



# Terminal Station Installation and User Manual

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## REVISION HISTORY

Rev.	Revision History	Date	Prepared By	Approved By
A	Initial release	8 January 2025	YW, SM	BG, SP, AA

## 1 INTENDED AUDIENCE

This guide is for the personnel responsible for installing or using RST's Terminal Station. Instructions for taking readings using the Terminal Station are also provided.

## 2 ICONS AND CONVENTIONS USED IN THIS GUIDE

This guide uses the following icons to call attention to important information.



**WARNING:** This icon appears when an operating procedure or practice, if not correctly followed, could result in personal injury or loss of life.



**CAUTION:** This icon appears when an operating procedure or practice, if not strictly observed, could result in damage to or destruction of equipment.



**NOTE:** This icon appears to highlight specific non-safety related information.

### 3 SAFETY

The Terminal Station is battery-operated, with no user-serviceable parts, and has minimal safety concerns. However, to ensure safe and efficient operation, please follow these guidelines:

- Regularly clean the unit, especially when used in outdoor or dusty environments, to prevent dust and dirt buildup in the wire terminals, battery compartment, and around the weather seal along the enclosure lid
- Ensure the weather caps for the USB and expansion ports are properly secured when they are not in use to protect against environmental factors
- Ensure that the enclosure lid is securely fastened when not in use to prevent damage due to water and dust ingress and maintain IP65 rating
- Ensure the batteries are inserted with the correct polarity. Incorrect polarity will result in damage to the board.

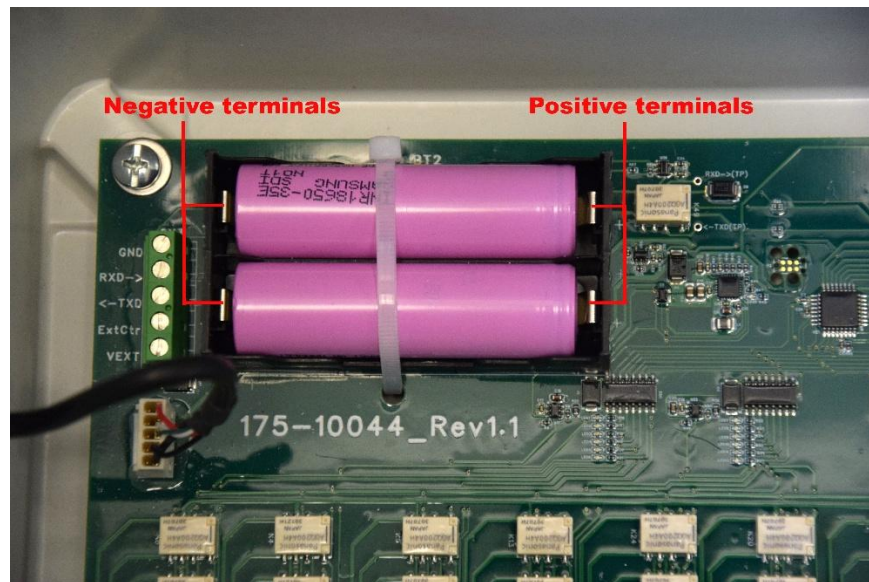


Figure 1: Ensure Batteries are Inserted with the Correct Polarity

## 4 ABBREVIATIONS AND ACRONYMS

Abbreviation or acronym	Definition
IP	Ingress Protection
NEMA	National Electrical Manufacturers Association
VWP	Vibrating Wire Piezometer
PCB	Printed Circuit Board
V	Volt
A	Ampere
mAh	Milliampere Hour
mm	Millimeter
in.	Inch
MΩ	Megaohm
mΩ	Milliohm

## 5 INTRODUCTION

The RST Terminal Station provides a single, organized enclosure for obtaining manual readings from installed vibrating wire sensors and their thermistors.

It is designed to offer an efficient and user-friendly solution for monitoring vibrating wire sensors in the field. The Terminal Station is powered by two rechargeable 18650 batteries, which offer reliable, long-lasting operation.

→ | **NOTE:** For optimal performance, please fully charge the batteries for 12 hours before first use.



Figure 2: RST Terminal Station Overview

→ | **NOTE:** Other than VW sensors and their thermistors, any sensor operating at a low voltage (<30 V typically) and drawing a small current (<1 A typically) can be connected to and read using the Terminal Station.



## 5.1 DUAL-FEED FUNCTION/PASS THROUGH WIRING

RST's Terminal Stations are designed with a dual-feed/pass-through wiring feature, which provides maximum flexibility in signal management. This feature allows each input signal to be simultaneously accessed through both the output terminal (see Figure 3) and the adjacent input terminal with the same number (see Figure 4). This means that when a sensor is connected to an input terminal, the signal can be passed through to both the output terminal and the adjacent input terminal, enabling the use of the same signal for multiple purposes without the need for additional wiring.

Each terminal channel is versatile and can accommodate various connection needs. Sensor wires can be connected directly to another Terminal Station, allowing for daisy-chaining or extended network configurations. Alternatively, sensor wires can be connected to a readout unit, such as a display or data logger, for immediate monitoring and data collection.

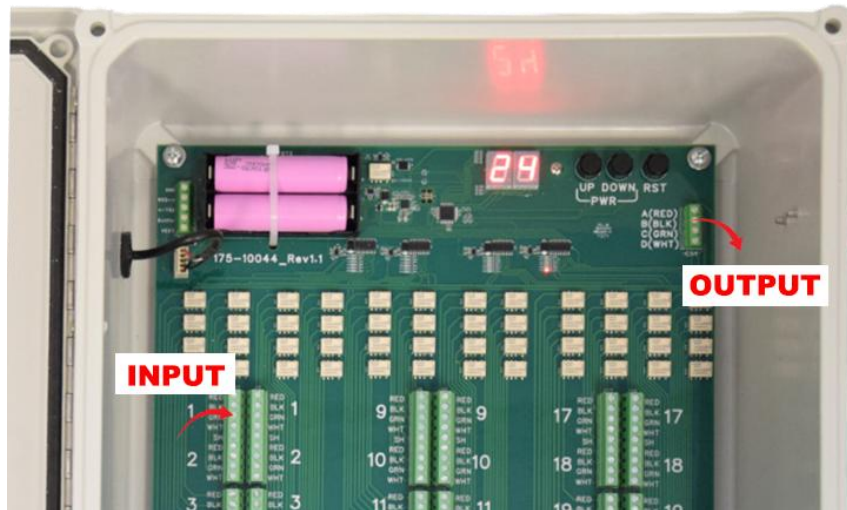


Figure 3: Signal Output Through Designated Output Terminal

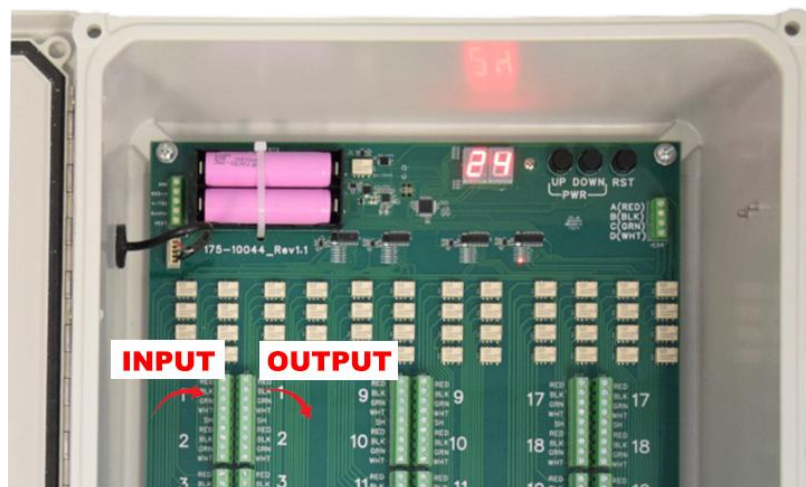


Figure 4: Signal Output Through Dual-Feed Function/Pass-Through Wiring



**NOTE:** If using the dual-feed function/pass-through wiring, the user is encouraged to keep track of the wires to ensure proper connections.

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## 5.2 FEATURES

- Simple operation to select desired sensor channel
- Includes ground lug for connection to a grounding rod for surge protection
- Rugged NEMA-4X (IP65) enclosure minimizes effects of harsh weather environments and minor impacts
- Clearly labelled terminal blocks for easy reading
- Dual-feed function provides maximum data handling flexibility in field

## 5.3 APPLICATIONS

Terminal Stations are commonly used where a single, organized enclosure is required for selecting installed vibrating wire sensors and their thermistors for quick and easy manual readings. It acts as a multiplexer allowing the end user to read multiple sensors using the same readout.



## 6 TERMINAL STATION PANEL OVERVIEW

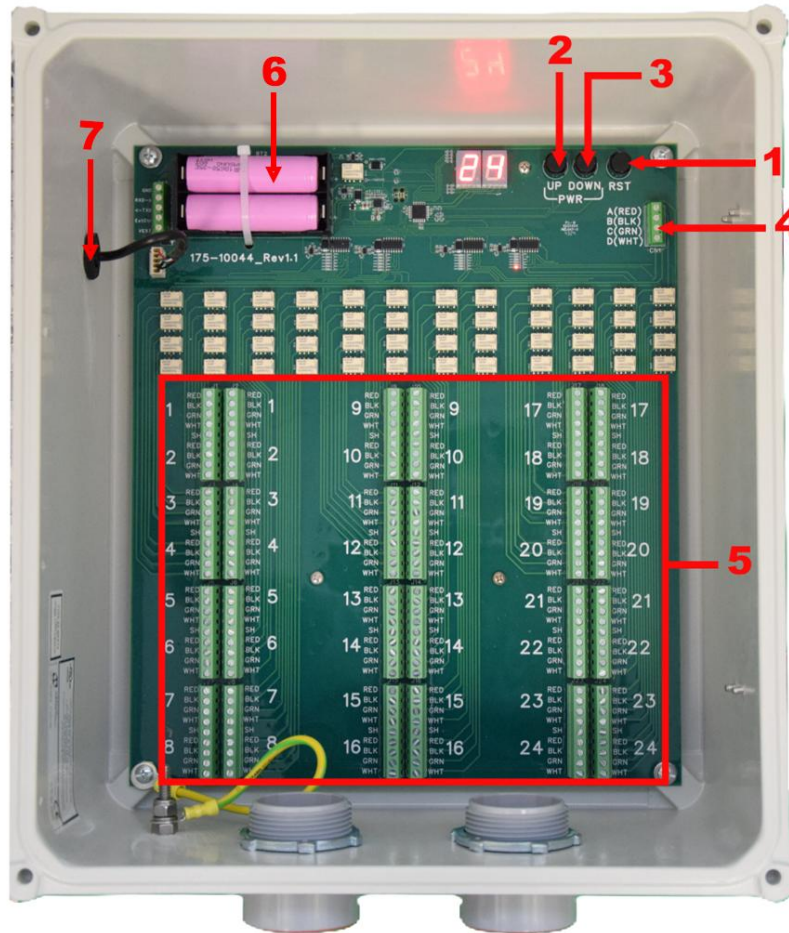


Figure 5: Terminal Station General Internal Layout

The main components of the Terminal Station are as follows:

- 1. Reset Button**  
Powers on the device and resets settings
- 2. Up Button**  
Moves up through input channels
- 3. Down Button**  
Moves down through input channels
- 4. Output Terminals**  
Interface for manual readout devices
- 5. Input Terminals**  
Interface for vibrating wire sensors and thermistor connections

## 6. Rechargeable 18650 Batteries and Battery Holder

Power source for the Terminal Station

## 7. USB Charging Port

Facilitates recharging of the two 18650 batteries

# 7 TERMINAL STATION OPERATION

## 7.1 REQUIRED COMPONENTS/ACCESSORIES

- Terminal Station to Readout Connector Cable
- USB Mini-B for charging batteries

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→ **NOTE:** Please note that only the charging cable is included with the order. The AC/DC charger is not included with the shipment and must be sourced separately.

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## 7.2 POWERING ON

To turn on the Terminal Station, press the **Reset** button **once**.

## 7.3 POWERING OFF

### 7.3.1 Manually Powering Off

Press and hold both the **Up** and **Down** buttons simultaneously until the device powers down.

### 7.3.2 Automatic Power-Off

The device will automatically shut down after 3 minutes of inactivity to conserve battery life.

# 8 TERMINAL STATION CONFIGURATION AND OPERATION

## 8.1 SETTING UP SENSORS AND OUTPUTS

The terminal station can be connected to different types of sensors.

The example provided in this section shows the procedure for reading a Vibrating Wire Piezometer (VWP) using a VW2106 Readout.

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→ **NOTE:** For more information on the RST VW2106 Vibrating Wire Readout, visit: <https://rstinstruments.com/product/vw2106-vibrating-wire-readout/>

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### 8.1.1 Connecting Input Terminals

Connect vibrating wire sensors and thermistors to the input terminals to enable sensor data readings. See Section 8.3 for wiring.

### 8.1.2 Connecting Output Terminals

Connect the output terminal to a compatible readout device, such as the VW2106 readout, to display sensor data. See Section 8.2 for wiring.

## 8.2 OUTPUT TERMINAL WIRING AND CONNECTION



**NOTE:** Refer to this wiring guide as needed when setting up or maintaining the Terminal Station in the field.

**Ensure proper wiring to avoid data errors.**

The output terminal on the Terminal Station features four designated positions, each dedicated to a specific wire connection.

Table 1: Output Terminal Wiring Table

Position	Wire Color	Function
A	Red	Signal (+)
B	Black	Signal (-)
C	Green	Thermistor (+)
D	White	Thermistor (-)

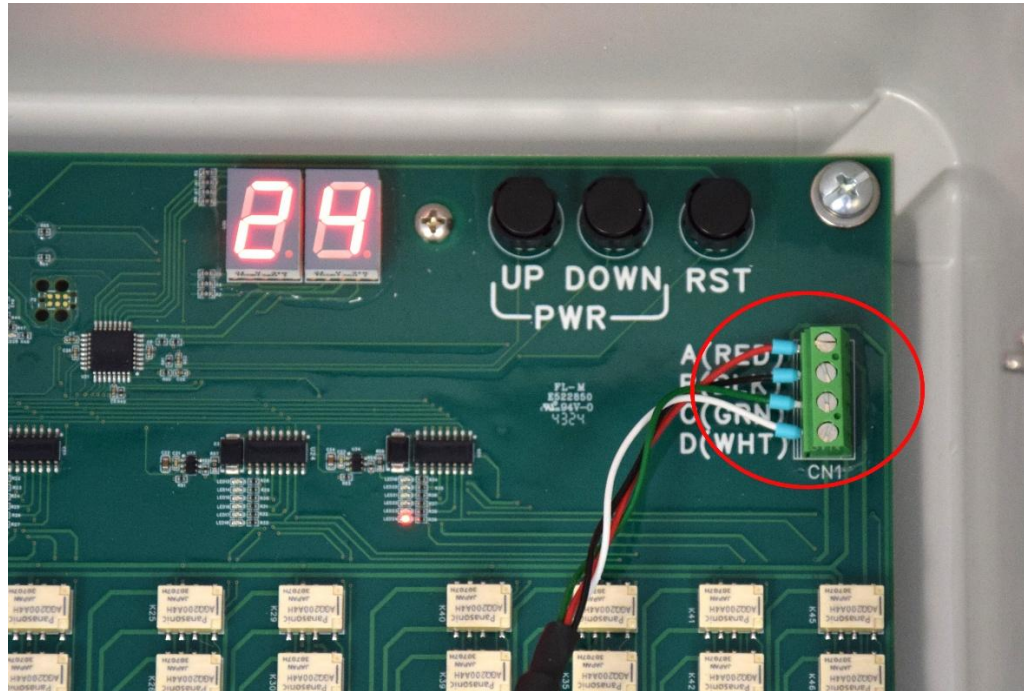


Figure 6: VWP Output Terminal Wiring Detail

### 8.2.1 Connection Instructions

1. Connect each wire to its designated position as shown in Table 1.
2. Ensure proper connections before powering on the Terminal Station for accurate readings.

## 8.3 INPUT TERMINAL WIRING AND CONNECTION

To connect the sensor instrument cables to the input terminals, following the steps below:



**NOTE:** Ensure all wires are securely connected to their appropriate terminals before initiating readings.

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1. Insert the stripped ends of the instrument cable into the matching labeled positions on the input terminals.
2. Refer to the table below for the standard color codes and corresponding wire transducers.

Table 2: Input Terminal Standard Wiring Color Codes

Wire Color	Wire Transducer
Red	Coil (+)
Black	Coil (-)
Green	Therm (+)
White	Therm (-)
Bare	Shield

## 8.4 READING VWP – CHANNEL SELECTION

Use the Up or Down button to scroll through and select the desired input channel for sensor readings. The reading from the VWP will be displayed on the VW2106.



**NOTE:** For more information on operating the RST VW2106 Vibrating Wire Readout, navigate to the Downloads section at:

<https://rstinstruments.com/product/vw2106-vibrating-wire-readout/>

**For more information, contact RST Instruments.**



Figure 7: Up/Down Selection Button Detail



## 9 MAINTENANCE TIPS

- **Battery Charging (USB Charging Port: 0.5 A at 5 V):**  
Charge the two 18650 batteries fully before first use, and recharge as needed to maintain uninterrupted operation by using the USB port on the panel.
  - To charge the battery, connect the mini-USB cable to the USB port located on the exterior left side of the enclosure (see Figure 8). Connect the USB-A end to a charging source.

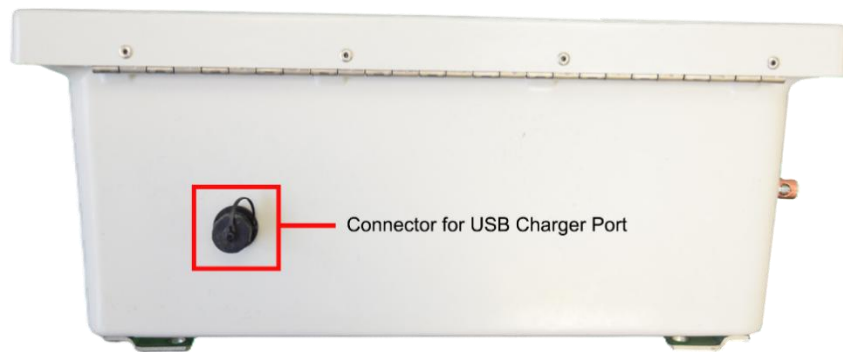


Figure 8: Connector for USB Charger Port Location

- The battery indicator LED light on the PCB has been labeled in Figure 9.
- The red battery indicator LED light will turn on when the batteries are being charged. The red light will only be active when a charging source has been connected, i.e. a USB charger has been connected to the port.
- The light will turn off when the batteries are fully charged.
- If the battery LED is flashing, the batteries are depleted and will need to be replaced.
- It takes approximately 12 hours to charge the batteries from empty to fully charged.

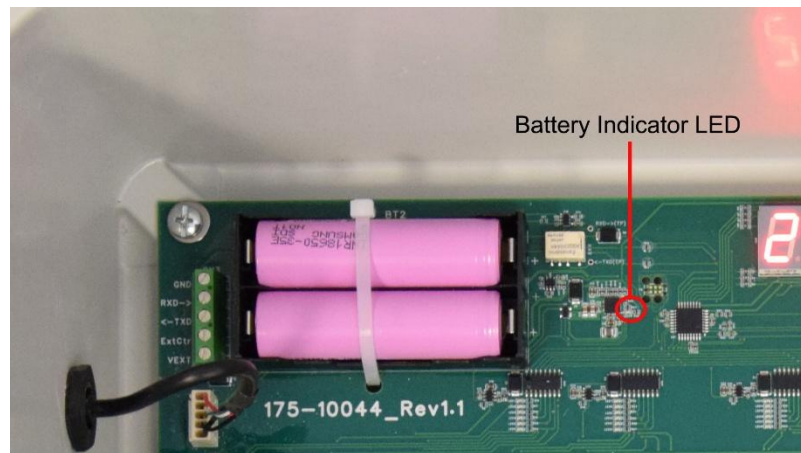


Figure 9: Battery Indicator LED Location on PCB

- **Inactivity Timeout:**  
The Terminal Station will shut off automatically after 3 minutes of inactivity to preserve battery life.
- **Cleaning:**  
Periodically clean the device to remove dust and debris, especially around the terminals and enclosure lid to maintain weather resistance.

## 10 TROUBLESHOOTING



**NOTE:** Troubleshooting for the Terminal Station is mainly to do with checking the battery and ensuring it is sufficiently charged. This product does not contain any user-serviceable parts. For additional troubleshooting support, repairs, or service, contact RST Instruments.

## 11 PRODUCT SPECIFICATIONS

Item	Specification
Power Source	2x 18650 rechargeable batteries
Power Source Capacity	3700 mAh (for each 18650 rechargeable battery)
Switching Current	0.5 A (typical)
Operating Current (Terminal Station)	0.12 A
Number of Channels	24 channels for sensor inputs (1 channel: 1x VW sensor, 1x thermistor)
Compatible Sensors	VW sensors (with or without thermistors)
Output Connection	Compatible with VW2106 VW Readout or similar
Automatic Power-Off	After 3 minutes of inactivity
Battery Life Estimate	30 hours of operation on a full charge
Enclosure Rating	NEMA 4X, IP65
Enclosure Dimensions	24 channel (4 pole): 359 x 311 x 156 mm (14 x 12 x 6 in.)
Switch Life	25,000 cycles minimum
Insulation Resistance	>10,000 MΩ
Initial Contact Resistance	100 mΩ

## 12 SERVICE, REPAIR AND CONTACT INFORMATION

This product does not contain any user-serviceable parts. Contact RST for product services or repairs.

- For sales information: [sales@rstinstruments.com](mailto:sales@rstinstruments.com)
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