

Operators Manual



ADAM-4024 module for optris PI/Xi series

IO module with 4-analog outputs

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1 General notes

1.1 Intended use

The industrial process interface (PIF) device supports 3 analog outputs (AO). For applications where more outputs are required, Optris recommends the 4-channel analog output module ADAM-4024 from the company Advantech. The module is cascadable and the maximum number of modules is limited to 100.

For the communication the ADAM-4024 module uses the RS485 standard. For an easy configuration Optris provides the ADAM IPC Tool as an interface between optris PIX Connect software and the Advantech ADAM module device. This tool works via inter-process communication (IPC) with the PIX Connect and serial over the RS485/422 - USB Adapter to the single modules. The ADAM module converts temperature values of given measure areas into output signals (0/4-20 mA or 0-10 V). Together with the program Advantech AdamApax.NET Utility you can easily set up all your configurations.

2 Technical Data

2.1 ADAM-4024 module

Product number	ADAM-4024-B1E
Power Supply	
Power Requirement	10~30 VDC
Analog Output	
Channels	4
Voltage Range	±10 V
Current Output	0~20 mA (Differential), 4~20mA (Differential)
General	
Watchdog Timer	System (1.6 second) & Communication
Connector	2 x plug-in terminal block (#14~28 AWG)
Temperature (Operating)	-10~70 °C (-13~158°F)
Humidity	5~95 %RH
Temperature (Storage)	-25~85 °C (-13~185 °F)
Interface	RS-485
Isolation Protection	3000 VDC
Communication Protocol	ASCII command & Modbus/RTU
Communication Speed	Serial: From 1,200 to 115.2 k
Comm. Distance	Serial: 1.2 km
Data Flow Control	Yes
Digital Input	
Channels	4
Input Voltage	Logic level 0: 1 VDC max. Logic level 1: 10~30 VDC

Table 1: Technical Data of ADAM-4024 module

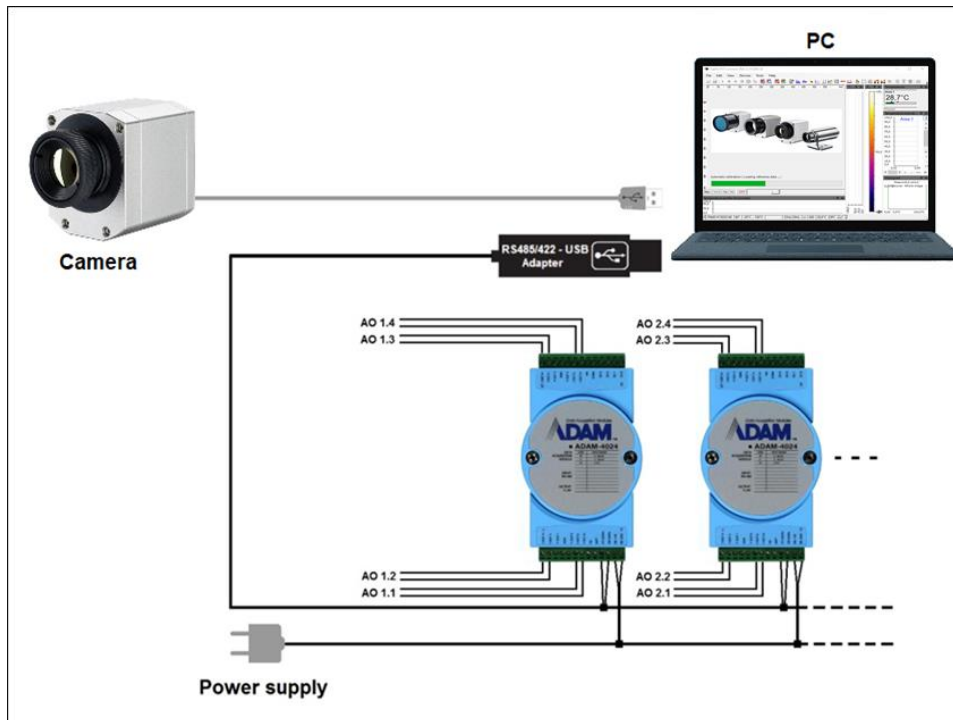
3 Installation

3.1 Hardware installation

A possible configuration of the ADAM module is shown in **Figure 1**. The optris camera is connected via USB to the computer. For this example two ADAM modules are connected together and supplied by a 10-30 V power supply. With an optional optris RS485/422-USB Adapter the two modules can be easily connected to your computer. With this configuration you have eight analog outputs, four per module.

Hardware and Software Recommendation:

- Computer with OS Windows 10 or higher
- Optris PI/Xi camera and PIX Connect software
- ADAM IPC Tool (included on software package PIX Connect)
- RS485/422 - USB Adapter (**Part No.: ACCTRS485USBK**)
- Advantech ADAM-4024-B1E module
- Advantech AdamApax.NET Utility (included in ADAM module or on supplier website)



Connection of RS485 adapter:

White cable on
DATA -

Brown cable on
Data +

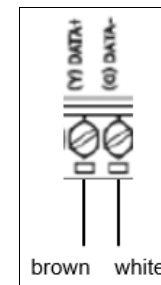


Figure 1: System overview with two ADAM-4024 modules

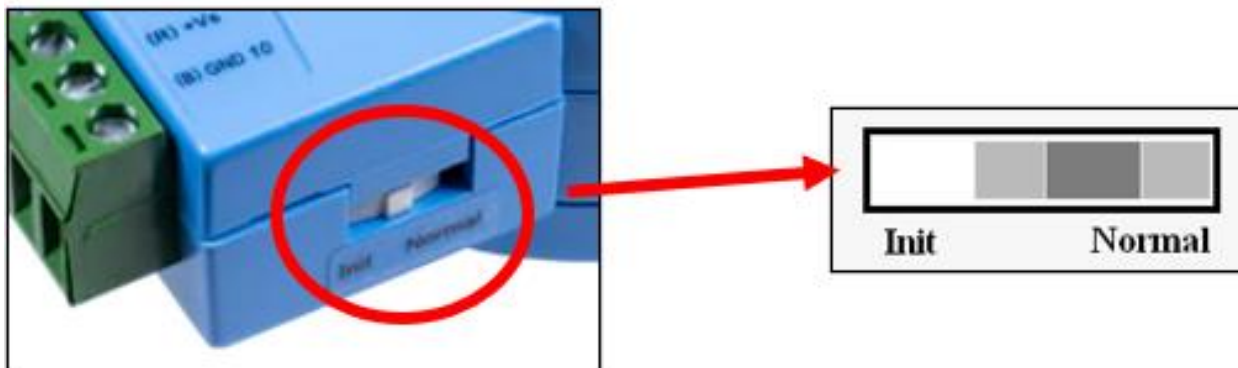


Figure 2: INIT switch – ADAM module



Make sure that the INIT switch is set to "Normal".

3.2 Connection pins of the ADAM-4024 module



Figure 3: Connection pins of the ADAM-4024 module

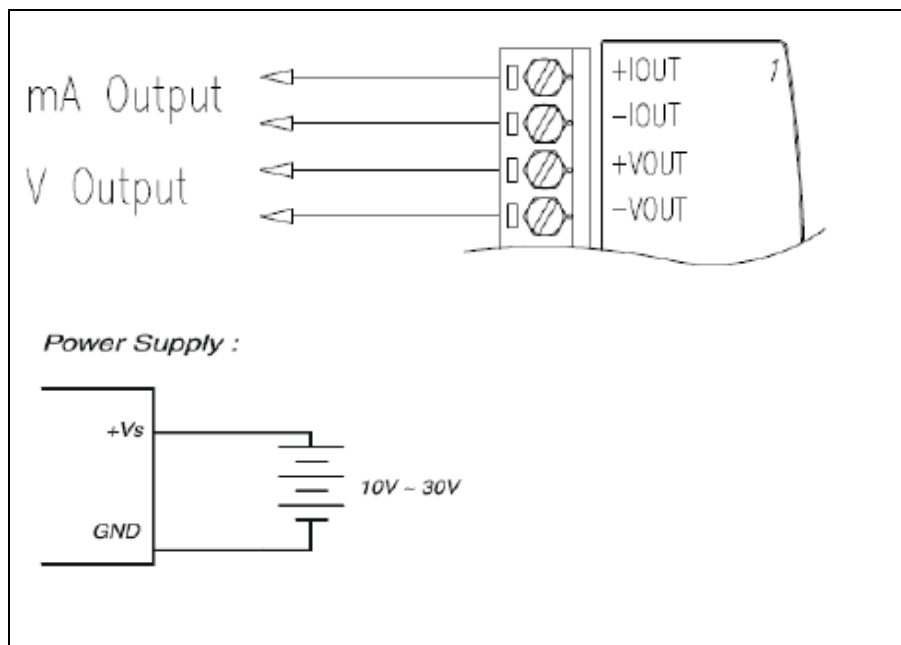


Figure 4: Power and Output pins of ADAM-4024 module

3.3 Configuration

After having connected your Hardware, you can now start to configure the ADAM module by using the **Advantech AdamApax.NET Utility** which is provided with the ADAM installation CD. You can also download it from the supplier website:

<http://support.advantech.com/Support/SearchResult.aspx?keyword=ADAM-4024>

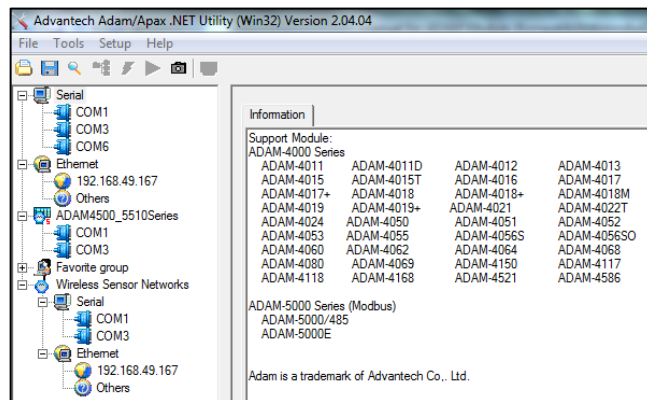


Figure 5: Advantech AdamApax.NET Utility program

If the driver of the RS485/422-USB Adapter is not installed automatically after connecting it, you can install the driver manually. You can find the driver on the software package PIX Connect under the folder **Serial communication/ USB to RS485 Adapter driver**.

After the installation open the program. To search for your modules make a right click on **Serial** and click **Refresh Subnode**. Then make a right click on your COM Port and select **Search** and **Start**. Wait until all modules are found and **Cancel** the search. If not all ports were found check again on your hardware if everything is connected correctly.

You can find your COM port number in the device manager under the category Ports (COM & LPT).

It is important, that each module must have unique address numbers starting from 1. Therefore click on the port and under **Module setting** you can change the address number (see **Figure 8**). Afterwards click on **Apply change**.

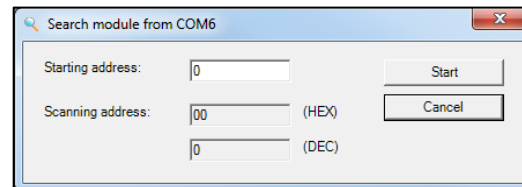


Figure 6: Search for modules

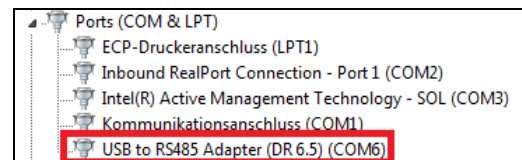


Figure 7: Device Manager

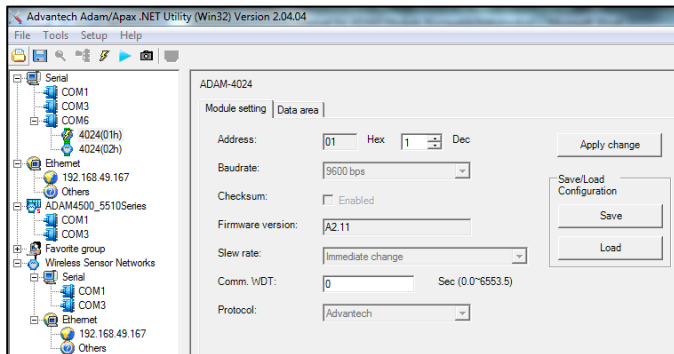


Figure 8: Module setting

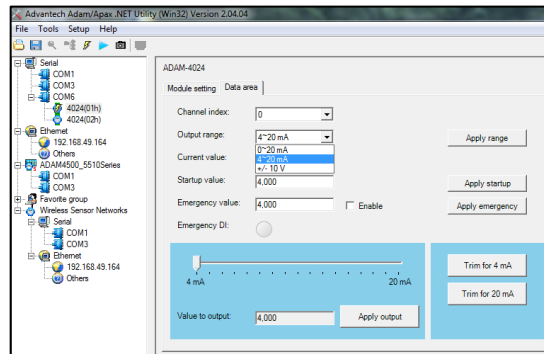


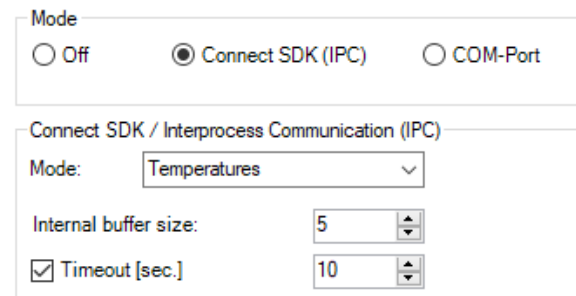
Figure 9: Data area

The preferred signal range can be changed for each output channel in **Data area** (next to the tab **Module setting**). In the selection **output range** you can choose between mA or V output. After choosing your output click on **Apply range**. All the parameters must be configured only once for each module. They remain saved in the module memory even in case of power off. For further information about the ADAM module settings look on the installation CD of the ADAM module or on the supplier website:

<http://support.advantech.com/Support/SearchResult.aspx?keyword=ADAM-4024>

After finishing up your configurations for the Advantech AdamApax.NET Utility, you can close the program. If not already done install the PIX Connect software and open it. Go to the menu **Tools**, **Configuration** and **External Communication**. Under Mode select **Connect SDK (IPC)** and for the Interprocess Communication (IPC) choose under Mode **Temperatures**.

After this setup, install the **Optris ADAM IPC Tool** which is also provided on the software package PIX Connect (folder: ADAM IPC Tool).



The screenshot shows the 'External Communication' configuration window. At the top, there is a 'Mode' section with three radio buttons: 'Off', 'Connect SDK (IPC)' (which is selected), and 'COM-Port'. Below this is a section titled 'Connect SDK / Interprocess Communication (IPC)'. Inside this section, there is a 'Mode:' label followed by a dropdown menu currently set to 'Temperatures'. Below that, there is a label 'Internal buffer size:' followed by a numeric input field containing '5' and a small up/down arrow icon. At the bottom, there is a checked checkbox labeled 'Timeout [sec.]' followed by a numeric input field containing '10' and a small up/down arrow icon.

Figure 10: External Communication under PIX Connect software



- Please close the Advantech AdamApax.NET Utility before opening the ADAM IPC Tool. A simultaneous use of both configuration programs is not possible.
- For the communication with the ADAM IPC tool, the PIX Connect software has to run.

After opening the ADAM IPC Tool set up the correct **Count of modules** that are used, the **Port name** and the **Baud rate**. If everything is set up correctly, you will see a note in green letters that the **port is opened** and the **IPC is active**. Otherwise it will turn to red.

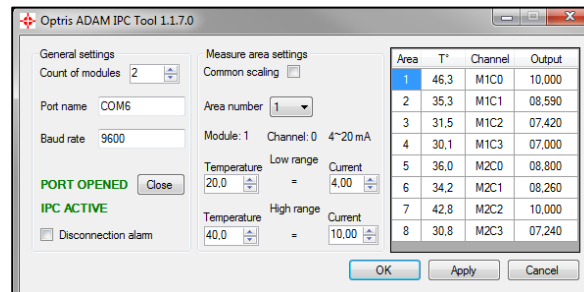


Figure 11: ADAM Tool without alarm output

If the checkbox is set to **Disconnection alarm** (see **Figure 12**), the last output is used as the alarm output for the last module. This output indicates whether the system is working properly. If this is the case, the low range signal is given (e.g. 4 mA). When the system has an interference, e.g. camera is not connected or software is not running, the high range signal is given (e.g. 20 mA). If the checkbox for **Disconnection alarm** is not set (see **Figure 11**), the last output is used as the normal temperature output, as all other outputs.

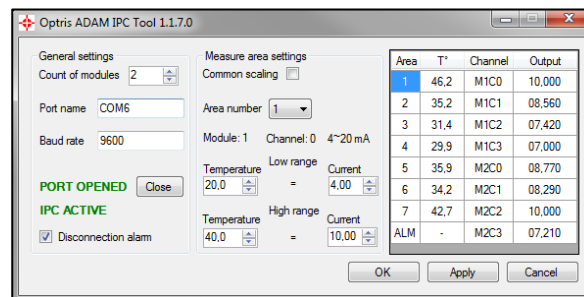


Figure 12: ADAM Tool with alarm output

Under **Measure area settings** the measure areas with the corresponding temperatures, the respective channel and the output value are displayed in a table. The temperature ranges (**Temperature**) and the output values (**Current**) can be set under **Low range** and **High range**. This scaling can be set common (**Common scaling**) or individual for each output channel under **Area number**. The order of the measure areas in PIX Connect match with the order of ADAM module channels:

Measure area 1 – Module 1 channel 0 (M1C0)

Measure area 2 – Module 1 channel 1 (M1C1)

Measure area 3 – Module 1 channel 2 (M1C2)

Measure area 4 – Module 1 channel 3 (M1C3)

Measure area 5 – Module 2 channel 0 (M2C0)

etc.

After you finished the setup press **Apply**. Now all adjustments are completed and you can start your measurements. If you press OK the software window will be minimized. You find the program icon now in the Windows task bar:



For proper function of the ADAM modules the ADAM IPC Tool must run in the background.

The settings of the ADAM IPC Tool are stored in C:\<User>\AppData\Roaming\Imager\ADAMIPC.xml file and can be changed here directly if necessary. Deleting this file restores default settings.

3.4 Using multiple cameras

It is possible to operate several cameras simultaneously. For this purpose, you need a separate software instance and a separate Adam IPC Tool instance for each camera. Each ADAM module is connected to its own RS 485 adapter. If more than 4 outputs are needed, several ADAM modules can be connected.

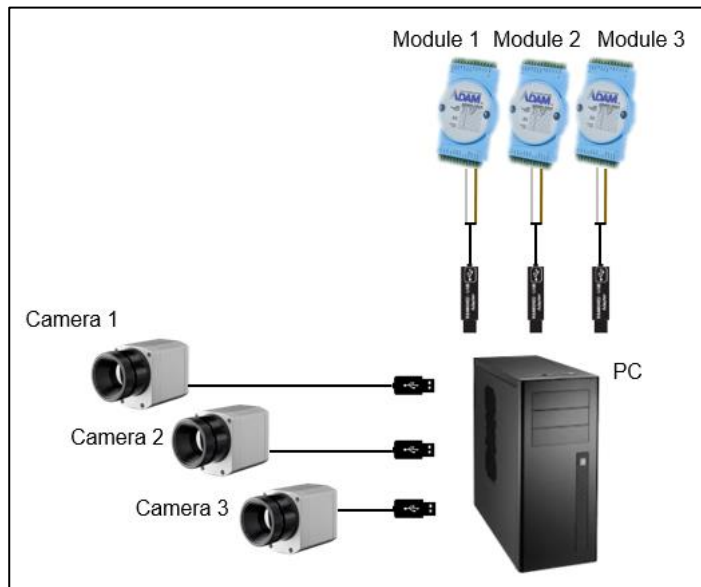


Figure 13: Connection of multiple cameras

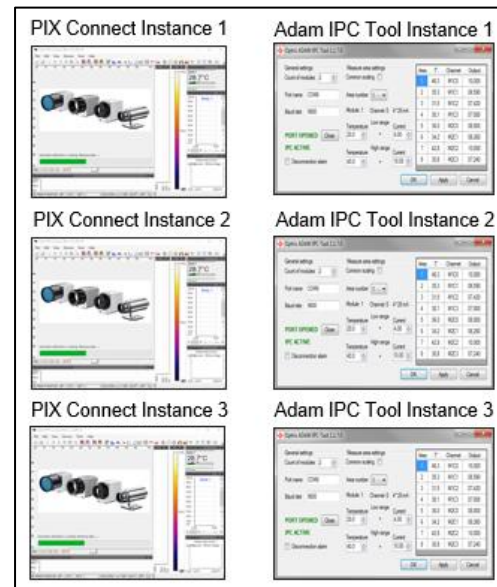


Figure 14: Software Instances:
PIX Connect and ADAM IPC Tool

In order that all instances can also be assigned correctly, different names must be defined. Shortcuts are required for this purpose. In these shortcuts, the names can be created under *Properties* (right mouse click on the shortcut) and in the *Shortcut* tab under *Target*. A space is required before you enter the command: "C:\Program Files (x86)\Optris GmbH\ADAM IPC Tool\ADAMIPC.exe" **/Name=Instance1**

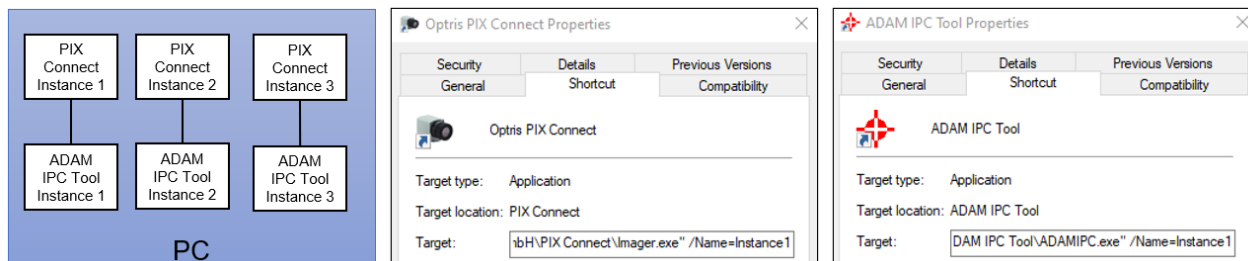


Figure 15: Start parameter for software instances of PIX Connect and ADAM IPC Tool

Now you can make the configuration as described in chapter 3.3 for each instance.

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