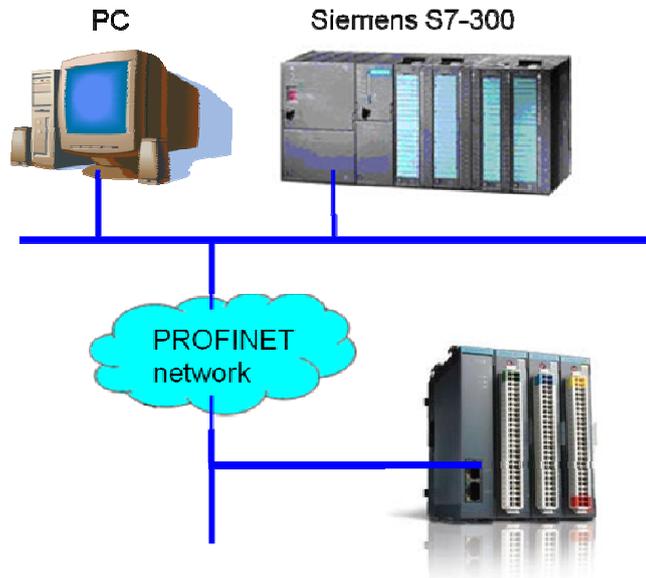


## 1.1 Hardware System Diagram

APAX-5071 coupler with APAX-5000 I/O modules will be controlled by any PROFINET master. Here, we use Siemens S7-300 PLC as example. The complete system includes APAX series, S7-300 PLC and a PC used to configure the setting of S7-300 PLC. The system hardware architecture can be shown as figure below.



*Note!!*

- 1. Do not use hub between the Ethernet/IP master and APAX-5072. Only Ethernet switch is acceptable.*
- 2. Quality of the network will influence the Ethernet/IP communication performance, so make the network as simple as possible.*

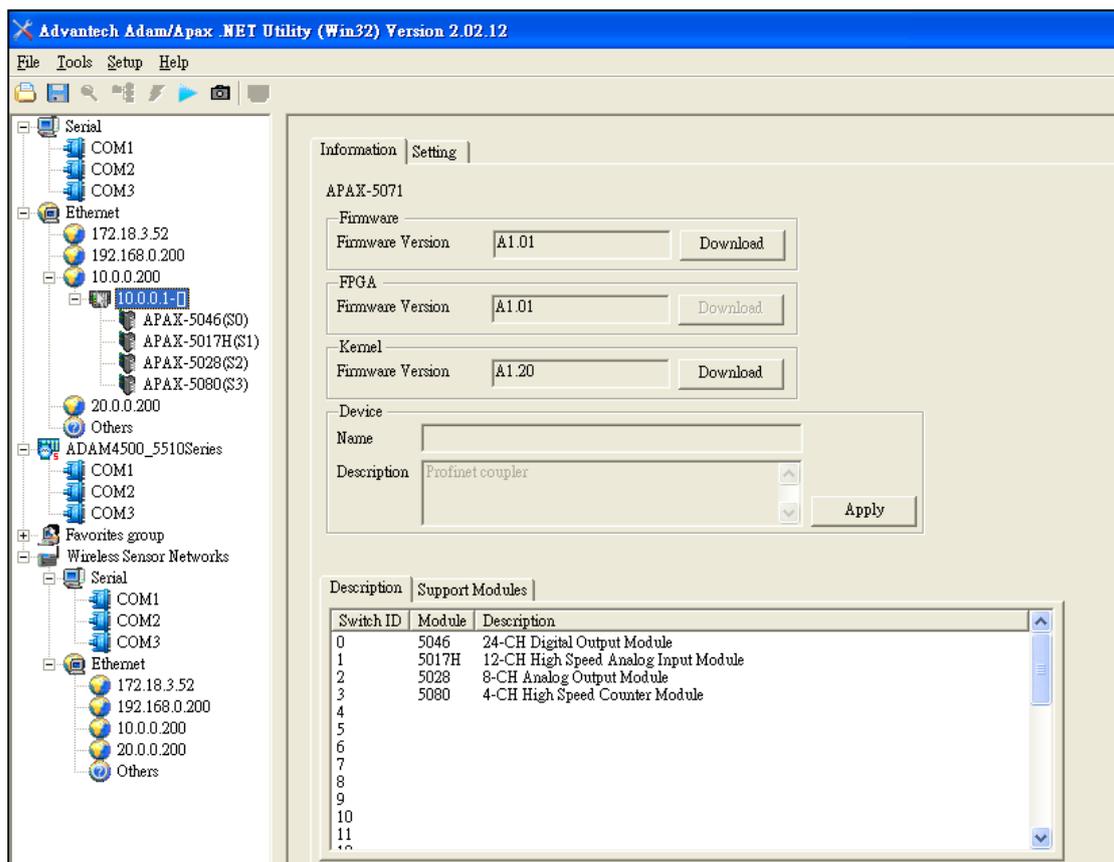
## 1.2 Installing the ADAM/APAX .NET Utility

Advantech provides the ADAM/APAX .NET utility which allows developers and end users to see APAX-5071 and connected I/O modules, perform configurations, and simple testing of the I/O. This software can be helpful when checking wiring inputs prior to installing the runtime project. It is also able to detect and test other Advantech supported hardware for this product such as Ethernet or Serial I/O. (ADAM-4000, ADAM-5000 and ADAM-6000 series). Therefore, you need to install ADAM/APAX .NET utility first to configure APAX-5071 and related APAX-5000 I/O modules. After that, you can use other software package which supports PROFINET protocol (such as Siemens S7-300 series) to perform write or read action to APAX-5072. The installation file is contained in the CD. When you launch the CD,

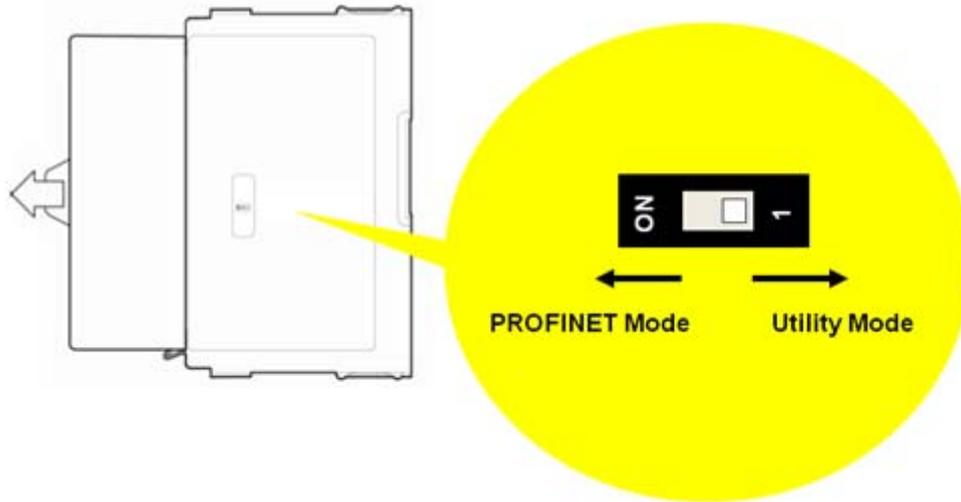
select the APAX Software button and click the ADAM/APAX .NET Utility button to find the installation file. Besides, you can link to the web site <http://www.advantech.com> and click into the **Download** area under the Support site to get the latest version of the ADAM/ APAX .NET utility.

### 1.3 Configuring APAX-5071 with ADAM/APAX .NET

Launch ADAM/APAX .NET utility by selecting **Start >> All Programs >> Advantech Automation >> AdamApax .NET Utility >> AdamApax .NET Utility**. On the left side of the utility window, you can see several items showing IP address under the **Ethernet** item. (These items represent the Ethernet port on your computer). Click on the item standing for the IP address of the LAN port which you use it to connect with APAX-5071 module, and then click the icon **Search Modules** on the toolbar. (Or you can right click the item and select **Search** option.) Then you should be able to see a new item appearing, showing the APAX-5071 IP address. Click that item (showing APAX-5071 IP address). All the connected APAX-5000 I/O modules will show, as figure below.



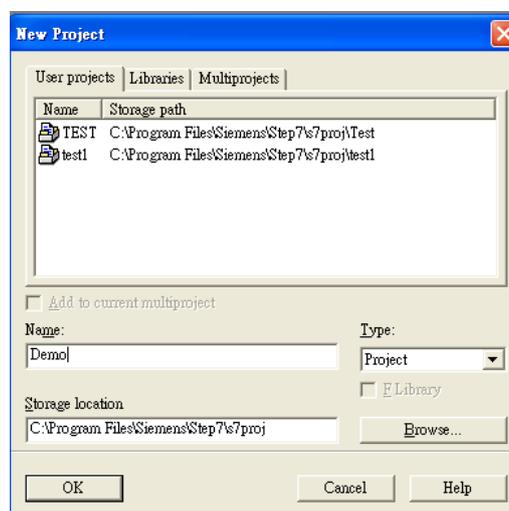
*Note! Before you start search the APAX-5071 module in utility, remember to change that APAX-5072 module's mode to Utility mode.*



On the right window, you can perform all related configurations toward APAX-5071 through the three tabs: **Information**, and **Setting**. You can upgrade related firmware to selected APAX-5071 coupler on the **Information** tab. Click the I/O modules items, then you can configure or read/write specific I/O modules.

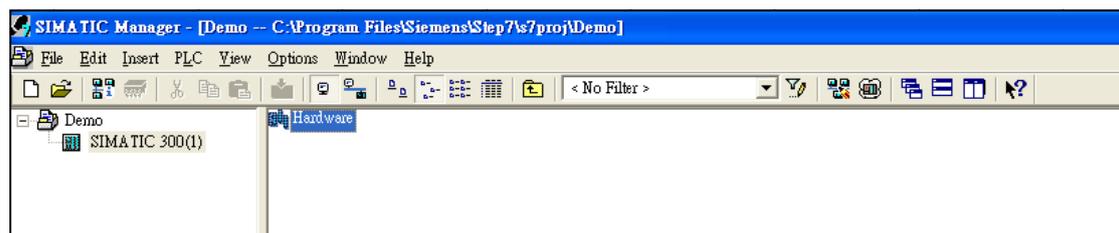
## 1.4 Configure & Access Data in PROFINET Master

Here, Siemens S7-300 CPU 315-2 PN/DP PLC is used as PROFINET master, to connect with APAX-5071 and APAX-5000 I/O modules. So we need to use Siemens STEP 7 software to configure the connection between S7-300 PLC and APAX-5071. First, launch Siemens STEP 7 software, create a new project as figure below.

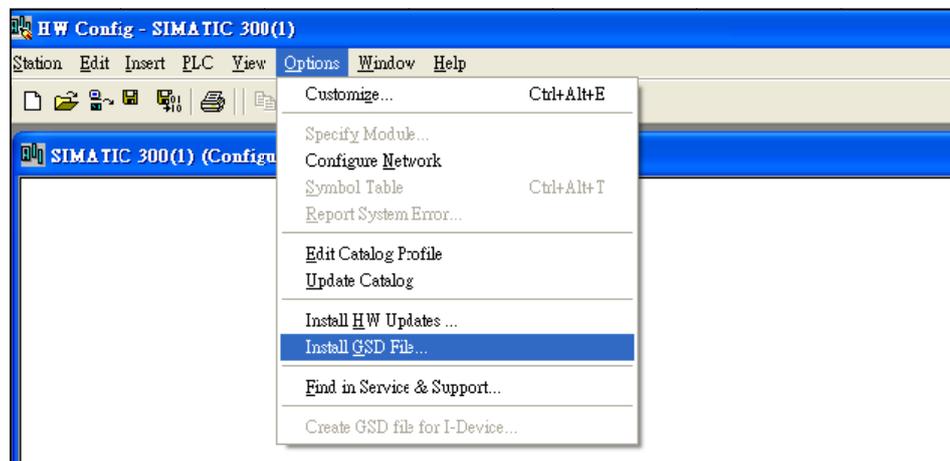


Note: Remember to change that APAX-5072 module's mode to PROFINET mode for PROFINET connection.

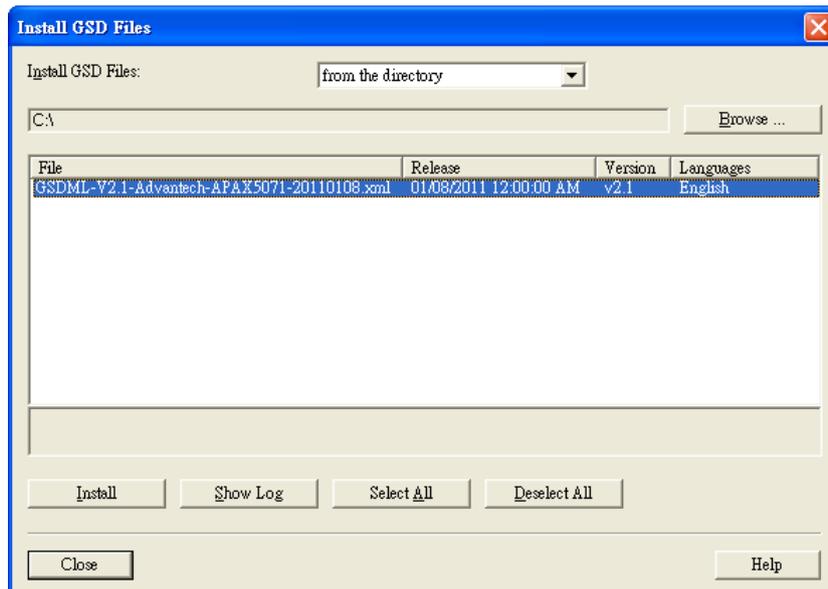
Right Click the project item and select **Insert New Object >> SIMATIC 300 Series** to create the object representing the Siemens S7-300 PLC.



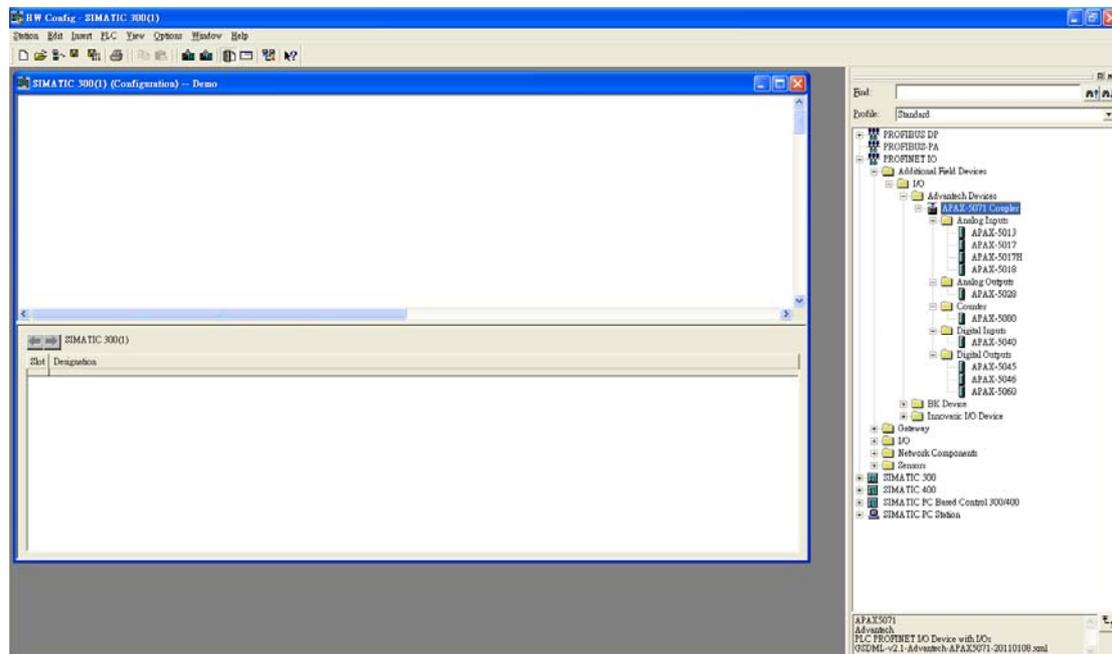
Double click the **Hardware** item on the right window. One new **HW Config** window will pop-up. Select **Install GSD File** on the **Options** menu to import GSDML file offered by Advantech, importing APAX-5071 and I/O modules' configuration into STEP 7 software.



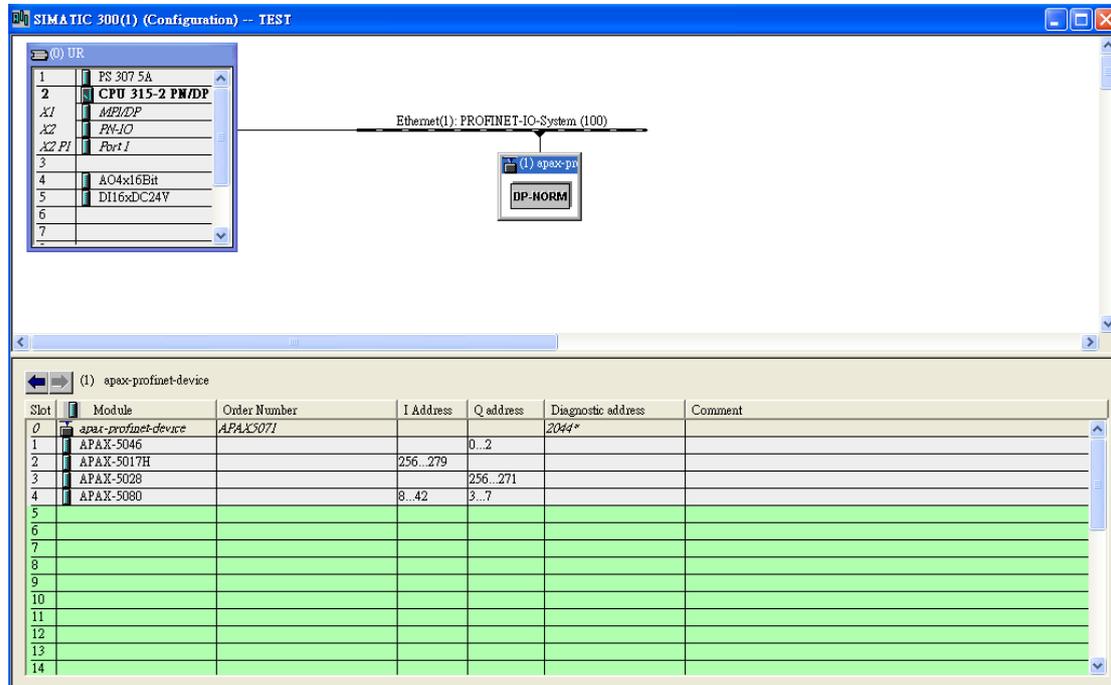
Click the **Browser** button and choose the GSDML file in your computer. After that file is shown on the window, click the **Close** button.



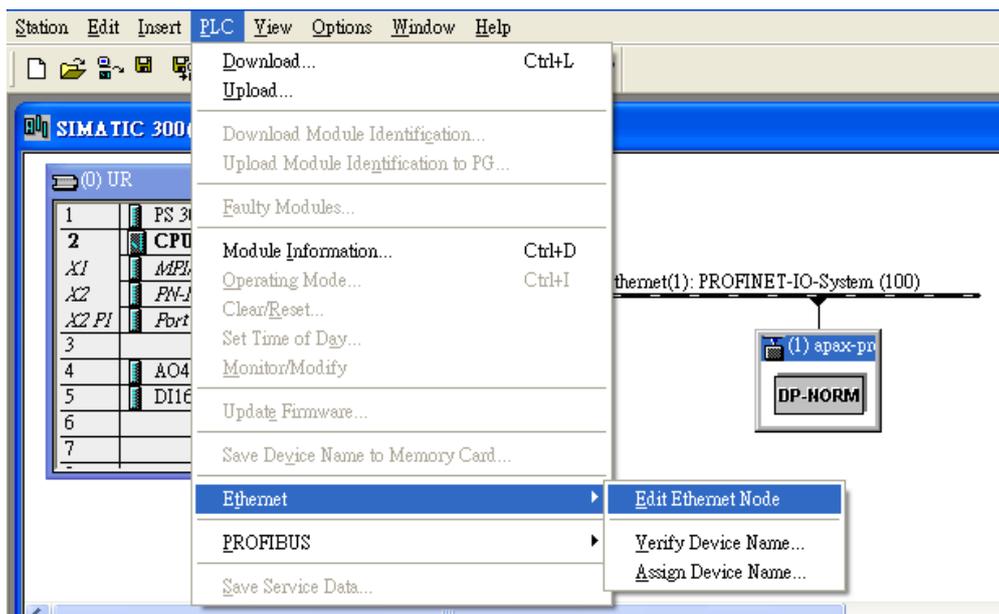
You can see APAX-5071 and APAX-5000 I/O modules showing on the right side window now, as shown by figure below.



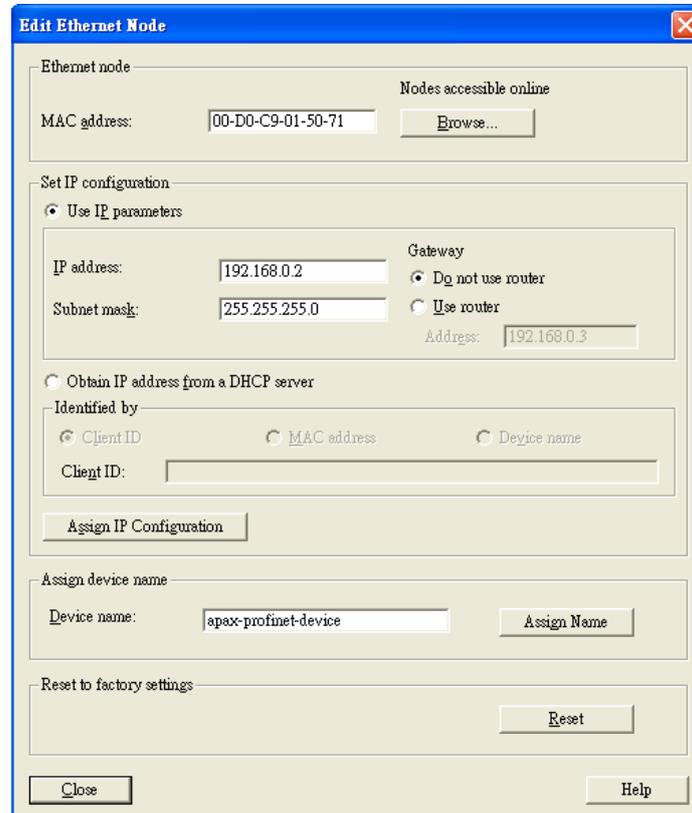
You can drag the component you want to the left window for programming usage. First, a PROFINET bus needs to be established. Then, APAX-5071 component needs to be dragged to attach on the PROFINET bus on the upper left window. After that, APAX-5000 I/O components can be dragged to selected “slot” row on the lower left window.



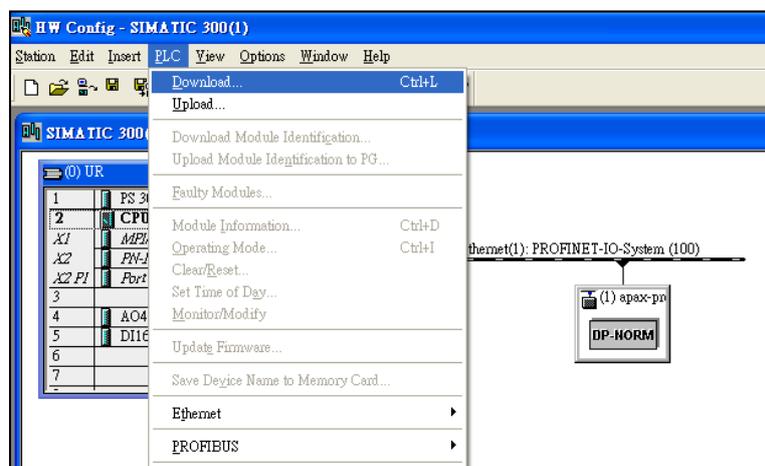
When you complete your program, you need to configure networking setting for APAX-5071. Select **Ethernet >> Edit Ethernet Node** on the **PLC** menu.



A **Edit Ethernet Node** window will pop-up. Ethernet node means APAX-5071 coupler module. You can type the correct MAC address into the MAC address text box or select it by clicking the **Browser** button. You also need to type the correct IP address of APAX-5071 on the **IP address** text box in the **Set IP configuration** area. After the configuration is done, click the **Close** button.



After the configuration is done, you can download your program to the Siemens S7-300 PLC by selecting **Download** item on the **PLC** menu. If all configurations are correct, you should be able to see the NETWORK LED on APAX-5071 flash with green color, and it means the AR connection is built.



## Appendix: Error Handling and Diagnostics

There are four LED for diagnostics on the front panel of APAX-5071. Below are the meanings for the 4 LEDs.

LED	Color	Status	Definition
PWR	Green	Stable	APAX-5071 is power-on.
	Dark	-	APAX-5071 is power-off or broken.
RUN	Green	Flash	Utility mode
	Orange	Flash	PROFINET mode
NETWORK	Green	Flash	AR connection is okay.
	Orange	Flash	AR connection is not ready.
I/O	Green	Stable	APAX I/O modules are normal.
	Orange	Stable	I/O Error
	Dark	-	No I/O are detected