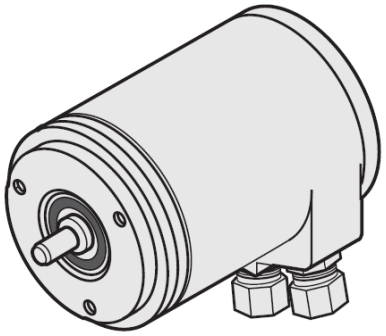
RM30xx Profibus

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.

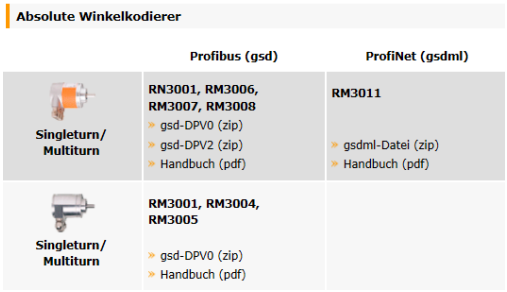
Safety instructions

- 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.

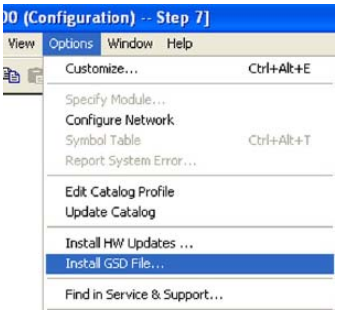
1 Installation

1.1 Software

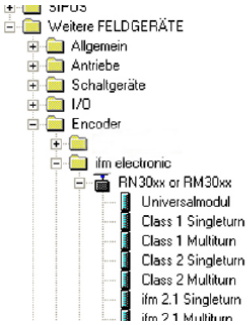
1. Download the GSD file from www.ifm.com => Article => [More information] => [Software download] => Device master data (GSD) file
   Example: RM3006 [gsd-DPV0]*****



2. Hardware catalogue => Install GSD (first, unzip the ZIP file)



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



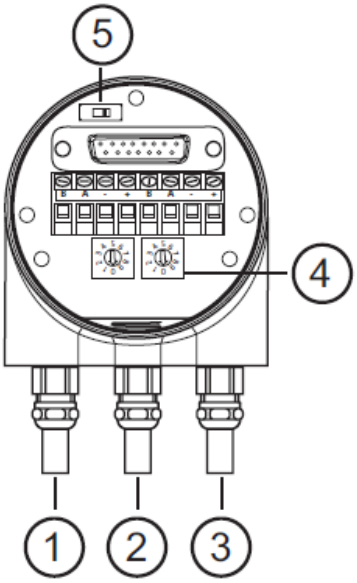
4. Drag the encoder into the project and assign a Profibus address
5. Parameter setting of the encoder (see chapter 3)
6. Set the requested variables (see chapter 5)

*****DP-V0: cyclic exchange of data and diagnoses **(standard)**

DP-V2: isochronous data exchange, lateral communication between the slaves and time synchronisation.

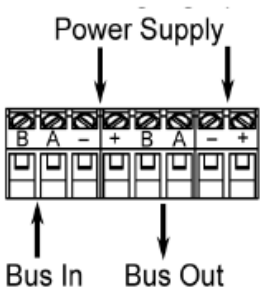
1.2 Hardware

1.2.1 Overview



1: voltage supply +Ub /-GND
2: bus IN
3: bus OUT
4: addressing
5: terminating resistor

1.2.2 Connection



Terminal	Description
B (left)	Signal cable B Incoming bus cable
A (left)	Signal cable A Incoming bus cable
-	0 V
+	10...30 V
B (right)	Signal cable B Outgoing bus cable
A (right)	Signal cable A Outgoing bus cable
-	0 V
+	10...30 V

2 Setting the encoder function:

2.1 Selection of the correct encoder:

Class1 Singleturn:
This setting enables only the setting of the direction of rotation at max. 8192 measuring units.

Class1 Multiturn:
This setting enables only the setting of the direction of rotation at max. 8192 measuring units x 4096 revolutions.

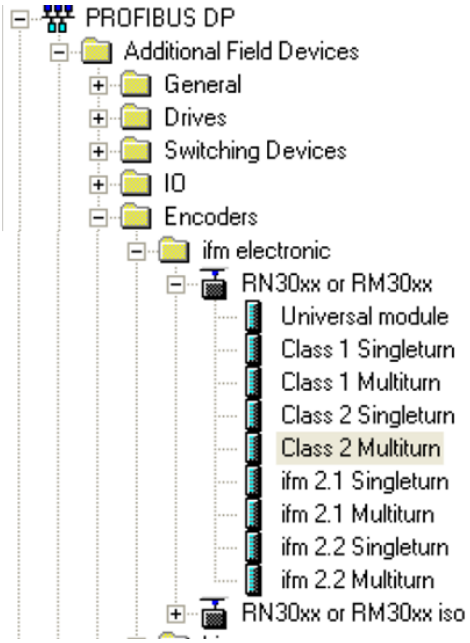
Class2 Singleturn:
This setting enables the setting of the direction of rotation, diagnostic function and scaling of the measuring units at 8192 units.

- Class2 Multiturn (standard):
This setting enables the setting of the direction of rotation, diagnostic function and scaling of the measuring units at 8192 units x 4096 revolutions.

ifm 2.1 Singleturn / Multiturn
Additionally to Class2: limit switch function, set-up mode.
For details see operating instructions.

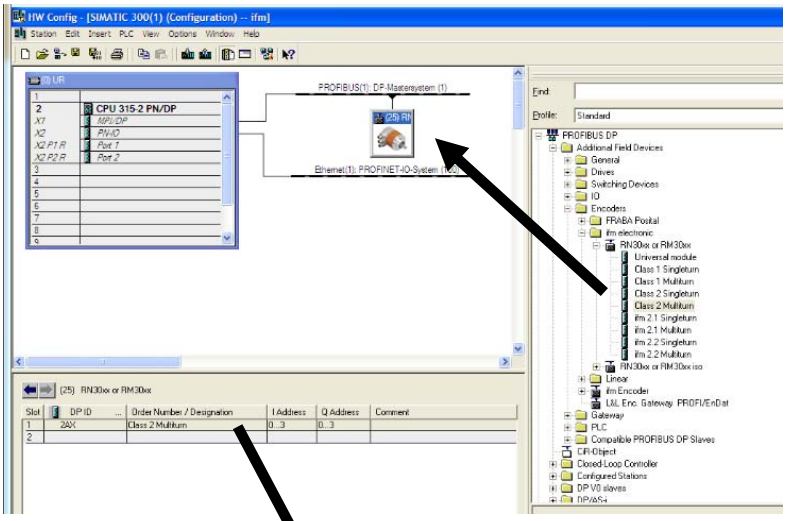
ifm 2.2 Singleturn / Multiturn
As in 2.1 but with provision of a speed value.
For details see operating instructions.

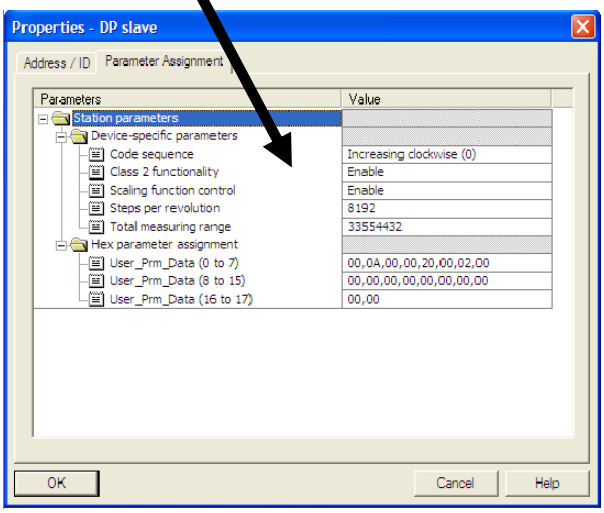
Hardware catalogue:



2.2 Multiturn encoder Class2 (standard):

Configuration (HW Config) => DP Slave Properties => Assigning Parameters



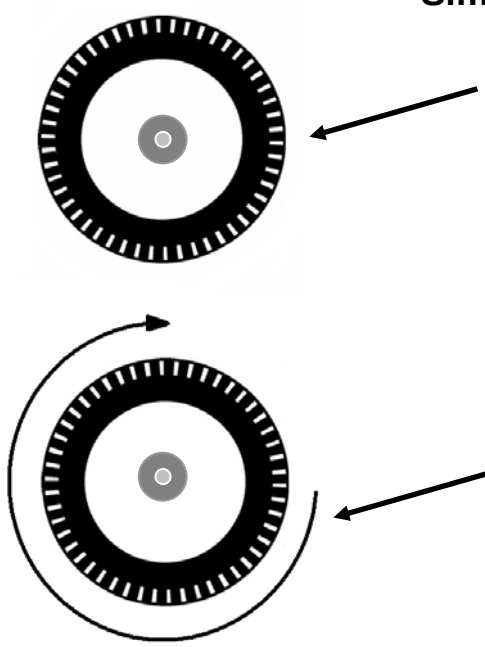


Setting options:

Code sequence:	Counterclockwise / clockwise
Class 2 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 x 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.

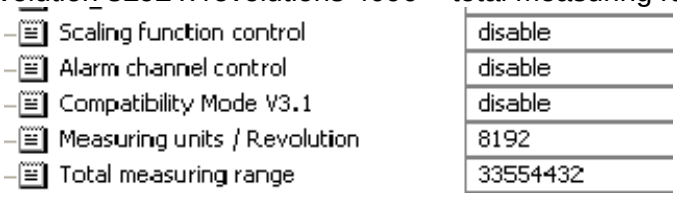
3.1 Setting examples

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

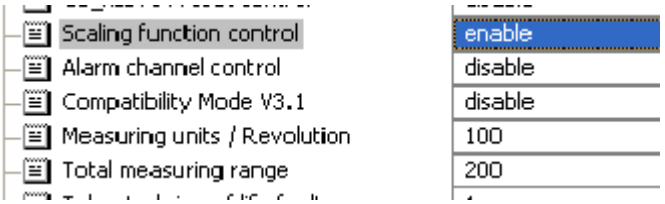
The total measuring range must be calculated.
Example.: 2000 pulses x 9 revolutions = 18 000

Standard: Scaling function disabled

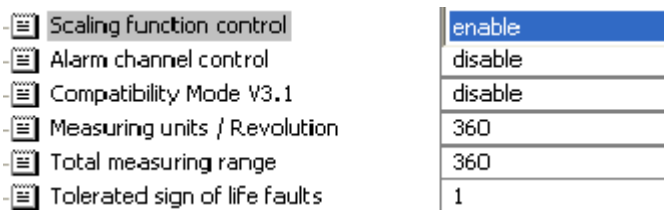
Resolution per revolution **8192** x revolutions 4096 = total measuring range **33 554 432**



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



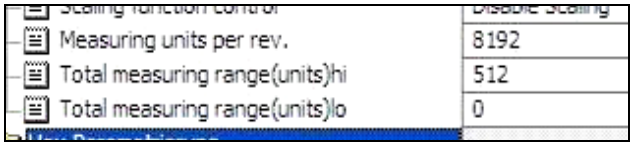
360 units x 1 revolution (total measuring range **360** singleturn):



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.

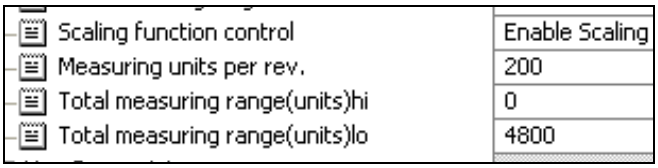
Standard setting 8192 units x 4096 revolutions:



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**

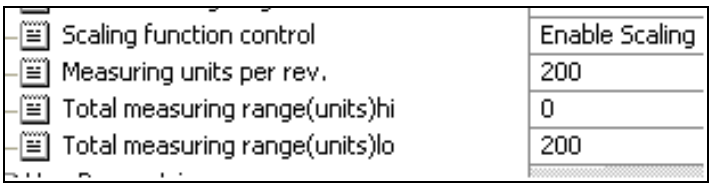
200 units x 24 revolutions - enable scaling:



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:

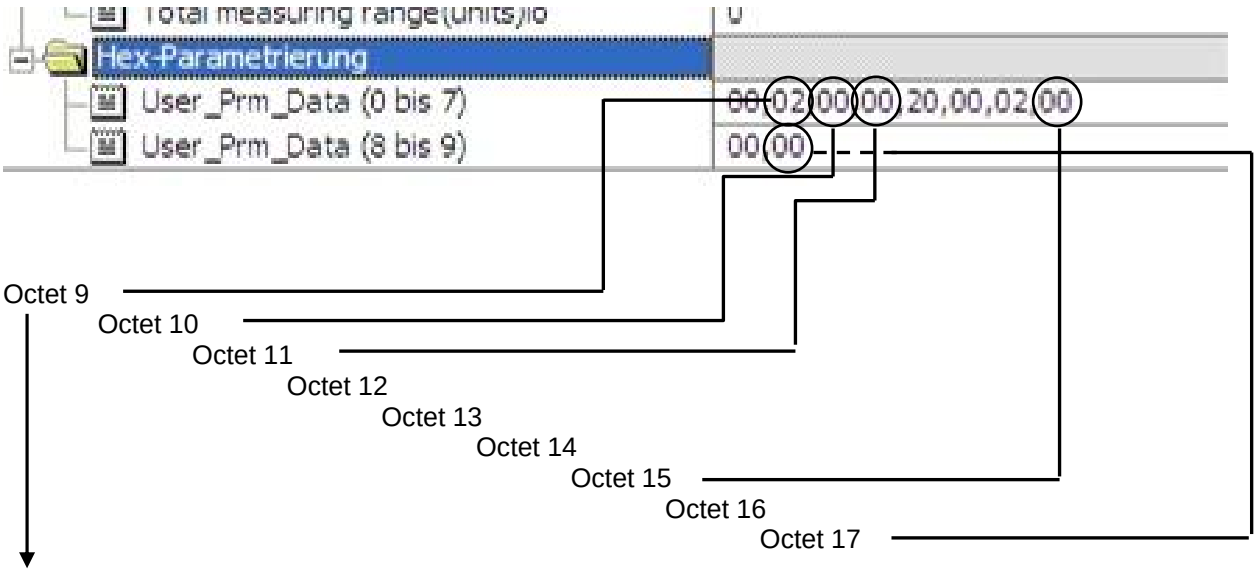


200 units x 1 revolution => total measuring range 200

total measuring range 200 in hex => 0000 00C8 hex
high word 0000 hex in decimal => **0**
low word 00C8 hex in decimal => **200**

4 Hex parameter setting for multiturn class 2:

Hex parameter setting means that the device-specific parameters are written in HEX coding.
These settings **do not have to be** made if already set in the device-specific parameters.



,02 (HEX - CODE)

0000 0010 (BINARY CODE)

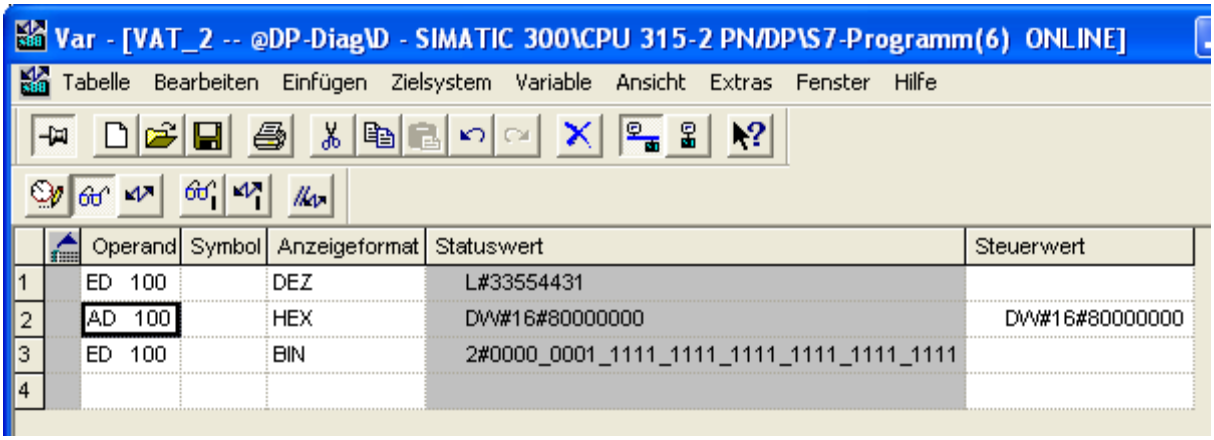
Meaning (read from right to left):

Octet 9 bit 0 => 0 = clockwise // 1 counterclockwise
Octet 9 bit 1 => 0 = class 2 disable // 1class 2 enable
Octet 9 bit 2 => 0 = "optional" set-up diagnosis No // 1 Yes

5 List of variables, reset and preset

5.1 Display variables

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



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

5.2 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#**0**000 0000	8000 0000

OPERAND	**DISPLAY FORMAT**	**STATUS VALUE**	**CONTROL VALUE**
ED 100	Dec..	L#0	
AD 100	Hex.:	DW#**8**000 0000	8000 0000

5.3 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**)

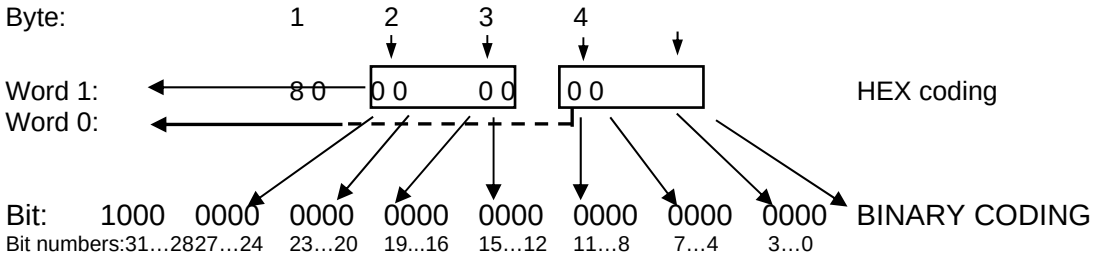
Example Preset:

OPERAND	**DISPLAY FORMAT**	**STATUS VALUE**	**CONTROL VALUE**
ED 100	Dec..	L#0	
AD 100	Hex.:	DW#**0**000 0000	8000 0E10

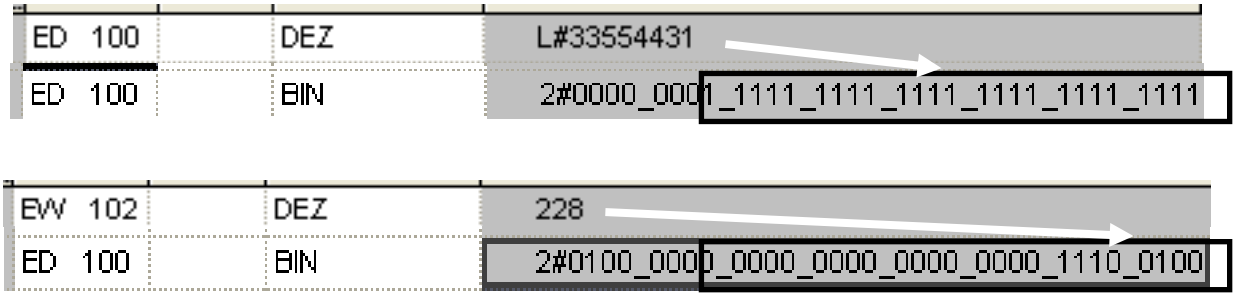
OPERAND	**DISPLAY FORMAT**	**STATUS VALUE**	**CONTROL VALUE**
ED 100	Dec..	L#3600	
AD 100	Hex.:	DW#**8**000 0E10	8000 0E10

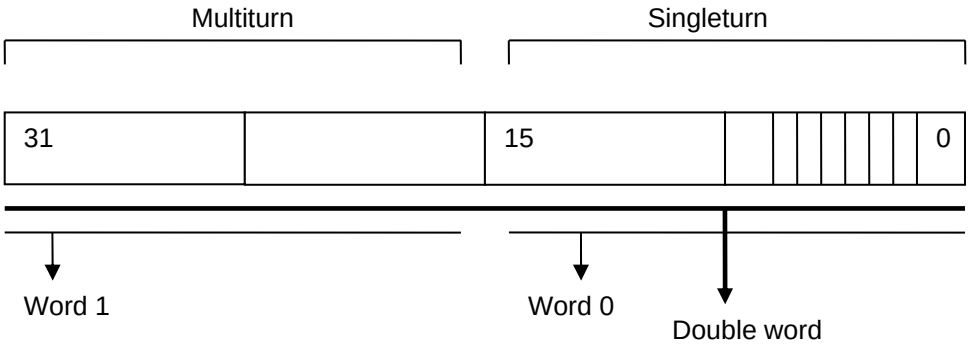
3600 (decimal) = 0E10 (hex)

6 Other:



Example decimal to binary:





8 bits = 1 byte = octet
16bits = 2 bytes = word
32bits = 4 bytes = double word (DWORD)
64bits = 8 bytes = quadruple word (L*ong*WORD)

