

FPAC2 UPGRADE INSTALLATION AND OPERATION MANUAL

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1 INTRODUCTION

This document is a quick guide on how to replace an previous Intellis FPAC electronic module device revisions 2, 3 or 4 with the new FPAC2 electronic module device revision 5. This document does not replace the installation and operation manuals VCIOM-05123 and TECH-502 that should be consulted for complete information about the product. The replacement process usually involves these steps:

1. Replace the electronic module or the complete Intellis FF unit.
2. Install the new DD/CF (0501) in the FF Host System database.
3. Decommission the old device and commission the new one.
4. Reconfigure the new standard transducer block to match the Intellis application.
5. Reassign the existent function blocks configuration in the FF Host System's control module(s) to the new device.
6. Download the control module configuration and test the new device.

This document shows an example where the FPAC is controlling 1 (one) rotary valve using the internal Hall Effect sensors as limit switches. The application controls the valve position through 1 (one) DO block and gets the position feedback from 1 (one) DI block. Other configurations can be adapted based on this example. See IOMs VCIOM-05123 and TECH-485 for more information on the Intellis and the FPAC module.

The example below assumes you are using DeltaV⁽¹⁾ revision 11.3 or greater (this is one of the FF host system mentioned above). The steps and windows may differ depending on the FF Host System and versions. Also, even if you are using the system mentioned above, it may be possible to replace a device following different methods and procedures. Then, keep in mind that the example described in this document serves as a general guideline.

Before starting to follow the steps mentioned in the rest of the documents it is a good idea to have available:

- The IOMs (old FPAC and the new FPAC - see Figure 1 & 2 on next page)
- Screw drivers. The size and type of the screws may vary depending on the Intellis model.
- Small wire cutters and wire tip finishing tools according to your application's installation rules and procedures.
- Proper access rights to the FF host system you are using. Some steps are not allowed to be performed by all the system users.
- PPI and safety permits. All that may be applicable not only to handle the Intellis device but the ones applicable to the process, area and or the plant where the Intellis device is installed
- Make sure that any action or procedure suggested below will not void the applicable guarantee agreements.



IMPORTANT

Before replacing the module make sure to follow all the necessary safety procedures. Notice the valve and actuator can move while replacing the module and changing the configuration, therefore make sure all safety measures have been taken.

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FIGURE 1
FPAC revisions 2, 3 and 4

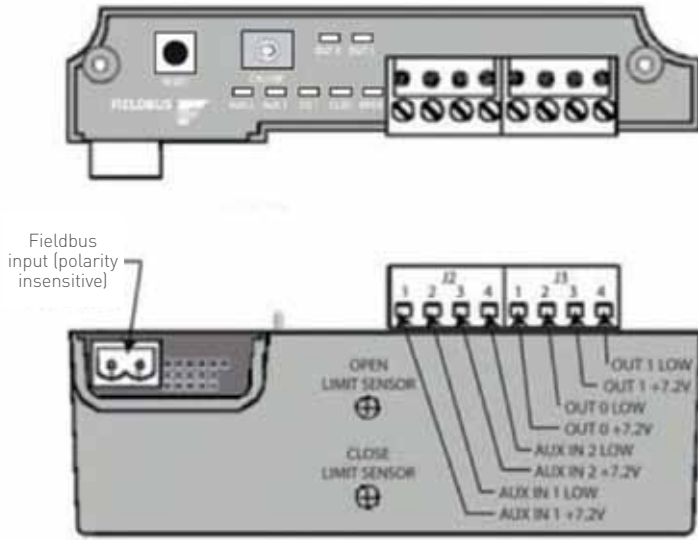
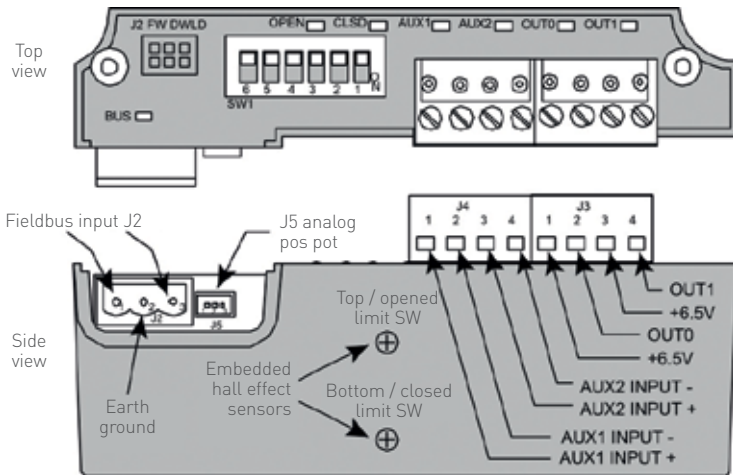


FIGURE 2
FPAC revision 5



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2 REPLACING THE ELECTRONIC MODULE

Step 1: Turn off the bus power and remove the fieldbus connector and I/O connectors. Remove the old electronic module from the housing. Put aside screws, washers and other accessories. See Figure 3.

Step 2: Replace the 2-pin fieldbus connector with the new 3-pin connector. Make sure to connect the grounding (J2 BUS pin #2) to the grounding point inside the housing. The grounding pin (J2 BUS pin #2) should not be connected to the cable shield. The cable's shield should be cut short and taped to avoid strains, contact with any metallic surface or other wires. See Figure 4.

Step 3: Install the new electronic module in the housing. Make sure to put back washers, tighten all screws and reconnect I/O and fieldbus connectors. See Figure 5.

Step 4: Energize the fieldbus (9-32 VDC) and verify that all LEDs blink once. If there is communication on the fieldbus the BUS LED will start blinking at a rate around 1 Hz. If the magnets are properly aligned OPEN or CLSD LED should light on indicating the current valve position.

FIGURE 3
Remove the old FPAC from the housing



FIGURE 4
Replace the old 2-pin fieldbus connector with new 3-pin connector



FIGURE 5
New electronic module installed with I/O connectors on



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3 INSTALLING THE NEW DD/CF REVISION 0501

Step 5: Check if the FF Host System has the support files for the FPAC device revision 5 (DD 0501 or higher). Open DeltaV Explorer, click on Library\Device Definitions\Fieldbus Devices\Westlock\FPAC VALVE CONTROLLER, and check if the latest DD (REV 5) is installed. See Figure 6.

Step 6: If it is not listed, contact Westlock to receive the latest DD/CF files (0501) or download it directly from the Fieldbus Foundation registered products website, link below^[2]. See Figure 7.

http://www.fieldbus.org/index.php?option=com_mtree&task=viewlink&link_id=1836&ffbstatus=Registered&Itemid=324

Step 7: Install the new DD/CF 0501 into the Fieldbus Host System following the system instructions.



NOTE

2. This URL is maintained by FieldComm Group - Fieldbus Foundation division. In case the link is not valid anymore contact Westlock or browse the FieldComm Group - Fieldbus Foundation web site to find the FPAC registration web page shown before.

FIGURE 6

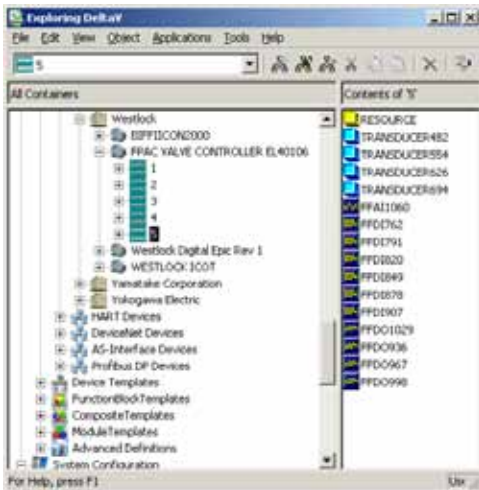


FIGURE 7



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4 DECOMMISSIONING THE OLD DEVICE AND COMMISSIONING THE NEW ONE

Step 8: Once the new device appears in the Decommissioned Fieldbus Devices list check if it is available for commissioning. If not, right-click on it and select Place in Standby. Wait until this process is finished and the window closes. See Figure 8.

Step 9: Right-click on the old device and select Decommission. In the window that opens, choose the option Make Spare. On the next window, click on Do Not Wait to close it. See Figure 9.

FIGURE 8

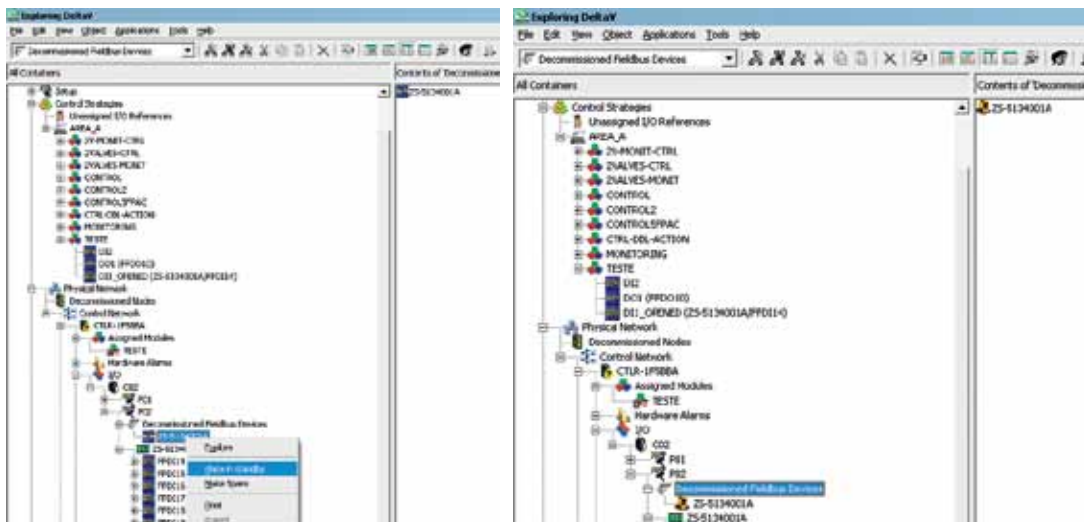
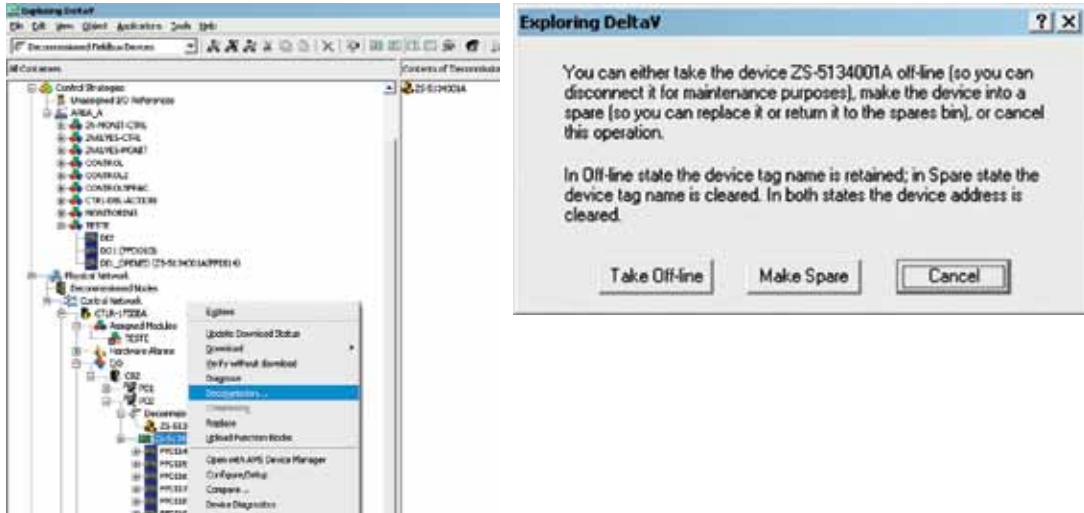


FIGURE 9



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Step 10: When decommissioning the old device is finished, right-click on it and select Properties, change device revision to "5" and click on OK. See Figure 10.

Step 11: If a warning message appears indicating some incompatibilities, click OK. Right-click on the old device again and select Commission. If a warning message appears, click OK. A window to select the new device will open. See Figure 11.

FIGURE 10

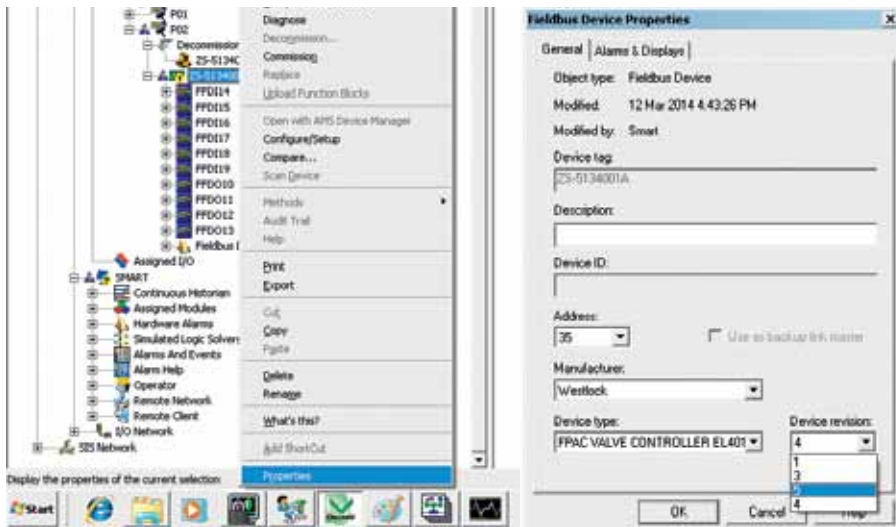
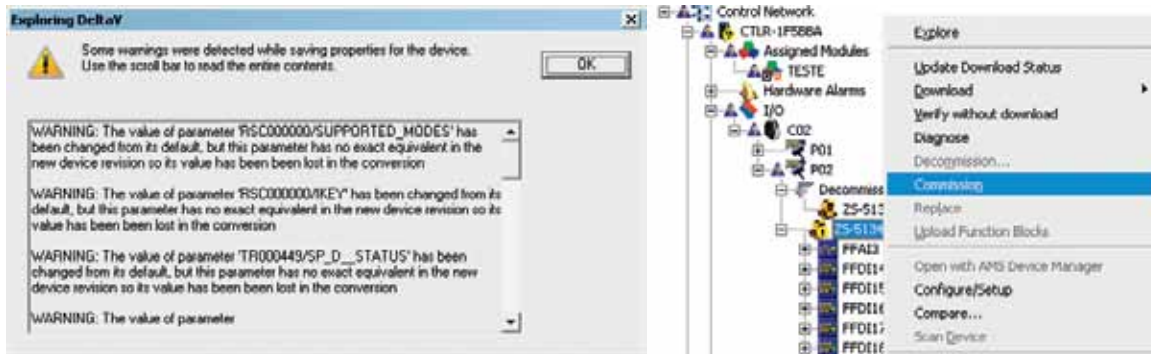


FIGURE 11



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Step 12: Selected the new device from the list and click OK. If a warning message appears, click OK. In the window that will appear DO NOT click Reconcile Device, just click Next. See Figure 12.

Step 13: Click Next and finally click on Finish, then wait until the device is commissioned. See Figure 13.

FIGURE 12

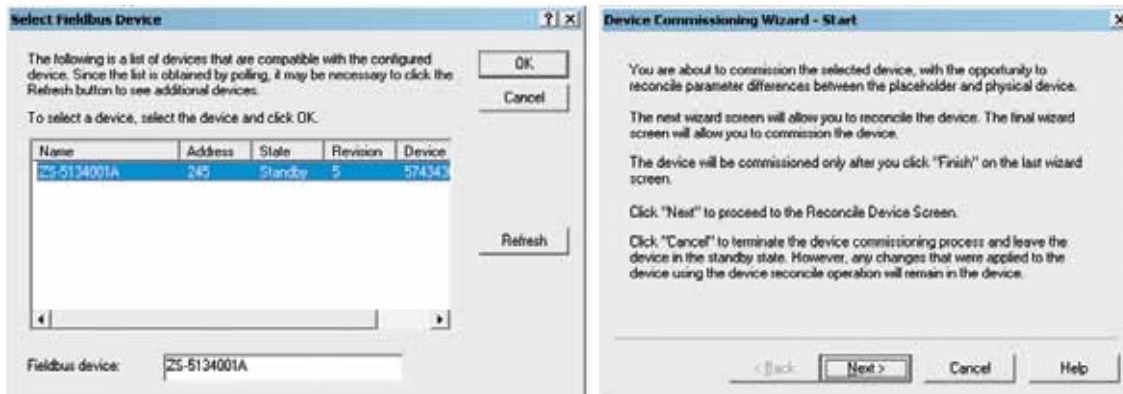
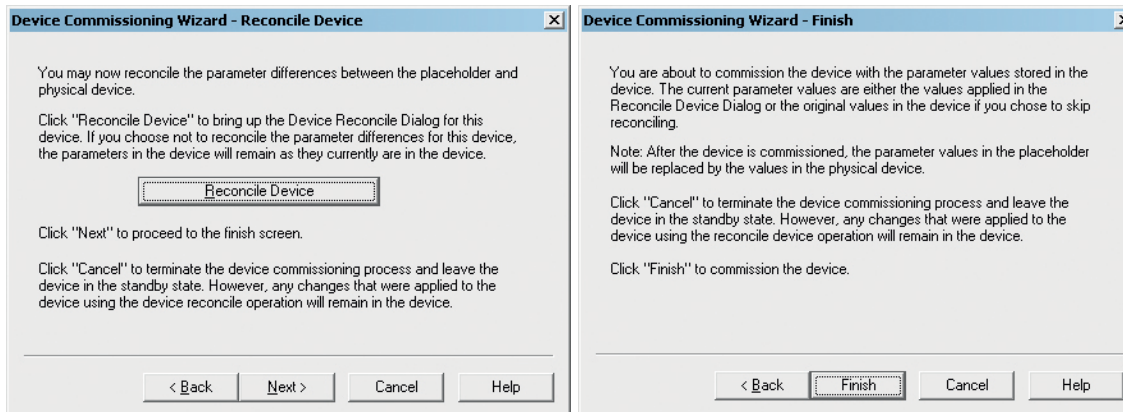


FIGURE 13



5 CONFIGURING THE NEW STANDARD TRANSDUCER BLOCK

Step 14: Once the new device is commissioned it is necessary to reconfigure the new standard transducer block(s) to match the old transducer block configuration. There are just a few parameters that have to be reconfigured for the basic functionality of control and monitor the valve position. Right-click on the device and select Configure/Setup. The AMS window will open. See Figure 14.

Step 15: In the menu tree, select Transducer Basic Setup. Reconfigure the new standard transducer block(s) Std Transducer 1 for the equivalent application, according to Appendix A, table 1. In this example, it is necessary to reconfigure ACTION_ELEMENT parameter to Single Action. It is not necessary to reconfigure Transducer 2, leave it as it is. See Figure 15.

Step 16: On the menu tree, select Function Block Utils, then Block Mode - Trd and Resource. Make sure Resource target and actual block modes are in Automatic (AUTO). See Figure 16.

FIGURE 14

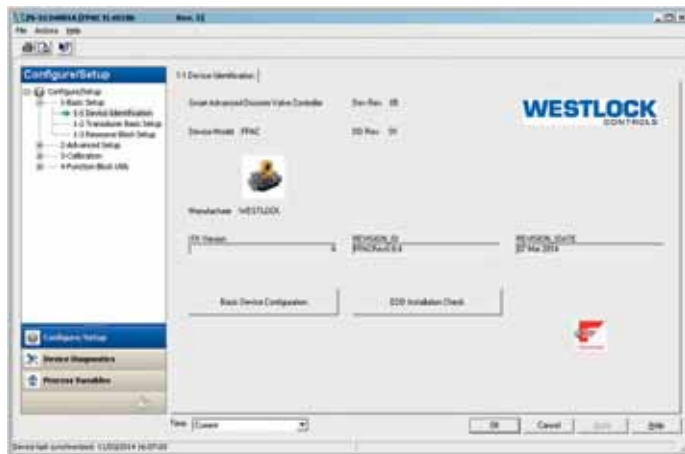
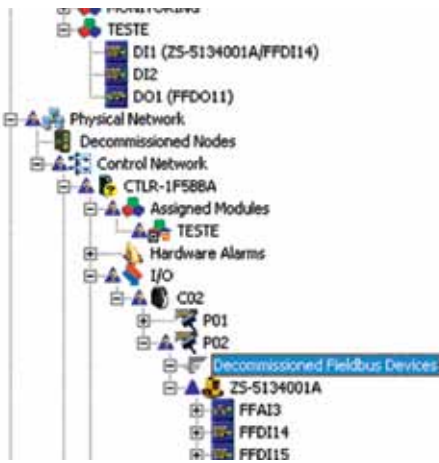
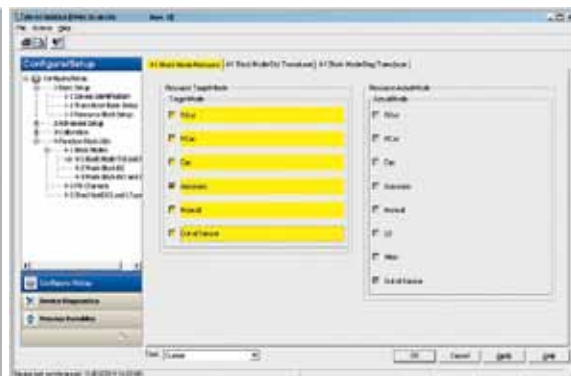
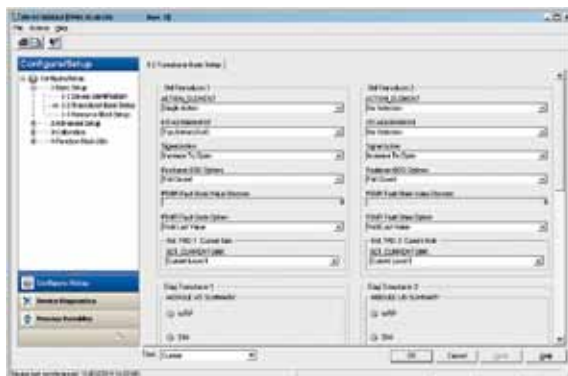


FIGURE 15

FIGURE 16



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Step 17: Make sure transducer block(s) mode is(are) also in Automatic (AUTO). See Figure 17.

Step 18: As soon as you finished reconfiguring the transducer block(s) close the AMS window. For more information and the complete standard transducer block functionality refer to VCIOM-05123.



NOTE

Although possible, it is not recommended to use AMS for function block (DI, DO) channel configuration once this configuration is not saved in the persistent database. Use DeltaV explorer or Control Studio for function blocks configuration as illustrated in the next section.

6 REASSIGNING THE FUNCTION BLOCKS IN THE EXISTENT CONTROL MODULE(S) TO THE NEW DEVICE

Step 19: Since the device VFD is not compatible between device revision 5 and previous revisions it is necessary to manually reassign the function blocks in the control module(s). See below a comparison between the old FPAC and the new FPAC. Notice the new FPAC has more transducer blocks. This characteristic shifts the function block indexes, causing an actual configuration mismatch. This difference prevents the control module from working without reassigning the function blocks. See Figure 18.

FIGURE 17

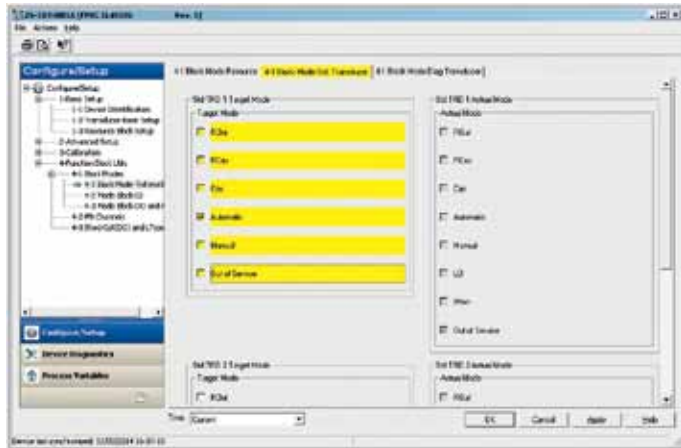
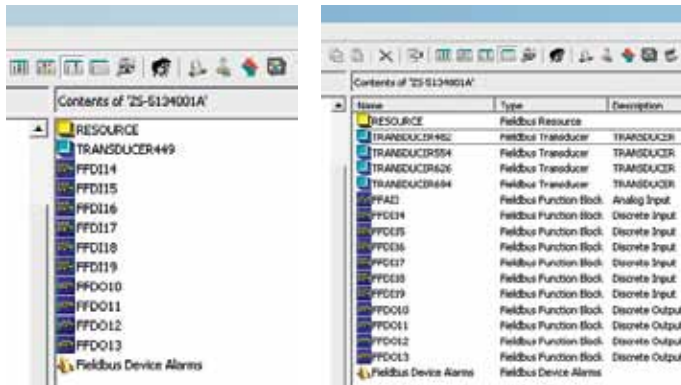


FIGURE 18



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Step 20: Open the control module(s) using Control Studio to reassign the function blocks in the application to the new device. In this example there is 1 (one) DI block instantiated in the FF Host. In the FPAC there are 1 (one) DO and 1 (one) DI blocks. See Figure 19.

Step 21: Right-click on the block(s), and select Assign I/O, then Unassign From Fieldbus to remove the assignment from the old FPAC. Repeat this for the DO and DI blocks. Sometimes this step is automatically done by the system, depending on the system's configuration. See Figure 20.

Step 22: After unassigning all function blocks, save the configuration and reassign the function blocks to the new FPAC. See Figure 21.

Step 23: Save the configuration again. Usually it is not necessary to change any parameterization in the function blocks. However, depending on the application, there are a few differences between the new FPAC and the old one, especially concerning CHANNELS. Refer to Appendix A tables 2 and 3 to confirm if you need to change any function block channel.

Step 24: After the control module is reconfigured, save the configuration.

FIGURE 19

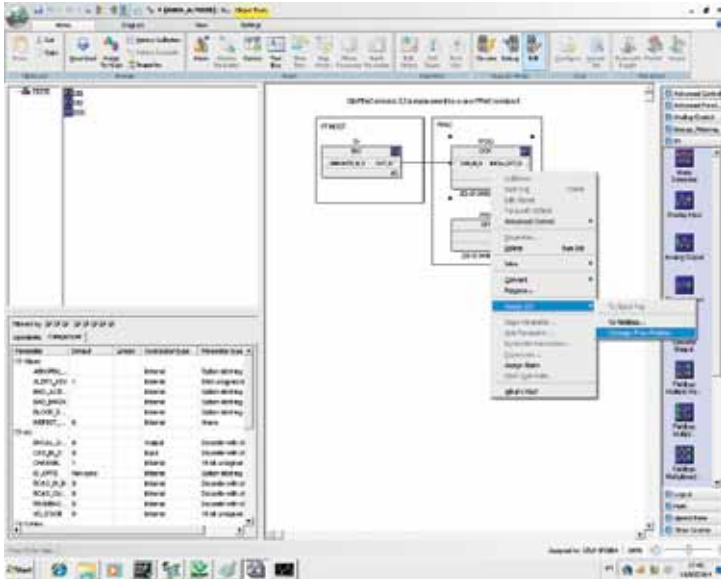


FIGURE 20

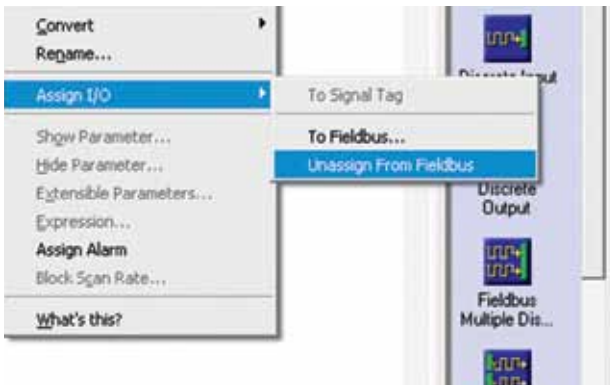
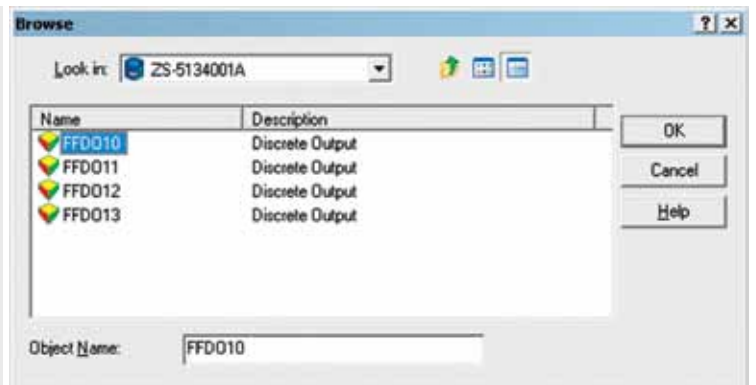


FIGURE 21



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7 DOWNLOADING AND TESTING THE NEW CONFIGURATION

Step 25: On the Control Studio menu, click Download. A message will appear, DO NOT click Upload Them Now, just click on Download Now. See Figure 22.

Step 26: If a message appears, click Yes/OK and wait until the download is finished successfully. See Figure 23.

Step 27: Close the download window and open the Control Studio in online mode (or the operator window). Command the valve to move to the opened and closed positions and check whether the new device is reporting the valve position correctly. If necessary make adjustments to the cams or limit switches. See below screenshot after the replacement showing the valve closed and opened. See Figure 24.

FIGURE 22

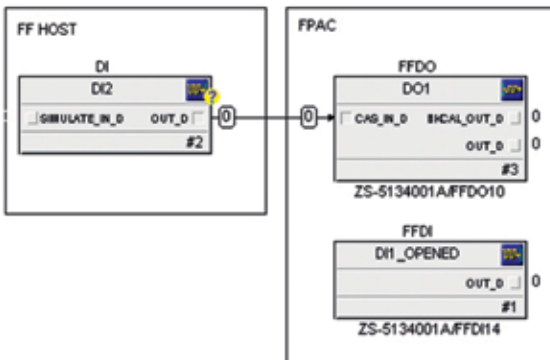


FIGURE 23

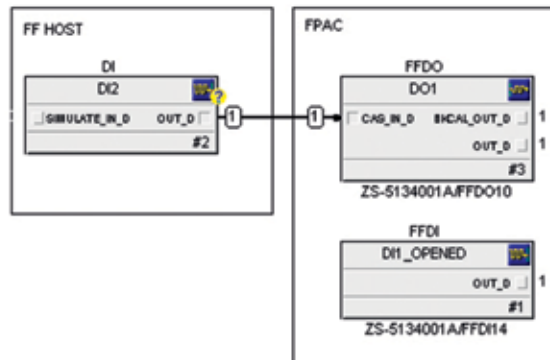


FIGURE 24

Old FPAC revision 2,3,4 replacement by a new FPAC revision 5



Old FPAC revision 2,3,4 replacement by a new FPAC revision 5



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8 APPENDIX A - SOME DIFFERENCES BETWEEN FPAC1 REV 2, 3, 4 AND FPAC2 REV 5

For the complete set of features for each device revision refer to IOMs VCIOM-05123 and TECH-485.

8.1 Transducer basic parameters mapping

Look up at the old FPAC transducer block configuration and take note of the value in the ACTION_ELEMENT parameter. This parameter has to be mapped into 3 (three) other parameters in the new FPAC2 standard transducer block, as indicated in the table below:

TABLE 1 - TRANSDUCER PARAMETERS BASIC CONFIGURATION MAPPING

FPAC1 rev 2,3,4 Transducer	FPAC1 rev 2,3,4 Transducer	FPAC2 rev 5 Standard Transducer blocks
Transducer	Transducer 1 (Valve 1)	Transducer 2 (Valve 2)
0 ACTION_ELEMENT = No Selection	ACTION_ELEMENT = 0: No Selection IO_ASSIGNMENT = 0: No Selection	ACTION_ELEMENT = 0: No Selection IO_ASSIGNMENT = 0: No Selection
1 ACTION_ELEMENT = Single Action	ACTION_ELEMENT = 1: Single Action IO_ASSIGNMENT = 1: Top,Bot,Out0 SIGNAL_ACTION = 0: Increase to Open	ACTION_ELEMENT = 0: No Selection IO_ASSIGNMENT = 0: No Selection
3 ACTION_ELEMENT = Double Action	ACTION_ELEMENT = 1: Double Action IO_ASSIGNMENT = 1: Top,Bot,Out0 SIGNAL_ACTION = 0: Increase to Open	ACTION_ELEMENT = 0: No Selection IO_ASSIGNMENT = 0: No Selection
4 ACTION_ELEMENT = Single Action, Reverse Acting	ACTION_ELEMENT = 1: Single Action IO_ASSIGNMENT = 1: Top,Bot,Out0 SIGNAL_ACTION = 1: Increase to Close	ACTION_ELEMENT = 0: No Selection IO_ASSIGNMENT = 0: No Selection
6 ACTION_ELEMENT = Double Action, Reverse Acting	ACTION_ELEMENT = 1: Double Action IO_ASSIGNMENT = 1: Top,Bot,Out0 SIGNAL_ACTION = 1: Increase to Close	ACTION_ELEMENT = 0: No Selection IO_ASSIGNMENT = 0: No Selection
8 ACTION_ELEMENT = Independent, both Normal Acting	ACTION_ELEMENT = 1: Single Action IO_ASSIGNMENT = 1: Top,Bot,Out0 SIGNAL_ACTION = 0: Increase to Open	ACTION_ELEMENT = 1: Single Action IO_ASSIGNMENT = 6: Aux1,Aux2,Out1 SIGNAL_ACTION = 0: Increase to Open
9 ACTION_ELEMENT = Independent, 1Reverse Acting 2Normal Acting	ACTION_ELEMENT = 1: Single Action IO_ASSIGNMENT = 1: Top,Bot,Out0 SIGNAL_ACTION = 1: Increase to Close	ACTION_ELEMENT = 1: Single Action IO_ASSIGNMENT = 6: Aux1,Aux2,Out1 SIGNAL_ACTION = 0: Increase to Open
10 ACTION_ELEMENT = Independent, 1Normal Acting 2Reverse Acting	ACTION_ELEMENT = 1 = Single Action IO_ASSIGNMENT = Top,Bot,Out0 SIGNAL_ACTION = 0: Increase to Open	ACTION_ELEMENT = 1: Single Action IO_ASSIGNMENT = 6: Aux1,Aux2,Out1 SIGNAL_ACTION = 1: Increase to Close
11 ACTION_ELEMENT = both Reverse	ACTION_ELEMENT = 1 = Single Action IO_ASSIGNMENT = Top,Bot,Out0 SIGNAL_ACTION = 1: Increase to Close	ACTION_ELEMENT = 1: Single Action IO_ASSIGNMENT = 6: Aux1,Aux2,Out1 SIGNAL_ACTION = 1: Increase to Close

8.2 Discrete Input (DI) Channels

For a complete description of the channels refer to IOMs VCIOM-05123 and TECH-485.

TABLE 2 - DIFFERENCES BETWEEN DI BLOCK CHANNELS

DI.CHANNEL block - Discrete Input Channels			Notes
FPAC1 rev 2,3,4	FPAC2 rev 5		
0 No Transducer Connection	0 No Transducer Connection		No change
9 Open/Close	9 TRD1: 0-Closed / 1-Opened		Same channel number and same functionality for valve 1
10 Open	10 TRD1: 0-Not Opened / 1-Opened		Same channel number and same functionality for valve 1
11 Close	11 TRD1: 0-Not Closed / 1-Closed		Same channel number and same functionality for valve 1
12 Open/Close/Stop	12 TRD1: 0-Closed / 1-Opened / 2-Stopped		Same channel number and same functionality for valve 1
13 Maskable Signal	13 TRD1: Maskable Signal		Same channel number and same functionality for transducer 1
14 Auxiliary Input	14 Auxiliary Input 1		Same channel number and same functionality for AUX1 input
15 Auxiliary Input 2	15 Auxiliary Input 2		Same channel number and same functionality for AUX2 input
16 Open/Close for second valve (when available)	29 TRD2: 0-Closed / 1-Opened		Channel number has changed. Same functionality for valve 2
17 Open for second valve (when available)	210 TRD2: 0-Not Opened / 1-Opened		Channel number has changed. Same functionality for valve 2
18 Close for second valve	211 TRD2: 0-Not Closed / 1-Closed		Channel number has changed. Same functionality for valve 2
-	212 TRD2: 0-Closed / 1-Opened / 2-Stopped		New channel functionality for valve 2
-	213 TRD2: Maskable Signal		New channel functionality for transducer 2

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8.3 Discrete Output (DO) Channels

For a complete description of the channels refer to IOMs TECH-485 and VCIOM-05123

TABLE 3 - DIFFERENCES BETWEEN DO BLOCK CHANNELS

DO.CHANNEL - Discrete Output Channels correspondence			
	FPAC1 rev 2,3,4	FPAC2 rev 5	Notes
0	No Transducer Connection	0 No Transducer Connection	No change
1	Open/Close	1 TRD1: 0-Close / 1-Open	Same channel number and same functionality for valve 1
2	Open	2 TRD1: 0-Not Open / 1-Open	Same channel number and same functionality for valve 1
3	Close	3 TRD1: 0-Not Close / 1-Close	Same channel number and same functionality for valve 1
4	Stop	4 TRD1: 0-Not Stop / 1-Stop	Same channel number and same functionality for valve 1
5	Open/Close/Stop	5 TRD1: 0-Close / 1-Open / 2-Stop	Same channel number and same functionality for valve 1
6	Open/Close for second valve (when available)	21 TRD2: 0-Close / 1-Open	Channel number has changed. Same functionality for valve 2
7	Open for second valve (when available)	22 TRD2: 0-Not Open / 1-Open	Channel number has changed. Same functionality for valve 2
8	Close for second valve	23 TRD2: 0-Not Close / 1-Close	Channel number has changed. Same functionality for valve 2
-	-	24 TRD2: 0-Not Stop / 1-Stop	New channel functionality for valve 2
-	-	25 TRD2: 0-Close / 1-Open / 2-Stop	New channel functionality for valve 2
-	-	91 FSTATE - TRD 1 (Valve 1)	New channel to force fault state on transducer 1
-	-	92 FSTATE - TRD2 (Valve 2)	New channel to force fault state on transducer 2

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Engineering document reference

These installation and operating instructions are based on the latest engineering update, and form part of the certification for the FPAC2 series. To ensure you have the most recent version of this document, please check the library on our website (westlockcontrols.com).

Translations

Where translated the copy is taken from the original English document VCIOM-05124-EN as checked by the relevant notified certification body and therefore the original English document will prevail. No rights or liability can be derived from any translation.

Previous documents

VCIOM-05124-EN replaces all previous installation and operating instructions for the FPAC2 series including TECH-508.



WARNING

This symbol warns the user of possible danger. Failure to observe this warning may lead to personal injury or death and/or severe damage to equipment.



ATTENTION

This symbol identifies information about operating the equipment in a particular manner that may damage it or result in a system failure. Failure to observe this warning can lead to total failure of the equipment or any other connected equipment.



NOTE

This symbol draws attention to information that is essential for understanding the operation and/or features of the equipment.



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