PULSAlink

Installation Operation Manual

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Introduction

PULSAlink is a cloud management portal for Pulsafeeder's web enabled controllers, designed for *MicroVision^{EX}*. The web based system allows for easy controller management, remote program changes, viewing real-time readings, viewing and downloading historical data, enabling alarm notifications and much more. This manual covers high level functionality of PULSAlink and begins to familiarize users with some of the webpages and functions. For a detailed explanation of the controller operation please see the *MicroVision^{EX}* IOM (72-900-06) available for download at:

http://www.pulsatron.com/products/microvision-ex-0

In order to access PULSAlink user specific credentials are required. If you do not have a login, please contact your company administrator or Pulsafeeder directly on how to get setup. In order to get your controller setup on PULSAlink you will need an activation certificate. You can pre-purchase a controller activated on PULSAlink or purchase an activation kit on compatible models after the fact.

1. GENERAL WARNINGS

⚠ Symbol hereinafter and upon the unit means WARNING!
⚠ If the equipment is used in a manner not specified by the manufacture, the overall safety may be impaired.

2. INSTALLATION

2.1 Connections

Two versions of the controller may be supplied. One version includes the RJ-45 Ethernet cable and the other version does not. If you have the version without the Ethernet cable installed an activation kit part number ACT-PULSALINK must be ordered and installed. The activation kit includes the proper cable and instructions.

Connect the RJ-45 cable to a router or cell modem with an internet connection. The *MicroVision^{EX}* will automatically detect and assign an IP address and will connect to https://www.pulsalink.net/ automatically.

Please remember, all wiring is per local codes and regulations. Also, be aware of the environment the device is installed and ensure the enclosure and wiring is done in appropriately rated enclosures.

2.2 Setting Up Your Controller on PULSAlink

A cloud capable *MicroVision^{EX}* from the factory comes equipped with an RJ45 Ethernet connector. The controller is already preconfigured to communicate to our

cloud software solution, PULSAlink. The controller only requires a network connection to the internet. When setting up your controller, ensure the *MicroVision^{EX}* has a reliable connection to the internet to ensure reliable performance.

2.2.1   Physical Connection Methods

2.2.1.1   Hard Wired Connection

The most reliable and robust way to install your *MicroVision^{EX}* would be a hard wired connection. The MVEX utilizes IEEE 802.3 and communicates via TCP/IP. The controller uses DHCP and ICMP to find an available IP address, it is not a static IP. In most cases, the controller should not require any special adjustments to a network in order to connect to PULSAlink, Pulsafeeder's cloud solution.

2.2.1.2   Wireless – LAN

Directly connecting the controller to a wired network port is not always possible. Some installs could still reside in a Wi-Fi LAN which has internet access. Another connection option would be a Wi-Fi to Ethernet adapter. Depending on the type of Wi-Fi, a compatible network adapter will need to be selected and connected to the available internet connected Wi-Fi.

2.2.1.3   Modem Connection

Despite the secure and robust communication of the *MicroVision^{EX}*, some locations do not desire external hardware to be connected to their internal network. For these cases, we would recommend a reliable modem. Ensure the selected modem has an available RJ45 port, the installation is done in an appropriately rated enclosure for installation environment, and the service provider has a strong cell signal. Typically, you can login to the modem-browser through the provided gateway information. Please follow the manufacturer's instructions.

2.2.2   Finalizing Setup

Now that the *MicroVision^{EX}* has been connected to a "live" Ethernet connection, ensure the token is set to a non-zero value (Menu->Communications->Networking->Token). For companies using unique tokens, please enter the value here. If there is no company specific token, please enter "000-000-001" locally on the controller.

With a non-zero token and a reliable network connection, reboot the controller and the *MicroVision^{EX}* will authenticate with PULSAlink upon start up. At this point, login to https://www.pulsalink.net/login on an authorized account (user email and password required) to see and manage the controller.

3. *PULSAlink* FEATURES

3.1 Security

PULSAlink is a very secure, modern, and scalable online platform. PULSAlink was designed with the future of the internet of things in mind. The controllers communicate to PULSAlink over a standard secure port (443) which allows network administrators to keep their LAN firewall secure. The controllers use their own proprietary API designed specifically for this market. Additionally, all transmitted data is encrypted to prevent tampering and to keep information secure. Similarly, users accessing PULSAlink are using user specific credentials and all of their interaction is protected and encrypted to maintain the highest level of security.

3.1.1 Connectivity Specifications

- Physical Layer: IEEE 802.3 – Wired Ethernet protocol (CAT5 connector)
- Connection Protocol: DHCP (Dynamic Host Configuration Protocol)
- Communication Port: 443

3.1.2 Communication Architecture
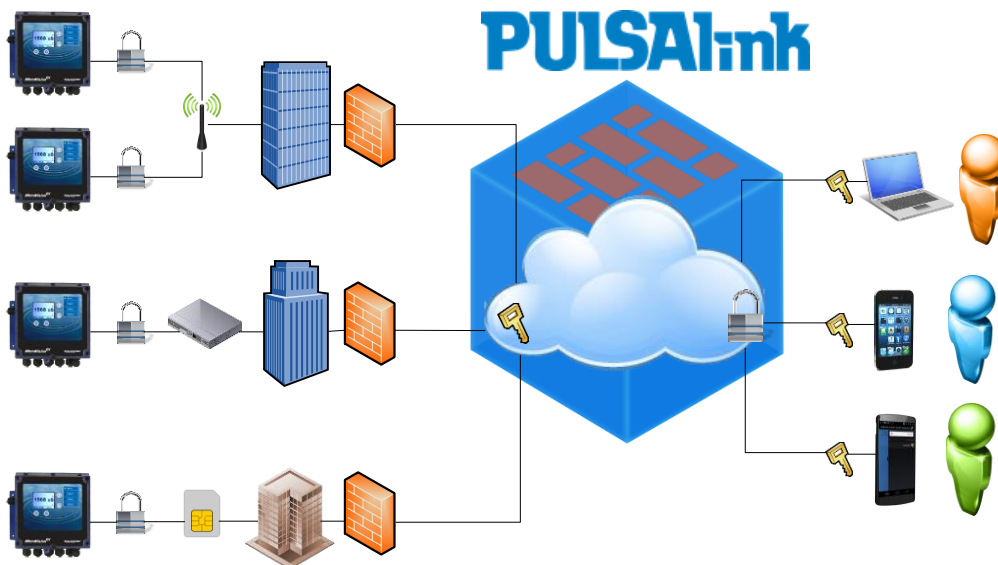
3.2 Access

MicroVision^{EX} controllers are accessed by going to https://www.pulsalink.net/login and entering your e-mail and Password. Alternatively, PULSAlink has a mobile application for both android and IOS. This can be found in the respective app stores. Through both the browser and the app, just enter your credentials to gain access to all of your equipment. If you do not have your login e-mail and password, contact your company administrator or equipment supplier.
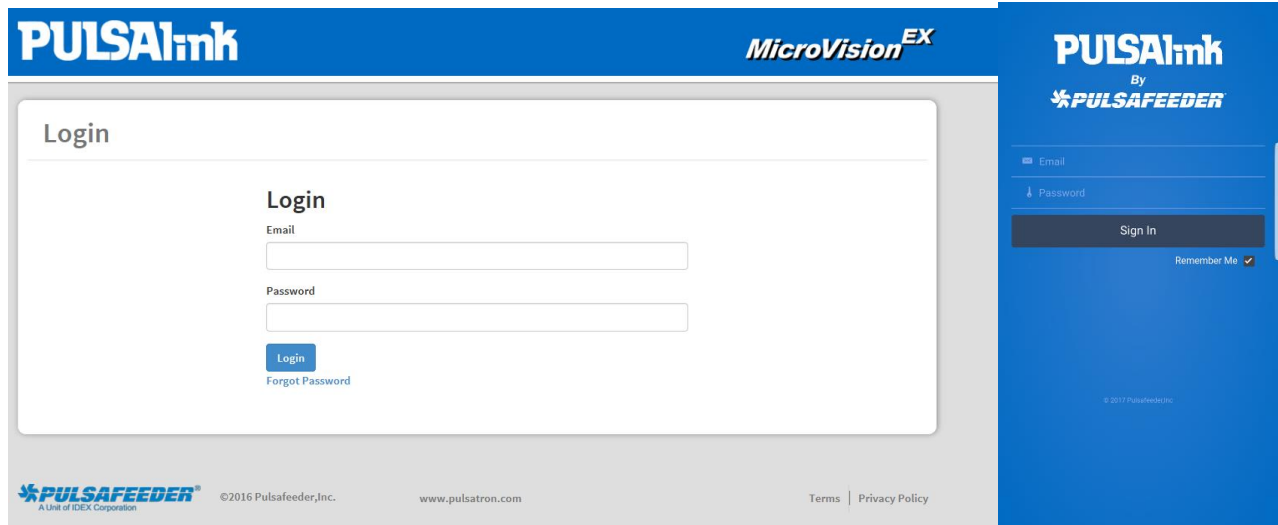
3.3 Home Screen

The PULSAlink home screen displays the list of controllers that are available for remote access. Depending on the controllers available to you, the home screen will look similar to below.
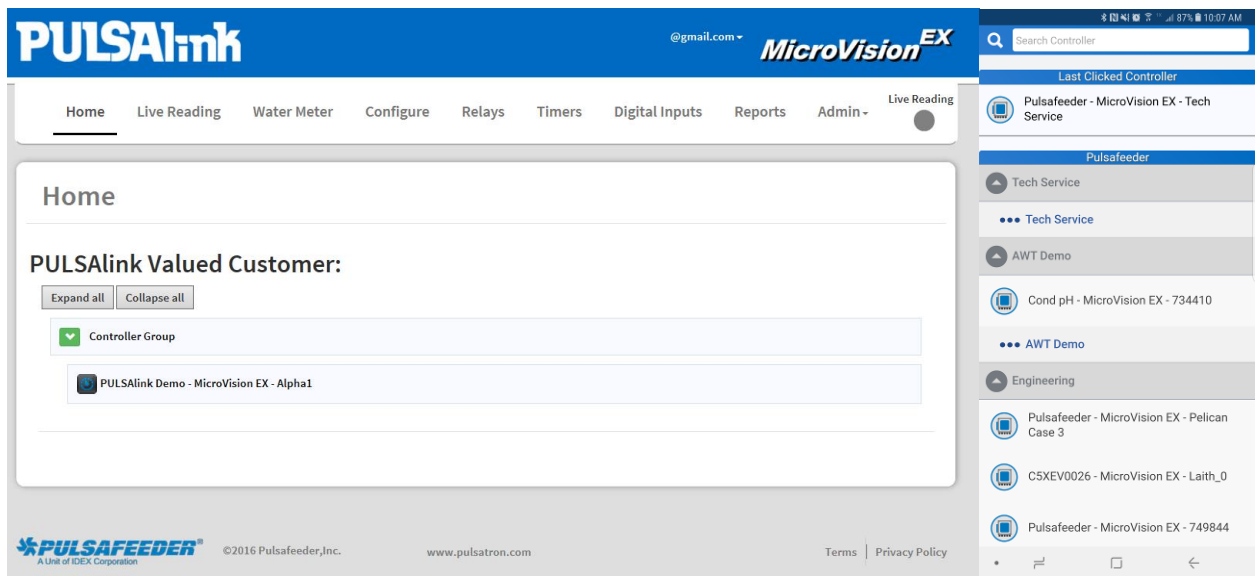
Group expansion button

Used to expand the group of controllers in each group.

Controller select button

Used to connect to a controller.

Each controller is identified by a controller select button followed by the display line 1 and display line 2 settings in the controller. Since the factory default for every controller is "Pulsafeeder" for display line 1 and display line 2 is "MicroVision EX", the serial number is also provided at the end of the description (serial number is "Alpha1" in the above example). The serial number is also located on the controller's data label. Click the controller select button to establish communication with a controller.

3.4 Live Readings Screen

When the controller select button is clicked the Live Readings page is displayed.
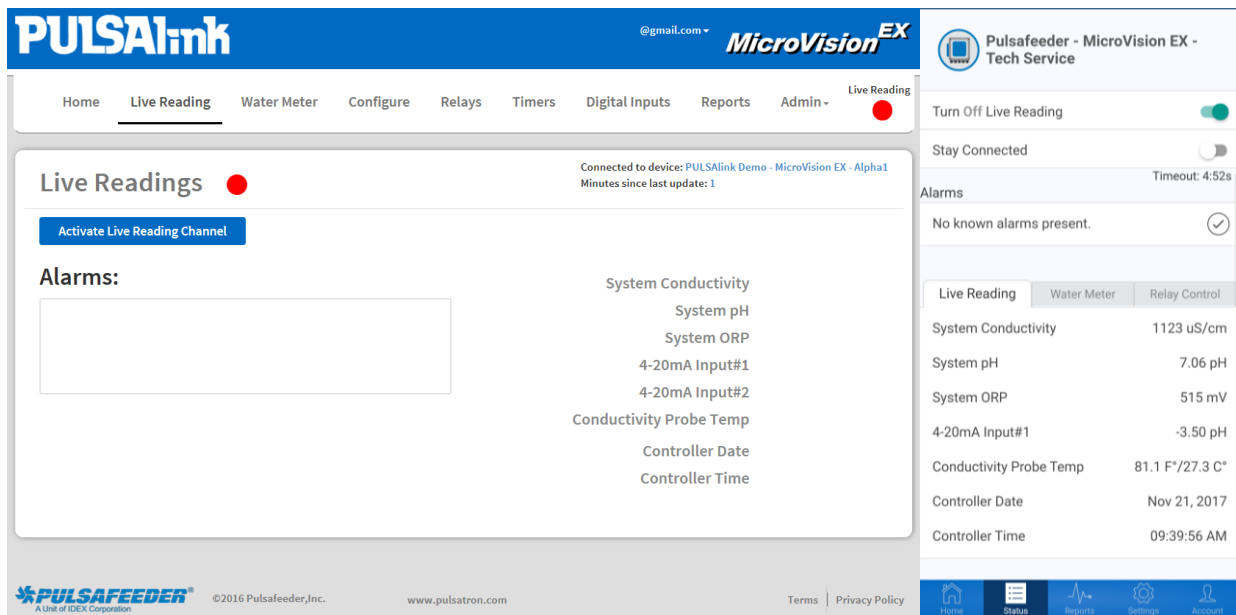
Pulsalink Web	Pulsalink App	Meaning
(red)	(off toggle)	RED – Live data is not on
(yellow)	(yellow toggle)	YELLOW – Live data Transitioning
(green)	(green toggle)	GREEN – Live Data on
Activate Live Reading Channel	(off toggle)	Used to activate or deactivate live data. Click or press to activate live reading

3.5 Live Readings Mode

When the live readings mode activates, the controller will begin streaming data to the cloud approximately every 10 to 15 seconds. The live data stream will time-out after five minutes unless the stay connected check box is selected.
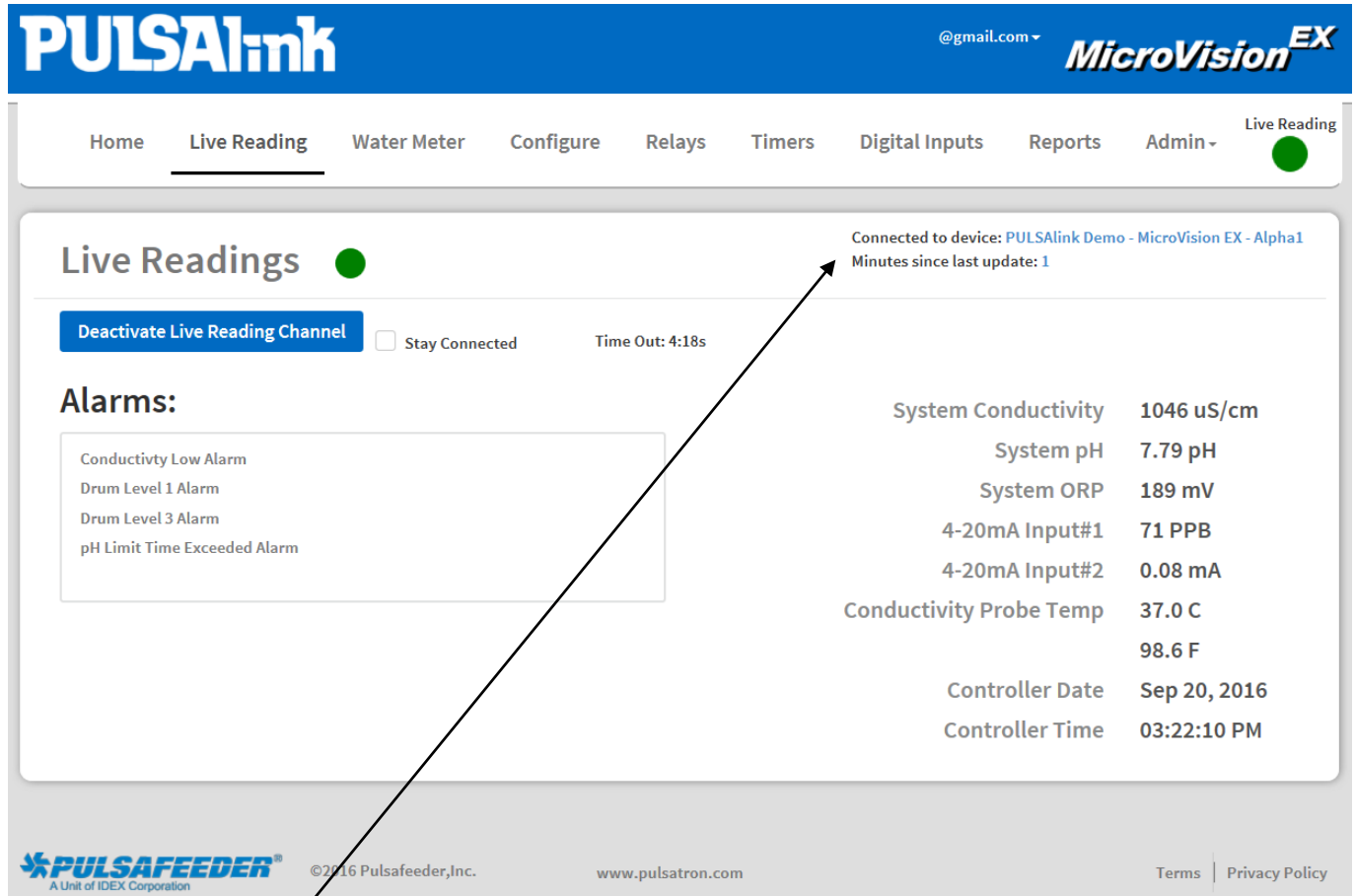
Connected to device: - This is the name of the device that is currently sending and receiving data. The name is the display line 1, display line 2 settings (see "configure/display settings") and the serial number of the controller.

Minutes since last update: - This is the number of minutes that has elapsed since the controller has sent updated information to the website. By default the controller will send a data file every one minute. However, this setting can be changed locally at the controller in the **Communications>USB>Data Log interval** screen, or viewed on the website on the **Configure>Communications** page. The minutes since last update should not exceed the data log interval setting unless communications to the controller has been lost. The maximum value is 120 minutes. Should the value exceed 120 minutes network troubleshooting is necessary.

3.6 Water Meter

On the water Meter page, each water meter's total value is displayed along with the date since last reset. (Hall Effect/Dry contact and the value of each pulse)

3.7 Configure

On the configure page the following controller menu options are available:

Configure: Set how many optional 4-20mA inputs or outputs are installed, the system units in gallons or liters, and the system language (English only).

Display Setting: Set the LCD brightness on the controller, display line 1, display line 2, the home screen scroll rate, alarm display size, and the display dampener settings.

Password: Set the local device security password. This is the controller keypad access password only.

Settings: Sets all of the system set points for conductivity, pH, ORP, 4-20mA inputs and outputs.

Consult the *MicroVision^{EX}* IOM for details on the above functions. The following PULSAlink specific options also appear in the configure menu and will be explained in further detail.

3.7.1   Configure Alerts:

This menu configures how PULSAlink will send e-mail notifications for system alarms and Live readings reports. The below is the default screen:

Subject:

Enter the desired subject line content for every e-mail sent from this controller.

Recipients:

Enter the e-mail addresses for everyone that should receive the e-mails. (Use the + symbol to add the e-mail after you type it in the box).

3.7.2   Alarm E-Mails

Click the check box for "Enable Alarm Notifications" and the following screen will appear:

Alarms

☑ **Enable Alarm Notifications**

For Alert Types

☑ Flow Switch Alarm
☐ Cond. High Alarm
☐ Cond. Low Alarm

Select every alarm condition that should result in an alarm e-mail being sent, then click "Save Changes".

3.7.3   Live Readings Report

Click the check box to enable live readings reports. The live readings report will e-mail the parameters from the controllers live readings page on either a daily, weekly, or a monthly basis. The actual time that the e-mail is sent is based on the PULSAlink server time, which is currently Eastern US and Canada, not the local controller time (controller may be located in different time zone).

Live Reading

☑ **Enable Live Reading Report**

☑ Daily   ☐ Weekly   ☐ Monthly

Start Date and Time

| 09/02/2016 | 🗓 | | 11 | : | 34 | AM | Eastern Time (US & Canada)

Save Changes

3.7.4 Communications

The controller has two primary methods of data collection; server data and controller data.

1. **Server Data Log:** This data is reported to the PULSAlink server by the controller over an internet connection. The frequency of the records is the same as the "data log interval setting" in the controller. The server is currently set to record up to 3 years of data.
2. **Controller Data Log:** This data is recorded by the controller on its internal memory. The frequency of the records is based on the data log interval setting in the controller.

Erase Data Log: Use this function to reset the controllers data log records. The current data log will be erased and cannot be recovered.

Data Log Name: Use this setting to give the exported data files from the controller via direct USB download a unique file name for each controller. The file name length is fixed at 16 characters.

Data Log Interval: Use this setting to define how much data the controller will store. Options are "Custom", 30 days, 60 days, 90 days, 120 days, 1 year or 2 years. All Data Log Interval ranges still record controller data every 1 minute. However, the "custom" setting allows for a range from 2 to 120 minutes to make exporting the data file to a USB drive or downloading faster. Because the custom range always uses the same size memory block, it stores various ranges of data.

Example:
> Custom range @ 2 Minutes = 60 Days
> Custom range @ 120 minutes = 9.8 Years

Normal data log interval settings create a file that could be as large as 350MB in size. The custom range settings create a file that could be as large as 40MB.

> ☼ **NOTE** **In order to access the data stored on the controller remotely the data log interval must be set in either 30 days @ 1 minute or any setting in the _custom_ menu.**

> ☼ **NOTE** **Changing the Data log interval erases the existing data log file in the controller to create a new one. To avoid losing data, download the current log file before changing this setting.**

Configuration File: The controller programming and set points can be downloaded for duplication of the program on other *MicroVision^EX* controllers or as a record of the current settings.

3.7.5 PULSAlink Graphing Tool

PULSAlink has an integrated on board graphical suite. It allows fast, intuitive access of the controller's data to monitor performance. Graph-able parameters are model dependent but include conductivity, pH, ORP, and any 4-20mA input (e.g. PTSA).

Interacting with the Data

Zoom: In order to zoom in and out you can use the scroll wheel on a mouse. If you have a touch capable device, pinch gestures work. The range can be specified in the top right and there are date picker boxes at the bottom. All of these are ways to adjust the time scope of your data view.

Add/Remove Parameters: In the top right you can click on the various displayed parameters. When the indicated parameter is dark in the top corner, you will see that parameter added to your graphical display.

Hover: To view any value on the trend line, simply hover with your mouse or touch the screen with a touch input.

Scroll: The scroll bar at the bottom allows you to keep your time range the same but rewind and fast forward in time.

Export Data: In order to export the current view of the graph, click the "Export Drop Down" icon in the top right corner of the graph. Select which format you would like to export the image. Simply save and use the image however you like.
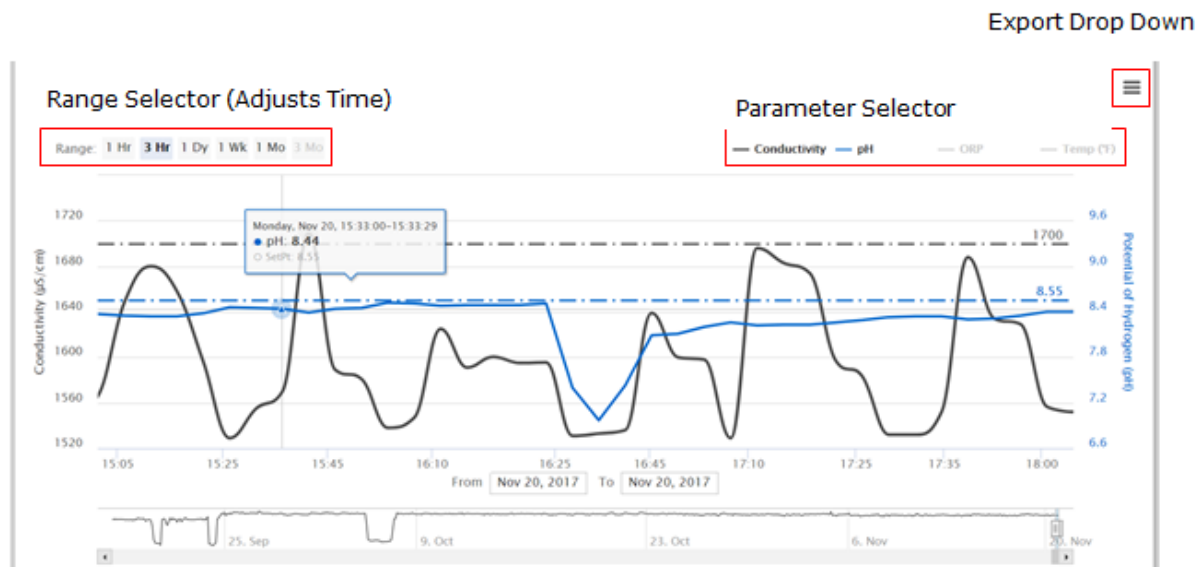
Offline Graphing Tool

The MicroVision EX data log output is a ".csv" file. This file can be opened for easy viewing and graphing of data using our provided graphic tool.

Visit: www.pulsatron.com/support/pulsaworks to download the tool and instructions on its use.

3.8 Relays

On the relays page, each relay of the controller is displayed including its assigned function, the current HOA (Hand Off Auto) mode, and the current relay status. On this screen the relays can be changed from manual on for five minutes, forced off indefinite or automatic modes. When changing relay HOA modes the Live Readings mode must be activated.

3.9 Timers

On the timers page, each timer on the controller can be programmed for the various modes of operation.

3.10 Digital Inputs

On the digital inputs page, each digital input on the controller can be programmed for the various modes of operation.

3.11 Reports

On the reports page, there is a complete interactive graphing widget. Viewable are the last 3 months of data. The user has the ability to filter and scope the data by date, choose which variables are graphed, and export useful graphics for reporting activity. Additionally, there is a link for downloading the PULSAlink offline graphing tool which provides additional information about your controllers operation.

3.12 Admin

The administration page is used for setting up user names and groups and managing controllers for users and groups. PULSAlink has different levels of administration as follows:

Company Administrator
This role is created by Pulsafeeder when the account is first setup. This role manages all levels of users and controllers; they can add all levels of users and can create groups for easier management at the management level.
Manager
Can add technicians and users and can create technician groups for easier management
**Technician**
Can add users and can create subgroups for easier management
User
Can access controllers that they are assigned

If you are not the company administrator, when you log into to PULSAlink you will see the groups and controllers assigned to you by the company administrator. Contact your equipment supplier or company administrator for a user name and password, if you do not have one.
If you have been setup as the Company Administrator, and at least one controller has been activated in your account, you will see a screen similar to the one below when you log into the system.
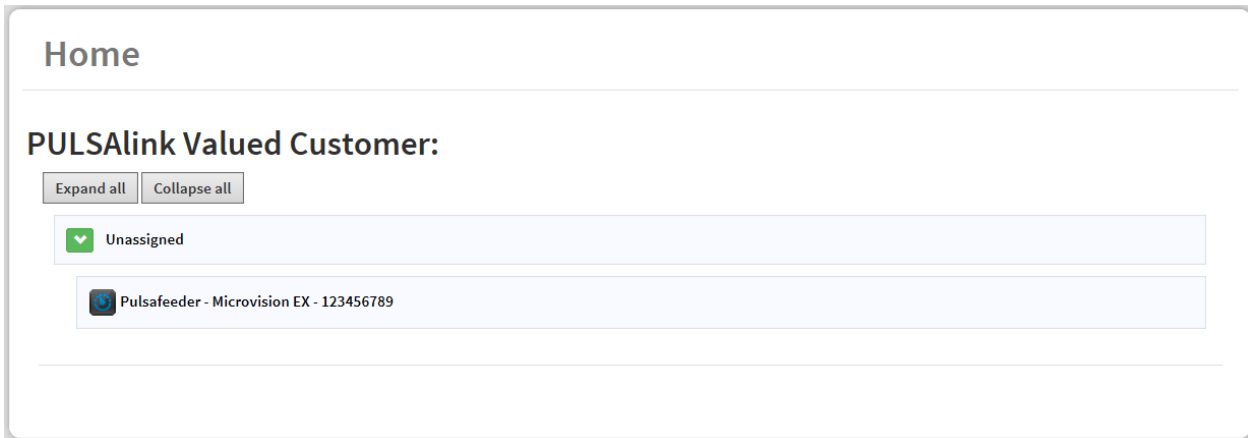
When a controller is activated, it is added to a new group called "unassigned". The controllers default name is "Pulsafeeder – Microvision EX" followed by the serial number of the unit itself. The serial number is printed on the box/packaging and the data label of the controller itself.

3.12.1   Manage

3.12.1.1   Unassigned Controllers
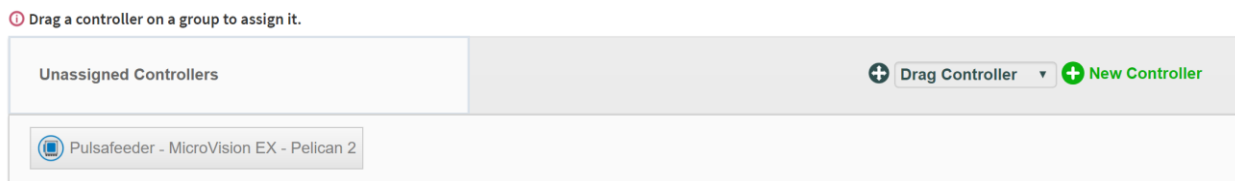
In order to access and manage your equipment you need to set up the devices into groups which are viewable on the home page. Any unassigned controllers will not be viewable on the home page. It is imperative you assign these controllers. Simply click and drag them into a group to get started. If you have not created any groups, please do so.

3.12.1.2   Root Groups
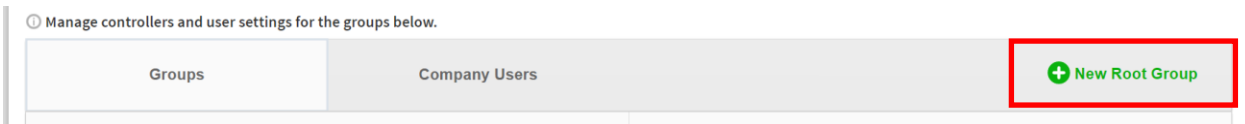
A root group is a top level folder to drop controllers and assign users to. This will allow you to manage the various regions, territories, and customers you have. A well-structured group hierarchy will allow for quick assignment of users and controllers.

3.12.1.3   Groups

Each group has a role level. The role level of a group correlates with the role level of users. Manager users can only be assigned to manger groups. To create subgroups, click on the group you would like to create a subgroup for, and look for the "+" symbol.

### 3.12.1.4   Controller Assignment
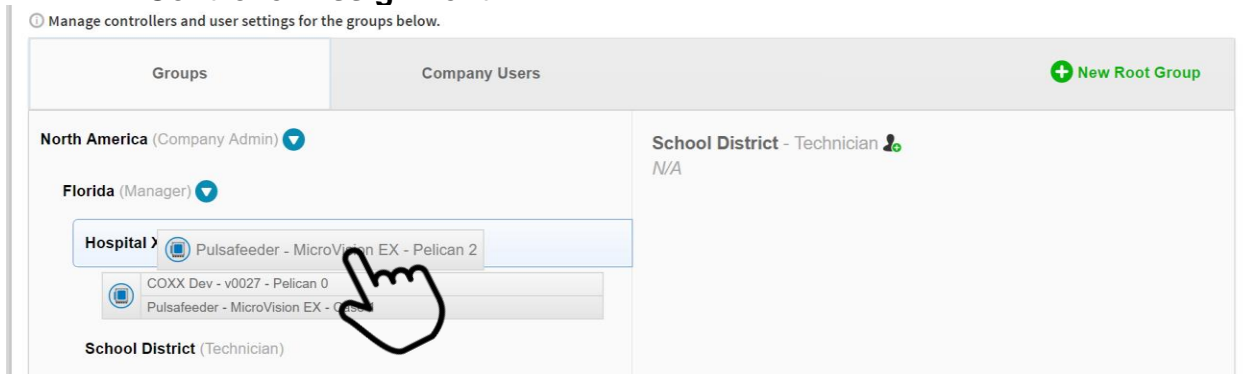
Controllers are intractable objects. A controller can only be assigned to one group at a time. To move the controllers around, you must select the controller by clicking, holding and dragging the controller. To assign the controller to a specific group, hover the controller over the group you wish to assign the controller and wait for the group to be highlighted. Then release the mouse button to drop the controller into the specified group.

3.12.1.5   User Management

To create, delete, and edit any users select the "Company Users" tab. You will see all of the current users here. Simply click any user when in edit mode to edit any information about that user.
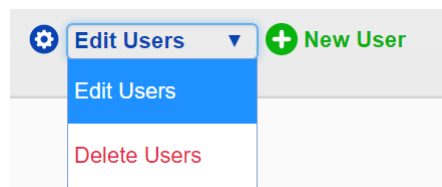
You can switch the mode of operation from edit mode to delete mode in the top corner. Additionally, creation of new users can be done here. Ensure during user creation you are assigning the user with the correct role. This will allow you to assign them to the appropriate group.

Create Users
Click Create new user

Create New User

Email

Manager@pulsalink.com

First Name

Pulsalink

Last Name

Manager

Password

••••••••••

Password Strength

Minimum length 8, 1 Special Character (Symbol), 1 Number, 1 Capital Letter

Confirm New Password

••••••••••

Phone (optional)

Enter Phone Number

Role

Cancel

Enter the user information; the e-mail address is used for login purposes. Assign the user a role that is appropriate for the group access they should have and then click save.
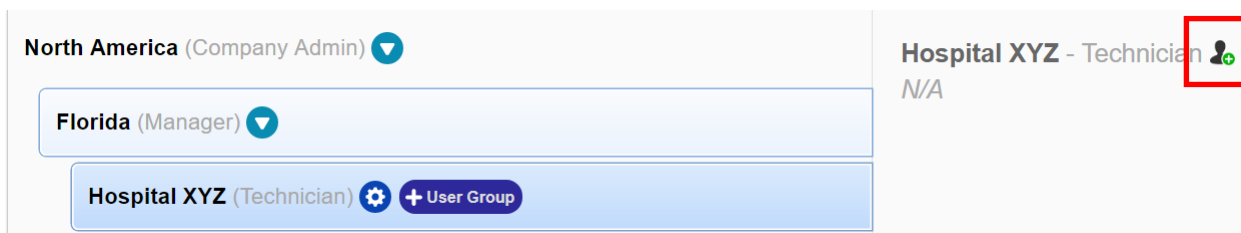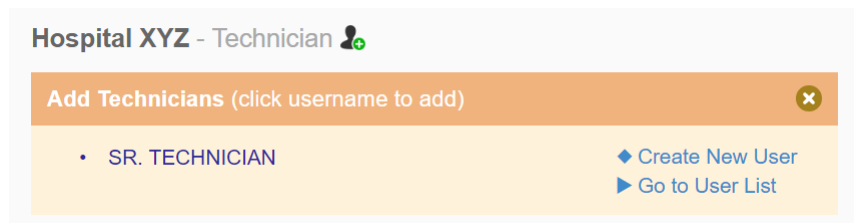
3.12.1.6   Read Only Users

☐ Read Only Access

During user creation you will see the option to create a "Read Only Access". Many states regulate who legally has the ability to feed biocides and change water treatment programming. PULSAlink allows the ability to create a user who can only read the content available. They are not able to change the programming of the controller, energize relays, or make any changes to the setup. This mode is perfect for facility managers who want to be informed about their equipment but are not legally qualified to make any changes. Simply check this box to enable read only mode.

3.12.1.7   User assignment

For users to have access to equipment, they need to be assigned to a group within which the equipment resides. In order to assign users to groups, select the group tab on the top of the manage page. Select the group to which you wish to assign a specific user. On the right hand side, there is an "Add User" symbol. Clicking the symbol will allow you to see all users of the correct role who are assignable to the group. If you do not see the user you wish to assign, please verify their role and/or that individual's user profile has been created in the company users tab.

North America (Company Admin) 🔽

Florida (Manager) 🔽

Hospital XYZ (Technician) ⚙ ➕ User Group

Hospital XYZ - Technician 👤➕
N/A

3.13 Company

As company administrator the company contact information can be changed or updated. In this section the company shared token can also be set.

> ⚠ **Changing the shared token setting can cause controllers to stop communicating**.

Shared Token: The shared token is an added level of security that can be implemented or the default value can be used. If a token other than 000000001 is used in this screen, the same token **MUST** be entered into the communications settings locally on the controllers for your account. If the token settings do not match, the controllers cannot connect to your account.

3.13.1   eService Compatibility

PULSAlink is compatible with H2tronics' eService reporting tool. Subscribing connected controllers to the eService tool is as simple as checking a box in the customer page. After the check box has been selected data will be sent over to the specified or the default address. In order to view the data on their end, contact H2tronics for additional configuration. You will need the 96-bit ID of the controller to setup your device on the eService report side.

4.   TROUBLE SHOOTING

Troubleshooting the *MicroVision^{EX}* Cloud Connection

Occasionally, the *MicroVision^{EX}*'s network communication will be interrupted or require some additional attention during setup. Unexpected power outages and networking issues could prevent the controller's access to PULSAlink. Controllers installed on a modem may experience poor network / cellular signal in remote areas or inside facilities with metal roofs or a basement installation. These steps will help identify any issue which the MicroVision EX might have communicating with PULSAlink.

4.1.1   Network Connection

Unfortunately, network issues could interrupt the *MicroVision^{EX}* from communicating with PULSAlink. If this is the case, contact the site network administrator for advice on this issue. The local IP address of the controller can be located under Menu->Communications->Networking->MAC/TCP. If a modem is used, log into the gateway of the device. Many modems and network jacks have lights which indicate their operation state. These can also

be useful tools in debugging your network connections. If the MicroVision^{EX} gets knocked offline after power cycles when it has a hard connection to LAN with internet access, ensure the physical connection is mapped to a static IP on the network.

4.1.2 Token

Please remember the controller has a unique token which provides you with an additional layer of security. Make sure the token is set to "000-000-001" if a generic token is used. Or, if a company specific token is used, enter the company specific token on the controller locally for communication. This must match the token as defined on PULSAlink to establish communication. Once the token has been changed, the device will need to be rebooted to establish connection (Menu->Communications->Networking->Token).

4.1.3 wDC Screen

Pulsafeeder provides a powerful tool for the user. Our wDC screen gives the user insight on the connection status of the controller. This screen can be accessed under Menu->Communication->Networking->wDC Info

Upon boot-up, this screen will say initializing.

Once boot up is complete the screen should say "Norm Conn", "Live Conn" or "RD Conn" on the top line under the header.

If live communication mode has been enabled, the screen says "Live Conn"

These two states indicate the controller has authenticated with PULSAlink and should be accessible to users who have been granted access.

If this screen is either blank or in "norm disconn" mode, please check the token and the network connection.

4.1.4 E-Mails

If you are not receiving the e-mails from PULSAlink, check your e-mail SPAM system or junk mail settings.

5. FORSEABLE MISUSE

The unit has many relays which can be programmed to operate on a variety of inputs and timers. It is important to verify the system is set up properly through testing, and that relays are actuated by the correct timer or input. It is important to verify all unit readings match a known value. Operating outside design intent may cause hazard. Connecting receptacles to unapproved hardware, e.g., drills, power tools, motor driven pumps, may cause a hazard. Use only as directed.   Unit has been designed for cooling tower applications and any other application should be discussed with the factory prior to install. Do not operate off another controller. Do not use with extension cords.

PULSAFEEDER