



# User Guide DAT11188PN

## **PROFINET IO SLAVE – 8 DIGITAL INPUTS AND 8 PNP OUTPUTS**

**GENERAL INFORMATION** 

Vendor Name: Datexel S.r.l. Vendor ID: 0x078B Device Name: DAT11188PN Device ID: 0x000B Product family: Datexel DAT11000 series Main Family: I/O

**Protocol implemented:** PROFINET IO **PN\_IO version:** v 2.44 **Requires Engineering Tool which supports at least GSDML version**: v 2.25

Supported RT Classes: RT CLASS 1 Conformance Class: B Netload Class : III

Address assignment: Profinet DCP

**I&M records supported**: 1,2,3,5

Additional protocols supported: SNMP, LLDP, MRP (as Client) Web Server supported: yes on Port 80 with HTTP protocol

Ethernet ports number: 2 Mautype: 16 (100BaseTXFD)

Number of slots: 3 Slot IDs: 0 (DAP),1 (Input Objects), 2 (Output Objects)

Cyclic data: Number of Input bytes: 32 Number of Output bytes: 4

Parameters Number of bytes: 6

Factory default state Station Name: "" (empty string – not name assigned) IP Address: 0.0.0.0 Subnet Mask: 0.0.0.0 Gateway Mask: 0.0.0.0

## **INPUT / OUTPUT DATA OBJECT STRUCTURE**

The Input / Output objects are represented in Unsigned Integer 16 bit format.

For Unsigned Integer 16 bit format, the values are composed of 2 bytes ordered as represented in the Structure 1 below.

The range of value is between 0 and 65535. If the value of a data is used to represent a number for which it is foreseen the sign (i.e. analogue input measure) it is necessary subtract 65536 from

the read value to obtain the true signed value. Refer to the description of the single object to know the number of decimal digits. Structure 1: Unsigned Integer 16 bit structure :

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Descr	MSB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	LSB
Byte		HB (1 byte)										LB (1	byte)			

 $\begin{array}{l} \mbox{Meaning:} \\ \mbox{MSB} \rightarrow \mbox{Most Significant Bit} \\ \mbox{LSB} \rightarrow \mbox{Least Significant Bit} \\ \mbox{HB} \rightarrow \mbox{High Byte} \\ \mbox{LB} \rightarrow \mbox{Low Byte} \end{array}$ 

## **DEVICE LEDs FUNCTION**

Front LEDs layout



## List of LEDs

LED name	LED state	Condition	Description
	Off	Device not powered	- No Power supply voltage applied to the device
PWR	Green	Device powered	- Power supply voltage applied to the device
	Green, blinking	Device in Watchdog	- Refer to Watchdog chapter
979	Off	Outputs correctly working	- Correct working
	Yellow, blinking	Short circuit alarm active	- Short circuit on output detected
	Off	Offline	- With PWR Off : device not power - With PWR Green: no connection with IOC
	Green	Online (RUN)	- Connection with IOC established - IO Controller in RUN state
	Green, 1 flash	Online (STOP)	- Connection with IOC established - IOC in STOP or IO data bad
NS	Green, blinking	Blink	Used by engineering tool to identify the node on the network
	Red	Fatal event	Major internal error (combined with MS led red)
	Red, 1 flash	Station Name error	Station Name not set
	Red, 2 flashes	IP address error	IP address not set
	Red, 3 flashes	Configuration error	- IP address conflict - Expected Identification differs from Real Identification
	Off	Not Initialized	- With PWR Off : device not power - With PWR Green : module is initializing
	Green	Normal operation	Correct working
MS	Green, 1 flash	Diagnostic Event	Diagnostic event present
	Red	Fatal event	Major internal error (combined with NS led red)
		Exception error	Device in exception
10	Off	Digital Input 0 OFF	State of Digital Input 0
	Red	Digital Input 0 ON	
11	Off	Digital Input 1 OFF	State of Digital Input 1
	Red	Digital Input 1 ON	
12	Off	Digital Input 2 OFF	State of Digital Input 2
	Red	Digital Input 2 ON	
13	Off	Digital Input 3 OFF	State of Digital Input 3
-	Red	Digital Input 3 ON	
14	Off	Digital Input 4 OFF	State of Digital Input 4
	Red	Digital Input 4 ON	
15	Off	Digital Input 5 OFF	State of Digital Input 5
	Red	Digital Input 5 ON	
16	Off	Digital Input 6 OFF	State of Digital Input 6
	Red	Digital Input 6 ON	
17	Off	Digital Input 7 OFF	State of Digital Input 7
	Red	Digital Input 7 ON	

LED name	LED state	Condition	Description
00	Off	Digital Output 0 OFF	State of Digital Output 0
00	Red	Digital Output 0 ON	
01	Off	Digital Output 1 OFF	State of Divided Output 1
01	Red	Digital Output 1 ON	
03	Off	Digital Output 2 OFF	State of Divided Output 2
02	Red	Digital Output 2 ON	
03	Off	Digital Output 3 OFF	Otata of Divital Output 2
03	Red	Digital Output 3 ON	
04	Off	Digital Output 4 OFF	State of Divided Output 4
04	Red	Digital Output 4 ON	
05	Off	Digital Output 5 OFF	State of Dividal Output 5
05	Red	Digital Output 5 ON	
00	Off	Digital Output 6 OFF	
06	Red	Digital Output 6 ON	State of Digital Output 6
07	Off	Digital Output 7 OFF	State of Dividal Output 7
07	Red	Digital Output 7 ON	

## DEVICE LEDs FUNCTION



## List of LEDs

LED name	LED state	Condition	Description
LED1	Off	Default	Not used; always in default state
	Off	Link not sensed on Port 1	- Ethernet not connected - Ethernet MAU Type different from 100 Mbps Full duplex
LED2	Green , blinking	Link / Act sensed on Port 1	Correct working
LED3	Off	Default	Not used; always in default state
LED4	Off	Link not sensed on Port 2	- Ethernet not connected - Ethernet MAU Type different from 100 Mbps Full duplex
	Green / Blinking	Link / Act sensed on Port 2	Correct working

#### NETWORK PARAMETERS ASSIGNMENT

The network parameters such as the Station Name, the IP Address, the Subnet Mask and the Gateway Mask are set using the Discovery and Basic Configuration Protocol (DCP), that is the protocol for PROFINET used for name and address resolution.

The data can be saved Temporally or Permanently.

If the data are saved Temporally they will be lost when the device is powered off. If the data are saved Permanently they will be kept when the device is powered off.

All of the data are set to factory default if a command of Reset takes place. For the description see the next chapter.

#### **RESET TYPES SUPPORTED**

A factory reset command from the network is done using the Discovery and Basic Configuration Protocol (DCP). The device supports the reset modes 2 and 8 described below. Behavior of the device:

#### Reset To Factory mode 2

IP Address = "0.0.0.0" Subnet Mask = "0.0.0.0" Gateway Address = "0.0.0.0" DNS1 = "0.0.0.0" DNS2 = "0.0.0.0" Host name = NULL Domain name = NULL Station Name = "" - SNMP MIB-II variables: • sysName = empty string • sysContact = empty string • sysLocation = empty string

- All PDev parameters set to default values.

#### Reset To Factory mode 8 and (legacy) FactoryReset

IP Address = "0.0.0.0" Subnet Mask = "0.0.0.0" Gateway Address = "0.0.0.0" DNS1 = "0.0.0.0" DNS2 = "0.0.0.0" Host name = NULL Domain name = NULL Station Name = "" - SNMP MIB-II variables: • sysName = empty string

- sysContact = empty string
- sysLocation = empty string
- All PDev parameters set to default values.
- I&M1-3 set to default values.

## PARAMETERS MAPPING

Byte Position	Description	Register Type/Format	Access
0 - 1	Bit 0 to 7 - Powerup value / Bit 8 to 15 Safe value	16-bit, Unsigned	WO
2 - 3	Debouncing Time as ms	16-bit, Unsigned	WO
4 - 5	Watchdog Time as sec	16-bit, Unsigned	WO

## CYCLIC INPUT DATA MAPPING

Byte Position	Description	Register Type/Format	Access
0 - 1	System Flags	16-bit, Unsigned	RO
2 - 3	Digital Outputs readback	16-bit, Unsigned	RO
4 - 5	Digital Inputs	16-bit, Unsigned	RO
6 - 7	Digital Input Rise Latch	16-bit, Unsigned	RO
8 - 9	Digital Input Fall Latch	16-bit, Unsigned	RO
10 - 11	Low part 32 bit Counter 0	16-bit, Unsigned	RO
12 - 13	High part 32 bit Counter 0	16-bit, Unsigned	RO
14 - 15	Low part 32 bit Counter 1	16-bit, Unsigned	RO
16 - 17	High part 32 bit Counter 1	16-bit, Unsigned	RO
18 - 19	Low part 32 bit Counter 2	16-bit, Unsigned	RO
20 - 21	High part 32 bit Counter 2	16-bit, Unsigned	RO
22 - 23	Low part 32 bit Counter 3	16-bit, Unsigned	RO
24 - 25	High part 32 bit Counter 3	16-bit, Unsigned	RO
26 - 27	Power up / Safe readback	16-bit, Unsigned	RO
28 - 29	Debouncing Time readback	16-bit, Unsigned	RO
30 - 31	Watchdog Timeout readback	16-bit, Unsigned	RO

## CYCLIC OUTPUT DATA MAPPING

Byte Position	Description	Register Type/Format	Access
0 - 1	Digital Outputs	16-bit, Unsigned	WO
2 - 3	Reset/Enable flags	16-bit, Unsigned	WO

### PARAMETERS

#### Definitions:

IOC = Controller IO;

AR = Application Relation: connection established between one or more IOC and the slave devices during the startup of a communication process.

It is possible to set the following parameters each time the IOC establishes an AR. Each parameter can be read back in the cyclic input data in order to check, if desired, the value of the parameters.

Parameter's bytes 0(L)/1(H) "Bit 0 to 7 - Powerup value / Bit 8 to 15 Safe value" - Values allowed from 0 up to 65535

Parameter's bytes 2(L)/3(H) : "Debouncing Time as ms" – Values allowed from 1 up to 255

Parameter's bytes 4(L)/5(H) : "Watchdog Time as sec" – Values allowed from 0 up to 255

#### PARAMETERS: POWER-UP / SAFE / WATCHDOG

The Power-Up (Bit 0÷7) condition sets the outputs of the device to a predefined value each time the device is powered-up.

The Safe (Bit 0÷15) condition sets the outputs of the device to a predefined value if the IOC has established an AR with the device performing a cyclic communication and the link state of the Ethernet is not sensed <u>on both</u> the ports for the time specified in the Parameter "Watchdog Time as sec" or if the IOC release the AR ,goes in debug and the link state of the Ethernet is not sensed <u>on both</u> the ports for the time specified in the Parameter "Watchdog Time as sec".

The value of the Power-up and Safe can be read cyclically in bytes 26/27 "Power up / Safe read back" of the Input Cyclic Data.

The value of the Power-up and Safe can be set in the Parameter "Bit 0 to 7 - Powerup value / Bit 8 to 15 Safe value". See table below for the association of bits to the digital outputs.

The Watchdog timer is disabled and doesn't work if the Parameter "Watchdog Time as sec" is set to 0 (default)

The Watchdog timer works if the Parameter "Watchdog Time as sec" is different from 0. The parameter is written each time the IOC establishes an AR with the device and it is expressed as seconds. The Watchdog bit will be set to 1 (see the description of "System Flags").

The value of the Watchdog time can be read cyclically in bytes 30/31 "Watchdog Timeout Read Back" of the Input Cyclic Data.

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Out #	Out 7	Out 6	Out 5	Out 4	Out 3	Out 2	Out 1	Out 0	Out 7	Out 6	Out 5	Out 4	Out 3	Out 2	Out 1	Out 0
Descr		Safe										Powe	er-Up			

#### PARAMETERS: DEBOUNCING TIME (MINIMUM DURATION PULSE)

The *Minimum Acceptable Pulse Duration* is set in this parameter so that the change of state or the counting of the counters is detected.

This function is applied to all of the digital inputs.

By setting this parameter, all pulses or spikes with a duration shorter than this value are *"filtered"/ ignored*. This allows, for example, to filter the spikes during the opening or closing of a mechanical contact (flow meters, litre counters, etc.) and therefore to get a *"clean"* counting in the pulse counter.

The value is expressed as milliseconds (ms).

The values must be between 1 and 254 ms.

The value 255 forces the minimum pulse duration to 50 ms.

The value of the Debouncing time can be read cyclically in bytes 28/29 "Debouncing Time readback" of the Input Cyclic Data.

EXAMPLE:

If the value written is 10, all pulses with duration shorter than 10 ms are filtered / ignored.

#### **CYCLIC INPUT DATA MAPPING**

#### SLOT ASSIGNMENT: USED IN SLOT 1 , FIXED IN SUB-SLOT 1

#### BYTES 0 – 1: SYSTEM FLAGS

This object allows to retrieve the system events of the device. The following parameters are implemented.

**Supervising Bits (bits 0,1,2)**: the combination of the values given by these 3 bits indicates the status of the device. Bit 0 = 0;Bit 1 = 1; Bit 2 = 0; status "WAIT PROCESS": the device is waiting for being supervised by an IOC Bit 0 = 1;Bit 1 = 1; Bit 2 = 0; status "IDLE" :the device has been supervised by an IOC but now the IOC is in STOP Bit 0 = 0;Bit 1 = 0; Bit 2 = 1; status "PROCESS ACTIVE" :the device is supervised by an IOC Bit 0 = 1;Bit 1 = 0; Bit 2 = 1; status "ERROR" :the device has detected an error condition Bit 0 = 1;Bit 1 = 1; Bit 2 = 1; status "EXCEPTION" :the device is in exception state

**Watchdog Event Enable (bit 8)**: this bit shows if the Watchdog event is disabled (0) or enabled (1). If enabled and the IOC has established an AR with the device performing a cyclic communication and the link state of the Ethernet is not sensed <u>on both</u> the ports for the time specified in the Parameter "Watchdog Time as sec" or if the IOC has realeased an AR and is in debug state and the link state of the Ethernet is not sensed <u>on both</u> the ports for the time specified in the Parameter "Watchdog Time as sec" or if the IOC has realeased an AR and is in debug state and the link state of the Ethernet is not sensed <u>on both</u> the ports for the time specified in the Parameter "Watchdog Time as sec", the PWR led flashes and the status of the outputs is automatically set as defined in the high byte of the "Bit 0 to 7 - Powerup value / Bit 8 to 15 Safe value" parameter. The "Watchdog Event Enable" bit resides in Eeprom therefore, in case of power failure, it maintains its status.

Watchdog Event (bit 9): if this bit is set to 1 indicates that the Watchdog condition has occurred (0 = Normal condition; 1 = alarm condition)

When the Watchdog event has occurred, this bit can be reset setting to 1 the bit 9 of the object "Reset/Enable Flags" of the Cyclic Output Data

**Power-Up Event (bit 10)**: this bit is forced to 1 at each power on and indicates that the device has been switched off. With the setting of this bit to 0 and checking its state, it is possible to monitor if an unexpected power-off of the device has occurred (0 = power-off not occurred; 1 = power-off occurred).

This bit can be reset setting to 1 the bit 10 of the object "Reset/Enable Flags" of the Cyclic Output Data .

**Short circuit Event (bit 12)**: the device is equipped with a sensor to detected short-circuits (protection against the over-currents) on digital outputs. In case of short-circuit on output, this bit is forced to 1. If this alarm is active the device must be reset and the connections checked (0 = over-currents protection not activated ; 1 = over-currents protection activated).

This bit can be reset setting to 1 the bit 12 of the object "Reset/Enable Flags" of the Cyclic Output Data .

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Descr									Wato Wato Powe Shor	chdog Eve chdog Eve er-up Eve t circuit E	ent Enable ent ent vent	e Su Bit	ipervising ts			

#### BYTES 2 – 3: DIGITAL OUTPUTS READ BACK

This object allows to monitor the state of the output relays driven in the object "Digital Outputs" of the Cyclic Output Data (0 = OFF ; 1 = ON).

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Out #	-	-	-	-	-	-	-	-	Out 7	Out 6	Out 5	Out 4	Out 3	Out 2	Out 1	Out 0

#### BYTES 4 – 5: DIGITAL INPUTS

This object shows the condition of the digital inputs (0 = OFF; 1 = ON).

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
In #	-	-	-	-	-	-	-	-	In 7	In 6	In 5	In 4	In 3	In 2	In 1	In 0

#### BYTES 6 - 7: DIGITAL INPUTS RISE LATCH

The bits of this object are used to indicate that an event of change of logic state of digital input from 0 to 1 (rise latch) has occurred. The latch event shows for each digital input the single change of state and is not updated by the system. It is possible to reset the whole object setting to 1 the bit 4 of "Reset/Enable Flags" of the Cyclic Output Data.

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Latch	-	-	-	-	-	-	-	-	In 7	In 6	In 5	In 4	In 3	In 2	In 1	In 0

#### BYTES 8 - 9: DIGITAL INPUTS FALL LATCH

The bits of this object are used to indicate that an event of change of logic state of digital input from 1 to 0 (fall latch) has occurred. The latch event shows for each digital input the single change of state and is not updated by the system. It is possible to reset the whole object setting to 1 the bit 5 of "Reset/Enable Flags" of the Cyclic Output Data.

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Latch	-	-	-	-	-	-	-	-	In 7	In 6	In 5	In 4	In 3	In 2	In 1	In 0

#### BYTES 10 - 11 (LOW) / BYTES 12 - 13: 32 BIT COUNTER DIGITAL INPUT 0

These four bytes contains the measure of the digital counter related to the input channel 0. The value is incremented at each change of state from 0 to 1 of the input channel 0. The type of data created is an *Unsigned Long 32 bit*. It is possible to reset the value of the counter setting to 1 the bit 0 of the object "Reset/Enable Flags" of the Cyclic Output Data.

<u>Note:</u> The counter is <u>not</u> retentive. When the device is switched off, the value contained in these bytes is lost.

#### BYTES 14 – 15 (LOW) / BYTES 16 – 17: 32 BIT COUNTER DIGITAL INPUT 1

These four bytes contains the measure of the digital counter related to the input channel 1. The value is incremented at each change of state from 0 to 1 of the input channel 1. The type of data created is an *Unsigned Long 32 bit*. It is possible to reset the value of the counter setting to 1 the bit 1 of the object "Reset/Enable Flags" of the Cyclic Output Data.

Note: The counter is not retentive. When the device is switched off, the value contained in these bytes is lost.

## BYTES 18 - 19 (LOW) / BYTES 20 - 21: 32 BIT COUNTER DIGITAL INPUT 2

These four bytes contains the measure of the digital counter related to the input channel 2. The value is incremented at each change of state from 0 to 1 of the input channel 2. The type of data created is an *Unsigned Long 32 bit*. It is possible to reset the value of the counter setting to 1 the bit 2 of the object "Reset/Enable Flags" of the Cyclic Output Data. **Note:** The counter is **not** retentive. When the device is switched off, the value contained in these bytes is lost.

#### BYTES 22 - 23 (LOW) / BYTES 24 - 25: 32 BIT COUNTER DIGITAL INPUT 3

These four bytes contains the measure of the digital counter related to the input channel 3. The value is incremented at each change of state from 0 to 1 of the input channel 3. The type of data created is an *Unsigned Long 32 bit*.

It is possible to reset the value of the counter setting to 1 the bit 3 of the object "Reset/Enable Flags" of the Cyclic Output Data. **Note:** The counter is **not** retentive. When the device is switched off, the value contained in these bytes is lost.

#### BYTES 26 - 27: POWER-UP / SAFE READ BACK

This object allows to read the value set in Parameter "Bit 0 to 7 - Power-Up value / Bit 8 to 15 Safe value" (0 = bit not enabled; 1 = bit enabled).

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Out #	Out 7	Out 6	Out 5	Out 4	Out 3	Out 2	Out 1	Out 0	Out 7	Out 6	Out 5	Out 4	Out 3	Out 2	Out 1	Out 0
Descr		Safe									Powe	er-Up				

#### BYTES 28 – 29: DEBOUNCING TIME READ BACK

This object allows to read the value set in Parameter "Digital Input Debouncing Time as milliseconds"

#### BYTES 30 - 31: WATCHDOG TIMEOUT READ BACK

This object allows to read the value set in Parameter ""Watchdog Time as sec""

### **CYCLIC OUTPUT DATA MAPPING**

## SLOT ASSIGNMENT: USED IN SLOT 2 , FIXED IN SUB-SLOT 1

#### **BYTES 0 – 1: DIGITAL OUTPUTS**

This object allows to drive the state of the output relays (0 = OFF; 1 = ON).

The value of this object can be read cyclically in bytes 2/3 "Digital Outputs Read Back" of the Input Cyclic Data

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Out #	-	-	-	-	-	-	-	-	Out 7	Out 6	Out 5	Out_ 4	Out 3	Out 2	Out 1	Out 0

#### BYTES 2 - 3: RESET / ENABLE FLAGS

The set to 1 of the bits of this object allow to do the following system operations:

- Reset counter digital input 0 (Bit 0): the value of 32 bit Counter Digital Input 0 (Cyclic Input bytes 10 - 11 - 12 - 13) will be set to 0

- Reset counter digital input 1 (Bit 1): the value of 32 bit Counter Digital Input 1 (Cyclic Input bytes 14 - 15 - 16 - 17) will be set to 0

- Reset counter digital input 2 (Bit 2): the value of 32 bit Counter Digital Input 2 (Cyclic Input bytes 18 - 19 - 20 - 21) will be set to 0

- Reset counter digital input 3 (Bit 3): the value of 32 bit Counter Digital Input 3 (Cyclic Input bytes 22 - 23 - 24 - 25) will be set to 0 - Reset Rise Latch object (Bit 4): the value of Digital Input Rise Latch (Cyclic Input bytes 6 - 7) will be set to 0

- Reset Fall Latch object (Bit 5): the value of Digital Input Fall Latch (Cyclic Input bytes 8 - 9) will be set to 0

- Reset Watchdog event bit (Bit 9): the value of Watchdog Event in System Flags (bit 9 Cyclic Input bytes 0 - 1) will be set to 0

- Reset Power-Up bit (Bit 10): the value of Power-Up Event in System Flags (bit 9 Cyclic Input bytes 0 - 1) will be set to 0

- Reset Short circuit alarm bit (Bit 12): the value of Short circuit alarm Event in System Flags (bit 12 Cyclic Input bytes 0 - 1) will be

set to 0

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Descr	Reset S Reset P Reset W	hort circu ower-Up /atchdog	uit bit bit event bit					Reset Fa Reset Ris Reset co Reset co Reset co Reset co	II Latch ol se Latch c unter digit unter digit unter digit unter digit	bject bbject tal input 3 tal input 2 tal input 1 tal input 0						

#### **IMPORTING THE DEVICE IN TIA PORTAL**

The following example has the purpose to show how to insert the GSDML file of the device in SIEMENS TIA PORTAL. It has been done using SIEMENS TIA PORTAL V17 and a PLC S7-1200; the example includes the creation of a new project using ladder. Run TIA PORTAL and wait for the application to be executed.

Step 1: create a new project. Click Start (A)  $\rightarrow$  Create New Project (A1)  $\rightarrow$  Set the name and path of the project (A2)  $\rightarrow$  Click Create (A3)



#### Wait for the creation of the project. Click "Configure a device" (A4)

roject: "TEST	r_DAT11188PN" was (	opened suc	ccessfully. Please select the next st	ep:
→		\$ <sup>9</sup>	Configure a device	
→		٢	Write PLC program	A4
H		-	Configure technology objects	
H		Ń	Configure an HMI screen	
				1

#### Step 2: Add the PLC.

Be sure that the PLC has been powered on and connected to the network. Click Add new device (A5)  $\rightarrow$  Click Controllers (A6)  $\rightarrow$ Select the Controller from the menus (A7)







Follow the wizard to define the security settings editing them as required from the project. When the procedure is completed click "Finish" (A9)



The PLC is added to the project.

#### Step 3: Set PLC Network.

In the project tree click the branch of PLC (B) and after double click on "Device configuration" (B1) Double click on PLC in the Device view of the project (B2).



The properties section appears below the project window.

Click the frame "General" (B3)

Click the branch "PROFINET Interface [X1]" (B4)

Click the branch "Ethernet addresses" (B5)

Scroll the scroll bar on the right down until you reach the section "Internet protocol version 4 (IPv4)" (B6)

Set the value of the IP address (B7) and press Enter. In this example the IP address of PLC is set to 192.168.1.88

General IO tags Syste	m constants Texts
General B3	Add new subnet
▼ PROFINET interface [X1]	
General	Internet protocol version 4 (IPv4)
Ethernet addresses 🚤 📕 🛱	
Time synchronization	<ul> <li>Set IP address in the project</li> </ul>
Operating mode	IP address: 192 168 1 33
Advanced options	B7
Web server access	Subnet mask: 255 . 255 . 0
► DI 14/DQ 10	Use router
▶ AI 2	Router address: 0 , 0 , 0 , 0
High speed counters (HSC)	IP address is set directly at the device
Pulse generators (PTO/PWM)	
Startup V	PROFINET

#### Step 4: Import the GSD file of the device in the project

Download the GSDML file of the device from the website www.datexel.it to a folder in your PC. On the menu bar click "Options"  $\rightarrow$  "Manage general station description file (GSD)" (C)



The window that allow to import the GSDML file will be opened (next page)

## Click the button "..." (C1)

Select the path where the GSDML file has been downloaded

Manage genera	al station descripti	on files e project			×	
Source path:	C:\Program Files\Si	emens\Autom	ation\Portal V17	Bin		- C1
Content of in	ported path					
File		Version	Language	Status	Info	
<					>	
				Delete Install	Cancel	

In the folder selected there may be more than one GSDML file; in this case all of the files corresponding to GSDML extension in the folder will be listed. Select the file about the device from the list (C2) Click "Install" (C3)

Aanage general statio	n description 1	files			×
Installed GSDs	GSDs in the pr	oject			
Source path: C:\Use	rs\lab\Desktop\Pr	ofinet\Upgrade	GSDML_2.44	DAT11188PN	
Content of imported	path				
File		Version	Language	Status	Info
GSDML-V2.44-Datexe	ISrl-DAT11188	V2.44	English	Not yet installed	DAT1118
					C2
1					
				Delete	Cancal
				Delete	Cancel

The system will take some time to complete the installation of the GSDML file and add it to the "Hardware catalog".

<u>Step 5: Add the device to the project</u> In the Project tree double click on the branch "Devices and networks" (D).

Project tree	
Devices Plant objects	
1 Bin	
TEST_DAT11188PN	
🌁 Add new device	
🛱 Devices & networks 🔫	┞╴┏
▼ 1 [CPU 1214C DC/DC/DC]	- T
III Device configuration	
😨 Online & diagnostics	
🕨 🔙 Program blocks	
🕨 🙀 Technology objects	
External source files	
PLC tags	

On the right of the software window some side menus will appear.

Click on "Hardware Click "Other field de Click "PROFINET I Click "I/O" (D4) Click "Datexel S.r.I. Click "Datexel DAT Click "dat11188pn"	catalog" (D1) evices" (D2) O" (D3) " (D5) 11000 series" (D6) (D7) and drag and	dro	op it to	the project.
Hardware catalog	<b>a</b> 🗉 🕨			
Options				
		3		
At Catalan		Į.	⊢ D1	
✓ Catalog		are		
<pre>&lt;&gt;earcn&gt;</pre>		8		
Filter Profile: <all></all>	·	盲		
Controllers		ē		
HM     RC systems		_		
Drives & starters		6		
Network components		2		
Detecting & Monitoring	1	ine		
Distributed I/O		đ		
Power supply and distr	ibution	Se		
Field devices				
👻 🛅 Other field devices 🔫	- D2	<b>.</b>		
🕨 🕨 🕅 Additional Ethernet	devices	5		
PROFINET IO	D3	sks		
Drives	-			
Encoders				
Gateway		5		
▼ 10 < D4		bra		
▼ Datexel S.r.l.◄	- D5	ries		
▼ Datexel DA	111000 series <b>— D6</b>			
	supn	_		
		dd		
Sensors		5		
PROFIBUS DP		S		
PROFIBUS PA				

The device will be added to the project.

#### Step 6: Link the device to PLC and configure it.

In "Devices and networks" → "Network view" right click of the mouse on the device's symbol, label "Not assigned" (E). Click "Assign to new IO controller" (E1)





A window that let to select the controller will appear (next page)



Select the controller (E2).

Click OK (E3). The device will be linked to PLC and its network.





Double click on the device (E4), click the image of the device it appears (E4A).

The properties section appears below the project window. Click the frame "General" (E5)

Click the branch "PROFINET Interface [X1]" (E6)

Click the branch "Ethernet addresses" (E7)

Scroll the scroll bar on the right down until you reach the section "Internet protocol version 4 (IPv4)" (E8) Set the value of the IP address (E9) and press Enter. In this example the IP address of the device is set to 192.168.1.18 Doing this, the IP parameter will be assigned in the project.

dat11188pn [dat11188pn]	Roperties
General IO tags Syste	m constants Texts
General     E5	Add new subnet
▼ PROFINET interface [X1]	
General	Internet protocol version 4 (IPv4)
Ethernet addresses 🚤 🗖	
Advanced options	Set IP address in the project
Identification & Maintenance	IP address: 192 168 1 18
Module parameters	192 100 1 10 E9
	Subnet mask: 255 . 255 . 0
	Synchronize router settings with IO controller

To establish a connection in PROFINET it is mandatory to assign a specific Station Name to the device otherwise it will result in a communication error. Scroll the scroll bar on the right down until you reach the section "PROFINET" (E10).

PROFINET <b>E10</b>	E11
	Generate PROFINET device name automatically
PROFINET device name:	dat11188pn < E12
Converted name:	dat11188pn
Device number:	1

If the flag "Generate PROFINET device name automatically" (E11) is checked, the default Station Name in GSDML file will be assigned. In PROFINET there can't be different devices with the same Stations name. If the flag is unchecked, it is possible to assign the name manually (E12). When PROFINET device name is modified the software will update automatically the field "Converted Name".

After the name has been set, it is necessary to assign the name to the device.

Look for the devices connected.

In the tool bar click the icon for Accessible devices (E13)



Before to procee	ed be sure that th	e device has b	een powered or	and connec	ted to the net	work.	
Select the interfa	ace (E14) and ne	twork (E15)					
Click Start search	ch (E16)	()					
	···· (=···)						
	Accessible devices						×
			Type of the PG/PC inter	face: <mark>V</mark> _PN/IE			- E14
			PG/PC inter	face: Realtek I	PCIe GBE Family Cont	roller 🔽 🗑	ଣ
				- Hebreit	cic ober only cont		E15
		Accessible nodes of	the selected interface:				
		Accessible nodes of	the selected intenace.				
		Device	Device type	Interface type	Address	MAC address	
	L 🛄						
	Elash I ED						
		-				Start coarch	<b>E</b> 16
	Online status information	n:			Display only	error messages	
1							
						Sho <u>w</u> <u>C</u> ancel	
When the searc	h for the devices	connected is ov	ver, the devices	will be listed	l and our devi	ce is included in i	t (E17)
	Accessible devices						×
			Type of the PG/PC inter	face: PN/IE			-
			PG/PC inter	face: 🛛 🔛 Realtek F	Cle GBE Family Contr	oller 💌 💌 💆	3
		Accessible nodes of t	the selected interface:				
		Device	Device type	Interface type	Address	MAC address	
		dat11188pn	dat11188pn	ISO	00-30-11-68-D9	. 00-30-11-68-D9-B3	<b>E</b> 17
		dat10188pn	dat11188pn	PN/IE	192.168.1.14	00-30-11-34-45-70	•
		la bora torios	SIMAIIC-PC	FINITE	192.166.1.55	0C-5B-E5-21-D6-A4	
	Elsch I ED						
						Start search	
	Online status information	1:			Display only	error messages	
	Found accessible de	vice dat10188pn					
	🚹 Scan completed. 3 d	levices found.					
	Retrieving device inf	ormation					
	Scan and informatio	n retrieval completed.					-
1							
						Show <u>C</u> ancel	

Click "Cancel", go back to "Device overview", double click on the device dat11188pn and click on button "Assign device name" (E18)



	ce name.				
		Configured PROFINE	T device		
		PROFINET device nar	ne: dat11188pn		-
		Device ty	pe: dat11188pn		
		Online access			
		Type of the PG/PC interfa	ce: PN/IE		
		PG/PC interfa	ce: Realtek PCIe (	SBE Family Controller	
				,,	
		Device filter			
		🔽 Ophyshow dovis	os of the same time		
			es or trie same type		
		Only show devic	es with bad parameter	settings	
		Only show device	es without names		
	Accessible de	vices in the network:			
	IP address	MAC address Devi	ce PROFINET devid	e name Status	
Flash LED					
Flash LED	<		1111		
Flash LED	<		III	Update list	Assign name
Flash LED	<		III	Update list	] Assign name
Flash LED	<		101	Update list	Assign name
Flash LED	<			Update list	Assign name
Flash LED	on:		m	Update list	E19
Flash LED	on:		10	Update list	E19
Flash LED	on:		10	Update list	Assign name
Flash LED	on:		10	Update list	Assign name
Flash LED	pn:		10	Update list	Assign name

When the list is filled, click on the row of the device (E20); click "Assign name" (E21)

Device type: dat11188pn  Device type: dat11188pn  Device filter  Device filter  Only show devices of the same type Only show devices with bad parameter settings Only show devices without names  Accessible devices in the network:  Paddress MAC address Device PROFINET device name assigned 192.168.1.14 00-30-11-34-45-70 dat11188 No device name a sligned 192.168.1.14 00-30-11-34-45-70 dat11188_ dat10188pn Device name is different Dupdate list Assign name information: h completed. 2 of 3 devices were found.		PROFINET devic	e name:	dat11188pn		-
Online access         Type of the PGIPC interface:         PGIPC interface:         PGIPC interface:         Image: PGIPC interface:         Imag		Dev	vice type:	dat11188pn		
Type of the PGIPC interface: PNIPE PGIPC interface: PReliek PCIe GBE Family Controller PGIPC interface: PReliek PCIe GBE Family Controller POINt show devices of the same type Only show devices with bad parameter settings Only show devices without names Accessible devices in the network: PROFINET device name Status 0.0.0.0 00-30-11-68-09-83 dat1188 det10188pn 192.168.1.14 00-30-11-34-45-70 dat11188 det10188pn Device name assigned 192.168.1.14 00-30-11-34-45-70 dat11188 det10188pn Device name is different information: h completed. 2 of 3 devices were found.		Online access				
PGIPC interface:  PGIPC inter		Type of the PG/PC i	nterface:	PN/IE		-
Device filter		PG/PC i	nterface:	Realtek PCIe GBE	Family Controller	- 🖲 🖪
		Device filter				
Only show devices with bad parameter settings     Only show devices with bad parameters settings     Only show devices with bad parameters settings     Only show devices with bad parameters settings     Only show devices were found.		Only show	devices of th	e same type		
Consysteme devices without names  Accessible devices in the network:  Paddress MACaddress Device PROFINET device name Status  0.00.0 003011-8-09-83 dat11188. — 1, No device name assigned  192168.1.14 0030-11-34-5-70 dat11188. dat10188pn Device name is different  2 Update list Assign nam  information: t completed. 2 of 3 devices were found.		Only show	devices with	had parameter set	ttings	
			devices with	bau parameter set	ungs	
Accessible devices in the network: IP address MAC address Device PROFINET device name Status IP address MAC address Device PROFINET device name Status IP address MAC address Device PROFINET device name is different IP address MAC address datilises		Only show	devices with	outnames		
IP address MAC address Device PROFINET device name Status     0.0.0.0     00-30-11-68-D9-83 dat11188     192.168.1.14     00-30-11-34-45-70     dat11188     dat10188pn     Device name is different     (<	Accessible devic	es in the network:				
0.0.0     00-30-11-68-09-83     dat11188     -      No device name assigned       192.168.1.14     00-30-11-34-45-70     dat11188     dat10188pn      Device name is different       Image: Completed and the second sec	IP address	MAC address	Device	PROFINET device n	ame Status	
192.168.1.14 00-30-11-34-45-70 dat11188 dat10188pn Device name is different Compared to the second data and the second data	0.0.0.0	00-30-11-68-D9-B3	dat11188		🚹 No device name ass	igned
formation: ompleted. 2 of 3 devices were found.	192.168.1.14	00-30-11-34-45-70	dat11188	dat10188pn	L Device name is diffe	rent 🗸
nformation: completed. 2 of 3 devices were found.						
DUpdate list Assign nam						
Image: Control of a devices were found.	2					
Update list Assign nam	<			111		
nformation: completed. 2 of 3 devices were found.					Update list A	ssign name
information: completed. 2 of 3 devices were found.						
information: 1 completed. 2 of 3 devices were found.						
completed. 2 of 3 devices were found.	information:					
	completed. 2 of 3 devices we	re found.				
III.						

When the name is assigned, the status OK appears on the row of the device (E22)

PROFINET device name:       det11188pn         Device type:       det11188pn         Online access       Type of the PGIRC interface:         Polic interface:       PROFECTION of the PGIRC interface:         Device filter       Image: Source of the provide of the same type         Image: Only show devices of the same type       Image: Only show devices without names         Accessible devices in the network:       Provide address:         Image: Pack LED       Device address:         Plack LED       Device address:	•
Provine tradine       with thought         Device type:       dit11188gn         Online access       Type of the PC/PC interface:         PGIPC interface:       PROLE         With the PC/PC interface:       PROLE         Only show devices of the same type       Only show devices of the same type         Only show devices of the same type       Only show devices with bad parameter settings         Only show devices without names       Accessible devices in the network:         Prodress       Device TROFINET device name Status         IP address       Device TROFINET device name Status         IP address       Device Att1188	۲
Controller ye: Bart Hooph     Controller     Contine access     Type of the PG/PC interface:     PG/PC interface:     PG/PC interface:     Only show devices of the same type     Only show devices with bad parameter settings     Only show devices without names     Accessible devices in the network:     Padress     MAC address     Device     PROFINET device name     Status     O 00-30-11-34-45-70     dat11188     dat10188pn     Dev     Padress     Pace     Pacee     Pace     Pace     Pacee     Pace     Pace     Pacee     P	•
Online access         Type of the PGIPC interface:         PMIE         POIDE interface:         Point End weices         Only show devices of the same type         Only show devices with bad parameter settings         Only show devices without names         Accessible devices in the network:         IP address         Device         PROFINET device name         Status         0 00-30-11-16-50-83         Device         Place LED	•
Type of the POIPC interface:     ▲ PANE       PGIPC interface:     ■ Realtek PCIe GBE Pamily Controller       ● Only show devices of the same type       ● Only show devices with bad parameter settings       ● Only show devices with bad parameter settings       ● Only show devices without names       Accessible devices in the network:       Pie address     Device       PROFINET device name     Status       0.0.0     00-30-11-68-09-83       192.168.1.14     00-30-11-34-45-70       Heach LED     ■	۲
PGIPC interface: PGIPC	•
Device filter         Image: Constraint of the same type         Image: Constraint of the same type<	
Only show devices of the same type     Only show devices with bad parameter settings     Only show devices without names  Accessible devices in the network:     Paddress MAC address Device PROFINET device name Status     00-30-11-38-09-83 dat11188 dat11188pn     Ork     parame is different     Plash LED	
Ohly show devices with bad parameter settings     Ohly show devices without names  Accessible devices in the network:      Padress     MAC address     Device     PROFINET device name     Status     0.0.0-00-11-134-05-70     dart1188     dart10188pn     OK     name is different     E22	
Ohyshow devices without names  Accessible devices in the network:      Padfess     MAC address     Device     PROFINET device name     Status     00-30-11-34-45-70     dat11188     dat10188pn     OK     name is different     E22	
Accessible devices in the network: IP address MAC address Device PROFINET device name Status 0.0.0 00-30-11-86-09-83 dat11188, dat11188pn OK 192.168.1.14 00-30-11-34-45-70 dat11188, dat10188pn Device name is different E22	
Accessible devices in the network: IPaddress MACaddress Device PROFINET device name Status 0.0.0.0 00-30-11-68-D9-83 dat11188 dat11188_n ↔ OK 192.168.1.14 00-30-11-34-45-70 dat11188 dat10188pn ↔ Device PROFINET device name is different Flash LED	
Plash LED     MAC address     Device     PROFINET device name     Status       Plash LED     0.30-01-134-45-70     dat11188     dat10188pn     OK     OK	
192.168.1.14     00-30-11-34-45-70     dat11188     dat10188pn     A     Dev     name is different       Flash LED     192.168.1.14     00-30-11-34-45-70     dat11188     dat10188pn     A     Dev     name is different	
Flash LED	
Flash LED	
Flash LED	
Update list Assign na	n name

#### Step 7: Creation of variables and mapping to the objects.

This example is about how to map the "Digital Inputs" and "Digital Outputs" variables.

Note: for the position of the variables you want to map always refer to the previous chapters of this document.

Select the device in "Devices and Network".

On the top right corner select "Device view" (F)

Select the row of Input Objects (F1)

				Topology	view	Network view	🛯 🔐 Device view	-
Device	overview							- E
<b>**</b>	Module	Rack	Slot	I address	Q address	Туре	Article no.	
	<ul> <li>dat11188pn</li> </ul>	0	0			dat11188pn	DAT11188PN	
	Interface	0	0 X1			dat11188pn		
	Input Objects_1	0	1	6899		Input Objects		L
	Output Objects_1	0	2		6467	Output Objects		<b>F1</b>

The "Digital Inputs" are mapped to the bytes 4 and 5 of the Cyclic Input Data (third position in the array). In the properties of Input Objects, frame IO tags (F2) in the column "Name" write the name of the variable that you want to be mapped in the third position of the array (F3); in the column "Tag table" select "Default tag table" (F4).

Input Objects_1 [Inp	nput Objects_1 [Input Objects]						🗓 Info 🔒 🗓 Diagnostics	
General IO ta	ngs 🥠 S	ystem con	stants Texts					
Name	Туре	Address	Tag table	Comment				
	Int	%IW68						~
	Int	%IW70						
🕘 Digital Inputs	Int	%IW72	Default tag table					_
	Int	%IW74	EA	•				
<b>`F3</b>	Int	%IW76	F4					
	Int	%IW78						
	Int	%IW80						
	Int	%IW82						
	Int	%IW84						
	Int	%IW86						
	Int	%IW88						
	Int	%IW90						~

#### In "Device view" (F), select the row of Output Objects (F5)

			·	Topology	view	Network view	Device view
Device	overview						
· *** ···	Module	Rack	Slot	I address	Q address	Туре	Article no.
	<ul> <li>dat11188pn</li> </ul>	0	0			dat11188pn	DAT11188PN
	Interface	0	0 X1			dat11188pn	
	Input Objects_1	0	1	6899		Input Objects	
	Output Objects_1	0	2		6467	Output Objects	
							F5

The "Digital Outputs" are mapped to the bytes 0 and 1 of the Cyclic Output Data (first position). In the properties of Output Objects, frame IO tags (F6) in the column "Name" write the name of the variable that you want to be mapped in the third position of the array (F7); in the column "Tag table" select "Default tag table" (F8).

	<b>,</b> , ,	<i></i>	<b>0</b> (	
Output Objects_1 [Output Obj	jects] F6		🖳 Pr	operties 🚺 Info 😧 🖫 Diagnostics
General IO tags	stem constants Texts			
Name Type	Address Tag table	Comment		
💷 Digital Outputs 👔 Int	%QW64 Default tag table			
Int Int	%QW66	F8		
V				
F7				

In the Project tree select the PLC, select PLC tags (F9), double click on Default tag table (F10).



<b>9</b>	ø [	) 🖓 🕆 🗘									
Default tag table											
	N	lame	Data type		Address		Retain	Acces	Writa	Visibl	Comment
1	-00	Digital Inputs	Int		%IW72	-		<b></b>	<b>~</b>	<b></b>	
2	-00	Digital Outputs	Int		%QW64			<b></b>	<b>~</b>	<b></b>	
3		<add new=""></add>						<b>V</b>	<ul> <li>Image: A start of the start of</li></ul>		

### Step 8: Creation of the project.

In this example it will be show a very simple project composed of a "Move" function with the purpose of moving the value on the inputs of the device to the outputs. Moreover, this example has also the purpose of show how to set the module parameters. In the Project tree under the branch of PLC select "Program blocks" (G), right click on it and select "Add new block" (G1)



Select "Program cycle" (G2) from "Organization block" (G3) and click OK (G4).

d new	Add new block				
block					
manization blocks (OB)	Name:				
ganzadon biocks (ob)	Main_1				
<b>2</b> -		AND DESCRIPTION OF A	Language:	LAD	
Main		AD Startup			
	OB	Time delay interrupt	Number:		0
	Organization	G2		() Manual	
	block	Hardware interrupt		Automatic	
		Time error interrupt		0	
	6	3 🖶 Diagnostic error interrupt			
		Pull or plug of modules	Description:		
		E-Rack or station failure	4 *Provence and		- Conthe
	Function block	💶 Time of day	and is the main	block of the program	m. This is
		👺 Status	where you plac	e the instructions th	at control
		🖀 Update	your application	n, and call additional	Luser
		Profile	220000		
	FC	MC-Interpolator			
	European	MC-Servo			
	runcuon	MC-PreServo			
		MC-PostServo			
	. ■DB				
	Data block				C1
eneral			more	1	04
reneral					

It will be created an empty project.

<ul> <li>Block title: "Main Program Sweep (Cycle)"</li> </ul>	
Comment	
Network 1:	
Comment	

In the Project tree, double click on the block "Main" (G5).



On the right it will appear the menu "Instructions".

Click "Basic Instruc	s" (G7) →	"MOVE" (G8)							
✓ Basic instruct	Basic instructions								
Name		Description							
🕨 主 Math functio	ons		^	1					
▼ 🔁 Move opera	🔻 🔁 Move operations ┥ G7								
🗐 MOVE 🚽		Move value							
🗐 Deseriali	ize G8	Deserialize							
Move value		Serialize							
MOVE_B	LK	Move block	~						

The instruction will be added to the project.

Network 1:			
Nove Inputs to Outputs			
	MOVE		
EN	ENO		
?? — IN	🚸 OUTI ·	- ??	

Click <???> IN to define the input variable (G9) Select the variable (G10). In this example the variable is "Digital Inputs"

	MOVE			
$\vdash$	G9 EN - EN	0		 
	TUO 🍀 N	n — <i><???></i>		
Ţ	dat11188pn Output_Objects	Hw_SubModule		^
æ	dat11188pn Proxy"	Hw_SubModule		
-	"Digital Inputs"	Int	%IW72	=
-	"Digital Outputs" G10	Int	%QW64	
æ	"Local"	Hw_SubModule		
P	"Local~AI_2_1"	Hw_SubModule		
æ	"Local-Common"	Hw_SubModule		
æ	"Local~Configuration"	Hw_SubModule		~

Click <???> OUT to define the output variable (G11) Select the variable (G12). In this example the variable is "Digital Outputs"

EN %////2	MOVE ENO 				
"Digital Inputs" — IN		"Digital Inputs"	Int	%IW72	*
		"Digital Outputs	Int	%QW64	
		<b>G12</b>			
-					
					~

The Move instruction needs an enable bit. It can be set using any available boolean. In this example a User constant defined in the "Default tag table" is used.

					•	Tags	User constants	×
<b>9</b> ;	ø							
D	efa	ult tag table						
		Name 🔺	Data type	Value	Comment			
1	Ξ	En_bit	Bool 🔳	TRUE				
2		<add new=""></add>						

## Insert an open contact in the "EN" branch and click on <??.?> to assign the variable (G13).



#### The simple project is complete.



#### Step 9: Set the module parameters

The parameters allow the setting of the system functions for the device when the PLC establishes the connection with it. All of these parameters can be monitored by means of Read back objects in Cyclic Input Data.

To set the parameters go to "Network view", select the dat11188pn, go to "Device view", double click on the device image. In properties under frame "General" click "Module parameters" (H).

Set the values as desired between the limits shown (H1) and press Enter.

General	IO tags	Sys	stem constants Texts	
General				
<ul> <li>PROFINET int</li> </ul>	terface [X1]		would parameters	-
General			Parameters	
Ethernet	addresses			
Advanced	d options		Bit 0 to 7 - Powerup value / Bit 8	
Identification	n & Maintenance		to 15 Safe value: 0	
Module para	ameters	-	Debouncing Time as ms: 1 H1	
		•	Watchdog Time as sec: 10	
	`H			

## Step 10: Compile the project, download it to PLC and monitor the variables

In the Project tree select the branch of PLC.

In the Toolbar click "Compile" (I)

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When the project is compiled, in the Toolbar click Download to device (I1) and follow the procedure to end the download correctly. When the download is complete, in the Toolbar click "Start CPU" (I2) and when asked by the system go in RUN mode. In the Toolbar click "Go online" (I3).

If there are not errors all the fields related with PLC communication are marked in green.



To monitor the variables go to PLC tag  $\rightarrow$  Default tag table. Click "Monitor all" (I4)

												🕣 Tags	User constants	🔎 System cons	tants
	<b>2</b>	🖻 🛃 😨 🛍													-
0	)efau	ilt tag table													
		Name	Data type	•	Address		Retain	Acces	Writa	Visibl	Monitor value	Comm	ent		
1		Digital Inputs	Int		%IW72	-			<b></b>		1		~ 15		
2	-	Digital Outputs	Int		%QW64			Image: A start and a start	<b></b>		1				
З		<add new=""></add>						<b>V</b>	<b>V</b>	<b>V</b>					
_															

In the column "Monitor value" (I5) is it possible to see the variables changing.

#### **IMPORTING THE DEVICE IN CODESYS**

The following example has the purpose to show how to insert the GSDML file of the device and it has been done using CODESYS 3.5 SP19 Patch 6 Soft PLC that includes the creation of a new project using a standard project template with PLC\_PRG in standard text. Run Codesys and wait for the application to be executed.

## Step 1: create a new project.

Click File  $\rightarrow$  New Project.

Categories		Templates			
Lib	raries ojects	Empty project	HMI project	Standard project	Standard project w
A project co Name	ontaining one device, one	application, and an e	empty implemen	tation for PLC_P	RG
Location	C:\Users\\ab\Desktop\P	rofinet\Codesys			×
	Ì			ок	Cancel

Select icon "Standard project" (A). Edit the name of the project (A1). Click OK (A2). Edit the project as follows and click OK (A3).

· · · · ·			~
Standard F	Project		×
	You are abou objects withi - One program - A program I - A cyclic tasi - A reference	t to create a new standard project. This wizard will create the following n this project: mmable device as specified below 2.C_PRG in the language specified below which calls PLC_PRG to the newest version of the Standard library currently installed.	
	Device	CODESYS Control Win V3 (3S - Smart Software Solutions GmbH)	$\sim$
	PLC_PRG in	Structured Text (ST)	$\sim$
		A3 OK Cancel	

The following screen with the basic project functions will appear.

Devices	- * ×							
Denem = ∰ dec_ADT/IMM = ∰ Arec_ADT/IMM = ∰ Rec Logs = ∰ Rec Logs = ∰ Rec Logs = ∰ Rec Rec Brack = ∰	- • x							
		Messages - Total O error(s), O warner Devices	ng(s), 0 message(s)	• 0 0 emor(s) • 0 w	amino(s) 0 message(s)	××		
	ć	Description			and a surgery			Project Object
Services Poula								
							 Last build: 🧿 0 😗 0	Precomple 🗸

Step 2: Connect to PLC This step may change in function of the PLC used. Activate the PLC.

Double click on "Device" in the tree-view of the project, click Communication Settings (B), insert the credential to access the PLC if required and click Scan Network (B1). Select the PLC and connect to it to obtain the following window with green marks.

Communication Settings	Scan Network Gateway - Device -
Applications	B B1
Backup and Restore	
Files	
Log	Gateway
	Gateway-1 V [0301.3036] (active) V
PLC Settings	IP-Address: Device Name: localhost LABORATORIO9
PLC Shell	Port: Device Address:
Users and Groups	1217 0301.3036
Access Rights	0000 0004
Symbol Rights	Target Type: 4096
Licensed Software Metrics	Target Vendor: 3S - Smart Software Solutions GmbH
IEC Objects	Target Version: 3.5.19.60
Task Deployment	
Status	
Information	

#### Step 3: insert an Ethernet Interface.

In the tree-view of the project select and right click of the mouse on "Device (Codesys Control Win V3)" (C) .



Select Add Device; the following window will appear.

🖞 Add Device		×
Name Ethernet		
Action		
Append device      Insert device	O Plug device O Update device	
String for a full text search	Vendor <all vendors=""></all>	~
Name	Vendor Version Rescription	
Eieldhuses	vendor vesion beschption	
CAN CANbus		
🗉 🔐 🔐 EtherCAT		
🖹 🕮 Ethernet Adapter 🚽	- D1	
Ethernet	CODESYS 4.2.0.0 Ethernet Link.	- D2 🛛 📗
therNet/IP		
Im Home&Building Automation	1	
B PROFIBUS		
PROFINET IO		
🗉 🕮 Ethernet Adapter		
PROFINET IO Device		
PROFINET IO Master		
Group by category Display al	I versions (for experts only) Display outdated versions	\$
Mame: Ethernet		
Categories: Ethernet Adapter	r, Ethernet Adapter, Ethernet Adapter,	
Home&Building Automation		
Order Number: -		~
Description: Ethernet Link.		
Append selected device as last ch	ild of	
Device		
(You can select another target r	node in the navigator while this window is open.)	
	Add Davica	Close
	Add Device	ciose

Select "Fieldbuses" (D)  $\rightarrow$  select "Ethernet Adapter" (D1)  $\rightarrow$  Select "Ethernet" (D2). Click button "Add Device" (D3). The branch Interface "Ethernet" will be added to the tree-view of the project (D4)



Double click on "Ethernet" (D4). The following window appears. Click button "Browse" (D5). Select the network interface and click button "OK" (D6).

General		Network interface			Browse	
thernet Device I	I/O Mapping	IP address	192 . 168 . 0 . 1			_
thernet Device I	IEC Objects	Subnet mask	255 . 255 . 255 . 0			
		Default gateway	0.0.0.0	1		
og		Adjust operating	system settings			
tatus						
nformation						
etwork Adapters					×	<
etwork Adapters					×	<
etwork Adapters nterfaces Name Descr	iption	IP address			×	<
etwork Adapters nterfaces Name Descr Ehemet Realte	iption k PCle GBE Family Contr	IP address oller 192.168.1.54			×	<
etwork Adapters nterfaces Name Descr Ethemet Realte	iption k PCIe GBE Family Contr	IP address oller 192.168.1.54			×	<
etwork Adapters nterfaces Name Desci Ethemet Realte	iption k PCIe GBE Family Contr	IP address oller 192.168.1.54			×	<
etwork Adapters nterfaces Name Descr Ethemet Realte	iption k. PCIe GBE Family Contr	IP address oller 192.168.1.54	_		×	<
etwork Adapters nterfaces Name Descr Ethernet Realte	iption k. PCIe GBE Family Cont	IP address oller 192 168 1 54			×	<
etwork Adapters nterfsces Name Descr Ethernet Realte	tption k, PCIe GBE Family Contr 192 . 168 . 1	IP address oller 192.168.1.54			×	<
etwork Adapters nterfaces Name Desce Bhemet Realte P address Subnet mask	tption k PCIe GBE Family Contr 192 168 1 255 255 255	IP address oller 192.168.1.54			×	< l
etwork Adapters nterfaces Name Desc Ethemet Realte P address Subnet mask Default gateway	tplion k PCIe GBE Family Contr 192 - 168 - 1 255 - 255 - 255 192 - 168 - 1	IP address oller 192.168.1.54			×	

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#### Step 4: Insert PN Controller.

In the tree-view of the project select and right click of the mouse on "Ethernet" (E)



Select "Add Device"; the following window will appear

PN_Controller					
ı 					
ppend device 🔘 Insert device	OPlug device OI	Jpdate device			
g for a full text search	Vendor	<all vendors=""></all>			~
me	Vendor		Version	Description	
👔 Fieldbuses 🚽 🗕 🗖 🖬					
🗉 👄 EtherNet/IP					
Modbus	-0				
PROFINET IO	=2				
PROFINET IO Master	<b>E</b> 3				
PN-Controller	3S - Smart Softwar	e Solutions GmbH	H 4.4.0.0	PROFINET IO	Control
	E4				
				_	
roup by catagony . 🔲 Display al	luoraiona (for ava arta r	alu) 🔲 Disali	would stad you	niana	/
	iversions (for experts t		ay outdated ver	SIUTIS	
Name: PN-Controller Vendor: 35 - Smart Software 5	Solutions GmbH				
Categories: PROFINET IO Ma	ster				
Order Number: 1				- Sector - S	
Description: PROFINET IO Co	ontroller				
and colocted device as 1-t-t	ild of				
ernet					
(You can select another target r	node in the navigator v	hile this window	v is open.)		/
			Add Devi	ce Cl	ose

Select "Fieldbuses" (E1)  $\rightarrow$  select "PROFINET IO" (E2)  $\rightarrow$  Select "PROFINET IO Master" (E3)  $\rightarrow$  "Select PN Controller" (E4). Click button "Add Device" (E5).

The element "PN Controller" will be added under the branch "Ethernet" to the tree-view of the project (E6)





## Step 5: Install the GSDML file of the device into Device Repository of Codesys.

Download the GSDML file of the device from the website www.datexel.it to a folder in your PC. In the Menu bar of Codesys click "Tools"  $\rightarrow$  "Device Repository..." The following window appears.

							-
tion Syst	tem Repository	>				~	Edit Locations
(C:\F	ProgramData\CODESYS\Devic	es)					
alled Device	Descriptions						
ng for a full t	ext search	Vendor	<all vendors=""></all>			~	Install
ame		Vendor		Version	Description		Uninstall
Miscellar	neous						Export
Fieldbus	ses						
	Vopen						
🗄 🔐 Bedi Ethe	erCAT						
🗄 - 🂵 Ethe	ernet Adapter						
🗷 👄 Ethe	erNet/IP						
Hom	ne&Building Automation						
B- 54 119	39						
	fbus						Details
B- ## PRC	OFIBUS	- 1					53220500
PRC	DFINET IO	1					
王 田野	Ethernet Adapter						
· · · · · · · · · · · · · · · · · · ·	PROFINET IO Device		F2				
B	PROFINET IO Slave	1					
	🗀 I/O						
	CIFX PROFINET Device	3S - Sma	rt Software Solutions GmbH	SW=V3.x, HW=2	CODESYS PLC running as PROFINET Device (CIFX based)		
	EL6631-0010 V2.0	Beckhoff		SW=V1.00, HW=V1.00	PROFINET I/O device - EtherCAT slave terminal, V2.0		
sero	tos						
PICs	nces						
SoftMot	ion drives						

Select "Fieldbuses" (F)  $\rightarrow$  select "PROFINET IO" (F1)  $\rightarrow$  Select "PROFINET IO Slave" (F2)  $\rightarrow$  Click button "Install" (F3). The window "Install Device Description" will appear; recall the path of the folder wherein you downloaded the GSDML file of the device, select it and click "Open" (F4) (next page).

Install Device Description					×
$\leftarrow$ $\rightarrow$ $\checkmark$ $\uparrow$ $\frown$ $\checkmark$ Users $\rightarrow$ lab $\rightarrow$ Deskte	op > Profinet > UpgradeGSDML_2.44 > DAT11	188PN	✓ Ö Search	DAT11188PN	,c
Organize 🔻 New folder				== -	?
Progressivo PFC	Name	Date modified	Туре	Size	
Screenshot Errori programmi di tarat	GSDML-V2.44-DatexelSrl-DAT11188PN-2	7/5/2024 2:13 PM	XML File	15 KB	
STDV Realizzati					
OneDrive - Personal					
💻 This PC					
🗊 3D Objects					
Desktop					
Documents					
🕂 Downloads					
Music					
E Pictures					
Videos					
🟪 Local Disk (C:)					
File name: GSDML-V2.44	DatexelSrl-DAT11188PN-20240705		~ PROFI	NET GSDML (GSDML*.x	m ~
			Ор	en 🚽 Cance	4

The file will be installed under the folder "I/O" (Main family of the device). If it is the first time that a Datexel's device is installed, Codesys will create the folder "Datexel DAT11000" (F5), otherwise the device's GSDML will be added inside it. Select the file installed (F6) and click "Close" (see previous page - F7) on Device Repository window.

I/O      ODESYS PLC      Datexel DAT11000 series	F5			
🗝 📶 dat11018pn	Datexel S.r.l.	SW=1.0.0, HW=1	Supports RT and non-cyclic communications.	
🚽 🕕 dat11130pn	Datexel S.r.l.	F6 SW=1.0.0, HW=1	Supports RT and non-cyclic communications.	
🚽 🗹 dat11188pn	Datexel S.r.l.	SW=1.0.0, HW=1	Supports RT and non-cyclic communications.	

#### Step 6: Scan the network for the device and add it to the project.

In the Menu bar of Codesys click "Build"  $\rightarrow$  "Clean" and after click "Build"  $\rightarrow$  "Generate Code". Once the project has been compiled in the Menu bar of Codesys click "Online"  $\rightarrow$  "Login" to login to the PLC. In the tree-view of the project right click of the mouse on the element "PN Controller". Check that the device has been powered-on and that the Ethernet cable is connected to Port1 or Port2. Select "Scan for Devices". The below window will appear, the system takes some seconds and the device will be listed.

Device name	Device type	Station Name	ID number	MAC Address	IP Address	Subnet Mask	Gateway
	dat11188pn	dat10188pn	16#80010000	00:30:11:34:45:70	192.168.1.14	255.255.255.0	
dat10188pn_1	Input Objects		16#0000001				
dat10188pn_2	Output Objects		16#0000002				
The identification data is not available. Check the IP address.	Vendor-ID: 0x078B, Device-ID: 0x0009		Error: A valid IP is required.	00:30:11:68:1E:49	0.0.0.0	0.0.0.0	
The identification data is not available. Check the IP address.	Vendor-ID: 0x078B, Device-ID: 0x000B		Error: A valid IP is required.	00:30:11:68:D9:B3	0.0.0.0	0.0.0.0	_
The identification data is not available. Check the IP address	Vendor-ID: 0x002A, Device-ID: 0x0202	laboratorio6 🚩	error: RPC Aborted: 0x16C9A049	6C:3B:E5:21:D8:A4	192.1.8 1.55	255255.255.0	19.168.1
9						$\sim$ $\sim$ $\sim$	
9			`GI			G2	
M Auto-IP <> Reset Blink LED Set Name and IF	P │ Show only unnamed stations					G2	nces to proj

Being provided as Factory default the device is supplied with communication parameters not set.

To import the device in the project it is necessary set them as follows.

Select the row of the device (G)

Edit the Station Name in the proper column (G1); example: "dat11188pn"

Edit the Network Parameters in the proper columns (G2); example: IP Address:"192.168.1.18" Subnet Mask: "255.255.255.0" Gateway Mask:"192.168.1.1"

Click "Set Name and IP" (G3) and wait for the end of operation.

Click "Scan Devices" (G4). The below window will appear and after some seconds the device will be listed and updated.

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	Device type	Station Name	ID number	MAC Address	ID Address	Subnet Mack	Gateway
- dat10199ap	dat11100pp	dat10100ap	16#90010000	00-20-11-24-45-70	102 100 1 14	255 255 255 0	Gateway
dat10188pp 1	Input Objects	datioiooph	16#0000001	00.30.11.34.43.70	132.100.1.14	200.200.200.0	
dat10188pn 2	Output Objects		16#00000001				
• The identification data is not available. Check the IP addres	s. Vendor-ID: 0x078B. Device-ID: 0x0009		Error: A valid IP is required.	00:30:11:68:1E:49	0.0.0.0	0.0.0.0	
dat11188pn	dat11188pn	dat11188pn	16#80010000	00:30:11:68:D9:B3	192.168.1.18	255.255.255.0	
			16#0000001	05			
dat11188pn_1	Input Objects		10#0000001	1(45			
dat11188pn_1 dat11188pn_2	Input Objects Output Objects		16#00000002	G5			
- dat11188pn_1 dat11188pn_2 - The identification data is not available. Check the IP addres	Input Objects Output Objects s. Vendor-ID: 0x002A, Device-ID: 0x0202	laboratorio6	16#00000002 error: RPC Aborted: 0x16C9A049	GC:3B:E5:21:D8:A4	192.168.1.55	255.255.255.0	192.168.
dat11188pn_1 dat11188pn_2 The identification data is not available. Check the IP addres A Auto-IP <> Reset Blink LED Set Name and	Input Objects Output Objects s. Vendor-ID: 0x002A, Device-ID: 0x0202	laboratorio6	16#00000002 error: RPC Aborted: 0x16C9A049	G5 6C:3B:E5:21:D8:A4	192.168.1.55	255.255.255.0	192.168. ences to pro
dat11188pn_1     dat11188pn_2 The identification data is not available. Check the IP addres      A Auto-IP <> Reset Blink LED Set Name and	Input Objects Output Objects s. Vendor-ID: 0x002A, Device-ID: 0x0202	laboratorio6	16#0000002 error: RPC Aborted: 0x16C9A049	6C:3B:E5:21:D8:A4	192.168.1.55	255.255.255.0	192.168.
dat11188pn_1     dat11188pn_2     The identification data is not available. Check the IP addres     M Auto-IP <> Reset Blink LED Set Name and     oduct: dat11188pn (0x000B)	Input Objects Output Objects s. Vendor-ID: 0x002A, Device-ID: 0x0202 IP Show only unnamed stations	laboratorio6	16#00000002 error: RPC Aborted: 0x16C9A049	6C:38:E5:21:08:A4	192.168.1.55	255.255.255.0	192.168 ences to pr

To import the device in the project select the row of the device (G5) and click "Copy to project" (G6). The device will be added to the tree-view of the project as a branch of the element "PN Controller". In the Menu bar of Codesys click "Online" $\rightarrow$  "Logout".



Double click on the line of the DAP icon of the device (H3).

In the window that will appear it is possible to set the parameters of the device that are not included in the cyclic Process Data Objects. These parameters will be set each the PLC establishes an AR See next page.

Click "General" (H6)							
General HG	Station name dat11188 Station status	8pn					
Port data							
IOxS	IP Parameter						
Log	IP address 193	2 . 168 . 1 . 18					
PNIO I/O Mapping	Subnet mask 255	5 . 255 . 255 . 0					
PNIO IEC Objects	Default gateway 0	. 0 . 0 . 0					
Status	Communication						
Information	Send clock (ms) 1	✓ Data ho	old time (ms	) 1	2 🔹		
Included	Reduction ratio 4	VLAN I	D		0		
	Phase -	$\sim$					
	RT class RT	T Class 1	``	/			
	Options						
	Fast Startup						
	Shared device						
	Settings						
	Set All Default Values	s Read All Va	lues	<b>∼</b> ∰Write	All Values		
	Parameters		Value	Data Type	Allowed Values	Description	
	Parameters						-
	Bit 0 to 7 - Powerup val	lue / Bit 8 to 15 Safe value	0	Unsigned 16	065535		
	Watchdog Time as sec	>	10	Unsigned 16	0255		
				H7			

Edit the desired values of the parameters writing them within limits in the column "Value" of each row (H7). To map the "Digital Inputs" object double click on the line dat11188pn\_1 (Input Objects) - (H4) in the tree-view of the project. Click "PNIO Module I/O Mapping" (H8). Double click on the line of the object to map, in this example "Digital Inputs" (H9). The window Input Assistant appears. Click on the variable to be mapped (H10). Click "OK" (H11). The object will be associated to the variable

	Find		Filter Show all		•	🕂 Add FB for IO Cha	nnel 🎽 Go to	Instance			
PNIO Module I/O Mapping	Variable	Mapping	Channel	Address	Туре	Unit	Description				
PNIO Module IEC Objects			System Flags	%IW2	UINT						
	·		Digital Outputs ReadBack	%IW3	UINT [						
Status	8 3		Digital Inputs	%IW4	UINT	Input Assistant					
	-*	_	Digital Inputs Rise Latch	%IW5	UINT		and an				
Information	- *		Digital Inputs Fall Latch	%IW6	UINT	Text Search Categ	lories				
	1		Low part 32 bit Counter 0	%IW7	UINT	Variables		Name	Type	Address	Origin
H9	- *		High part 32 bit Counter 0	%IW8	UINT			=- 🛱 Application	Application		-
	*>		Low part 32 bit Counter 1	%IW9	UINT				PROGRAM		
	- *		High part 32 bit Counter 1	%IW10	UINT			@ In0			
	-*		Low part 32 bit Counter 2	%IW11	UINT			Ø Out	UINT		
	- *>		High part 32 bit Counter 2	%IW12	UINT			B- 🚳 IoConfig Glob	VAR GLOBAL		
	-*		Low part 32 bit Counter 3	%IW13	UINT				Library	Ic	DrvEthernet, 4.2
	- 🍫		High part 32 bit Counter 3	%IW14	UINT						
	-*		Power Up / Safe ReadBack	%IW15	UINT						
	- *>		Debouncing Time ReadBack	%IW16	UINT			H.	10		
	L <b>₩</b>		Watchdog Timeout ReadBack	%IW17	UINT						
	L 🇤		Inputs PS	%IB36	Enumera						
						Structured view				Filter Non	2
									Z to and with some	uments Insert w	th namespace prefix
						Desamentation			✓ Insert with arg		
						Documentation			☑ Insert with arg		
						Documentation In0: UINT(VAR)			✓ Insert with arg		
						Documentation In0: UINT(VAR) digital input			⊻ insert with arg		
						Documentation In0: UINT(VAR) digital input			insert with arg		
	Ky = Create new variable	~ <b>∳</b> = Ma	p to existing variable			Documentation In0: UINT(VAR) digital input			⊻ insert with arg		
essages - Total 1 error(s), 0 warning(	Ky = Create new variable	~ <b>@</b> = Ma	p to existing variable			Documentation In0: UINT(VAR) digital input			⊻ insert with arg		
sssages - Total 1 error(s), 0 warning( ecompile	Ky = Create new variable ky, 8 message(s)	°∲ = Ma error(s) ● 0 wa	p to existing variable	< ¥		Documentation Ino: UINT(VAR) digital input			≥ µsert win arg		OK Canc

#### Input mapped.

Variable	Mapping	Channel	Address	Туре
		Inputs	%IW2	
		System Flags	%IW2	UINT
···· *		Digital Outputs ReadBack	%IW3	UINT
Application.PLC_PRG.In0	<b>`</b>	Digital Inputs	<del>%IW4</del>	UINT
···· *		Digital Inputs Rise Latch	%IW5	UINT
🍫		Digital Inputs Fall Latch	%IW6	UINT

To map the output object double click on the line dat11188pn\_2 (Output Objects) - (H5) in the tree-view of the project. Click "PNIO Module I/O Mapping" (H12). Double click on the line of the object to map, in this example "Digital Outputs" (H13). The window Input Assistant appears. Click on the variable to be mapped (H14). Click "OK" (H15). The object will be associated to the variable

General	Find		Filter Show all		- + A	dd FB fo	r 10 Channel	→ Go to Instance			
PNIO Module I/O Mapping PNIO Module IEC Objects Status	H12 3	Mapping	Channel Outputs Digital Outputs Reset / Enable Flags Outputs CS	Address %QW0 %QW0 %QW1 %IB37	Type UINT UINT	Unit	Description				
Information	H13	3			Text Search Cate( Variables	ories		Name Application Polication PLC_PRG PLC_PRG Out	Type Application PROGRAM UINT Varry VAR & Codau Land 4	Address	Origin CAA Device Diagnosi IoDrvEthernet, 4.2
					Structured view				⊡ Insert with a	Filte rguments Ir	r None
		ble Type = Ma	ap to existing variable		Documentation Out: UINT(VAR) digital outputs				⊡ Insert with a	Filte rguments Ir	r None
essages - Total 1 error(s), 0 warning	K→ = Create new variab g(s), 8 message(s)	ble <sup>™</sup> ⊕ = Ma	ap to existing variable		Structured view Documentation Out: UINT(VAR) digital outputs				Insert with a	Filte rguments Ir	IT None
lessages - Total 1 error(s), 0 warning recompile Description	♥ = Create new variab g(s), 8 message(s)	ble <sup>™</sup> • = Ma • 1 error(s) ● 0 wa	ap to existing variable	ye(s) × ¥	Structured view Documentation Out: UINT(VAR) digital outputs	1			∑ Insert with a	Filte	rr None sert with namespace prefix

#### Output mapped.

Find	Filter Sho	ow all		- 🕂 Add FB for	IO Chann	el → Go to Inst
Variable	Mapping	Channel	Address	Туре	Unit	Description
		Outputs	%QW0			
Application.PLC_PRG.Out	<b>~</b>	Digital Outputs	<del>%QW0</del>	UINT		
<b>*</b>		Reset / Enable Flags	%QW1	UINT		
· · · · · · · · · · · · · · · · · · ·		Outputs CS	%IB37	Enumeration of BYTE		

#### Step 8: run the project.

After the mapping of variables is complete, it is necessary to define the communication cycle time. In the tree-view of the project double click on the element "Profinet Communication Task" (I) Define the interval of execution as milliseconds (I1)

Devices 🗸 🕂 🗙
□ - 10 test_DAT11188
i i i i i i i i i i i i i i i i i i i
- int PLC Logic
a Application
aaa iiii → ∰ MainTask (IEC-Tasks)
B PLC_PRG
🖙 🥸 Profinet_CommunicationTask (IEC-Tasks)
- ④ PN_Controller.CommCycle
Profinet_IOTask (IEC-Tasks)
⇒ <u>(jj)</u> Ethernet (Ethernet)
PR_Controller (PN-Controller)
- m difficient (definition)
i datti 1880n 2 (Output Objects)
/ III PLC_PRG / III Device / III Ethernet / III PN_Controller / Se Profinet_ToTask / Se Profinet_CommunicationTask X / Se MainTask
Conguiston
The second s
Phonty ( U31 ): 14 Hask group IEC-Hasks V
Type
( Cyclic v Interval (e.g. t=200ms) 1
and the
Time (e.g. t#200ms)
Sensitivity
💠 Add Call 🔀 Remove Call 🖄 Change Call   🕆 Move Up 🔿 Move Down   Gpen POU
POU Comment

in the Menu bar of Codesys click "Build" $\rightarrow$  "Clean" and after click "Build" $\rightarrow$  "Generate Code". When the project has been compiled in the Menu bar of Codesys click "Online" $\rightarrow$  "Login" to login to the PLC. Click "Debug" $\rightarrow$  "Start". If the communication ends correctly the project tree looks like as follows with all green marks.



#### Clicking on PLC\_PRG, it will be possible to see the variables changing.

Device Application.PLC_PRG					
Expression	Туре	Value	Prepar	Address	Comm
Ø INO	UINT	1			digital in
Ø Out	UINT	1			digital o
1 Out 1:=In0 1;					
2 💿 RETURN;					
3 RETURN					

#### **WEB-SERVER**

The device is supplied by default with the IP address set to 0.0.0.0. Therefore it is not possible to access the web-server with an "out of the box" device. It is necessary to assign to the device a valid IP address. To do it, before to run the web browser:

- assign via PROFINET DCP a valid IP address and Subnet Mask

- tip in the address bar of the web browser the device's IP address. It will appear the Home page

For the devices using PROFINET the web server is intended for visualization only.

Due to this there won't be required any credentials to access it.

Depending on the Web browser in use some icons and/or graphics may appear with little variation in shape and colour. The supported web browsers are: Chrome, Firefox, Opera and Edge.

Home page	
DAT11000 SERIES	
Language Selection	
Italiano A	
Français	
	Follow us:
	in Linkedin A1
	<ul> <li>Instagram</li> <li>Facebook</li> </ul>
www.datexel.it A2	

The "Home page" is composed of:

- Language selection to access the page with the menus of the device selected (A). Once the language has been selected the Network Parameters page will appear

- Link to the Datexel social media (A1)

- Link to the Datexel web site "www.datexel.it" (A2) .

#### **Network Parameters**



The "Network Parameters page" is composed of:

- Indication of the device connected (B).

- Menu selection (B1)

- List of Network Parameters (B2)

Indication of the device connected (B)

This label indicates the Order Number of the device connected. It is a parameter common for all of the pages available with the exception of the Home Page therefore it will be described only here.

This parameter doesn't correspond to the Station Name of the device.

### Menu Selection (B1)

These buttons are common for all of the pages available with the exception of the Home Page therefore they will be described only here.

The green background on the button shows which is the page currently visualized. Mouse click on a button recalls a specific menu. The list of the menu is the following:

- Network Parameters: it shows the main network settings of the device
- Module Information: it shows the main information about the device
- Digital Inputs: it shows the status of digital inputs, the value of debouncing time and the value of the input counters.
- Digital Outputs: it shows the status of digital outputs, Power-up, safe and Watchdog.
- Home: allows to go back to the Home Page.

#### Network Parameters (B2)

The list of Parameters shown is the following

- IP Address: visualizes the unique IP address value assigned to the device.
- Subnet Mask: visualizes the Subnet Mask value assigned to the device.
- Gateway Mask: visualizes the Gateway Mask value assigned to the device.

- Ethernet Port 1 / Ethernet Port 2 : visualize the status of connection for Ethernet Port 1 and Ethernet Port 2. The status shown are: No link: it means there is not a connection sensed on the port indicated.

100 Mbit: it means there is a connection sensed on the port indicated.

- MAC address: visualizes the unique MAC address value of the device

#### **Module Information**

DAT11188PN	Module	e information		
	Module Name:	dat11188pn		
	Vendor ID:	0x078B		
Network Parameters	FW Version:	1.00.00		
	Web Version:	041024		
Module Information	Vendor Name:	Datexel S.r.I.		
Digital Inputs	Module Status:	WAIT PROCESS		
Digital Outputs	Protocol:	PROFINET IO		
Home	PowerUp Event:			
	Uptime:	0 Days , 00h:23m:32s		
			Refresh	С

The "Module Information page" is composed of:

- Indication of the device connected (C).
- Menu selection (C1)
- Overview of the Device main information (C2)
- Button Refresh (C3).

Information (C2)

- Module Name: shows the device name of the device connected. This parameter doesn't correspond to the Station Name of the device.

- Vendor ID: shows the unique Vendor ID assigned to Datexel S.r.I. by PI association
- FW version: shows the firmware version of the device
- Web version: shows the version of the web server
- Vendor Name: shows the vendor name (Datexel S.r.l.)
- Module Status: shows the current status of the device; refer to section CYCLIC INPUT DATA MAPPING Bytes 0/1 System Flags
- Supervising Bits for the description of values.
- Protocol: shows the communication protocol (PROFINET IO)
- PowerUp Event: shows the status of PowerUp bit (red: PowerUp event detected gray: PowerUp event reset )
- Uptime: shows the time elapsed since the moment the device was powered up.

#### Refresh (C3)

The button allows to refresh the parameters of this page reading them from the device.

#### **Digital Inputs**



The "Digital Inputs page" is composed of:

- Indication of the device connected (D).
- Menu selection (D1)
- Column of Digital Inputs (D2)
- Column of Digital Inputs State (D3)
- Column of Digital Inputs Rise Latches (D4)
- Column of Digital Inputs Fall Latches (D5)
- Column of Digital Inputs Counters (D6)
- Debouncing Time (D7)
- Functional buttons (D8)

#### Column of Digital Inputs (D2)

Divided by rows per each input shows the status of the digital input channel.

Column of Digital Inputs State (D3)

Divided by rows per each input shows the status of the digital input (red: Input state 1 - gray: Input state 0).

#### Column of Digital Inputs Rise Latches (D4)

Divided by rows per each input shows if a rise latch event for the specific digital input has occurred (checked: event occurred – unchecked: event not occurred ).

#### Column of Digital Inputs Fall Latches (D5)

Divided by rows per each input shows if a fall latch event for the specific digital input has occurred (checked: event occurred – unchecked: event not occurred ).

#### Column of Digital Inputs Counters (D6)

Divided by rows per each input shows the value of the counter associated to the specific digital input.

Debouncing Time (D7)

Shows the value in ms of the Debouncing Time.

#### Functional buttons (D8)

Contains the buttons to perform the communication;

Read: single read command sent to the device.

Continuous reading: continuos read command sent to the device.

Stop: stop the reading from the device if a continuos read command has been previously sent.

#### **Digital Outputs** DATEX PROFI NET DAT11188PN E **Digital Output E1** rk Parar l Out 4 dule Information Out ital Out 6 gital Inpu tal Out 7 Digital Outputs ec (0 = disabled) www.datexel.it

The "Digital Outputs page" is composed of:

- Indication of the device connected (E).
- Menu selection (E1)
- Column of Digital Outputs (E2)
- Column of Digital Outputs State (E3)
- Column of Digital Outputs PowerUp (E4)
- Column of Digital Outputs Safe (E5)
- Short Circuit Alarm (E6)
- Watchdog Alarm (E7)
- Watchdog Timeout (É8)
- Refresh button (E9)

Column of Digital Outputs (E2)

Divided by rows per each output shows the status of the digital output channel.

Column of Digital Outputs State (E3)

Divided by rows per each output shows the status of the digital output (red: output activated - gray: output not activated ).

#### Column of Digital Outputs PowerUp (E4)

Divided by rows per each output shows the setting to which the specific digital output will be forced to when a Powerup event occurs (checked: output will be set to state 1 – unchecked: output will be set to state 0).

Column of Digital Outputs Safe (E5)

Divided by rows per each output shows the setting to which the specific digital output will be forced to when a Safe event occurs (checked: output will be set to state 1 – unchecked: output will be set to state 0).

Short Circuit Alarm (E6)

Shows if a Short circuit alarm has occurred (checked: event occurred – unchecked: event not occurred ).

Watchdog Alarm (E7)

Shows if a Watchdog alarm has occurred (checked: event occurred - unchecked: event not occurred ).

Watchdog Timeout (E8)

Shows the value in seconds of the Watchdog Timeout; a value of 0 means that the functionality is disabled.

## Refresh (E9)

The button allows to refresh the parameters of this page reading them from the device.

#### ADDITIONAL COMMANDS TO IDENTIFY THE NETWORK IN USE

The following additional commands can be used to identify which network the PC is connected to. <u>To use the following commands, run the Command Prompt (cmd.exe) as Administrator (Pict.1).</u>

#### "Ipconfig" command

It is possible to display the networks available on the PC by typing this command and pressing Enter.

The system will return a list of all the PC networks (Pict.2). Before trying to establish a communication with the device, the user must be sure that he is in the correct subnet and network parameters have already been assigned via PROFINET DCP.

#### "Ping" command

Once the IP Address has been set, to verify if a device is connected to the network, you can use the "ping" command which is an administration utility for computer networks used to measure the time expressed in milliseconds of one or more packets to reach a network device and return origin. To use the command type the command "ping" followed by the IP address of the device and press Enter. Example:

ping 192.168.1.100

If the device is connected, the system will return the response from the device with the IP address used (Pict.3).

If the system returns the "Destination host unreachable" message, the device is not connected to the network in use.

In this case, it is suggested to check the assignment of the network parameters.

Pict. 1		Pict. 2	
		🔤 Administrator: Command Prompt 📃	×
All Apps Documents Setting:	s Web More 🔻	Microsoft Windows [Version 10.0.18362.418] (c) 2019 Microsoft Corporation. All rights reserved.	^
Best match		C:\WINDOWS\system32>ipconfig	
Command Prompt		Windows IP Configuration	
Anne	G Run as administrator	Ethernet adapter Ethernet:	
<ul> <li>Node.js command prompt</li> <li>Prompt dei comandi degli strumo nativi di VS2015 x64</li> </ul>	Run as different user       I Open file location      =       Pin to Start	Connection-specific DNS Suffix .: Link-local IPv6 Address : fe80::9c67:4c59:b502:f8c7%7 IPv4 Address : 192.168.1.163 Subnet Mask : 255.255.255.0 Default Gateway : 192.168.1.1	
<ul> <li>Prompt dei comandi degli strume ARM di VS2015 x86</li> </ul>		C:\WINDOWS\system32>_	
Search the web C cmd - See web results	Run ▷ Ope -⊐ Pint		
Settings (1)	-🛱 Pin t		~

#### Pict. 3

🔤 Administrator: Command Prompt	_	х
C:\WINDOWS\system32>ping 192.168.1.100		^
Pinging 192.168.1.100 with 32 bytes of data: Reply from 192.168.1.100: bytes=32 time<1ms TTL=100 Reply from 192.168.1.100: bytes=32 time=1ms TTL=100 Reply from 192.168.1.100: bytes=32 time=1ms TTL=100 Reply from 192.168.1.100: bytes=32 time=1ms TTL=100		
Ping statistics for 192.168.1.100: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 0ms, Maximum = 1ms, Average = 0ms		
C:\WINDOWS\system32>ping 192.168.1.123		
Pinging 192.168.1.123 with 32 bytes of data: Reply from 192.168.1.163: Destination host unreachable. Reply from 192.168.1.163: Destination host unreachable. Reply from 192.168.1.163: Destination host unreachable. Reply from 192.168.1.163: Destination host unreachable.		
Ping statistics for 192.168.1.123: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),		
C:\WINDOWS\system32>		$\sim$

## **EXAMPLE TO CHECK WINDOWS ® CONFIGURATION**

This example shows how to change the IP of the Personal Computer (the graphics and the procedure change in relation to the operating system in use) in order to allow the search for the device on the network. To do this a valid IP address must have been assigned to the device via PROFINET DCP.

1) Access to Control Panel -> Network and Sharing Center

Control Panel\All Control Panel Items								-		×
+					Search Control Panel			P		
File Edit View Tools										
Adjust your computer's settings							View by: Lar	ge icons *		
Administrative Tools		AutoPlay	*	Backup and Restore (Windows 7)	1	Color Manage	ment			
Credential Manager	<b>P</b>	Date and Time	6	Default Programs		Device Manag	er			
Devices and Printers	0	DTS Audio Control Panel	C	Ease of Access Center		File Explorer C	ptions			
File History	۶	Flash Player (32-bit)	A	Fonts	R	Indexing Optic	ons			
Internet Options	0	IObit Uninstaller	-	Java	~	Keyboard				
Mouse		Network and Sharing Center	3	Phone and Modem	1	Power Options	6.			
Programs and Features		Recovery	8	Region	1	RemoteApp ar Connections	nd Desktop			
Y Security and Maintenance	۲	Sound	Ş	Speech Recognition	) H	Storage Space	5			
Sync Center	9	System	8	Taskbar and Navigation		Troubleshooti	ng			
See Accounts	-	Windows Defender Firewall		Work Folders						

#### 2) Network and Sharing Center $\rightarrow$ *Change Adapter Settings*

# 3) Change Adapter Settings → select the interested network → right click → Properties

Properties



4) Properties  $\rightarrow$  Internet Protocol version 4  $\rightarrow$  Properties



5) Change parameters and click OK.

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