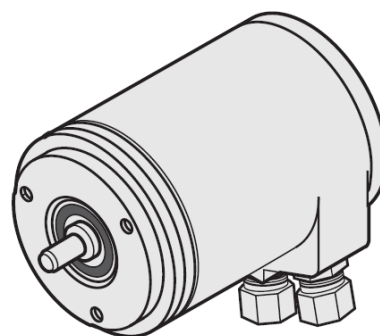




RM30xx ProfiNet

Brief instructions

efector400





Contents

The description may contain deviations from the user system, because different manufacturers or software versions may require different installations!
The description was created based on Siemens S7 version V5.4 + SP4.

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Safety instructions

- Please read the product description prior to set-up of the unit. Ensure that the product is suitable for your application without any restrictions.
- The unit complies with the relevant regulations and EC directives.
- Improper or non-intended use may lead to malfunctions of the unit or to unwanted effects in your application.
- That is why installation, electrical connection, set-up, operation and maintenance of the unit must be carried out by qualified personnel authorised by the machine operator.



1 Installation

1.1 Software

1. Download the GSD file from www.ifm.com => Article => [More information] => [Software download] => Device master data (GSD) file
Example: RM3011 gsdml file

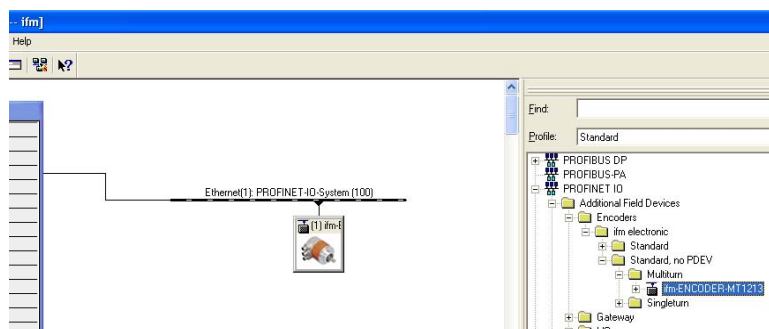
Absolute Winkelkodierer		
	Profibus (gsd)	ProfiNet (gsdml)
 Singleturn/ Multiturn	RN3001, RM3006, RM3007, RM3008 ▶ gsd-DPV0 (zip) ▶ gsd-DPV2 (zip) ▶ Handbuch (pdf)	RM3011 ▶ gsdml-Datei (zip) ▶ Handbuch (pdf)
 Singleturn/ Multiturn	RM3001, RM3004, RM3005 ▶ gsd-DPV0 (zip) ▶ Handbuch (pdf)	

2. Extras => Administer GSD => Install GSDML



3. Additional Field Devices => Encoder, select ifm Encoder (see chapter 2)

Standard (optional): for controllers which support the IRT* function.
 Standard, no PDEV: for controllers which do not support the IRT* function



*IRT = Isochronous Real Time (frequency rate <1ms; jitter accuracy 1μs)



4. Drag the encoder into the project and assign a device name and address

The 'Properties - ifm-ENCODER' dialog box is shown with the 'General' tab selected. It contains the following fields and options:

- Short description: ifm-ENCODER
- Order no. / firmware: RM30x / V10.0
- Family: ifm electronic
- Device name: ifm-ENCODER
- GSD file: GSDML-V2.2-IFM-RM30x+RM30x+20130802.xml
- Change Release Number... button
- Node in PROFINET IO system section:
 - Device number: 1
 - PROFINET IO-System (100)
 - IP address: 192.168.10.5
 - Ethernet... button
 - ☒ Assign IP address via IO controller
- Comment: (empty text area)
- Buttons: OK, Cancel, Help

5. Assign device name

The 'Assign device name' dialog box is shown. It contains the following fields and options:

- Device name: ifm-ENCODER
- Device: ifm electronic
- Available devices table:

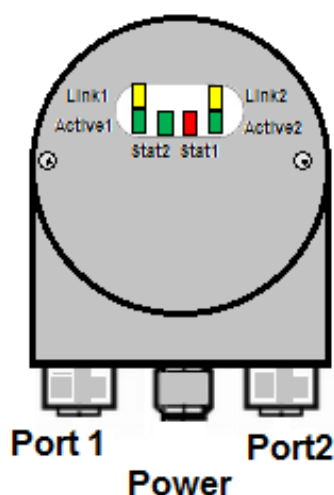
IP address	MAC address	Device type	Device name
192.168.10.5	00:0E:CF:04:28:EF	ifm electronic	ifm-encodes
- Assign name button
- Node flashing test section:
 - Duration (seconds): 3
 - Flashing on button
 - Flashing off button
- Checkboxes: ☐ Show only devices of the same type, ☐ Display only devices without names
- Buttons: Update, Export..., Close, Help

6. Parameter setting of the encoder (see chapter 3)

7. Set the requested variables (see chapter 4)

1.2 Hardware

Overview and connection



Port 1: Communication to the encoder

	1: Tx + 2: Rx + 3: Tx - 4: Rx -
Ethernet: 4 pin female, D-coded	

Power: Voltage supply

	1: US (10 - 30 V DC) 2: not connected (n.c.) 3: GND (0 V) 4: not connected (n.c.)
Power supply: 4 pin male, A-coded	

Port 2: Communication to further field devices

	1: Tx + 2: Rx + 3: Tx - 4: Rx -
Ethernet: 4 pin female, D-coded	



2 Setting the encoder function:

2.1 Selection of the correct encoder:

Standard (optional): for controllers which support the IRT* function.

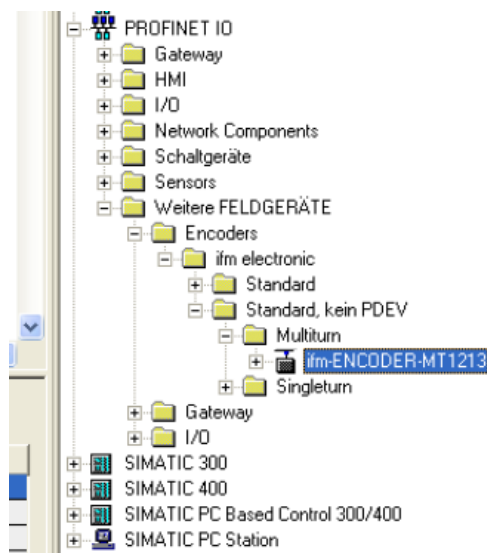
Singleturn: 8192 signals
Multiturn: 8192 signals x 4096 revolutions

Standard, no PDEV: for controllers which do not support the IRT* function

Singleturn: 8192 signals
Multiturn: 8192 signals x 4096 revolutions

For detailed information see operating instructions

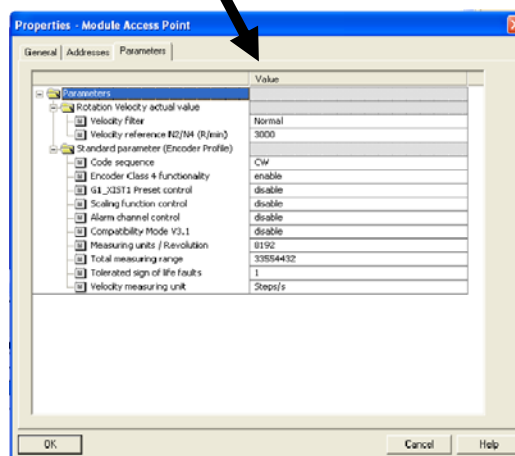
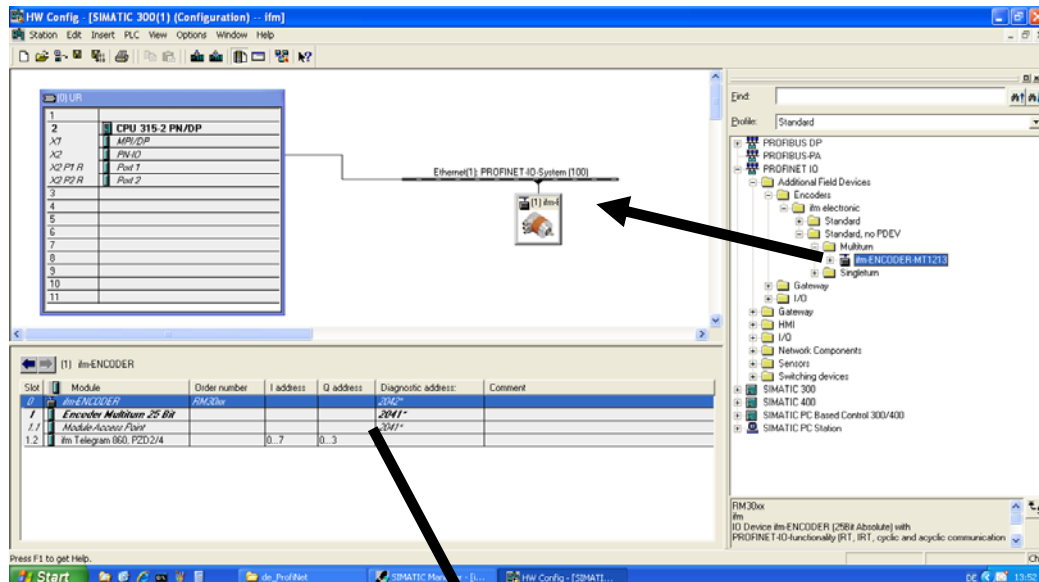
Hardware catalogue :





2.2 Multiturn encoder ifm Telegram 860 (standard):

Configuration (HW Config) => Properties Module Access Point => Parameter setting

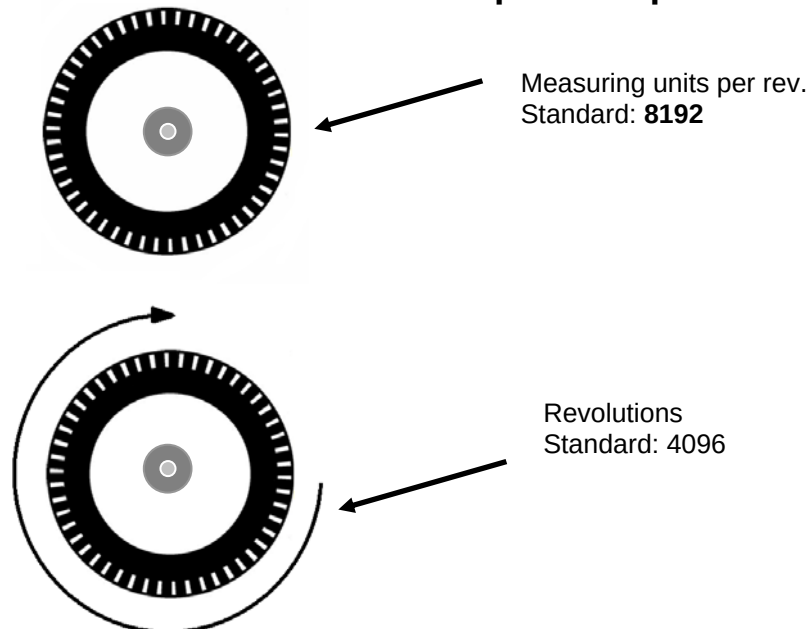


Setting options:

Code sequence:	Counterclockwise / clockwise
Class 4 functionality:	Enable / disable
Scaling function control:	Enable scaling / disable scaling
Measuring units per rev.:	8192 (factory setting)
Total measuring range:	33554432 (factory setting)

3 Setting of the measuring units (measuring range):

Simplified representation:



The resolution per revolution are the pulses which are provided for a revolution. The revolutions are the further pulses for another entire revolution.

Example: 8192×2 revolutions = total: 16384
(1,2,...8192, 8193,...16383, 16384,1,2,...)

Input of the figures:

Maximum units:

8192 units x 4096 revolutions => total measuring range 33 554 432

The revolutions must never be more than 4096, therefore the number of total measuring units is irrelevant.

Example:

7096 units x 2048 revolutions = 14 532 608 total measuring range => OK.

196 units x 4097 revolutions = 803 012 total measuring range => not OK.

Integers:

Only integer values may be entered.

Example:

8192 units x 2.5 revolutions = 20 480 total measuring range => not OK.



3.1 Setting examples

The value for the resolution (pulses for a revolution) must be entered for measuring units per revolution:

Measuring units / Revolution	2000
------------------------------	------

The total measuring range must be calculated.
Example.: 2000 pulses x 9 revolutions = 18 000

Total measuring range	18000
-----------------------	-------

Standard: Scaling function disabled

Resolution per revolution **8192** x revolutions 4096 = total measuring range **33 554 432**

Scaling function control	disable
Alarm channel control	disable
Compatibility Mode V3.1	disable
Measuring units / Revolution	8192
Total measuring range	33554432

100 units x 2 revolutions (total measuring range 200):

Scaling function control	enable
Alarm channel control	disable
Compatibility Mode V3.1	disable
Measuring units / Revolution	100
Total measuring range	200

360 units x 1 revolution (total measuring range 360 singleturn):

Scaling function control	enable
Alarm channel control	disable
Compatibility Mode V3.1	disable
Measuring units / Revolution	360
Total measuring range	360
Tolerated sign of life faults	1



3.2 Setting examples with high and low word

For some controllers the value for the total measuring range must be converted to a high word and a low word.

Standard setting 8192 units x 4096 revolutions:

Scaling function control	Disable Scaling
Measuring units per rev.	8192
Total measuring range(units)hi	512
Total measuring range(units)lo	0

8192 units x 4096 revolutions => total measuring range 33 554 432

total measuring range 33 554 432 in hex => 0200 0000 hex

high word 0200 hex in decimal => **512**

low word 0000 hex in decimal => **0**

200 units x 24 revolutions - enable scaling:

Scaling function control	Enable Scaling
Measuring units per rev.	200
Total measuring range(units)hi	0
Total measuring range(units)lo	4800

200 units x 24 revolutions => total measuring range 4800

total measuring range 4800 in hex => 0000 12C0 hex

high word 0000 hex in decimal => **0**

low word 12C0 hex in decimal => **4800**

200 units x 1 revolution - enable scaling:

Scaling function control	Enable Scaling
Measuring units per rev.	200
Total measuring range(units)hi	0
Total measuring range(units)lo	200

200 units x 1 revolution => total measuring range 200

total measuring range 200 in hex => 0000 00C8 hex

high word 0000 hex in decimal => **0**

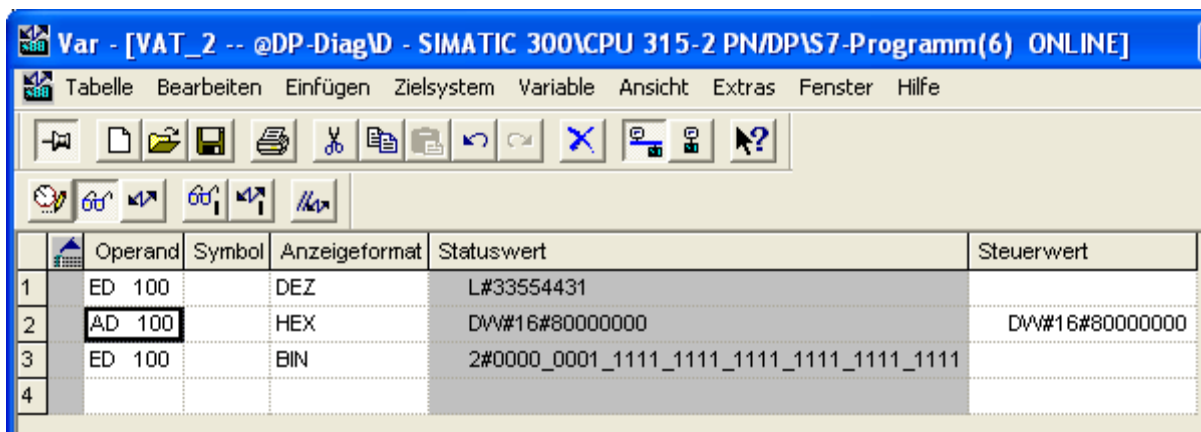
low word 00C8 hex in decimal => **200**



4 List of variables, reset and preset

4.1 Display variables

Simatic Manager => CPU 315-2 (select) TAB → PLC => Monitor/control variable



	Operand	Symbol	Anzeigeformat	Statuswert	Steuerwert
1	ED 100		DEZ	L#33554431	
2	AD 100		HEX	DW#16#80000000	DW#16#80000000
3	ED 100		BIN	2#0000_0001_1111_1111_1111_1111_1111_1111	
4					

Display measured value:

Operand ED 100 (for set input address 100...103), display format DEC, and monitor variables.

Attention: When the properties are changed, a reset must be carried out to display the current value.

Wort	Wort 1		Wort 0
Funktion	Prozess-Istwert		
Bit	31...30	29...16	15...0
	0	X	X



4.2 Reset:

Operand AD 100 (for set E address 100...103), display format HEX, enter 8 at the first position in the control value (DW = Double Word) for a value change.

Only a change of the status value from 0 to 8 is detected; no value change is carried out when the status value of 8 remains 8.

(Attention! Only to be carried out when the encoder is standing still)

Example reset:

OPERAND	DISPLAY FORMAT	STATUS VALUE	CONTROL VALUE
ED 100	Dec..	L#5120	
AD 100	Hex.:	DW#0000 0000	<u>8000 0000</u>

OPERAND	DISPLAY FORMAT	STATUS VALUE	CONTROL VALUE
ED 100	Dec..	L#0	
AD 100	Hex.:	DW# <u>8000 0000</u>	8000 0000

4.3 Preset:

Operand AD 100 (for set E address 100...103), display format HEX, enter 8 at the first position in the control value (DW = Double Word) for a value change.

Only a change of the status value from 0 to 8 is detected; no value change is carried out when the status value of 8 remains 8.

(Attention! Only to be carried out when the encoder is standing still)

Example Preset:

OPERAND	DISPLAY FORMAT	STATUS VALUE	CONTROL VALUE
ED 100	Dec..	L#0	
AD 100	Hex.:	DW#0000 0000	<u>8000 0E10</u>

OPERAND	DISPLAY FORMAT	STATUS VALUE	CONTROL VALUE
ED 100	Dec..	L#3600	
AD 100	Hex.:	DW# <u>8000 0E10</u>	8000 0E10

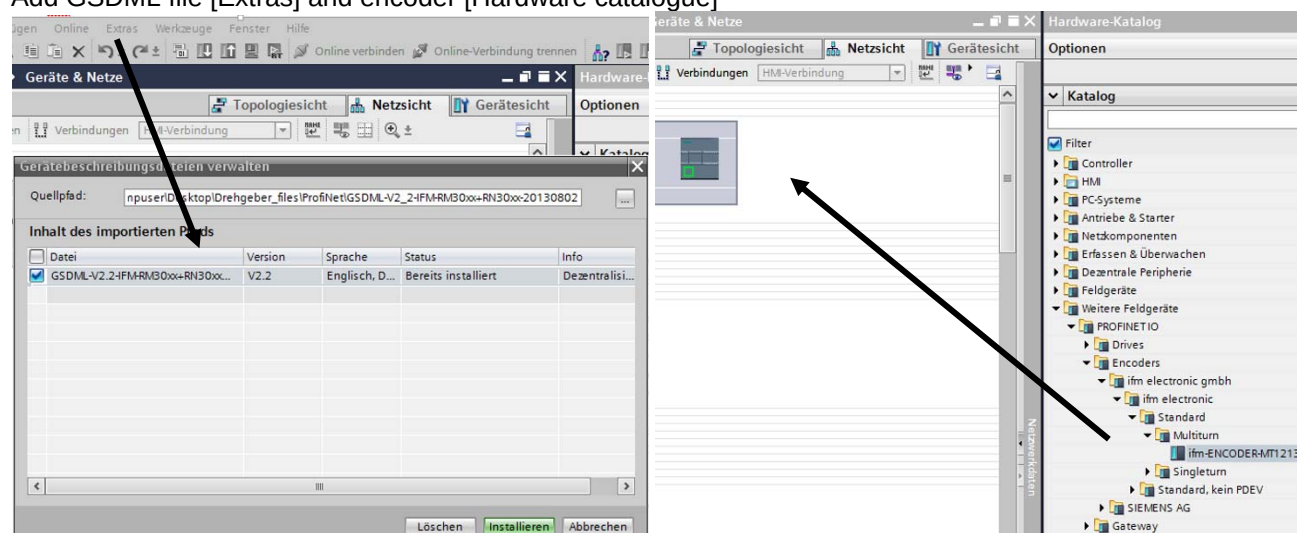
3600 (decimal) = 0E10 (hex)

5 View in TiA portal

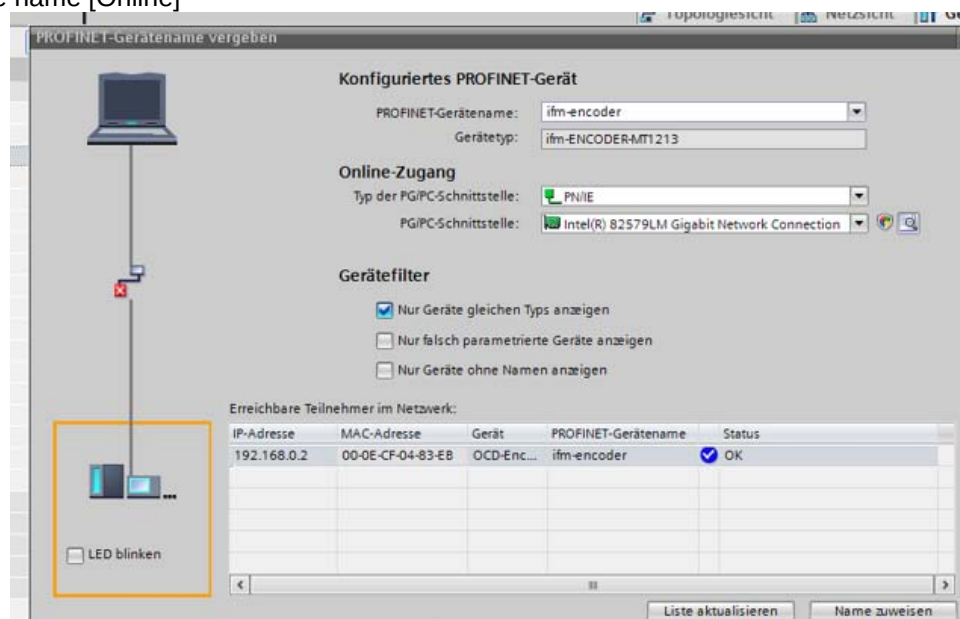
The integration of the encoder is done in the TiA portal as described in chapter 1-6, see below for the views on the respective sections:

5.1 Installation

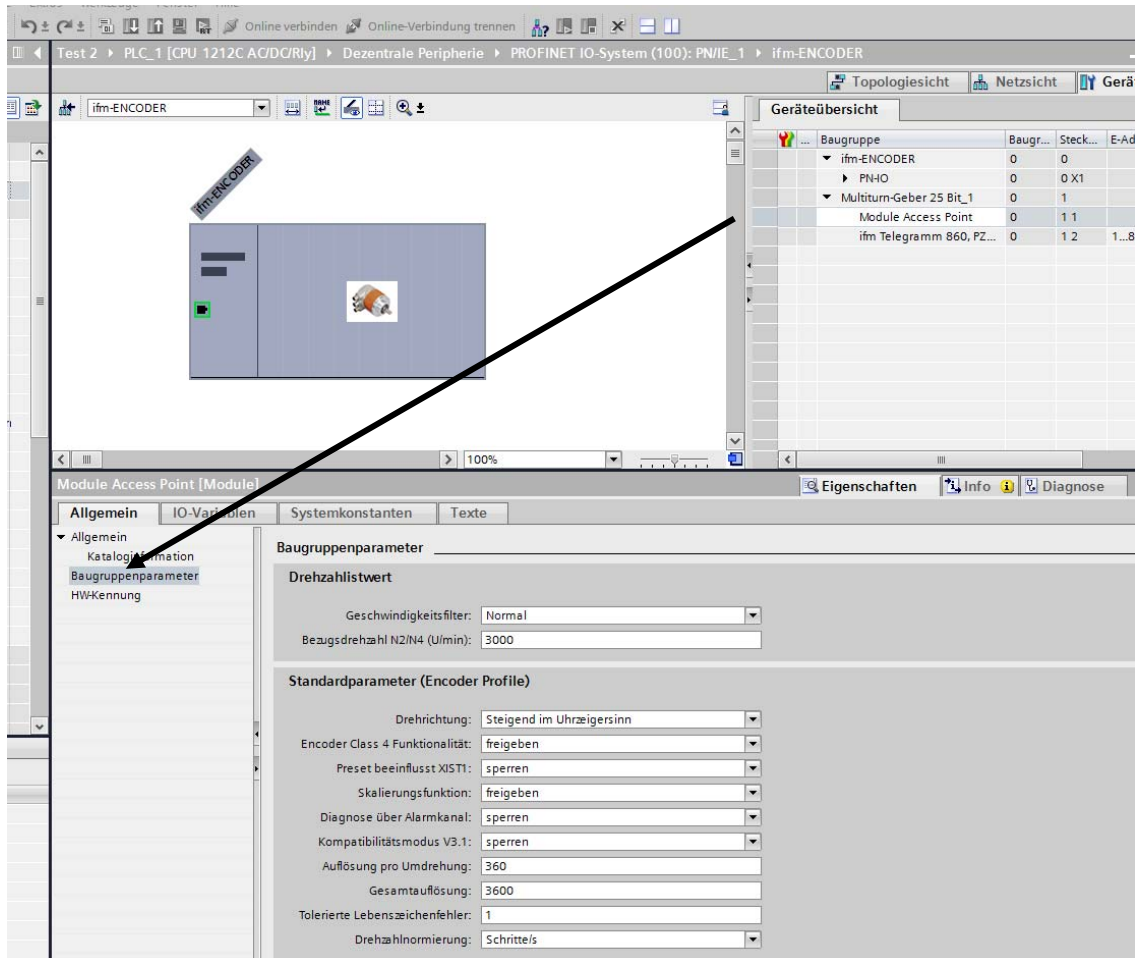
Add GSDML file [Extras] and encoder [Hardware catalogue]



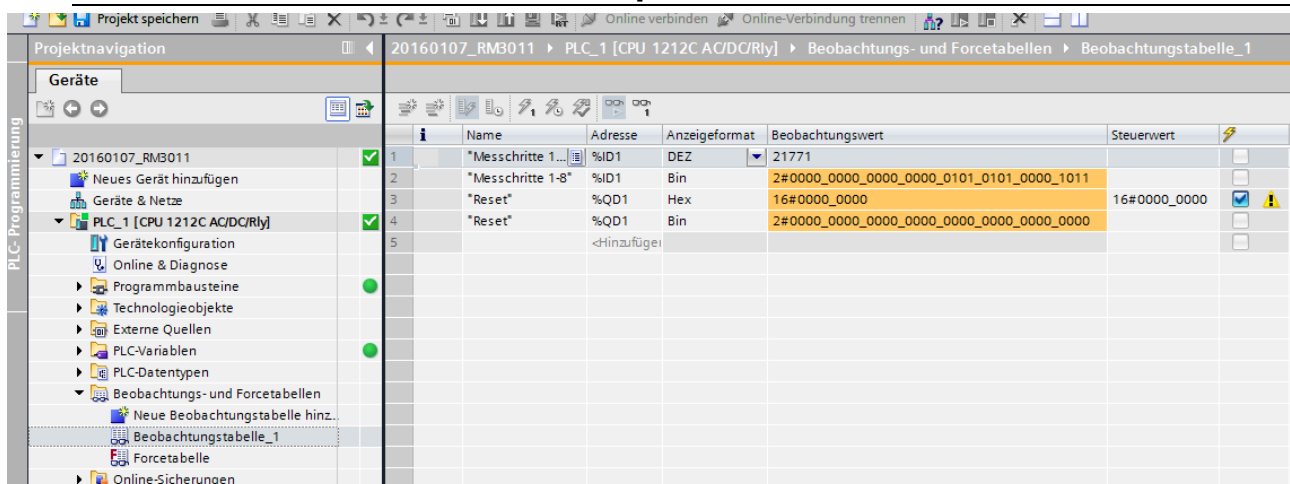
Assign device name [Online]



5.2 Setting the encoder function

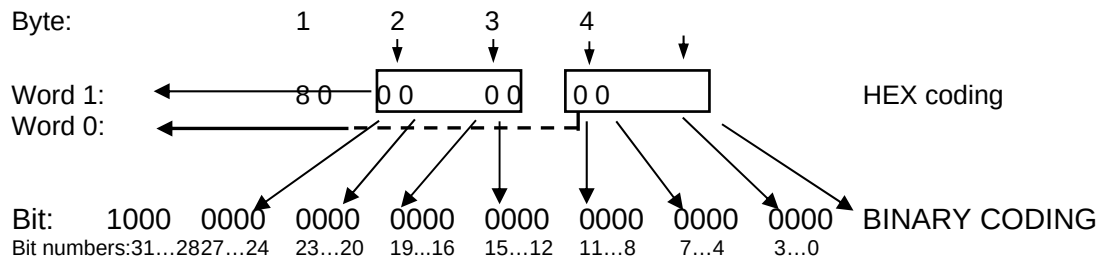


5.3 List of variables, reset and preset:





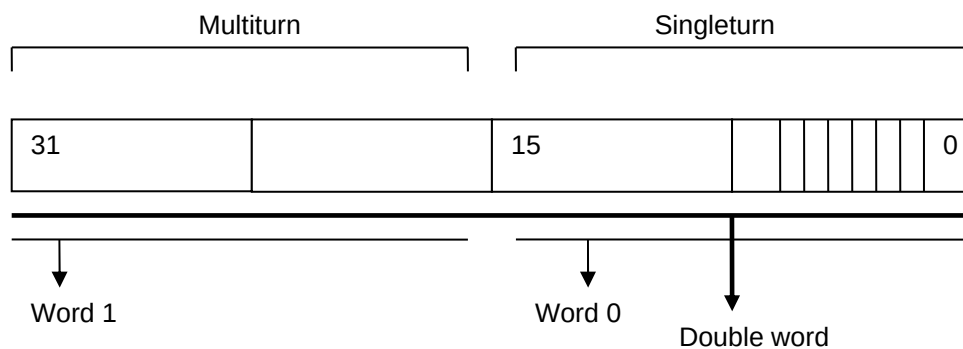
6 Other:



Example decimal to binary:

ED 100	DEZ	L#33554431
ED 100	BIN	2#0000_0001_1111_1111_1111_1111_1111_1111

EW 102	DEZ	228
ED 100	BIN	2#0100_0000_0000_0000_0000_0000_1110_0100



8 bits = 1 byte = octet
 16bits = 2 bytes = word
 32bits = 4 bytes = double word (DWORD)
 64bits = 8 bytes = quadruple word (LongWORD)