Fisher™ LoopConnect™ Software

X1903

This quick start guide provides configuration and setup for the DPC2K digital process controller using Fisher LoopConnect software

Do not install, operate, or maintain a DPC2K controller without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. **To avoid personal injury or property damage, it is important to carefully read, understand, and follow all contents of this quick start guide, including all safety cautions and warnings.** If you have any questions about these instructions, contact your [Emerson sales office](#) before proceeding.

Refer to the DPC2K Quick Start Guide (D104559X012) for information on installing the DPC2K digital process controller.

Related Documents

The following documents include DPC2K installation information, product specifications, reference materials, custom setup information, maintenance procedures, and replacement part details. If a copy of any of these documents is needed scan or click the QR code below, contact your [Emerson sales office](#), or visit our website at Fisher.com.

- Bulletin 34.7:DPC2K - Fisher FIELDVUE DPC2K Digital Process Controller ([D104561X012](#))

- Fisher FIELDVUE Digital Valve Controller Quick Start Guide (D104559X012)

- Fisher FIELDVUE DPC2K Digital Process Controller Instruction Manual (D104786X012)

Scan or click for Installation
Documents & Field Support

emrsn.co/FieldSupportDPC2K

Security

NOTICE

Physical security is an important part of any security program and is fundamental to protecting your system.

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and must be protected against by restricting access of unauthorized personnel in your facility.

- The DPC2K Single Loop Controller has several security capabilities:

  - System stores configuration and log data.

  - DPC2K Signed Firmware prevents the downloading of corrupted or unauthorized firmware.

  - The DPC2K has the capability to enable or disable the provided communication channels as well as enabling or disabling various types of communication on those channels.

  - The Write Protect switch, located under the terminal cover, when enabled, helps prohibit unintentional configuration and calibration changes over all interfaces.

- If unsecured, any device in the field is vulnerable to a physical attack; safety and security procedures must include mitigation by physical security controls.

- By default the instrument is shipped from the factory with all the communication channels disabled. The following are unsecured, unencrypted inputs and outputs used by the DPC2K single loop controller:

  - AI1: Analog input capable of reading a 4-20 mA signal and communicating HART FSK as a secondary device.

  - AI2: Analog input capable of reading a 4-20 mA signal.

  - AO: Analog output capable of driving a 4-20 mA signal.

  - Communication Channels:

    RS-485 – In normal operation, this channel is used to communicate Modbus.

    HART-FSK – The DPC2K will be a secondary HART communicating device on AI1.

    LUI – Local user interface provides ethernet configuration options and monitoring.

    LAN/TCP – Supports user defined HART-IP port and a Modbus defined TCP port.

    LAN/UDP – Supports up to four UDP sessions over HART-IP.

- The DPC2K uses LoopConnect software for device configuration, including enabling communication protocols used and data monitoring. It is expected that LoopConnect software is installed and run on a computer that is configured and operated according to local security policies.

- Product Operation Best Practices:

  - Ensure that operation personnel are trained both on local security policies and the secure operation of the DPC2K and LoopConnect software.

- It is recommended that you set the Write Lock switch in the enabled position after configuration is complete.

- Operate the device within a controlled and secured physical environment.

- When connected to a network, operate the DPC2K and LoopConnect software within a controlled and secured network environment.

- Configure security settings of the DPC2K, providing access to only what is absolutely required to perform configuration and operational functions.

- Apply security patches and updates as they are released.

Note

Work with your Emerson sales office to stay informed and obtain access to security patches and updates.

- Report security incidents and potential product vulnerabilities at:
  https://go.emersonautomation.com/reportvulnerability_en

- Product Disposal Guidelines

  When the device needs to be disposed of consider the following aspects of device removal:

  - Identify whether the device can be reused in another part of the process or for testing or training purposes.

  - Identify what data is stored on the device and sanitize this data with the latest industry recommended methods. To restore the device back to factory defaults:
    1. Using LoopConnect navigate to the Device Data Tab.
    2. Select "Restore Factory Defaults" and follow on screen instructions.

  If the device will not be reused, follow local disposal policy.

  To uninstall LoopConnect software from your computer go to Start > Settings > Apps > Apps & features and select LoopConnect.

Installing LoopConnect Software

The complete LoopConnect software installation process includes several steps. In order to successfully install and run LoopConnect software, it is important that you follow all of the steps below.

Note

LoopConnect software is available from your [Emerson sales office](#). Contact your Emerson sales office if a copy of this software is needed or to ensure you have the latest version installed.

Ensure you have Administrator rights on the computer the software is being installed.

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1. Download LoopConnect Software.
2. Unzip the download file.
3. Open file and run setup.exe.
4. Click Next to install the software.
5. Read license agreement and accept by selecting Next.
6. Click Finish once the install is complete.

Verify IP Address

Note

This procedure is performed using the Local User Interface (LUI) on the DPC2K digital process controller.

From the HOME SCREEN press the right arrow to advance to the MAIN MENU.

From the the MAIN MENU, use the up, down, or right navigation buttons to advance through the selections. The left arrow takes you back to the HOME SCREEN or a previous screen.

Note

Navigate to Setup > Communication Settings > LAN if connecting to a network with settings other than the default of 192.168.1.9.

LAN Settings may be viewed and modified through the Local User Interface (LUI), including:

- IP Address and Network configurations

- DHCP Enable, to connect to an existing network that supports DHCP and NTP Servers

When DHCP is enabled, the IP address, Net Mask, and Gateway information are displayed. Make note of the HOSTNAME and IP address for connection by a host or configuration software.

LoopConnect Software also provides a simple method for network setup. Once connected, use either the IP Address assigned if static or the HOSTNAME if DHCP to connect.

Connecting to the DPC2K Digital Process Controller

Use a standard Ethernet cable to connect the DPC2K to a computer for configuration and monitoring.


Notes

When DHCP is not enabled, the factory default IP address and subnet mask is 192.168.1.9, 255.255.255.0.

If you need to verify the IP Address of the DPC2K, use the DPC2K Local User Interface (LUI) to view or change the IP Address:

  a. Ensure the DPC2K is powered up.

  b. Press any button on the LUI to view the Main menu.

  c. Use down arrow to Setup.

  d. Use right arrow or Select to view the Setup menu.

  e. Use down arrow to Communication Settings.

  f. Use right arrow or Select to access LAN.

  g. The LAN Menu shows the current (default) IP Address, and allows you to make changes, depending upon the network architecture.

Figure 1. Ethernet Cable Connection
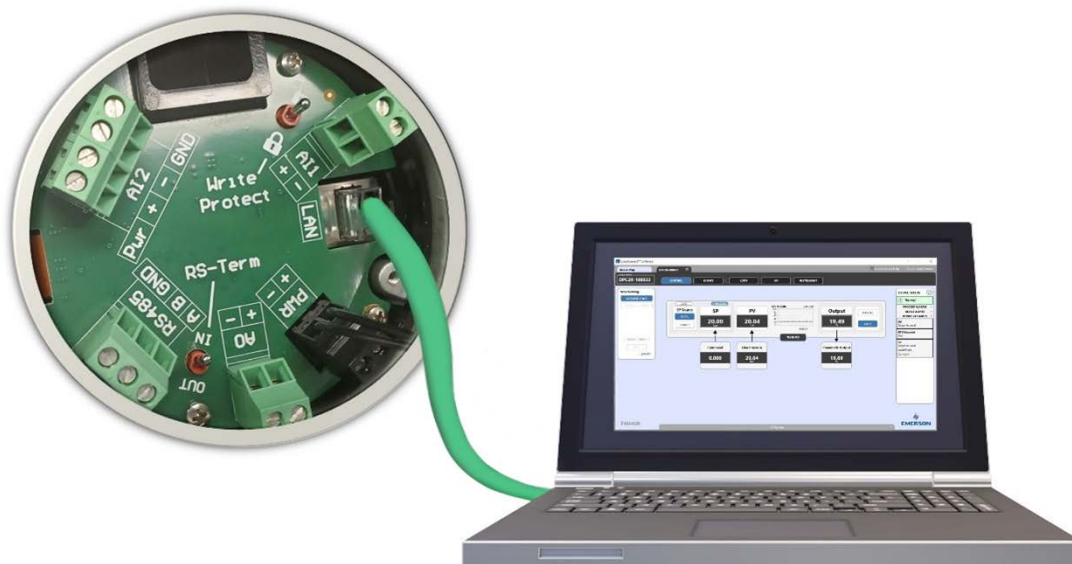
The computer will need to be configured to from a private network before communicating with the Gateway. The network settings can be found in the control panel of the computer running a Microsoft platform based operating system.

To configure these settings:

1. Find and open the Control Panel (generally accessed from the Start Menu).
2. Open Network and Sharing Center.
3. Select Change Adapter Settings.
4. Click on desired Network Adapter (See Figure 2).

Figure 2. Network Connections
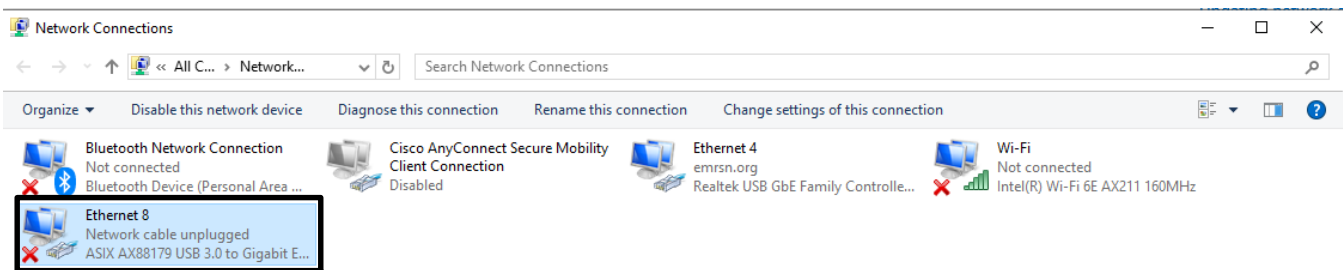
Note

If using a USB network adapter, ensure it is plugged in and recognized as a network connection.

5. Right click and select Properties.
6. Select Internet Protocol (TCP/IP), then Properties (see Figure 3).
7. From the General tab, select Use the following IP address button.
8. Set the IP Address to 192.168.1.XX (where XX range is from 2 to 255) then tab on the keyboard (See Figure 4).

Note

The XX cannot be 9 or 1.

9. Select OK to close the Internet Protocol (TCP/IP) window.
10. Select Close on the Local Area Connection window.

Figure 3. Ethernet Properties
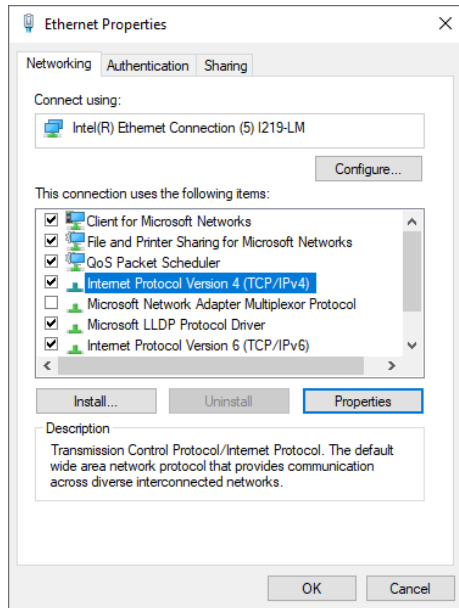
Figure 4. IP Address Configuration
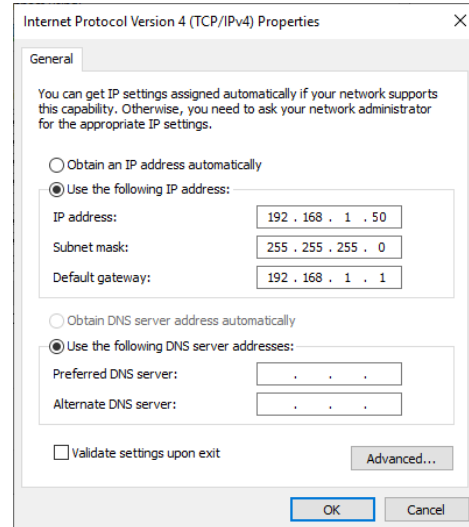
LoopConnect Software

To connect to a DPC2K digital process controller using LoopConnect click CONNECT and navigate to your instrument.

Note

If a message pops up indicating issues with screen resolution open the computer's Display Settings and change from Default (150%) to 125% or 100%. Re-open the software.

Note

Once a manual connection is made, it will stay live and active until manually disconnected or the application is closed.

Note

If a change is made to the DPC2K locally during start-up, you will need to apply that change through the LUI.

Dashboard Overview

When the software is connected to the DPC2K, the dashboards display information about the device. Status and troubleshooting assistance is displayed in the Now Viewing and DEVICE STATUS panels, as shown in Figure 5.

Note

You may also encounter popup messages noting configuration errors, along with suggestions for resolving the error.

For example, there are several configuration changes that can only be performed when the Loop is in MANUAL operation.

Figure 5. LoopConnect Software Dashboards
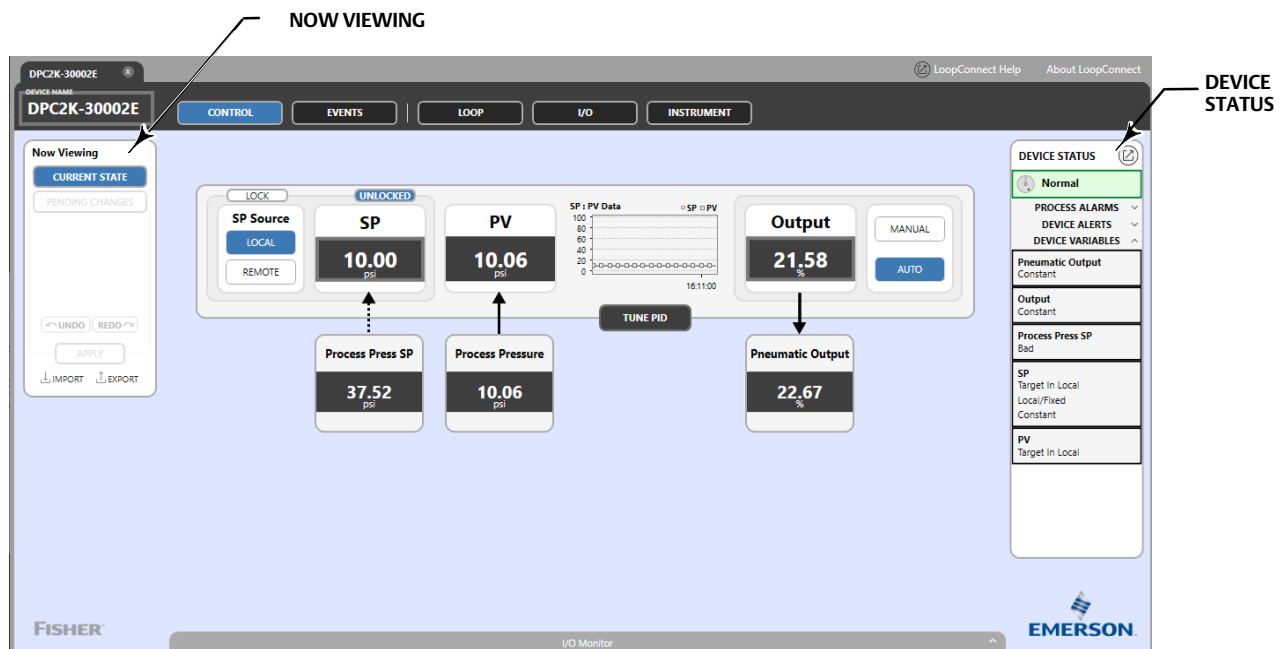
Instrument Setup

Upon connection the display opens on the CONTROL dashboard.

Figure 6. CONTROL Dashboard

Note

Configuration tasks generally start with the Instrument dashboard on the right and move left to the Loop dashboard.

Open the INSTRUMENT dashboard, shown in Figure 7, to:

1. Customize Security Settings and
2. Update the IP Address

Customizing Security Settings allows all configuration and writable parameters to be modified.

Customize Security Settings

The security settings can be modified to meet your company's security requirements.

Security Setting can be modified as follows:

- Open the Security Settings tab and enable only the communication port and type of communication needed.

- Select the port or protocol column heading to allow/disallow each column.

- Individual settings may also be modified by clicking on the individual item.

Note

Pending changes are indicated by the color goldenrod (yellow). An error, or other important message is indicated by the color red.

Once the Security Settings have been set as desired, apply the changes to enable the modified security settings.

Figure 7. Instrument Dashboard, Security Settings

Update the IP Address

Open the Communication Settings tab to access the IP Address.

Note

It is recommended that the IP Address, found under LAN Settings be changed from the default (192.168.1.9). This will allow multiple controllers to be accessed simultaneously through a simple network switch.

Figure 8. Instrument Dashboard, Communication Settings
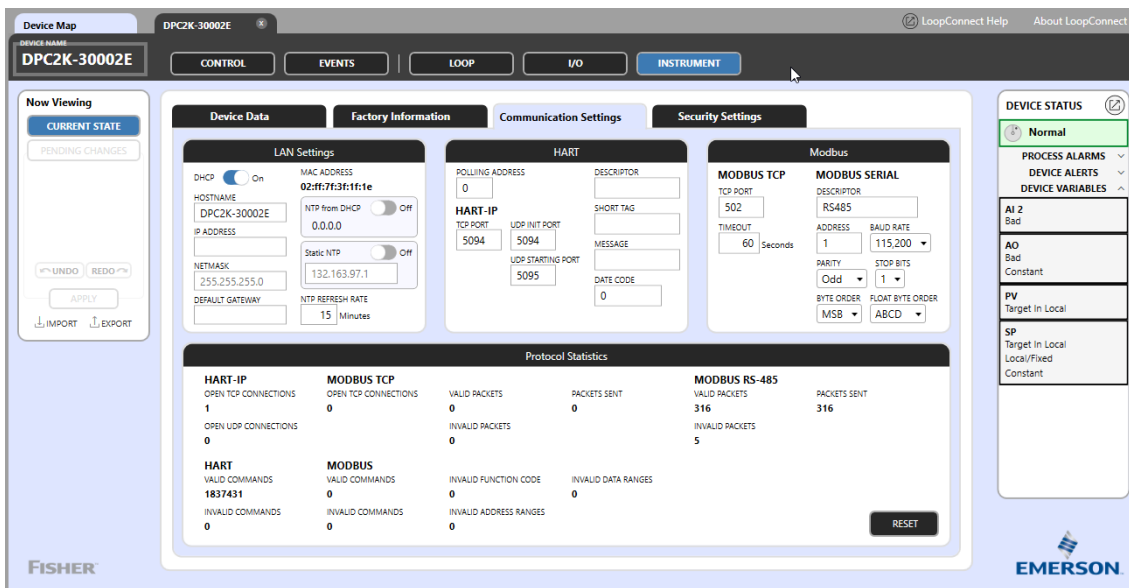
Note

The DPC2K controller will restart, connection will be reestablished, and the Device Map will be updated with the new IP address. Once the IP Address has been modified each new controller you add will follow this same basic process.
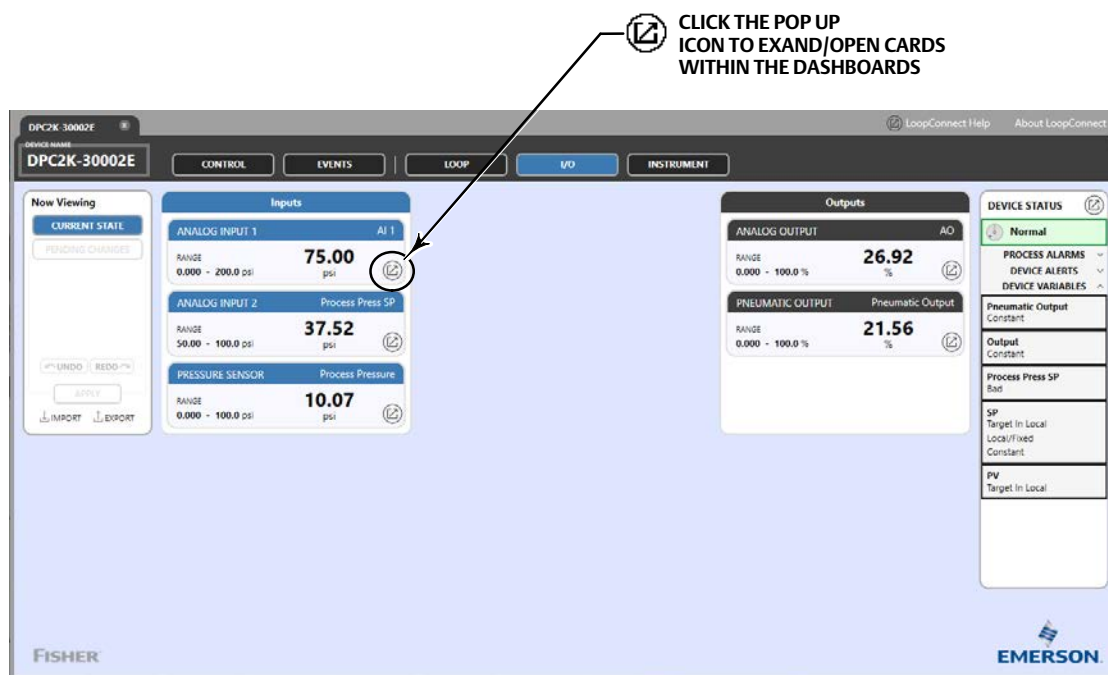

I/O Configuration

Navigate to the I/O dashboard.

Note

Configuration Notices, found under the Now Viewing panel on the left side of the software, provide details about conditions required to complete configuration changes.

They are only visible when such conditions are present.

Figure 9. I/O Dashboard

Expand each I/O point (see Figure 9) to access and configure :

- Point name

- Units

- Ranges

- Calibration

You can also view information regarding the triggers for status alerts.

Note

It is recommended that you modify the POINT NAME to be descriptive of the connection or Tag on a P&ID drawing. For example, change AI 1 to "Process Input" or AO to "Valve Output".

Select the engineering units and set the lower and upper range values.

If Calibration is required, connect a calibrated source to the Analog Inputs to verify the 4 and 20 mA points.

⚠ WARNING

During calibration the valve will move full stroke. To avoid personal injury and property damage caused by the release of pressure or process fluid, isolate the valve from the process and equalize pressure on both sides of the valve or bleed off the process fluid.

Note

The Analog Output requires a calibrated measurement to verify the 4 and 20 mA outputs.

Note

The analog output is calibrated at the factory and should not need to be re-calibrated; however if adjustments are required perform the calibration procedure.


Configuring the Pneumatic Output

The Pneumatic Output must be set to Manual before you can make changes using LoopConnect software.

Note

Configuration Notices, found under the Now Viewing panel on the left side of the software (Figure 10), provide details about conditions required to complete configuration changes.

Configuration Notices are only visible when such conditions are present.

Figure 10. Configuration Notices

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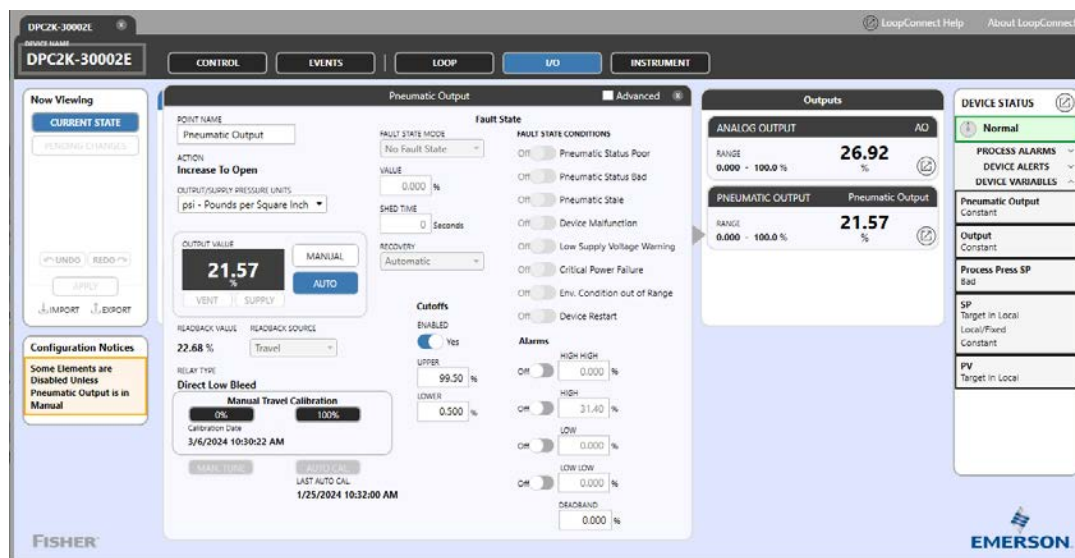
Note

Set the Output to MANUAL then VENT or SUPPLY prior to performing a Travel Calibration or AUTO CAL. Refer to Figure 11.

Once the conditions are enabled and the Output is at vent (fail condition) a Manual Travel Calibration or Auto Cal. may be performed.

Note

During this process, the valve will move through its full stroke using the VENT and SUPPLY buttons.


Figure 11. Setting the Output
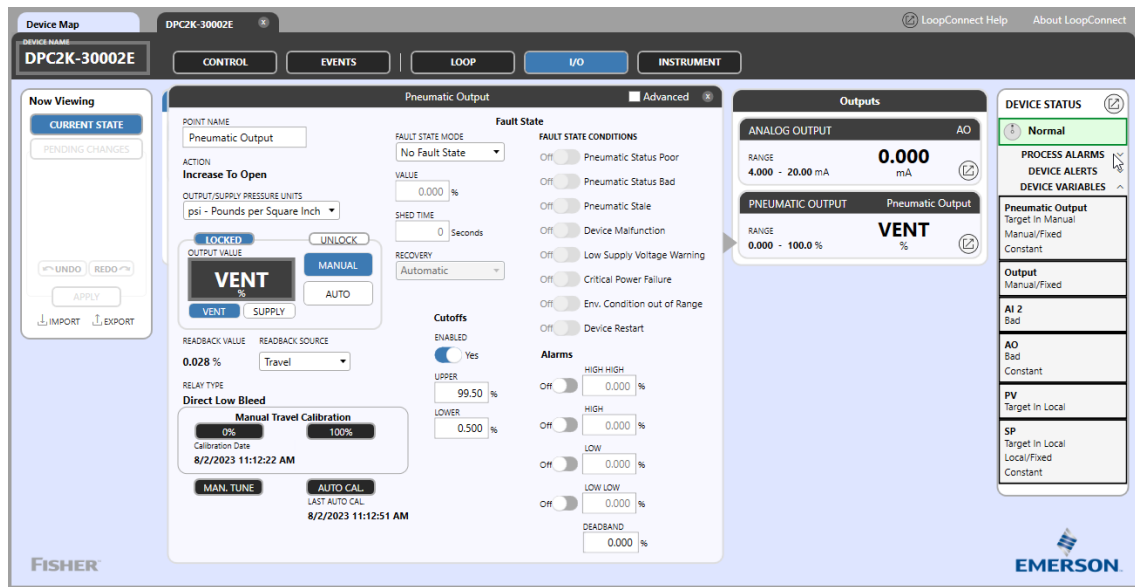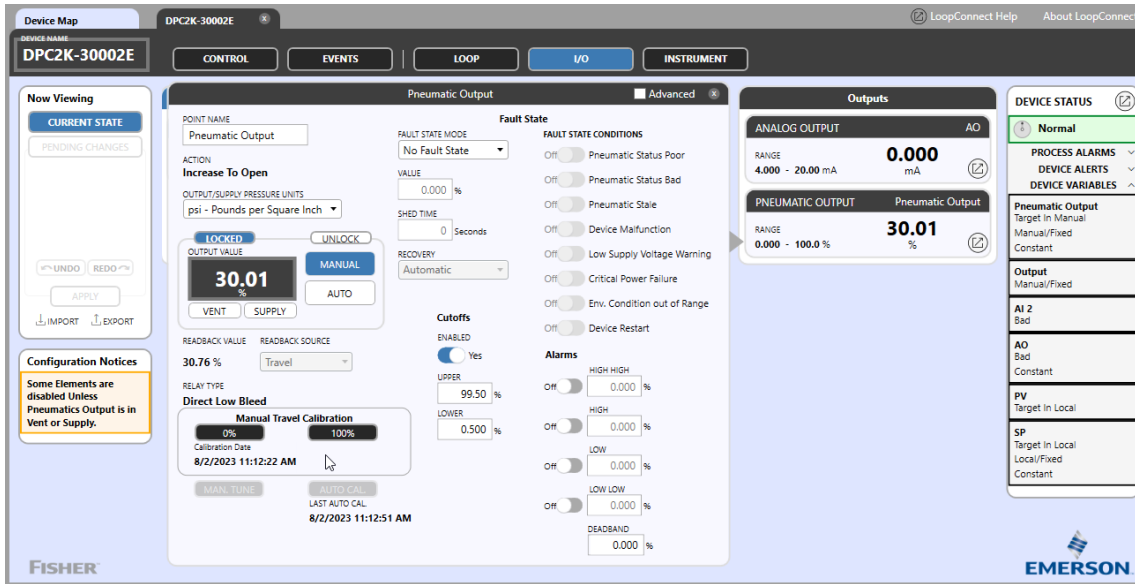
Auto Calibration

The DPC2K is calibrated at the factory and should not need to be re-calibrated. However, if adjustments are needed, perform the following calibration procedure.

⚠ WARNING

During calibration the valve will move full stroke. To avoid personal injury and property damage caused by the release of pressure or process fluid, isolate the valve from the process and equalize pressure on both sides of the valve or bleed off the process fluid.

Auto Cal, found on the bottom left of the of the Pneumatic Output card, adjusts the performance of the pneumatic output.

Figure 12. Auto Cal: Pneumatic Output
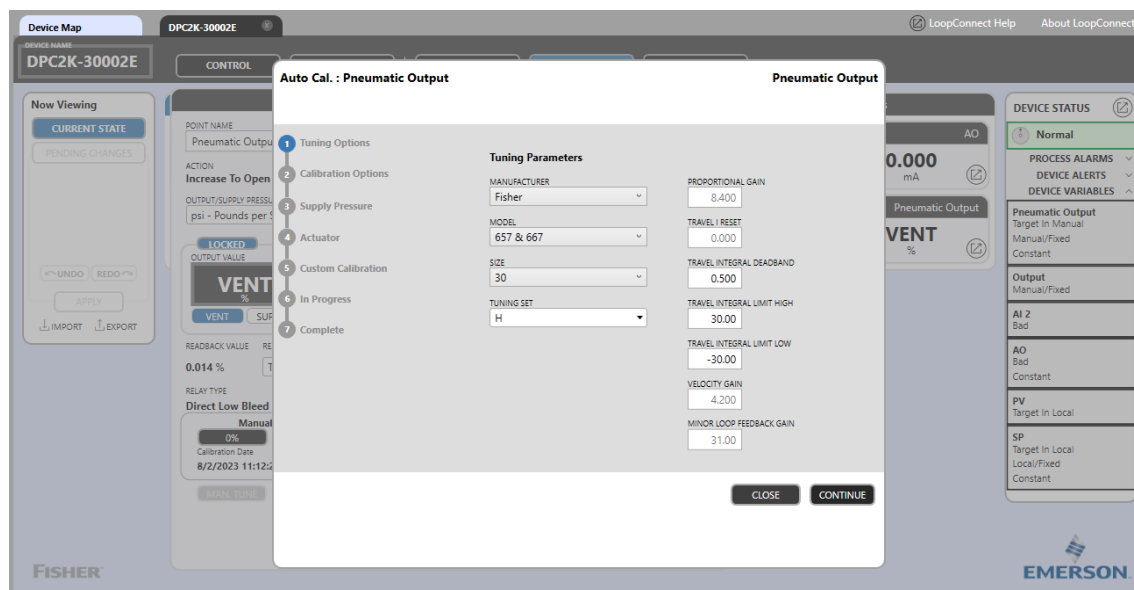
Step 1: Tuning Options

Select from the following drop downs:

1. Actuator Manufacturer (or closest match)
2. Actuator Model
3. Actuator Size

Note
Actuator Manufacturer, Actuator Model, and Actuator Size are optional if the Tuning Set is known.

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4. Tuning Set

Note

The Tuning Set selection will populate the parameters required to tune the pneumatic output to match.

Select APPLY & CONTINUE

Step 2: Calibration Options

Note

The Supply and Output A are calibrated at the factory and should not need to be re-calibrated.

Select the Calibration you wish to run upon startup.

- Calibrate Supply

- Calibrate Output A

- Custom Auto Cal.

Step 3: Supply Pressure

Note

Pressure Sensor Calibrations require a calibrated gauge on the supply to match with the supply and actuator pressure sensors.

After Supply Pressure is calibrated, the matched actuator pressure sensor will automatically update to match the supply pressure calibration.

Step 4: Actuator

The firmware needs to know where the initial position of the valve is at: 0% relates to a fully closed valve, 100% relates to the valve being fully opened.

Step 5: Custom Calibration (if selected in Step 2)

Note

Custom Auto Cal is appropriate in cases where prior selections either fail or timeout due to accessories or non-standard conditions and should only be selected by advanced users or as guided by factory support.

⚠ WARNING

All safety precautions need to be in place before initiating Step 6. Failure to follow the necessary safety precautions may result in personal injury or property damage.

Step 6: In Progress

Note

During this process the valve will move through its full range before settling at a 50% bias point.

Step 7: Complete

Return to the Output card.

Once the I/O is configured, navigate to the LOOP dashboard (Figure 13).

Loop Configuration

In the default state:

Inputs: AI2 is configured as the Process Variable Source unless there is a Process Pressure Sensor installed. When installed the Process Pressure Sensor is the default PV input.

Outputs: AO as the PID output (Manipulated Variable). However, when there is a Pneumatic Output module installed, the Pneumatic Output will default to the OUTPUT.

The LOOP dashboard uses a drag and drop method to configure the PID Control Loop.

To configure the Process Variable, drag the correct input to the PV Source and drop, then select APPLY in the Now Viewing panel on the left hand side of the screen (see Figure 14).

CONTROL ACTION, as shown in Figure 15, is also set in the PID Loop configuration.

Note

Control Action selection is dependent upon the action taken by the output with respect to the error between the setpoint and the process variable.

Choices are direct- or reverse-acting. In direct-acting, the output of the controller output rises if the process variable increases. Reverse-acting (default) means that the controller output drops when the process variable rises.

The process configuration determines whether a controller is direct- or reverse-acting.

The CONTROL ACTION is dependent of the method of control in a control valve actuator. Pneumatically actuated valves may be defined as air-to-open or air-to-close.
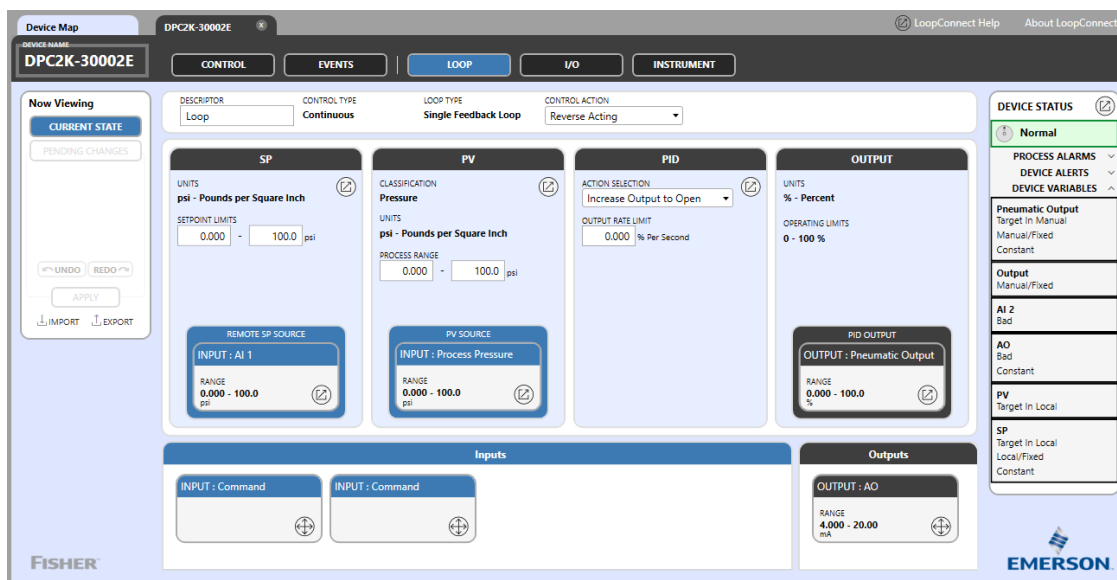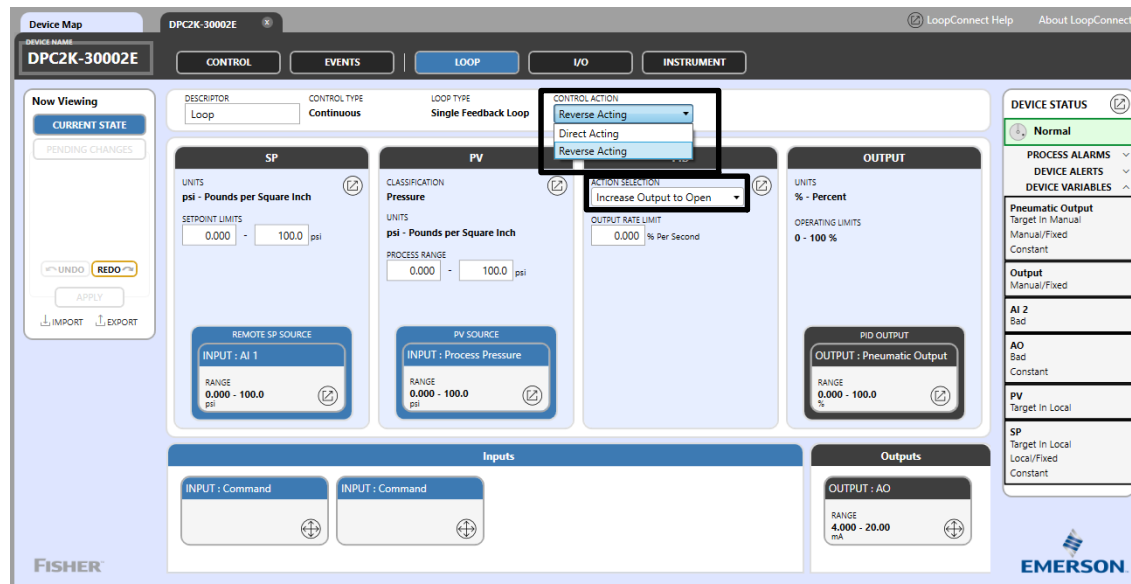

Figure 13. Loop Dashboard

Figure 14. Process Variable Configuration

Figure 15. Control Action/Action Selection

Note

Pay attention to any configuration notices in the left-hand navigation column.

Select Apply to make any changes.

Note

The example in Figure 16 shows the configuration of a remote setpoint; the Configuration Notices advise that the units for Setpoint and Process Variable must match.

You can open the I/O card from this dashboard to modify the units if needed.
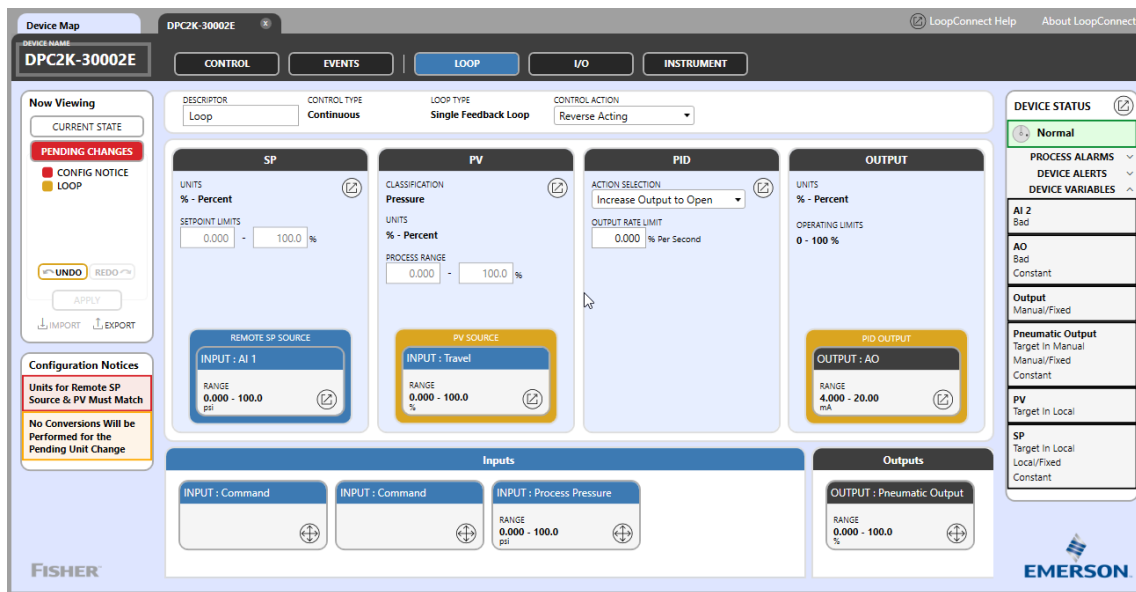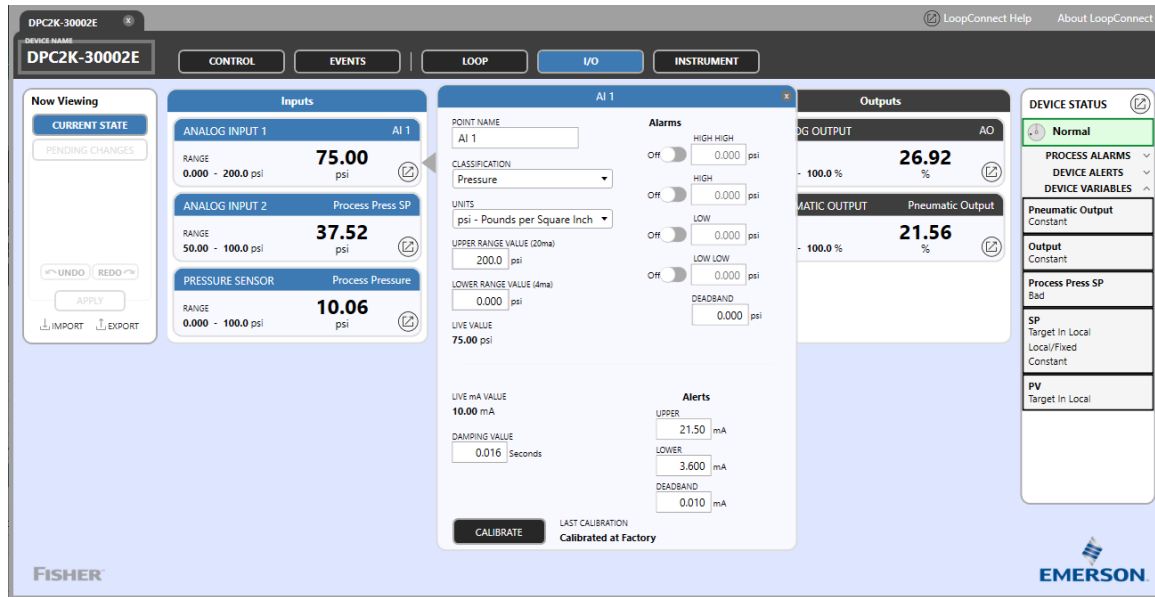
Figure 16. LOOP Dashboard, Configuration Notices

Figure 17. I/O Dashboard, I/O Card

Control Operation

The CONTROL dashboard is the primary operational dashboard and provides you with the data and controls to perform tasks associated with the control loop. It updates live values approximately every 1-2 seconds and lets you verify your I/O connections and values. Connectivity lines indicate the relationships between the I/O points and the Control Loop parameters.

At-a-glance information provides insight into the performance of the loop.

From left to right viewable parameters are:

- Setpoint (SP)
- Process Variable (PV)
- Output value (Output)

The far left and right ends of the loop displays information regarding the source of the Setpoint (Local/Remote), and the setting for the Output (Manual/Auto).

Figure 18. Control Dashboard

When the loop is in Local, the SP Value may be highlighted, and the value changed.

To control the output manually, highlight the Output value to write a new value to the Output (Manipulated Variable).
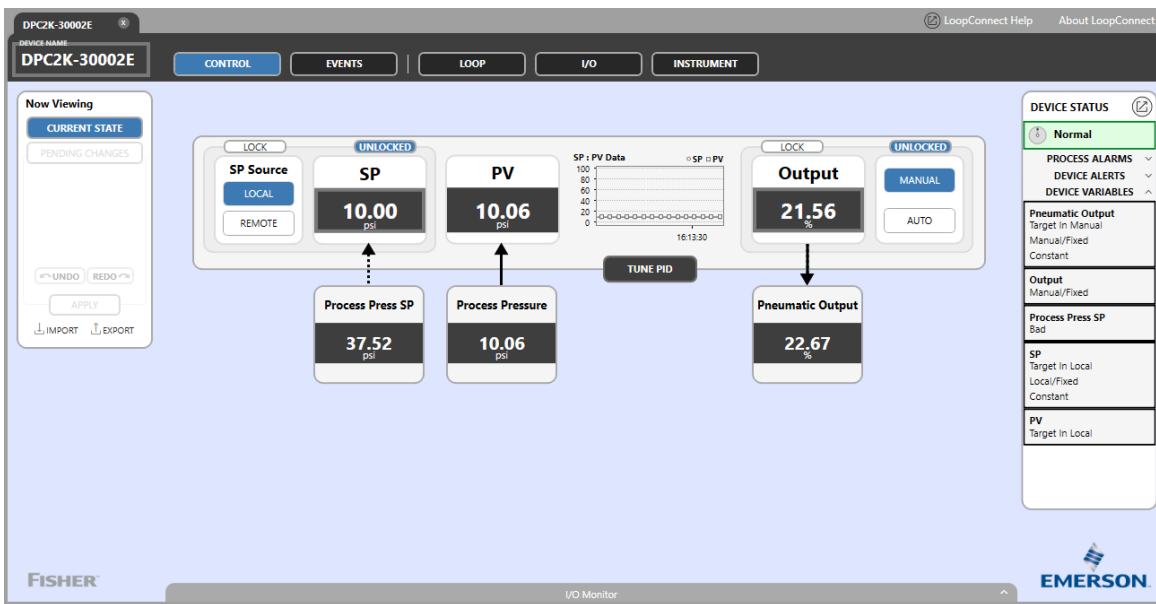
Note
The highlighted fields change color prior to the new values being written.

Note

At this point, LoopConnect Software has control of these variables for operational safety reasons. The SP and Output are LOCKED when the change is applied and can be UNLOCKED to allow other connections access for control .

Figure 19. Control Dashboard

Notes

The same logic is applied if there is an onsite operator doing service work and needs to be safe from remote operation. When LOCK is initiated using the LUI, a LOCK icon will be displayed.

An LUI LOCK can only be unlocked by the LUI.

The I/O Monitor at the bottom of the screen, shown in Figure 20, provides a view of the I/O points not used in the PID control.

When the loop is connected, Select TUNE PID (Figure 21) to bring up a larger graphic display to aid in tuning the loop.

Note

When this graph is active, data is collected for each data point with a sampling rate of 50 msec.
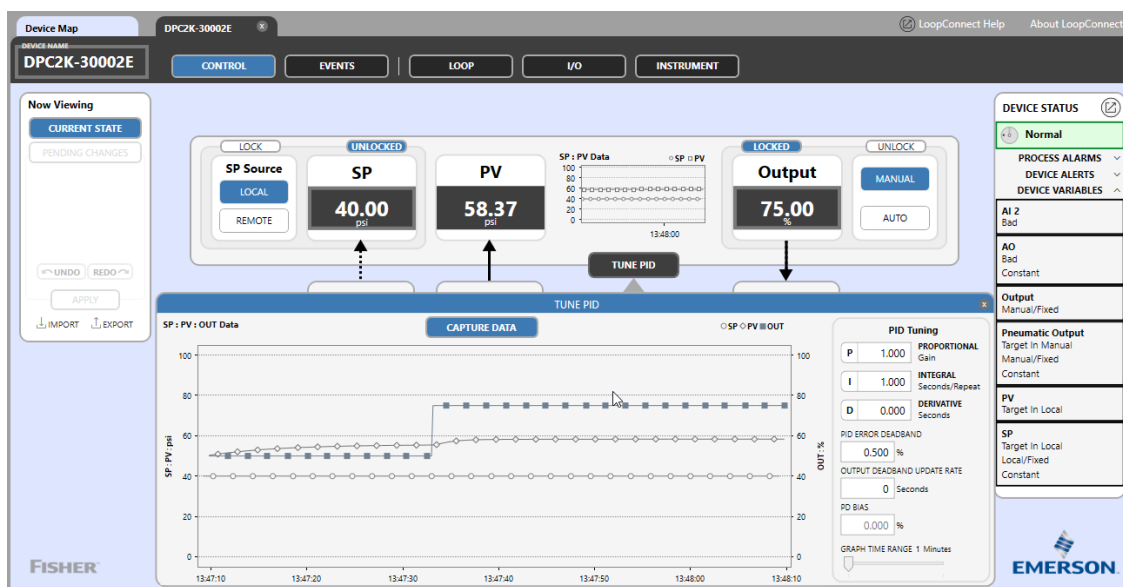
Figure 20. I/O Monitor

Figure 21. Tune PID
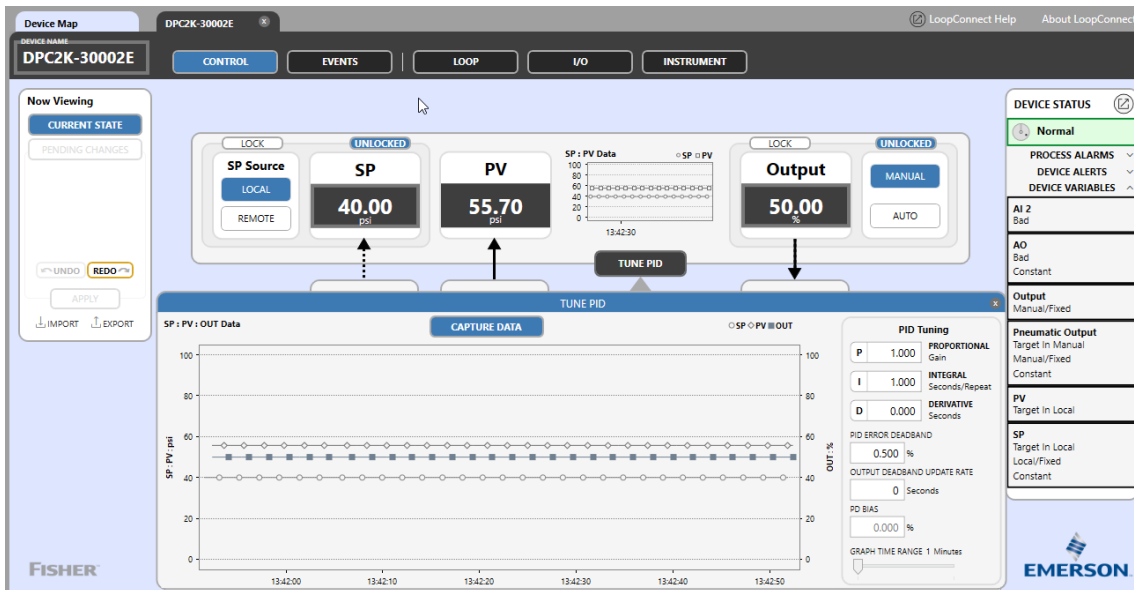
The CONTROL dashboard allows you to enter a manual output value to observe the response (Figure 22) and enter a setpoint while in local setpoint.

Figure 22. Enter a Manual Output Value

Note

The controller by default performs output tracking to avoid output jumps when switching between Manual and Auto operating modes.

Note

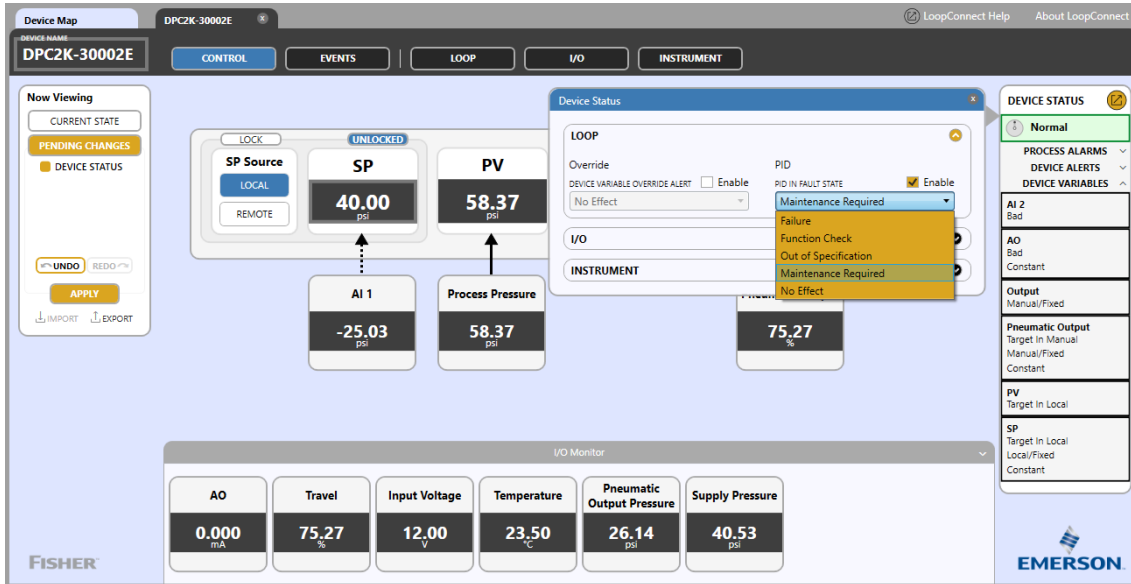For slower process loops the TUNE PID graph has a slider that allows up to 10 minutes of data to be shown.

You can also enable the remote setpoint, enter a new value from this screen, or use the LUI to manually enter a new setpoint.

In order to troubleshoot the DPC2K controller, use the Device Status monitor (Figure 23) to view the device variables, alerts and status for the PID, I/O and the Event log. The status monitor can be setup according to the level of detail you wish using NAMUR NE107 priority coding.

Note

Refer to the DPC2K Instruction Manual (D104786X012) for NE10 priority and status messages.

Figure 23. Device Status Monitor

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