





# FNC-APM PROFINET ENCODER USER GUIDE





### CONTENTS

FIG	URES	S	3
TAE	BLES		4
CAI	BLES A	AND PORTS OF ENCODER	5
HA	RDWA	/ARE INSTALLATION	6
1.	Com	mmunication Telegrams for Cyclic Process Data	7
1	.1.	I/O Signals	7
1	.2.	Structure Of Telegram 81 to 84	7
	1.2.	2.1. Structure of Telegram 81	7
	1.2.	2.2. Structure of Telegram 82	8
	1.2.	2.3. Structure of Telegram 83	8
	1.2.4	2.4. Structure of Telegram 84	9
2.	Con	ntents of The Signals	
2	2.1.	Signal 6: Speed Value (NIST_A)	
2	2.2.	Signal 8: Speed Value (NIST_B)	
2	2.3.	Signal 9: Sensor 1 Control Word (G1_STW)	
2	2.4.	Signal 10: Sensor 1 State Word (G1_ZSW)	
2	2.5.	Signal 11: Position Values in The Telegram Part (G1_XIST1)	
2	2.6.	Signal 12: Position Values in The Telegram Part (G1_XIST2)	
2	2.7.	Signal 39: Position Values in The Telegram Part (G1_XIST3)	13
2	2.8.	Signal 80: Encoder Control Word 2 (STW2_ENC) Hata!	Yer işareti tanımlanmamış.
2	2.9.	Signal 81: Encoder State Word 2 (ZSW2_ENC)	13
3.	Inte	egration Into The PLC	19
3	8.1.	Installing the GSDML file (only once)	19
3	3.2.	Loading encoder in the user interface	20
3	3.3.	Configuration of the encoder via the Parameter Access Point	21
	3.3.	8.1. Reading the position	23
	3.3.2	8.2. Setting preset value	24
3	8.4.	Configuring encoder as technology object	Yer işareti tanımlanmamış.





## FIGURES

Figure 1: Connection	6
Figure 2: Installing device description file in the TIA portal	19
Figure 3: FNCAPS58/FNCAPM58 PROFINET in Other Field Devices	20
Figure 4: Connection from the PLC to FNCAP58S or FNCAP58M	20
Figure 5: Configuration Data	22
Figure 6: Reading the position	23
Figure 7: Configuration data for a preset value	24
Figure 8: Vendor specific configuration data for a preset value	24
Figure 9: Setting bit 12 of G1_STW	25
Figure 10: Setting bit 13 of G1_STW	25





### TABLES

Table 1: Signal numbers of the I/O data	7
Table 2: Output data in the telegram 81	7
Table 3: Input data in telegram 81	7
Table 4: Output data in the telegram 82	8
Table 5: Input data in telegram 82	8
Table 6: Output data in the telegram 83	8
Table 7: Sensor 1 state word (G1_ZSW)	
Table 8: Example for position values in G1_XIST1 MSW	
Table 9: Example for position values in G1_XIST1 LSW	
Table 10: Example for position values in G1_XIST2 MSW	
Table 11: Example for position values in G1_XIST2 LSW	
Table 12: Example for position values in G1_XIST3	
Table 13: Encoder control word 2 (STW2_ENC)	
Table 14: Encoder state word 2 (ZSW2 ENC)	





## CABLES AND PORTS OF ENCODER

Power cable and data cable are correctly connected to the device. Details about the connection pinout structure are explained in the section "<u>4.Connector & Pin Assignment</u>". Power cable and data cable are indicated in the figure on the side. It is also specified to which input ports the power cable and data cable will be connected to the Fenac PROFINET encoder. The device can be supplied with DC voltage in the range of 10V to 30V. The other end of the



data cable must be connected to an PROFINET master. Here we will talk about two methods. Defining a personal computer as an PROFINET master device and connect the data cable to the ethernet port of a PC is an easy method, as no external hardware is required. You can do your various tests in this way. The other method is to use a PLC device with PROFINET Master as traditionally.





## HARDWARE INSTALLATION

In order to connect the Fenac PROFINET encoder and make its adjustments, a connection must be made as shown in the figure.



Figure 1: Connection





#### 1. Communication Telegrams for Cyclic Process Data

#### 1.1. I/O Signals

Different signals are processed in the different telegrams. Table 1 shows all the signals implemented in the APM PROFINET.

Signal Numbers	Meaning	Abbreviation	Length(bit)	Sign
6	Speed A	NIST_A	16	Yes
8	Speed B	NIST_B	32	Yes
9	Sensor 1 control word	G1_STW	16	No
10	Sensor 1 state word	G1_ZSW	16	No
11	Position 1	G1_XIST1	32	No
12	Position 2	G1_XIST2	32	No
39	Position 3	G1_XIST3	64	No
80	Encoder control word 2	STW2_ENC	16	No
81	Encoder state word 2	ZSW2_ENC	16	No

Table 1: Signal numbers of the I/O data

#### 1.2. Structure Of Telegram 81 to 84

#### 1.2.1. Structure of Telegram 81

- Output (PLC to slave)
- Input (slave to PLC): Position 1 and Position 2

Data Word	1	2
Value	STW2_ENC	G1_STW
Signal	80	9
Length	16 Bit	16 Bit
Meaning	Encoder control word 2	Sensor 1 control word

Table 2: Output data in the telegram 81

Data Word	1	2	3	4	5	6
Value	ZSW2_ENC	G1_ZSW	G1_XIST	G1_XIST1	G1_XIST	G1_XIST2
			MSW	LSW	MSW	LSW
Signal	81	10	11		12	
Length	16 Bit	16 Bit	32 Bit		32	Bit
Meaning	Encoder state	Sensor 1 state	Posit	tion 1	Posit	ion 2
	word 2	word				

Table 3: Input data in telegram 81





#### 1.2.2. Structure of Telegram 82

- Output (PLC to slave)
- Input (slave to PLC): Position 1 and position 2 as well as speed A

Data Word	1	2
Value	STW2_ENC	G1_STW
Signal	80	9
Length	16 Bit	16 Bit
Meaning	Encoder control word 2	Sensor 1 control word

Table 4: Output data in the telegram 82

Data Word	1	2	3	4	5	6	7
Value	ZSW2_ENC	G1_ZSW	G1_XIST1	G1_XIST1	G1_XIST2	G1_XIST2	NIST_A
			MSW	LSW	MSW	LSW	
Signal	81	10		11	1	2	6
Length	16 Bit	16 Bit	32 Bit		32 Bit		16 Bit
Meaning	Encoder state	Sensor 1	Position 1		Posit	ion 2	Speed A
	word 2	state word					

Table 5: Input data in telegram 82

#### 1.2.3. Structure of Telegram 83

- Output (PLC to slave)
- Input (slave to PLC): Position 1 and position 2 as well as speed B

Data Word	1	2
Value	STW2_ENC	G1_STW
Signal	80	9
Length	16 Bit	16 Bit
Meaning	Encoder control word 2	Sensor 1 control word

Table 6: Output data in the telegram 83

Data Word	1	2	3	4
Value	ZSW2_ENC	G1_ZSW	G1_XIST1	G1_XIST1
			MSW	LSW
Signal	81	10		11
Length	16 Bit	16 Bit	32 Bit	
Meaning	Encoder state word 2	Sensor 1 state word	Р	osition 1

Data Word	5	6	7	8
Value	G1_XIST2	G1_XIST2	NIST_B	NIST_B
	MSW	LSW	MSW	LSW
Signal	12		8	
Length	32	Bit	32 Bit	
Meaning Position 2		ion 2	Spe	ed B
-	•		•	

Table 7: Input data in telegram 83





#### 1.2.4. Structure of Telegram 84

- Output (PLC to slave),
- Input (slave to PLC): Position 2 and position 3 as well as speed B

Data Word	1	2		
Value	STW2_ENC	G1_STW		
Signal	80	9		
Length	16 Bit	16 Bit		
Meaning	Encoder control word 2	Sensor 1 control word		

Table 8: Output data in the telegram 84

Data Word	1	2
Value	ZSW2_ENC	G1_ZSW
Signal	81	10
Length	16 Bit	16 Bit
Meaning	Encoder state word 2	Sensor 1 state word

Data Word	3	4	5	6						
Value	G1_XIST3	G1_XIST3	G1_XIST3	G1_XIST3						
	MSW			LSW						
Signal		3	9							
Length		64	Bit							
Meaning	Position 3									

Data Word	7	8	9	10			
Value	G1_XIST2	G1_XIST2	NIST_B	NIST_B			
	MSW	LSW	MSW	LSW			
Signal	1	2	8	3			
Length	32	Bit	32 Bit				
Meaning	Posit	ion 2	Spe	ed B			

Table 9: Input data in the Telegram 84





#### 2. Contents of The Signals

#### 2.1. Signal 6: Speed Value (NIST\_A)

The current speed value is transmitted in 16 bits right-justified.

**NOTE:** Ensure that you use a unit for the speed measurement suitable for the rotational speed of the encoder. Otherwise, the value that can be represented within the 16 bits may be exceeded.

#### 2.2. Signal 8: Speed Value (NIST\_B)

The current speed value is transmitted in 32 bits right-justified.

#### 2.3. Signal 9: Sensor 1 Control Word (G1\_STW)

Bit	Designation	Description
15	Acknowledging a sensor error	<ul> <li>0 = Encoder error message not acknowledged by PLC</li> <li>1 = Encoder error message acknowledged by the PLC</li> </ul>
14	Activate Park mode	<ul><li>0 = Normal operation</li><li>1 = Activate Park mode</li></ul>
13	Request for the absolute position value	<ul> <li>0 = No request</li> <li>1 = Request by the master</li> <li>Results in the cyclic output of the position values in</li> <li>G1_XIST2</li> </ul>
12	Activate preset value	Defines that a configured preset value is used <b>0</b> = Preset value is <b>not</b> activated <b>1</b> = Preset value is activated
11	Preset mode	Defines how a configured preset value is used <b>0</b> = Preset value is used as a new absolute value <b>1</b> = Preset value is added to the previous value
100	Reserved	-

Table 10: Sensor 1 control word (G1\_STW)

NOTE: To activate the preset value, bit 10 in control word STW2\_ENC has to be set: STW2\_ENC = 0400h





Bit	Designation	Description
15	Encoder Error	<b>0</b> = No Error
		1 = Error
		The error code is output in G1_XIST2
14	Park Mode Activated	<b>0</b> = Normal operation
		1 = Park mode activated
		Feedback based on G1_STW bit 14:
		No output of position data G1_XIST1 and G1_XIST2
13	Transmission of absolute position	<b>0</b> = No transmission
	value	1 = Position value is output in G1_XIST2
12	Status of the Preset function	<b>0</b> = No Preset function active
	(set/shift of home position executed)	1 = Preset function is run
		Feedback based on G1_STW bit 12:
		• New position value is output in <b>G1_XIST1</b>
		and G1_XIST2.
		• On conclusion of the preset function the bit
		is set to 0.
11	Requirement of error	<b>0</b> = No return acknowledgement of encoder error
	acknowledgement detected	1 = Requirement of error acknowledgement
		detected
		Reaction to bit 15 in the sensor control word 1
		G1_STW is acknowledged
10	Reserved	-
90	Not supported	-

#### 2.4. Signal 10: Sensor 1 State Word (G1 ZSW)

Table 7: Sensor 1 state word (G1\_ZSW)





#### 2.5. Signal 11: Position Values in The Telegram Part (G1\_XIST1)

The current position value is transmitted in 32 bits **shifted to left** by the shift factor in the two data words. The shift factor **always** has the following values:

- APSxx = 14
- APMxx = 2

The configuration of the parameter Total measuring range has an influence on this position value.

The following example shows the largest possible position value of 1,073,741,824 steps in 30 bits.

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Value	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 8: Example for position values in G1\_XIST1 MSW

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
				-	Tarkla Or	E		a thi an a succ	lung in (		1 1 (14/					

Table 9: Example for position values in G1\_XIST1 LSW

**NOTE:** A preset value transmitted via acyclic process data only has an effect on G1\_XIST1 if the parameter G1\_XIST1 Preset Control is active.

#### 2.6. Signal 12: Position Values in The Telegram Part (G1\_XIST2)

The current position value is transmitted in 32 bits right-justified in the two data words. The configuration of the parameter **Total measuring range** and a configured preset value have always an influence on the position value.

The following example shows the largest possible position value of 1,073,741,824 steps in 30 bits.

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Value	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
				Тс	able 10:	Example	e for pos	sition va	lues in (	G1_XIST.	2 MSW					

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

Table 11: Example for position values in G1\_XIST2 LSW

#### NOTE:

- If errors occur, an error code instead of the position value is output via G1\_XIST2.
- To transmit the position value in the telegram part G1\_XIST2, corresponding bits must be set in the control words:
  - o G1\_STW: 2000h
  - o STW2\_ENC: 0400h





#### 2.7. Signal 39: Position Values in The Telegram Part (G1\_XIST3)

The current position value is transmitted in 64 bits **right-justified**. The configuration of the parameter **Total measuring range** and a configured preset value have always an influence on the position value.

The following example shows the largest possible position value of 1,073,741,824 steps in 30 bits.

Bit	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
Value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rit	47	46	45	АА	43	47	<i>A</i> 1	40	30	38	37	36	25	34	22	37
Bit	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	3
Bit Value	47 0	46 0	45 0	44 0	43 0	42 0	41 0	40 0	39 0	38 0	37 0	36 0	35 0	34 0	33 0	32 0

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Value	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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

Table 12: Example for position values in G1\_XIST3

#### 2.8. Signal 80: Encoder Control Word 2 (STW2\_ENC)

Bit	Designation	Description
1512	Master's Sign of Life (not relevant)	-
10	Control by PLC	<ul> <li>0 = No control by the PLC</li> <li>1 = Control by the PLC Enables the PLC by using control words to activate /</li> </ul>
7	Fault acknowledge	Error-buffer handling not supported
11,9,8,60	Reserved	-

Table 13: Encoder control word 2 (STW2\_ENC)

#### 2.9. Signal 81: Encoder State Word 2 (ZSW2\_ENC)

Bit	Designation	Description
1512	Encoder's Sign-of-Life (not relevant)	-
11,10	Reserved	-
0	Control requested	<b>0</b> = No control by the PLC requested
5	control requested	<b>U</b> = NO control by the FLC requested
		1 = Control by the PLC requested
80	Reserved	-

Table 14: Encoder state word 2 (ZSW2\_ENC)





#### 3. Configurable Functions

The APMxx PROFINET is configured using the configuration tool for a PLC (e.g., Siemens TIA Portal V18).

The following figures illustrate how to access these parameters in the Siemens TIA Portal V18 program, respectively.

**STEP 1**: Open your project at TIA Portal V18. After that, double click the "Devices & networks" button that at the project tree.



Figure 2: STEP 1

**STEP 2**: Now you'll see the devices. Double click on the FENAC encoder.

FNC_APM_58S6_S18 > Devices & networks	_ # = ×
le la	Topology view 🐘 Network view 📑 Device view
💦 Network 🔛 Connections HMI connection 💌 💀 Relations 🕎 📆 🖼 🛄	🛛 🔍 ± 🔤 Network overview 🕢 🕨
	Device
	S7-1200 station_1 PLC_1
	CK GSD device_1
PLC 1	FNCAPM58
PN/IE_1	
	~
< III > 100%	▼ <u></u> ₹ < m >

Figure 3: STEP 2





#### **STEP 3**: Under the "Device overview" tab, click the "Parameter Access Point" tab.

FNC_APM_58S6_S18  Vingrouped devices  FNCAP	PM58 [FNCAPM58 Multiturn e	encoder Advanced 30	) Bit V1.0] _ 🗖 🗖	×
		🚽 Topology view	A Network view IY Device view	٦
🔐 FNCAPM58 [FNCAPM58 Multit. 🗨 🛄 🔛 🔚	€ <b>, ±</b>		Device overview	
FRUXPAUS			<ul> <li>Module</li> <li>FNCAPM58</li> <li>Interface</li> <li>EO Multiturn_1</li> <li>Parameter Access Point Standard Telegram 81</li> </ul>	R
K	> 100%			>
General		roperues		-
No 'properties' available. No 'properties' can be shown at the moment. There is	either no object selected or the s	elected object does not	have any displayable properties.	

Figure 4: STEP 3





**STEP 4**: Click on the Properties tab. Now finally you'll see the "Vendor specific parameter data" and "Parameter data" under the "Module parameters".

FNC_APM_58S6_S18 → Ungrou	uped devices  FNCAPM58 [FN	CAPM58 Multitum encoder Advanced 30 Bit V1.0]			_ # # # *
				F Topology view	A Network view Device view
H FICAPIASE [FICAPIASE Multit]	<b> </b>				
m Farameter Access Point (Param	FEIRAC eter Access Point]		∑ 100%	vv	K III S
General IO tags Syst	tem constants Texts				
Nodule parameters	Module parameters Vendor specific Parameter D Storage mode for the preset value: Transfer preset value: Round axis (endless shaft, ES) function: ES: Number of turns, Divisor: Velocity filter: sampling rate: Velocity filter: number of measurements: Preset value: Parameter Data	Auto save Enable Disable 2048 1 5 200 600			
	Code Sequence: Class 4 Functionality:	CW (0) Enable			×
	Scaling Function Control:	Disable			
	Alarm Channel Control (Profile V3):	Enable			<b>•</b>

Figure 5: STEP 4

**NOTE:** After changing the parameter, the encoder must remain energized for at least 1 sec. to save the parameter change(s).

#### 3.1. Code Sequence

The code sequence defines the direction of rotation, viewed on the shaft, in which the position value increases.

**NOTE:** The parameter can only be configured if the class 4 functionality is activated.

#### 3.2. Class 4 Functionality

The **class 4 functionality** is activated from the factory. This parameter permits or prevents changes to the parameters **Code sequence**, **Scaling** and **Implementation of the preset**.

If the parameter is deactivated (disable), the settings for the following parameters are fixed:

- Code sequence = clockwise
- Scaling = off
- No preset via telegram or preset pushbutton possible

#### 3.3. G1\_XIST1 Preset Control

The parameter defines whether the preset function affects the telegram part G1\_XIST1. Otherwise, the preset only acts on G1\_XIST2.

**NOTE:** The parameter can only be configured if the class 4 functionality is activated.





#### 3.4. Scaling

The parameter **Scaling** makes it possible to scale the resolution per revolution and the total resolution.

**NOTE:** Only if the Scaling parameter is activated (enable), the values entered for the resolution and total resolution are applied to the configuration. Otherwise, the values will be ignored!

#### 3.5. Alarm Channel Control

**NOTE:** The parameter can only be deactivated (disable) if the parameter **Compatibility mode** is activated (enable).

- Alarm channel control active
   The diagnostic data are transmitted as per encoder profile V4.1.
- Alarm channel control inactive No "Alarms" are transmitted.

#### 3.6. Compatibility Mode

Using this parameter, the encoder can be configured such that it operates as per encoder profile **V3.1** and not as per V4.1. This parameter also affects the following functions:

• Alarm channel control

The parameter can be configured inactive in the compatibility mode.

• In addition, it is assumed that the bit Control by PLC in the telegram part STW2\_ENC is permanently set to 1, as if the control system is constantly requesting control.

#### 3.7. Measuring Range per Revolution

The measuring range per revolution is stated in two parameters, as Least Significant Double Word (LSDW) and as Most Significant Double Word (MSDW).

The resolution is max. 262,144 steps per revolution. The resolution can be scaled from 1 ... 262,144 as an integer.

For example, if you are using an encoder to monitor the rotation of a motor and the encoder has a value of 1000 pulses per revolution (PPR), you will have 1000 pulses per revolution. In this case, you would have 1000 measurement units per revolution.

**NOTE:** The parameter is not used if the round axis functionality is activated.

#### 3.8. Total Measuring Range

The total measuring range is stated in two parameters, as Least Significant Double Word (LSDW) and as Most Significant Double Word (MSDW).

#### 3.9. Velocity Measuring Unit

Using this parameter, you can define the unit with which the speed is transmitted in telegrams 82, 83 and 84 (message 81 does not contain any speed values).

Possible units are:

- Steps/s
- Steps/100 ms
- Steps/ 10 ms
- Rpm

The factory setting is **rpm**.





#### 3.10. Storage Mode for The Preset Value

Using this parameter, you can define the way in which the configuration parameters (1.006, 1.007, 65.000) are saved.

- Auto save: The values are written automatically to the EEPROM on each change.
- P971: The values must be written to the EEPROM using the parameter 971.

#### 3.11. Transfer Preset Value

Using this parameter, you can define whether the preset is transmitted on switching on or initializing the encoder.

- **Enable:** The preset value is transmitted on switching on or initializing the encoder into the parameter 65.000. The preset value can be changed in operation via acyclic process data.
- **Disable:** The parameter is not transmitted on switching on or initializing the encoder.

The preset value is only used when the related bits of the sensor 1 control word G1\_STW are set and bit 10 in control word STW2\_ENC is set.

#### **3.12.** Round Axis Functionality

The round axis functionality removes the restriction that the total resolution must be 2<sup>n</sup> times the Steps per revolution. The shaft is considered as an endless shaft.

The steps per revolution are not configured directly, instead the nominator and divisor for the number of revolutions are defined.

The total measuring range can be scaled from 1 ... 1,073,741,824 as an integer.

#### 3.13. Number of Turns (Nominator)

The nominator can be scaled from 1 ... 2,048 as an integer. The default factory setting for the nominator is 2,048.

#### **3.14.** Number of Turns (Divisor)

The divisor can be scaled from 1 ... 65,535 as an integer. The default factory setting for the divisor is 1.

#### 3.15. Velocity Filter (Sampling Rate)

The speed value is calculated as an average value and output. The sampling interval defines the time between measurements and how measurements are made. It can be between 1 and 100 ms.

#### **3.16.** Velocity Filter (Number of Measurements)

The number of measurements defines the number of measured values from which the average speed is calculated. The number can be 1 to 200.

#### 3.17. Preset Value

The Preset value parameter contains the value that is transmitted to the encoder with the parameter Transmit preset value.





#### 4. Integration Into The PLC

**NOTE:** All software instructions relate to the Siemens TIA Portal V18.

#### 4.1. Installing the GSDML file (only once)

#### Start the TIA Portal on your PLC

VA Siemens - C:\Users\m.kilic\Documents\Automation\F	NC_APM_5856_\$18\FNC_APM_5	856_518		_ # X
Project Edit View Insert Online Options Tools	Window Help		Totally Integrated Automat	tion
📑 📑 🔚 Save project 📑 💥 🏥 🕻 🍸 Settings		ne 🖉 Goldfline 🌆 🖪 🖪 💉 🖃 🛄 😰 छ -Search in projects 🛛 🎪	PO	RTAL
Project tree Support gackage	ges	ices & networks 🛛 🖉 🖬 🗙	Hardware catalog	
Devices Manage genera	al station <u>d</u> escription files (GSD)	Topology view 💩 Network view 🛐 Device view	Options	10/2
Start Automatic	on License Manager	IM connection Relations 2 1 1 1 0 ± 1 Network overvice		- H
Show reference	e text		Y Catalog	- dv
▼ TFNC_APM_5856_518	,	Y Device	Catalog	are
Add new device Add new device Coviets & networks Coviets & netw	PLC_1 CPU 1211C		Priter Profile: All>     Priter Profile: All>     Controllers     HM     PG systems     Drives & starters     Dolves & starters     Dolves & starters     Dolves & starters     Dolves & starters     Dotecting & Monitoring     Distributed NO     Power supply and distribution     Field devices     Other field devices	catalog 3 Online tools (@) Tasks ()
Local modules     Jacob Ungrouped devices	< 11	> 100% V 0 ( U >		ibraries
Security settings	PLC_1 [CPU 1211C DC/DC/D	C Properties Linfo L Diagnostics -		
Common data      Details view	, General IO tags Cycle	System constants Texts Protection & Security		- Add
Module       Name       IP Device configuration       V. Online & diagnostics       Program blocks       Program blocks	Communication load System and clock memory SIMATIC Memory Card Web server Multilingual support Time of day Protection & Security OPC 10A	Security settings wizard  Start security wizard  Protection of the PLC configuration data		lins
External source files	Advanced configuration	( )	> Information	
Postal view Poweriew	ces & ne		APN 5856 518 opened	

Figure 6: Installing device description file in the TIA portal

Install the GSDML file GSDML-V2.25-FENAC-APx58-xxxxxxxxx and for the APM58/APS58 PROFINET via the Options menu, Install GSD file command. The GSDML file for the encoder is available at <u>www.fenac.com.tr</u> for download.





#### 4.2. Loading encoder in the user interface

In the Hardware catalog open the Other Field Devices, PROFINET IO, Encoders, FENAC, FENAC folder again and finally the FNCAPx58 folder. Here there is a dedicated icon for each of the two variants of the encoder.

Edit View Insert Online Optic	ns Tools Window Help					Totally Integrated Autom	ation
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Figure 7: FNCAPS58/FNCAPM58 PROFINET in Other Field Devices

> Add the device **FNCAPM58** or **FNCAPS58** to the **Network view** using drag-and-drop.

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Figure 8: Connection from the PLC to FNCAP58S or FNCAP58M

Using the mouse, drag a connection from the control system icon to the encoder icon.





#### 4.3. Adding Telegram Modules

You should add the telegram module that you want to use before you go to watch table. Click the network view, then double click on the Fenac encoder. You'll jump to device view page. Then find the telegram modules from the hardware catalog tab and under the submodules folder. Probably first you'll see the Standard Telegram 81 module. It's added default. Delete the standard telegram 81 module from there if you want to use another telegram module. Then drag the telegram module you want to use and drop the place that you deleted previous module. In this example, we added standard telegram 84 instead of standard telegram 81.



Figure 9: Adding Telegram Modules





#### 4.4. Configuration of the encoder via the Parameter Access Point

Mark the encoder icon and in the **Device view**, change the configuration data and the vendor specific configuration data in the middle window at the bottom in **Parameter Access Point**. Do these configurations before you go online and do it only once.

#### **Configuration data**

Parameter Data		
Code Sequence:	CW (0)	-
Class 4 Functionality:	Enable	
G1_XIST1 Preset Control:	Disable	-
Scaling Function Control:	Disable	2
Alarm Channel Control (Profile V3):	Enable	-
Encoder Profile V3 Compatibility:	Profile version 4	
Measuring Units per Revolution MSDW:	0	
Measuring Units per Revolution LSDW:	262144	
Total Measuring Range MSDW:	0	
Total Measuring Range LSDW:	1073741824	
Master Lifesign Failure Unit (Profile V3):	1	
Velocity Measuring Unit (Telegram 82-84):	Revolutions per Minute	-

Figure 10: Configuration Data

The APM58/APS58 PROFINET is supplied with the configuration data shown.

#### Vendor specific configuration data

Storage mode for the preset		
value:	Auto save	1
Transfer preset value:	Disable	
Round axis (endless shaft, ES)		
function:	Disable	
ES: Number of turns,		
Nominator:	2048	
ES: Number of turns, Divisor:	1	
Velocity filter: sampling rate:	5	
Velocity filter: number of		
measurements!	200	
Preset value:	0	

The APM58/APS58 PROFINET is supplied with the vendor specific configuration data shown.





#### 4.4.1. Reading the position

To read from position 2 (the right-justified position value) in the input data for telegrams 81 to 84, select **STW2\_ENC** (encoder control word 2) and **G1\_STW** (sensor 1 control word)

i Nam	e /	Address	Display format	Monitor value	Modify value	9		Comment	
	•	%ID5	DEC	289104				G1_XIST1	
		%ID9	DEC	72276				G1_XIST2	
	•	%QW1	Hex	16#0400	16#0400		1	STW2_ENC	
		%QW3	Hex	16#2000	16#2000		4	G1_STW	
		Add new>							

Figure 11: Reading the position

- Set bit 10 of the control word STW2\_ENC to 1 (= 0400h).
- Set bit 13 of the control word G1\_STW to 1 (= 2000h). This results in the cyclic output of the position value in G1\_XIST2





#### 4.4.2. Setting preset value

A preset value only affects G1\_XIST1 if the related parameters are set. For G1\_XIST1 this is position 1 in the input data for telegrams 81 to 84

#### **Configuration data**

- Set the parameter **Class 4 functionality** to **Enable**.
- > Set the parameter **G1\_XIST1** Preset control to Enable

Parameter Data		
Code Sequence:	CW (0)	
Class 4 Functionality:	Enable	
G1_XIST1 Preset Control:	Enable	
Scaling Function Control:	Disable	
Alarm Channel Control (Profile V3):	Enable	
Encoder Profile V3 Compatibility:	Profile version 4	
Measuring Units per Revolution MSDW:	0	
Measuring Units per Revolution LSDW:	262144	
Total Measuring Range MSDW:	0	
Total Measuring Range LSDW:	1073741824	
Master Lifesign Failure Unit (Profile V3):	1	
Velocity Measuring Unit (Telegram 82-84):	Revolutions per Minute	

Figure 12: Configuration data for a preset value

#### Vendor specific configuration data

- > Set the parameter **Transmit preset value** to **Enable**.
- Set the parameter **Preset value** e.g. to 600.

Storage mode for the preset		
value:	Auto save	
Transfer preset value:	Enable	
Round axis (endless shaft, ES)		1
function:	Disable	
ES: Number of turns,		
Nominator:	2048	
ES: Number of turns, Divisor:	1	
Velocity filter: sampling rate:	5	
Velocity filter: number of		
measurements:	200	
Preset value:	600	

Figure 13: Vendor specific configuration data for a preset value





#### **Control words**

- Set Bit 10 of the control word STW2\_ENC on 1 (=400h).
- Set Bit 12 of the control word G1\_STW to 1 (= 1000h) (1)

With the edge change on bit 12 of G1\_STW from 0 to 1, the preset value is set8) and initially output only in **Position 1** (G1\_XIST1 – left-justified) (2)

Name	Address	Display form	mat	Monitor value	Modify va	lue	9		Comment	
	%ID5	DEC		2400 2					G1_XIST1	
	%ID9	DEC		0 3					G1_XIST2	
	%QW1	Hex		16#0400	16#0400			4	STW2_ENC	
	WQW3	Hex	-	16#1000	16#1000	1		4	G1_STW	
	<add new=""></add>									

Figure 14: Setting bit 12 of G1\_STW

Initially a position value is not output in Position 2 (G1\_XIST2 - right-justified) (3)

To output the position value in **Position 2** (G1\_XIST2), you must set bit 12 to 0 and bit 13 of the control word G1\_STW to 1 (= 2000h) (4)

Name	Address	Display form	mat	Monitor value	Modify value	9	Comment	
	%ID5	DEC		2400			G1_XIST1	
	%ID9	DEC		600 5			G1_XIST2	
	%QW1	Hex		16#0400	16#0400		STW2_ENC	
	B %QW3	Hex	-	16#2000	16#2000 4		G1_STW	
	<add new=""></add>							

Figure 15: Setting bit 13 of G1\_STW

The preset value set is then output in **Position 2** (G1\_XIST2) (5)







#### 4. Connector & Pin Assignment

**Pin Assignment** 



cable

FCSM DTM1204 R200 : D Type M1204 Female Connector with 2 meter cable



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