View and make changes to instruments connected to a VuLink.

Specify a destination for uploads, like HydroVu or an FTP server.

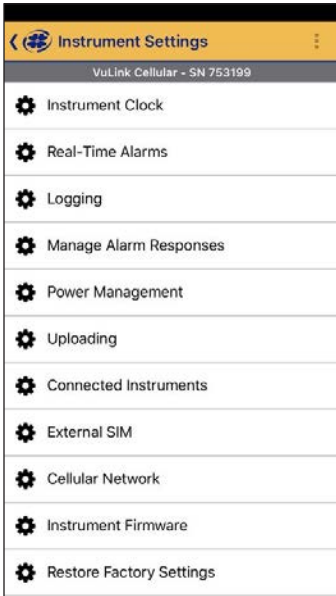
Create and modify logs.

Adjust VuLink and instrument settings.

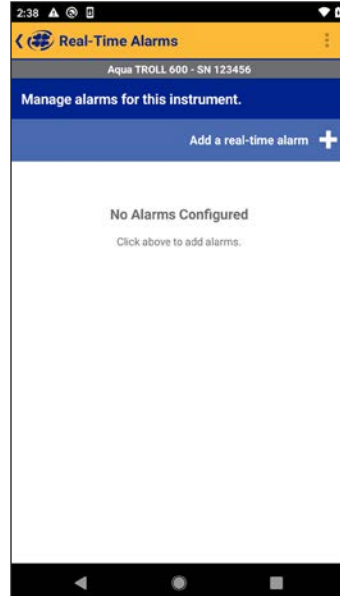
Creating Alarms



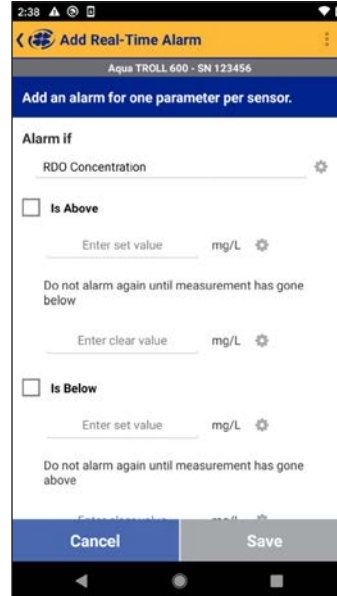
VuLink alarms notify you via SMS when instrument batteries run low, a parameter crosses a specified threshold, or other events occur at a remote monitoring site.



Tap **Settings** from the menu, and then choose **Real-Time Alarms**.



To create an alarm, tap **Add a real-time alarm**.



Select the parameter that should trigger the alarm and set the limits.

Updating VuLink

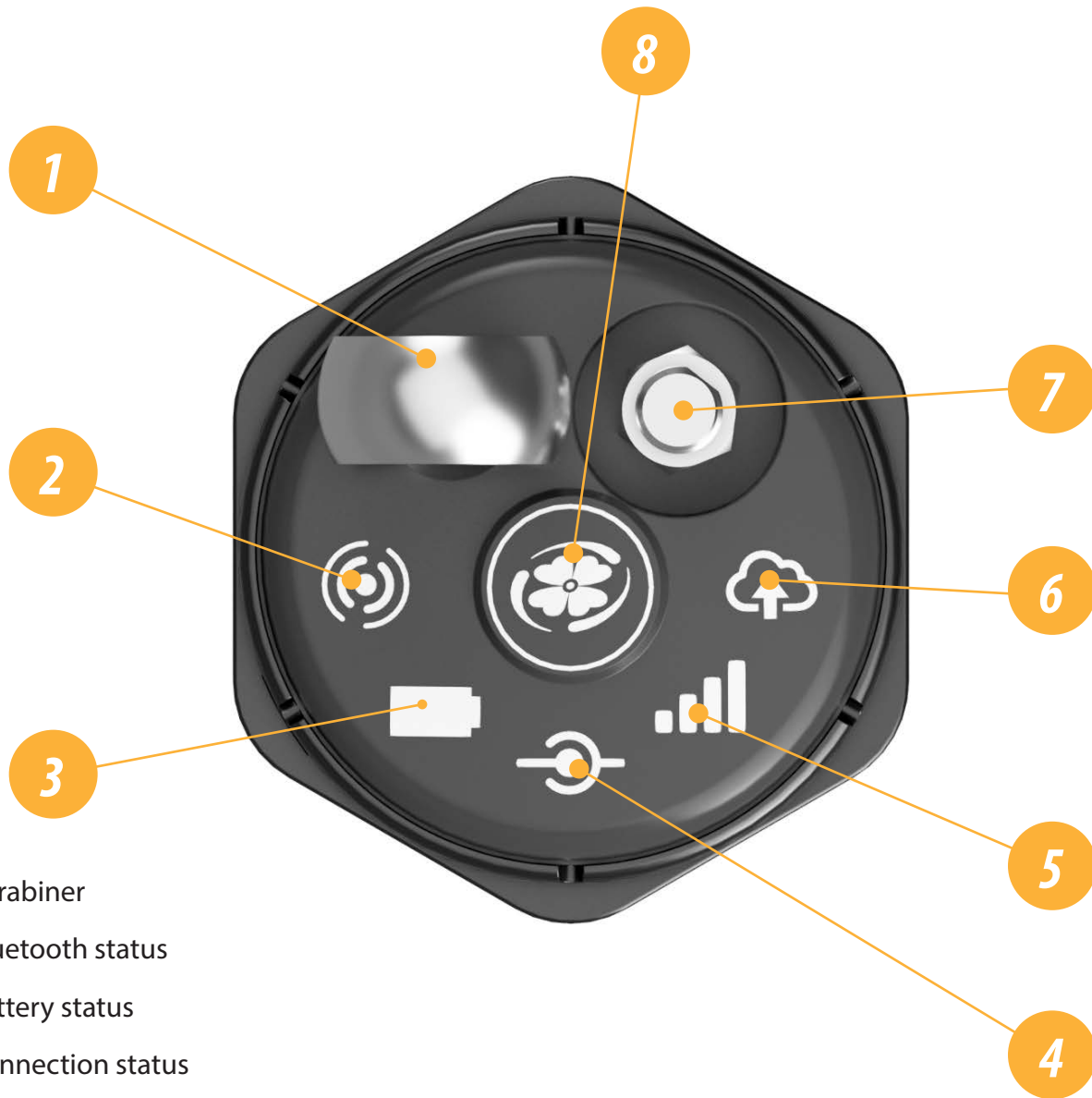


The automatic update option ensures that VuLink always has the current firmware.

Controls



LEDs on VuLink's control panel indicate the device's status.



- 1 Carabiner
- 2 Bluetooth status
- 3 Battery status
- 4 Connection status
- 5 Network connection status
- 6 Cloud connection status
- 7 Antenna
- 8 Power

Specifications

Battery	(3) D cell (1.5V - 3.6V) Alkaline/Li-SOCl ₂ [Lithium Thionyl Chloride]/Li-MnO ₂ [Lithium Manganese Dioxide] supported. Li-MnO ₂ [Lithium Manganese Dioxide] recommended for best performance
Operation Time (24-hour reporting)	Under evaluation
Operation Time (15-minute reporting)	Under evaluation
Clock Accuracy	Less than 1 minute drift per year with ability to synchronize to network provided time for accuracy less than 1 second accuracy
Network Type	4G LTE Category M1/NB-IoT with 2G fallback
Bands	LTE Global - B1(2100), B2(1900), B3(1800), B4(AWS1700), B5(850), B8(900), B12(700), B13(700), B18(800), B19(800), B20(800), B28(700) Verizon - B4(AWS1700), B13(700) 2G Quadband - B2(1900), B3(1800), B5(850), B8(900)
Protocols	HTTPS (HydroVu), FTP, SMS (alarms)
Data Provider	Built-in free* global roaming (see Network List Addendum for details: In-Situ.com/VuLinkNetworks)
Antenna	SMA-M connector
GPS	Up to 3m accuracy, built-in antenna
File Format (non-HydroVu)	CSV
Remote Setup	Supported
Overall Length	19.1"
Diameter	1.85"
Weight	2.2 pounds/1.0 kg (with included alkaline batteries and carabiner, excluding antenna)
Materials	Ryton (housing), PVC (battery cover)

Storage Temperature	-20C to 60C
Operating Temperature	-20C to 50C (Li-MnO ₂), 5C - 40C (Alkaline)
Ingress Protection	Device: IP68 System: Up to IP68 per antenna specification
Protocols	Modbus over RS-485, SDI-12, Pulse low/high frequencies (max 40 khz)
Connectors	1 In-Situ Twistlock (supports multiple instruments via Rugged Cable Splitter or Load-bearing Universal Adaptor)
Simultaneous Connections	Up to 8 instruments
Venting	Built-in on all models, no desiccant required
Barometric Compensation	Built-in on all models for automatic compensation of level readings
Barometer Accuracy	+/- 1 hPa
Alarms	Configurable based on instrument readings and device parameters, second reading/reporting schedule available when in alarm state
Power	Max 75mA provided to connected instruments at 16V
Wireless Setup	Supported via Bluetooth Low Energy
Logging Rate	1 minute to 7 days
Transmission Rate	5 minutes to 7 days
Memory	512 MB (on-board)

Authorised distributor

In Australia:

For customer service, call 1300-735-292
 To email an order, ordersau@thermofisher.com
 To order online: thermofisher.com

In New Zealand:

For customer service, call 0800-933-966
 To email an order, ordersnz@thermofisher.com
 To order online: thermofisher.com

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