



ConfigXP User's Manual

for XP2i

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Overview

INTRODUCTION

ConfigXP provides an easy way to customize your gauge (DTG, XP2, or XP2i). With only a serial cable (P/N: 2400, or equivalent*), a computer running Windows, and the ConfigXP program you can:

- View and print an *as receive* versus *as left* change report
- Load and save custom configurations
- Return the gauge to factory configuration
- Select pressure units (e.g., disable inches Hg, if you never use this scale)
- Adjust (calibrate) the gauge
- Identify firmware version

Note: DTGs require an RS-232 interface adapter kit (P/N: 2746).

CAPABILITIES

Some features are dependant on the model and firmware version of your device. You may update your firmware using [XP2iUpdate](#).

For many gauges, you will be able to:

- Password protect the gauge to prevent unauthorized changes
- Disable (or enable) the (peak) button
- Select your preferred H₂O water density: 4°C, 60°F, 68°F/20°C
- Define a special pressure unit (e.g., display pressure as torque)
- Store a message or identification number
- Limit or expand the zero adjustment range
- Program a TARE value
- Enable and adjust display damping (averaging)
- Display rate of pressure change
- Disable the ability to adjust (calibrate) the gauge from the keypad
- Create calibration reminders

Note: Features not available on your gauge will be grayed out in ConfigXP.

! **CAUTION:** Straight pass-through RS-232 cable required. DO NOT use a null-modem cable.

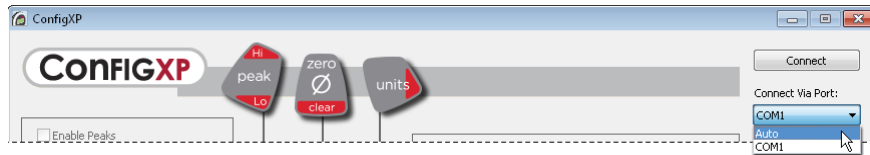
! **CAUTION:** Changing the settings of your gauge using this program can cause the unit to display inaccurate readings or behave differently than the factory defaults. Only personnel qualified to make changes should do so.

Operating Instructions

INSTALLATION

ConfigXP is distributed as a self-extracting Setup application. Launch ConfigXPSetup.exe and follow the on-screen prompts. If the program was provided on CD, run the SETUP.EXE from the ConfigXP folder and follow the on-screen prompts.

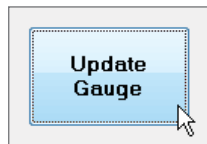
The first time you start ConfigXP, you must select the communications port to be used. From the drop down box under the **Connect button** and choose **Auto** to have ConfigXP automatically detect your gauge, or select an appropriate COM port for your computer.



Select a port to connect to an XP2i pressure gauge.

Click the **Connect button** to establish connection to your gauge. If an error is displayed, check cables and verify that the gauge is operating. If you continue to have problems, verify that you can send basic commands, such as "?VER" over the serial connection using a program such as HyperTerminal to connect to the unit.

If the connection is successful ConfigXP displays information retrieved from the gauge, such as the serial and model number, etc., and the current configuration of the gauge. Make any changes desired then click the **Update Gauge button** to commit those changes to the gauge.



The Update Gauge button commits your configuration changes.

Changes take effect immediately, except on some older gauges.

If you have more than one gauge to be customized, click the **Disconnect button**, connect the serial cable to the next gauge to be customized and then click the **Connect button**. If no further changes are necessary, click the **Close button** to exit ConfigXP.

Settings

Settings are arranged in groups;

GAUGE IDENTITY

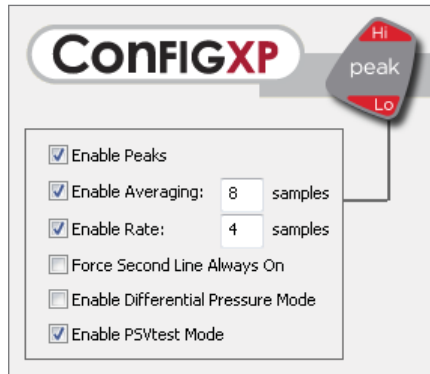
The only user setting is the “message store” – all other information is programmed by the factory.

Gauge Identity	
S/N: 260882	Model: 30P5IXP2I-DD
Range: 30 PSI	Firmware Version: R0221
Datalogger Enabled: Yes	Password Protected: Yes
Message Store:	<input type="text" value=""/>

Store information specific to an individual gauge in the Message store text box.

- **S/N:** The serial number as reported by the gauge.
- **Model:** Model of the gauge (not available on older models).
- **Range:** The pressure range of the gauge, reported in psi regardless of the default unit.
- **Firmware Version:** The firmware version of the gauge.
- **Datalogger Enabled:** Indicates if the gauge is enabled for data logger mode. See [DataLoggerXP](#) for more information.
- **Password Protected:** Indicates if the password protection has been enabled for the gauge.
- **Message Store:** A location for storing information such as an asset number, tag or identification number, owner information or any combination of text up to a maximum of 12 characters.

PEAK BUTTON OPTIONS



Use the Peak button options to control how peaks and averaging are displayed.

- **Enable Peaks:** When unchecked this prevents the display of Peak High or Peak Low. This does not affect averaging, if available.
- **Enable Averaging:** When unchecked this prevents the display of average pressures. The edit field next to this check box controls the number of samples to be used to calculate an average pressure reading. This number can be between 1 and 10. Not available on all models.
- **Enable Rate:** When unchecked this prevents the display of pressure rate. The edit field next to this check box controls the number of calculations used to produce an average rate. This number can be between 3 and 10. Not available on all models.
- **Force second line always on:** When checked, the second line of a XP2i-DD cannot be turned off. Not available on all -DD models.
- **Enable Differential Mode:** Only available on -DD models, differential mode allows the XP2i-DD gauge (the master) to be connected to a second XP2i or XP2i-DD gauge (the slave) and display the pressure difference between the two gauges. A standard RS232 cable (p/n 2400) and null modem adapter (p/n 3456) or a NULL modem cable are required to directly connect the gauges. Once enabled, use the (peak) button on the master gauge until the Peak High (▲HI) and Peak Low (▼LO) icons are displayed simultaneously. The XP2i-DD gauge must be running firmware version R0111 or later, and the XP2i gauge must be running firmware version R0010 or later for this feature to work. Use [XP2iUpdate](#) to upgrade to the latest firmware.
- **Enable PSVtest Mode:** PSVtest mode is designed for PSV and PRV (“Pressure Safety Valve” and “Pressure Relief Valve”, respectively) as well as for Rupture Disc (also known as “Burst Disc”) testing. It increases the measurement rate of the XP2i gauge to approximately eight times per second and replaces the Peak Low logic with a method of automatically recording the closing pressure of the valve after it opens.

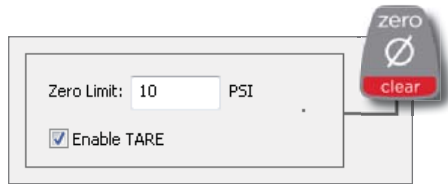
Use ConfigXP to activate PSVtest Mode. When the Peak High icon (▲HI) flashes, PSVtest mode is enabled. A special feature of PSVtest is that Peak Low is automatically reset to the Peak High value whenever a new Peak High value is detected. Once pressure stops increasing, as when a PSV opens (and the pressure drops below the maximum pressure) XP2i detects the new minimum pressure values (the Peak Low), capturing the closing pressure of a PSV.

Press the (peak) button once to view the captured reseal pressure. The Peak Low icon (▼LO) will flash on the display.

To clear the peaks, press the (clear) button while the display shows the High (▲HI) or Low (▼LO) icons.

Application note *AN-006—Pressure Safety Valve Testing* detailing the operation of the PSVtest mode is available on xp2i.com, and includes examples on how to use the gauge in relief valve and burst disk testing.

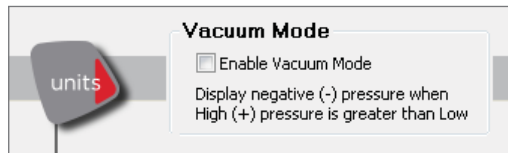
ZERO BUTTON OPTIONS



Use the Zero button options to adjust the pressure the gauge reads as zero.

- **Zero Limit:** By default, all gauges come pre-programmed with a 20 psi maximum zero limit. This means that you can apply pressure (up to 20 psi) to the gauge, press the **(zero)** button, and the gauge will read zero. In some situations it may be desirable to increase or decrease the maximum pressure that the gauge could be set to read zero pressure. It's also possible to disable the **(zero)** button entirely by setting a zero Limit of negative (-)15 psi.
- **Enable TARE:** Enabling the TARE mode allows the second line to display a tare value (instead of forcing the display to read zero at an elevated pressure). This applies to dual line display (-DD) models only. Not available on all -DD models.

ENABLE VACUUM MODE



Only available on DP gauges, this sets the gauge into Vacuum Mode. When working with vacuum, the vacuum pressure should be applied to the – (vacuum) port of the DP gauge. However, when applying vacuum to the – port, it creates a positive differential pressure, and therefore will display a positive pressure on the gauge. By enabling Vacuum Mode, the reading on the gauge will properly display a negative pressure value when applying vacuum.

UNITS BUTTON OPTIONS

Select the pressure units you need, and turn off the pressure units you never use (at least one unit must be selected).

Use the Unit button options to control which units the pressure gauge will display.

- **Default Unit:** The pressure unit displayed after a reset, and the unit used when in datalogging mode. (Reset occurs when the batteries are changed, when an IRST command is sent to the gauge over the serial port or, on older units, when the calibration settings are changed.)
- **Water Density:** From the dropdown menu, select **4°C (39.2°F)**, **15.6°C (60°F)**, or **20°C (68°F)**. Affects inches of water (inH₂O), only.

- **User Defined Units:** This section allows you to create a custom pressure unit. When you select this unit the gauge will display **USER**. The display will equal the User Factor multiplied by the measured psi plus the User Offset. Use the **Resolution** dropdown menu to select the number of decimal places on the display. ConfigXP automatically limits the maximum number of decimal places depending on the pressure range of the gauge, so that only valid numbers can be displayed on the gauge.

Using the User Units Wizard

The User Units Wizard operates in two modes: Linear Fit or Tank Level. Both modes calculate an optimum User Factor and User Offset.

► The Linear Fit tab

The **Linear Fit** tab allows you to quickly calculate the best User Factor and User Offset by entering actual measurements and the corresponding desired reading for each measurement. In each row, enter the displayed pressure in the first column and the reading you want the gauge to display in the **Desired Indication** column. The User Factor and User Offset will be recalculated after each point entered. The **Gauge Reading** column shows what the gauge will actually display using the calculated User Factor and User Offset. The **Delta** column indicates how much error there is between the Desired Indication and the Gauge Reading.

User Units Wizard

Linear Fit Tank Level

To calculate an optimum User Factor and User Offset;
Enter the indicated reading from the gauge in the first column.
Enter the desired value in the second column

Pressure Units: PSI

PSI	Desired Indication	Gauge Reading	Delta
100.000	500.00	491.67	-8.33
200.000	1050.00	1066.67	16.67
300.000	1650.00	1641.67	-8.33

Resolution: 0.01 Gauge Reading: 89.17 = User Factor: 5.75 * PSI + User Offset: -83.334 at 30,000 PSI

► The Tank Level tab

The **Tank Level** tab allows you to setup the gauge as a height or percent of capacity indicator for a tank or reservoir by entering in a few basic measurements. The tank level assumes the fluid density is constant, and that the fluid is not compressible. You will need the following information:

The screenshot shows the 'User Units Wizard' window with the 'Tank Level' tab selected. The 'Linear Fit' section is active. The 'Tank Level Units' dropdown is set to 'meters'. The 'Height of Tank' is 10 meters. The 'Gauge Height' section shows a distance of 5 meters from the gauge to the base of the tank, with the gauge positioned 'above' the base. The 'Media Density' is 1000 kg/m³. The 'Local Gravity' section has two options: '9.80665 m/s²' (selected) and 'Calculate Local Gravity' (which includes fields for Latitude: 35 Degrees, 14.5 Minutes, and Elevation: 47 meters). Below this, it shows 'Local Gravity: [] m/s²' and '100.00% of standard gravity (9.80665 m/s²)'. At the bottom, a summary section displays: Resolution: 0.01, Gauge Reading: 26.09, User Factor: 0.70307, and User Offset: 5 at 30.000 PSI.

- Desired units to be displayed on gauge (feet, meters, % of capacity, etc.). If % of capacity is chosen, you will also need the height of the tank.
- The vertical distance from the gauge to the bottom of the tank, and if the gauge is above or below the bottom of the tank.
- Media density, in kg/m³, lbs/ft³, or slugs/ft³.
- The local gravity. If local gravity is unknown, you can calculate local gravity if the latitude and elevation is known, or use the standard gravity value of 9.80665.

The User Factor and User Offset will be calculated from these parameters.

Note: The User Offset and User Unit Wizard is only available for gauges running firmware version R0013 or later (for XP2i gauges) or R0113 or later (for XP2i-DD gauges). Use [XP2iUpdate](#) to upgrade any gauge to the latest firmware.

CALIBRATION OPTIONS

The screenshot shows the 'Calibration' window. It contains a checkbox labeled 'Disable Keypad Userspan'. Below it, the 'Userspan' is set to 1, and there is a button labeled 'Userspan Wizard...'. The window has a title bar that says 'Calibration'.

- **Userspan:** Usually set to 1 at the factory, and used to adjust the gauge for component aging. All readings are multiplied by this number. For instance, if the readings are low by 0.1%, set this number to 1.001 to correct the readings (1.001 is equivalent to 100.1%).
- **Disable Keypad Userspan:** Checking this box prevents calibration adjustments using the keypad, only. This does not affect the ability to change the userspan value with ConfigXP.
- **Zero Value Adjust (available on Absolute gauges only):** Allows long term zero drift of absolute gauges to be calibrated out. Zero value adjust is added to the displayed pressure.

CALIBRATION MESSAGES

The XP2i has a calibration reminder feature that can help to assure that you never use the gauge after its calibration certificate has expired. It can be programmed to alert you prior to, on, and after the gauge's calibration due date. Due dates, reminder times, and message types can be set after enabling calibration messages.

Enable Calibration Messages
 Show Cal Warning: 5 Days Before Cal Due
 Cal Due On: 5/7/2017
 Show Cal Due: Gauge Startup

- **Enable Calibration Messages:** Checking this box enables calibration messages.
- **Show Cal Warning:** Set the number of days or weeks prior to the Cal Due date when the first warning should appear. The gauge will display “Cal Soon” once the defined time prior is reached.
- **Cal Due On:** Set the date when the XP2i is due for a re-calibration. This is the date where the XP2i message will switch from “Cal Soon” to “Cal Due”.
- **Show Cal Due:** Set the type of alert once the calibration due date has been reached.
 - **Gauge Startup:** The XP2i will flash “Cal Due” three times during the startup process. After this, no additional warnings will occur until power is recycled again.
 - **Always:** The XP2i will display “Cal Due” until a button is pressed and then the gauge operates normally. After this, no additional warnings will occur until power is recycled. Add Password Protection to make the gauge non-operational and always display “Cal Due.”
 - **Alternate with Readings:** The XP2i will alternate displaying “Cal Due” and over pressure readings.

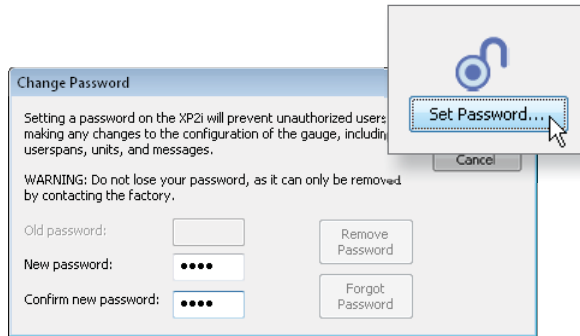
AS RECEIVED/AS LEFT REPORT

The As Received / As Left Report is a summary of the gauge configuration before and after any changes made using ConfigXP. The As Received state is the condition of the gauge after the initial connect. The As Left state includes all changes since the initial connect, including any changes not yet written to the gauge.

As Received / As Left Report for 260882

As Received Conditions	As Left Conditions
Features:	Features:
Peak Enabled	Peak Enabled
Zero Limit:10	Zero Limit:10
User Factor:1	User Factor:1
User Offset:0	User Offset:0
User Resolution:0.01	User Resolution:0.01
Userspan Enabled	Userspan Enabled
TARE Enabled	TARE Enabled
2nd Line Forced On (Disabled)	2nd Line Forced On (Disabled)
Rate Enabled	Rate Enabled

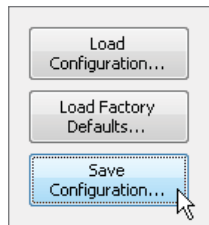
PASSWORD PROTECTION



The password protection feature of the gauge allows you to prevent unauthorized changes to the gauge configuration by setting a four digit password. Once the password is set you will not be able to make any changes to the gauge through ConfigXP without the password. In addition, any functions within the gauge itself that can be accessed by the keypad or serial interface, such as water reference select or userspan adjustment, will be disabled. Any serial interface command that attempts to change a protected feature will return a **X,0** message indicating that feature cannot be changed. Passwords can only be set or removed using ConfigXP.

In the event you lose the password, you will need to contact the factory for an unlock code, which will remove the password protection.

LOADING AND SAVING CONFIGURATIONS

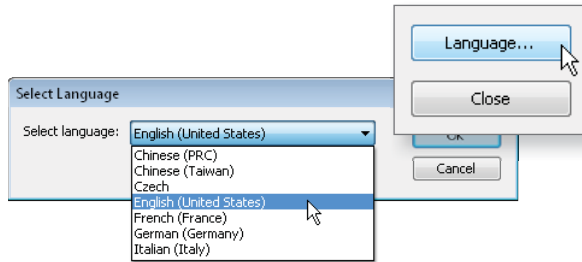


Use the **Load Configuration** and **Save Configuration** buttons to create custom setups—like enabling a limited set of engineering units or enabling other features in the gauge—and storing those configurations for later use. Applications might include using a saved configuration to setup multiple gauges identically, or using different configurations for the same gauge to customize it for different applications. Configurations do not include the password or userspan value.

RESET TO FACTORY DEFAULTS

The **Load Factory Defaults** button will return the gauge to the configuration as shipped from the factory. As part of the reset function, the password will be removed from the gauge, but the userspan value will be unaffected.

LANGUAGE SELECTION



ConfigXP supports alternate languages for the user interface. Some languages are available directly from the Crystal Engineering web site, while others can be obtained directly from your local Crystal Engineering distributor.

To choose an alternate language, click the **Language** button to open the Select Language dialog box. You must use the version of ConfigXP included with the language file. If you upgrade ConfigXP using the English version, it is very likely that the language file will no longer work and the program will start in English.

Support

TROUBLESHOOTING

Firmware Revision Dependencies

Some older versions of the firmware do not fully support all of the features provided in ConfigXP.

A known issue exists with disabling units which may cause the unit to only operate in psi mode even if that unit is not selected. To prevent this problem, simply select psi or kgf/cm² as one of the units and the gauge should work properly.

CONTACT US

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