

PROFINET

Communication protocol:
PUE HX5.EX Weighing Indicator

SOFTWARE MANUAL

ITKP-02-04-04-23-EN



RADWAG
ADVANCED WEIGHING TECHNOLOGIES

RADWAG BALANCES AND SCALES

APRIL 2023

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1. WEIGHING INDICATOR SETTINGS - CONFIGURATION

To set indicator communication via PROFINET protocol go to **<SETUP / IM01.EX communication module / Additional modules / Anybus module>**. For detailed description of settings configuration read „PUE HX5.EX - Software manual” user manual.

2. DATA STRUCTURE

2.1. Input Address

Input variables list:

Variable	Offset	Length [WORD]	Data type
Mass	0	2	float
Tare	4	2	float
Unit	8	1	word
Platform status	10	1	word
LO threshold	12	2	float
Process status (Stop, Start)	16	1	word
Inputs status	66	1	word
Min	68	2	float
Max	72	2	float
Fast dosing threshold	76	2	float
Slow dosing threshold	80	2	float
Lot number	84	2	dword
Operator	88	1	word
Product	90	1	word
Customer	92	1	word
Packaging	94	1	word
Formulation	100	1	word
Dosing process	102	1	word

2.2. Input Registers

Platform mass – returns platform mass in current unit.

Platform tare – returns platform tare in an adjustment unit.

Platform unit – determines current mass unit of a given platform.

Unit bits	
0	gram [g]
1	kilogram [kg]
2	carat [ct]
3	pound [lb]
4	ounce [oz]
5	Newton [N]

Example:

Read HEX value: 0x02. Binary form:

B1/7	B1/6	B1/5	B1/4	B1/3	B1/2	B1/1	B1/0	B0/7	B0/6	B0/5	B0/4	B0/3	B0/2	B0/1	B0/0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

The unit of the weighing instrument is kilogram [kg].

Platform status – determines state of a given weighing platform.

Status bits	
0	Measurement correct (the weighing instrument does not report any error)
1	Measurement stable
2	Weighing instrument indicates zero
3	Weighing instrument tared
4	Weighing instrument in II weighing range
5	Weighing instrument in III weighing range
6	Weighing instrument reports NULL error
7	Weighing instrument reports LH error
8	Weighing instrument reports FULL error

Example:

Read HEX value: 0x13

B1/7	B1/6	B1/5	B1/4	B1/3	B1/2	B1/1	B1/0	B0/7	B0/6	B0/5	B0/4	B0/3	B0/2	B0/1	B0/0
0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1

The weighing instrument does not report any error, measurement stable in II weighing range.

LO threshold – returns value of platform’s **LO** threshold in an adjustment unit.

Process status – determines dosing or formulations process status:

- 0x00 – process disabled
- 0x01 – process stopped
- 0x02 – process aborted
- 0x03 – process finished

Input state – bitmask of indicator inputs. The first 4 least significant bits represent weighing terminal inputs.

Example:

Read HEX value: 0x000B

B1/7	B1/6	B1/5	B1/4	B1/3	B1/2	B1/1	B1/0	B0/7	B0/6	B0/5	B0/4	B0/3	B0/2	B0/1	B0/0
0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1

Inputs 1, 2 and 3 of the weighing indicator take HI state.

MIN - response: **MIN** threshold value (in current unit).

MAX - response: **MAX** threshold value (in current unit).

Fast dosing threshold - returns fast dosing threshold value in an adjustment unit.

Slow dosing threshold - returns slow dosing threshold value in an adjustment unit.

Lot number – response: lot number. Only numerical values are accepted! All other characters are skipped.

Operator – response: code of logged in operator.

Product – response: code of selected product.

Customer – response: code of selected customer.

Packaging – response: code of selected packaging.

Formulation – response: code of selected formulation.

Dosing process – response: code of selected dosing process.

2.3. Output Address

Input variables:


Variable	Offset	Length [WORD]	Data type
Command	0	1	word
Command with parameter	2	1	word
Platform	4	1	word
Tare	6	2	float
LO threshold	10	2	float
Output state	14	1	word
Min	16	2	float
Max	20	2	float
Lot number	32	2	dword
Operator	36	1	word
Product	38	1	word
Customer	40	1	word
Packaging	42	1	word
Formulation	48	1	word
Dosing process	50	1	word

2.4. Output Registers

Basic command – writing the register with respective value triggers the following actions:

Bit No.	Operation
0	Zero the platform
1	Tare the platform
2	Delete statistics
3	Save/Print
4	Start

5	Breakdown (STOP without confirmation)
6	Tare/Zero the platform
7	Lock keypad
8	Unlock keypad

	<p><i>A command is executed once upon detecting that its bit has been set. If the command is to be executed more than once, it is necessary to zero the bit first, and reset it to the required value next.</i></p>
---	--

Example:


Writing the register with value 0x02

B1/7	B1/6	B1/5	B1/4	B1/3	B1/2	B1/1	B1/0	B0/7	B0/6	B0/5	B0/4	B0/3	B0/2	B0/1	B0/0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

This causes scale taring.

Complex command – setting a respective value results with performance of a given task, see the table:

Bit No.	Operation
0	Setting tare value for a given platform
1	Setting LO threshold value for a given platform
2	Setting lot number
3	Setting outputs status
4	Operator selection
5	Product selection
6	Packaging selection
7	Setting MIN threshold value
8	Customer selection
11	Dosing process selection
12	Setting MAX threshold value

	<p><i>Complex command requires setting a respective parameter (offset from 4 to 50 – refer to output registers table)</i></p>
---	--



A command with a parameter is executed once upon detecting that its bit has been set. If the command is to be executed more than once, it is necessary to zero the bit first, and reset it to the required value next.

Example:

Sending tare of 1.0 value for the 1st platform.

Carrying out the command requires writing 3 registers:

offset 2 – command with parameter - value 0x01 – i.e. tare setting.

offset 4 – number of a weighing platform to which the tare is to be written - 0x01 value for the 1st first platform.

offset 6 – tare value in float format - 1.0.

Platform – complex command parameter: weighing platform number.

Tare – complex command parameter: tare value (in an adjustment unit).

LO threshold – complex command parameter: LO threshold value (in an adjustment unit).

Output state – complex command parameter: determines state of the weighing indicator and communication module outputs.

Example:

Setting high state to outputs 1 and 3 of the weighing indicator.

Output mask has the following format:

B1/7	B1/6	B1/5	B1/4	B1/3	B1/2	B1/1	B1/0	B0/7	B0/6	B0/5	B0/4	B0/3	B0/2	B0/1	B0/0
0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1

After conversion to HEX the result is 0x05

Carrying out the command requires writing 2 registers:

offset 2 – command with parameter - value 0x08 – i.e. record of outputs state.

offset 14 – outputs mask 0x05

As a result, outputs number 1 and 3 take high state.

MIN – complex command parameter: MIN threshold value (in a unit of current working mode).

MAX – complex command parameter: MAX threshold value (in a unit of current working mode).

Lot number – complex command parameter: lot number value. Only numerical values are accepted! All other characters are skipped.

Operator – complex command parameter: operator code (digits only).

Product – complex command parameter: product code (digits only).

Customer – complex command parameter: customer code (digits only).

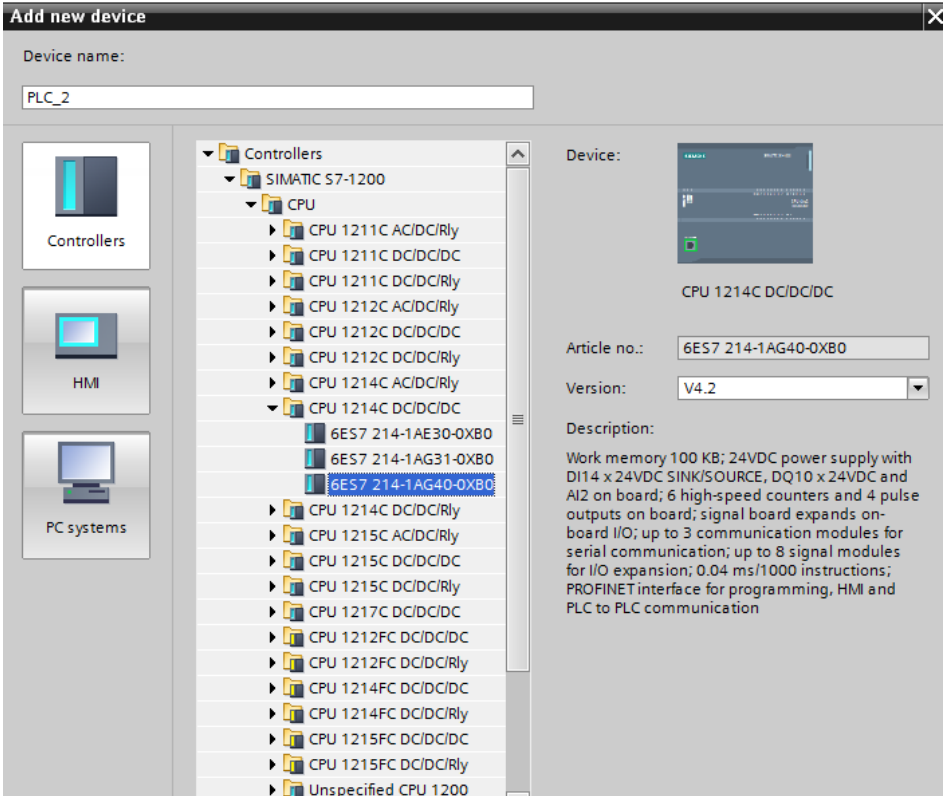
Packaging – complex command parameter: packaging code (digits only)

Formulation – complex command parameter: formulation code (digits only).

Dosing process – complex command parameter: dosing process code (digits only).

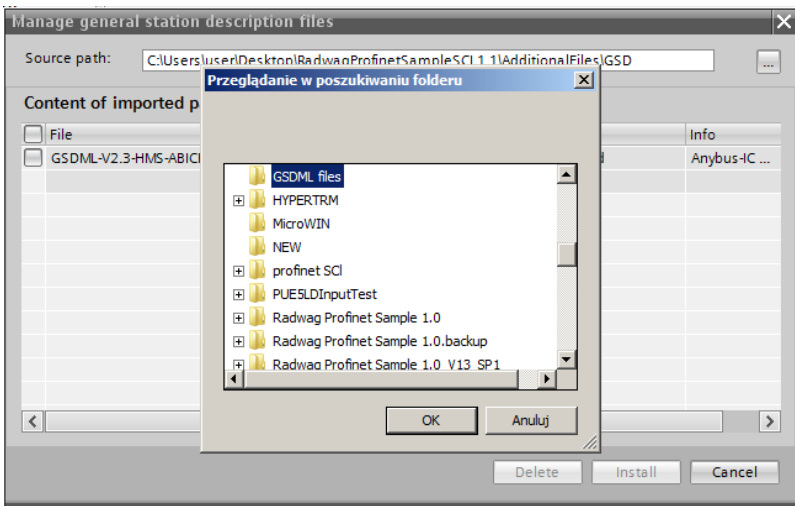
3. CONFIGURATION OF PROFINET MODULE IN TIA PORTAL V14

Operating the environment has to be preceded with creating a new project in which the topology of the PROFINET network with MASTER PLC is determined (in this example: SIEMENS S7-1200).

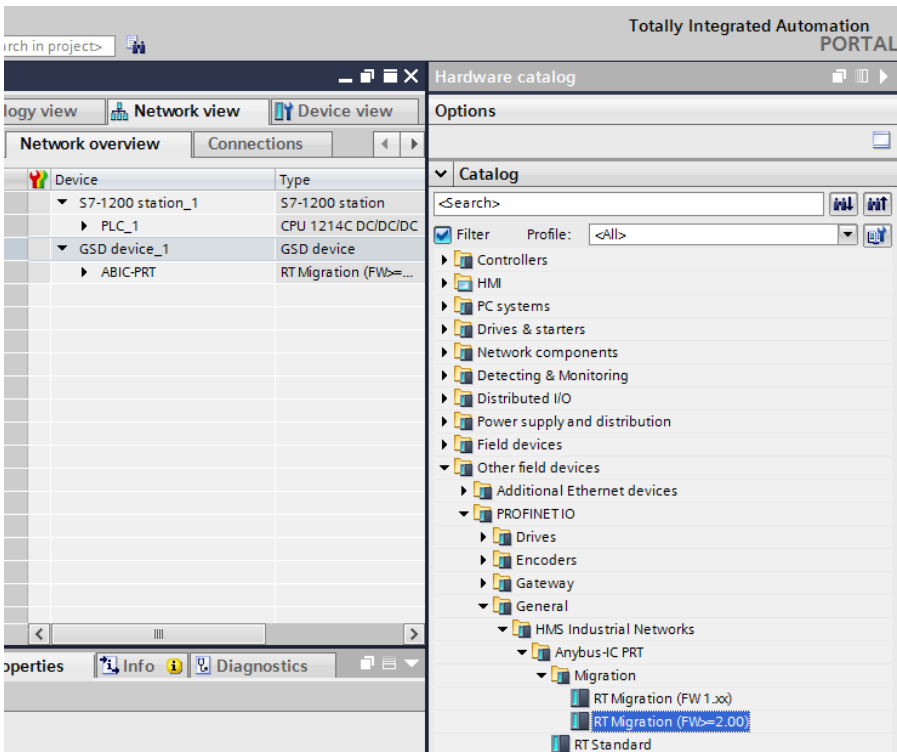


3.1. GSD Import

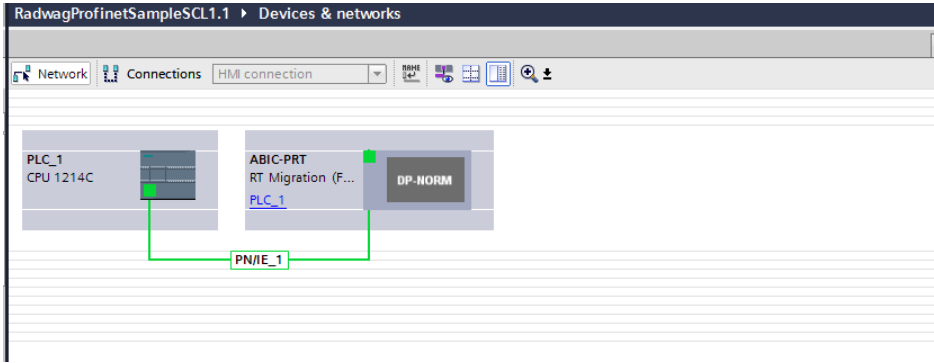
Using the included GSD configuration file add new device to the environment. Use OPTIONS tab first, MANAGE GENERAL STATION DESCRIPTION FILES (GSD) next and indicate the path to GSD file.



Upon successful adding of the file using list of devices, find ABIC-PRT module:



You can now create a network consisting of one MASTER PLC and added SLAVE module:



3.2. Module Configuration

At this stage, create a network consisting of MASTER device and SLAVE device (weighing instrument). Upon connecting the power supply, search for device using ACCESSIBLE DEVICES function. The list should contain MASTER and SLAVE devices:

Accessible nodes of the selected interface:

Device	Device type	Interface type	Address	MAC address
Accessible device	S7-PC	ISO	---	00-16-76-25-13-51
pro2	RT Migration (FW 1.xx)	PN/IE	10.10.8.64	00-30-11-0D-EE-17
plc_1	CPU 1214C DC/DC/DC	PN/IE	10.10.8.244	28-63-36-9C-D1-12

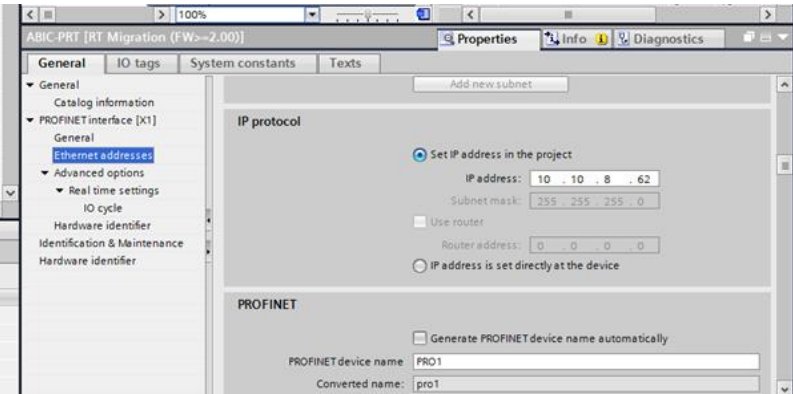
Flash LED

Online status information: Display only error messages

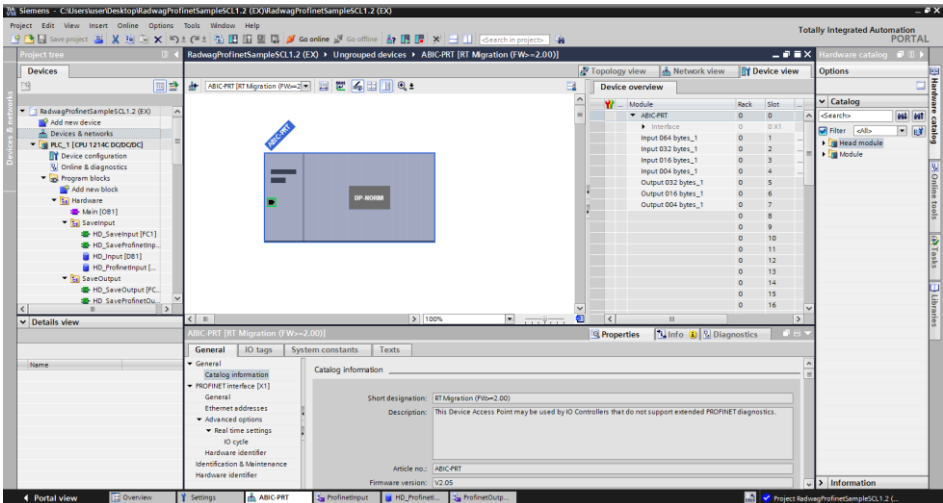
- Found accessible device Accessible device [00-16-76-25-13-51]
- Scan completed. 3 devices found.
- Retrieving device information...
- Scan and information retrieval completed.

Show Cancel

Next, specify the IP address of the module and its name in PROFINET network. Upon selecting the module in PROPERTIES tab, find PROFINET INTERFACE and enter IP address and name. Those settings have to be the same as the ones set in the weighing instrument menu. IP SLAVE address has to be part of the same subnet as the MASTER address.



Proceed to module configuration. Start by determining the size and the starting address of input and output registers. To do this, select modules from the list of INPUT and OUTPUT modules as in the picture below. The maximum size of the input and output data is 116 bytes each. Default starting addresses were used in the project - 68 for INPUT module and 64 for OUTPUT module:



Siemens - C:\Users\User\Desktop\Radwag\ProfinetSampleSCL1.2 (EX)\RadwagProfinetSampleSCL1.2 (EX)

Project: Edit View Insert Online Options Tools Window Help

Totally Integrated Automation PORTAL

Project tree: RadwagProfinetSampleSCL1.2 (EX) > Ungrouped devices > ABC-PR1 [RT Migration (FW=2.00)]

Devices & networks: RadwagProfinetSampleSCL1.2 (EX) > Devices & networks > PLC_1 (CPU 1214C-2 DC) > Device configuration > Device & diagnostics > Program blocks > Add new block > Hardware > Main [DB1] > SaveInput > HD_SaveInput [FC1] > HD_SaveProfinetIn...

Topology view: ABC-PR1 [RT Migration (FW=2.00)]

Device overview:

Module	Back	Slot
ABC-PR1	0	0
Interface	0	0 x1
Input 004 bytes_1	0	1
Input 002 bytes_1	0	2
Input 016 bytes_1	0	3
Input 004 bytes_1	0	4
Output 002 bytes_1	0	5
Output 016 bytes_1	0	6
Output 004 bytes_1	0	7

Properties: Input 004 bytes_1 [Input 004 bytes]

IO addresses:

Input addresses:

Start address: 68
End address: 131
Organization block: (Automatic update)
Process image: Automatic update

Siemens - C:\Users\User\Desktop\Radwag\ProfinetSampleSCL1.2 (EX)\RadwagProfinetSampleSCL1.2 (EX)

Project: Edit View Insert Online Options Tools Window Help

Totally Integrated Automation PORTAL

Project tree: RadwagProfinetSampleSCL1.2 (EX) > Ungrouped devices > ABC-PR1 [RT Migration (FW=2.00)]

Devices & networks: RadwagProfinetSampleSCL1.2 (EX) > Devices & networks > PLC_1 (CPU 1214C-2 DC) > Device configuration > Device & diagnostics > Program blocks > Add new block > Hardware > Main [DB1] > SaveOutput > HD_SaveOutput [FC1] > HD_SaveProfinetOut...

Topology view: ABC-PR1 [RT Migration (FW=2.00)]

Device overview:

Module	Back	Slot
ABC-PR1	0	0
Interface	0	0 x1
Input 004 bytes_1	0	1
Input 002 bytes_1	0	2
Input 016 bytes_1	0	3
Input 004 bytes_1	0	4
Output 002 bytes_1	0	5
Output 016 bytes_1	0	6
Output 004 bytes_1	0	7

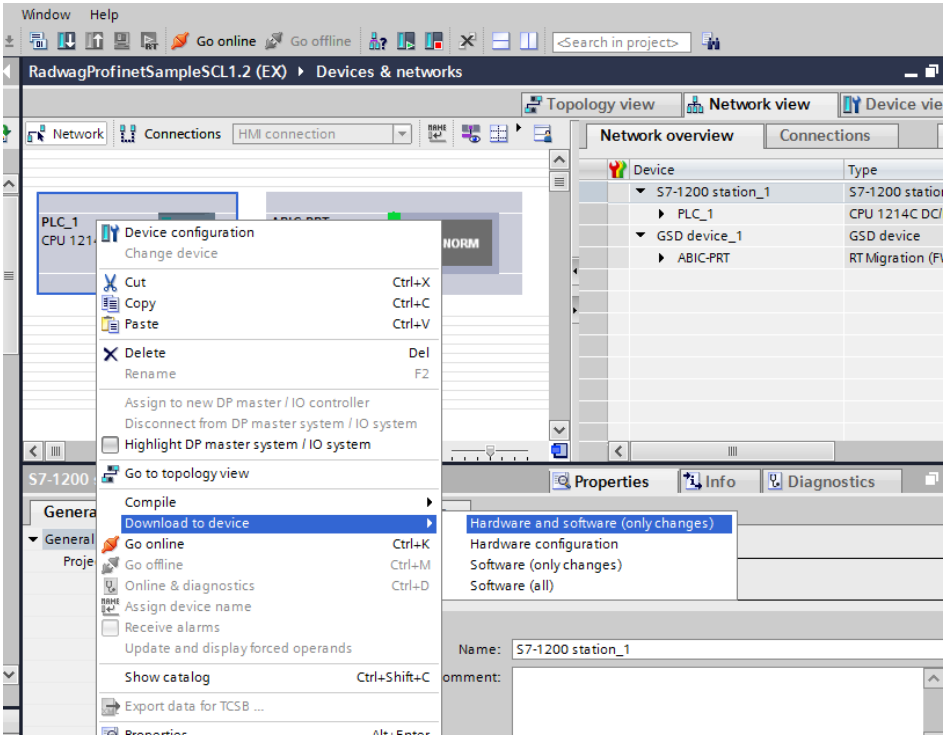
Properties: Output 002 bytes_1 [Output 002 bytes]

IO addresses:

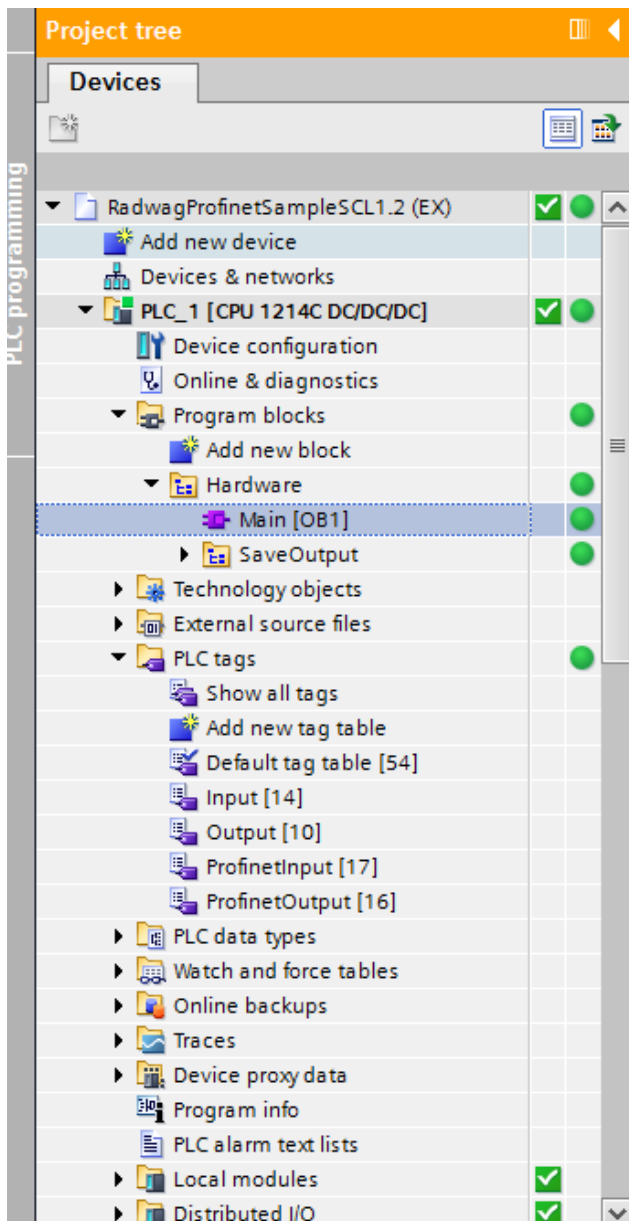
Output addresses:

Start address: 64
End address: 95
Organization block: (Automatic update)
Process image: Automatic update

On this stage you can download hardware and software configuration to the device and download data to the device.



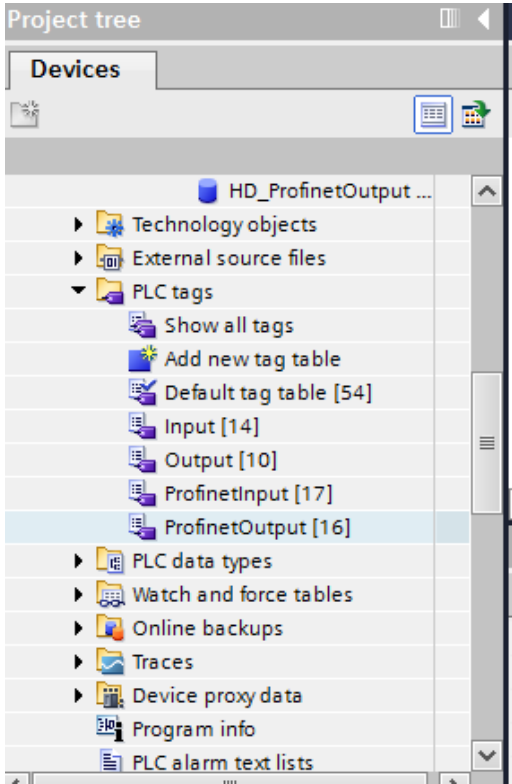
Upon successful compilation and loading of the code, MASTER and SLAVE modules should establish communication. You can check this by pressing GO ONLINE field. The result has to be similar to the result presented below.



The next step will be to create program code.

4. PLC SOFTWARE SAMPLE

Start creating the application by determining symbolic names of input and output registers. For this purpose, use the branch of the project tree: PLC TAGS. For the purpose of this example, the figure below contains exemplary tags tables:



INPUT and OUTPUT tables refer to the physical inputs/outputs of the MASTER device and are not relevant in terms of this application. The PROFINET module input and output registers are specified in ProfinetInput and ProfinetOutput tables.

The pictures below present determined symbolic names and addresses:

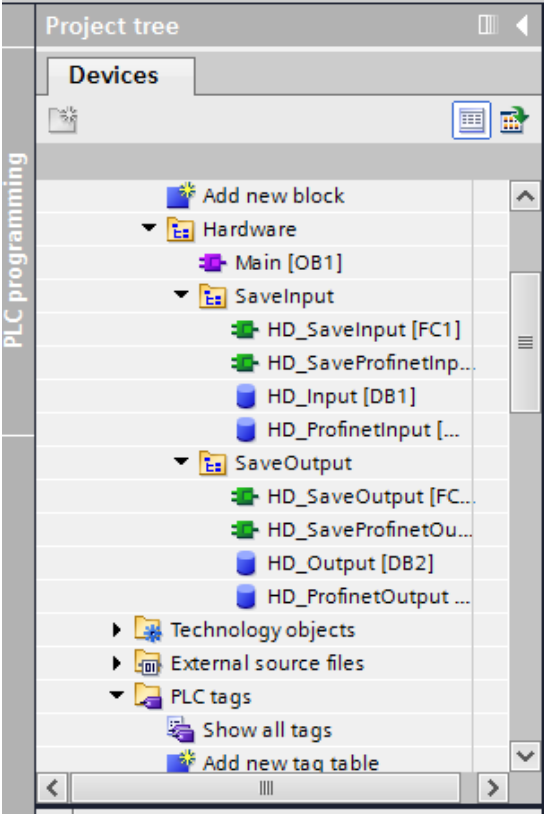
RadwagProfinetSampleSCL1.2 ang(EX) ▶ PLC_1 [CPU 1214C DC/DC/DC] ▶ PLC tags ▶ ProfinetInput [17]

ProfinetInput									
	Name	Data type	Address	Retain	Acces...	Writa...	Visibl...	Comment	
1	mass	Real	%ID68	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
2	tare	Real	%ID72	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
3	unit	Word	%IW76	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
4	status	Word	%IW78	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
5	LO	Real	%ID80	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
6	process status	Word	%IW84	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
7	inputs	Word	%IW134	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
8	min	Real	%ID136	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
9	max	Real	%ID140	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
10	lot number	DWord	%ID152	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
11	operator	Word	%IW156	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
12	article	Word	%IW158	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
13	customer	Word	%IW160	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
14	packaging	Word	%IW162	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
15	source warehouse	Word	%IW164	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
16	target warehouse	Word	%IW166	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
17	formulation/dosing process	Word	%IW168	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
18	<Add new>			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

RadwagProfinetSampleSCL1.2 ang(EX) ▶ PLC_1 [CPU 1214C DC/DC/DC] ▶ PLC tags ▶ ProfinetOutput [16]

ProfinetOutput									
	Name	Data type	Address	Retain	Acces...	Writa...	Visibl...	Comment	
1	cammand	Word	%QW64	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
2	complex command	Word	%QW66	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
3	platform	Word	%QW68	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
4	set tare	Real	%QD70	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
5	set lo	Real	%QD74	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
6	outputs	Word	%QW78	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
7	set min	Real	%QD80	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
8	set max	Real	%QD84	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
9	set lot	DWord	%QD96	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
10	set operator	Word	%QW100	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
11	set article	Word	%QW102	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
12	set customer	Word	%QW104	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
13	set source warehouse	Word	%QW108	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
14	set target warehouse	Word	%QW110	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
15	set formulation/dosing	Word	%QW112	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
16	set packaging	Word	%QW106	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
17	<Add new>			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

In order to avoid working directly on module physical inputs/outputs, create data blocks containing the representations of those registers and create function 'rewriting' the values between them. Create HARDWARE group in PROGRAM BLOCKS branch and determine data blocks in the same way as presented below:



HD_OUTPUT and HD_INPUT blocks refer to physical MASTER inputs/outputs and are not relevant in terms of this project. HD_ProfinetOutput and HD_ProfinetInput blocks refer to the PROFINET module input/output registers on a weighing instrument. They look as follows:

Keep actual values Snapshot Copy snapshots to start values Load start values as actual values

HD_ProfinetInput

	Name	Data type	Start value	Retain	Accessible f...	Writa...	Visible in ...	Setpoint	Comment
1	Static			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	mass	Real	0.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	tare	Real	0.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	unit	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	status	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	lo	Real	0.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7	process status	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	inputs	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9	min	Real	0.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10	max	Real	0.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11	lot number	DWord	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12	operator	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13	article	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
14	customer	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
15	packaging	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
16	source warehouse	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
17	target warehouse	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
18	formulation/dosing pr...	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Keep actual values Snapshot Copy snapshots to start values Load start values as actual values

HD_ProfinetOutput

	Name	Data type	Start value	Retain	Accessible f...	Writa...	Visible in ...	Setpoint	Comment
1	Static			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	command	Word	16#02	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	complex command	Word	16#0008	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
4	platform	Word	16#0001	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	set tare	Real	2.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	set lo	Real	1.5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7	outputs	Word	16#0000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
8	set min	Real	2.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9	set max	Real	2.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10	set lot number	DWord	16#0000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11	set operator	Word	16#0004	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12	set article	Word	16#0001	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13	set customer	Word	16#01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
14	set packaging	Word	16#0004	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
15	set source warehouse	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
16	set target warehouse	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
17	set formulation/dosin...	Word	16#0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

The functions that rewrite values between physical inputs/outputs of the module may look like this:

...wagProfinetSampleSCL1.2 ang(EX) | PLC_1 [CPU 1214C DC/DC/DC] | Program blocks | Hardware | SaveOutput | HD_SaveProfinetOutput [FC4]

Name	Data type	Default value	Comment
1	Input		
2	<Add new>		
3	Output		

```

IF... CASE... FOR... WHILE... OF... TO DO... DO... (*..*) REGION
1 "command" := "HD_ProfinetOutput".command;
2 "complex command" := "HD_ProfinetOutput"."complex command";
3 "platform" := "HD_ProfinetOutput".platform;
4 "set tare" := "HD_ProfinetOutput"."set tare";
5 "set lot" := "HD_ProfinetOutput"."set lot";
6 "outputs" := "HD_ProfinetOutput".outputs;
7 "set min" := "HD_ProfinetOutput"."set min";
8 "set max" := "HD_ProfinetOutput"."set max";
9 "set lot" := "HD_ProfinetOutput"."set lot number";
10 "set operator" := "HD_ProfinetOutput"."set operator";
11 "set article" := "HD_ProfinetOutput"."set article";
12 "set customer" := "HD_ProfinetOutput"."set customer";
13 "set packaging" := "HD_ProfinetOutput"."set packaging";
14 "set source warehouse" := "HD_ProfinetOutput"."set source warehouse";
15 "%QW108 / Word"arehouse" := "HD_ProfinetOutput"."set target warehouse";
16 "set formulation/dosing" := "HD_ProfinetOutput"."set formulation/dosing process";
17
18
19
20

```

RadwagProfinetSampleSCL1.2 ang(EX) | PLC_1 [CPU 1214C DC/DC/DC] | Program blocks | Hardware | SaveInput | HD_SaveProfinetInput [FC3]

Name	Data type	Default value	Comment
1	Input		
2	<Add new>		
3	Output		

```

IF... CASE... FOR... WHILE... OF... TO DO... DO... (*..*) REGION
1 "HD_ProfinetInput".mass := "mass";
2 "HD_ProfinetInput".tare := "tare";
3 "HD_ProfinetInput".unit := "unit";
4 "HD_ProfinetInput".status := "status";
5 "HD_ProfinetInput".lot := "lot";
6 "HD_ProfinetInput"."process status" := "process status";
7 "HD_ProfinetInput".inputs := "inputs";
8 "HD_ProfinetInput".min := "min";
9 "HD_ProfinetInput".max := "max";
10 "HD_ProfinetInput"."lot number" := "lot number";
11 "HD_ProfinetInput".operator := "operator";
12 "HD_ProfinetInput".article := "article";
13 "HD_ProfinetInput".customer := "customer";
14 "HD_ProfinetInput".packaging := "packaging";
15 "HD_ProfinetInput"."source warehouse" := "source warehouse";
16 "HD_ProfinetInput"."target warehouse" := "target warehouse";
17 "HD_ProfinetInput"."formulation/dosing process" := "formulation/dosing process";
18
19
20
21
22
23
24

```

Invoke the functions in the main program loop.

The screenshot shows the SIMATIC Manager interface for a PLC program. The title bar indicates the project is 'RadwagProfinetSampleSCL1.2 (EX)' on a 'PLC_1 [CPU 1214C DC/DC/DC]' in the 'Main [OB1]' program block. The main window displays a variable declaration table for the 'Main' program.

Name	Data type	Default value	Comment
Input			
Initial_Call	Bool		Initial call of this OB
Remanence	Bool		=True, if remanent data are available
Temp			
<Add new>			
Constant			

Below the table, the LAD editor shows the following code:

```

1 "HD_SaveInput" ();
2 "HD_SaveOutput" ();
3 "HD_SaveProfinetInput" ();
4 "HD_SaveProfinetOutput" ();
5

```

On the right side of the editor, a symbol table lists the variables and their addresses:

"HD_SaveInput"	%FC1
"HD_SaveOutput"	%FC2
"HD_SaveProfinetInput"	%FC3
"HD_SaveProfinetOutput"	%FC4

Upon compiling and loading the program to the device in the data block you can read interesting output registers (MONITOR ALL) and save output registers (e.g. by changing START VALUE and LOAD START VALUES AS ACTUAL) of the SLAVE mode.



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