ADAM 5000 Device Driver Guide

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1.1.1 ADAM5K Block-Types

The ADAM-5000 Distributed I/O Systems from Advantech are supported by the ADAM5K **Device Type** drivers in WebAccess.

The ADAM5k Device driver reads the IO Modules of the ADAM-5000 directly. Both Tags and Blocks read IO Modules of the ADAM5K.

IO Tags

A **Tag** reads only one **channel** of an IO Module. The Model Number, slot and channel constitute the **address: Model, slot, channel**.

For example, a Tag that reads Slot number 1, Channel 4 of a 5017 Analog Input Module, the address of the tag is: 5017,1,4

Blocks

A **Block** reads multiple **channels** of an IO Module. The individual **parameters** within the block read one channel each. Each **parameter** has a unique address: **Model, slot, channel**.

For example, a **simple Block** that reads Slot number 2 and all 8 Channels of a 5017 could be built using the following parameters and addresses:

parameter	address
AI_0	5017,2,0
AI_1	5017,2,1
AI_2	5017,2,2
AI_3	5017,2,3
AI_4	5017,2,4
AI_5	5017,2,5
AI_6	5017,2,6
AI_7	5017,2,7

A User could easily build this simple block. It would be useful if he repeatedly used lots of IO Modules like it. However, it might be just as easy to build IO tags instead, and more useful, since the tags could have individual tagnames but the same block name is used to reference all parameters of a block. Also, this simple block uses only part of the functionality of the ADAM 5017 IO Module. The A5051 Block type is a simple Block that read 16 Digital Inputs.

The Block-types supplied with the ADAM5K Device driver take advantage of the full functionality of the ADAM 5000 IO Modules. These Blocks not only read the IO Channels, but also read and write to the configuration parameters. This allows users to modify the local alarming and calibrate the IO module from WebAccess using VIEW.

5017 Block-Type

The 5017 is a **Block Type** that reads all 8 Input Channels, plus reads associated "reference channels.

The 5017 Block-type reads all 8 analog inputs channels using the same parameters as in the simple block example above (AI_0, AI_1, AI_2, AI_3, AI_4, AI_5, AI_6, AI_7). Plus it reads configurable "alarm parameters" and other parameters. This allows users to modify the local alarming and calibrate the IO module from WebAccess using VIEW

The 5017 IO Module can read a variety of Input types, including: mA, mV and V. If a user where using a 0-500 milliVolt, he would probably also want to read the Cold Junction Compensation (this would allow him to "calibrate" his temperature). So, the WebAccess Block includes these parameters for each channel: AI_1_CJC, AI_2_CJC, AI_3_CJC etc. The user can ignore these parameters, or delete them from his block or block type if he is not using these channels for Temperature measurement.

The 5017 can trigger a Digital Output based on an alarm, for each Analog Input Channel. So, the WebAccess Block also includes these parameters for each IO Channel. For Channel 0, these are:

A0_H_LMT	analog **High Alarm Limit** - this is a number that triggers an alarm if exceeded by the AI.
A0_H_S	analog **Alarm H Slot** Connection - this is the Slot of the Digital Output to be driven if a High Alarm occurs.
A0_H_C	**Alarm H Channel** Link - this is the Channel of the Digital Output to be driven if a High Alarm occurs.
A0_L_LMT	analog **Low Alarm Limit** - this is a number that triggers an alarm if exceeded by the AI.
A0_L_S	analog **Alarm Low** Link **Slot** Update - this is the Slot of the Digital Output to be driven if a Low Alarm occurs.
A0_L_C	analog **Alarm Low** Link **Channel** - this is the Channel of the Digital Output to be driven if a Low Alarm occurs.

These parameters are repeated for Channel 1 (A1_H_LMT, A1_H_S, A1_H_C, etc.) and all other channels.

There are many other "programmable" features in a 5017 IO Module. The WebAccess Block has connections to all of them. This allows users to "program" the IO module from WebAccess using VIEW.

Please refer to the manufacturer's reference Guide for more information about the many parameters in an ADAM 5017 IO Module.

Block Offset

For the simple Block example of 8 AI, it is relatively easy for the user to modify the address for each parameter to match the actual Model, Slot and Channel number.

For the complex block-types, like the 5017, which have 13 parameters associated with each of 8 channels; there would be 201 addresses to modify!

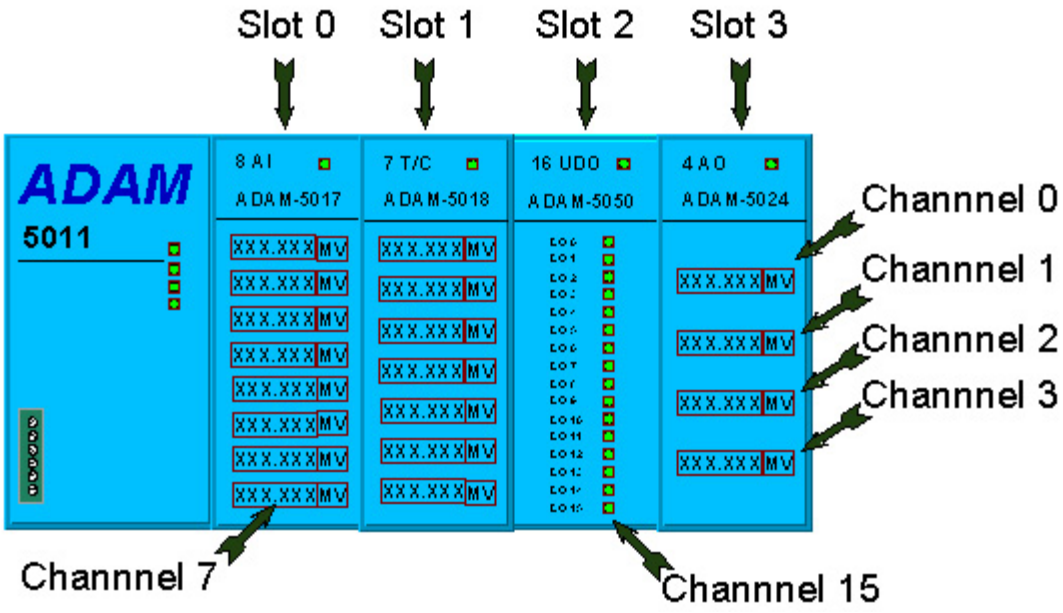
The Block Offset allows all 201 addresses in the 5017 Block (or any Block) to be modified by typing on address Offset. Probably a better name for Block Offset is Address Offset.

The trick to using Block offset is to change only part of the address. For a 5017, all we need to specify is the model number and the slot (5017,slot, blank). We can't enter Blank so we use 0 instead, for the block offset of a field that is not changed: 5017, slot, 0

For example, to create a Block that reads all 8 Input Channels and reads and writes all the configurable parameters of a 5017 IO Module installed in the second slot (i.e. slot 1), the Block offset is: 5017,1,0

You might ask why you have to enter the 5017, for a 5017 block type. That is because we use the same parameters in different Block Types. For example the AI_0 is used in the 5017 and 5018 Block Types.

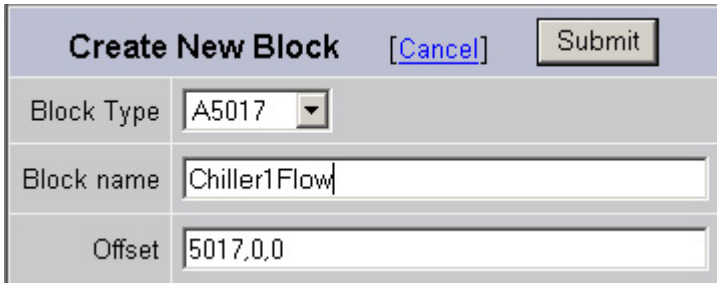
1.1.1.1 Configure ADAM5K Block example



This example is to configure 4 Blocks that represent the above drawing of a ADAM 5011 processor rack, with 4 IO Modules: 5017, 5018, 5051 and 5024 in slots 0 to 3 respectively.

1. Open **Internet Explorer**.
2. Connect to **Project Node**.
3. Start **WebAccess Configuration**.
4. Select **Project**.

5. Select **SCADA Node**.
6. Select an ADAM5K **Device**.
7. Select **Add Block**.
8. From **Block Type** Pull Down List Select **5017**.
9. Enter a **Block name** users can use to identify this block of measurements. For example, if these Flow measurements are from an HVAC Chiller #1, enter **Chiller1Flow**.
10. For **Block Offset**, enter: **5017,0,0**

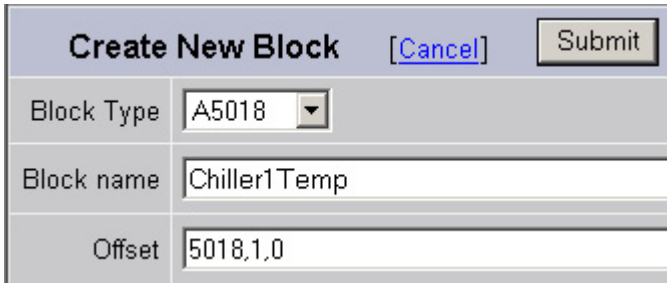


11. Press **Submit**

Notice that Chiller1Flow:A0_H_C has and address 5017,0,0
Chiller1Flow:A1_H_C has and address 5017,0,1
Chiller1Flow:A2_H_C has and address 5017,0,2
etc.

You could modify the parameters. For example modify the descriptions, Chiller1Flow:AI_0 description = Inlet Flow, Chiller1Flow:AI_0 description = Outlet Flow, Chiller1Flow:AI_0 description = Recycle Flow.

12. Select the ADAM5K **Device** again to **add the second Block for the 2nd IO Module**.
13. Select **Add Block**.
14. From **Block Type** Pull Down List Select **5018**.
15. Enter a **Block name** users can use to identify this block of measurements. For example, if these Temperature measurements are from an HVAC Chiller #1, enter **Chiller1Temp**.
16. For **Block Offset**, enter: **5018,1,0**



17. Press **Submit**.

    Notice that Chiller1Temp:A0_H_C has and address 5018,1,0
    Chiller1 Temp:A1_H_C has and address 5018,1,1
    Chiller1 Temp:A2_H_C has and address 5018,1,2
    etc.

    You could modify the parameters. For example modify the descriptions, Chiller1 Temp:AI_0 description = Inlet Temperature,
    Chiller1 Temp:AI_0 description = Outlet Temperature,
    Chiller1 Temp:AI_0 description = Recycle Temperature.

18. Select the ADAM5K Device again to **add the third Block for the 3rd IO Module**.

19. Select **Add Block**.

20. From **Block Type** Pull Down List Select **5051**.

21. Enter a **Block name** users can use to identify this block of measurements. For example, if these are Pump Start/Stop signals to an HVAC Chiller #1, enter **C1Starter**.

22. For **Block Offset**, enter: **5051,2,0**

23. Press **Submit**.

Block : Project1 • Node1 • 5 • ADAM_PLC • C1STARTER	
Block name	C1STARTER
	C1STARTER:DI_00 5051,2,0
	C1STARTER:DI_01 5051,2,1
	C1STARTER:DI_02 5051,2,2
	C1STARTER:DI_03 5051,2,3
	C1STARTER:DI_04 5051,2,4
	C1STARTER:DI_05 5051,2,5
	C1STARTER:DI_06 5051,2,6
	C1STARTER:DI_07 5051,2,7
	C1STARTER:DI_08 5051,2,8
	C1STARTER:DI_09 5051,2,9
	C1STARTER:DI_10 5051,2,10
	C1STARTER:DI_11 5051,2,11
	C1STARTER:DI_12 5051,2,12
	C1STARTER:DI_13 5051,2,13
	C1STARTER:DI_14 5051,2,14
	C1STARTER:DI_15 5051,2,15

Notice that the 5051 is a much simpler Block Type with only 16 parameters.

24. Select the ADAM5K Device again to **add the fourth Block for the 4th IO Module**.
25. Select **Add Block**.
26. From **Block Type** Pull Down List Select **5024**.
27. Enter a **Block name** users can use to identify this block of measurements. For example, if these Setpoints are to an HVAC Chiller #1, enter **C1Setpoints**.
28. For Block off set, enter: **5024,3,0**
29. Press **Submit**.

Congratulations, you have just built connections to over 300 parameters by entering just 4 address offsets (the Block Offsets).

1.1.1.2 Configure a Tag in an ADAM5k

This example is to configure a two Tags that read an Analog Input (Channel 3, Slot 0) and an Analog Output (Channel 1, slot 3) represented in the above drawing of a ADAM 5011 processor rack, with 4 IO Modules: 5017, 5018, 5051 and 5024 in slots 0 to 3 respectively.

1. Open **Internet Explorer**.
2. Connect to **Project Node**.
3. Start **WebAccess Configuration**.
4. Select **Project**.
5. Select **SCADA Node**.
6. Select an ADAM5K **Device**.
7. Select **Add Tag**.
8. From **Parameter** Pull Down List Select **AI_3**. This will configure an Analog Input from Channel 3 (the fourth input). Wait for the Page to update.
9. Optionally, select **ALARM** from the ALARM pulldown list. Wait for the Page to update with a PINK highlight around alarm (an additional Alarm Fields at bottom of page).
10. Enter a **Tagname** users can use to identify this Analog Input measurement. For example, if this is a Flow measurement , enter **Flow1**.
11. Edit the **Address**, by adding the Model Number of the Module and the Slot (5017, 0). Enter: **5017,0,3**
12. Enter a Description. This will help identify this tags to Users and Operators. For example, enter Boiler #1 Steam Flow.
13. Optionally enter, Scaling, Span Hi, Span Low, Engineering Units, and Alarms; enable data logging, etc.
14. Press **Submit**.
15. From **Parameter** Pull Down List Select **AO_1**. This will configure an Analog Output from Channel 1 (the second output). Wait for the Page to update.
16. Optionally, select **ALARM** from the ALARM pulldown list. Wait for the Page to update with a PINK highlight around alarm (an additional Alarm Fields at bottom of page).
17. Enter a **Tagname** users can use to identify this Analog Output measurement. For example, if this is a signal to a Valve, enter **Valve1**.

18. Edit the **Address**, by adding the Model Number of the Module and the Slot (5024, 3). Enter: **5024,3,1**

19. Enter a Description. This will help identify this tags to Users and Operators. For example, enter Boiler #1 Steam Valve.

20. Optionally enter, Scaling, Span Hi, Span Low, Output Limits, Engineering Units, and Alarms; enable data logging, etc.

21. Press **Submit**.

Congratulations! You have just configured a Measurement and Output Tags to an ADAM 5000.