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# Industrial Automation Updating PAX<sup>®</sup> 2C Databases for Tech Note 39 FlexBus<sup>™</sup> Firmware



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## **Abstract:**

This document includes a list of enhancements available beginning with PAX2C FlexBus firmware Version 1.5 and describes the process for converting a Version 1.0x PAX2C database file to a Version 1.5+ PAX2C database file.

## **Products:**

PAX2C

## **Use Case / Problem Solved: Short Description**

In order to utilize the new features in FlexBus firmware Version 1.5+, the previous 1.0x files need to be converted. This document includes instructions for converting a Version 1.0x program file for use in a Version 1.5+ PAX2C

## **Required Software:**

Crimson<sup>®</sup> 2.0, Build 572; or Crimson 2.1

## **Required Firmware:**

PAX2C, Version 1.51 or later

## **Required Operating System:**

Microsoft Windows 2000, or above

## PAX2C Enhancements

Red Lion's PAX2C PID controller's Version 1.50 FlexBus Firmware adds FlexCard™ plug-in options that provide users greater input, output, and communications versatility. FlexCard features include:

- Heater Current Monitor (PX2FCA10)
- Process Input/Remote Setpoint (PX2FCA00)
- Custom multi-point linearization support for the standard Analog Output option card (PAXCDL10)
- Increased parameter viewing options: allows a parameter to be view/accessed in multiple display loops (Main, Parameter, and Hidden)
- Proportional Band is now entered as display units (previously entered as % input range).

**NOTE 1:** Programming modules affected by the enhancements include: process input scaling, display locks, and PID settings.

**NOTE 2:** PAX2C PID Version 1.50 Firmware requires Crimson 2.0, Build 572; or Crimson 2.1; later Versions of Crimson (i.e., 3.0 and 3.1) are **not** compatible.

## EXISTING VERSION 1.0X PAX2C APPLICATIONS

If you have an existing application and associated database file, you may continue to use the database on the new PAX2C using your current build of Crimson 2. Or, you can opt to use the latest Crimson 2 build contained on the USB flash drive provided with your PAX2C device. Simply download (Link, Send) the database file to the new PAX2C. During the download process, the new PAX2C will be “down-graded” to Version 1.0x and configured for your application.

If using the build of Crimson 2 contained on the included USB flash drive, review the next paragraph regarding the changes to the Band and Deviation Alarm Modes for Version 1.06 PAX2C firmware, as it may affect your application.

### PAX2C Version 1.06 Band/Deviation Alarm Modes

The PAX2C Band/Deviation alarm modes have been changed to provide setpoint tracking. As the setpoint is changed, the alarm trigger points will shift to provide alarming around the new setpoint. If you've previously set the alarm value to accomplish this, it is no longer necessary. The alarm value, however, will need to be set to zero; otherwise an alarm offset will occur. Refer to the Alarm Figures in the PAX2C manual contained on the USB flash drive.

## DATABASE FILE/PAX2C FIRMWARE CONVERSION:

The easiest method for converting a 1.0x database file is to use the latest build of Crimson 2 to extract the database file from a Version 1.0x PAX2C. The extracted database is then sent to the new PAX2C. To do this, perform the following:

1. Install Crimson 2 from the USB Flash Drive.
2. Apply power to the Version 1.0x PAX2C.
3. Connect a USB cable from the PAX2C to a PC.



4. Open Crimson 2, select *File, New*, select the “PAX2 Panel Meters/Controllers” Product Family and model “PX2C Temp/Process PID Controller w/FlexBus V1.5+”.
5. Select *Link, Extract*, and respond *Yes* at the “Do you wish to convert?” prompt.
6. The database settings will automatically be converted to a Version 1.5 database file. Save the newly extracted file.
7. Disconnect the Version 1.0x PAX2C and apply power to the Version 1.5 PAX2C.
8. Connect the USB cable from the Version 1.5 PAX2C to the PC.
9. Send the converted Version 1.5 database file to the new PAX2C using the Crimson 2 *Link, Send* operation.
10. All configuration settings should be checked.

If a Version 1.0x PAX2C is not available, another conversion method is to send the existing 1.0x database file to the new PAX2C, as is. Then extract into a new Version 1.5 database file, and resend to the PAX2C.

## PROPORTIONAL BAND CONVERSION

Beginning with Version 1.5, the Proportional Band units have been changed from % input range to display units. If keying in the Proportional Band value from a Version 1.0x unit, the Proportional Band value must be converted from % input range to display units. Note that the latest build of Crimson 2 converts the values automatically when extracting the database from a Version 1.0x PAX2C for conversion into a Version 1.5 database.

### Conversion Example:

Version 1.0x Settings:

Proportional Band = 21.4  
Input Type = T  
Display Scale = °C  
Display Decimal = 0.0

Conversion of the Version 1.0x Proportional Band value from % input range to display units can be accomplished using the following formula:

$$\text{Version 1.5 Proportional Band} = \text{Input Range} * (\text{Version 1.0x Proportional Band} / 100)$$

Using the Input Range Tables below, select the input type range for the applicable input type. In this example, we are using a Type T thermocouple, so the input range value would be 600 °C.

By substituting known values into the equation above, the Version 1.5 proportional band can be calculated:

$$\text{Version 1.5 Proportional Band} = \text{Input Range} * (\text{Version 1.0x Proportional Band} / 100)$$

$$\text{Version 1.5 Proportional Band} = 600 * (21.4 / 100)$$

$$\text{Version 1.5 Proportional Band} = 128.4 \text{ (For Display Scale = °F, multiply result by 1.8; For Display Decimal point = 0, round result to nearest whole unit)}$$



### Input Range Tables

Tables 1 through 3 provide input ranges for various Thermocouple Input Types, RTD Input Types, and Current/Voltage/Resistance Input Types, respectively.

**TABLE 1.**

<b>THERMOCOUPLE INPUT TYPE</b>	<b>RANGE (IN °C)</b>
T	600
E	950
J	960
K	1450
R	1768
S	1768
B	1670
N	1500
C	2315

**TABLE 2.**

<b>RTD INPUT TYPE</b>	<b>RANGE (IN °C)</b>
385	1050
392	1050
672	339
427	370

**TABLE 3.**

<b>Current/Voltage/ Resistance Input Type</b>	<b>Range</b>
ALL	Full Scale Input Range

## Disclaimer

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