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sigmaline nanoPAC nP4.0 User Manual

User Manual

M.U.

Code: ISTR_U_nP4_E_02_--



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Appendix B

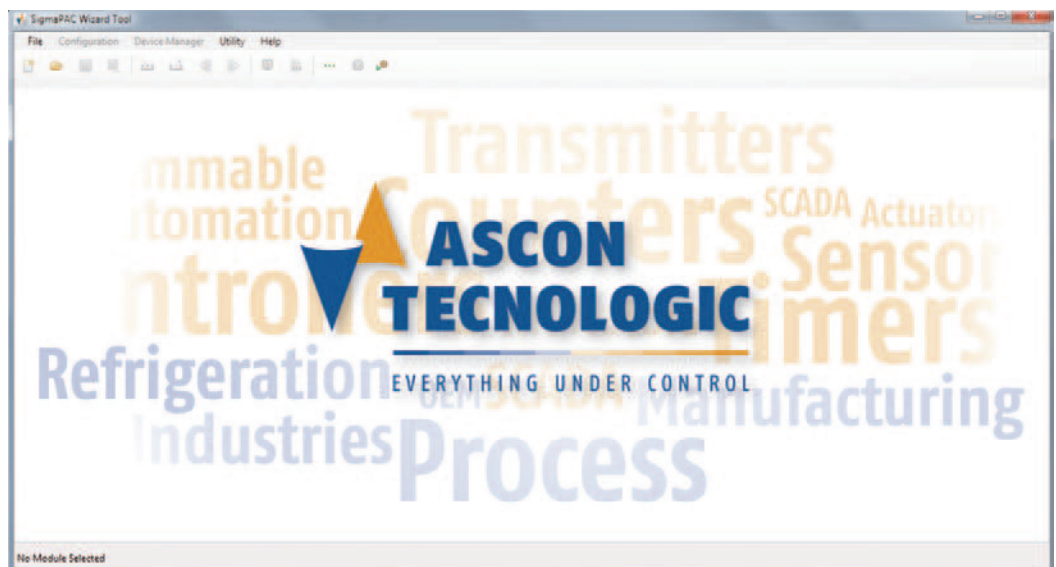
AT SigmaPAC Wizard Tool

The SigmaPAC Wizard Tool is an application especially designed to perform the offline hardware configuration of any Ascon Tecnologic's programmable CPUs. Through the same application it is possible to perform some remote commands, manage the diagnostic error tag list, the upload/download of the projects, configuration and/or retentive variables files.

B-1 User Interface

B-1-1 Main Screen

Once the software has been run, the following main screen is displayed.



B-1-2 Program commands





The commands to control the program are grouped in the higher part of the page. They are grouped in drop down menus, but are also displayed in graphical icon form.

File menu

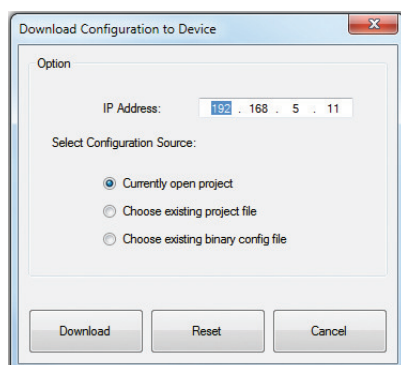
Menu entry	Icon	Description
New project		Allows to create a new Configuration project
Open		Allow to open an already saved project (note)
Save		Allow to save the current project (note)
Save as		Allow to save the actual project with a desired name (note)
Exit		Exits the AT Wizard

Note: The Configuration file is saved in a proprietary format:
*.swp = sigmaPAC Wizard Project.



B-1-3 Configuration

Menu entry	Icon	Description
Import Bin (1)		Allow to select/import an already saved CPU binary format Configuration file
Export Bin (1)		Allow to save the current CPU Configuration file in the binary format
Upload Configuration from device		Loads the Configuration from the CPU connected to the PC (requires the IP address)
Download Configuration from device (2)		Tranfers the actual Project to a connected CPU (requires the IP address)

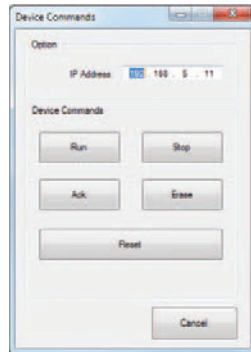
- Notes:**
1. The Configuration files in binary format (*.bin) are typically used to load the Configuration data into a CPU from a memory stick. The binary format is compatible with all the Ascon Technologic CPUs.
 2. The file selection is made through a specific page.



B-1-4 Device manager

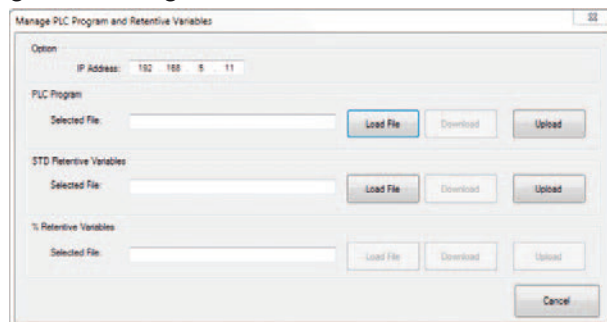
Menu entry	Icon	Description
Device Commands (1)		Shows a panel from where the user can Start or Stop the CPU, Acknowledge the alarms, Erase the program file or Reset the CPU (Power cycle)
PLC Program - Retentive Vars (2)		Shows a popup that allows to manage (upload or download) the program and the retentive data present in the CPU

Notes: 1.



If needed, the selection of the “*Erase PLC program*” command will delete the PLC program from the media selected location: the overall time needed to perform the operation depends by the project size. Please wait until the “*Persistence setup menu*” screen reappears as confirmation for complete PLC program erasing.

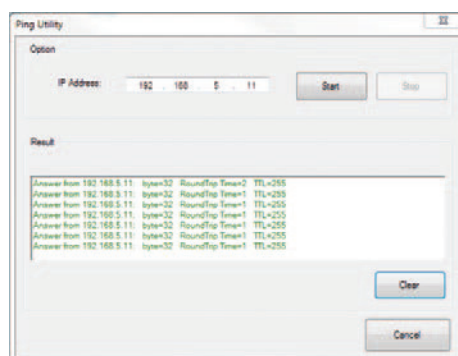
2.



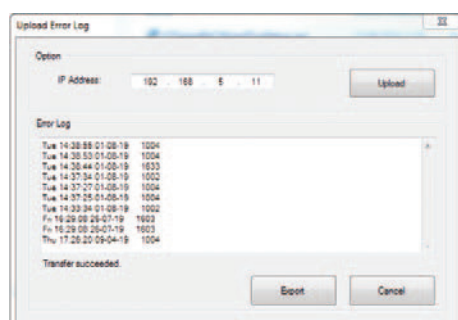
B-1-5 Utility

Menu entry	Icon	Description
TCP Ping Utility	■ ■ ■	Shows a popup (1) from where can be verified the CPU connection through the Ping utility
Upload Error Log	✖	Shows a popup (2) which allows to upload the Error Log information from the connected CPU
Run External Tool (3)	⚙	Runs a utility which allows to configure the xP4 expansion modules

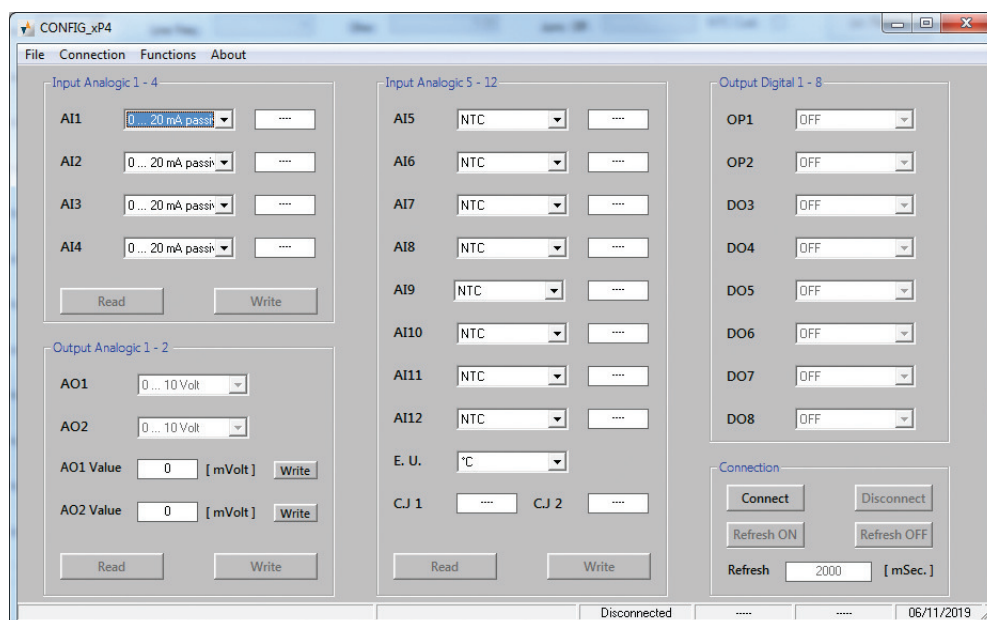
Notes: 1.



2.



3.



B-2 How to perform the CPU Setup

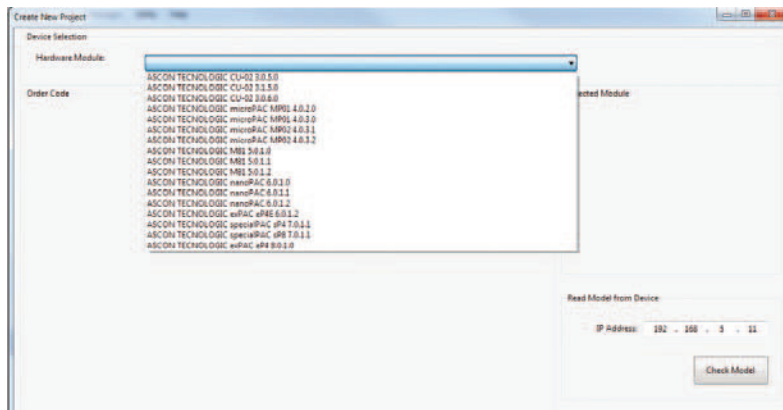
To be able to establish the connection with the CPU, it is necessary to:

- Correctly install the AT Wizard Tool on a PC specifying that the usage is for “Everyone” (in order to obtain the Administrator’s privileges);
- Know the IP address of the CPU to connect with;
- Properly connect and configure your PC in the same Ethernet subnet (Factory default CPU IP address: 192.168.5.xxx);
- Have PC full Administrator privileges;
- Allow the application to run through the Windows Firewall.

B-2-1 Create a new Configuration project

On the main screen, click on the “New project” Icon (📁) to open the “Create New project” page.

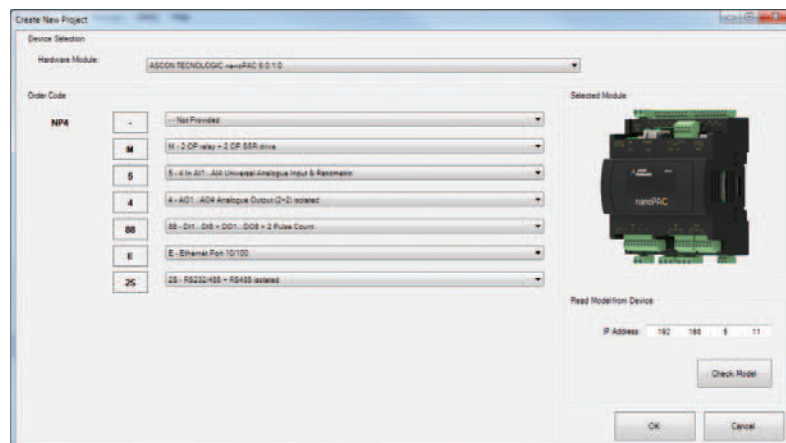
New
Configuration
project screen



The new configuration screen is a very important page, as helps the user in determining the Hardware configuration of the CPU. It can be used online or offline (in the case the CPU is momentarily not connected to the PC).

Online configuration

This is the easiest way to configure the software, as the CPU is connected to the PC and powered ON, click on the “Check Model” button. The Wizard asks to the CPU the order code info and reports them on the screen.



Click on the **OK** button, the Wizard is ready to operate.

Offline configuration

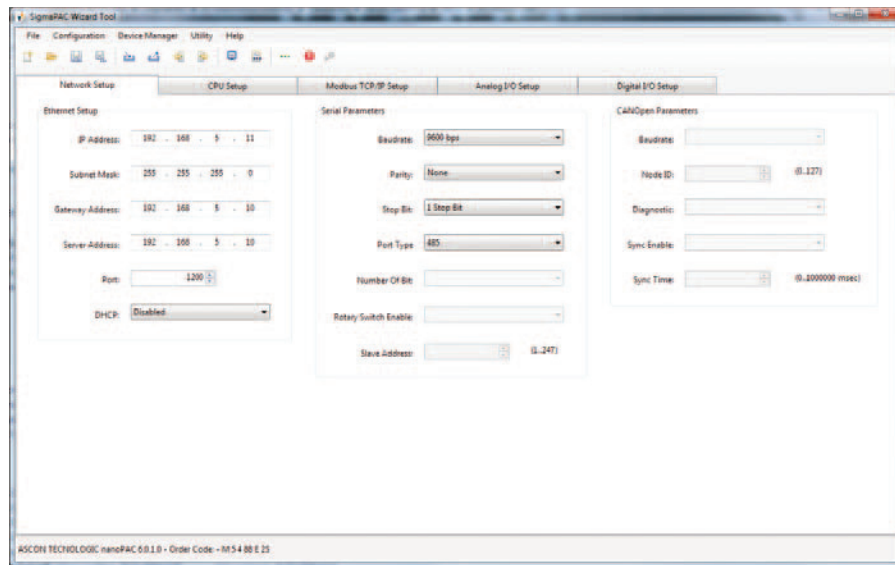
When a CPU is not connected to the PC, the configuration is a little more complex.

- First of all, the user must retrieve the CPU order code available from the back-side plastic box label;
- From the scroll down menu “Device selection” > “Hardware Module”, select the correct CPU model (Ascon Tecnologic NanoPAC X.X.X.X);

- Once the software has recognized the choice, complete the mask by selecting the specific codes to populate the order code form;
- Completed the list, click on the **OK** button to end the Wizard configuration session.

After the new configuration project has been created and completed, is time to setup the various options available within the CPU. This can be done from the menus displayed, after the CPU has been correctly recognized.

B-3 Network Setup



This page allows to configure the communication ports parameters.

B-3-1 Ethernet Setup Menu

Item	Description	Range	Factory Default
IP Address	CPU IP Address	0.0.0.0/ 255.255.255.255	192.168.5.11
Subnet Mask	CPU subnet mask	0.0.0.0/ 255.255.255.255	255.255.255.0
Gateway Address	Network Gateway Address	0.0.0.0/ 255.255.255.255	192.168.5.10
DNS Server Address	DNS Server Address	0.0.0.0/ 255.255.255.255	192.168.5.10
Port	OpenPCS Port	0... 65535	1200
DHCP	DHCP Protocol Status	Disable/Enable	Disabled

B-3-2 Serial Setup Menu

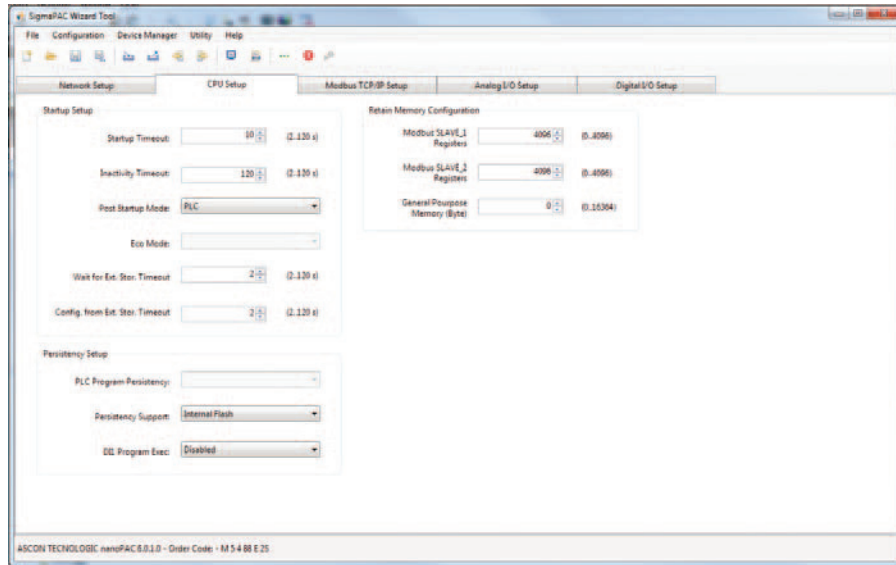
Item	Description	Range	Factory Default
Type	COM1 type	0/1 [RS485/RS232]	RS485
Baudrate	COM1 baudrate	0... 6 [2400... 57600]	9600
Parity	COM1 parity	0... 2 [None/Even/Odd]	None
Stop bit	COM1 stop bit	1/2	1

Note: The COM2 port can be configured from the OpenPCS ambient **ONLY**.

B-3-3 CanOpen Menu

The CanOpen port is **not present** on the nP4 CPU. All the field are greyed because **not active**.

B-4 CPU Setup



B-4-1 Startup Setup Menu

Item	Description	Range	Factory Default
Startup Timeout	Timeframe window to enter the startup session	2... 120 (s)	10
Inactivity Timeout	Inactivity Timeout (please see 3-1-3 for details)	2... 120 (s)	120
Post Startup Run	Operation phase to be executed after the startup session	PLC/I/O Watch	PLC
DO used for watchdog	Enabling DO16 for watchdog management	Disabled/Enabled	Disabled

B-4-2 Persistency Setup Menu

Item	Description	Range	Factory Default
Erase PLC Program	Command to erase the PLC program from flash memory	-	-
PLC Program Persistency	Function to save PLC program into flash memory	Disabled/Enabled	Enabled
Persistency Support	Media where to save copy of the PLC program	Internal Flash/USB key	Internal Flash
DI Control Program Exec	Reserves D01 for PLC program RUN/STOP function	Disabled/Enabled	Disabled

The CPU can save the PLC program into different persistent memory supports. Each time a program download is executed, the CPU makes a permanent copy of it into the configured desired media for the next future executions.

11-5-1 Retain Config

Item	Description	Range	Factory Default	Time to retain
MB Slave 1 Split register	Amount of Slave 1 Modbus agent retained registers	0... 4096	4096	10 ms
MB Slave 2 Split register	Amount of Slave 2 Modbus agent retained registers	0... 4096	4096	10 ms
Simple Split byte	Amount of generic memory retained bytes	0... 16384	0	15 ms

Standard and Retentive memory The IEC 1131 programming tool allows to declare retentive variables using specific files and syntax. These variables are handled by a 32 kB size of “*non volatile memory*” (for security reasons, the memory is duplicated for redundancy and re-freshed during runtime operations). Differently, it is possible to declare variables up to 32 kB in the % marker memory area (8192 Bytes for each Modbus slave agent).

In particular, the range available as retentive is:

Modbus Slave 1: %MW1128.0... %MW9320.0 (8192)

Modbus Slave 2: %MW10128.0... %MW18320.0 (8192)

Marker Area: %MB22000.0... %MB38384.0 (16384)

From the CPU setup session, by dedicated entries, it is possible to define the amount of registers/Bytes to be retained.

Note: The process which saves the retentive variables operates in parallel with the PLC application: for this reason the cycle time of the whole project will be effected/delayed ONLY!

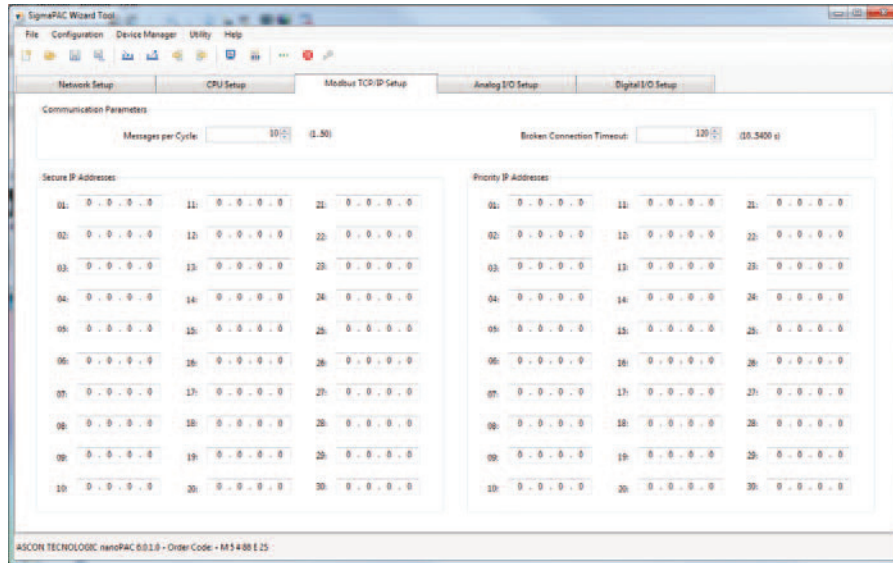
- In case of “*Cold start*” command, the standard retentive variables will be reset or preset to the initialization value whereas the % retentive variables will be reset. In case of retain file corruption error, both the two memory areas are separately reset or initialized.
- In case of “*Warm Start*” command, if the PLC program has not been modified, both the standard and % retentive variables will remain to last previous values. In case of retain file corruption, the % retentive variables will be reset.
- In case of “*Hot start*” command, both the standard and % retentive variables will be unaffected.

It is possible to upload/download the whole retentive memory areas, standard and % variables (using a TFTP session). It is possible to perform this operation ONLY in the timeframe window available during the CPU boot-up phase, before the Device Configuration timeframe session. On how to perform the upload or download the specific retentive memory files, please refer to the:

“*Device command*” (page 159) or “*sigmaline nanoPAC nP4.0 User Manual*” at paragraph: “*Chapter 9 - CPU Configuration Software (TFTP File Access)*”.

Note: The CPUs User Manuals can be freely downloaded from the Ascon Tecnologic Internet site.

B-5 Modbus TCP/IP Setup



Item	Description	Range	Factory Default
Messages per Cycle	Max. number of processed messages per cycle	1... 50	10
Broken Connection Timeout	Inactivity Timeout of a TCP/IP connection	10... 5400 (s)	120
Secure Address Setup	Secure IP Address Setup Menu	-	-
Priority Address Setup	Priority IP Address Setup Menu	-	-

To verify the connection status after a long period of inactivity, is used the TCP/IP “keep alive” protocol. The protocol performs the following sequential steps:

1. At each received message the timeout is reset;
2. If timeout expires, a “test” message is sent in order to verify if the connection is still active;
3. If an answer to the “test” is received, then the timeout is reset;
4. In case of no answer, the “test” will be sent again three times, every 10 s;
5. If even after the fourth “test” nothing has been received, the connection will be closed.

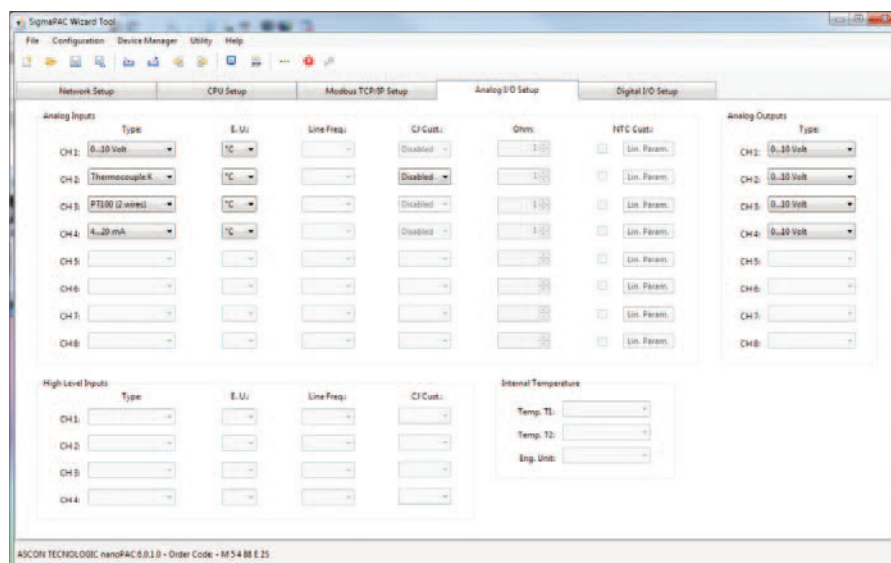
B-5-1 Modbus TC/IP Secure Addresses Table Menu

If the security function will be enabled (please see the “Ascon Technologic Firmware Function Block Library” [3]), the list of addresses present in this menu will indicate the external Modbus TCP/IP Clients allowed to access the CPU Modbus TCP/IP server. To add a new address, enter the new one in the first free position of the list. To delete an address, simply enter the number 0 (zero) in the location to be removed.

B-5-2 Modbus TC/IP Priority Addresses Table Menu

The rules to insert a desired value is the same just described above for the “Secure address table”. The addresses specified in the “Priority connection table” are managed in a very particular dedicated way because the Modbus TCP/IP server agent can sustain up to 10 TCP client simultaneous connections at the same time. So, when a new connection request is made, and all 10 available connections are already used, the system will close one of the active connections to satisfy the new request. Addresses not belonging to the “Priority connection table” will be closed as first, followed by those which have been inactive longest.

B-6 Local Analogue I/O Setup Menu



B-6-1 Setting the AI Channels

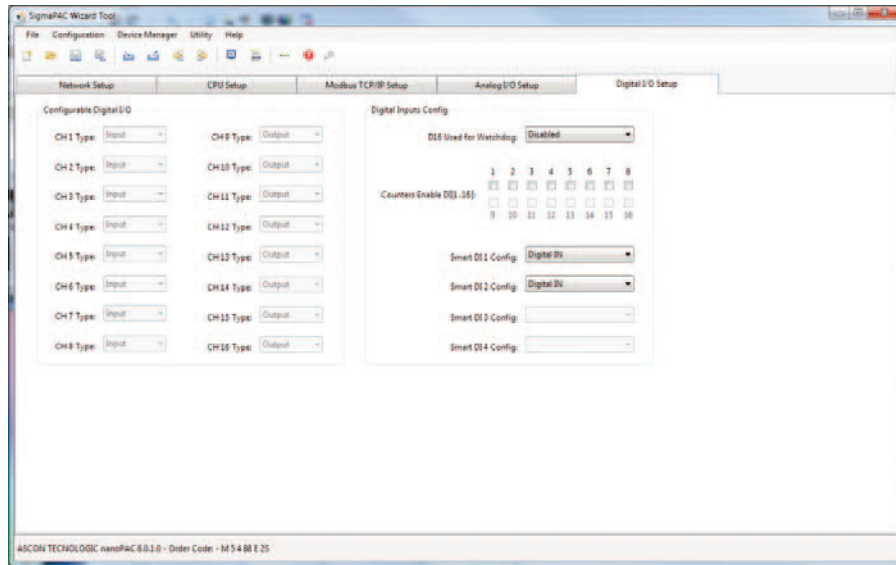
Note: The corresponding configuration choices for all the 4 analogue input channels is as described in the following table.

Analogue Input Type and Range	
Type	Range
0... 5 Volt	0.0... 5.5 V
1... 5 Volt	0.6... 5.4 V
0... 10 Volt	0.0... 11.0 V
0... 20 mA	0.0... 22.0 mA
4... 20 mA	2.4... 21.6 mA
Thermocouple J	-245.25... +1235.5°C
Thermocouple K	-249.3... +1411.3°C
Thermocouple L	-220.0... +620.00°C
Thermocouple N	-32.5... +1332.5°C
Thermocouple R	-40.0... +1640.0°C
Thermocouple S	-44.0... +1804.0°C
Thermocouple T	-215.0... +415.0°C
PT100 (2 wires)	-232.3... +882.7°C
PT1000	-232.3... +882.7°C
Potentiometer	0... 1000000 Ω
NTC SEMITEC 103AT-2	-56.5... +141.5°C
Ratiometric 5 V	0.0... 5.5 V

B-6-2 Analogue Output Ch1 - Ch2 or Ch3 - Ch4 Menu

Analogue Output Types
0... 5 Volt
1... 5 Volt
0... 10 Volt
2... 10 Volt
0... 20 mA
4... 20 mA

B-6-3 Local Digital I/O Setup Menu



Note: The channels enabled in the “*Configurable Digital I/O*” part are automatically configured by the Wizard accordingly to the number of I/Os selected during the project creation. Note that the 16 digital I/O can freely be set only when the “**16 Configurable Digital Channels + 2 Pulse Count**” selection has been made.

B-6-4 Configuring the Digital I/Os type

I/O Channel	Digital Input/Output Types	
	Default value	Selectable values
Ch1 (D01)	Input	Input/Output
...
Ch16 (D16)	Input	Input/Output

Note: The Channels can freely be set only when the “**16 Configurable Digital Channels + 2 Pulse Count**” selection has been made.

B-6-5 Digital Input/Output Config

I/O channel	Default value	Selectable values
D01 Used for Watchdog (note)	Disabled	Disabled/Enabled
Counters Enable DI[01... 16]	No (no checkmark)	Yes (checkmark)
Smart DI1 Config	Digital I/O	Digital I/O or Pulse Counter
Smart DI2 Config	Digital I/O	Digital I/O/Pulse Counter

The channel used by the nP04 for the Watchdog is Channel D16 and must be set as “*Output*”.

