



STAD

Profibus-Profinet EthernetIP-EtherCat COBRA / TAIPAN 365



USER MANUAL, CONFIGURATION,
INSTALLATION OF PROFIBUS/PROFINET
ETHERNET IP/ ETHERCAT
ETHERNET MODBUS/TCP NETWORKS
“OPTIONAL CARDS”



2006/42/EEC

Rev. #	Date	Topic	Initials
2.1	23/10/2018		

Product overview

The purpose of this manual is to provide an aid in the configuration and management of the Profibus Profinet - EtherNet/IP - EtherCat - EtherNet TCP and EtherNet ModBus/TCP networks between PLC and Cobra Taipan 365.

IMPORTANT: the control unit does not support direct communication with the field via the listed protocols but requires the installation of one of the two converter cards on the instrument.

NOTE: *Since the card is optional, it must be requested when ordering.*

The converters “translate” the FIELDBUS telegrams to MODBUS-RTU strings which can be understood by the instrument. As explained later in the manual, the converter does not need to be configured, so it does not have an address in either of the networks in which it operates. For this reason, it is necessary to install a converter card for each device on the network. In this manual there are some writing/reading examples, the registers refer to the Cobra 365 instrument; for the Taipan, the procedure is the same but the address of the registers can be different. The complete tables of the Cobra 365 and Taipan 365 registers are shown at the end of this manual.

The instruments have a default standard configuration of the areas with 2 INPUT pages and 8 OUTPUT pages already filled in (INPUT 128 bytes + OUTPUT 128 bytes).

Through special parameters it is possible to reduce the size of the INPUT and OUTPUT areas (32/64/96/128 bytes).

Alternatively, through a dedicated application **PWIN75** (downloadable from our website), you can fill in the I/O areas as you wish: the application allows you to associate a parameter to each register.

You can customise up to 2 INPUT pages and 1 OUTPUT page.

When customising the areas, it is necessary to store the instrument configuration so that you can replicate it in case you need to replace the instrument.

Features common to all protocols

Selectable protocols

The selectable fieldbus protocols are the following: PROFIBUS – PROFINET – ETHERNET IP - ETHERCAT.

Fieldbus protocols are managed via fieldbus/serial communication interfaces (optional hardware modules installed internally).

To configure the protocol in the weighing control unit, use the following path:

MENU → TECHNICAL MENU → COMM. PORTS → COM1 PROTOCOL

PROFINET interface. The instrument can manage 3 different PROFINET interface modules (HMS, HILSCHERnic50 or HILSCHERnic52).

The PROFINET interface model is factory-set during production, however, it can be checked or modified as follows: Press the SETUP icon at the top right corner when the interface is switched on.

FACTORY SETUP → password 1605 → ENTER → PROFINET MODEL

Select Hilscher for the cards: HILSCHERnic50 or HILSCHERnic52 (installed from 2019 onwards)

Select HMS for HMS card (installed until 2019)

The **ETHERNET/IP** and **ETHERCAT** interfaces are installed internally and provide for the management of HILSCHER modules only. Therefore, it is not necessary to set the installed card model.

Data area size

Starting from Rel. 2.13 (Cobra365) and Rel.1.95 (Taipan 365), it has been implemented the possibility to select the size of the output and input pages of the fieldbus (32, 64, 96 or 128 Bytes) through dedicated parameters (“Input Area” and “Output Area”).

In previous versions, the input and output areas have a set size (128 Bytes).

To configure the size of the input and output areas in the weighing control unit, use the following path:

MENU → TECHNICAL MENU → COMM. PORTS → INPUT AREA or OUTPUT AREA

INPUT DATA AREA - Data produced by the instrument and read by the master

Input area size: **32, 64, 96 or 128 bytes (64 registers) by default.**

Single registers size: **16 bits.**

Registers update frequency: **10 Hz.**

The instrument manages 2 different INPUT DATAAREAS. The input page is selected by writing in the command register (bytes 0-1 of the output area) the corresponding value, as shown in the table at the bottom of the manual

OUTPUT DATA AREA - Data written by the master and acquired by the instrument

Output area size: **32, 64, 96 or 128 bytes (64 registers) by default.**

Single registers size: **16 bits.**

Registers acquisition frequency: **10 Hz.**

CUSTOMISED MAPPING OF INPUT/OUTPUT AREAS

The registers contained in the INPUT DATA AREA and OUTPUT DATA AREA can be customised by the user using a dedicated application that can be downloaded from our website (see paragraph “*Customised mapping of INPUT and OUTPUT areas*”).

Endianness

By using the appropriate ENDIANNESS F. parameter it is possible to select the endianness in the fieldbus registers (16 bit register size).

This selection allows you to use the **BIG-ENDIAN** (default selection) or **LITTLE-ENDIAN** order.

To configure the endianness in the weighing control unit, use the following path:

MENU → TECHNICAL MENU → COMM. PORTS → ENDIANNESS F.

Summary of available cards and software

Listed software and utilities are available for download on our website: www.stadsrl.com:

PROFIBUS

GSD configuration file: *hms_1810.gsd*.

For the customisation of IN+OUT AREAS:

Utility for the customisation of IN+OUT AREAS: *PWIN75*

Area configuration file relevant to the instrument release: *CFG_PWTSXX_Rel_ENG.csv*

PROFINET HMS

XML configuration file: *GSDML-V2.3-HMS-ABICPRT-20130219.xml*.

Tool for Name and IP address setting: *Ethernet Device Configuration*

For the customisation of IN+OUT AREAS:

Utility for the customisation of IN+OUT AREAS: *PWIN75*

Area configuration file relevant to the instrument release: *CFG_PWTSXX_Rel_ENG.csv*

PROFINET HILSCHER (*nic50 & nic52*)

XML configuration file: *GSDML-V2.33-HILSCHER-NIC 5X-RE PNS-20170704.xml*.

Tool for Name and IP address setting: *Ethernet Device Configuration*

For the customisation of IN+OUT AREAS:

Utility for the customisation of IN+OUT AREAS: *PWIN75*

Area configuration file relevant to the instrument release: *CFG_PWTSXX_Rel_ENG.csv*

ETHERNET/IP

EDS configuration file:

- *HILSCHER NIC 52-RE EIS V1.1 -32.EDS* (input area 32 bytes, output area 32 bytes).
- *HILSCHER NIC 52-RE EIS V1.1 -64.EDS* (input area 64 bytes, output area 64 bytes).
- *HILSCHER NIC 52-RE EIS V1.1 -96.EDS* (input area 96 bytes, output area 96 bytes).
- *HILSCHER NIC 52-RE EIS V1.1 -128.EDS* (input area 128 bytes, output area 128 bytes).

For the customisation of IN+OUT AREAS:

Utility for the customisation of IN+OUT AREAS: *PWIN75*

Area configuration file relevant to the instrument release: *CFG_PWTSXX_Rel_ENG.csv*

ETHERCAT

XML configuration file:

- *Hilscher NIC 52 RE ECS V4.2.X 32 Byte.xml* (input area 32 bytes, output area 32 bytes).
- *Hilscher NIC 52 RE ECS V4.2.X 64 Byte.xml* (input area 64 bytes, output area 64 bytes).
- *Hilscher NIC 52 RE ECS V4.2.X 96 Byte.xml* (input area 96 bytes, output area 96 bytes).
- *Hilscher NIC 52 RE ECS V4.2.X 128 Byte.xml* (input area 128 bytes, output area 128 bytes).

For the customisation of IN+OUT AREAS:

Utility for the customisation of IN+OUT AREAS: *PWIN75*

Area configuration file relevant to the instrument release: *CFG_PWTSXX_Rel_ENG.csv*

ETHERNET MODBUS/TCP

Utility for IP address configuration: *PWIN33*

PROFIBUS-DP

Main features

Connection: **D-SUB 9P MALE Profibus connector**

GSD configuration file: ***hms_1810.gsd***.

Input area size: **32, 64, 96 or 128 bytes (64 registers)**.

Output area size: **32, 64, 96 or 128 bytes (64 registers)**.

Communication address: ***programmable via instrument***.

Configuring the communication on the instrument

To configure the weighing control unit, use the following path:

MENU → **TECHNICAL MENU** → **COMM. PORTS** →

COM1 PROTOCOL → **Select PROFIBUS**

COM1 BAUD RATE → **set to 38400**

PROFIBUS ADDRESS → **Select** the address corresponding to the network configuration

COM1 ADDRESS → set 1

After entering the new data, click the ESC key until you reach the data saving page and save to confirm the changes made.

Communication between the instrument and the PROFIBUS interface is carried out via the Modbus RTU serial protocol, the address (slaveModbus) of the module is fixed (**01**).

The communication baud rate is automatically forced as soon as the protocol is selected and is fixed (38400 bits/sec).

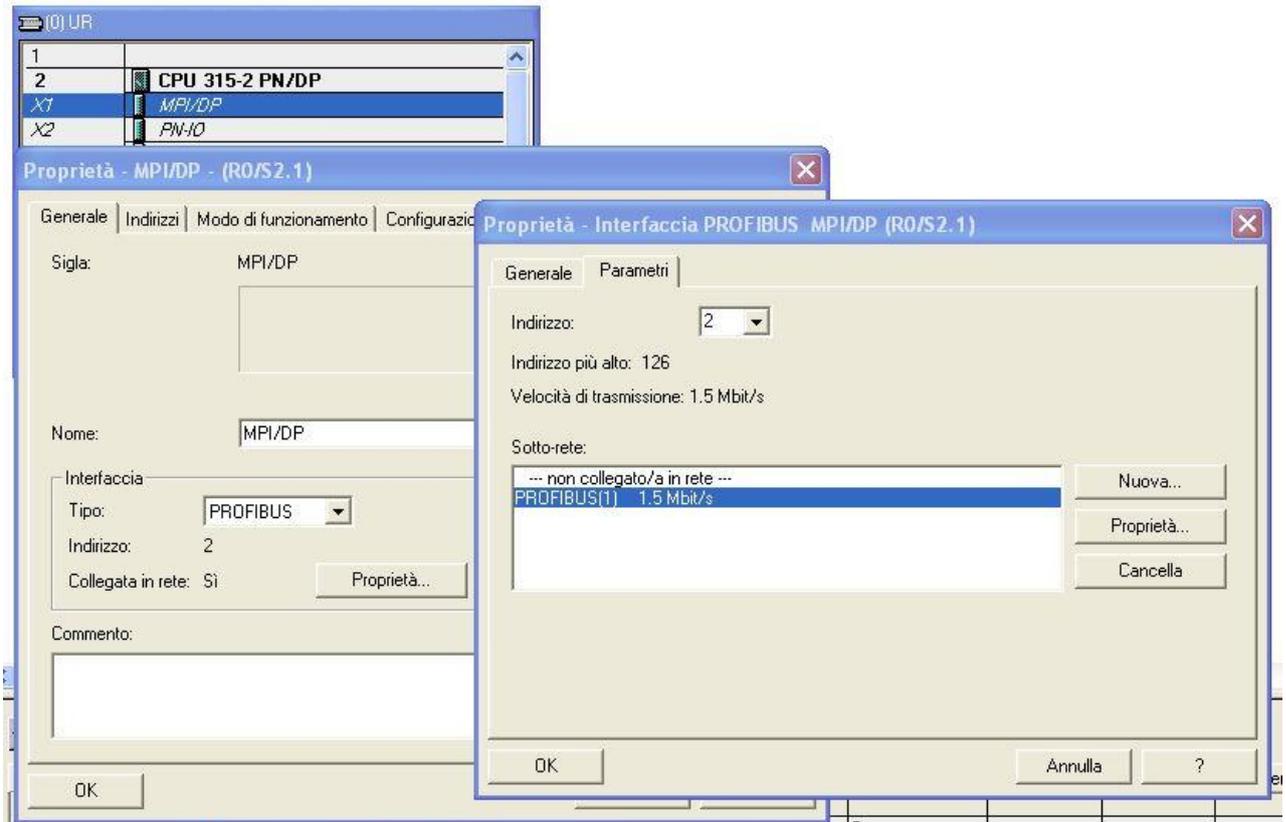
The timeout on the response is set to 300mS.

NOTE: it is necessary to activate the termination resistors on the 2 devices located at the end of the network.

Configuring the communication on PLC side

In this network, the PLC performs the function of PROFIBUS-DP master and the instrument acts as a slave unit. Therefore, configure first the PROFIBUS-DP communication between master and slave.

In the "Hardware Configuration" software within the Simatic Manager, add the PLC CPU and configure the network as follows:



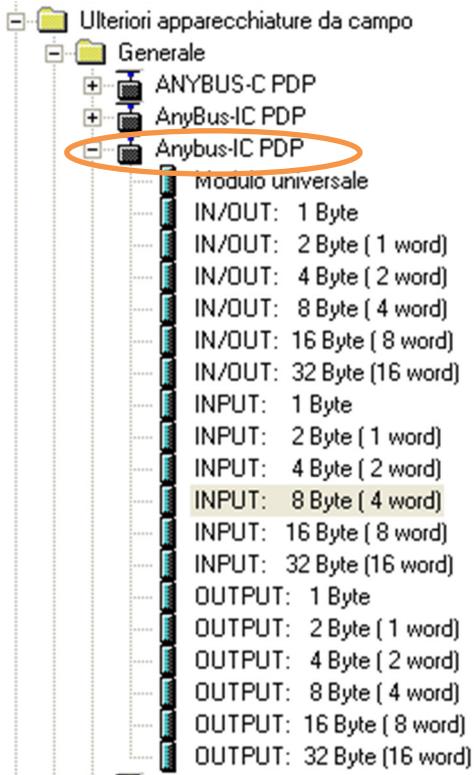
As shown in the previous image, it is **COMPULSORY** to configure the network at a speed of 1.5 Mbit/s.

At this point, add the instrument in the configuration of the PROFIBUS-DP network.

As mentioned above, the COBRA 365 does not communicate directly over the PROFIBUS-DP network, but it uses a network adapter, which is why in the configuration of the DP network the adapter will be added instead of the COBRA-TAIPAN 365 control unit.

Once you install the GSD file (hms_1810.gsd) of the "PROFIBUS-DP Module" go to the "Catalogue" window using the following path:

PROFIBUS-DP → Other field appliances → General



Once the module is added to the network, a screen page will request the PROFIBUS-DP address to be assigned to the module (in the following example address 3 has been assigned to the module).

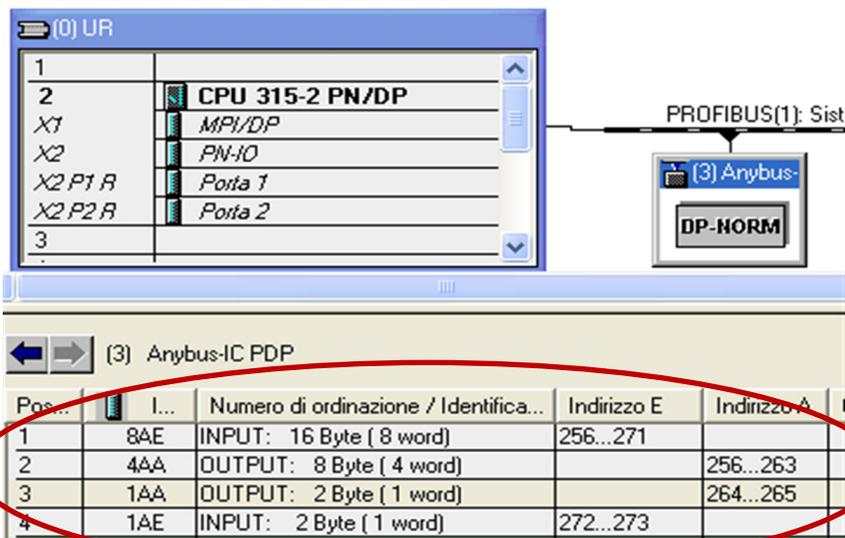
How many data exchange bytes should be entered?

At this point, enter the IN and OUT bytes necessary to read and write the registers of the COBRA-TAIPAN 365 control unit.

The amount of bytes to be exchanged between the network PLC Master and the weighing control unit depends on how many registers you want to use in the management software of the machine.

It is possible to enter IN and OUT modules without a specific order, even mixing them.

The PLC will sort the data in a consistent way and make them available to the user program. Below is a sample configuration of unsorted devices:



PROFINET IO

Main features

PROFINET HILSCHER

Connection: **Double Profinet RJ45 connector**

Allowed connections: loop connection through internal or star switch or through external switch.

XML configuration file: **GSDML-V2.33-HILSCHER-NIC 5X-RE PNS-20170704.xml**.

Input area size: **32, 64, 96 or 128 bytes (64 registers)**.

Output area size: **32, 64, 96 or 128 bytes (64 registers)**.

Communication address: **not programmable via instrument**.

Baud Rate: 100MBit/s

PROFINET IO Real Time (RT) communication

Modbus TCP/Server

Up to 144 bytes of Fieldbus i/o in each direction

Configuring the communication of COBRA 365 control unit

To configure the weighing control unit, use the following path:

MENU → **TECHNICAL MENU** → **COMM. PORTS** →

COM1 PROTOCOL → Select **PROFINET**

COM1 BAUD RATE → **set to 115200**

COM ADDRESS → Select **1**

After entering the new data, click the ESC key until you reach the data saving page and save to confirm the changes made.

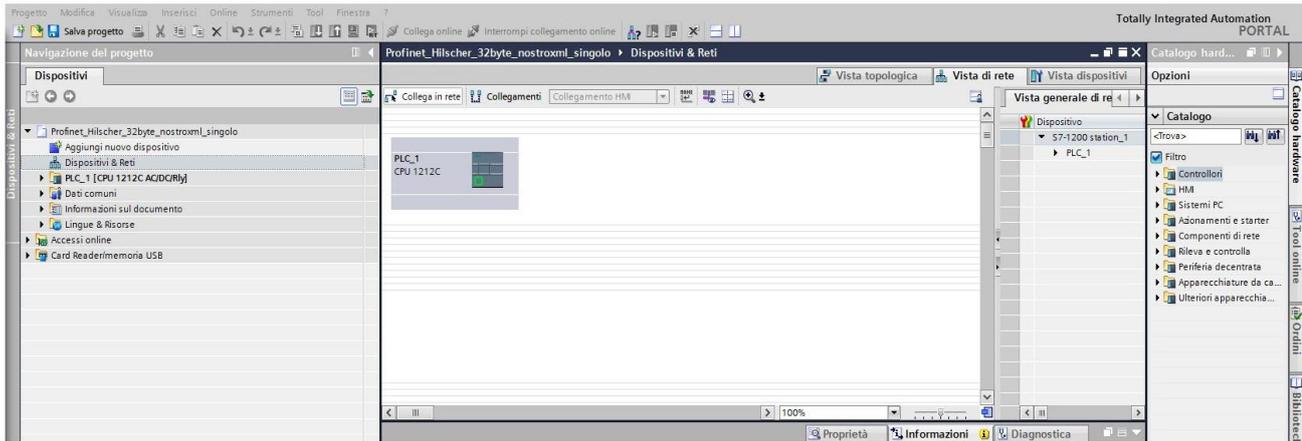
Connecting the instruments to the network

In case of Profinet protocol, the two ports are interchangeable if the instrument is connected to a switch (star connection). It is also possible to use the internal switch of the module by connecting several instruments in series.

Configuration on PLC side through TIA Portal

Import the device description file **GSDML-V2.33-HILSCHER-NIC 5X-RE PNS 20170704.xml**

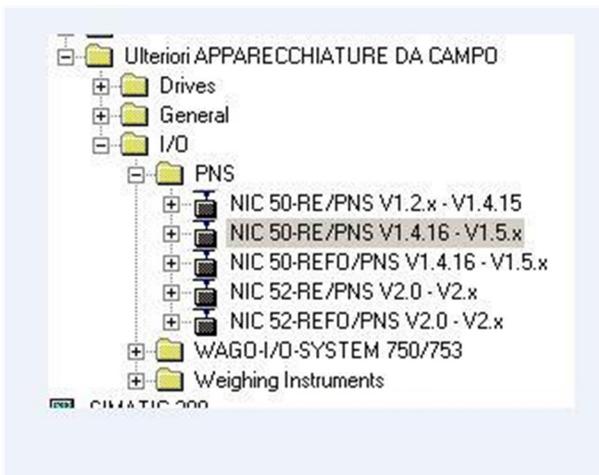
Once this file has been successfully installed, in the “Devices & Networks” window, add the device through the catalogue research function.



The device is in the following path: *Additional field devices* → *PROFINET IO* → *I/O* → *Hilscher Gesell....* → *PNS*
The folder contains various devices. The following cards can be installed on our instruments:

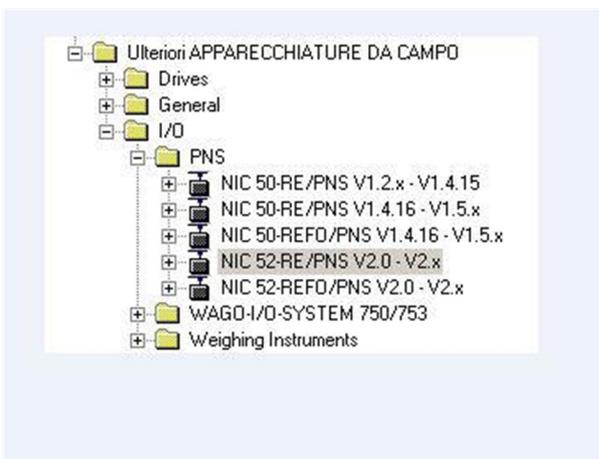
“NIC 50” interface card (supplied until the beginning of 2019)

Select the model shown in the image

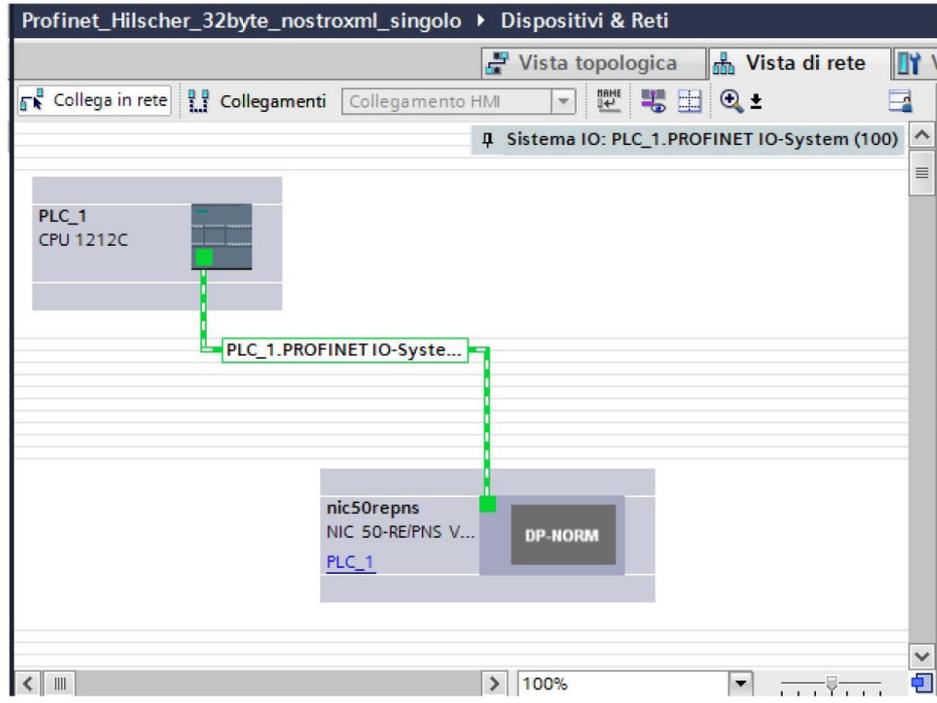


“NIC 52” interface card (supplied from 2019 onwards)

Select the model shown in the image



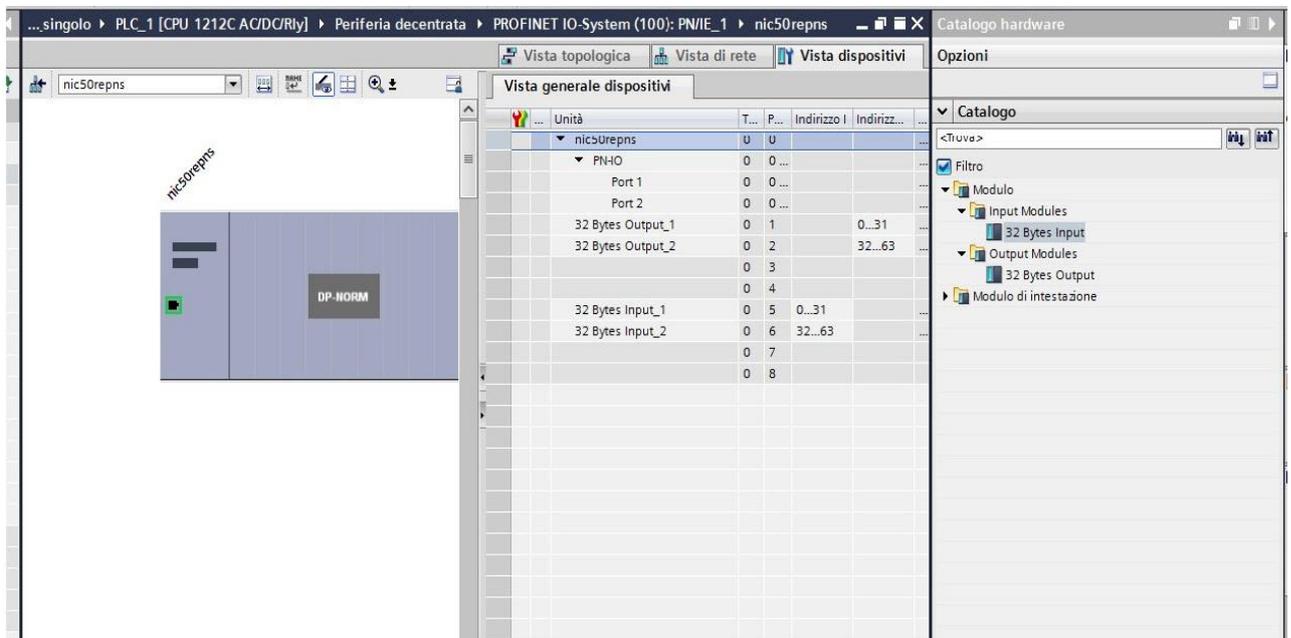
Once you have found the model, drag it inside the project and connect it to the Master Network



Once the connection has been established, it is possible to insert within the module up to 4 32-byte slots in input and output areas (up to max. 128 bytes for each area)



Note: Use only 32 byte slots as slots of other sizes will not be managed.

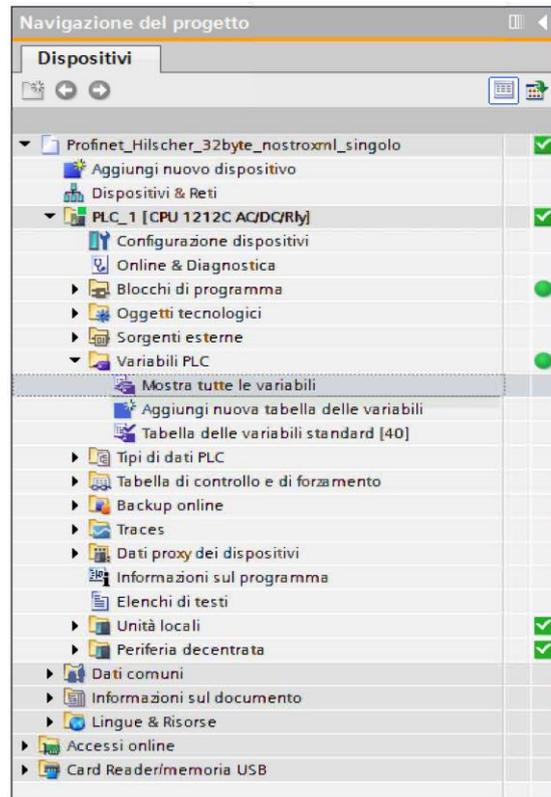


The screenshot shows the 'Vista dispositivi' (Device View) for the 'nic50reps' module. The main window displays a rack diagram with the 'DP-NORM' module. The 'Vista generale dispositivi' (General Device View) table is shown below:

Unità	T...	P...	Indirizzo 1	Indirizz...
nic50reps	U	U		
PNHO	0	0	...	
Port 1	0	0	...	
Port 2	0	0	...	
32 Bytes Output_1	0	1	0...31	
32 Bytes Output_2	0	2	32...63	
		3		
		4		
32 Bytes Input_1	0	5	0...31	
32 Bytes Input_2	0	6	32...63	
		7		
		8		

The right-hand pane shows the 'Catalogo hardware' (Hardware Catalog) with 'Opzioni' (Options) set to 'Filtro'. The catalog lists 'Modulo' (Module) with sub-categories for 'Input Modules' (32 Bytes Input) and 'Output Modules' (32 Bytes Output).

The instrument, has an invalid name and an IP address of 0.0.0.0. as factory default. Therefore, it is necessary to connect the device to the network and assign the desired name and IP address. After loading the program on the PLC, it will be possible to connect and check the correct connection of the instrument, as shown in the following picture.



Posto connettore	Unità	Numero di ordina...	Indirizzo E	Indirizzo A	Indir...	Commento
0	Cobra365-1	ABIC-FRT			2042 ^{nc}	
1	Input 128 bytes		300...427			
2	Output 064 bytes			300...363		

The moment you insert a device on the PROFINET network, the Simatic Manager automatically assigns to each of them an **update time** of 4ms. In the case of Cobra 365 units, update time must be set to at least 32ms (this value also depends on the extension and articulation of the PROFINET network in which the Cobra 365 units are inserted).

To change the update time of each Cobra 365, access the properties of the PROFINET network (as shown below), Update time section.

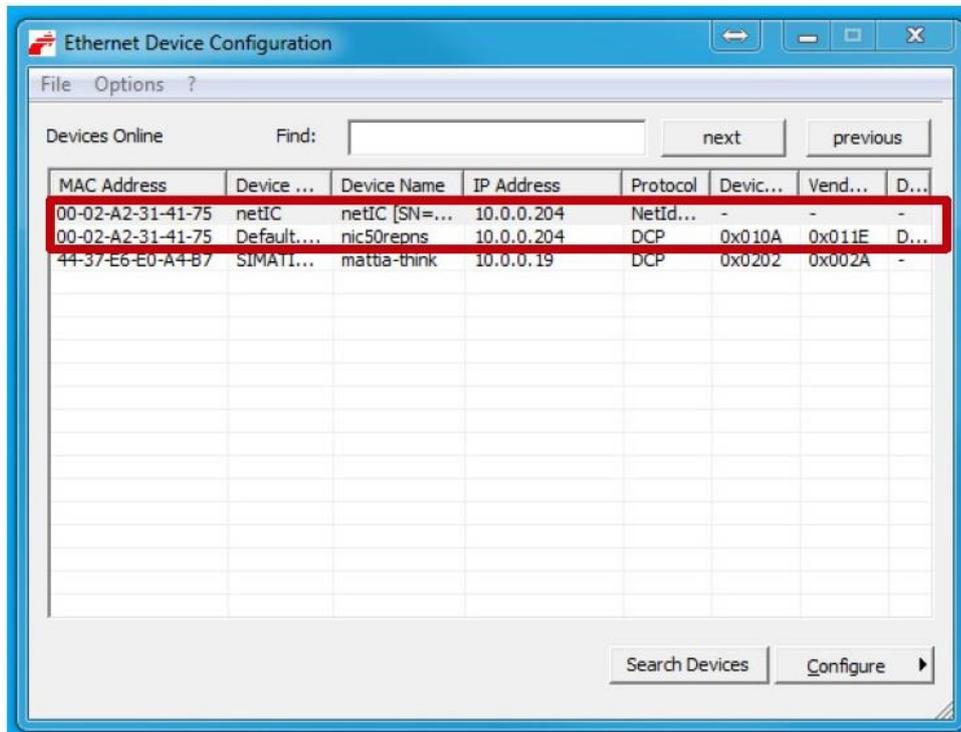
Select the Cobra 365 device for which you want to change the values and:

- In the **Mode** column, change from Automatic to Update time
- In the **Update Time (ms)** column, change the default value (4ms) in 32ms. As mentioned earlier, this value may also depend on the same network, then you may need to increase it further.

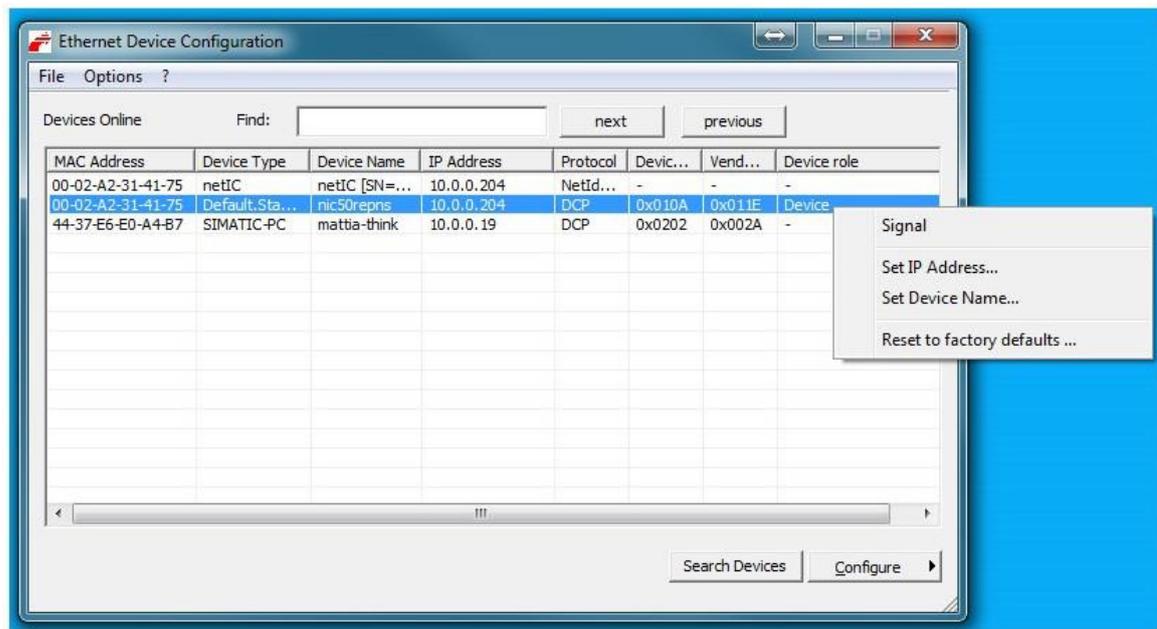
Setting the name and IP address using a dedicated software.

As an alternative to the TIA PORTAL application, it is possible to set the name and IP address of the Profinet instruments. Use the **Ethernet Device Configuration** tool (supplied by us) to set the name and IP address of the Profinet instruments.

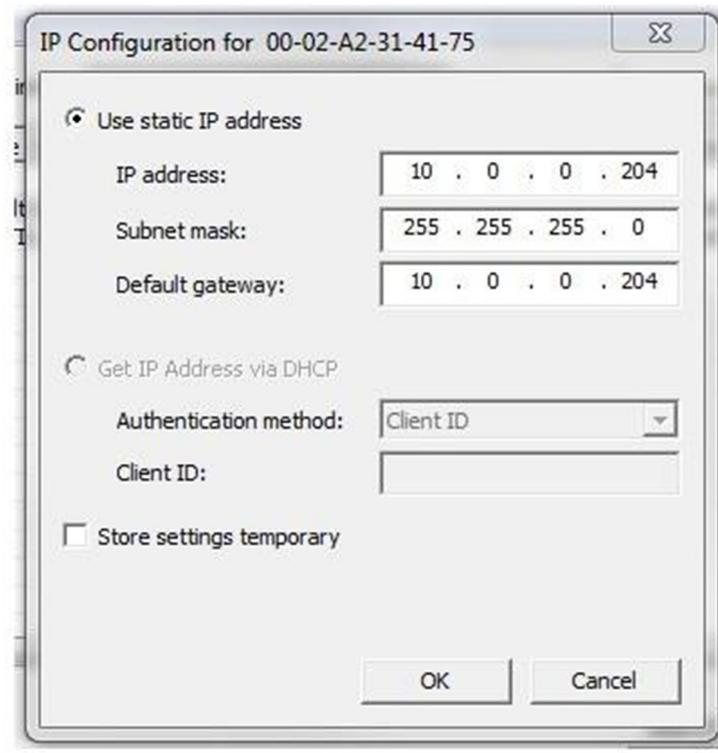
Open the software and select "Search Devices": all network devices shall be shown. For each Profinet instrument, two Devices will be shown (see picture). It can be understood they refer to the same instrument because they have the same MAC address.



Between the two available options, select the one that has the DCP protocol and right-click on it.



At this point, it is possible to set the IP address by selecting Set IP Address.



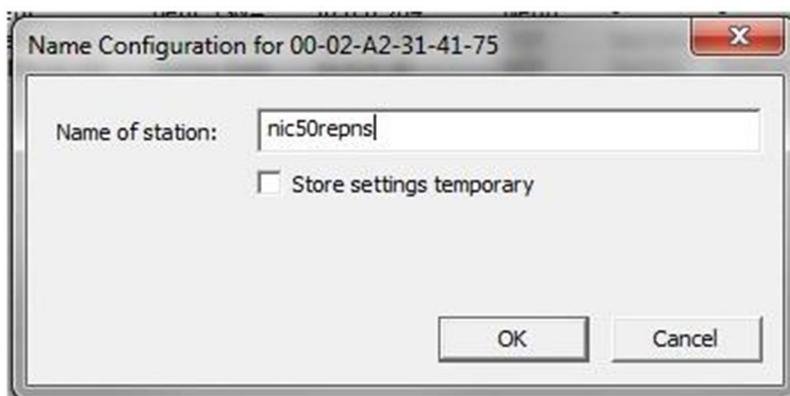
Type the desired values. Values can be saved in definitive or temporary basis according to the selection of "Store Settings Temporary" option.

By selecting the option, after turning off and on the instrument, the previously set values will be all equal to 0.0.0.0.

By deselecting the option, these values will be permanently saved.

The same procedure applies for setting the Profinet name, by selecting "Set Device Name".

Also in this case, if "Store Settings Temporary" is selected, when the instrument is turned on again the name will be empty.



By selecting "Reset to factory defaults", all address parameters will be reset to 0.0.0.0. and the name will be invalid.

ETHERNET IP

Main features

The instrument works as slave in an ETHERNET/IP network.

Connection: **Double Profinet RJ45 connector**

EDS configuration file: **HILSCHER NIC52-RE EIS V1.1-128.EDS**

Input area size: **32, 64, 96 or 128 bytes (64 registers).**

Output area size: **32, 64, 96 or 128 bytes (64 registers).**

Communication address: **IP address and subnet mask can be programmed via the instrument**

10 and 100 Mbit operation, Full and Half Duplex

Up to 128 bytes of Fieldbus I/O in each direction

Configuring the communication of COBRA 365 control unit

To configure the weighing control unit, use the following path:

MENU → TECHNICAL MENU → COMM. PORTS →

COM1 PROTOCOL → Select *ETH/IP*

ETHERNET/IP IP + ETH/IP S. Mask → Select the desired network data

COM ADDRESS → Select **1**

Instruments with Ethernet/IP module are supplied with IP address of 10.0.0.201.

The size of the Input and Output areas set in the PLC must match the size of the input and output areas of the instrument (128 bytes for input area, 128 bytes for output area by default).

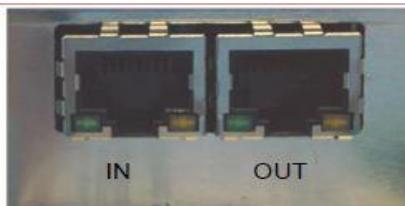
ETHERCAT

Main features

Card type: HILSCHER nic-52

Connection: **Double Profinet RJ45 connector**

The EtherCat protocol requires that the instruments are connected through a loop connection; the master will be connected to the IN of the first instrument whose OUT will connect to the IN of the second instrument, etc.



XML configuration file: **HILSCHER NIC 52 RE ECS V.4.2.x 128 Byte.xml.**

Input area size: **32, 64, 96 or 128 bytes (64 registers).**

Output area size: **32, 64, 96 or 128 bytes (64 registers).**

Communication address: **not programmable via instrument.**

The size of the Input and Output areas set in the PLC must match the size of the input and output areas of the instrument (128 bytes for input area, 128 bytes for output area by default).

Configuring the communication of COBRA 365 control unit

To configure the weighing control unit, use the following path:

MENU → TECHNICAL MENU → COMM. PORTS →

COM1 PROTOCOL → Select **ETH/IP**

COM1 BAUD RATE → **set to 115200**

COM ADDRESS → Select **1**

ETHERNET TCP/IP

This Ethernet card is transparent for the Cobra/Taipan instrument; program the instrument as for a normal serial interface (MODBUS or ASCII).

The IP network address and other parameters are configured using our **PWIN33** PC software (instructions available directly from the program).

Through this interface, it is possible to exchange all the parameters listed in the MODBUS REGISTER LIST table, which is attached to the specific manual of the instrument.

Supported protocols: **TCP, Modbus/TCP, UDP, IP, ICMP, ARP**

Communication modes: **TCP server**

Indicator LEDs (2): **Ethernet line and communication/diagnostics presence**

Buffer size: **256 bytes**

Connection Timeout: **Min 30 seconds - Max 90 seconds**

Link Timeout (disconnected cable): **30 seconds**

Note: The Ethernet cable RJ45 has a variable maximum length, depending on the type of cable. A common Cat5 shielded cable may have a maximum length of about 180 m.

It is possible to connect the Ethernet communication port directly to the PC without using other network devices (routers, switches, hubs, LAN-bridge or other), but special RJ45 cables, called "crossover" cables, should be used.

Normally, the cables are "direct" and allow the connection to network devices such as routers or hubs, but do not directly connect two PCs (although currently there are network cards with auto-sensing technology, which recognise the type of cable and the type of connection allowing direct PC-PC connections also using cables other than "crossover").

Configuring the communication of COBRA 365 control unit

To configure the weighing control unit, use the following path:

MENU → **TECHNICAL MENU** → **COMM. PORTS** →

COM1 PROTOCOL → **Select MODBUS or ASCII**

COM1 BAUD RATE → **selectable**

COM ADDRESS → **Select 1**

Communication address: **IP address and SUBNET can be configured through the utility PWIN33**

DATA AREAS

COMMON TO ALL PROTOCOLS EXCEPT ETHERNET MODBUS/TCP

Normally, data is exchanged via two predefined areas already present in the instrument requiring no configuration:

- INPUT DATA AREA (2 pages) Areas in which the master PLC READS the data of the control unit
- OUTPUT DATA AREA (8 pages) Area in which the master PLC WRITES the data of the control unit

Both areas are divided into groups (called PAGES) of preset registers.

You can also configure in the instrument which and how many registers you want to read and write from the master using a specific application (see “Customised mapping of I/O areas”). Full list of programmable registers.

The Cobra365 and Taipan 365 instruments are managed in the same way, what differs is the layout of the INPUT and OUTPUT areas.

Refer to the tables of DATA EXCHANGE AREAS at the end of this manual.

Operating instructions

Reading/writing registers

Reading registers *(PLC receives data from the instrument)*

The register division into groups makes it impossible to read them one at a time.

The instrument sends the values of the registers of the active PAGE to the network master, following their order within the PAGE. Therefore, for instance, it is not possible to read only the "Set Point" register, but it is necessary to enable the reception for all the registers in the PAGE and preceding the value that you want to receive. Below is an example that should help you better understand the data reading mechanism via the COBRA 365:

If you want to read the "Set Point" register 3016 you must configure at least 7 words in reading mode from the PLC side. This is because the communication converter transmits the registers of the INPUT DATA AREA PAGE to the PLC, ALWAYS starting from the first register preconfigured in the same PAGE (then "Input page number" register 6001).

Then (assuming you have configured the periphery of the Master PLC with address from PEW256) data exchange will be as follows:

COBRA 365 INPUT DATA AREA [01]		PLC Master PROFIBUS-DP
6001 - Input page number	----->	PEW 256
3011 - Flowrate	----->	PEW 258
3012 - Total H	----->	PEW 260
3013 - Total L	----->	PEW 262
3014 - Grand Total H	----->	PEW 264
3015 - Grand Total L	----->	PEW 266
3016 - Set point	----->	PEW 268

This is the only procedure to read any register that COBRA 365 makes available through the FieldBus network.

Given that the INPUT DATA AREAS are 2, it is necessary to select which area you want to read.

To activate the reading of an INPUT DATA AREA page, simply write the page number in the register 5001 "Command Register" of any OUTPUT DATA AREA (1 for the INPUT DATA AREA 01 - 2 for the INPUT DATA AREA 02).

To read the registers of an INPUT DATA AREA page not active, write the page number to be activated in the register 5001 "Command Register" of the OUTPUT DATA AREA (the procedure is explained in the next chapter).

COMMAND REGISTER table	
Value	Command
01	<i>INPUT DATA AREA selection page 1</i>
02	<i>INPUT DATA AREA selection page 2</i>

Writing registers *(PLC sends data to the instrument)*

The first 4 registers (8 bytes) of the OUTPUT AREA, common to all OUTPUT AREA pages, are acquired directly and continuously by the instrument.

OUTPUT DATA AREA (01)		
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7

Using the first 3 registers we have 2 possibilities:

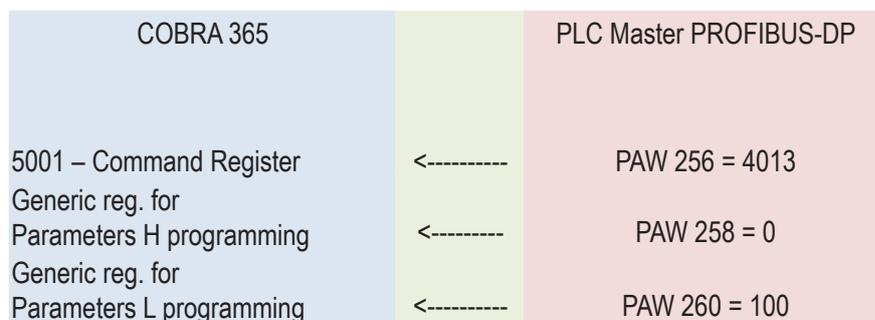
1. Write ONE register at a time
2. Write ALL registers of a PAGE at the same time

To stop any active writing, set "Command Register" to 0.

Editing the content of a register

To edit the content of a register it is necessary to write the new value in the registers "Generic register for Parameters programming" and the address of the register in the "Command Register".

If, for example, you want to write the number 100 in register 4013 "Manual Out," and you configured the periphery of the Master PLC with address starting from PAW256, the PLC should perform the following writings:



Caution: in order to avoid the continuous updating of the parameters, most of which are written in E2PROM, a control is available.

To make 2 consecutive writings of the same parameter, write 0 in the command register first.

Example: after writing 100 in the register 4013 "Manual Out" (see example above), you want to change the parameter and write 50.

To do this, the PLC must perform the following writings:

COBRA 365		PLC Master PROFIBUS-DP
5001 – Command Register Generic reg. for Parameters H programming	<-----	PAW 256 = 0
Generic reg. for Parameters L programming	<-----	PAW 258 = 0
5001 – Command Register	<-----	PAW 260 = 50
	<-----	PAW 256 = 4013

Editing the content of an entire PAGE

To edit the content of all registers of an area page write the new value in the bytes of the periphery corresponding to the location of the registers in the PAGE, and the necessary command in the "Command Register".

Below is a writing example of PAGE 1:

COBRA 365 OUTPUT DATA AREA [01]		PLC Master PROFIBUS-DP
5001 – Command Register	<-----	PAW 256 = 4010
Generic reg. for Parameters H programming	<-----	PAW 258
Generic reg. for Parameters L programming	<-----	PAW 260
Test Register	<-----	PAW 262
Num. Set	<-----	PAW 264
Auto / Man	<-----	PAW 266
Manual Out	<-----	PAW 268
Var. Setpoint	<-----	PAW 270
Specific weight	<-----	PAW 272
Ext. IO module 1 INPUT	<-----	PAW 274
Ext. IO module 1 OUTPUT	<-----	PAW 276
Ext. IO module 2 INPUTS	<-----	PAW 278
Ext. IO module 2 OUTPUTS	<-----	PAW 280

The 4010 command written in the "Command Register" in the example above is used to write PAGE 1 of OUTPUT DATA AREA. Special commands are provided to write the other available PAGES; all the commands to write whole PAGES are listed in the following table:

Tabella COMMAND REGISTER	
Valore	Comando
01	Selezione INPUT DATA AREA Pag. 1
02	Selezione INPUT DATA AREA Pag. 2
4010	Programmazione intera OUTPUT DATA AREA Pag. 1
2040	Programmazione intera OUTPUT DATA AREA Pag. 2
2000	Programmazione intera OUTPUT DATA AREA Pag. 3
1000	Programmazione intera OUTPUT DATA AREA Pag. 4
1040	Programmazione intera OUTPUT DATA AREA Pag. 5
10	Programmazione intera OUTPUT DATA AREA Pag. 6
150	Programmazione intera OUTPUT DATA AREA Pag. 7
1060	Programmazione intera OUTPUT DATA AREA Pag. 8
5000	Programmazione intera OUTPUT DATA AREA Pag. 9
32767 (7FFFh)	Programmazione intera OUTPUT personalizzata

WARNING: using the writing command of a PAGE, all registers of the page will be overwritten! Pay particular attention to the use of this feature to avoid unnecessary register changes!

The registers are written only once; the command register must be reset before writing again.

Special commands

For certain operations on the instrument using the PROFIBUS-DP network, you must use special commands. Basically, you have to write the code for the command in the two generic registers and the register address for the command in the "Command Register".

In this case, the register on which you need to act is the "Command Register", so write the value 5001 inside it.

The special commands available are the following:

reset total – command code 1

COBRA 365 OUTPUT DATA AREA [01]		PLC Master PROFIBUS-DP
5001 – Command Register	<-----	PAW 256 = 5001
Generic reg. for Parameters H programming	<-----	PAW 258 = 0
Generic reg. for Parameters L programming	<-----	PAW 260 = 1

reset belt – command code 2

COBRA 365 OUTPUT DATA AREA [01]		PLC Master PROFIBUS-DP
5001 – Command Register	<-----	PAW 256 = 5001
Generic reg. for Parameters H programming	<-----	PAW 258 = 0
Generic reg. for Parameters L programming	<-----	PAW 260 = 2

save Data – command code 3

COBRA 365 OUTPUT DATA AREA [01]		PLC Master PROFIBUS-DP
5001 – Command Register	<-----	PAW 256 = 5001
Generic reg. for Parameters H programming	<-----	PAW 258 = 0
Generic reg. for Parameters L programming	<-----	PAW 260 = 3

Activate customised output area – command code 7FFFh

COBRA 365 OUTPUT DATA AREA [01]		PLC Master PROFIBUS-DP
5001 – Command Register	<-----	PAW 256 = 5001
Generic reg. for Parameters H programming	<-----	PAW 258 = 0
Generic reg. for Parameters L programming	<-----	PAW 260 = 7FFFh

Requesting the instrument RUN

To give the RUN command to the instrument via PROFIBUS-DP network, bit 0 of register 5002 must be set to ON. As for the special commands, you have to write the required value in the two generic registers and the register address for the command in the "Command Register".

The RUN command to the instrument may be given in two ways:

1. by closing the input "In1" of the COBRA 365 control unit through the electromechanical circuit
2. by passing the command via the network

Since the two situations listed above act on a single control unit command, you must specify in the control unit which of the two systems has priority over the other. To do this, use the bit 15 of register 5002.

Basically, by setting the bit 15 of register 5002 to ON, the COBRA 365 control unit assigns the priority of the command to the PROFIBUS-DP network. Otherwise, priority is assigned to the electro-mechanically controlled input.

In order to give the RUN command to the instrument, through the PROFIBUS-DP network, you need to write the hexadecimal value 8001 in the "Generic register for parameters L programming" (WORD3) and then write 5002 (decimal) in the Command Register (5001, WORD1):

COBRA 365 OUTPUT DATA AREA [01]		PLC Master PROFIBUS-DP
5001 – Command Register	<-----	PAW 256 = 5002
Generic reg. for Parameters H programming	<-----	PAW 258 = 0
Generic reg. for Parameters L programming	<-----	PAW 260 = 8001 HEX

To stop the RUN status of the instrument, you must write the hexadecimal value 8000 in the "Generic register for parameters L programming" (WORD3) and then write 5002 (decimal) in the Command Register (5001, WORD1):

COBRA 365 OUTPUT DATA AREA [01]		PLC Master PROFIBUS-DP
5001 – Command Register	<-----	PAW 256 = 5002
Generic reg. for Parameters H programming	<-----	PAW 258 = 0
Generic reg. for Parameters L programming	<-----	PAW 260 = 8000 HEX

If you want to return the priority of the command to inputs In1 of the control unit set the bit 15 of register 5002 to OFF writing the Hex value 0000 in it:

COBRA 365 OUTPUT DATA AREA [01]		PLC Master PROFIBUS-DP
5001 – Command Register Generic reg. for Parameters H programming	<-----	PAW 256 = 5002
Generic reg. for Parameters L programming	<-----	PAW 258 = 0
	<-----	PAW 260 = 0000 HEX

Master PLC - COBRA 365 control unit communication diagnostics

The COBRA 365 control unit is detected by the Master network PLC as a normal PROFIBUS node.

For this reason, it is possible to perform network diagnostics via the special FCs and FBs available from Siemens.

This system makes network diagnostics transparent for the user program of the PLC, and does not require a long time to be implemented in the program.

7001 Test Register

Another way to perform communication diagnostics is to use the "Test Registers".

Write a known value in the OUTPUT DATA AREA register and the instrument will automatically copy the number set in the "Test Register" of the INPUT DATA AREA. In this way we can be sure that the instrument has received the data and that, therefore, the communication is working.

Since the value of the Test Register is automatically acquired by the instrument, it is not necessary to write the value of the register (7001) in the Command Register; it can also be modified using the procedure for editing the content of an entire page.

In the event that the PROFIBUS communication is lost, the "Test Register" value of the OUTPUT DATA AREA is not modified, generating a false positive in the network test. Therefore, it is necessary to change the number inside the OUTPUT DATA AREA register (expecting to find the corresponding number in the INPUT DATA AREA register); only in this way you can be sure that the network is really active.

FIELDBUS Alarm

In case of parameter 0114 active (Fieldbus Alarm), alarm 8 (connection to PROFIBUS / PROFINET) is also activated in the event of a communication timeout from the master. In this case, parameter 7001 (Test Register) should be updated by the PROFIBUS / PROFINET master with a different value, at a frequency above 0.5Hz; if the value of parameter 7001 remains unchanged for more than 2 seconds, the instrument reports the PROFIBUS / PROFINET network connection error.

In case of PROFIBUS / PROFINET alarm (code 6-7-8) and only in the case of parameter 0114 active (Fieldbus Alarm), the instrument performs the following actions:

- belt operation is stopped;
- outputs 1-2-3-4 of the external I/O modules are disabled.

Depending on the selection of parameter 1030 (ALARM ALWAYS ON), it can operate in 2 ways.

- if 1030 = NO (0): the alarm is activated only when the instrument is in RUN mode:
- if 1030 = YES (1): the alarm is always active.

MANAGEMENT OF ERRORS

[Err. PROFIBUS] Communication failure between Modbus and module S125: after 5 consecutive communication timeouts. An attempt to restore the communication is carried out automatically. If it fails the error is displayed and you can manually reset it by pressing the RESET button.

[NoCom. PROFIBUS] PROFIBUS network off-line: for example, in case of failure to connect the module S125 to the Profibus network. This error is acknowledged automatically as soon as normal connection is restored.

[CRC PROFIBUS] CRC error in the ModBus communication.

The response timeout in the module is set to 100mS.

SPECIAL REGISTERS ENCODING

Most registers transmit/receive an integer value for which it is not necessary to process the data. Below is a list of commands that require encoding.

5001 – Command Register:

Programmable values	COBRA 365	
7FFFh	enable customised OUTPUT area	enable customised OUTPUT area
1	reset total counter	reset total counter
2	Belt automatic reset	Save data
3	Save data	Not Used

After programming the parameters, send the command 3 (save data) in order to save the changes made. The only parameters that are automatically saved are 0143, 4011, 4012, 4013 and 4015.

3017 – alarm codes:

Alarm code	Cobra 365	Taipan 365
1	Regulation impossible	Regulation impossible
2	No signal from encoder	Refilling timeout
3	Flowrate =0 or weight lower than MINIMUM WEIGHT	Flowrate below minimum
4	Load cell signal error	Load cell signal error
5	Fixed weight	
6	ProfiBus/Net module connection error	Load cell signal error
7	ProfiBus/Net CRC Error	ProfiBus/Net CRC Error
8	ProfiBus/Net network connection error	ProfiBus/Net network connection error
9	Supply voltage > 20Vdc	Supply voltage > 20Vdc
10	Tolerance Alarm	

3018 - input status:

Through this register it is possible to detect the status of the digital inputs, each bit is associated to an input (refer to the following table for encoding). It can assume the following values:

0 = input open

1 = input closed

bit	Corresponding digital output
0	In1
1	In2
2	In 3
3	In 4
4	In 5
5	In 6
6-15	Not used

3019 - output status:

Through this register it is possible to detect the status of the digital outputs, each bit is associated to an output (refer to the following table for encoding). It can assume the following values: 0 = output not active 1 = output active

bit	Corresponding digital output
0	Out 1
1	Out2
2	Out 3
3	Out4
4	Out5
5	Out 6
6-15	Not used

3027- Test Status:

Register Value	Cobra 365	Taipan 365
0	none	none
1	I/O Test	I/O Test
2	Belt calibration	System calibration
3	System test	DAC Test
4	Zero Stand-by	Simulation
5	Zero Belt	Manual reload
6	DAC	Reload during dosing
7	Simulation	-----

3029 Flowrate Decimals

3030 Total Decimals

3031 Weight Decimals

Based on the value of the registers 3029, 3030 and 3031, you may identify units of measurement and decimal numbers of total and flowrate and net weight data. Use the following tables for encoding.

E.g.: if the register 3029 (flowrate decimals) will assume the value 4 it means that the hourly flowrate received has 2 decimals and is expressed in t/h.

Decimals 3029 register Flowrate Value	Cobra 365 Taipan 365	
	Decimal numbers	Unit of measurement
0	0	Kg/h
1	1	Kg/h
2	2	Kg/h
3	3	Kg/h
4	1	T/h
5	2	T/h
6	3	T/h

Decimals 3030 register Total Value	Cobra 365 Taipan 365	
	Decimal numbers	Unit of measurement
0	0	Kg
1	1	Kg
2	2	Kg
3	3	Kg
4	1	T
5	2	T
6	3	T



Decimals 3031 register Flowrate Value	Cobra 365 Taipan 365	
	Decimal numbers	Unit of measurement
0	0	Kg
1	1	Kg
2	2	Kg
3	3	Kg

Customised mapping of input/output areas

It is possible to configure the I/O areas of fieldbus PROFIBUS DP, PROFINET IO, ETHERNET IP and ETHERCAT so as to have an ordered list of parameters according to the specific needs of the system.

This configuration is done using a special utility **PCWIN75** connected through RS232/USB to the COM2 port of the instrument (selectable communication parameters).

The configurator PCWIN75 has an easy to use graphic interface through which you can make the I/O areas: each register can be associated with a parameter chosen from a special drop-down menu. It is possible to customise up to 2 INPUT pages and 1 OUTPUT page.

The application and operating instructions are available for download on our website.

The table with the complete list of the registers can be found in the standard instrument manual (Cobra 365 or Taipan 365).

CUSTOMISED MAPPING AREA ACTIVATION DETAILS



INPUT area: The first register of the Input area always identifies the page number (1 = page 1; 2 = page 2), the next 63 registers are customisable. It is possible, but not mandatory, to define up to two customised virtual pages.

OUTPUT area: The first register of the Output area is always the Command Register.

Its value identifies the meaning of the next 63 available registers. To activate the “customised Output area” provide the **7FFFh** command: as long as the Command Register contains this command, the next 63 registers will correspond to the user’s customised parameters. You can define only one Customised output page.

The logic according to which the value of the Command Register identifies the meaning of the next 63 available registers is maintained.

The available functions with the pre-filled pages remain active (single register writing or pre-filled entire OUTPUT page writing).

In other words, it is possible to write 0x7FFFh in the command register for the customised page writing but also any value corresponding to the writing of an entire page.

The single register writing function remains active. To proceed, simply enter the address of the variable you want to write in the command register and the value to send in the following 2 registers.

PWIN75 utility instructions to create a customised mapping of input/output areas

NOTE: The application does not require a connection to the instrument to be used.

You can therefore open the application at any time, make your mappings, save them, or recall them from a file.

The only operations that require connection to the instrument are obviously the reception / transmission of the mappings via serial connection.

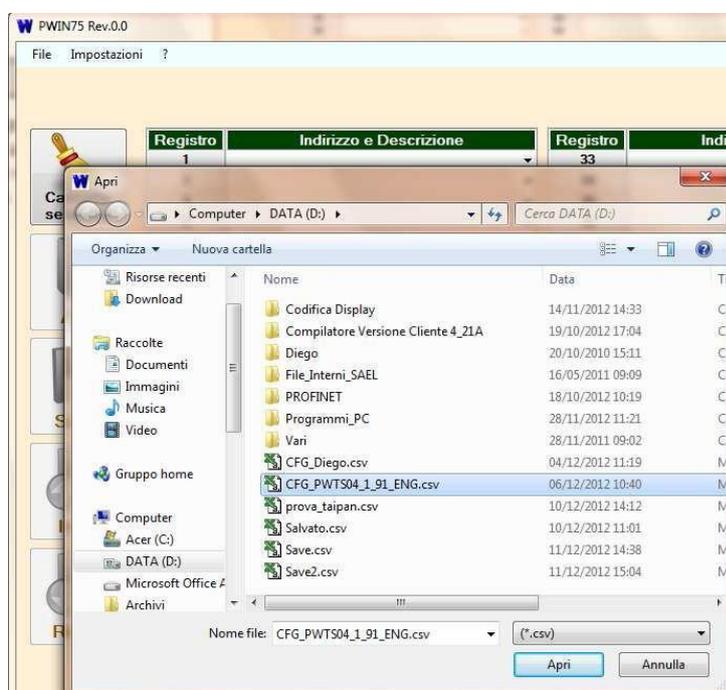
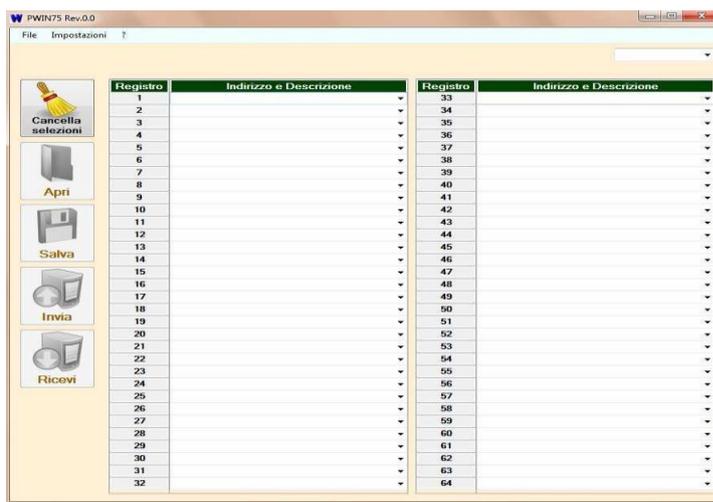
INSTALLATION PROCEDURE

A) Launch the SETUP.EXE application and follow the instructions of the installation procedure. If the MicrosoftNET framework 4.0 is not installed in the PC, it will be automatically downloaded (in this case you need an internet connection) and you will be asked to confirm the installation; confirm the installation of the framework.

B) Install the USB driver *CP210xWindows_Drivers W10*

STARTING THE APPLICATION

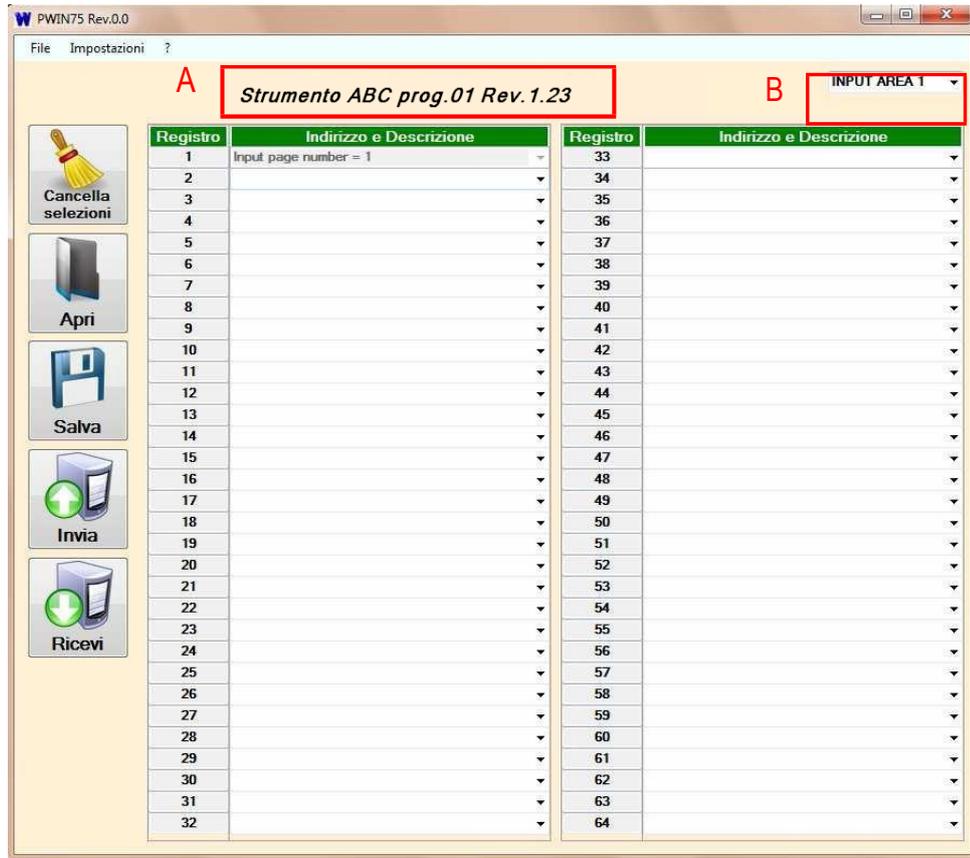
Select the “*Configurator_Prof*” software from the Programs menu and start the application. The following screen page will appear:



By clicking on “File/Open Configuration File” you can open the .csv configuration file. Select the desired file and click on “Open”.

Each software version of each instrument has an associated configuration file; from this file the PCWIN75 application obtains information such as the number of I/O areas to be displayed, the list of registers to show, etc.

INITIALIZING THE APPLICATION



Once the desired configuration file has been opened, the code of the instrument, to which the configuration file (A) refers, appears at the top of the display. Selectable I/O areas (B) are shown at the top right side of the display. The “Open”, “Save”, “Send” and “Receive” keys are enabled.

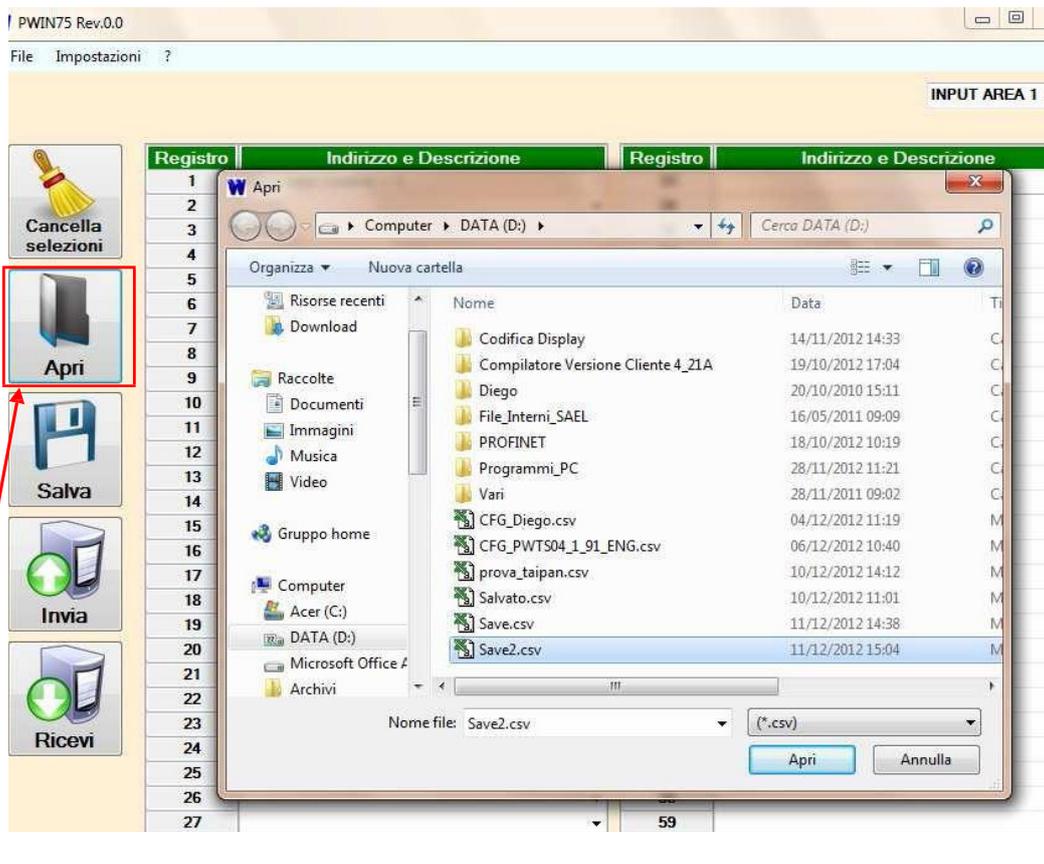
CUSTOMIZING THE REGISTER MAPPING

Use the drop-down menu to select the I/O area to be displayed in the table.

It is possible to associate a parameter chosen from those shown in the drop-down menu to each register



OPENING A MAPPING FROM FILE (*.csv)



By clicking on the OPEN button you can open a previously performed mapping. The operation takes a few seconds during which the message “file opening in progress” is displayed.

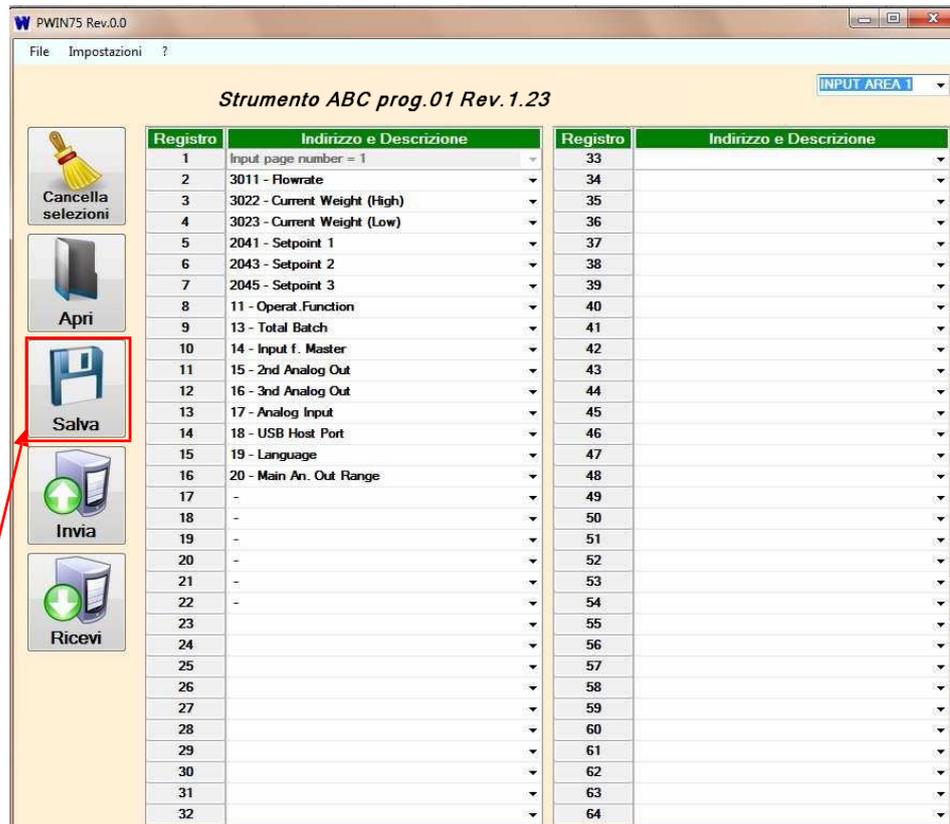
File Impostazioni ?

INPUT AREA 1

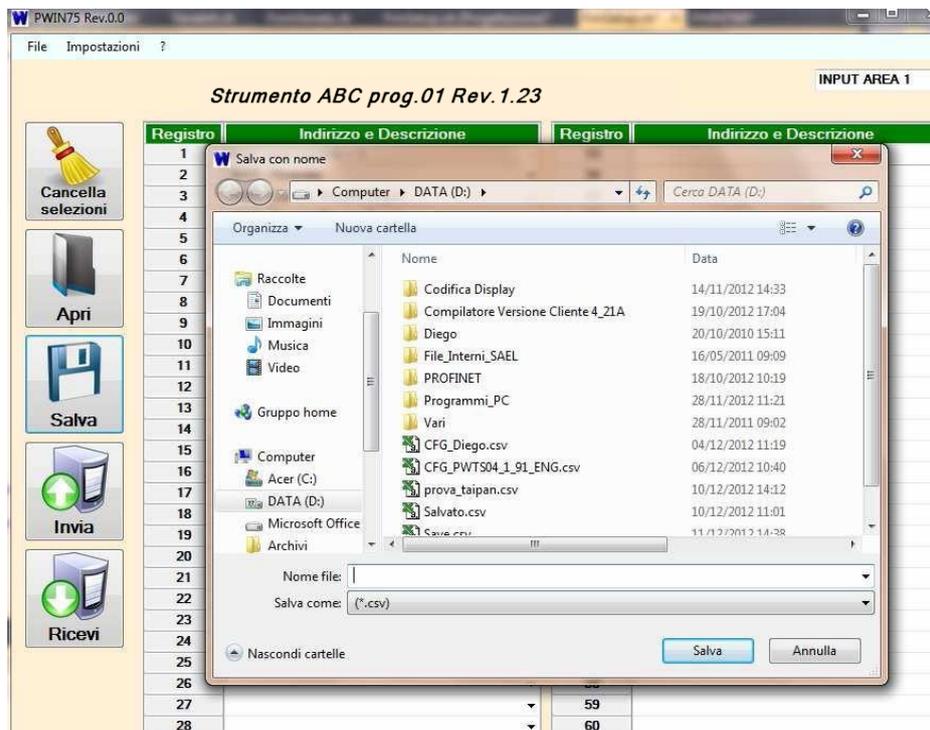
Strumento ABC prog.01 Rev.1.23

Registro	Indirizzo e Descrizione	Registro	Indirizzo e Descrizione
1	Input page number = 1	33	
2	3011 - Flowrate	34	
3	3022 - Current Weight (High)	35	
4	3023 - Current Weight (Low)	36	
5	2041 - Setpoint 1	37	
6	2043 - Setpoint 2	38	
7	2045 - Setpoint 3	39	
8	11 - Operat. Function	40	
9	13 - Total Batch	41	
10	14 - Input f. Master	42	
11	15 - 2nd Analog Out	43	
12	16 - 3rd Analog Out	44	
13	17 - Analog Input	45	
14	18 - USB Host Port	46	
15	19 - Language	47	
16	20 - Main An. Out Range	48	
17	101 - COM1 Protocol	49	
18	102 - COM1 Baud Rate	50	
19	103 - COM1 Frame Sel.	51	
20	104 - COM2 Protocol	52	
21	105 - COM2 Baud Rate	53	
22	106 - COM2 Frame Sel.	54	
23		55	
24		56	
25		57	
26		58	
27		59	
28		60	
29		61	
30		62	
31		63	
32		64	

SAVING THE CURRENT MAPPING IN A FILE (*.csv)



The current mapping can be saved as a .csv file at any time. Select SAVE to perform this operation.



Enter the file name and press Save. The operation takes a few seconds during which the message "Saving file in progress" is displayed.

TRANSMITTING THE CURRENT MAPPING VIA SERIAL CONNECTION (From PC to Instrument)

The current mapping can be transmitted via serial connection to an instrument connected to the PC.

Procedure:

1. When the mapping is received, to enable the connected instrument, press the SETUP icon that appears at the top right side of the instrument when switched on.
2. Select the **LOAD FIELDB IO LOAD PROFI** key to enable the Touchscreen to receive the configuration.
3. Select **SEND** on the PC utility to transmit the current mapping. The transmission takes a few seconds; at the end of the transmission a message indicating that the operation has been successfully completed will be displayed.

RECEIVING A MAPPING VIA SERIAL CONNECTION (from Instrument to PC)

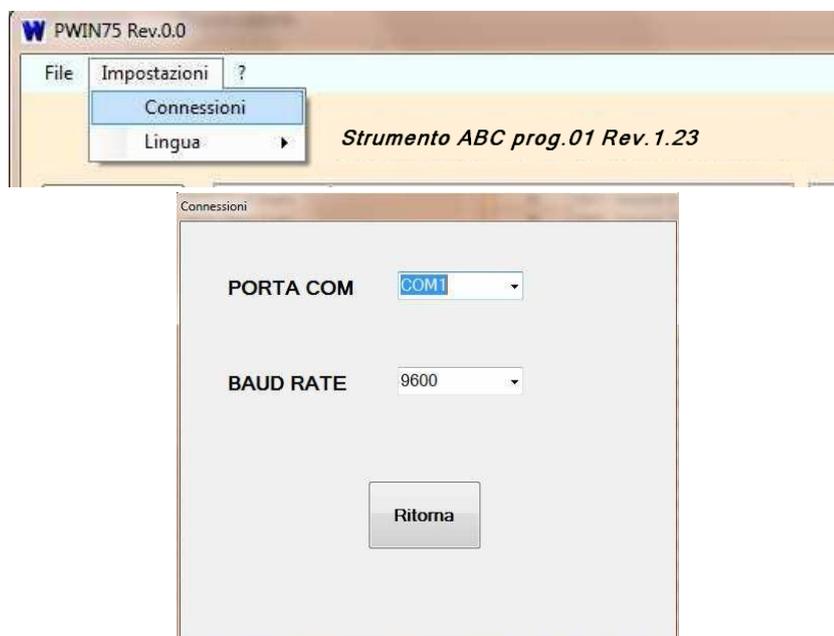
You can receive the current mapping from an instrument connected to the PC. Procedure:

1. When the mapping is received, to enable the connected instrument, press the SETUP icon that appears at the top right side of the instrument when switched on.
2. Select **RECEIVE** on the PC utility to receive the current mapping. If the PC does not receive any mapping within 10 seconds, an error message is shown and an “empty” mapping is displayed.
Start the mapping transmission procedure on the connected instrument by pressing the **SAVE FIELDB IO** key.
3. In case of correct reception, the mapping received from the instrument will be displayed.

SETTINGS

To change serial connections access “Settings/Connections” section.

The following screen page will open where you can select the COM port and Baud rate. The data format is set to N/8/1.



The settings relating to serial communications, as well as the selected language, are stored by the application and prompted again in subsequent uses.

RESETTING THE I/O AREAS TO DEFAULT VALUES

Through the password 1012 in FACTORY SETUP, accessible from the Setup Menu on power on, it is possible to reset INPUT areas to the default values shown in the following pages. This operation also causes the deletion of the customised OUTPUT area.

COMPATIBILITY WITH PREVIOUS SW VERSIONS

Full compatibility with previous software versions is guaranteed.

- INPUT area: thanks to the function that forces the configuration to default values
- OUTPUT area: compatibility is always guaranteed because the meaning of the registers of the area always depends on the value of the command register.

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

INPUT DATA AREAS

INPUT DATA AREA [01] - Factory settings		
Address ref.	Variables	Bytes mapping
6001	Input page number	0-1
3011	Flowrate	2-3
3012	Total H	4-5
3013	Total L	6-7
3014	Grand Total H	8-9
3015	Grand Total L	10-11
3016	Setpoint	12-13
3017	Alarm Code	14-15
3018	Input	16-17
3019	Output	18-19
3020	Speed H	20-21
3021	Speed L	22-23
3022	Current Weight H	24-25
3023	Current Weight L	26-27
3024	Analog Out 1	28-29
3025	Analog Out 2	30-31
3026	Analog Input	32-33
3027	Test Status	34-35
3028	Run Status	36-37
3029	Flowrate Decimals	38-39
3030	Total Decimals	40-41
3031	Weight Decimals	42-43
4011	Num. Set	44-45
4012	Auto / Man	46-47
4013	Manual Out	48-49
4014	Var. Setpoint	50-51
2041	Setpoint 1	52-53
2042	Manual Out Set 1	54-55
2043	Setpoint 2	56-57
2045	Setpoint 3	58-59
2047	Setpoint 4	60-61
2049	Setpoint 5	62-63

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

(...continued) INPUT DATA AREA [01] - Factory settings		
Address ref.	Variables	Bytes mapping
2051	Setpoint 6	64-65
2053	Setpoint 7	66-67
2055	Setpoint 8	68-69
2057	Setpoint 9	70-71
2059	Setpoint 10	72-73
2061	Setpoint 11	74-75
2063	Setpoint 12	76-77
2065	Setpoint 13	78-79
2067	Setpoint 14	80-81
2069	Setpoint 15	82-83
2001	Total Set H	84-85
2002	Total Set L	86-87
2003	Total Preset H	88-89
2004	Total Preset L	90-91
2005	Total Flying H	92-93
2006	Total Flying L	94-95
1001	Sampling Time	96-97
1002	Proportional Constant	98-99
1003	Integral Const.	100-101
1004	Dead Band	102-103
1005	Flowrate Limit	104-105
1006	Dead Band %	106-107
1007	Flowrate Limit %	108-109
1041	Stop Delay	110-111
1042	Weight timeout	112-113
1043	Regulation delay	114-115
1044	Flow Limit Delay	116-117
1045	Limit Init Delay	118-119
1063	Min. Weight	120-121
5002	Run Command Reg	122-123
7001	Test Register	124-125

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

INPUT DATA AREA [02] - Factory settings		
Address ref.	Variables	Bytes mapping
6001	Input page number	0-1
11	Operat. Function	2-3
131	Operating Mode	4-5
132	Lap Time	6-7
133	Lap Length	8-9
134	Tare	10-11
135	Max Remote Tare	12-13
141	K Factor	14-15
143	KK Factor	16-17
151	Max Flowrate H	18-19
152	Max Flowrate L	20-21
163	Dead Band Unit	22-23
164	Tolerance Unit	24-25
181	Max actual flowrate H	26-27
182	Max actual flowrate L	28-29
7001	Test Register	30-31
3032	Weight / metre H	32-33
3033	Weight / metre L	34-35
3034	Density	36-37
3035	System ready	38-39
4015	Specific weight	40-41
4016	Ext. IO module 1 Input	42-43
4017	Ext. IO module 1 output	44-45
4018	Ext. IO module 2 Inputs	46-47
4019	Ext. IO module 2 outputs	48-49

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

OUTPUT DATA AREAS

OUTPUT DATA AREA [01]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
4011	Num. Set	8-9
4012	Auto / Man	10-11
4013	Manual Out	12-13
4014	Var. Setpoint	14-15
4015	Specific weight	16-17
4016	Ext. IO module 1 Input	18-19
4017	Ext. IO module 1 output	20-21
4018	Ext. IO module 2 Inputs	22-23
4019	Ext. IO module 2 outputs	24-25

OUTPUT DATA AREA [02]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
2041	Setpoint 1	8-9
2042	Manual Out Set 1	10-11
2043	Setpoint 2	12-13
2045	Setpoint 3	14-15
2047	Setpoint 4	16-17
2049	Setpoint 5	18-19
2051	Setpoint 6	20-21
2053	Setpoint 7	22-23
2055	Setpoint 8	24-25
2057	Setpoint 9	26-27
2059	Setpoint 10	28-29
2061	Setpoint 11	30-31
2063	Setpoint 12	32-33
2065	Setpoint 13	34-35
2067	Setpoint 14	36-37
2069	Setpoint 15	38-39

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

OUTPUT DATA AREA [03]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
2001	Total Set H	8-9
2002	Total Set L	10-11
2003	Total Preset H	12-13
2004	Total Preset L	14-15
2005	Total Flying H	16-17
2006	Total Flying L	18-19

OUTPUT DATA AREA [04]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
1001	Sampling Time	8-9
1002	Proportional Constant	10-11
1003	Integral Const.	12-13
1004	Dead Band	14-15
1005	Flowrate Limit	16-17
1006	Dead Band %	18-19
1007	Flowrate Limit %	20-21

OUTPUT DATA AREA [05]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
1041	Stop Delay	8-9
1042	Weight timeout	10-11
1043	Regulation delay	12-13
1044	Flow Limit Delay	14-15
1045	Limit Init Delay	16-17
1063	Min. Weight	18-19

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

OUTPUT DATA AREA [06]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
151	Max Flowrate H	8-9
152	Max Flowrate L	10-11
163	Dead Band Unit	12-13
164	Tolerance Unit	14-15
181	Max actual flowrate H	16-17
181	Max actual flowrate L	18-19

OUTPUT DATA AREA [07]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
11	Operat. Function	8-9
131	Operating Mode	10-11
132	Lap Time	12-13
133	Lap Length	14-15
134	Tare	16-17
135	Max Remote Tare	18-19
141	K Factor	20-21
143	KK Factor	22-23

OUTPUT DATA AREA [08]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
5002	Run Command Reg	8-9

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

INPUT DATA AREAS

INPUT DATA AREA [01] - Factory settings		
Address ref.	Variables	Bytes mapping
6001	Input page number	0-1
3011	Flowrate	2-3
3012	Total H	4-5
3013	Total L	6-7
3014	Grand Total H	8-9
3015	Grand Total L	10-11
3016	Setpoint	12-13
3017	Alarm Code	14-15
3018	Input	16-17
3019	Output	18-19
3020	Speed H	20-21
3021	Speed L	22-23
3022	Current Weight H	24-25
3023	Current Weight L	26-27
3024	Analog Out 1	28-29
3025	Analog Out 2	30-31
3026	Analog Input	32-33
3027	Test Status	34-35
3028	Run Status	36-37
3029	Flowrate Decimals	38-39
3030	Total Decimals	40-41
3031	Weight Decimals	42-43
4011	Num. Set	44-45
4012	Auto / Man	46-47
4013	Manual Out	48-49
4014	Var. Setpoint	50-51
2041	Setpoint 1	52-53
2042	Manual Out Set 1	54-55
2043	Setpoint 2	56-57
2045	Setpoint 3	58-59
2047	Setpoint 4	60-61
2049	Setpoint 5	62-63

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

INPUT DATA AREAS

INPUT DATA AREA [01] - Factory settings		
Address ref.	Variables	Bytes mapping
6001	Input page number	0-1
3011	Flowrate	2-3
3012	Total H	4-5
3013	Total L	6-7
3014	Grand Total H	8-9
3015	Grand Total L	10-11
3016	Setpoint	12-13
3017	Alarm Code	14-15
3018	Input	16-17
3019	Output	18-19
3020	Effective Max Flow	20-21
3021	Dosed	22-23
3022	Current Weight H	24-25
3023	Current Weight L	26-27
3024	Analog Out 1	28-29
3025	Analog Out 2	30-31
3026	Analog Input	32-33
3027	Test Status	34-35
3028	Run Status	36-37
3029	Flowrate Decimals	38-39
3030	Total Decimals	40-41
3031	Weight Decimals	42-43
4011	Num. Set	44-45
4012	Auto / Man	46-47
4013	Manual Out	48-49
2041	Setpoint 1	50-51
2042	Manual Out Set 1	52-53
2043	Setpoint 2	54-55
2045	Setpoint 3	56-57
2047	Setpoint 4	58-59
2049	Setpoint 5	60-61
2051	Setpoint 6	62-63

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

(...continued) INPUT DATA AREA [01] - Factory settings		
Address ref.	Variables	Bytes mapping
2053	Setpoint 7	64-65
2055	Setpoint 8	66-67
2057	Setpoint 9	68-69
2059	Setpoint 10	70-71
2061	Setpoint 11	72-73
2063	Setpoint 12	74-75
2065	Setpoint 13	76-77
2067	Setpoint 14	78-79
2069	Setpoint 15	80-81
2001	Total Set H	82-83
2002	Total Set L	84-85
2003	Total Preset H	86-87
2004	Total Preset L	88-89
2005	Total Flying H	90-91
2006	Total Flying L	92-93
1001	Sampling Time	94-95
1002	Proportional Constant	96-97
1003	Flowrate Sensitivity	98-99
1004	Dead Band	100-101
1005	Flowrate Limit	102-103
1006	Dead Band %	104-105
1007	Flowrate Limit %	106-107
1008	Flowrate Delta %	108-109
1041	Start Delay	110-111
1042	Stop Delay	112-113
1043	Loading Timeout	114-115
1044	Flow Limit Delay	116-117
1045	Limit Init Delay	118-119
5002	Run Command Reg	120-121
5003	Refilling Cmd Reg	122-123
7001	Test Register	124-125

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

INPUT DATA AREA [02] - Factory settings		
Address ref.	Variables	Bytes mapping
6001	Input page number	0-1
11	Operat. Function	2-3
131	Flowrate @ 20%	4-5
132	Flowrate @ 30%	6-7
133	Flowrate @ 40%	8-9
134	Flowrate @ 50%	10-11
135	Flowrate @ 60%	12-13
136	Flowrate @ 70%	14-15
137	Flowrate @ 80%	16-17
151	Max Flowrate H	18-19
152	Max Flowrate L	20-21
155	Lower Level H	22-23
156	Lower Level L	24-25
157	Upper Level H	26-27
158	Upper Level L	28-29
160	Tare Weight	30-31
163	Dead Band Unit	32-33
164	Tolerance Unit	34-35
1063	Minimum Flowrate	36-37
1064	Min Analog Out	38-39
7001	Test Register	40-41
3032	System ready	42-43
4014	Ext. IO module 1 Input	44-45
4015	Ext. IO module 1 output	46-47
4016	Ext. IO module 2 Inputs	48-49
4017	Ext. IO module 2 outputs	50-51

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

OUTPUT DATA AREAS

OUTPUT DATA AREA [01]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
4011	Num. Set	8-9
4012	Auto / Man	10-11
4013	Manual Out	12-13
4014	Ext. IO module 1 Input	14-15
4015	Ext. IO module 1 output	16-17
4016	Ext. IO module 2 Inputs	18-19
4017	Ext. IO module 2 outputs	20-21

OUTPUT DATA AREA [02]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
2041	Setpoint 1	8-9
2042	Manual Out Set 1	10-11
2043	Setpoint 2	12-13
2045	Setpoint 3	14-15
2047	Setpoint 4	16-17
2049	Setpoint 5	18-19
2051	Setpoint 6	20-21
2053	Setpoint 7	22-23
2055	Setpoint 8	24-25
2057	Setpoint 9	26-27
2059	Setpoint 10	28-29
2061	Setpoint 11	30-31
2063	Setpoint 12	32-33
2065	Setpoint 13	34-35
2067	Setpoint 14	36-37
2069	Setpoint 15	38-39

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

OUTPUT DATA AREA [03]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
2001	Total Set H	8-9
2002	Total Set L	10-11
2003	Total Preset H	12-13
2004	Total Preset L	14-15
2005	Total Flying H	16-17
2006	Total Flying L	18-19

OUTPUT DATA AREA [04]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
1001	Sampling Time	8-9
1002	Proportional Constant	10-11
1003	Flowrate Sensitivity	12-13
1004	Dead Band	14-15
1005	Flowrate Limit	16-17
1006	Dead Band %	18-19
1007	Flowrate Limit %	20-21
1008	Flowrate Delta %	22-23

OUTPUT DATA AREA [05]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
1041	Start Delay	8-9
1042	Stop Delay	10-11
1043	Loading Timeout	12-13
1044	Flow Limit Delay	14-15
1045	Limit Init Delay	16-17

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

OUTPUT DATA AREA [06]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
11	Operat. Function	8-9
131	Flowrate @ 20%	10-11
132	Flowrate @ 30%	12-13
133	Flowrate @ 40%	14-15
134	Flowrate @ 50%	16-17
135	Flowrate @ 60%	18-19
136	Flowrate @ 70%	20-21
137	Flowrate @ 80%	22-23

OUTPUT DATA AREA [07]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
151	Max Flowrate H	8-9
152	Max Flowrate L	10-11
155	Lower Level H	12-13
156	Lower Level L	14-15
157	Upper Level H	16-17
158	Upper Level L	18-19
160	Tare Weight	20-21
163	Dead Band Unit	22-23
164	Tolerance Unit	24-25

OUTPUT DATA AREA [08]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
1063	Minimum Flowrate	8-9
1064	Min Analog Out	10-11

PROFIBUS DP, PROFINET IO, ETH/IP, ETHERCAT PROTOCOL (continued)

OUTPUT DATA AREA [09]		
Address ref.	Variables	Bytes mapping
5001	Command Register	0-1
-	Generic register for parameters H programming	2-3
-	Generic register for parameters L programming	4-5
7001	Test Register	6-7
5002	Run Command Reg	8-9
5003	Refilling Cmd Reg	10-11