

Connecting Needs with Capabilities

# VeriFast™ MicroView 4.0

## Ethernet / IP

### User Manual

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# Supporting Documentation

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In addition to this user manual, use the following CenterLine documents:

- *VeriFast™ MicroView 4.0 – Screen Guide.*

Also refer to any relevant information for the welding equipment and machinery that is being used with the VeriFast™ MicroView 4.0.

# Safety Information

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- Read and understand this user manual in its entirety prior to installation, operation, or maintenance of the equipment illustrated in this document.
- CenterLine has made every effort to ensure that the descriptions and procedures illustrated in this user manual are accurate. However, CenterLine reserves the right to make product changes that might not be reflected in this document.



To prevent potentially serious or fatal injury:

- Learn how the equipment works. Prior to installation, operation, or maintenance of the equipment, understand its hazards and safety features.
- Do not modify the equipment.
- Do not install the equipment in an area with flammable materials.
- Keep the equipment free of dirt and obstructions.

# Equipment Lockout Procedure

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Before any installation, maintenance, or service procedure is started, all the equipment and surrounding equipment must be put into lockout state.

De-energize all sources of power (for example: pneumatic, water, electrical), and ensure that the equipment is unable to be restarted while service work is being performed. Improper safety measures may result in personal injury or equipment damage.

Before turning the equipment ON again, make sure all the components are assembled correctly.

# Potential Hazards Related to the VeriFast™ MicroView 4.0 and Surrounding Equipment

The VeriFast™ MicroView 4.0 system has no specific hazards related to it. However, as the VeriFast™ MicroView 4.0 is used in conjunction with other equipment such as welding equipment and machinery, robot, air supply, etc., the user should be aware of the warnings, hazards, and precautions related to the use of the equipment as a whole.

# Equipment Overview

## Intended Use of Equipment

The VeriFast™ MicroView 4.0 (also referred to as “MicroView 4.0”) is a process monitor that allows the simple integration of analog linear position sensing devices into resistance welding systems that require Ethernet/IP communication. A maximum of 2 analog devices can be connected to and monitored by the MicroView 4.0 at a time. The MicroView 4.0 can be configured either from the integrated CLCS HMI display(s), or from a browser via Wi-Fi/Ethernet.

## Equipment Configuration

The MicroView 4.0 consists of 2 primary components:

- Process Monitor
- CLCS HMI. Note: A secondary CLCS HMI is optional.

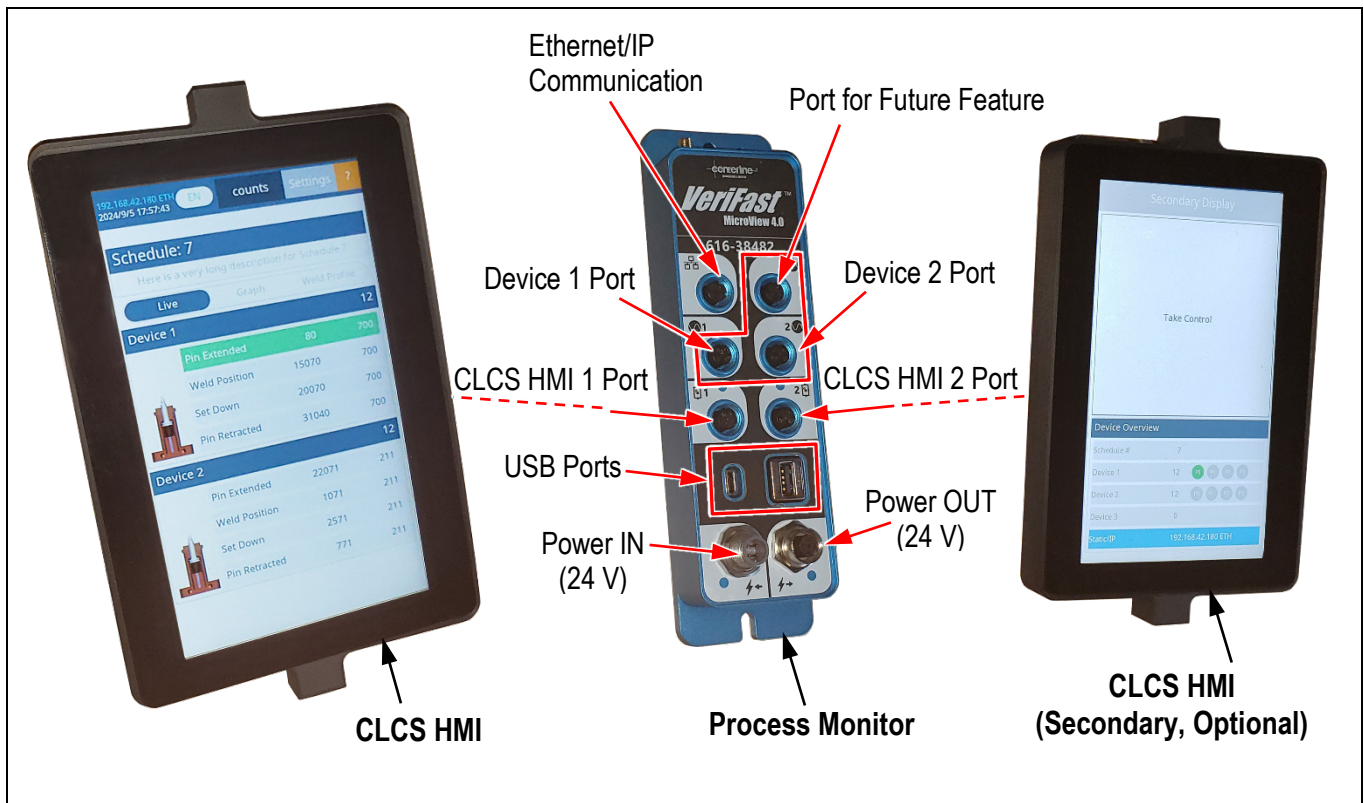


Figure 1 – Configuration of VeriFast™ MicroView 4.0

## How it Works

The Process Monitor (see Figure 1) can monitor up to two of the following analog linear position sensing devices:

- VeriFast™ IA
- VeriFast™ LPT
- VeriFast™ LVDT (requires additional external hardware)
- Generic device that operates on 0 to 10 V

\* Note: The VeriFast™ MicroView 4.0 is optimized for use with the VeriFast™ IA welding electrodes.

Each of the two monitored devices must be connected to the Process Monitor either into the Device 1 Port or Device 2 Port (see Figure 1), which are 0-10 V analog input channels with 16 bits resolution. Through the integrated Ethernet communication, the Process Monitor has access to process variables, such as set points and tolerance bands. Note: Device 3 Port is reserved for future features and is unused at this time.

The standard MicroView 4.0 integrates one CLCS HMI, which allows the user to configure and monitor the system. The CLCS HMI is usually mounted on the machine being monitored. A second CLCS HMI is optional and can also be mounted, for example, on the cell fence for remote teaching and monitoring. The two HMIs are identical, but the menus displayed are specific either to a primary or secondary HMI. Only one HMI can be primary at a moment, but the roles of the HMIs can be swapped at any time.

The menus that are displayed on the HMI are intuitive and guide the user through the configuration and monitoring processes. The MicroView 4.0 supports 127 weld schedules for automated machines. Every schedule can monitor up to four (4) linear positions / parameters. A set of independent upper / lower tolerance window can be set individually for each position / parameter.

The USB ports integrated with MicroView 4.0 allow to download weld data to external USB storage.

The On-board storage has the ability to store over 500,000 reading per channel (roughly 14 weeks at 47,720 readings per week).

The Over-The-Air (OTA) software updates and connectivity allow for alternately configuring the MicroView 4.0 from a PC or phone, using a web browser via Wi-Fi or Ethernet.

The MicroView 4.0 uses selectable and scalable units in: counts, mm, or inch.

The MicroView 4.0 offers multi language support in: English, Spanish, Portuguese.

## Technical Specifications

Table 1 – Technical Specifications of VeriFast™ MicroView 4.0

Parameter	Value
<b>Power:</b>	
Input Voltage / Current	20 VDC – 30 VDC, 1 A max @ 24 VDC
<b>Communication</b>	
Field Protocol	Ethernet/IP
Wireless 2.4 GHz	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n WPA/WPA2 Security
<b>Environmental:</b>	
Operating Temperature Range	-20°C to 50°C
Device dimensions	See Figure 3 on page 8.

# Pinout Diagram of the Process Monitor

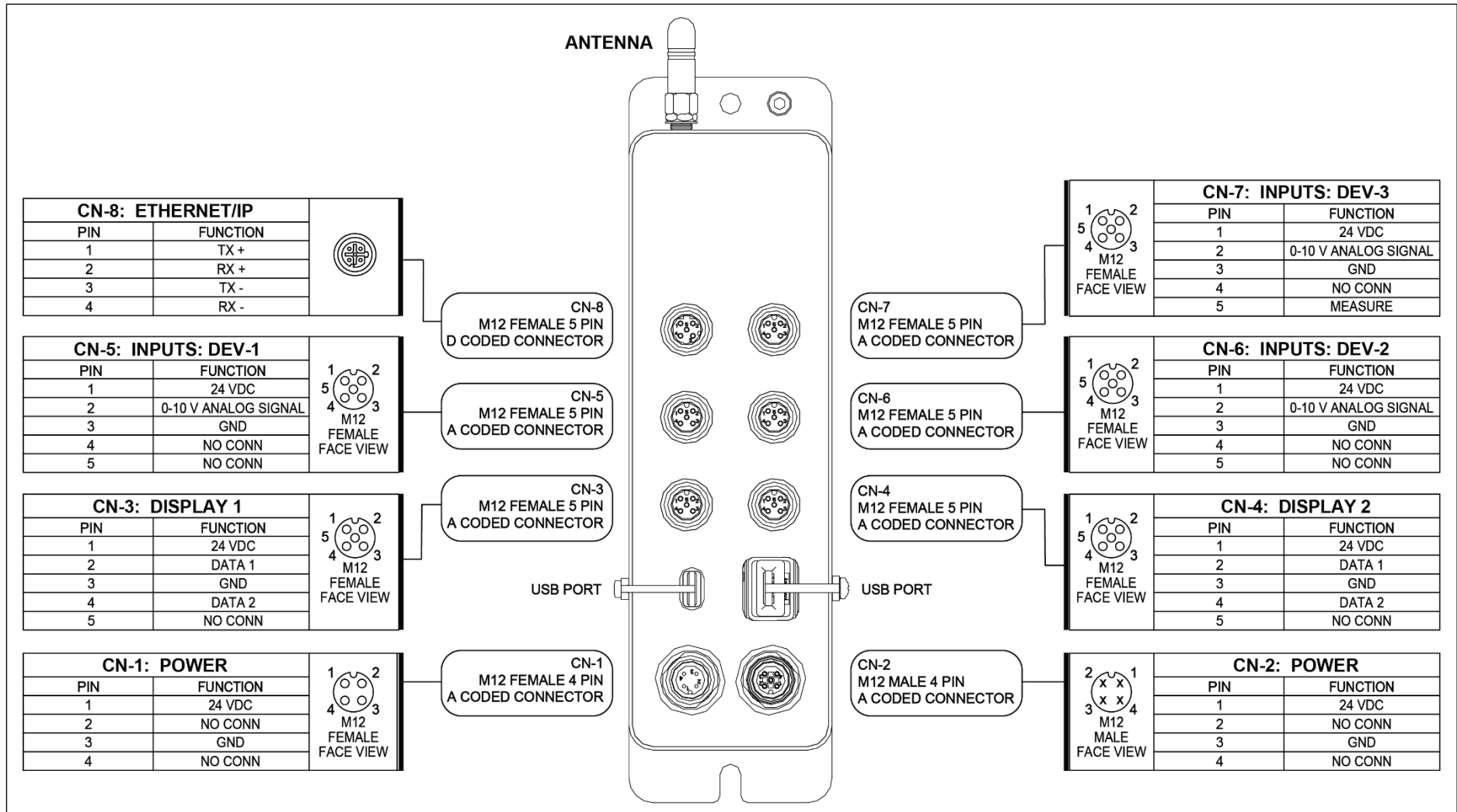


Figure 2 – Pinout Diagram of the VeriFast™ MicroView 4.0 Process Monitor

## Dimensions of the Process Monitor

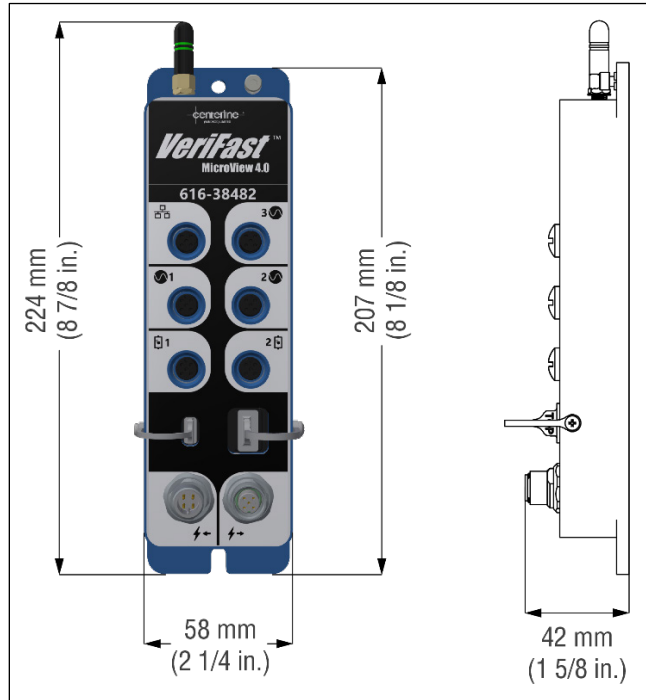


Figure 3 – Dimensions of the Process Monitor

## Part Ordering Information

The VeriFast™ MicroView 4.0 is marked with labels providing information about your specific configuration. When ordering a replacement component, please check your own equipment to find its specific part number. As a reference, see Figure 4.

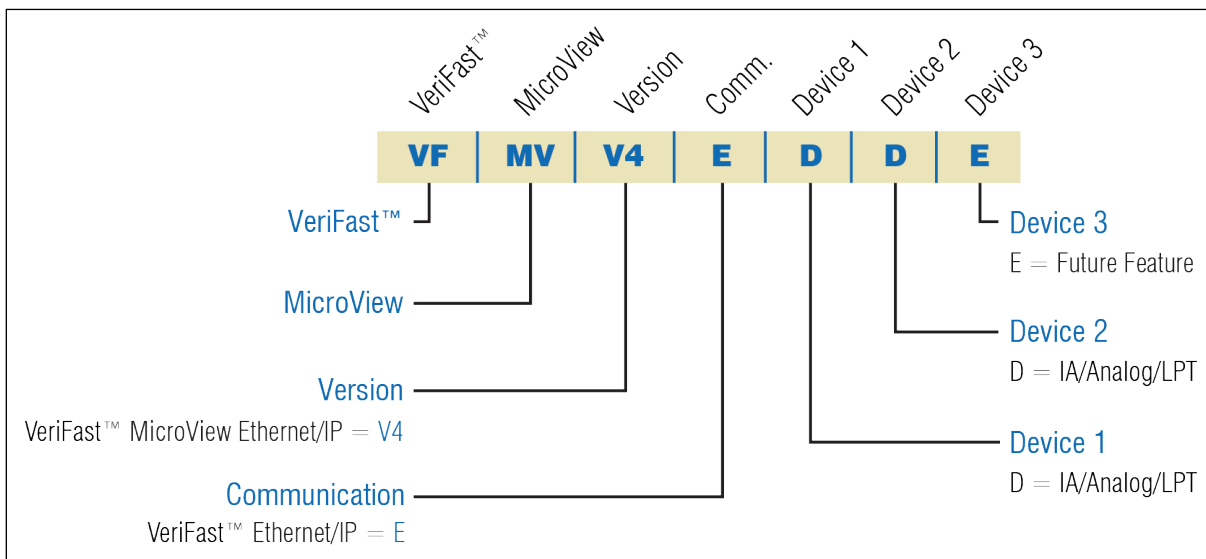


Figure 4 – VeriFast™ MicroView 4.0 Part Numbering System



# Installation Guidelines

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CenterLine recommends that qualified electrical personnel be involved with the setup and operation of the VeriFast™ MicroView 4.0. Also, a qualified weld engineer or quality control personnel should be available for tolerances adjustments and scaling, when required.

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## Mounting the Process Monitor

The Process Monitor must be mounted on a flat surface in a convenient location on the machinery or fixture that will be monitored. Do the following:

1. Perform the *Equipment Lockout Procedure* shown on page 4, so that the components of the surrounding equipment cannot move.
2. Using two M6 screws, mount the Process Monitor on a flat surface on the machinery or fixture being monitored. Ensure that the mounting location allows access to connect cables to the ports of the Process Monitor.

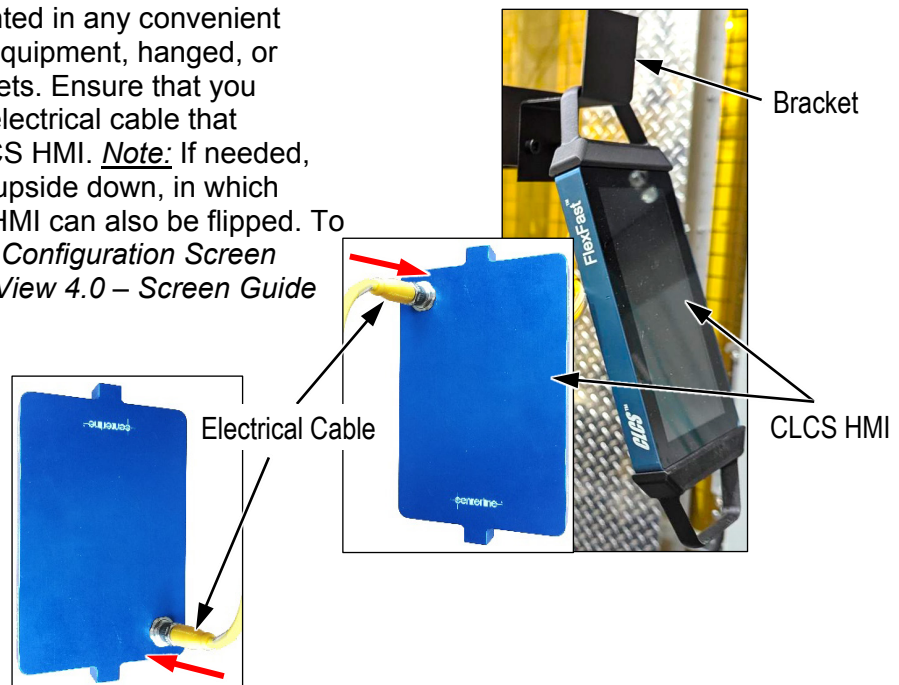


- Ground the Process Monitor by attaching a Grounding Braid (not provided) to the location indicated in the image on the right. The other end of the Grounding Braid must be attached to the grounding terminal on the main equipment.



## Mounting the CLCS HMI(s)

The CLCS HMI(s) can be mounted in any convenient location, attached to the main equipment, hung, or placed in custom holding brackets. Ensure that you account for the position of the electrical cable that attaches at the back of the CLCS HMI. *Note:* If needed, the CLCS HMI can be hung upside down, in which case the display on the CLCS HMI can also be flipped. To enable this feature, refer to the *Configuration Screen* section in the *VeriFast™ MicroView 4.0 – Screen Guide* document.



## Establishing the Connections for the MicroView 4.0

Establish the connections indicated in Figure 5.

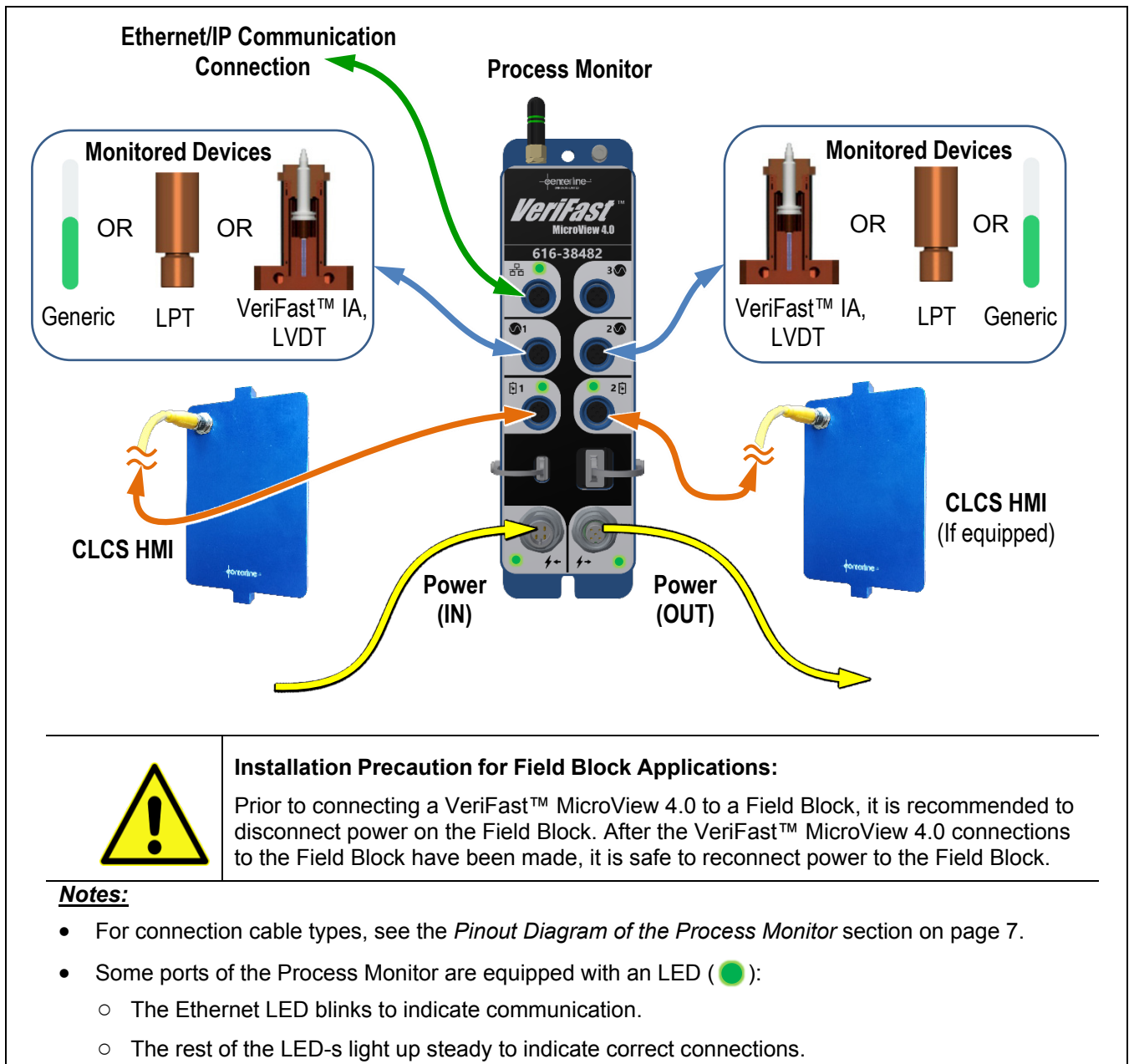
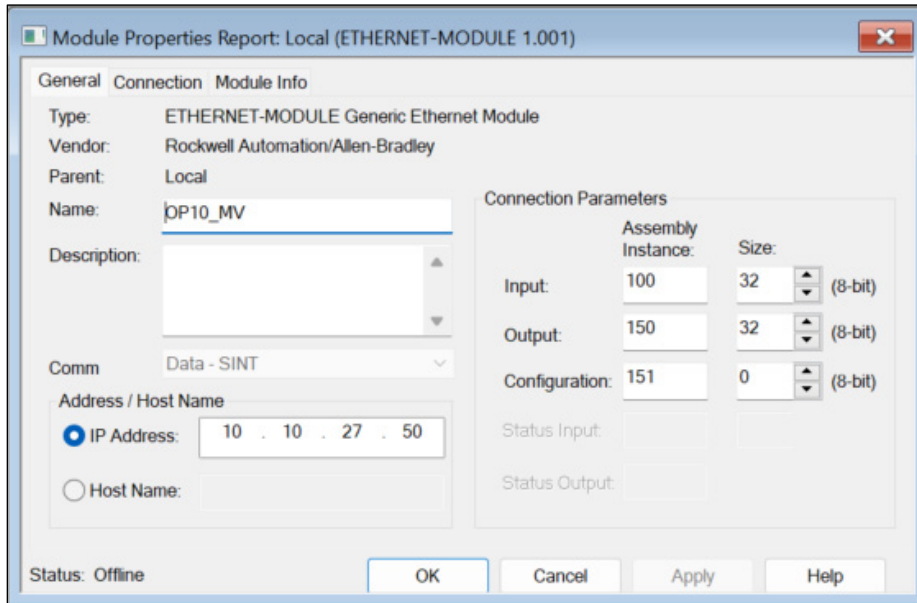


Figure 5 – MicroView 4.0 Connections

# Ethernet/IP Communication

The MicroView 4.0 process monitor is a self-contained fastener detection system, with integrated Ethernet IP communication, which allows the monitoring process to be sent directly to the machine/PLC and not depend on direct output selection. This characteristic expands the capability of the integrating system to monitor and process parameters from the PLC control unit. The data package is as follows:



- OP10_MV_Data	{ ... }	{ ... }		MV4
- OP10_MV_Data ToMV	{ ... }	{ ... }		ToMV
+ OP10_MV_Data ToMV.Schedule	1		Decimal	DINT
+ OP10_MV_Data ToMV.Login	0		Decimal	DINT
OP10_MV_Data ToMV.Device0_Enabled	1		Decimal	BOOL
OP10_MV_Data ToMV.Device1_Enabled	1		Decimal	BOOL
OP10_MV_Data ToMV.Device2_Enabled	1		Decimal	BOOL
- OP10_MV_Data FromMV	{ ... }	{ ... }		FromMV
+ OP10_MV_Data FromMV.Device0_Raw	32651		Decimal	DINT
+ OP10_MV_Data FromMV.Device1_Raw	12584		Decimal	DINT
+ OP10_MV_Data FromMV.Device2_Raw	0		Decimal	DINT
OP10_MV_Data FromMV.Device0_Enabled	1		Decimal	BOOL
OP10_MV_Data FromMV.Device0_P1	0		Decimal	BOOL
OP10_MV_Data FromMV.Device0_P2	0		Decimal	BOOL
OP10_MV_Data FromMV.Device0_P3	0		Decimal	BOOL
OP10_MV_Data FromMV.Device0_P4	0		Decimal	BOOL
OP10_MV_Data FromMV.Device1_Enabled	1		Decimal	BOOL
OP10_MV_Data FromMV.Device1_P1	0		Decimal	BOOL
OP10_MV_Data FromMV.Device1_P2	0		Decimal	BOOL
OP10_MV_Data FromMV.Device1_P3	0		Decimal	BOOL
OP10_MV_Data FromMV.Device1_P4	0		Decimal	BOOL
OP10_MV_Data FromMV.Device2_Enabled	1		Decimal	BOOL
OP10_MV_Data FromMV.Device2_P1	0		Decimal	BOOL
OP10_MV_Data FromMV.Device2_P2	0		Decimal	BOOL
OP10_MV_Data FromMV.Device2_P3	0		Decimal	BOOL
OP10_MV_Data FromMV.Device2_P4	0		Decimal	BOOL

Figure 6 – Data Package for VeriFast™ MicroView 4.0

Table 2 – Inputs for Ethernet/IP Communication of VeriFast™ MicroView 4.0

Inputs_4_100 (size 4 bytes)		
	Input	range (dec)
DINT	Device 1	0 - 32767
DINT	Device 2	0 - 32767
<del>DINT</del>	<del>Device 3 *</del>	<del>0 - 32767</del>
BYTE	Device 1 State_Window	0 - 31
BYTE	Device 2 State_Window	0 - 31
<del>BYTE</del>	<del>Device 3 State_Window *</del>	<del>0 - 31</del>

\* Device 3 Port is reserved for future features and is unused at this time.

Table 3 – Outputs for Ethernet/IP Communication of VeriFast™ MicroView 4.0

Outputs_4_150 (size 4 bytes)		
	Output	range (dec.)
BYTE	Schedule Selection	0 - 127
BYTE	Login	0 - 2
BYTE	Device State	7

## IMPORTANT

Care should be taken to ensure that the network is not overloaded with unnecessary high communication rates. For best results, the Requested Packet Interval (RPI) in the PLC should be set to be greater than 100 ms.

Descriptions of terminology appearing in Table 2 and Table 3 are provided below, along with examples.

## Input Assembly Instance Mapping

(Defining the parameters from Table 2)

- **Device 1/2/3-\***: Value that represents the Device 1/2/3 Live Data sent from MicroView 4.0 to the PLC. An example is shown below:

Value		Device 1/2/3-* Live Data [4 bytes] DINT																
(hex)	(dec.)	b31-b16	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
0-7FFF	0-32767	0	0	1	0	1	0	0	0	0	0	0	0	1	1	0	0	1
Meaning: Device Live value is 20505																		

\* Device 3 Port is reserved for future features and is unused at this time.

- **Device 1/2/3 State\_Window \***: Number that represents the **State** and the **Device specific position** status.

Device State and Position [1 byte] BYTE							
Value			Device State	Positions			
			EN (1) / $\overline{EN}$ (0)	P4	P3	P2	P1
(hex)	(dec.)	b7-b5	b4	b3	b2	b1	b0
0-1F	0-31	0	1	1	0	0	0
Meaning: The Device is enabled and Position 4 is active. For example, for a lower electrode, the pin is retracted. For an LPT, the gun is open.							

## Output Assembly Instance Mapping

(Defining the parameters from Table 3)

- **Schedule Selection**: Schedule selected by the PLC.
- **Login**: The PLC has priority over the MicroView 4.0 Login:

Login Output	
byte	Status
0	Logged out from MicroView 4.0
1	Login at User Level
2	Login at Maintenance Level

- **Device State**: Enable/Disable Device 1/2/3, meaning that:
  - b0 enable/disable Device 1
  - b1 enable/disable Device 2
  - ~~b2 enable/disable Device 3~~ \* Note: Device 3 Port is reserved for future features and is unused at this time.

# Changing the Default Passwords

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The VeriFast™ MicroView 4.0 is configured with two default passwords to protect menus at different usage levels (user and maintenance level).

## IMPORTANT

Changing both passwords during the initial setup of the VeriFast™ MicroView 4.0 is strongly recommended in order to improve the security and safety of your equipment.

The two **default passwords** are:

- User Password: **12345**
- Maintenance Password: **65500**

The initial passwords provided with the unit can be quickly changed. Refer to the *Maintenance Settings Screen* section in the *VeriFast™ MicroView 4.0 – Screen Guide* document.

# Setup Scaling

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After the VeriFast™ MicroView 4.0 is mounted and wired, the necessity of performing a setup procedure (called “Scaling”) depends on the type of the measuring unit that will be used during the operation process (i.e., counts, mm, inch):

- **Using Counts during operation** – No setup (scaling) of the VeriFast™ MicroView 4.0 is necessary.
- **Using mm or inch during operation** – Setup (scaling) of the VeriFast™ MicroView 4.0 is required in order for the unit to provide accurate readings during operation.

## IMPORTANT

Scaling must be performed for each new device that is connected to the VeriFast™ MicroView 4.0, and uses **mm** or **inch** as the measuring unit. For devices measuring in counts, scaling is not required. For instructions on how to perform the scaling procedure, refer to the *Scaling Screen* section in the *VeriFast™ MicroView 4.0 – Screen Guide* document.

## Teaching the MicroView 4.0

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Two Teach screens allow the user to teach the schedules for the devices connected to the MicroView:

- **Teach Screen** – for teaching schedules for regular applications
- **Step-Thru Teach Screen** – for teaching schedules that are typical to robotic applications.

Both screens are protected by passwords, see the *Changing the Default Passwords* section on page 12. For descriptions of and instructions on how to access these two screens, refer to the *MicroView 4.0 Screen Guide*.

### IMPORTANT

If the measuring unit during operation is either **mm** or **inches**, another procedure called "*Scaling*" must be performed **prior** to teaching the MicroView 4.0. Using counts during operation does not require prior scaling. For details, see the *Setup Scaling* section on page 15.

The principles of learning the MicroView 4.0 for working with a VeriFast™ IA (Integrated Amplifier), VeriFast™ LVDT (Linear Variable Displacement Transformer), or an LPT (Linear Position Transducer) are similar in both the regular Teach screen, or in the Step-Thru Teach screen (for robotic applications).

To teach any of the positions, place the connected device in the desired position, ensure that the value displayed in the Live Data field is correct, and press the corresponding "Teach" button (situated on the same line with the taught parameter for the standard Teach screen). The taught position will become highlighted green and remain as such until the status of the device will change (e.g., pin will move into a different position). Different positions can be taught for VeriFast™ IA, VeriFast™ LVDT, or the LPT, as shown below.

**Note:** During normal consumable wear, or after consumables are replaced, some or all VeriFast™ IA, LVDT, and/or gun positions may require re-teaching.

## CLCS HMI and PC Web Server Screens

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For detailed descriptions and usage of the MicroView 4.0 CLCS HMI and PC Web Server screens, please refer to the *VeriFast™ MicroView 4.0 – Screen Guide* document.

## Servicing the VeriFast™ MicroView 4.0

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The VeriFast™ MicroView 4.0 Process Monitor and CLCS HMI(s) are sealed enclosures and are NOT user serviceable. In the unlikely event that a component fails, it must be replaced.



# Troubleshooting Quick Guide



- Before starting to troubleshoot the MicroView 4.0, ensure that it is safe to approach the equipment.
- Before turning ON the equipment, make sure all components are assembled properly.

Table 4 – Troubleshooting the VeriFast™ MicroView 4.0

Problem	Hint	Suggestion
MicroView 4.0 not running	Is the MicroView 4.0 connected / wired properly?	Check the power source for correct voltage. Consult the <i>Technical Specifications</i> section on page 6.
		Check the power connection on the Process Monitor and ensure that it has power. See the following sections: <ul style="list-style-type: none"> <li>• <i>Technical Specifications</i> on page 6.</li> <li>• <i>Pinout Diagram of the Process Monitor</i> on page 7.</li> <li>• <i>Establishing the Connections for the MicroView 4.0</i> on page 11.</li> </ul>
No Ethernet/IP communication	Is the Ethernet cable connected / wired properly?	Check the Ethernet cable and ensure that the Ethernet LED is blinking. See Figure 5 on page 11.
	Ethernet cable is connected, but is its LED blinking?	Ensure that the IP address is correctly set with the PLC and VeriFast™ MicroView 4.0. See the <i>VeriFast MicroView 4.0 – Screen Guide</i> document for instructions.
		Ensure that the PLC and VeriFast™ MicroView 4.0 have the same Ethernet configuration (Static / DHCP). See the <i>VeriFast MicroView 4.0 – Screen Guide</i> document for instructions.
Erroneous distance reading (for example, moving the sensor 1 mm, but the device indicates 2 mm)	Improper setup scaling.	MicroView 4.0 requires proper scaling for each device connected to it. For instructions, see the <i>Setup Scaling</i> section on page 12.
Password not working	Incorrect password.	Reset the MicroView 4.0 to factory default password. See the <i>Resetting Passwords</i> section in the <i>VeriFast MicroView 4.0 – Screen Guide</i> document.

# Decommissioning

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## Preparing for Storage

The following guidelines should be followed when removing a VeriFast™ MicroView 4.0 from service:

- Disconnect the VeriFast™ MicroView 4.0 system from all external supplies (i.e., electrical) and connected devices. Identify the connections to facilitate a future installation.
- The storage location must be clean, dry, and not expose the VeriFast™ MicroView 4.0 system to mechanical or thermal damage. If the VeriFast™ MicroView 4.0 will be covered, there should be some air circulation to prevent condensation.