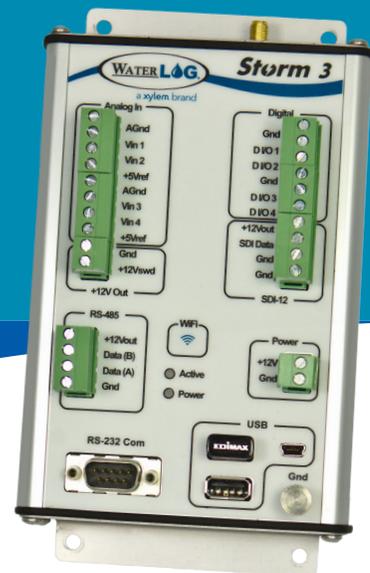




# Storm 3

GETTING STARTED GUIDE



a xylem brand

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This guide is a brief overview of the Storm 3 data logger and its basic features. Additional communication options that can be connected to the Storm Central cloud server, including cellular modems and GOES satellite transmitter support, are not included in this guide. Please refer to [waterlog.com/storm](http://waterlog.com/storm) or contact your sales representative for more information. Updated manuals, new firmware updates, brochures, technical notes, and supporting software are available.

For additional assistance, please contact us at +1.435.753.2212 or [sales@waterlog.com](mailto:sales@waterlog.com)



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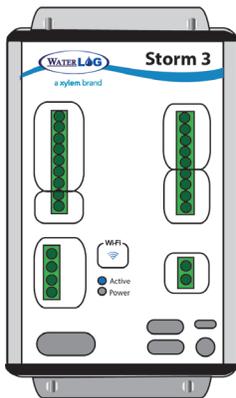
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# 01 / GET TO KNOW YOUR STORM 3

What's in the Box  
Hardware: Left Side  
Hardware: Right Side

## Get to Know Your Storm 3

The WaterLOG® Storm 3 is a mid-range data logger with an ideal cost-to-performance ratio. Built with communications in mind, the Storm 3 supports both internal and external cellular modems and GOES satellite radios. Its balanced set of I/O includes four analog inputs, four independently configurable digital I/O, SDI-12, RS-485 and RS-232 serial connections. The Storm 3 requires no special software and is easily configurable through either its direct USB connection or Wi-Fi interface supporting all standard web browsers on PCs, tablets and smart phones. Other key features include library-based sensor setup, built-in help menus, intuitive browser-based Graphical User Interface (GUI) and more.



### What's in the Box

When unpacking your Storm 3, make sure all the components ordered are received and undamaged from shipping. The basic package includes the following:

**Storm 3 Main Unit**



**Sensor/Power/Communication Terminal Blocks**

4 Four position blocks, 2 Three position blocks, 2 Two position blocks



**USB Communication Cable**

Standard USB-A connector to Mini-B connector, 6 feet



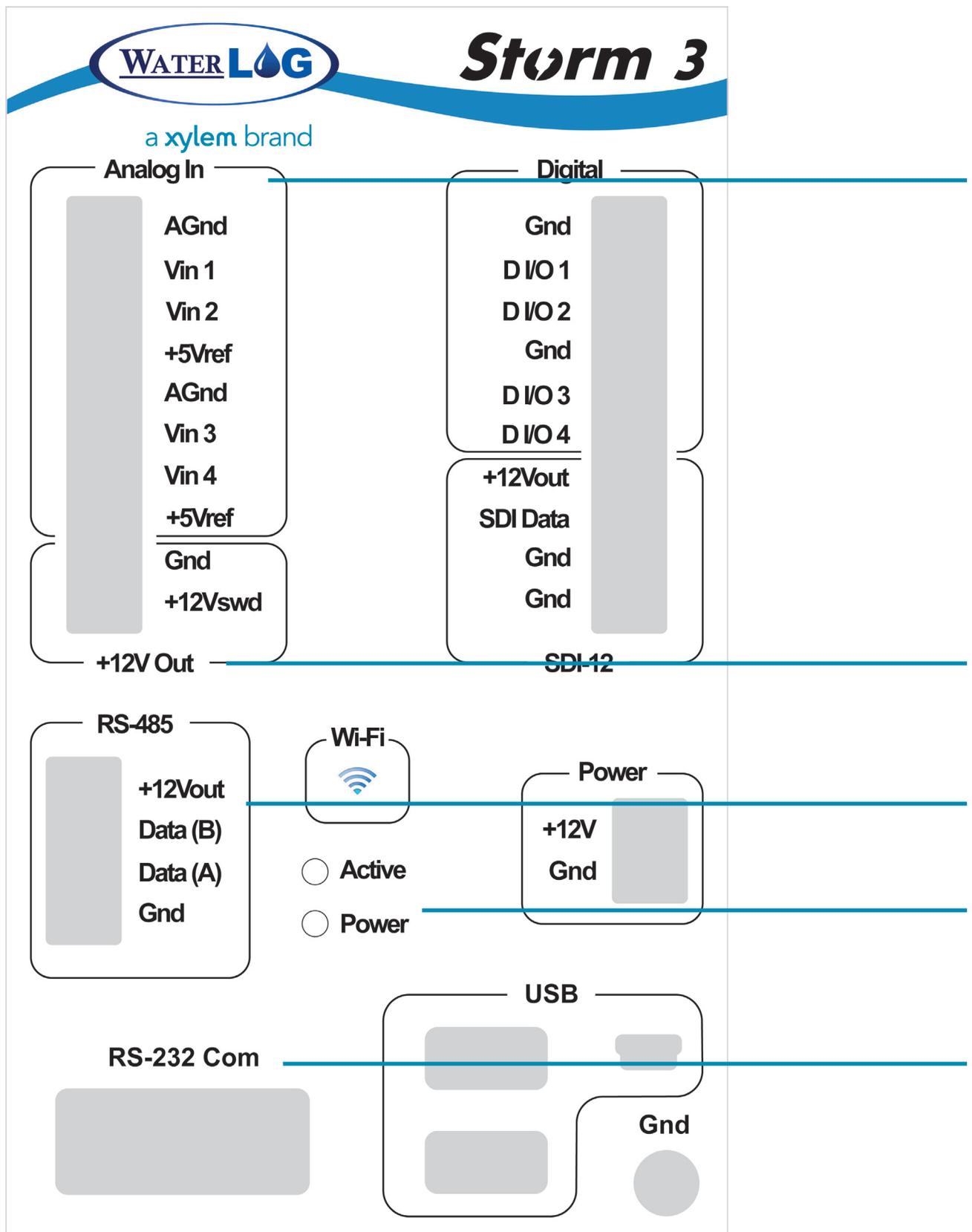
**Wireless (Wi-Fi) USB Adaptor**



**Dust Caps For The RS-232 Port and USB Ports**

# HARDWARE

## LEFT SIDE CONNECTIONS



## Analog

There are four analog input channels labeled Vin1 to Vin4. They are grouped in sets of two with each set having a common ground and +5Vref terminal connection. The standard input range for all channels is 0 to 5 volts. The Analog to Digital converter is highly accurate and can accurately measure low level (microvolt) signals.

There are two analog ground connection points. In order to preserve signal integrity, it is important to use the analog grounds only for sensors connected to the analog section. The current flowing through an analog sensor is relatively small and normally very stable. If a digital sensor is connected to an analog ground, the currents from the digital sensor will flow through the analog circuitry causing voltage level shifts and noise based on digital switching. Power and digital grounds should not be connected to analog grounds.

The +5Vref output is used for analog sensors requiring a precision reference voltage. The maximum output current is 10 milliamps. The Analog to Digital converter uses this excitation for its reference to provide a ratio-metric relationship for sensors using this excitation.

## +12 Volt

The Switched +12 volt excitation is provided to power sensors, and by default, this port is not powered. The +12Vswd port can be configured to turn on only during a measurement (to save power) or to remain on all the time.

## RS-485

A four position terminal block is provided for the RS-485 connection. This port can be programmed to communicate with RS-485 sensors or other RS-485 devices.

## Active and Power LEDs

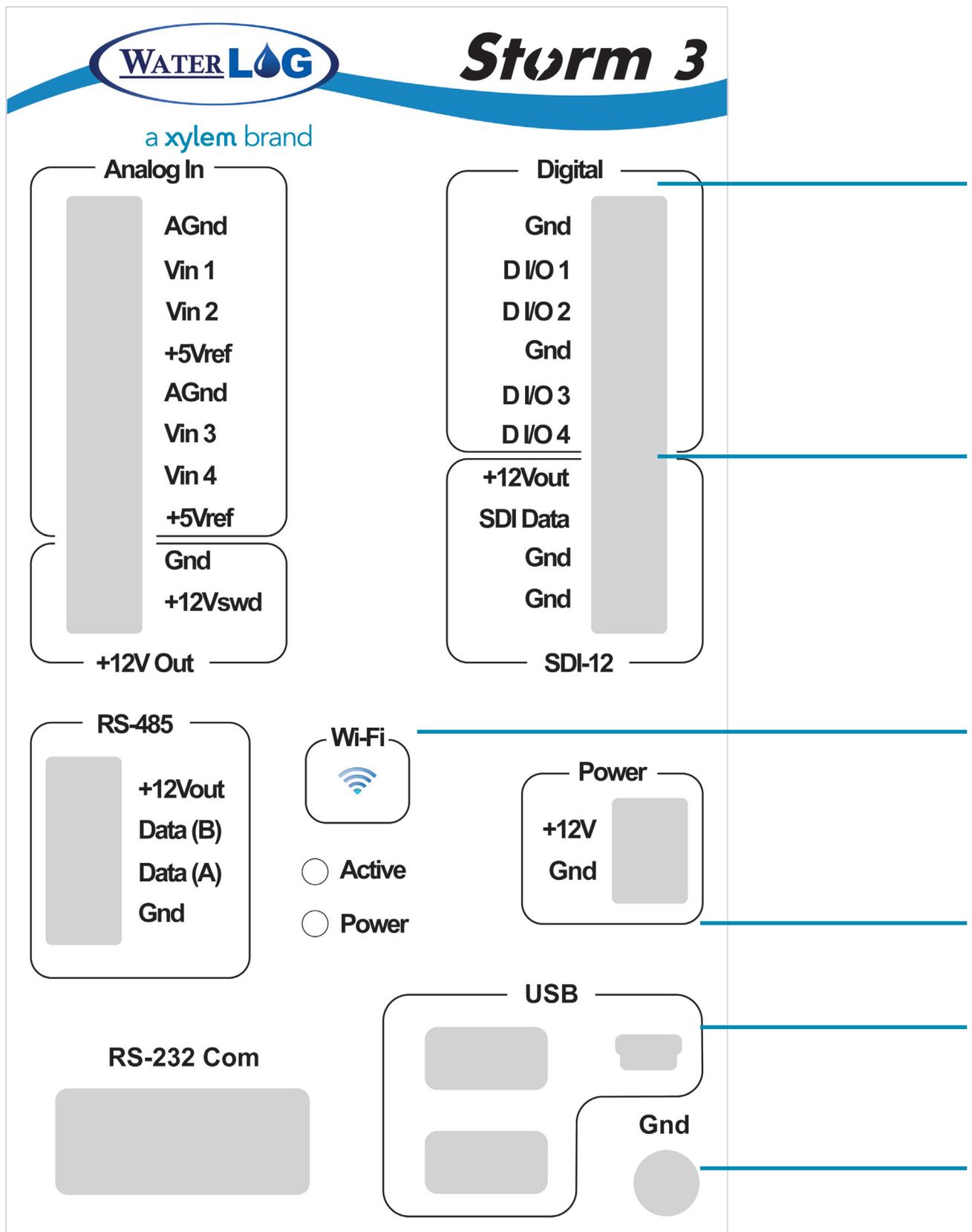
The Active LED will blink when the system is not in the low power sleep mode and performing some activity. The Power LED will blink about every five seconds when proper power has been applied to the system.

## RS-232

The RS-232 port provides a connection to a PC, cellular modem, GOES transmitter, remote display, or other standard serial sensors and communication equipment. The port is configured as a DTE type of device. This means it will plug directly into a modem (DCE type device), but will require a NULL modem adaptor and gender changer if connected to a PC (DTE type device).

# HARDWARE

## RIGHT SIDE CONNECTIONS



### Digital I/O

The Digital I/O connections can be configured independently as inputs or outputs. In input mode, the signal has an internal pull up resistor of 47K Ohms. This allows a switch closure to ground to activate the input. It can also be driven using normal 5 volt logic levels. Each port can also be set up as a counter input for applications such as a tipping bucket rain gauge. As an output, a 100-Ohm protection resistor limits the drive capability. The output will still be about 4.0 volts with a load of 10.0mA or less.

### SDI-12

The SDI-12 port operates as a "Master", is V1.3 compliant and compatible with standard SDI-12 sensors. SDI-12 sensors have a minimum of three wires, which are +12V, Data, and Ground. If connecting several SDI-12 sensors to the system, then an external bussed terminal strip may be helpful. The +12Vout excitation grouped with the SDI-12 connections is active any time power is applied to the unit. It cannot be turned off. There are two internally connected ground connections for convenience, as some sensors have both a ground and a shield wire. In some cases, the shield wire from the sensor should be connected to the case shield connection point provided.

### Wi-Fi Button

The Wi-Fi button can be gently pressed to activate the Wi-Fi signal (this is a capacitive button and therefore may not work if using gloves). The USB Wi-Fi adaptor must be plugged into one of the USB Host ports for the Wi-Fi button to work properly. The Active LED will turn on for a couple of seconds when the button is successfully pressed. Wi-Fi adaptors power off automatically after three minutes of inactivity.

### Power Connection

The Power input uses a separate 2 position connector so the power can be disconnected individually.

### USB

Two USB-A connectors and one mini-B are provided, allowing direct connection to an external device such as a Wi-Fi adaptor, laptop, tablet, or USB flash drive. USB flash drives can be used to download data, save or load configuration files, and load firmware updates.

### Ground Lug

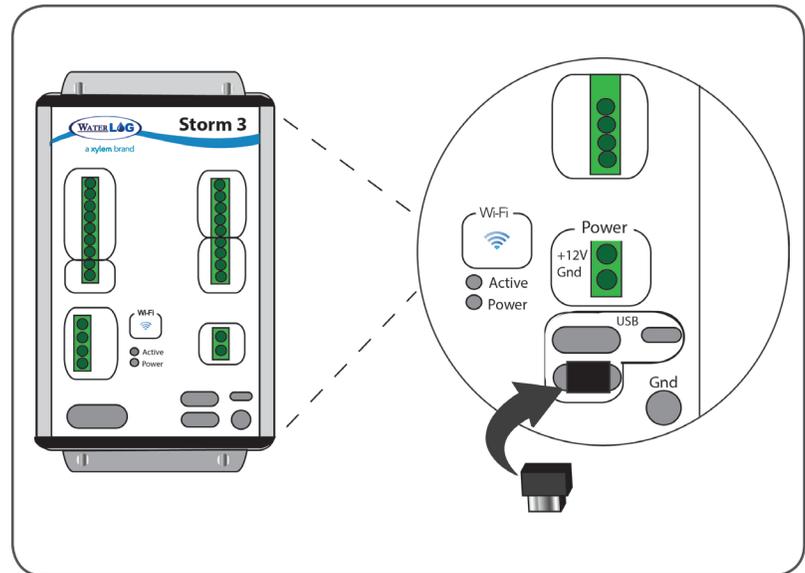
Proper shield or earth grounding should be used to protect the equipment from exposure to ESD and other induced interference.

# 02 / CONNECT TO THE STORM 3

- LED Indicators
- USB Wi-Fi Connection
- USB Cable Connection

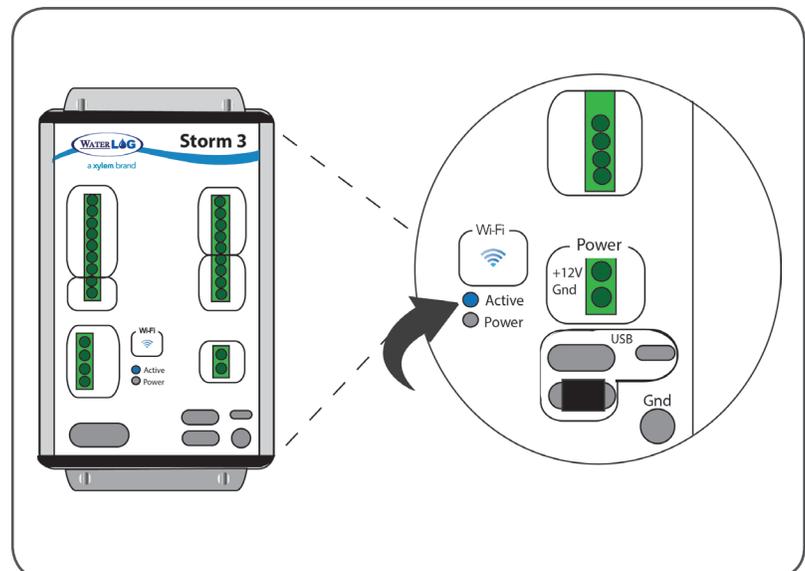
## Connect To The Storm 3

The Storm 3 contains a built-in graphical user interface, accessible by either a Wi-Fi or cable connection. No special software is needed to access the user interface. All computers, laptops, tablets, smart phones, and other equipment containing either a Wi-Fi connection or USB port can communicate with and configure the Storm 3 data logger. The Wi-Fi connection works automatically, whereas the device cable requires a one-time install of the communication driver on the PC or other device used to communicate with the Storm data logger.



## LED Indicators

As the Storm 3 has no built-in display, the startup sequence and the Power and Active LEDs detail what is happening internally on the Storm data logger. Upon applying power to the Storm, the Power LED will begin its regular five second blink pattern. Within a few seconds, the Active LED will turn on as well, showing solid initially, and then begin blinking. When the blinking stops and the Active LED is no longer lit, the Storm has completed its boot sequence and has entered its low-power sleep. The entire boot sequence typically occurs within 30 seconds.



The Wi-Fi adaptor or USB device cable can be used any time after the Storm has finished booting to awaken the Storm and begin communication. When a connection has been set up on the Storm, the Active LED will blink every few seconds, indicating the Storm is awake and ready.

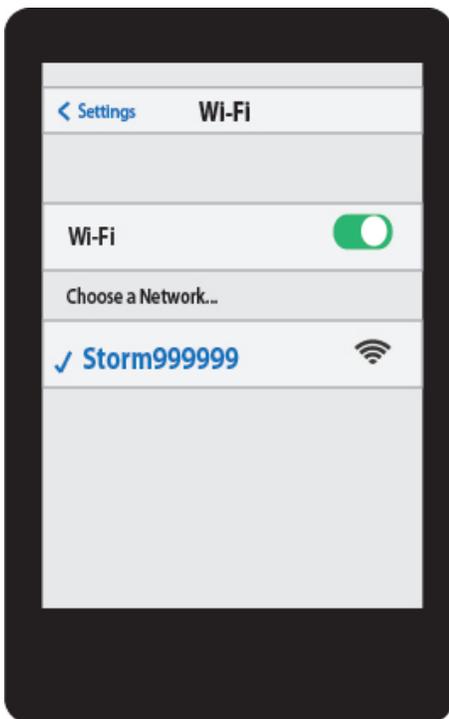
# USB CONNECTION

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## USB WiFi Connection

To wirelessly connect to the Storm 3 data logger, either plug in the USB Wi-Fi adaptor or, if the Wi-Fi adaptor is already connected to the Storm, press the Wi-Fi button on the front of the Storm to enable the Wi-Fi connection. The Storm will begin setting up a Wi-Fi hotspot. After a few seconds an internal LED on the Wi-Fi adaptor will begin blinking, indicating the hotspot connection is ready. The hotspot connection will typically become available within ten seconds.

Once the hotspot is active, navigate to the Wi-Fi networks setting of your Wi-Fi enabled device. Refreshing the list should reveal a Storm Wi-Fi hotspot. Connect to the hotspot. Connecting to the hotspot's network generally occurs within ten seconds. After successfully connecting, open a web browser and navigate to <http://172.20.20.20/>. If the hotspot connection was successful, the Storm 3 user interface will appear in the browser window.



### iOS

Wireless networks appear under the Settings application, listed under the Wi-Fi topic. Wireless networks are automatically refreshed every few seconds. Simply touch a network to connect to it. A checkmark will appear next to the network once a connection has been made. Open the Safari web browser and navigate to <http://172.20.20.20/>.

### Windows 7

Wireless networks appear under the "Network Status" icon in the system tray, next to the clock. Left click on the Network Status icon to show available wireless networks. The listing of wireless networks can be refreshed by pressing the Refresh button in the upper right corner. Select the Storm network and press the Connect button. Once the connection has been established, open Internet Explorer and navigate to <http://172.20.20.20/>.

Note: The user interface will be displayed on only one hardware connection (Wi-Fi or USB device cable) at a time. The USB Wi-Fi connection takes precedence when plugged in. Thus if using the USB device cable, be sure to have the USB Wi-Fi adaptor unplugged from the data logger. Or if the USB device cable is currently active, the Wi-Fi adaptor will have no effect when plugged in (i.e. the Wi-Fi signal will not be activated). The USB device cable supports a single connection whereas multiple devices can connect to the Wi-Fi adaptor at the same time.

## USB Device Cable Connection

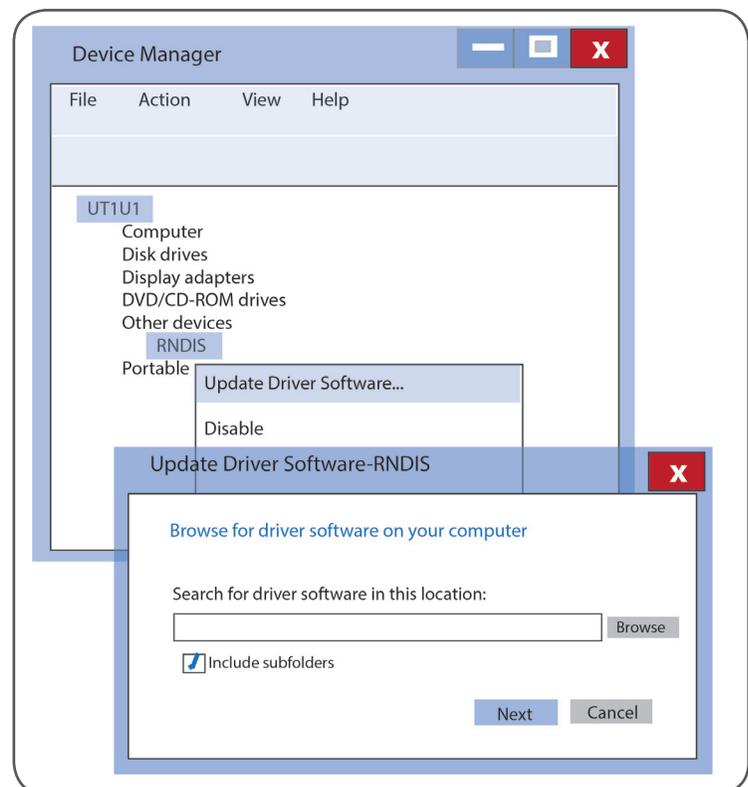
To connect directly to the Storm data logger, the supplied USB device cable can be used. The first use of the device cable will require a simple driver to be installed for communication. The driver is stored internally on the Storm and becomes available when the USB device cable is plugged in. After the driver has been installed, a new network connection will be established with the Storm. This typically occurs within ten seconds. Once the network has been established, open a web browser and navigate to <http://172.20.20.20/>. If the connection was successful, the Storm 3 user interface will appear in the browser window.

### Windows 7 Driver Installation

First-time use of the Storm with a PC will attempt to automatically install the drivers for the Storm 3. As the drivers will not be automatically discovered, the driver will need to be manually installed. This can be done through the Device Manager.

To open the Device Manager, first navigate to the Control Panel, then System and Security > System > Device Manager (or just System > Device Manager if using classic icons).

Look for a device labeled RNDIS with an exclamation mark next to it. Right click on the RNDIS label and select Update Driver Software. Select "Browse my computer for the driver software". Then click the "Browse" button and choose the drive letter listed for "Removable Disk". The "Removable Disk" is created by the Storm when the USB Device cable is plugged in. Press Next. The Storm driver should be found and will begin installing.



A warning window may appear noting "Windows can't verify the publisher of this driver software". Select the "Install this driver anyway" option and the driver installation will complete. The driver only needs to be installed on the first connection for this device. After the driver has finished, disconnect and reconnect the USB device cable to initialize the network connection. Once the connection has been established, open Internet Explorer and navigate to <http://172.20.20.20/>.

# 03 / USER INTERFACE

- Home Page Navigation
- Set Date & Time
- Adding & Configuring Sensors
- Enabling Scanning
- Download Data

## Home Page Navigation

Once connected to the Storm 3 data logger, the above interface will become available within a web browser. The interface is divided into three main components:

### Navigation Pane

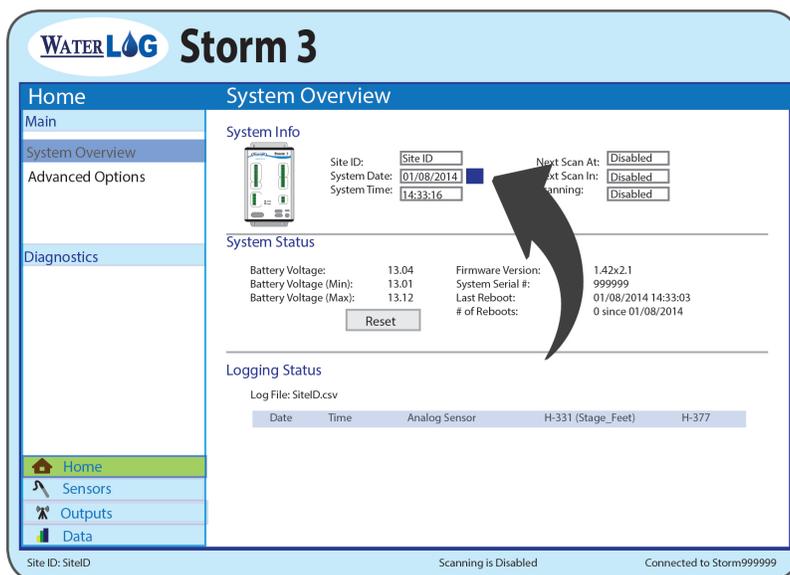
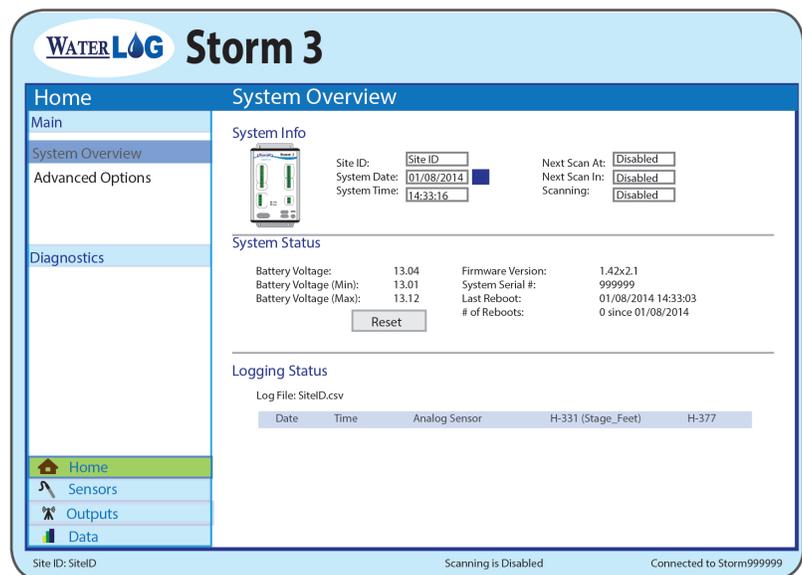
The left side contains the navigation pane and any additional screens.

### Current Screen Content

The right side contains the content for the current screen. Contextual help is available on each screen by clicking the question mark icon in the upper right corner.

### Site ID, Connection and Status

The bottom of each screen contains the status of "Scanning" (i.e. whether the data logger is actively taking measurements, recording data, transmitting, etc.) as well as the current connection status.



## Set Date and Time

The SiteID, date, and time can all be set on the initial Home > System Overview screen. To change any of the settings, simply click on the current setting and type in a new value. The date can be set by using the calendar icon next to the entry field to more easily select a specific date.

Pressing enter or leaving the entry box will cause the values to be saved.

# SENSORS

## Adding & Configuring Sensors

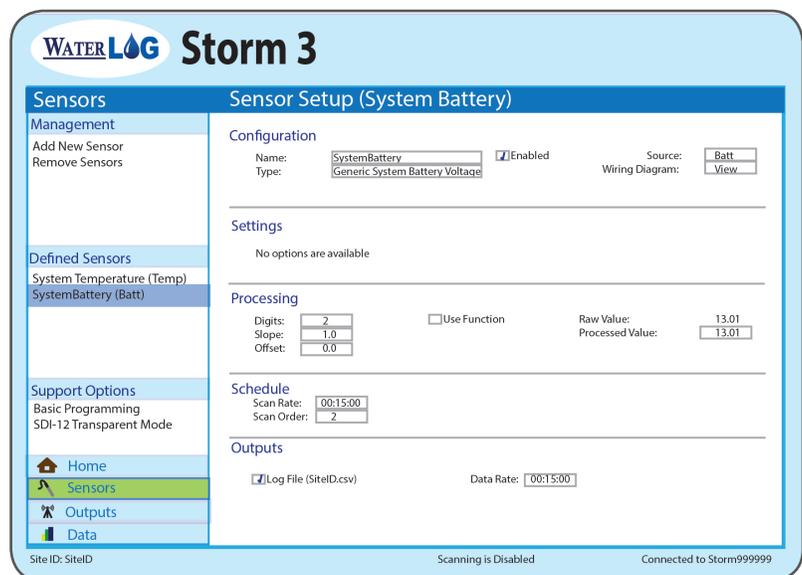
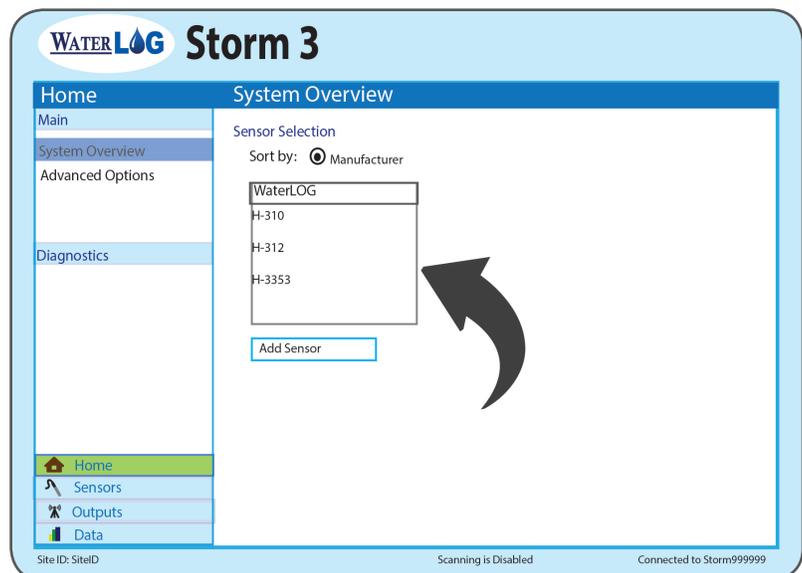
The Storm 3 data logger uses a set of sensor libraries to quickly and easily configure the system. Sensors can be added and configured by pressing the Sensors button near the bottom of the navigation pane.

New sensors can be added by selecting a sensor from the available dropdowns. If a sensor isn't listed within the library options, the Generic Sensor Type can be used for the sensor type. For example, an analog sensor that was not listed under the available libraries could still easily be used by selecting the Generic Analog Sensor option.

For every sensor that has been added, a Sensor Setup screen will become available under the navigation pane. The name of the sensor will be displayed as the navigation link. Sensors will have different settings available based on their sensor type.

The sensor will be measured based on the scan rate listed under the Schedule section of the Sensor Setup screen. The format is HH:MM:SS (hours, minutes, and seconds) in 24-hour format.

Each sensor measurement can be saved to the internal memory of the Storm data logger by using the Log File output option. Simply check the checkbox under the Outputs section for the sensor to record to the indicated log file. The ordering within and additional information about the log file itself can be found by pressing the Outputs button in the navigation pane on the left of the screen.





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