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USER'S GUIDE

iServer 2

Virtual Chart Recorder and Webserver

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1. Notes, Cautions, and Warnings

If the equipment is used in a manner not specified in this manual, the protection by the equipment may be impaired.

Do not operate the equipment in flammable or explosive environments.

It is important to read and follow all precautions and instructions in this manual before operating or commissioning this device as it contains important information relating to safety and EMC. Failure to follow all the safety precautions may result in injury and/or damage to the equipment.

The following identifiers provide information that is especially important to note:

Note: Provides information that is important to successfully set up and use the iServer 2.
Caution, Warning, or Important: Informs of circumstances that can affect the functionality of the instruments and must refer to accompanying documents.

1.1. Security and Public Data Access (Port Forwarding)

The iServer 2 is designed to be used in a secure, local-area network (LAN) using a private address. Exposing the device to public Internet traffic through Port Forwarding or similar methods may lead to significant security risks to the user's network and data. OMEGA Engineering cautions users against exposing the iServer 2 to public access through Port Forwarding.

2. Introduction

The iServer 2 virtual chart recorder and webserver offers an intuitive way to collect and display live sensor readings through a web-based user interface or by integrating the device into an existing Omega Link Cloud account.

An iServer 2 unit can accept up to two Omega Link Smart Probes through an M12 connector accessory (PN#: **M12-MT-079-2F** cable is required for dual Smart Probe functionality, sold separately) or two thermocouples through thermocouple ports, depending on the model purchased.

Model No.	Model Name	Sensor Type	Description
iS2-THB-B	iServer 2 – Basic	Smart Probe	Virtual chart recorder and webserver with M12 Smart Probe compatibility, 1x USB port
iS2-THB-ST	iServer 2 – Standard	Smart Probe	Virtual chart recorder and webserver with M12 Smart Probe compatibility, 4.3" LCD, 1x USB Port, Digital I/O and Relays
iS2-THB-DP	iServer 2 – Deluxe Probe	Smart Probe	Virtual chart recorder and webserver with M12 Smart Probe compatibility, 4.3" LCD, 1x USB Port, Digital I/O and Relays, Power over Ethernet
iS2-THB-DTC	iServer 2 – Deluxe Thermocouple	Thermocouple	Virtual chart recorder and webserver with 2x Thermocouple ports, 4.3" LCD, 1x USB Port, Digital I/O and Relays, Power over Ethernet

The iS2-THB-ST, iS2-THB-DP, and iS2-THB-DTC feature 2 configurable digital I/O and relay ports. These can be used for a myriad of applications including driving relays or physical alarms. The iServer 2 can also be utilized as an edge controller, with autonomous independent decision-making capabilities to generate local alarms or provide control outputs based on sensor inputs. A fully configurable alarm system is available in the web UI to create events and thresholds that will trigger a notification should those conditions be met. A modern notification system allows users to be notified via email or text. Omega Link compatible devices, such as the iServer 2, can be added to an existing Omega Link Ecosystem to provide data anytime, anywhere, by first adding the iServer 2 device to an Omega Enterprise Gateway account and then adding that account to the Omega Link Cloud.

3. Hardware Setup

The iServer 2 can be assembled to be mounted in a variety of ways. Refer to the following sections for instructions on how to assemble the hardware for different applications. The physical reset button is located on the left side of the iServer 2 unit as shown in the figure below.

3.1. Wall Mounting and DIN Rail Assembly

All models of the iServer 2 are wall-mountable and come with an optional DIN rail bracket. The distance between the two wall-mounting screw holes is 2 ¾" (69.85 mm). To attach the DIN rail bracket hardware, locate the two screw holes on the underside of the unit and use the two included screws to secure the bracket in place as indicated in the figure below:

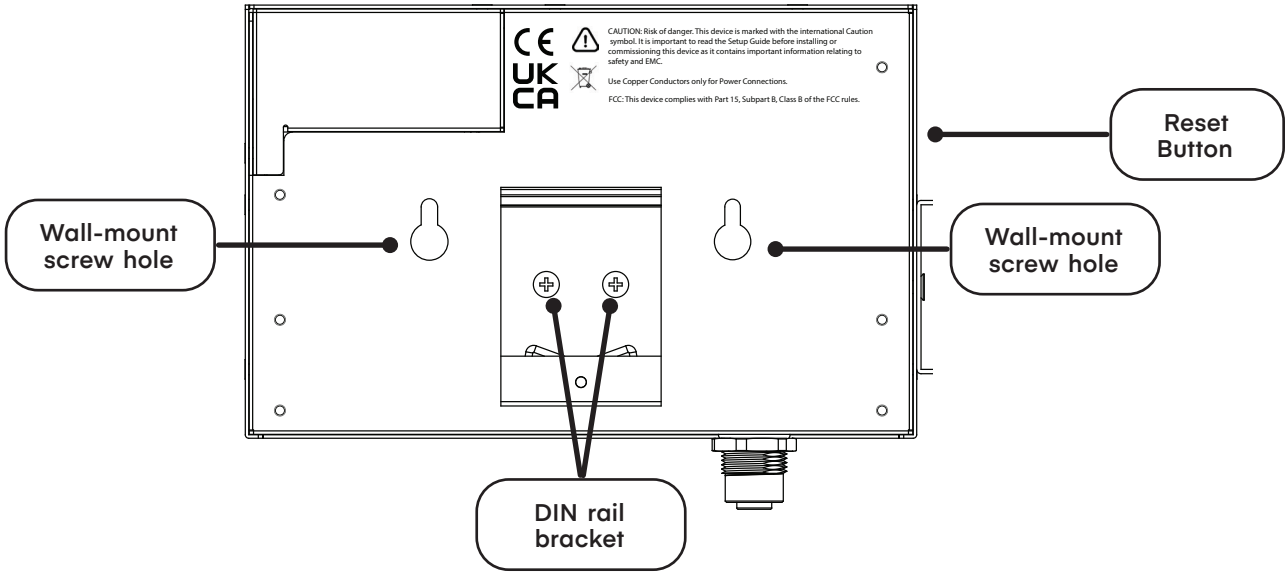


Figure 1: DIN rail bracket and wall-mount screw hole locations

3.2. Smart Probe Bracket Assembly

The iS2-THB-B, iS2-THB-ST, and iS2-THB-DP come with a Smart Probe Bracket and stand-off extenders to mount the Omega Link Smart Probe 1 ½" away from the unit.

Step 1: Locate the two screw holes on the left side of the unit and screw in the standoff extenders. For accurate sensor readings, the standoff extenders are highly recommended.

Step 2: Align the screw holes of the smart probe bracket with the standoff extenders and use the two included screws to secure the bracket in place as indicated in the figure below.

Note: Ensure the wider end of the bracket opening is pointing upwards.

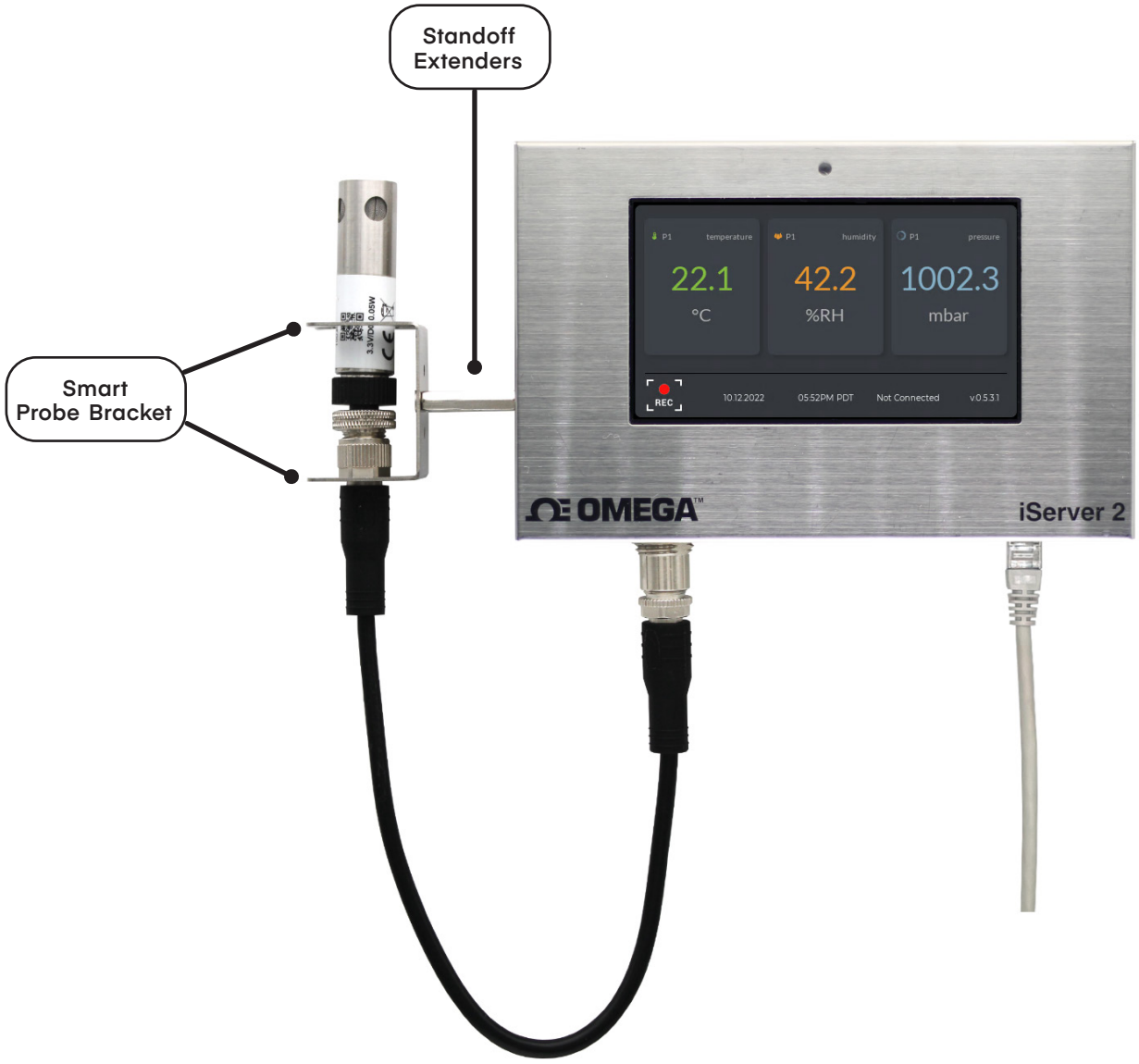


Figure 2: iServer 2 unit with standoff extenders and smart probe bracket attached

4. Sensing Device Setup

The sensing device setup will vary for the smart probe and thermocouple variants of the iServer 2.

M12 Omega Link Smart Probes Models

- iS2-THB-B
- iS2-THB-ST
- iS2-THB-DP

Thermocouple Model

- iS2-THB-DTC

Refer to either the section titled **4.1 M12 Omega Link Smart Probe** or **4.2 Thermocouple Connection** to complete the sensing device setup.

4.1. M12 Omega Link Smart Probe Connection

The iS2-THB-B, iS2-THB-ST, and iS2-THB-DP can accept up to two Omega Link Smart Probes through an M12 connector (PN#: **M12-MT-079-2F** cable is required for dual Smart Probe functionality, sold separately). Begin by plugging in the included Smart Probe to the iServer 2 unit using the included M12 8-pin extension cable. Take note of the keyway on the connectors.

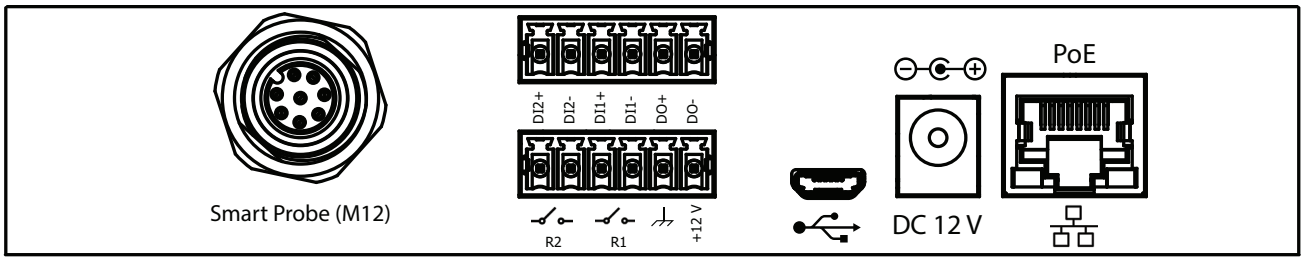
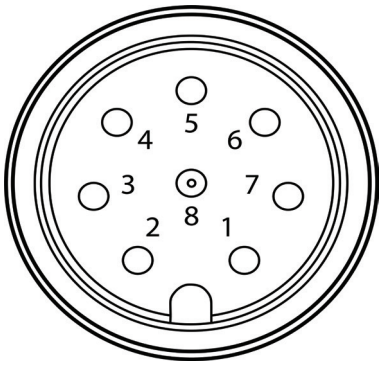


Figure 3: iS2-THB-DP with M12 Smart Probe connector



Pin	Description
Pin 1	I2C-2_SCL
Pin 2	Interrupt Signal
Pin 3	I2C-1_SCL
Pin 4	I2C-1_SDA
Pin 5	Shield Ground
Pin 6	I2C-2_SDA
Pin 7	Power Ground
Pin 8	Power Supply

Figure 4: M12 8-pin female connector for iServer 2 front view and pin layout

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Important: It is recommended that users access the digital I/O provided by the iServer 2 instead of the connected Smart Probe. Using the digital I/O of the Smart Probe may cause device operation errors. See the following section titled **4.3 Digital I/O and Relays**.

4.1.1. Smart Probe SYNC Configuration

Omega Link Smart Probes can be configured using Omega's free SYNC configuration software when connected to a Windows PC using an Omega Link Smart Interface such as the wired IF-001 or wireless IF-006. When the Omega Link Smart Probe and Smart Interface are connected to a Windows PC running SYNC, users may click the Refresh button on the SYNC interface to auto-detect the connected Smart Probe. Once the device has been detected, the user will be presented with the available configuration options.

4.1.1.1. Important Smart Probe Digital I/O Configuration

To ensure proper operation between the iServer 2 and connected Omega Link Smart Probe, Smart Probes that offer Digital I/O (DIO) must have the Digital I/O set to **Active Low** at the Smart Probe level. Setting the Omega Link Smart Probe Digital I/O to Active Low can be completed using one of the first two methods listed below:

Method 1: The factory default setting to the Digital I/O is Active Low. If the user has not changed the Digital I/O settings, there is no change needed. If the Digital I/O has been changed, a factory reset can be used to set the Digital I/O back to the default Active Low.

Method 2: Using SYNC configuration software, the user may navigate to the **Inputs** tab of the connected Smart Probe and manually change the Digital I/O of the Smart Probe to Active Low as shown below.

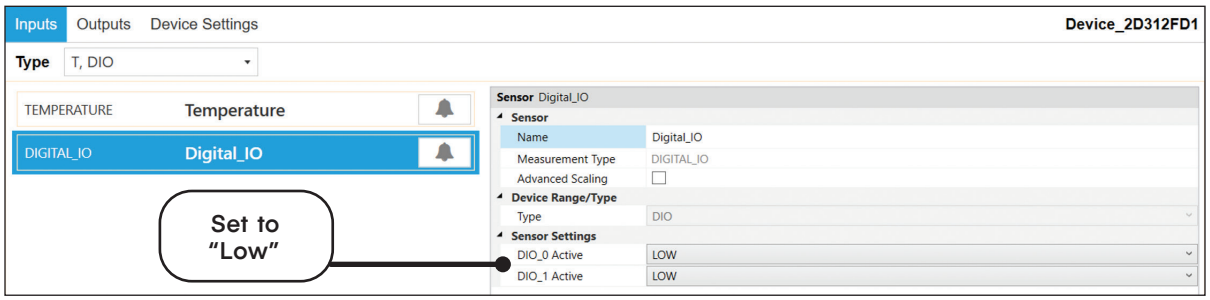

Figure 5: SYNC configuration of smart probe digital I/O set to Low

Method 3: Using SYNC Configuration software, the user may navigate to the **Type** dropdown associated with the Smart Probe and select a **Type** that does not include **DIO** as shown below.

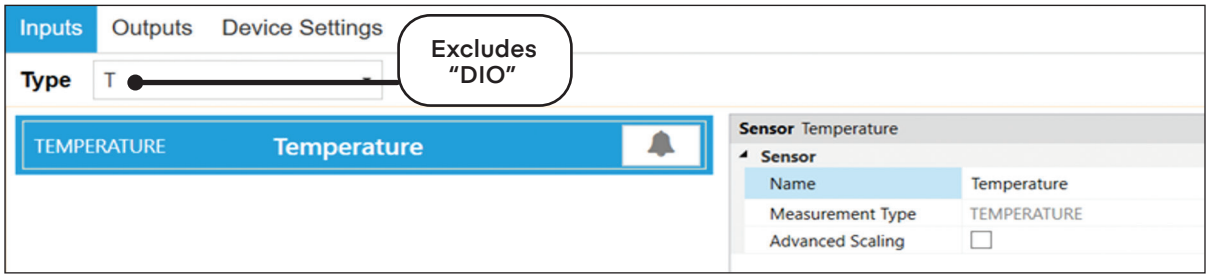

Figure 6: SYNC configuration smart probe type excludes DIO

Important: If the user proceeds with a method that requires the DIO to be manually changed in the SYNC Inputs tab (Method 2 and Method 3), the user must also ensure the DIO settings in the Output tab to be set to Active Low for **BOTH** Outputs. A **Factory Reset** also sets the Output DIO to Active Low by default.

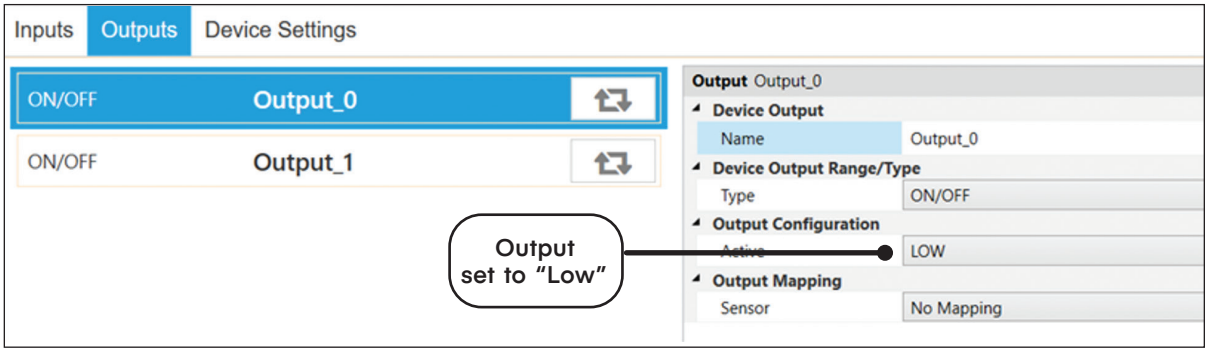

Figure 7: SYNC configuration smart probe output set to Low

4.2. Thermocouple Connection

The iS2-THB-DTC can accept up to two thermocouples. Refer to the thermocouple connector diagram below to properly connect your thermocouple sensor to the iServer 2 unit.

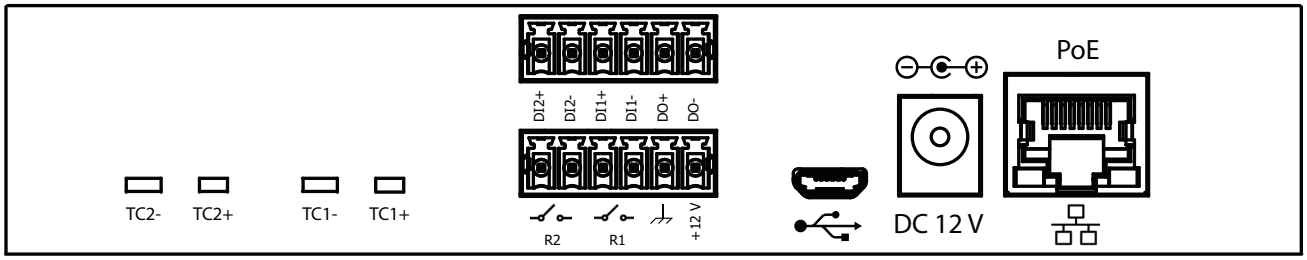

Figure 8: iS2-THB-DTC with thermocouple connectors

Important: Currently there is Cold Junction Calibration menu available for B-type thermocouples. To compensate for the B-type thermocouple wire error, users may configure the Offset (b) and Gain (m) available in the sensor channel settings menu. Refer to section **6.9.1 Gain and Offset** for more information.

4.3. Digital I/O and Relays

Use the provided terminal block connectors and the connector diagram in Figure 9 to wire Digital I/O and Relays to the iServer 2.

The **DI** connections (**DI2+, DI2-, DI1+, DI1-**) accept a 5 V (TTL) input.

The **DO** connections (**DO+, DO-**) require an external voltage and can support up to 0.5 amps at 60 V DC.

The **Relays** (**R2, R1**) can support a load of up to 1 amp at 30 V DC.

Important: When wiring the included terminal block connectors to access the digital I/O, alarms, or relays, it is recommended that users ground the unit by connecting a wire to the chassis ground of the connectors shown in **Figure 9**.

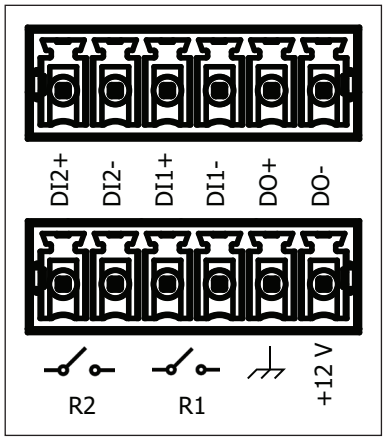

Figure 9: iServer 2 - Deluxe digital I/O and relays terminal block

Below is an example of an LED circuit connected to the digital inputs and outputs.

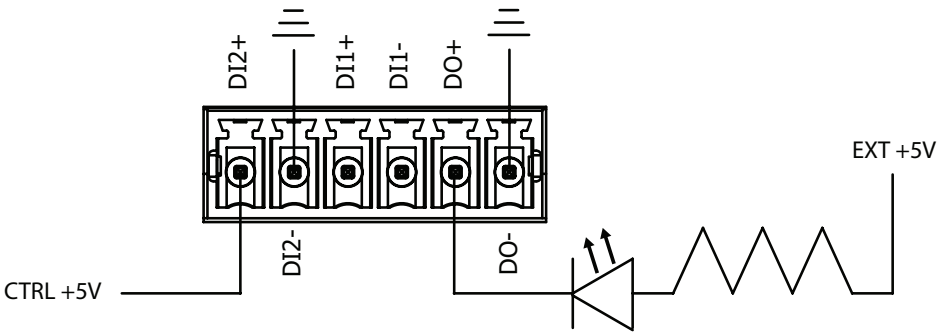

Figure 10: iServer 2 sample LED circuit with digital input and output

Further configuration regarding Normally Open/Normally Closed Initial State or Triggers can be completed in the iServer 2 web UI. For more information, refer to sections **6.7.2 Relay 1 and Relay 2** or **6.7.4 Digital I/O**.

4.4. Powering the iServer 2

All iServer 2 variants come with a DC power supply, international power supply adapters, and a 9 V battery. Models that offer Power over Ethernet can be powered with a network switch that supports PoE or a PoE injector (sold separately). Once the device is powered on, fully booted up, and the appropriate sensor is connected, readings will appear on the display. To power the iServer 2 using the DC power supply, plug in the power supply to the DC 12 V port located on the iServer 2. For instructions on how to power the iServer 2 through the Power over Ethernet feature, refer to section **4.4.3 Power Over Ethernet**.

4.4.1. LED Status Indicator

Refer to the following LED Status Indicator table to identify the different iServer 2 behaviors and statuses.

Figure 11: LED status indicator

LED Color	Status	Description
OFF	No Power	No power applied.
Red (Blinking)	System Boot	System rebooting.
Red (Solid)	Factory Reset	Press and hold the reset button for 10 seconds to reset the iServer 2 to factory default. **WARNING:** The factory reset will reset all stored data and configuration.
Green (Solid)	Internet Connection Detected	iServer 2 is connected to the Internet.
Green (Blinking)	Firmware Updating	Firmware update in progress. **WARNING:** Do not unplug power while update is in progress.
Amber (Solid)	No Internet Connection Detected	iServer 2 is not connected to the Internet.

4.4.2. 9 V Backup Battery

To access the 9 V battery compartment, remove the two screws indicated in the figure below and gently pry open the battery compartment.

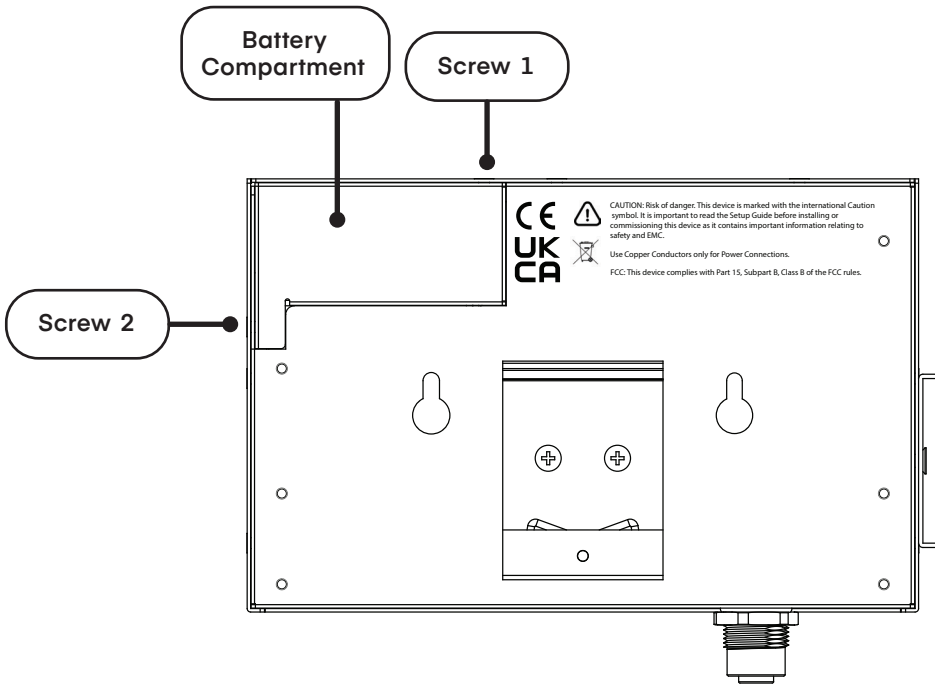

Figure 12: 9 V battery installation

Insert the 9-volt battery and secure the screws again. The battery will serve as a backup power source in case of a power outage. A fully charged 9 V battery will allow the iServer 2 to continue logging up to 10,000 data points for a period of 96 hours.

Important: When the 10 000 logged data points have been exceeded while running on the backup battery, the oldest logged data point on the Smart Probe will be overwritten starting from the oldest data point saved on the Smart Probe. A logging interval of at least 35 seconds or longer will prevent the overwriting of data during the 96 hour period the battery is in use.

4.4.3. Power Over Ethernet (PoE)

The iS2-THB-DP and iS2-THB-DTC both offer a Power over Ethernet (POE) feature that provides the device with sufficient power to operate when connected to a PC or router that supports Power over Ethernet. Use an RJ45 Ethernet cable to connect the output port of the PoE Injector to the iServer 2. Then use a second RJ45 Ethernet cable to connect the input port of the PoE Injector to a standard router or PC in conjunction with the PoE injector. When the assembled PoE Injector is plugged into a power outlet, the device will power on.

5. Connecting to a PC

To connect your iServer 2 unit to your PC, follow the instructions for one of the three setup methods listed below.

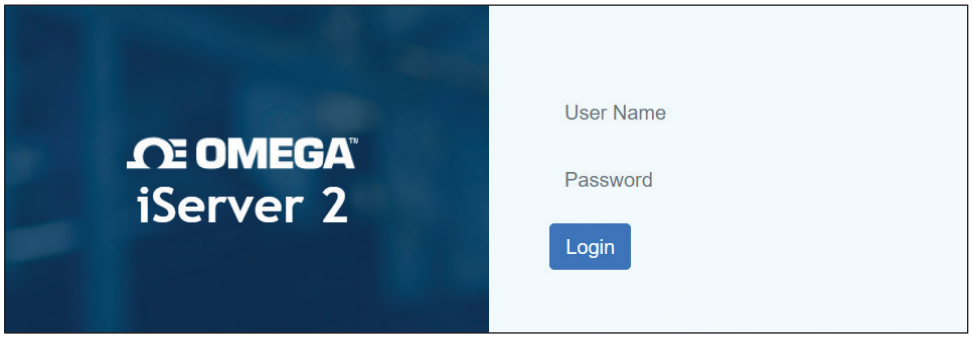

Figure 13: iServer 2 login page

A successful setup will result in the user accessing the webserver login page. Refer to the applicable connection method below:

5.1. Method 1 - DHCP Router Setup (Display Models Only)

Connect your iServer 2 directly to a DHCP-enabled router using an RJ45 cable. On the display model, the assigned IP address will appear on the lower right of the device display. Open a web browser and navigate to the assigned IP address to access the web user interface (UI).

Important: For non-display models, the user will need to check the router's client IP table to connect via DHCP or connect using **Method 2** or **3**.

5.2. Method 2 - Direct to PC Setup with an RJ45 Ethernet Cable (Display and Non-Display Models)

Connect your iServer 2 directly to your PC using an RJ45 Ethernet cable. Identify the MAC Address assigned to your iServer 2 by checking the label on the backside of the device.

Open a web browser and enter the following URL to access the web UI:

http://is2-omegaXXXX.local

(the **XXXX** should be replaced by the last 4 digits of the iServer unit MAC address)

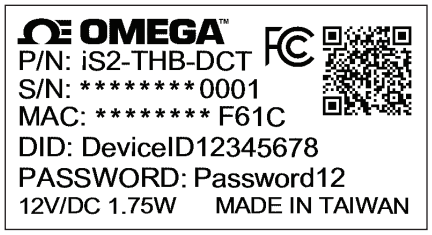

Figure 14: iServer 2 label showing unique MAC address

5.3. Method 3 - Direct to PC Setup with a Micro-USB 2.0 (Display and Non-Display Models)

Important: Administrator access to the PC may be required to change the PC Network Properties. The default static IP for connections through USB is: **192.168.3.200**. If the user is unable to access the iServer 2 webserver UI, the Bonjour Service may need to be installed. The service can be downloaded from the following URL: https://omegaupdates.azurewebsites.net/software/bonjour

To begin, connect the iServer 2 directly to the PC using a micro-USB 2.0 cable.

Step 1: Navigate to the **Windows Control Panel** and click **Network and Sharing Center**.

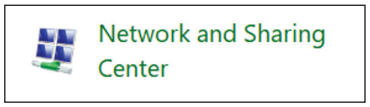

Figure 15: Windows Control Panel Network and Sharing Center

Step 2: Click the **Unidentified Network Connection**.

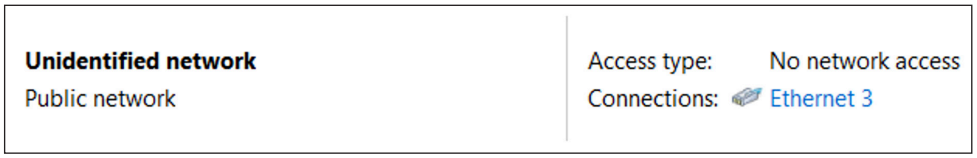

Figure 16: Network and Sharing Center - Unidentified Network

Step 3: Click **Properties**.

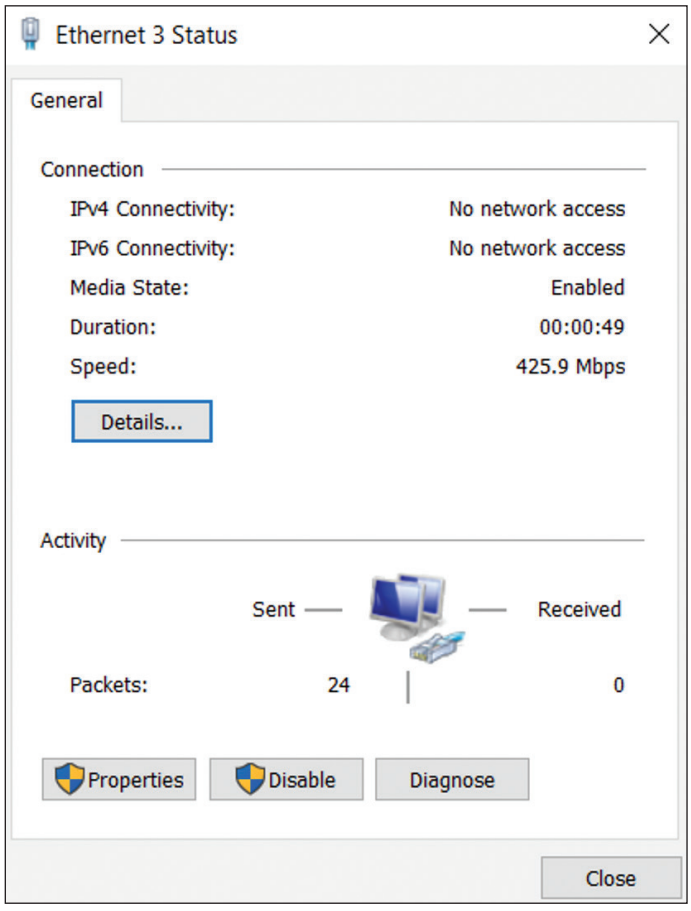

Figure 17: Unidentified Network Status

Step 4: Click **Internet Protocol Version 4 (TCP/IPv4)** to highlight the selection and then click **Properties**.

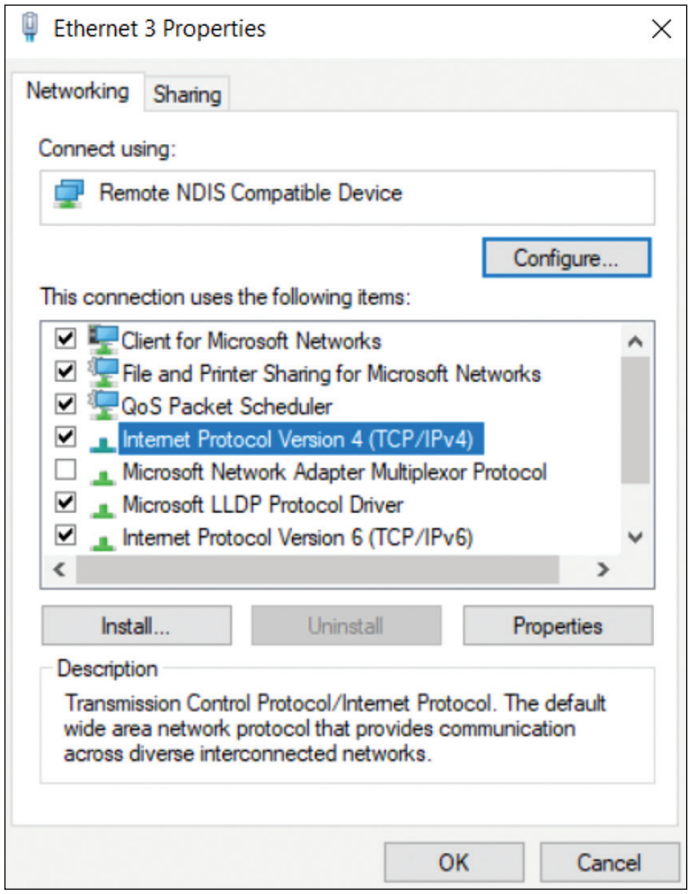

Figure 18: Unidentified Network Properties

Step 5: Fill out the field for the IP address with the following:

192.168.3.XXX

(the **XXX** can be any value that is **NOT** 200) Fill the Subnet Mask field with the following:

255.255.255.0

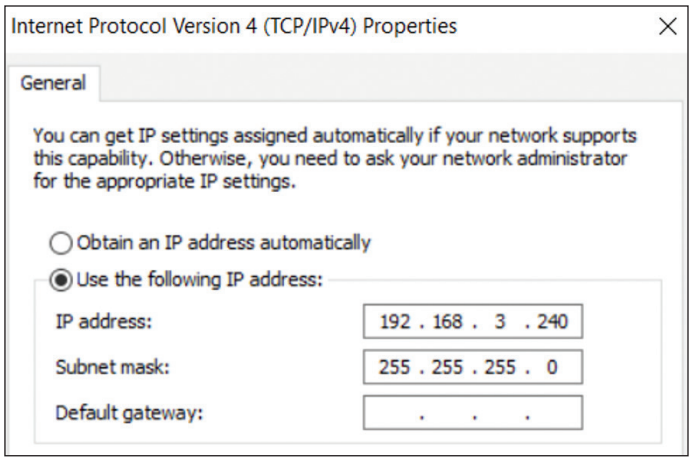

Figure 19: TCP/IPv4 and subnet mask properties for micro USB 2.0 connection

Click OK to finalize and then reboot the PC. Open a web browser and navigate to the following address to access the web UI: http://192.168.3.200

6. Navigating the iServer 2 Web UI

When the iServer 2 has been properly connected to a PC and the user has accessed the webserver login by following one of the methods in the previous section, they will be presented with the login page.

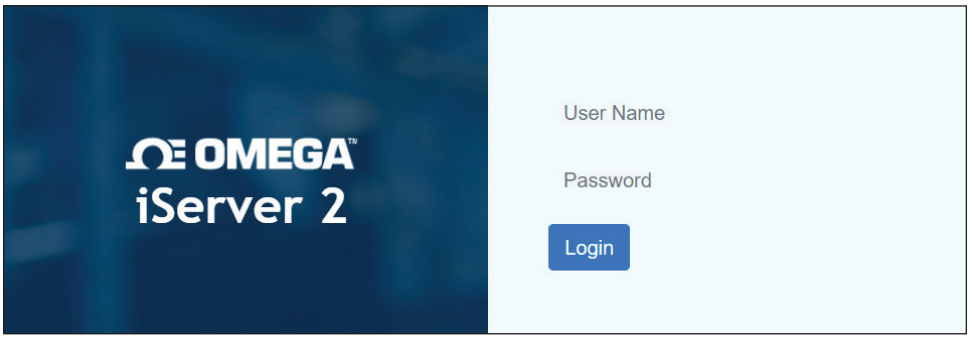

Figure 20: iServer 2 login page

Users who are signing in to the web UI for the first time, or if the login information has not been changed, can type the following information to login:

Username: **admin**

The password is provided on a label located on the back of the physical unit. Once logged in, the web UI will display the sensor readings as different gauges.

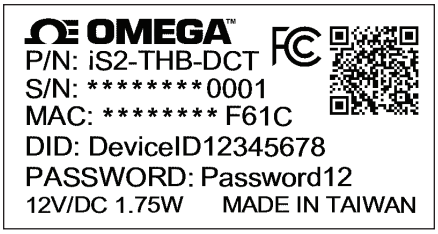

Figure 21: iServer 2 label showing unique MAC address

Figure 22: iServer 2 web UI sensor readings homepage - Gauge View

From the web UI, users can configure Network settings, Logging settings, Events & Notifications, and System settings.

6.1. Downloading the Latest iServer 2 Firmware

Step 1: From the iServer 2 webserver interface, click the **System** tab on the upper right of the screen. A **System Configuration** pop-up window will appear.

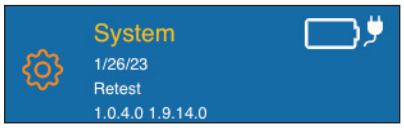

Figure 23: Webserver UI System tab

Step 2: Click the **Download Firmware** button. Note that two download links should appear.

Important: iServer 2 devices require two firmware files to complete the firmware upgrade process: a **.bin** and **.hex** file. Both download URLs should appear when the user clicks the **Download Firmware** button.

iServer 2 devices that are using an older firmware version may only have one download link appear at a time. In case only one firmware link appears, proceed to download and install the file according to the steps outlined in the rest of this section and the following section, then clear the web browser cache being used, and finally repeat the process starting from **Step 2** of this section, until the iServer 2 firmware is up-to-date.

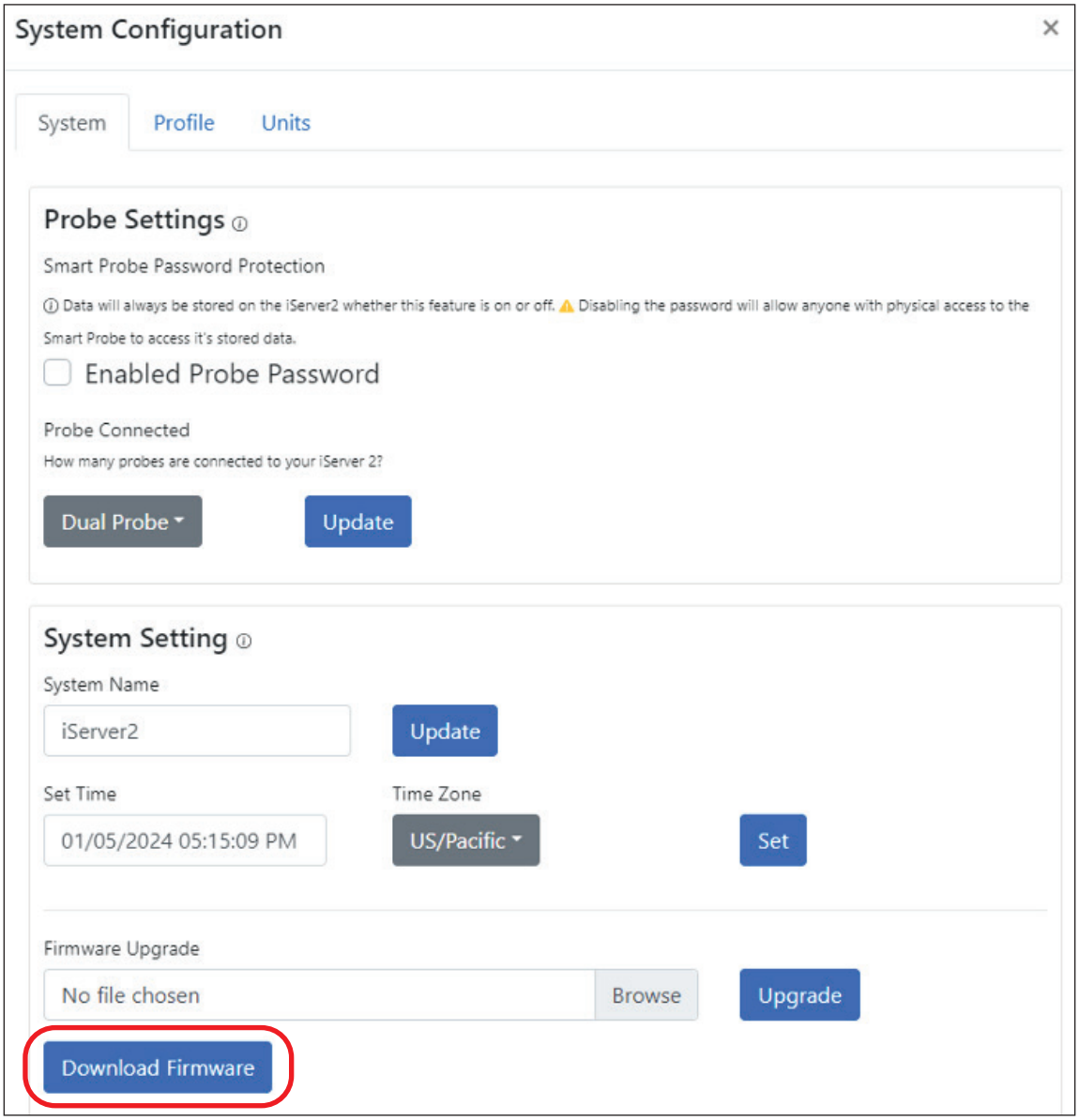

Figure 24: System Configuration pop-up window, Download Firmware button

Step 3: Click on both download links that appear to download both firmware upgrade files. Note that both files are necessary to successfully complete the firmware upgrade.

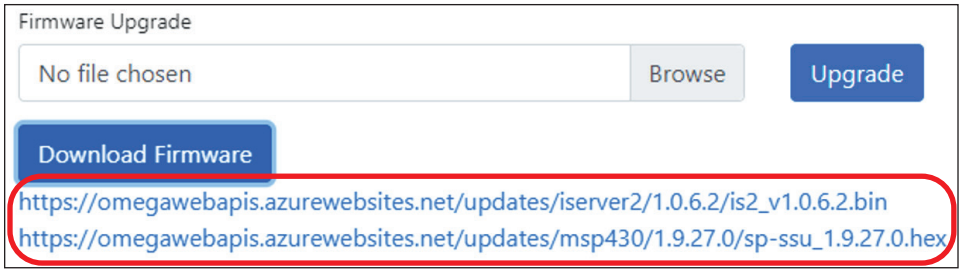

Figure 25: iServer 2 firmware download links

6.2. Upgrading the iServer 2 with the Latest Firmware

The instructions below will outline the steps necessary to perform the iServer 2 firmware upgrade process using the recently downloaded firmware files.

Step 1: From the System tab in the iServer 2 webserver interface, click on the **Browse** button to locate the first firmware file that will be used in the upgrade. The user may choose to start with either firmware file (.bin or .hex) as the order does not matter.

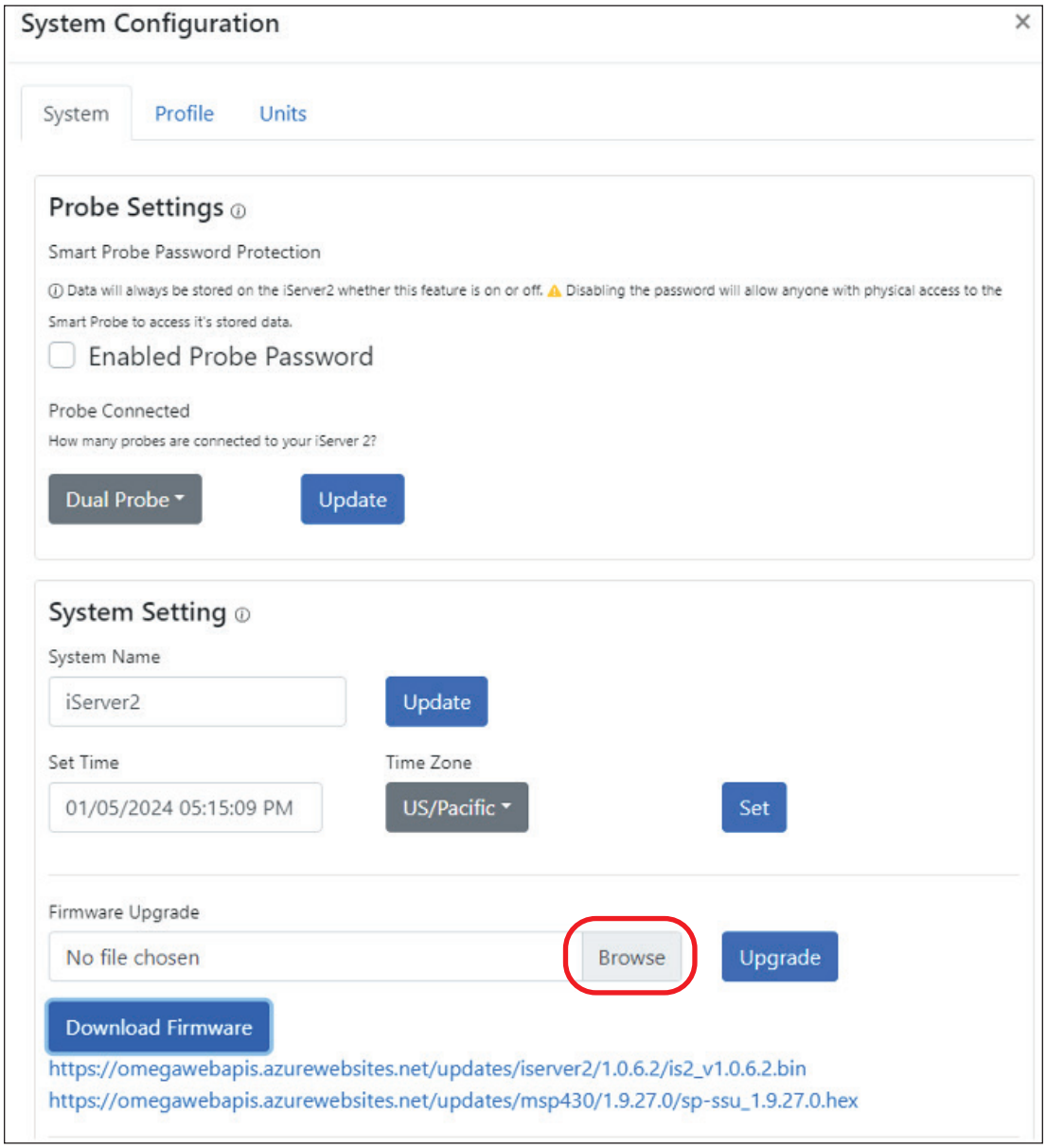

Figure 26: System Configuration pop-up window, Browse button

Step 2: A pop-up window will appear allowing the user to select one of the recently downloaded firmware files to be used for the upgrade. Click **Open** to finalize the selection.

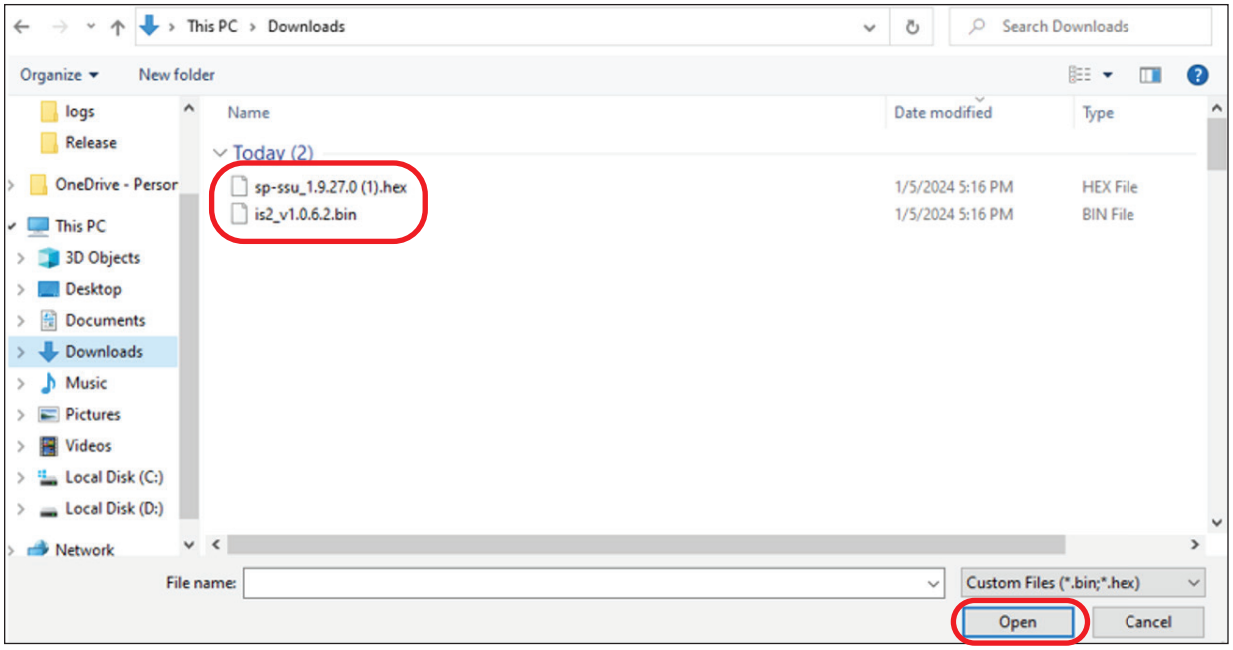

Figure 27: Firmware file selection for iServer 2 upgrade

Step 3: With one of the firmware files selected, click the **Upgrade** button. The iServer 2 will begin the upgrade process and will reboot when the process is complete.

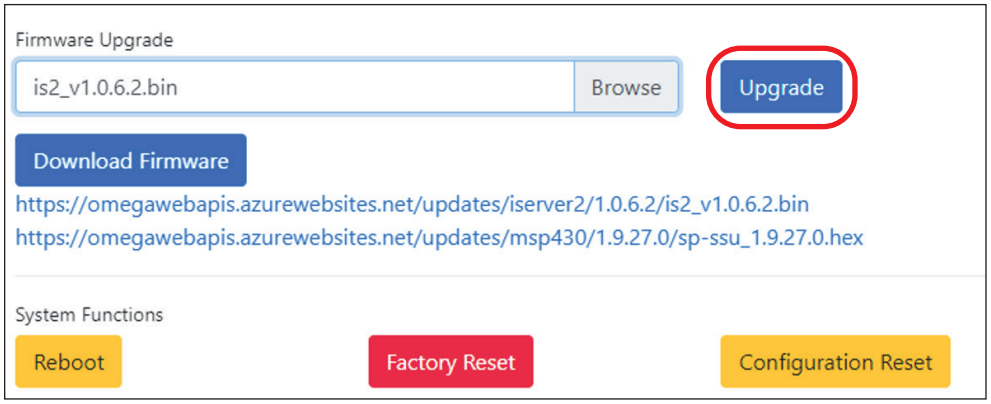

Figure 28: System Configuration Upgrade button

Step 4: Repeat the process starting from **Step 1** of this **Upgrade the iServer 2 with the Latest Firmware** section with the second firmware (.bin or ,hex, depending on which was used for the upgrade first).

6.3. Device Name and Sensor Firmware Information

While in Gauge View, the Gear Icon under the **System Tab** will allow users to configure the name of the iServer 2 device and view the current firmware, available channels, and core version number. When the Gear icon is clicked, the user will be able to choose between **Configure** and **Information**.

6.4. Configuring the Name of the Probe

From the Configure window, users may update the sensor device name as it appears in the web UI.

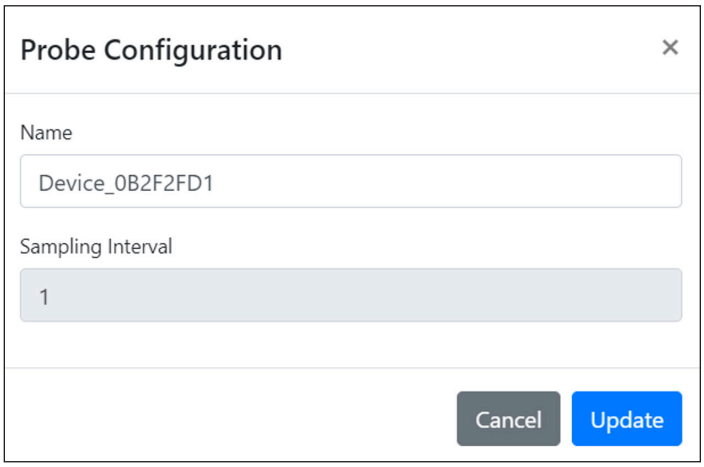

Figure 29: Probe name configuration

6.4.1. Omega Link Smart Probe Firmware Download and Update

From the **Information** window, users can check online for the latest firmware version of their Smart Probe and download it. If a firmware update is available, the user will be able to download it directly from the clickable **Update Required** or **Download Firmware** link that appears below.

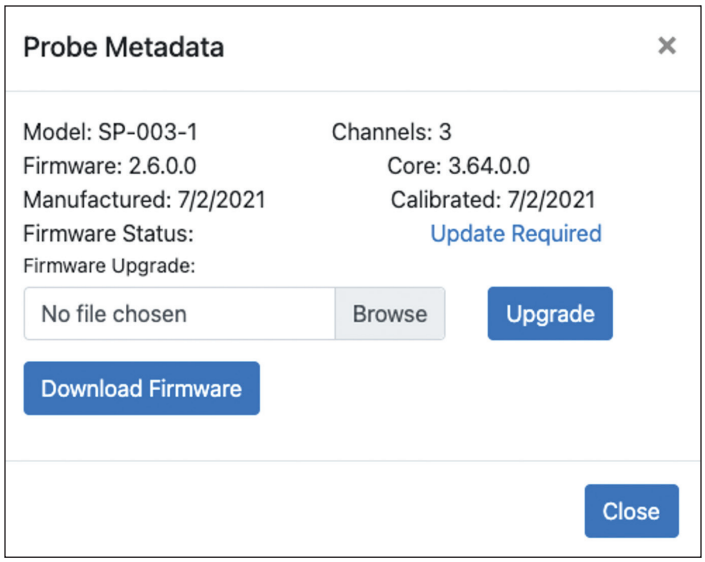

Figure 30: Smart Probe firmware update available

Once the firmware update file has been downloaded to the PC, the user will need to click **Browse** and select the recently downloaded firmware file. Once the file has been selected, click **Upgrade** to start the firmware update process.

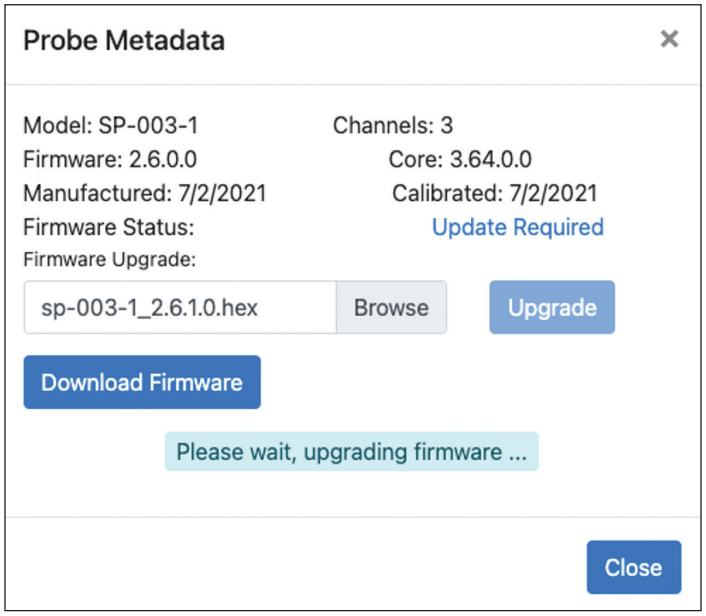

Figure 31: Smart Probe update in progress

When the Smart Probe firmware update is successful, a success message will briefly appear and instruct the user to reboot the device. At this point, the user may reboot the device and refresh the iServer 2 web UI page to sign back into the web UI and view the updated probe information.

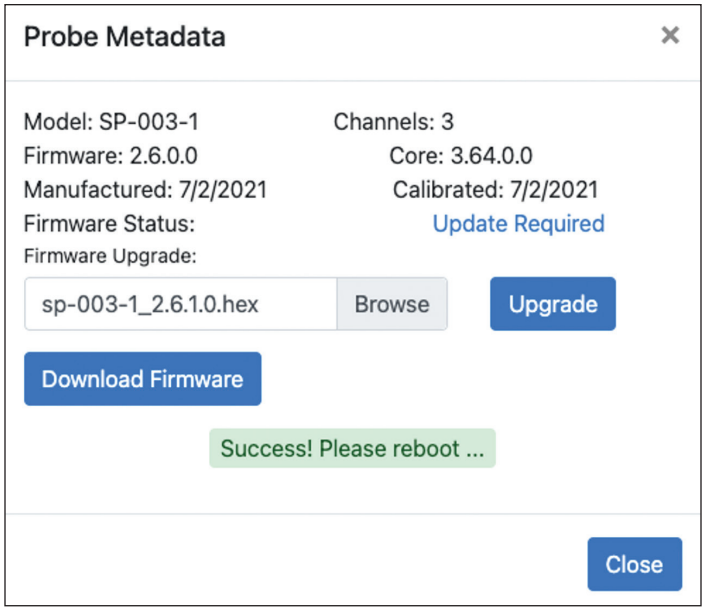

Figure 32: Successful smart probe firmware update

If the probe is up to date and no update is required, the web UI will state that the latest firmware is being used.

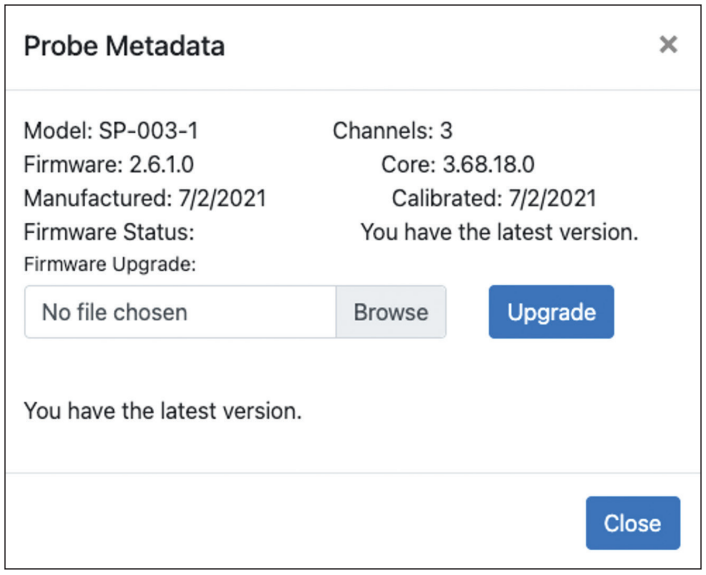

Figure 33: Confirmation that the latest smart probe firmware is installed

6.4.1.1. Advanced Smart Probe Configuration and Alternative Firmware Update with SYNC

Omega Link Smart Probe firmware updates can also be completed through Omega's SYNC configuration software. **The firmware must still be downloaded from the iServer 2 web UI**. Simply launch the software on a PC with an open USB port, and connect the Smart Probe to the PC using an Omega Link Smart Interface, such as the IF-001 or IF-006-NA.

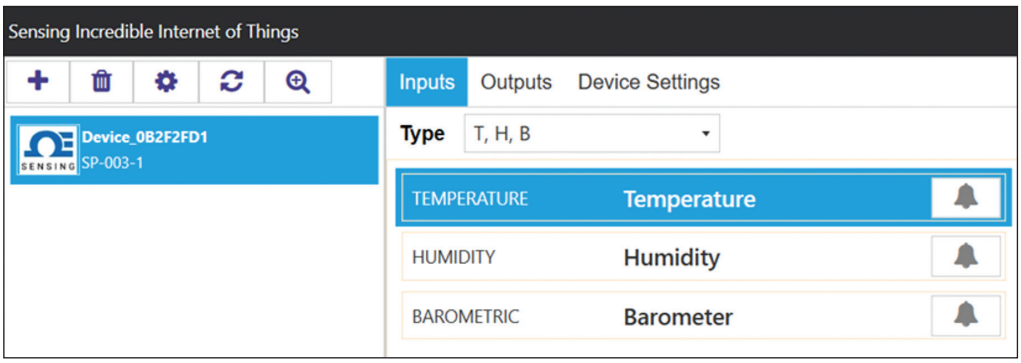

Figure 34: SYNC auto-detects smart probes connected through an Omega Smart Interface like IF-001

SYNC will automatically detect the connected Smart Probe and will display the device **Inputs** tab. Click the **Device Settings** tab and click the **Firmware Update** button.

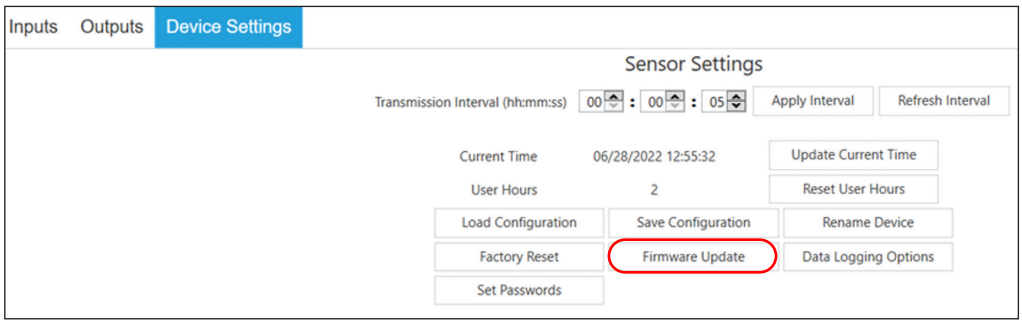

Figure 35: SYNC Device Settings and Firmware Update button

The user will be given the option to save any previously logged device data, however, users should note this option may take up to 10 minutes to complete.

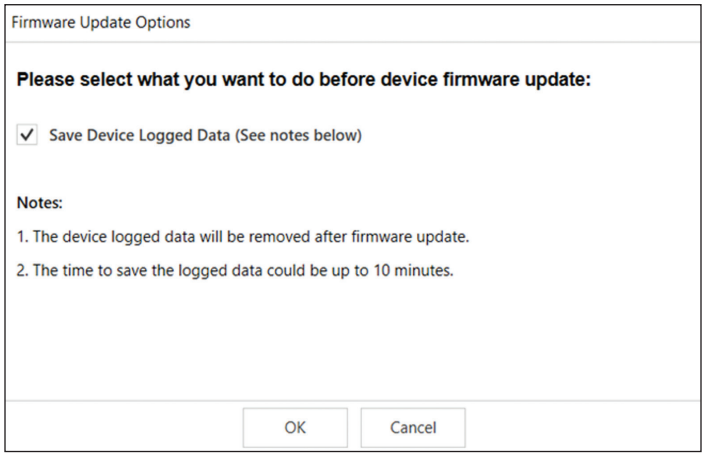

Figure 36: Firmware update process

Open the update file from the PC File Explorer containing the latest firmware for your Smart Probe to begin the firmware update process.

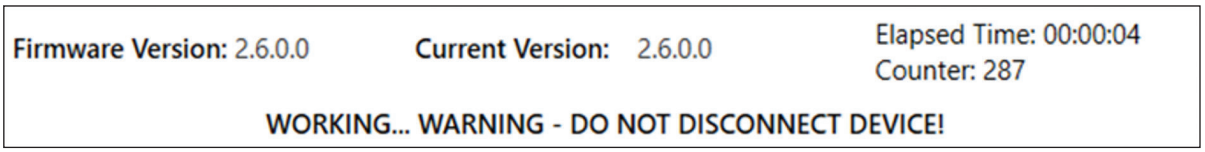

Figure 37: DIN rail bracket and wall-mount screw hole locations

When the update is complete, the user will need to confirm on screen that the device will be power cycled. SYNC will reopen the Inputs UI tab once the process is complete.

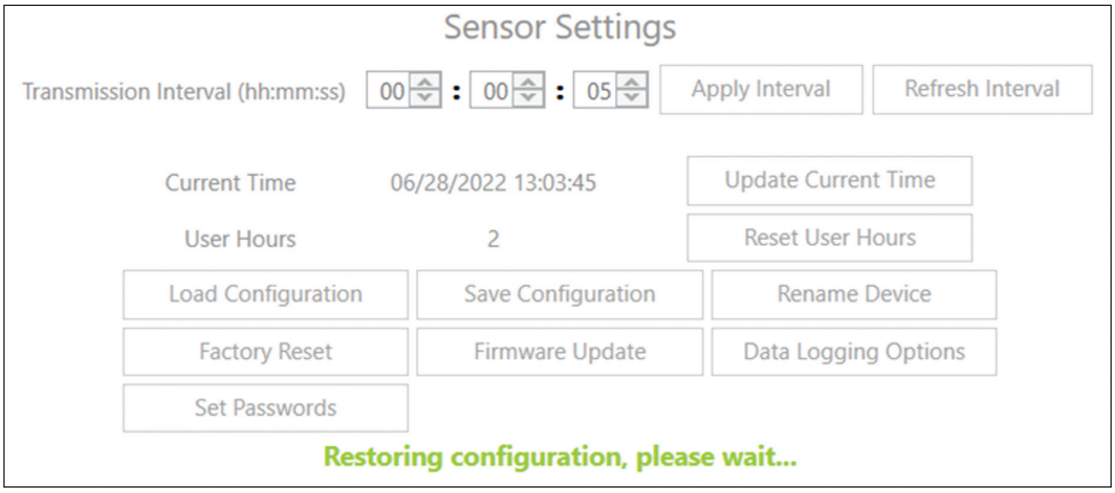

Figure 38: After the update process, SYNC will open on the Inputs tab of the connected sensor once complete

For additional information regarding the configuration of your Smart Probe, refer to the user's documentation associated with your Smart Probe model number. SYNC configuration software can be downloaded for free at:

https://www.omega.com/en-us/data-acquisition/software/sync-software/p/SYNC-by-Omega

6.5. Network

To manually change the IP Address, Netmask, and Gateway address of the iServer 2, the user must click the primary Network Tab from the main iServer 2 web UI page.

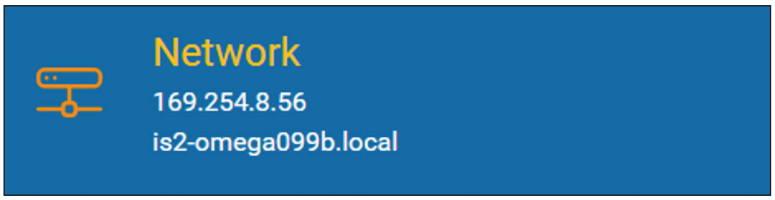

Figure 39: iServer 2 web UI Network tab

Click the Static bubble as shown in section **6.5.1 Network Configuration** to enable the manual configuration of the IP Address, Netmask, and Gateway addresses.

6.5.1. Network Configuration

Clicking the Network tab of the iServer 2 web UI provides a window to configure IP parameters and Ethernet interface options.

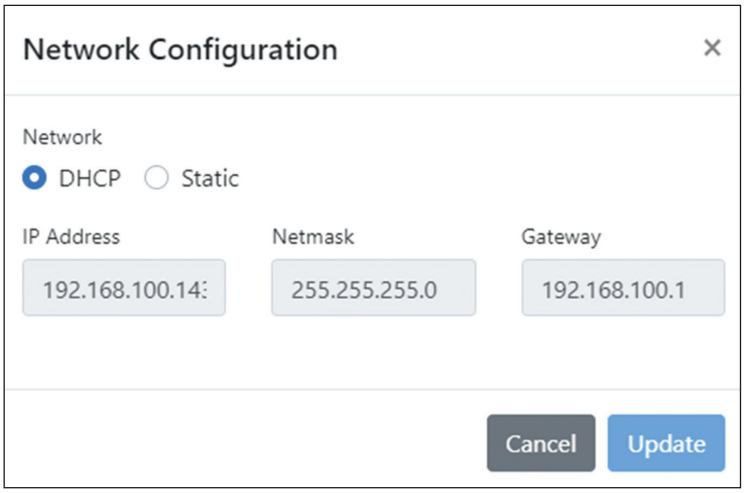

Figure 40: DHCP/Static network configuration window

- **DHCP** – If the DHCP bubble is selected, the iServer 2 will dynamically request an IP address, a subnet mask, a gateway address, and a DNS address from the DHCP server. The DHCP option is enabled by default.
- **Static** – If the Static bubble is selected, the user will be able to configure the IP Address, Netmask, and Gateway address for the iServer 2 manually.
- **IP Address** – This indicates the IP address of the iServer. When DHCP is enabled, this field will be dimmed. When Static is enabled, the IP Address can be changed.
- **Netmask** – A 32-bit number that is used to distinguish the network and host portions of the IP address. The iServer 2 default Netmask is **255.255.255.0.** When DHCP is enabled, this field will be dimmed. When Static is enabled, the IP Address can be changed.
- **Gateway Address** - The IP address of the router which functions as gateway to the network. This points to the router that forwards traffic to a destination address outside of the subnet on which the iServer 2 resides.

6.6. Logging

The features in the logging tab allow users to set the automatic logging interval, retrieve recorded data from a date range, and save it as a **.CSV** file. The Clear Log Data button can be used to erase data that has been recorded in the internal 11 GB memory.

Note: The maximum log interval for a Smart Probe is 66 536 seconds, or about 18 hours.

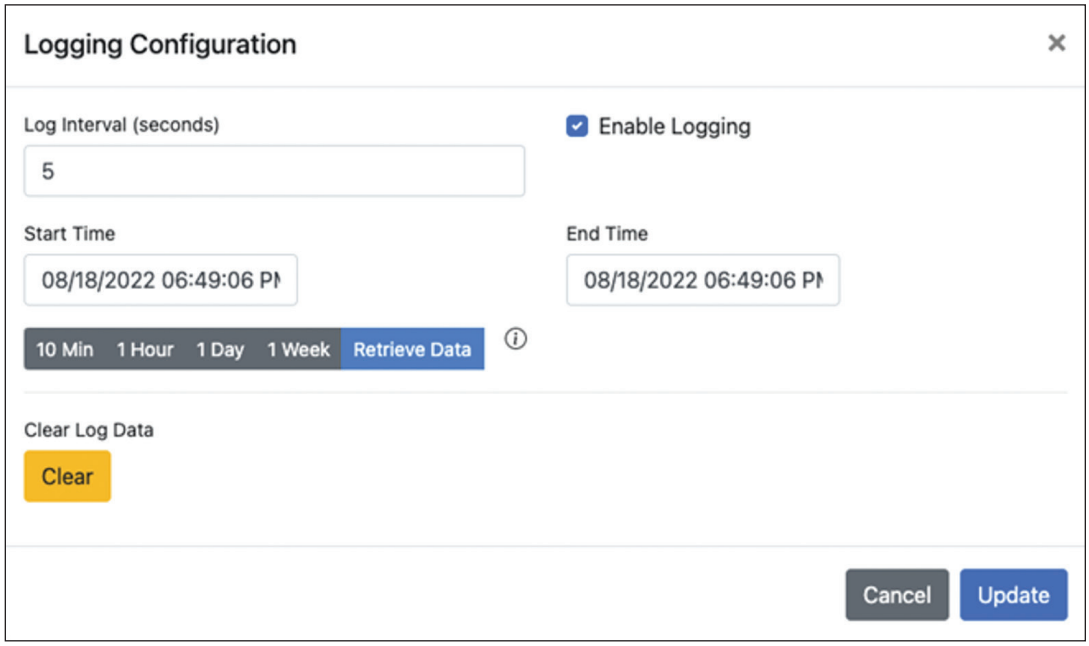

Figure 41: Logging configuration window

6.6.1. Clear Log Data When Switching Smart Probe Types (Smart Probe Models Only)

Important: The iServer 2 accepts a multitude of different Omega Link Smart Probe types. If the user intends to plug in a Smart Probe of a different measurement type, the Clear Log Data button must be pressed before the new Smart Probe is plugged in.

Follow the instructions below to complete the process:

Step 1: Unplug the Smart Probe currently plugged in to the iServer 2 unit.

Step 2: Click the Clear Log Data button on the iServer 2 web UI. The iServer 2 will reboot.

Step 3: Plug in the new Smart Probe.

Note: This function is only available when logged in as an Admin to the webserver.

6.6.2. How to Retrieve Logged Data

After a date range is set, click Retrieve Data to download the logged data as a .CSV file. If changes are made to the logging interval, click Update to finalize the changes.

The log interval can be configured to change the frequency that data is logged. Data will be logged into the internal 11 GB memory. Some Smart Probes come with more than one active sensor. These sensors can be individually enabled or disabled using Omega's SYNC configuration software. The log interval can be configured to adjust the lifespan of the internal memory capacity according to this table:

Sample Rate	2 Active Sensors	4 Active Sensors
1 second (max)	4 years	2 years
5 seconds	24 years	12 years
10 seconds	40 years	20 years

6.7. Events and Notifications Configuration

The Events and Notifications window of the iServer 2 web UI allows users to configure alarm thresholds, triggers, and notification parameters. The following table describes the available alarm triggers.

Alarm Trigger	Description
System Error	Notifies the user when there is a probe fault.
Battery Level Warning	Notifies the user when the iServer 2 battery power is running low.
TTL Contact Activation	Notifies the user when a Contact Closure alarm has been triggered.
Probe Disconnection	Notifies the user when a probe has been disconnected from the iServer 2.
Out of Memory	Notifies the user when the internal iServer 2 memory is full.
Power Reset	Notifies the user when a power reset has occurred.

6.7.1. Buzzer

From the **Alarm** tab, users can enable or disable the alarm notification, set the trigger event, and select the measurement device that the alarms will apply to.

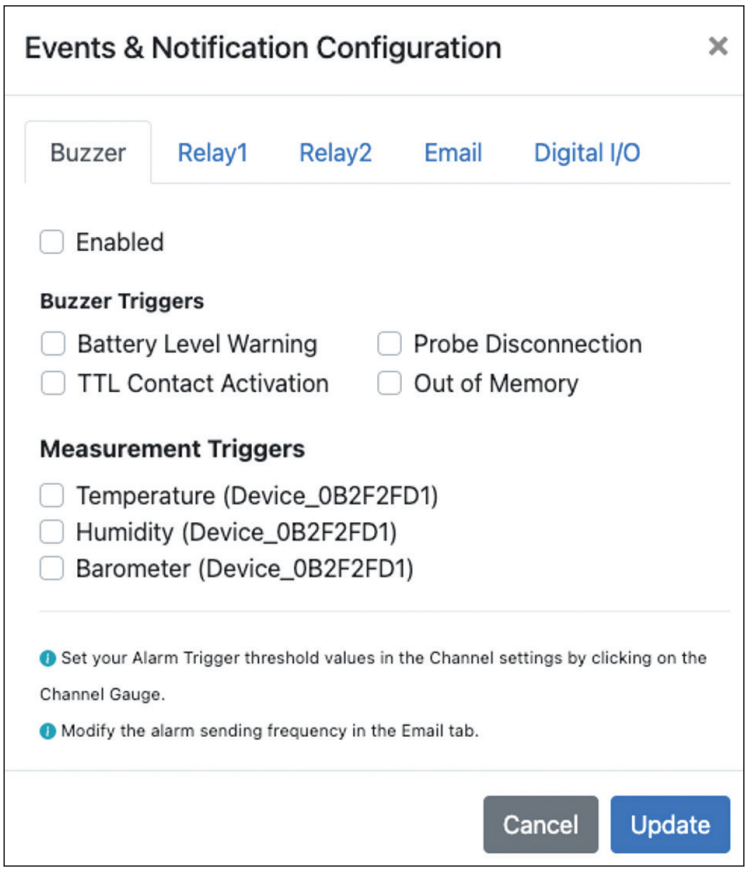

Figure 42: iServer 2 buzzer alarm notification configuration

6.7.2. Relay 1 and Relay 2

The **Relay 1** and **Relay 2** tabs allow users to configure the first and second relays of the iServer 2. The initial relay states can be changed between **Normally Open** and **Normally Closed**. The relay triggers and input devices they apply to can be selected in this window as well. For more information regarding the relay connector, refer to section **4.3 Digital I/O and Relays**.

Important: When wiring the included terminal block connectors to access the digital I/O, alarms, or relays, it is recommended that users ground the unit by connecting a wire to the chassis ground of the connectors shown in Figure 9.

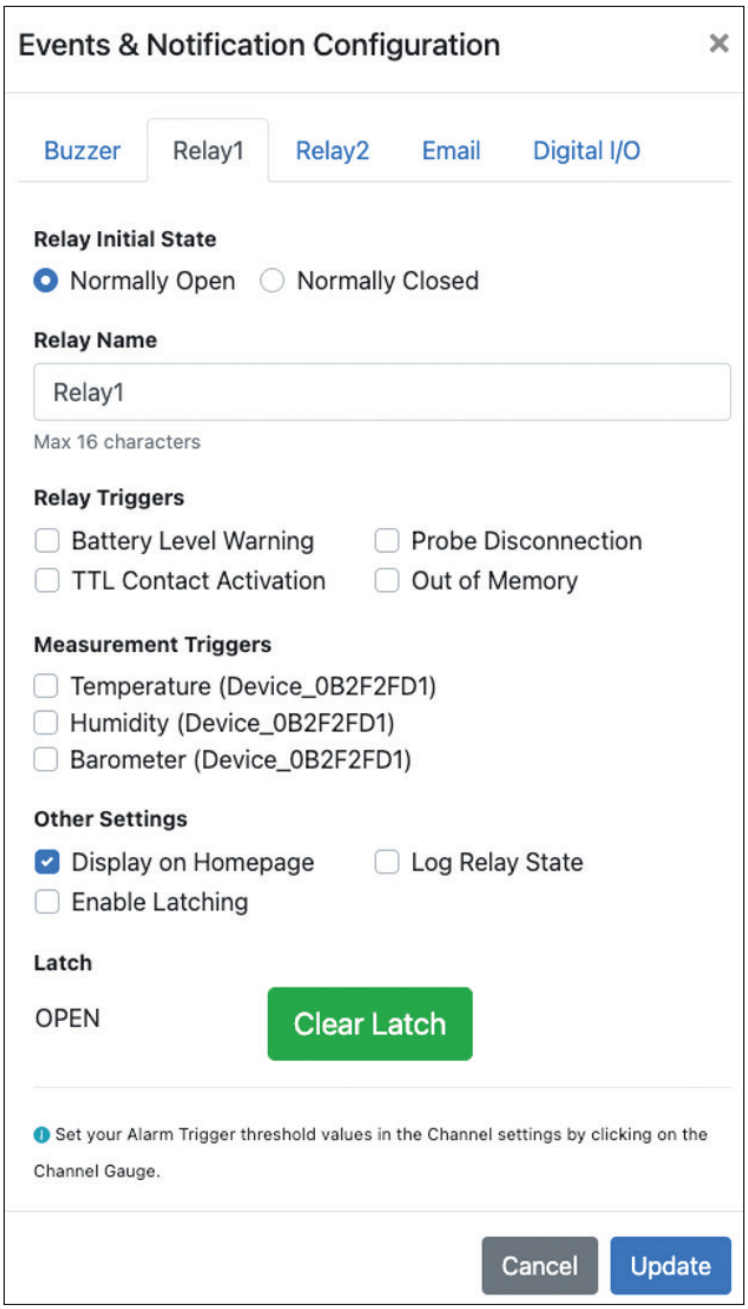

Figure 43: Relay notification configuration window

6.7.3. Email

From the **Email** tab, users can create a list of recipients who will be notified via email depending on the parameters that are established. The **Heartbeat Interval** provides normal operation updates at a configurable frequency. The **Alarm Interval** controls the frequency of alarm notifications that will be sent via email after the initial notification is sent.

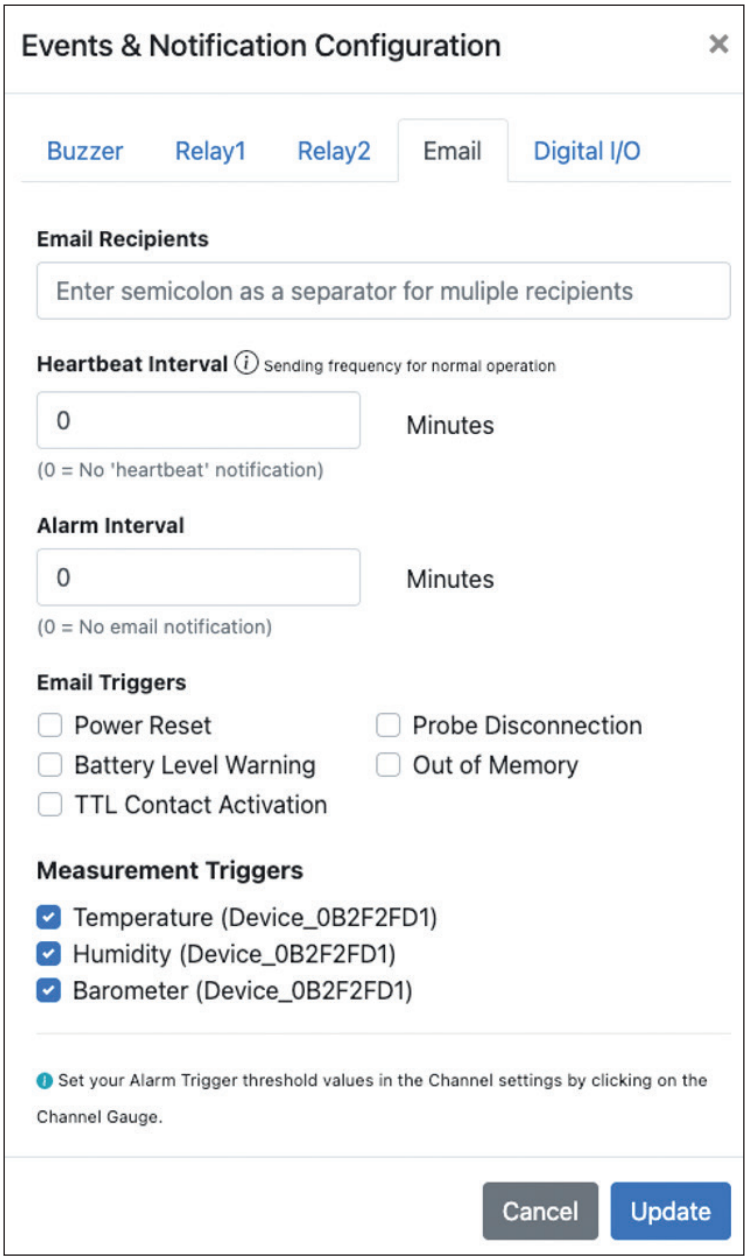

Figure 44: iServer 2 email notification configuration

6.7.4. Digital I/O

The Digital I/O tab is used to configure the first and second **Digital Inputs** on the iServer 2. Both can be enabled or disabled independently of one another and can be set to be displayed on the homepage or Log. For wiring and pinouts, refer to section **4.3 Digital I/O and Relays**. The initial state of the contacts can be set to **Normally Open** or **Normally Closed**.

The **Digital Output** can be set to **Active High** or **Active Low**.

Important: When wiring the included terminal block connectors to access the digital I/O, alarms, or relays, it is recommended that users ground the unit by connecting a wire to the chassis ground of the connectors shown in Figure 9.

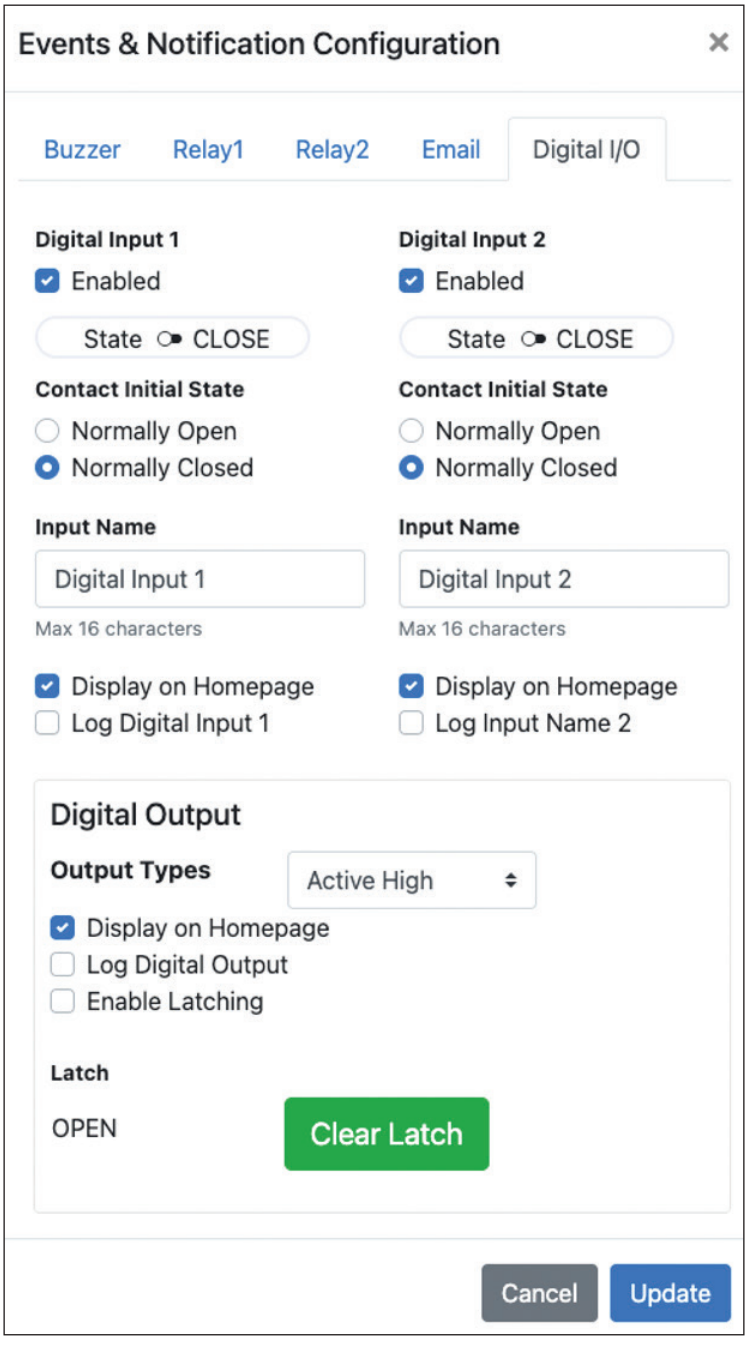

Figure 45: iServer 2 Digital I/O notification configuration

6.8. System Configuration

The **System Configuration** menu provides users with configuration options that affect the iServer 2 unit and web UI. Changes to the units, date, and time will affect logging information and will be reflected in the web UI and on the iServer 2 display.

6.8.1. System - Single or Dual Probe / Thermocouple Configuration

The primary **System** tab allows users to control a variety of functions such as factory resets, firmware updates, and configuring the system time.

The Probe Settings are only available on Smart Probe compatible iServer 2 models and can be set to **Single** or **Dual Probe** and allows users to create a password for Smart Probe configuration.

The Onboard Thermocouple Selection is only available on the iS2-THB-DTC and can be set to **Single** or **Dual TC**.

The **Date**, **Time**, and **Time Zone** as it appears in the UI can be set manually. Additionally, firmware update files can be selected and uploaded here. **System Reboot**, **Factory Reset**, and **Configuration Reset** may be performed here.

Caution: Clicking the Factory Reset or Configuration Reset button while a Smart Probe is plugged in to the iServer 2 will clear any user set probe configuration settings.

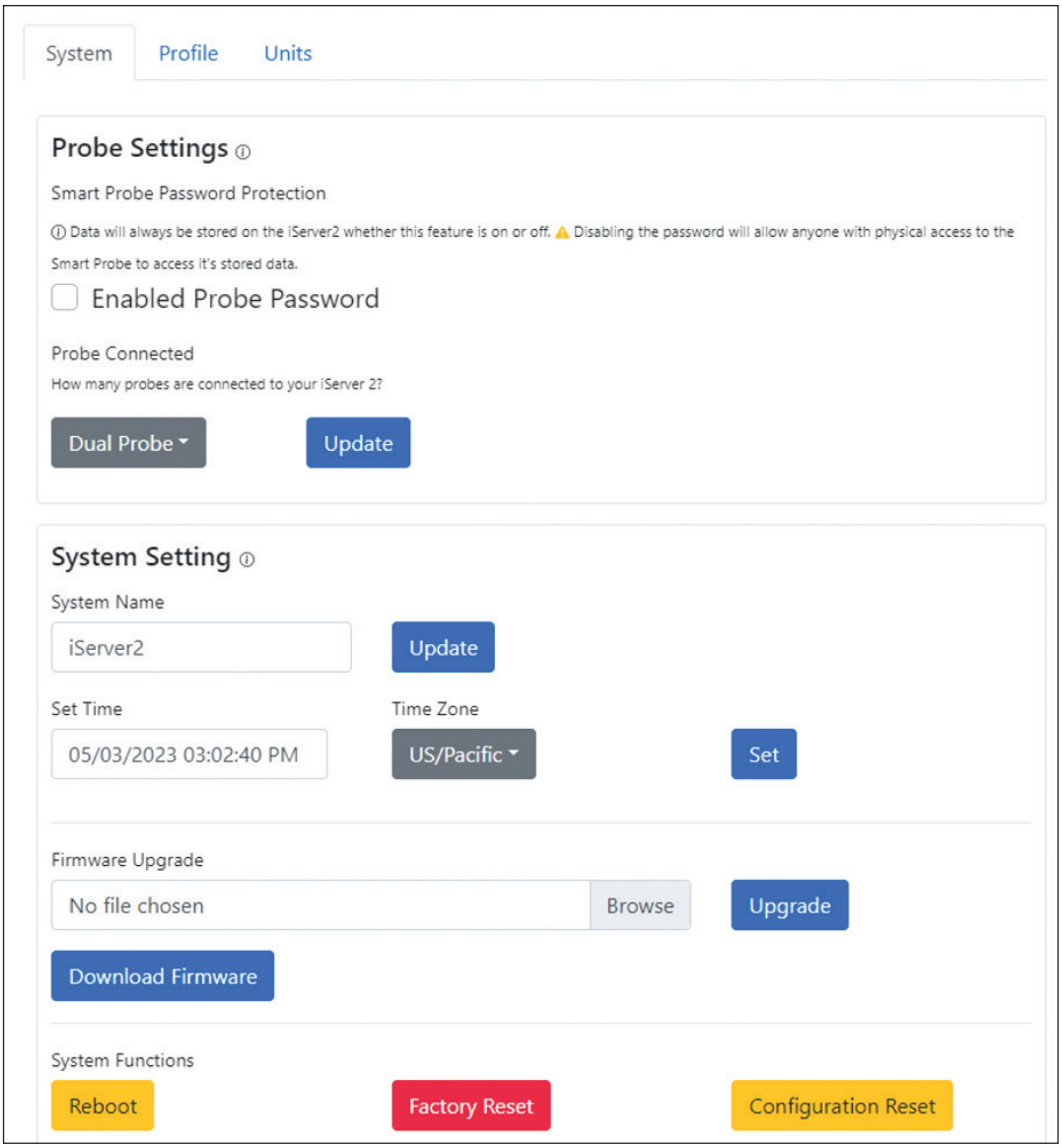

Figure 46: iServer 2 system configuration window

6.8.2. Profile

The Profile tab allows users to update their username and password.

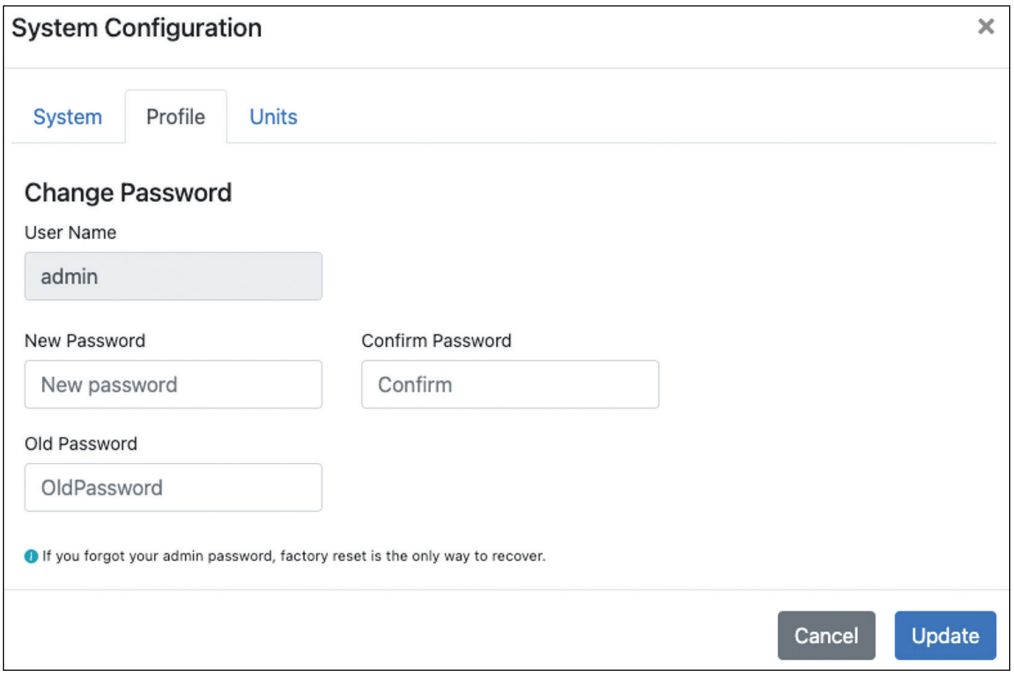

Figure 47: iServer 2 web UI User Name and Password configuration

6.8.3. Units

The Units tab allows users to configure the displayed units of measure as they appear in the web UI.

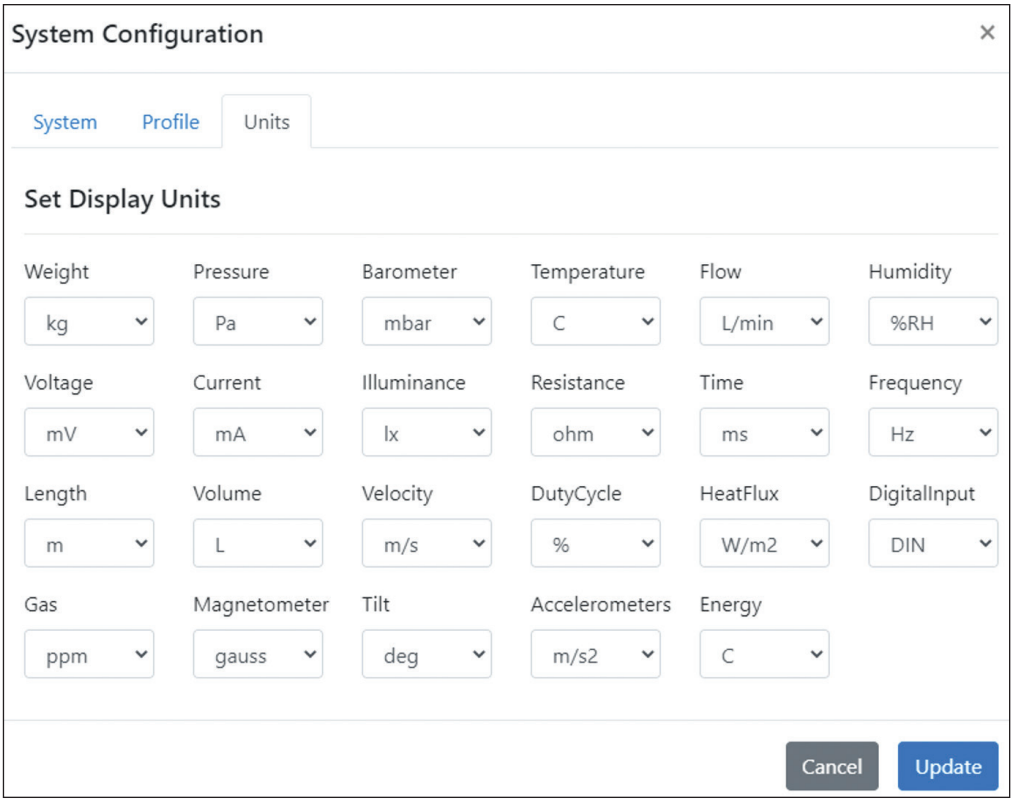

Figure 48: iServer 2 web UI display units configuration

6.9. Channel Settings

Clicking on the individual gauge display readings in the web UI will bring up the Channel Settings window. Gain and Offset values can be applied, display ranges can be set, and alarm triggers can be defined. If any configurations are made to this menu, the user must click **Update** to finalize the changes.

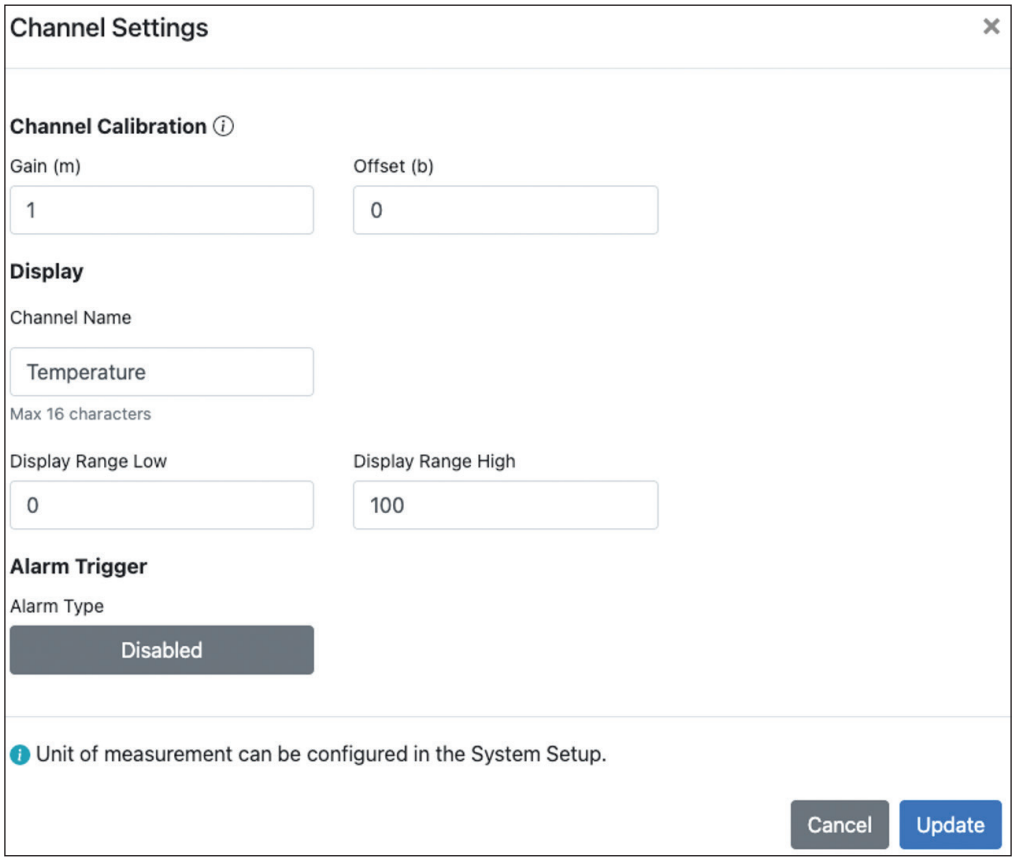

Figure 49: Sensor input channel configuration

6.9.1. Gain and Offset

A Gain value is a multiplier added to the sensor reading value. The Gain value can be positive, negative, and/or a decimal value. A decimal value will divide the sensor reading. A negative value will invert the sensor reading. An Offset value adds or subtracts a constant value to the sensor reading. The offset is applied after the Gain.

The equation for an input value scaled by Gain and Offset is given below:

$$\mathbf{Input_{Scaled} = (Input_{Raw}\ X\ Gain) + Offset}$$

6.9.2. Alarm Trigger

Alarms for a channel input may be configured to trigger based thresholds that can be set to a range (High Low), Above, or Below a certain reading.

6.9.3. Thermocouple Configuration Interface (TC Models Only)

Thermocouple compatible models of the iServer 2 offer a Cold Junction Calibration feature in the web UI. To begin cold junction calibration, follow the steps below:

Note: Cold Junction Calibration is not available for thermocouple types: R, S, and B.

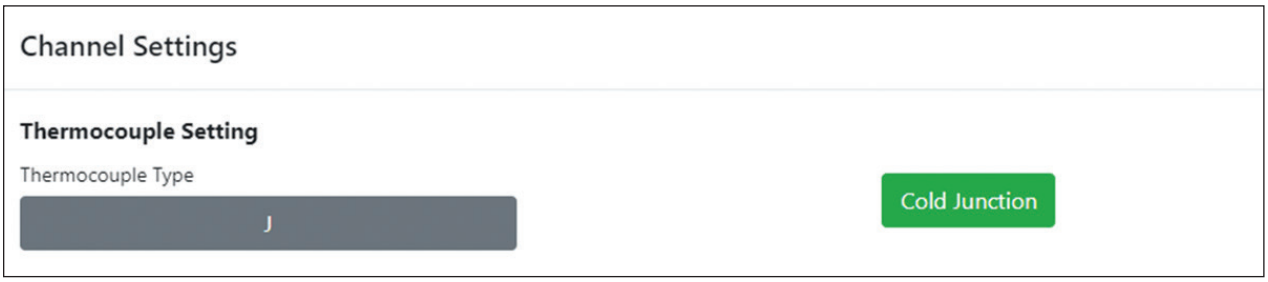

Figure 50: Thermocouple Cold Junction Calibration

Step 1: Click on the channel readings for the input that will undergo cold junction calibration.

Step 2: Click on the **Cold Junction** button.

Step 3: Click the **Proceed** button.

Step 4: Once notified by the web UI that the calibration was successful, click **OK** to finalize the changes.

6.10. Gauge/Chart Web UI View

The iServer 2 web UI presents sensor readings in Gauge View by default, however, users can select the Chart button to enable Chart View.

Figure 51: iServer 2 web UI - Chart View

From Chart View, users can still access the different sensor channel inputs by clicking the readings. Live readings will be graphed automatically once the Chart View is enabled. View range and the Secondary Y-Axis source can be updated by clicking the buttons at the bottom of the UI, while the Maximum and Minimum graphed values can be adjusted on the left and right sides of the chart.

7. Adding an iServer 2 to Omega Enterprise Gateway (OEG)

iServer 2 devices can be added to Omega Enterprise Gateway 2.4 (OEG) in a non-internet environment by adding the iServer 2 to OEG as a device. An active OEG license and access to a Windows 7, 8, 9, or 10 OS PC is required to download and run OEG. OEG can be purchased and downloaded from the following link: https://www.omega.com/en-us/oeg

There are two methods to connect the iServer 2 to OEG. The first method requires the iServer 2 to be set to the default DHCP network setting and requires access to a DHCP-enabled router with an open port and an RJ45 Ethernet cable. The second method requires Administrator access to the Windows OS PC running OEG and requires the iServer 2 to be set to the Static IP network setting and the iServer 2 unit to be plugged in directly to the Windows PC.

7.1. Method 1 - DHCP Router Method

To add an iServer 2 to OEG using the DHCP router method, begin by ensuring the iServer 2 is set to the default DHCP network settings (**6.5.1 Network Configuration**) and follow the steps below.

Step 1: Connect the iServer 2 unit to a DHCP-enabled router using an RJ45 Ethernet cable.

Step 2: Ensure the Windows PC that will run OEG is on the same network as the connected iServer 2.

Step 3: Launch and log in to your OEG account.

Step 4: Click the + icon or **Add Devices**. Then select **iServer 2** from the **Product Family** dropdown and click **TC** or **Probe** from the **Product Model** dropdown, depending on the model of iServer 2 being connected.

Figure 52: OEG Add Devices menu - iServer 2 Model

Step 5: Input the IP Address of the connected iServer 2 **as it appears in your local-area network**.

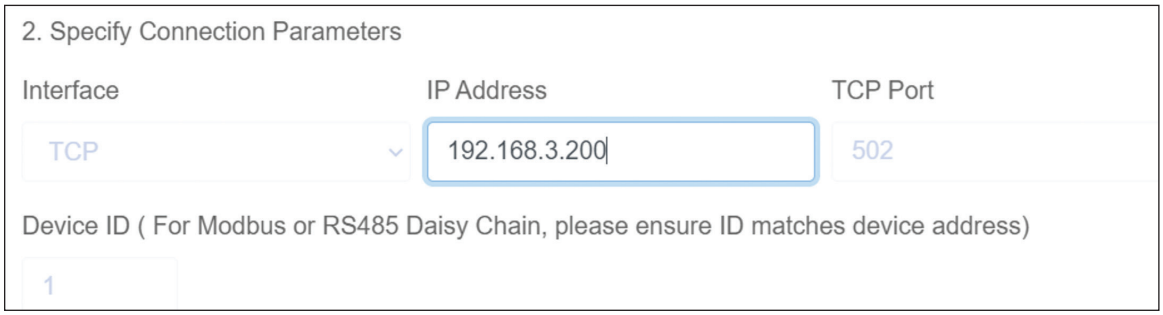

Figure 53: OEG Add Devices menu - Connection Parameters

Important: If the DHCP-enabled iServer 2 unit has been disconnected and moved to a separate DHCP-enabled, local-area network router or PC, the user must identify the new IP Address that the unit has been assigned under the local-area network. For models with a display, the new IP Address will appear on the unit display. For models without a display, users can access the iServer 2 web UI to check the new IP Address (**6.5.1 Network Configuration**).

Step 6: Click **Add** to finalize the configuration.

All sensing devices connected to the iServer 2 will appear on OEG after the pairing is successful. The readings from offline units will display NaN. For more information on how to navigate OEG, refer to the OEG Software User's Manual.

7.2. Method 2 - Static IP Method (Direct to PC)

To add an iServer 2 to OEG using the Static IP (direct to PC) method, begin by ensuring the iServer 2 is set to the Static IP network settings (**6.5.1 Network Configuration**) and confirm the Static IP address is set to the preferred address. The Windows PC network settings will need to be configured to properly pair the iServer 2 and OEG. Follow the steps below:

Important: Administrator access to the Windows PC is required to configure the Network settings of the PC.

Step 1: Navigate to the iServer 2 web UI and assign a Static IP address to the iServer 2 unit. Then exit the web UI.

Step 2: Connect the iServer 2 unit directly to the Windows PC with OEG using an RJ45 Ethernet cable.

Step 3: Navigate to the **Windows Control Panel** and click **Network and Sharing Center**.

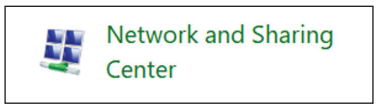

Figure 54: Windows Control Panel Network and Sharing Center

Step 4: Click the **Unidentified Network Connection**.

Figure 55: Network and Sharing Center - Unidentified Network

Step 5: Click **Properties**.

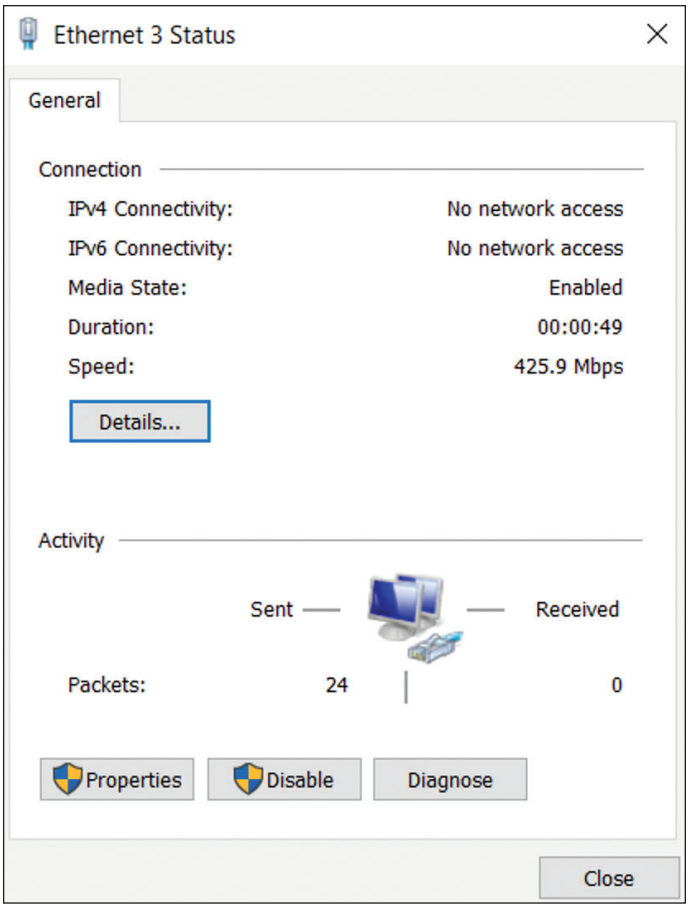

Figure 56: Unidentified Network Status

Step 6: Click Internet Protocol Version 4 (TCP/IPv4) to highlight the selection and then click Properties.

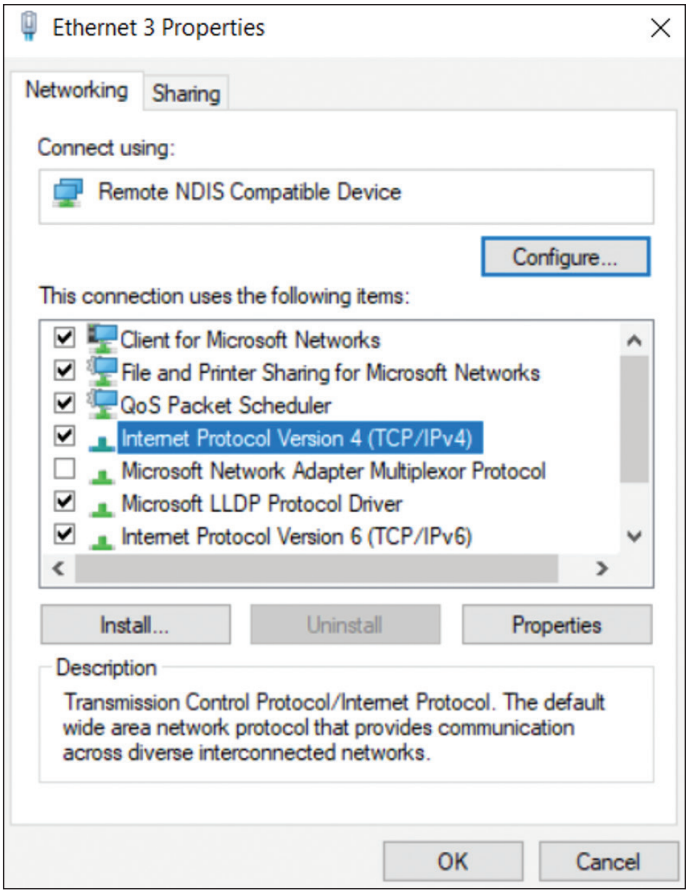

Figure 57: Unidentified Network Properties

Step 7: Click **Use the following IP address** and enter an IP address that uses the same network part (the first nine digits of the IP address) but with a unique host part (the last three digits of the IP address) as the static IP Address assigned to the iServer 2 in Step 1.

For example, if the Static IP assigned to the iServer 2 is: 192.168.3.200, then the IP address entered in the text box should be: **192.168.3.XXX** (the **XXX** should be any value that is **NOT** 200)

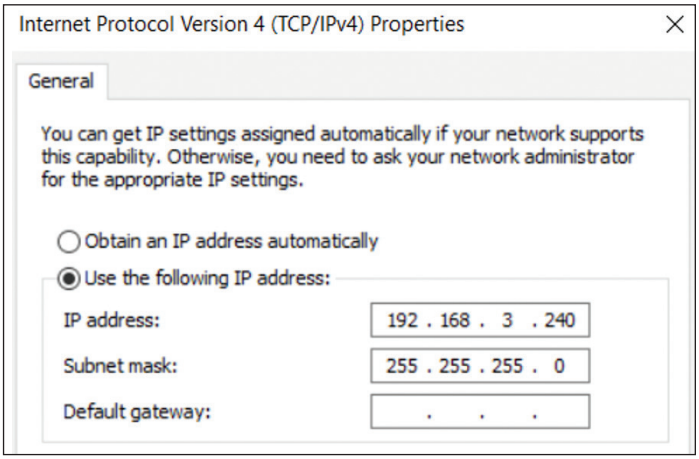

Figure 58: TCP/IPv4 and subnet mask properties for micro USB 2.0 connection

Step 8: Click **OK** to finalize.

Step 9: Launch OEG and log in to your account.

Step 10: Click the + icon or **Add Devices**. Then select **iServer 2** from the **Product Family** dropdown and click **TC** or **Probe** from the Product Model dropdown, depending on the model of iServer 2 being connected.

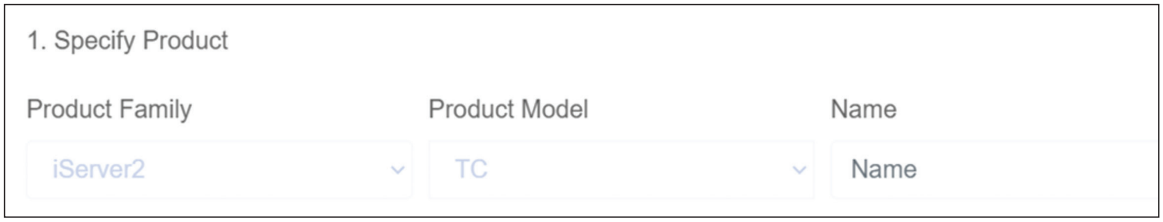

Figure 59: OEG Add Devices menu - iServer 2 Model

Step 11: Input the static IP Address of the connected iServer 2.

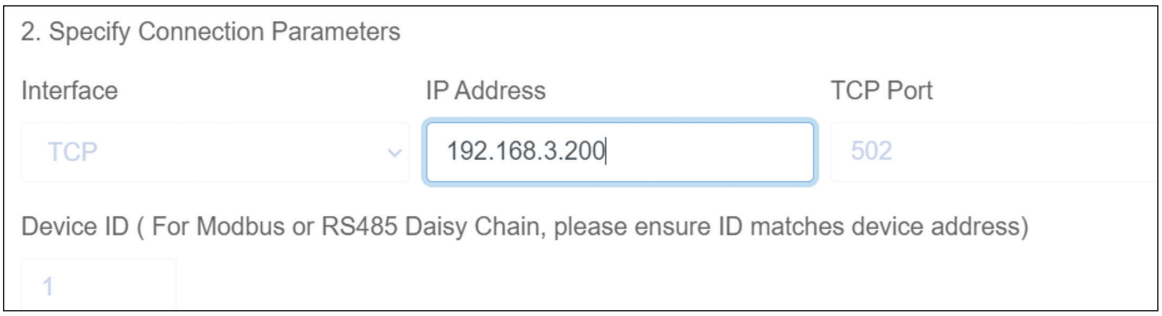

Figure 60: OEG Add Devices menu - Connection Parameters

Step 12: Click **Add** to finalize your configuration.

All sensing devices connected to the iServer 2 will appear on OEG after the pairing is successful. The readings from offline units will display NaN. For more information on how to navigate OEG, refer to the OEG Software User's Manual.

7.3. Configuring Sensing Devices after Pairing with OEG

If a sensing device paired to the iServer 2 has been configured or modified after the iServer 2 has been added to OEG, the user must reboot the iServer 2 and restart the OEG software to sync with the configuration made to the connected device.

8. iServer 2 Modbus Holding Register Partition

The following section details the Modbus Register list associated with the iServer 2.

8.1. Holding Registers Partition

The iServer 2 Modbus registers are partitioned as listed below in the table below.

Address	Description	Usage
0x0000 – 0x0063	Channel readings (read only)	Readings from the iserver2
0x0064 – 0x0191	Device meta	Model number, firmware version, device information
0x0192 – 0xFFFF	Configuration	Configuration registers for device and readings

8.2. Channel Value Registers

Channel registers range from 0000 to 0063. All registers in this range are read-only. Each measurement or input consists of 2 registers. The registers are defined as:

Register 1	Register 2
Value (IEEE 754 floating point value)	

NaN is used as an indicator for no measurements, disabled, hardware failure, out of spec, etc..

The iServer2 queries different probes depending on the model. "Probe 0" is for thermocouple readings only available for -DTC models. "Probe 1" and "Probe 2" are designated for Omega Link Smart Probes attached to Smart Probe compatible variants of the iServer 2. Each "Probe" has a maximum of 4 channels (0-3). The Modbus address can be calculated as such:

Modbus address = (probe number)*8 + (channel_number)*2

Floating point value of the measurement if the value is NaN:

- 0x7f800000: value error
- 0x7f800001: open
- 0x7f800002: short
- 0x7f800003: range

Register (Decimal)	Register (Hex)	Description	RW	Type	Values	Register Size
0	0x0000	Thermocouple 1 Channel 0 reading	R	Float	Thermocouple 1 channel 0 reading	2
2	0x0002	Thermocouple 2 Channel 1 reading	R	Float	Thermocouple 2 channel 1 reading	2
8	0x0008	Probe 1 Channel 0 reading	R	Float	Smart probe 1 channel 0	2
10	0x000A	Probe 1 Channel 1 reading	R	Float	Smart probe 1 channel 1	2
12	0x000C	Probe 1 Channel 2 reading	R	Float	Smart probe 1 channel 2	2
14	0x000E	Probe 1 Channel 3 reading	R	Float	Smart probe 1 channel 3	2
16	0x0010	Probe 2 Channel 0 reading	R	Float	Smart probe 2 channel 0	2
18	0x0012	Probe 2 Channel 1 reading	R	Float	Smart probe 2 channel 1	2
20	0x0014	Probe 2 Channel 2 reading	R	Float	Smart probe 2 channel 2	2
22	0x0016	Probe 2 Channel 3 reading	R	Float	Smart probe 2 channel 3	2

8.3. Device Meta Modbus Registers

Channel registers range from 0x0064 to 0x0191. Device meta registers define device meta information including firmware, name, etc.

Register (Decimal)	Register (Hex)	Description	RW	Type	Values	Register Size
100	0x0064	Model	R	STRING_16	Max 16 Character Model	8
114	0x0072	Firmware Version	R	UINT_32	32-bit integer. Translate to form of major, minor, bug, build, corresponding to each byte	2
116	0x0074	Hardware Version	R	UINT_32	32-bit integer. Value interpolates as REV xxx	2
118	0x0076	Device ID	R	UINT_32	Unique identifier such as serial number. 32-bit integer	2
120	0x0078	Device Name	R/W	STRING_16	Device name, Max 16 characters	8
134	0x0086	Manufactured Date	R	UINT_32	Date comes from probe 0	2
136	0x0088	Calibrated Date	R	UINT_32	Date comes from probe 0	2

8.4. Device Configuration and Channel Configuration Registers

Device configuration and channel configuration range from 0x0192 – 0xFFFF.

Register (Decimal)	Register (Hex)	Description	RW	Type	Values	Register Size
402	0x0192	Log Enable	R/W	UINT_16	0 – disable, 1- enable	1
403	0x0193	Log Rate	R/W	UINT_16	Logging rate in seconds	1
404	0x0194	Buzzer Triggers	R/W	UINT_32	Event triggers for turning on the buzzer.	2
406	0x0196	Relay 1 Triggers	R/W	UINT_32	Event triggers for opening/ closing relay1.	2
408	0x0198	Relay 1 Configuration	R/W	UINT_32	Bit 0–0-normally closed, 1-normally open Bit 1–0-don't log, 1-log Bit 2–0-don't display on homepage, 1-display on homepage Bit 3–0–disable latching, 1-enable latching	2
410	0x019A	Relay 1 Clear Latch	W	UINT_32	1-Clear latch	2
412	0x019C	Relay 1 Name	R/W	STRING_16	Max 16 chars	8
420	0x01A4	Relay 2 Triggers	R/W	UINT_32	Event triggers for opening/ closing relay2.	2
422	0x01A6	Relay 2 Configuration	R/W	UINT_32	Bit 0 – 0- normally closed, 1-normally open Bit 1 – 0- don't log, 1- log Bit 2 – 0 -don't display on homepage, 1- display on homepage Bit 3 – 0 – disable latching, 1- enable latching	2
424	0x01A8	Relay 2 Clear Latch	W	UINT_32	1-Clear latch	2
426	0x01AA	Relay 2 Name	R/W	STRING_16	Max 16 chars	8

Register (Decimal)	Register (Hex)	Description	RW	Type	Values	Register Size
434	0x01B2	Probe 0 Sensor Count	R	UINT_16	Number of active thermocouples	1
435	0x01B3	Probe 1 Sensor Count	R	UINT_16	Sensor count on smart probe 1	1
436	0x01B4	Probe 2 Sensor Count	R	UINT_16	Sensor count on smart probe 2	1
437	0x01B5	Thermocouple 1 Channel 0 measurement type	R	UINT_16	Thermocouple 1 channel 0 measurement type	1
438	0x01B6	Thermocouple 2 Channel 1 measurement type	R	UINT_16	Thermocouple 2 channel 1 measurement type	1
441	0x01B9	Probe 1 Channel 0 measurement type	R	UINT_16	Smart probe 1 channel 0 measurement type	1
442	0x01BA	Probe 1 Channel 1 measurement type	R	UINT_16	Smart probe 1 channel 1 measurement type	1
443	0x01BB	Probe 1 Channel 2 measurement type	R	UINT_16	Smart probe 1 channel 2 measurement type	1
444	0x01BC	Probe 1 Channel 3 measurement type	R	UINT_16	Smart probe 1 channel 3 measurement type	1
445	0x01BD	Probe 2 Channel 0 measurement type	R	UINT_16	Smart probe 2 channel 0 measurement type	1
446	0x01BE	Probe 2 Channel 1 measurement type	R	UINT_16	Smart probe 2 channel 1 measurement type	1
447	0x01BF	Probe 2 Channel 2 measurement type	R	UINT_16	Smart probe 2 channel 2 measurement type	1
448	0x01C0	Probe 2 Channel 3 measurement type	R	UINT_16	Smart probe 2 channel 3s measurement type	1
464	0x01D0	Thermocouple 1 Channel 0 name	R/W	STRING_16	Thermocouple 1 channel 0 name	8
472	0x01D8	Thermocouple 2 Channel 1 name	R/W	STRING_16	Thermocouple 2 channel 1 name	8
496	0x01F0	Probe 1 Channel 0 name	R/W	STRING_16	Smart probe 1 channel 0 name	8
504	0x01F8	Probe 1 Channel 1 name	R/W	STRING_16	Smart probe 1 channel 1 name	8

Register (Decimal)	Register (Hex)	Description	RW	Type	Values	Register Size
512	0x0200	Probe 1 Channel 2 name	R/W	STRING_16	Smart probe 1 channel 2 name	8
520	0x0208	Probe 1 Channel 3 name	R/W	STRING_16	Smart probe 1 channel 3 name	8
528	0x0210	Probe 2 Channel 0 name	R/W	STRING_16	Smart probe 2 channel 0 name	8
536	0x0218	Probe 2 Channel 1 name	R/W	STRING_16	Smart probe 2 channel 1 name	8
544	0x0220	Probe 2 Channel 2 name	R/W	STRING_16	Smart probe 2 channel 2 name	8
552	0x0228	Probe 2 Channel 3 name	R/W	STRING_16	Smart probe 2 channel 3 name	8
560	0x0230	Thermocouple 0 unit	R	STRING_4	Thermocouple 1 unit	2
562	0x0232	Thermocouple 1 unit	R	STRING_4	Thermocouple 2 unit	2
568	0x0238	Probe 1 Channel 0 unit	R	STRING_4	Smart probe 1 channel 0 unit	2
570	0x023A	Probe 1 Channel 1 unit	R	STRING_4	Smart probe 1 channel 1 unit	2
572	0x023C	Probe 1 Channel 2 unit	R	STRING_4	Smart probe 1 channel 2 unit	2
574	0x023E	Probe 1 Channel 3 unit	R	STRING_4	Smart probe 1 channel 3 unit	2
576	0x0240	Probe 2 Channel 0 unit	R	STRING_4	Smart probe 2 channel 0 unit	2
578	0x0242	Probe 2 Channel 1 unit	R	STRING_4	Smart probe 2 channel 1 unit	2
580	0x0244	Probe 2 Channel 2 unit	R	STRING_4	Smart probe 2 channel 2 unit	2
582	0x0246	Probe 2 Channel 3 unit	R	STRING_4	Smart probe 2 channel 3 unit	2
584	0x0248	Probe 0 Name	R/W	STRING_16	Onboard msp name	8
592	0x0250	Probe 1 Name	R/W	STRING_16	Smart probe 1 name	8
600	0x0258	Probe 2 Name	R/W	STRING_16	Smart probe 2 name	8

9. Appendix: Troubleshooting

See the table below for error messages and descriptions that may appear while operating the iServer 2.

Error Message	Description
OPEN	Probe sensor reads open, or thermocouple disconnected
SHORT	Sensor is shorted
RANGE	Reading is out of range
NAN / INVAL	Reading is invalid

10. iServer 2 Specifications

INTERFACES

Available input ports vary depending on the iServer 2 model

Ethernet (RJ45): 1x port (Power over Ethernet available on qualifying models)
Supported Protocols: TCP, UDP, SNMP, SNTP, ARP, ICMP, DNS, HTTP, and Telnet
Omega Link Smart Probe: 1x M12 8-Pin port (PN#: M12-MT-079-2F cable is required for dual Smart Probe functionality, sold separately)
Thermocouple: 2x ports (available on qualifying models)
Digital I/O and Relays: 2x RS232/RS485 1.5 A @ 30 V DC
LED Indicators: 100 BASE-T, Network Link and Activity, DHCP, Internet
Alarm I/O: Two contact inputs TTL 0.5; one open collector output 150 mA @ 30 V DC
Sample Rate: 8 samples/second max
Memory Capacity and Sample Rate: The table below lists the lifespan of the internal storage before the 11 GB of storage is filled. Some Smart Probes come with more than one active sensor. These sensors can be individually enabled and disabled using Omega's SYNC configuration software.

Sample Rate	2 Active Sensors	4 Active Sensors
1 second (max)	4 years	2 years
5 seconds	24 years	12 years
10 seconds	40 years	20 years

Management: Device and probe configuration and monitoring through embedded WEB server
Embedded WEB Server: Servers WEB pages containing real-time data and live updated gauge views and charts within definable time intervals.

MECHANICAL

Dimensions of Base Device: 101.6 mm L x 155.6 mm W x 330 mm H (4 in. L x 6.13 in. W x 12.99 in. H) not including bracket and M12 connector
Material: Stainless Steel
Display: LCD 32 mm L x 93.5 mm W
Weight: 655 g (1.44 lbs.), including battery

POWER

Power Input: 9 to 12 V DC
Consumption: 4 W
AC Power Adapter (Included) Nominal Output: 12 V DC @ 1.5 A
Power Over Ethernet: IEEE 802.3AF, 44 V – 49 V, Power Consumption under 10 W
Input: 100 to 240 V AC, 50/60 Hz
Back-Up Battery: 9 V DC, alkaline. 96 hours at 5 seconds recording intervals and 1 second reading with two connected probes

ENVIRONMENTAL

Operating Temperatures

iServer 2 Unit: 0 to 60°C (32 to 140°F)
Battery: -18 to 55°C (-0.4 to 131°F)
AC Power Adapter: 0 to 40°C (32 to 104°F)
Industrial Cable: -40 to 125°C (-40 to 257°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)

GENERAL

Configuration: Internal Web UI
Software: Access web server using any modern web browser such as Chrome, Edge, or Firefox on the same local network; Firmware upgrade from Internet; Export probe data log to CSV files
Agency Approvals: CE, UKCA, Canada ICES-3(B)/NMB-3(B), FCC (Part 15, Subpart B, Class B of the FCC rules)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications made to this equipment not expressly approved by Omega Engineering, Inc. may void the user's authorization to operate this equipment.

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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