

EMGZ49X

PLC Examples for PROFINET, EtherNet/IP and EtherCAT

Quick Start Guide

Document version 3.1

Document date 11. October 2024

Author

Thomas Ziörjen

Change log

Date	Revision	Author	Changes
06 April 2017	1.0	Thomas Ziörjen	Initial version
28 July 2023	3.0	Thomas Ziörjen	- TIA Portal example added - The chapters are numbered now
10 October 2024	3.1	Thomas Ziörjen	- Reformatted

Contents

1	Simatic PROFINET.....	1
1.1	Use the Step 7 SIMATIC Manager examples.....	1
1.1.1	Setting up the project.....	1
1.1.2	Using of the example program.....	1
1.1.3	Adaptation of the module address.....	2
1.1.4	Screenshot for the EMGZ491.....	4
1.1.5	Screenshot for the EMGZ492.....	5
1.2	Use the TIA Portal examples.....	6
1.2.1	Setting up the TIA project.....	6
1.2.2	How to use the TIA example program.....	8
1.3	Siemens PLC Operation Commands.....	11
1.3.1	How to reset a PLC to factory settings.....	11
1.3.1.1	Resetting PLC with Step 7 SIMATIC Manager.....	11
1.3.1.2	Resetting PLC with TIA Portal.....	12
1.3.2	How to assign the PROFINET device name.....	13
1.3.2.1	Name assignment with Step 7 SIMATIC Manager.....	13
1.3.2.2	Name assignment with TIA Portal.....	14
2	RSLogix 5000 EtherNet/IP.....	15
2.1	Setting up the project.....	15
2.2	Using of the example program.....	20
2.3	Writing Parameters from a PLC Program.....	23
2.4	Calibration from a PLC Program.....	24
2.5	Find Out the Device IP.....	27
2.6	Device Replacement in an Existing System.....	29
3	TwinCAT 3 - EtherCAT.....	31
3.1	Setting up the project.....	31
3.2	Using of the example program.....	32
3.2.1	Show cycle data.....	32
3.2.2	Change parameters.....	33
4	Firmware Update.....	35

1 Simatic PROFINET

1.1 Use the Step 7 SIMATIC Manager examples

1.1.1 Setting up the project

- Copy the project to the PC on which the Simatic development software is installed.
- Open the example project EMGZ49x_PN_Vy_y (x stands for the utilized device, y stands for the example program version).
- Give the EMGZ491 or EMGZ492 the device name **emgz491** or **emgz492** and an IP-address that suits your network.
- Check if the EMGZ491 or EMGZ492 has got the assigned IP-address by open the web interface with the web browser.

1.1.2 Using of the example program

- Check the module hardware configuration and change it if it doesn't match.
- Open the following variable tables:
 - EMGZ491_Read_Data or EMGZ492_Read_Data
 - EMGZ491_Write_Input_Par or EMGZ492_Write_Input_CH_A and EMGZ492_Write_Input_CH_B
 - EMGZ491_Write_Output_Par or EMGZ492_Write_Output_Par
 - EMGZ491_Calibrate or EMGZ492_Calibrate
- Arrange the windows similar to the shown screenshot for the particular device.
- Follow the numbers ascending on the screenshot.

1.1.3 Adaptation of the module address

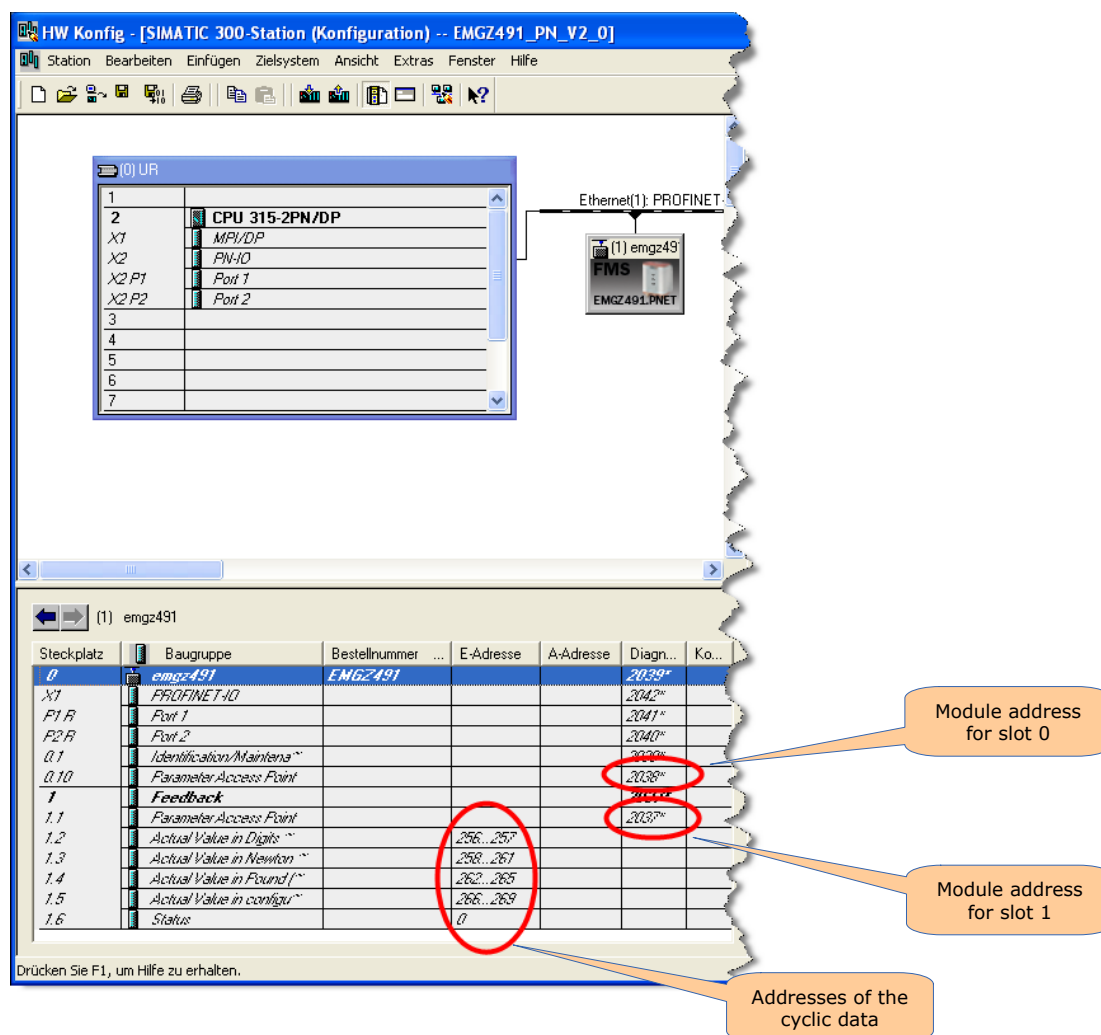
By default, the example programs use the addresses shown in the below dialogs. Make sure that they are set accordingly.

The address for slot 0 gives access to the EMGZ49x output parameters.

The address for slot 1 gives access to the EMGZ49x configuration parameters as well as to the cycle data.

Make sure that the input addresses for the cyclic data are also set correctly.

EMGZ491

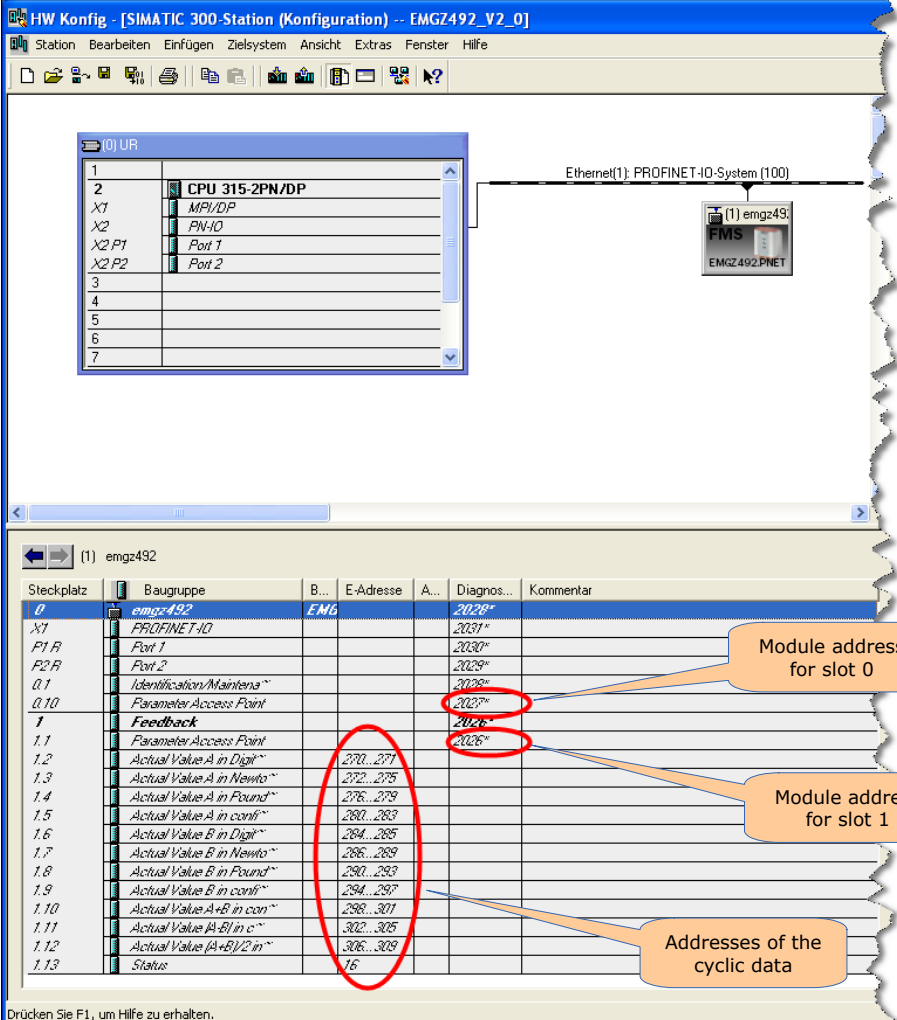


The screenshot displays the SIMATIC Manager HW Config interface. The top part shows the rack configuration with a CPU 315-2PN/DP in slot 2 and the EMGZ491 module in slot 1. The bottom part shows the module's parameter table with addresses for slot 0 and slot 1. Red circles highlight specific addresses: 2039 for slot 0, 2038 for slot 1, and 266-269 for cyclic data.

Steckplatz	Baugruppe	Bestellnummer	E-Adresse	A-Adresse	Diagn...	Ko...
0	emgz491	EMGZ491			2039*	
X1	PROFINET-I/O				2042*	
P1 A	Port 1				2041*	
P2 A	Port 2				2040*	
Q 1	Identification/Maintena...				2039*	
Q 10	Parameter Access Point				2038*	
1	Feedback				2037*	
1.1	Parameter Access Point				2037*	
1.2	Actual Value in Digits ~		266...267			
1.3	Actual Value in Newton ~		268...269			
1.4	Actual Value in Pound f~		262...265			
1.5	Actual Value in configur~		266...269			
1.6	Status		0			

Drücken Sie F1, um Hilfe zu erhalten.

EMGZ492



HW Konfig - [SIMATIC 300-Station (Konfiguration) -- EMGZ492_V2_0]

Station Bearbeiten Einfügen Zielsystem Ansicht Extras Fenster Hilfe

10) UR

1	
2	CPU 315-2PN/DP
X1	MPV/DP
X2	PN-IO
X2 P1	Port 1
X2 P2	Port 2
3	
4	
5	
6	
7	

Ethernet(1): PROFINET-IO-System (100)

(1) emgz492

Steckplatz	Baugruppe	B...	E-Adresse	A...	Diagnos...	Kommentar
0	emgz492	EMG		2028*		
X1	PROFINET-IO			2031*		
P1 R	Port 1			2030*		
P2 R	Port 2			2029*		
0.1	Identification/Maintena...			2028*		
0.10	Parameter Access Point			2027*		
1	Feedback			2026*		
1.1	Parameter Access Point			2026*		
1.2	Actual Value A in Digit...		270...271			
1.3	Actual Value A in Newto...		272...275			
1.4	Actual Value A in Pound...		276...279			
1.5	Actual Value A in confi...		280...283			
1.6	Actual Value B in Digit...		284...285			
1.7	Actual Value B in Newto...		286...289			
1.8	Actual Value B in Pound...		290...293			
1.9	Actual Value B in confi...		294...297			
1.10	Actual Value A+B in con...		298...301			
1.11	Actual Value A+B in c...		302...305			
1.12	Actual Value A+B/2 in ...		306...309			
1.13	Status		16			

Drücken Sie F1, um Hilfe zu erhalten.

Module address for slot 0

Module address for slot 1

Addresses of the cyclic data

1.1.4 Screenshot for the EMGZ491

1 Select the window EMGZ491_Read_Data and start the cyclic read process.

2 Click the send button to transfer changed data to the EMGZ491. Make previously sure the correct window is selected.

3 Cyclic force values and parameters will be live updated when they are changing.

4 Change a parameter as needed.

5 To write a parameter to the EMGZ491 the according flag must be set to **true**, and the send button **2** must be clicked. Make sure only one write flag is set at the time.

6 To set the offset the flag must be set to **true**, and the send button **2** must be clicked. Make sure only one write flag is set at the time.

7 To calibrate the EMGZ491 enter the **weight in mN**, set the flag **true**, and click the send button **2**. Make sure only one write flag is set at the time.

Operand	Symbol	Symbolkommentar	Anzeigeformat	Statuswert	Steuervwert
1	INPUT PARAMETERS				
2	Slot 1				
3	DB4.DBB 0	"WRITE_PARAM" UNIT	DEZ	0	0
4	DB4.DBX 10	"WRITE_PARAM" OFFSET	DEZ	-55	-55
5	DB4.DBW 2	"WRITE_PARAM" GAIN	DEZ	2111	2111
6	DB4.DBB 4	"WRITE_PARAM" SYSTEM_FORCE	DEZ	false	false
7	DB4.DBW 6	"WRITE_PARAM" CUTOFF_FREQU	DEZ	10	10
8	DB4.DBX 8	"WRITE_PARAM" CUTOFF_FREQU	DEZ	10	10
9	DB4.DBW 10	"WRITE_PARAM" CUTOFF_FREQU	DEZ	100	100
10	DB4.DBB 12	"WRITE_PARAM" CUTOFF_FREQU	DEZ	100	100
11	DB4.DBW 14	"WRITE_PARAM" CUTOFF_FREQU	DEZ	100	100
12	DB4.DBB 16	"WRITE_PARAM" CUTOFF_FREQU	DEZ	100	100
13	DB4.DBW 18	"WRITE_PARAM" CUTOFF_FREQU	DEZ	100	100
14	DB4.DBB 20	"WRITE_PARAM" CUTOFF_FREQU	DEZ	100	100
15	DB4.DBW 22	"WRITE_PARAM" CUTOFF_FREQU	DEZ	100	100

Operand	Symbol	Symbolkommentar	Anzeigeformat	Statuswert	Steuervwert
1	EMGZ491				
2	DB1.DBD 0	"FMS_ACYCLIC_DB".ADDRESS_SLOT0	HEX	DW#16#000007F1	DW#16#000007F1
3	DB1.DBD 4	"FMS_ACYCLIC_DB".ADDRESS_SLOT1	HEX	DW#16#000007F0	DW#16#000007F0
4	PARAMETERS EMGZ491				
5	Slot 0				
6	DB1.DBD 22	"FMS_ACYCLIC_DB".TENSION_MAX_OUTPUT	DEZ	L#1000000	L#1000000
7	DB1.DBB 26	"FMS_ACYCLIC_DB".OUTPUT_FILTER_ON	DEZ	1	1
8	DB1.DBW 28	"FMS_ACYCLIC_DB".CUTOFF_FREQU_OUTPUT	DEZ	100	100
9	Slot 1				
10	DB1.DBB 8	"FMS_ACYCLIC_DB".UNIT	DEZ	0	0
11	DB1.DBW 10	"FMS_ACYCLIC_DB".OFFSET	DEZ	-1311	-1311
12	DB1.DBW 12	"FMS_ACYCLIC_DB".GAIN	DEZ	902	902
13	DB1.DBD 14	"FMS_ACYCLIC_DB".SYSTEM_FORCE	DEZ	L#1000000	L#1000000
14	DB1.DBB 18	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
15	DB1.DBW 20	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
16	DB1.DBB 22	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
17	DB1.DBW 24	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
18	DB1.DBB 26	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
19	DB1.DBW 28	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
20	DB1.DBB 30	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
21	DB1.DBW 32	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
22	DB1.DBB 34	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
23	DB1.DBW 36	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
24	DB1.DBB 38	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
25	DB1.DBW 40	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
26	DB1.DBB 42	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
27	DB1.DBW 44	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
28	DB1.DBB 46	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
29	DB1.DBW 48	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
30	DB1.DBB 50	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
31	DB1.DBW 52	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
32	DB1.DBB 54	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
33	DB1.DBW 56	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
34	DB1.DBB 58	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
35	DB1.DBW 60	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
36	DB1.DBB 62	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
37	DB1.DBW 64	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
38	DB1.DBB 66	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
39	DB1.DBW 68	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
40	DB1.DBB 70	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
41	DB1.DBW 72	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
42	DB1.DBB 74	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
43	DB1.DBW 76	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
44	DB1.DBB 78	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
45	DB1.DBW 80	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
46	DB1.DBB 82	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
47	DB1.DBW 84	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
48	DB1.DBB 86	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
49	DB1.DBW 88	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
50	DB1.DBB 90	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
51	DB1.DBW 92	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
52	DB1.DBB 94	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
53	DB1.DBW 96	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
54	DB1.DBB 98	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
55	DB1.DBW 100	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
56	DB1.DBB 102	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
57	DB1.DBW 104	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
58	DB1.DBB 106	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
59	DB1.DBW 108	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
60	DB1.DBB 110	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
61	DB1.DBW 112	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
62	DB1.DBB 114	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
63	DB1.DBW 116	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
64	DB1.DBB 118	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
65	DB1.DBW 120	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
66	DB1.DBB 122	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
67	DB1.DBW 124	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
68	DB1.DBB 126	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
69	DB1.DBW 128	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
70	DB1.DBB 130	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
71	DB1.DBW 132	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
72	DB1.DBB 134	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
73	DB1.DBW 136	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
74	DB1.DBB 138	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
75	DB1.DBW 140	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
76	DB1.DBB 142	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
77	DB1.DBW 144	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
78	DB1.DBB 146	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
79	DB1.DBW 148	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
80	DB1.DBB 150	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
81	DB1.DBW 152	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
82	DB1.DBB 154	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
83	DB1.DBW 156	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
84	DB1.DBB 158	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
85	DB1.DBW 160	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
86	DB1.DBB 162	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
87	DB1.DBW 164	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
88	DB1.DBB 166	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
89	DB1.DBW 168	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
90	DB1.DBB 170	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
91	DB1.DBW 172	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
92	DB1.DBB 174	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
93	DB1.DBW 176	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
94	DB1.DBB 178	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
95	DB1.DBW 180	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
96	DB1.DBB 182	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
97	DB1.DBW 184	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
98	DB1.DBB 186	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
99	DB1.DBW 188	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
100	DB1.DBB 190	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
101	DB1.DBW 192	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
102	DB1.DBB 194	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
103	DB1.DBW 196	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
104	DB1.DBB 198	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
105	DB1.DBW 200	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
106	DB1.DBB 202	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
107	DB1.DBW 204	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
108	DB1.DBB 206	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
109	DB1.DBW 208	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
110	DB1.DBB 210	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
111	DB1.DBW 212	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
112	DB1.DBB 214	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
113	DB1.DBW 216	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
114	DB1.DBB 218	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
115	DB1.DBW 220	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
116	DB1.DBB 222	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
117	DB1.DBW 224	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
118	DB1.DBB 226	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
119	DB1.DBW 228	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
120	DB1.DBB 230	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
121	DB1.DBW 232	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
122	DB1.DBB 234	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
123	DB1.DBW 236	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
124	DB1.DBB 238	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
125	DB1.DBW 240	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
126	DB1.DBB 242	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
127	DB1.DBW 244	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
128	DB1.DBB 246	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
129	DB1.DBW 248	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
130	DB1.DBB 250	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
131	DB1.DBW 252	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
132	DB1.DBB 254	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
133	DB1.DBW 256	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
134	DB1.DBB 258	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
135	DB1.DBW 260	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
136	DB1.DBB 262	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
137	DB1.DBW 264	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
138	DB1.DBB 266	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
139	DB1.DBW 268	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
140	DB1.DBB 270	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
141	DB1.DBW 272	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
142	DB1.DBB 274	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
143	DB1.DBW 276	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
144	DB1.DBB 278	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
145	DB1.DBW 280	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
146	DB1.DBB 282	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
147	DB1.DBW 284	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
148	DB1.DBB 286	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	1
149	DB1.DBW 288	"FMS_ACYCLIC_DB".CUTOFF_FREQU_ACTIVE	DEZ	330	330
150	DB1.DBB 290	"FMS_ACYCLIC_DB".ACTUAL_VALUE_ACTIVE	DEZ	1	

1.1.5 Screenshot for the EMGZ492

1 Select the window EMGZ492_Read_Data and start the cyclic read process.

2 Click the send button to transfer changed data to the EMGZ492. Make previously sure the correct window is selected.

3 Cyclic force values and parameters will be live updated when they are changing.

4 Change a parameter as needed.

5 To write a parameter to the EMGZ492 the according flag must be set to **true**, and the send button **2** must be clicked. Make sure only one write flag is set at the time.

6 To set the offset the flag must be set to **true**, and the send button **2** must be clicked. Make sure only one write flag is set at the time.

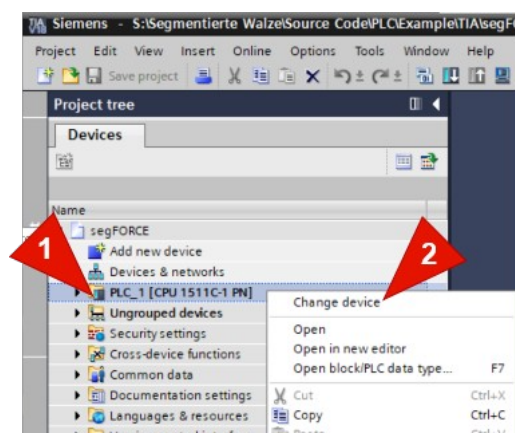
7 To calibrate the EMGZ492 enter the **weight** in mN, set the flag **true**, and click the send button **2**. Make sure only one write flag is set at the time.

Operand	Symbol	Symbolkommentar	Anzeigeformat	Statuswert	Steuerwert
1	//INPUT PARAMETERS EMGZ492				
2	// Slot 1 - Channel A				
3	DB4.DBB 0	"WRITE_PARAM" OFFSET_A	DEZ		0
4	DB4.DBW 1	"WRITE_PARAM" WRITE_OFFSET_A	DEZ		false
5	DB4.DBW 2	"WRITE_PARAM" WRITE_OFFSET_A	DEZ		-223
6	DB4.DBW 4	"WRITE_PARAM" WRITE_OFFSET_A	DEZ		false
7	DB4.DBW 6	"WRITE_PARAM" WRITE_OFFSET_A	DEZ		1000
8	DB4.DBW 8	"WRITE_PARAM" WRITE_OFFSET_A	DEZ		false
9	DB4.DBW 10	"WRITE_PARAM" WRITE_OFFSET_A	DEZ		L#2000000
10	DB4.DBW 12	"WRITE_PARAM" WRITE_OFFSET_A	DEZ		false
11	DB4.DBW 14	"WRITE_PARAM" WRITE_OFFSET_A	DEZ		1
12	DB4.DBW 16	"WRITE_PARAM" WRITE_OFFSET_A	DEZ		false
13	DB4.DBW 18	"WRITE_PARAM" WRITE_OFFSET_A	DEZ		10
14	DB4.DBW 20	"WRITE_PARAM" WRITE_OFFSET_A	DEZ		false

1.2 Use the TIA Portal examples

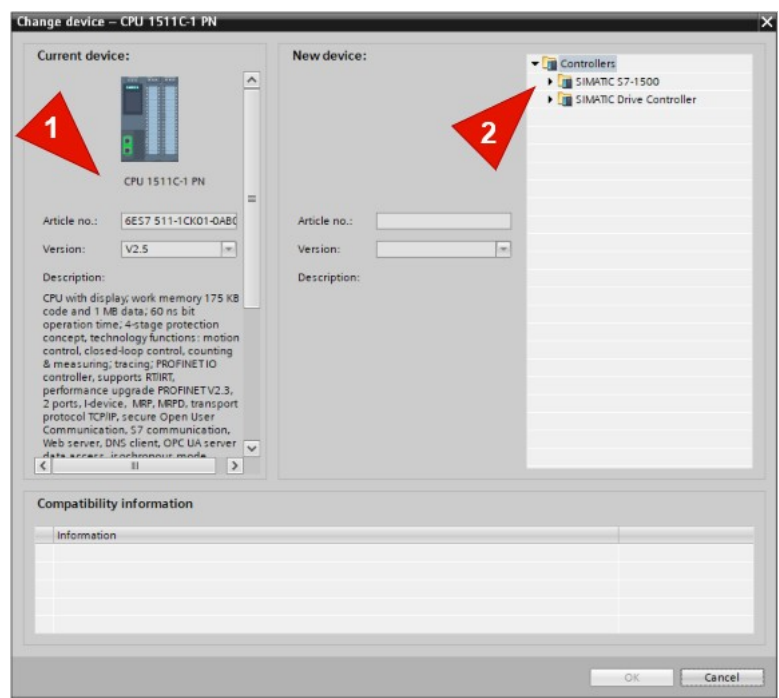
1.2.1 Setting up the TIA project

- Download the appropriate example program, depending on your device, EMGZ491_PN_IRT_TIA_Vx_x.zip or EMGZ492_PN_TIA_Vx_x.zip, from our web page.
(the small x is a placeholder for the container file version that includes the example programs)
Link: <https://www.fms-technology.com/en/downloadcenter/profinet>
- Unpack the example project to your preferred directory on your PC on which the **TIA Portal** development software is installed.
The Quick Start Guide uses the directory c:\EMGZ49X, where the X **is not replaced** with the device variant number, and all further explanations start from this directory without explicitly mentioning it again.
- Execute the **TIA Portal** program.
- The program normally starts with the portal view. Switch to the project view by clicking the **Project view** menu at the bottom left.
- Make sure you have a cleared PLC. Therefore do a factory reset before downloading the example program to the PLC. Refer to the chapter 1.3.1 *How to reset a PLC to factory settings*.
- Open the project c:\EMGZ49X\EMGZ49x_PN_TIA_Vx_x\EMGZ49x
(the small x is a placeholder for the example program version).
- The example program uses the PLC CPU 1511C-1 PN. You must change the configuration accordingly if you have a different device of the same SIMATIC series. Right-click on the item **PLC_1 [CPU 1511C-1 PN]** **1** and click after that on **Change devices** **2**. That action opens the Change device dialog.



But if you have a device from a different SIMATIC series, e.g., 1200, refer to the Siemens documentation to get the information on how to change PLC devices.

- The change device dialog shows the currently configured device on the left-hand side **1**. On the right, you can select your utilized device **2**.



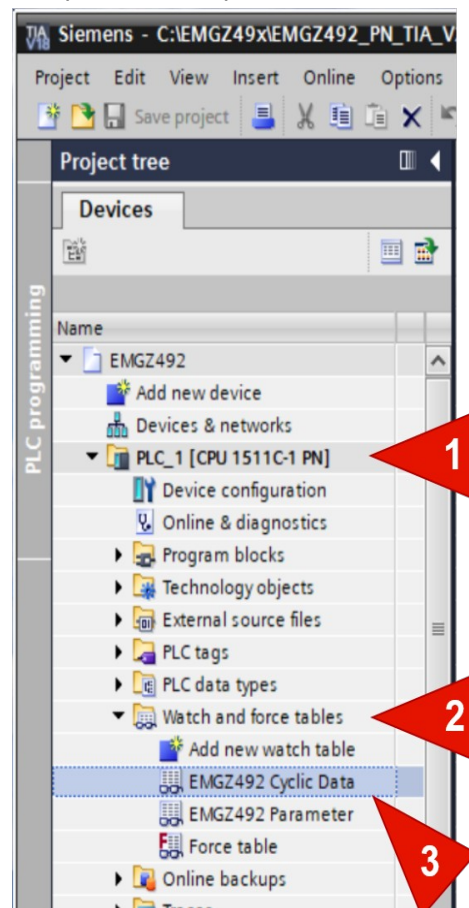
- The next step is searching for all PROFINET devices and assigning the EMGZ49x the name emgz491 or emgz492 depending on your device. Refer to Chapter 1.3.2 *How to assign the PROFINET device name*, for a detailed description. The PLC gives after that the EMGZ49x the IP 192.168.10.87. If the IP does not fit your network environment, change the IP before downloading the program to the PLC.
- Download program to the PLC.
- Continue with the next chapter when the example program has been downloaded successfully and configured. Therefore the left LED must permanently light green, and the other two LEDs must be dark. If that is not the case, fix the problems first.



1.2.2 How to use the TIA example program

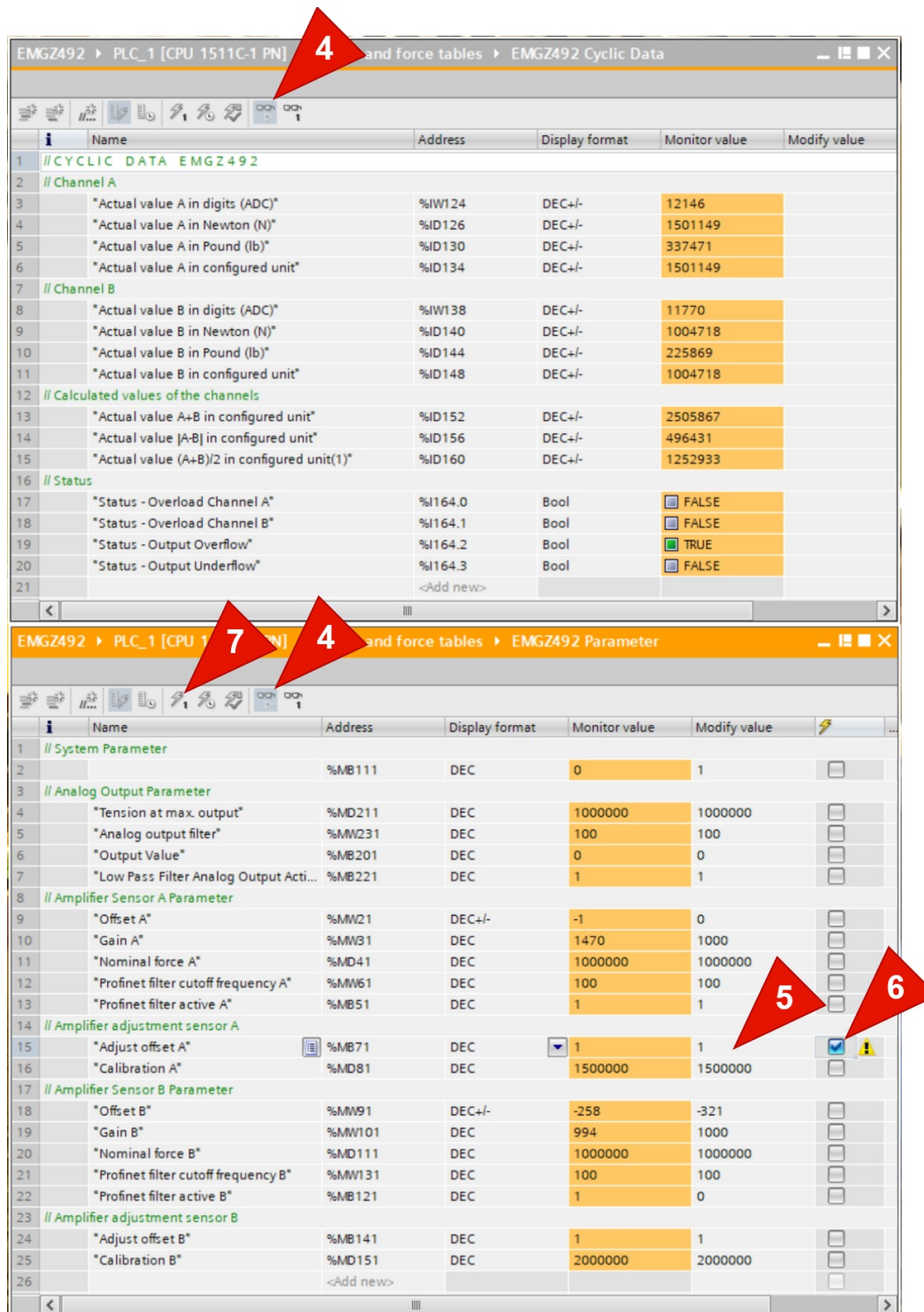
- Execute the **TIA Portal** program.
- The program normally starts with the portal view. Switch to the project view by clicking the **Project View** menu at the bottom left.
- Open the project ... \EMGZ49x_PN_TIA_Vx_x\EMGZ49x (the small x is a placeholder for the example program version and TIA portal version).
- Open the folder **Watch and force tables** **2** under the PLC project tree **1**.
- The project contains several predefined tables to display the cyclic data values and configure and adjust the amplifier.
- Open the appropriate watch table **3** depending on what you are interested in or if you want to parameterize. There are the following watch tables available:

- | | |
|-----------------------|--|
| - EMGZ49x Cyclic Data | Shows all the cyclic data of the amplifier. |
| - EMGZ49x Parameter | Show and change parameter values and adjust the amplifier. |



- Once the watch tables are open, click on the icon with the glasses **4**. This will start the monitoring process of the variables, and the values will be displayed continuously. To stop the monitoring click the icon again.


- The watch table **EMGZ492 Cyclic Data** shows all cyclic data live. The watch table **EMGZ492 Parameter** is for the configuration and adjustment of the device. Once the watch table is open,
 - click on the icon with the glasses
 - in this example, set the value from 0 to 1 to prepare to the offset adjustment
 - tick the checkbox to enable the current parameter for writing
 - click on the icon with the flash to send the command to the PLC



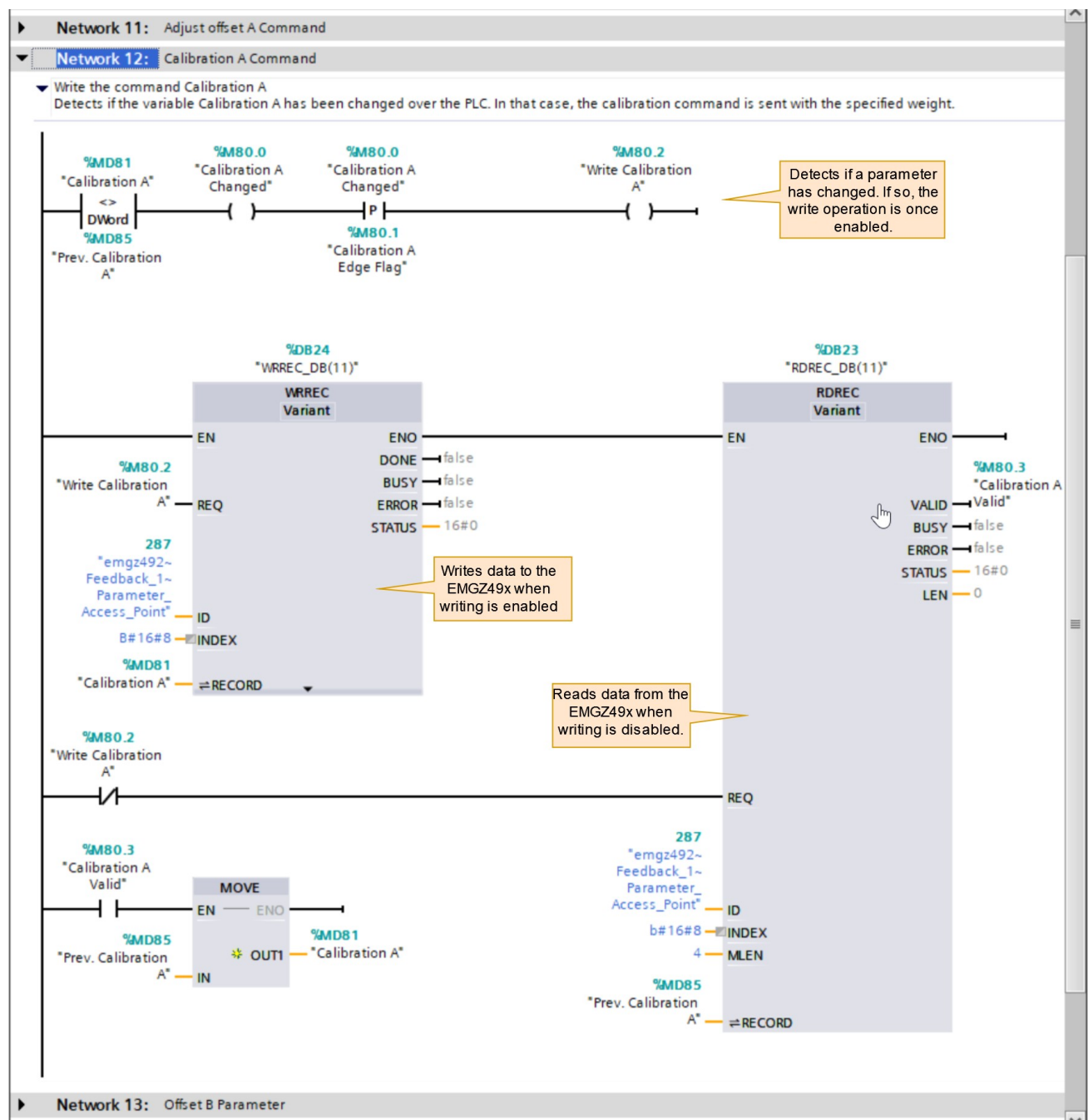
EMGZ492 Cyclic Data

Name	Address	Display format	Monitor value	Modify value
// CYCLIC DATA EMGZ492				
// Channel A				
Actual value A in digits (ADC)	%IW124	DEC+/-	12146	
Actual value A in Newton (N)	%ID126	DEC+/-	1501149	
Actual value A in Pound (lb)	%ID130	DEC+/-	337471	
Actual value A in configured unit	%ID134	DEC+/-	1501149	
// Channel B				
Actual value B in digits (ADC)	%IW138	DEC+/-	11770	
Actual value B in Newton (N)	%ID140	DEC+/-	1004718	
Actual value B in Pound (lb)	%ID144	DEC+/-	225869	
Actual value B in configured unit	%ID148	DEC+/-	1004718	
// Calculated values of the channels				
Actual value A+B in configured unit	%ID152	DEC+/-	2505867	
Actual value A-B in configured unit	%ID156	DEC+/-	496431	
Actual value (A+B)/2 in configured unit(1)	%ID160	DEC+/-	1252933	
// Status				
Status - Overload Channel A	%I164.0	Bool	<input type="checkbox"/> FALSE	
Status - Overload Channel B	%I164.1	Bool	<input type="checkbox"/> FALSE	
Status - Output Overflow	%I164.2	Bool	<input checked="" type="checkbox"/> TRUE	
Status - Output Underflow	%I164.3	Bool	<input type="checkbox"/> FALSE	
<Add new>				

EMGZ492 Parameter

Name	Address	Display format	Monitor value	Modify value	Write	Flash
// System Parameter						
	%MB111	DEC	0	1	<input type="checkbox"/>	
// Analog Output Parameter						
Tension at max. output	%MD211	DEC	1000000	1000000	<input type="checkbox"/>	
Analog output filter	%MW231	DEC	100	100	<input type="checkbox"/>	
Output Value	%MB201	DEC	0	0	<input type="checkbox"/>	
*Low Pass Filter Analog Output Acti...	%MB221	DEC	1	1	<input type="checkbox"/>	
// Amplifier Sensor A Parameter						
Offset A	%MW21	DEC+/-	-1	0	<input type="checkbox"/>	
Gain A	%MW31	DEC	1470	1000	<input type="checkbox"/>	
Nominal force A	%MD41	DEC	1000000	1000000	<input type="checkbox"/>	
Profinet filter cutoff frequency A	%MW61	DEC	100	100	<input type="checkbox"/>	
Profinet filter active A	%MB51	DEC	1	1	<input type="checkbox"/>	
// Amplifier adjustment sensor A						
Adjust offset A	<input checked="" type="checkbox"/> %MB71	DEC	1	1	<input checked="" type="checkbox"/>	
Calibration A	%MD81	DEC	1500000	1500000	<input type="checkbox"/>	
// Amplifier Sensor B Parameter						
Offset B	%MW91	DEC+/-	-258	-321	<input type="checkbox"/>	
Gain B	%MW101	DEC	994	1000	<input type="checkbox"/>	
Nominal force B	%MD111	DEC	1000000	1000000	<input type="checkbox"/>	
Profinet filter cutoff frequency B	%MW131	DEC	100	100	<input type="checkbox"/>	
Profinet filter active B	%MB121	DEC	1	0	<input type="checkbox"/>	
// Amplifier adjustment sensor B						
Adjust offset B	%MB141	DEC	1	1	<input type="checkbox"/>	
Calibration B	%MD151	DEC	2000000	2000000	<input type="checkbox"/>	
<Add new>						

The program logic for writing parameters and commands to the PLC is located in the function block OB1. It is the same algorithm for all items. Therefore only one is shown here. The only difference is the index, the tags, and sometimes the Access Point.

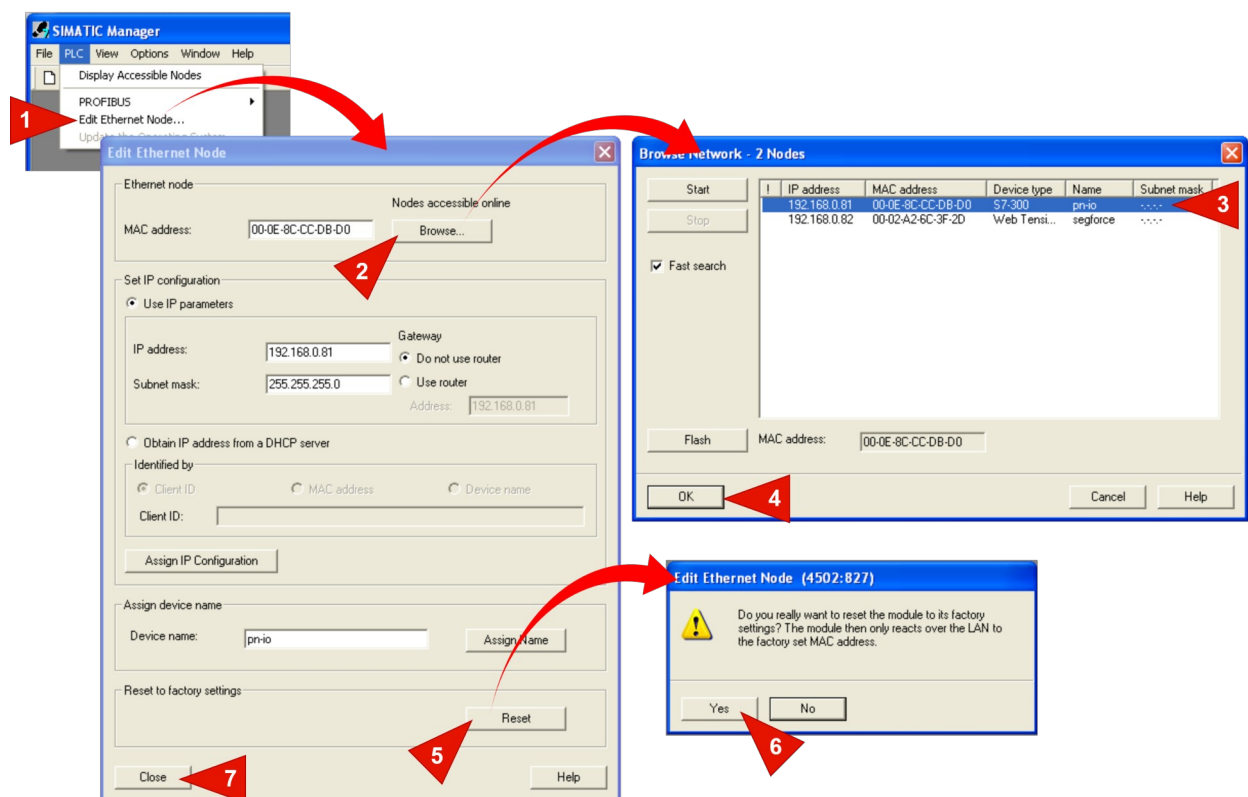


1.3 Siemens PLC Operation Commands

1.3.1 How to reset a PLC to factory settings

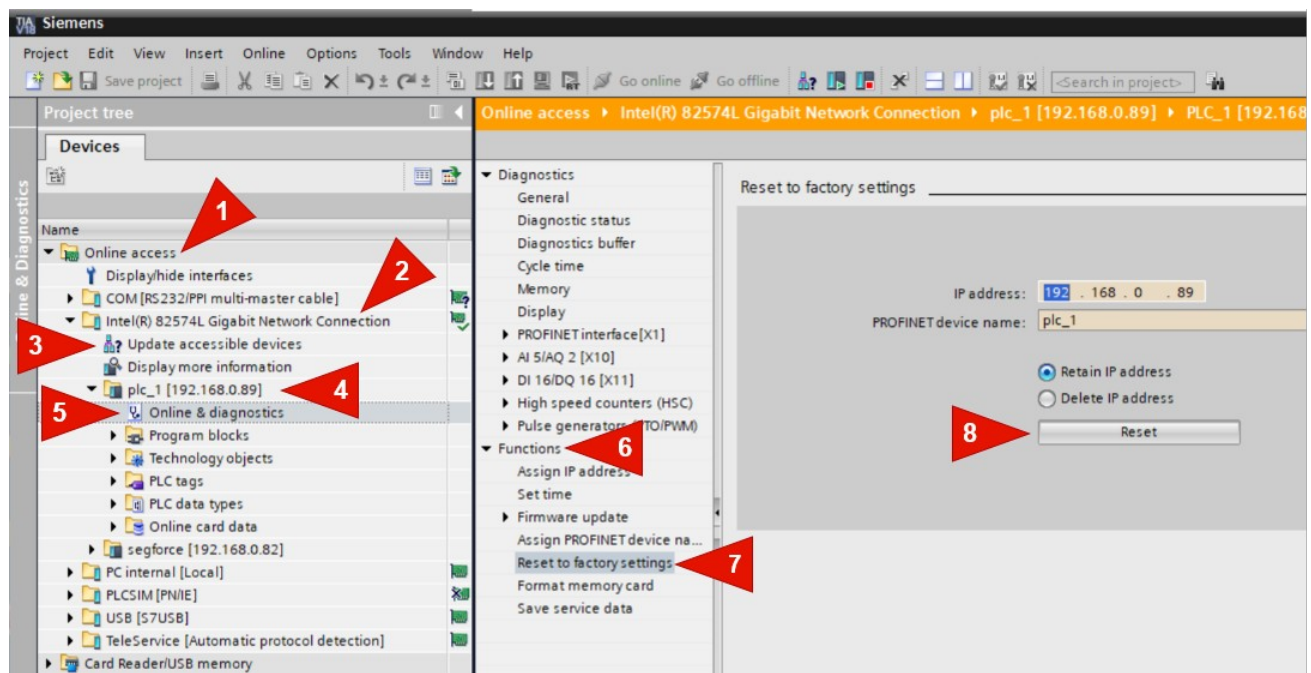
1.3.1.1 Resetting PLC with Step 7 SIMATIC Manager

- Execute the **SIMATIC Manager** program.
- Select the **PLC ->Edit Ethernet Node** **1** menu in the main window. A project doesn't need to be open; if so, the PLC menu contains several more entries. Just select the appropriate menu. This action opens the dialog Edit Ethernet Node.
- Click on **Browse** **2** which opens the dialog Browse Network. The search for PROFINET devices starts automatically after roughly 3 seconds. Just be patient until the list is filled with the found devices.
- Select the PLC from the list **3**, which should be reset to its factory defaults. If it is not listed, a network problem could be the reason, e.g., the cabling is wrong, a router is in between, or the PLC is not powered on.
- Click **OK** **4** to confirm the selection and return to the previous dialog in which the properties of the chosen PLC are filled up in the entry fields.
- Finally, click **Reset** **5** and confirm the action on the popped-up dialog with **Yes** **6**.
- All work is done, therefor leave the dialog by clicking on **Close** **7**.



1.3.1.2 Resetting PLC with TIA Portal

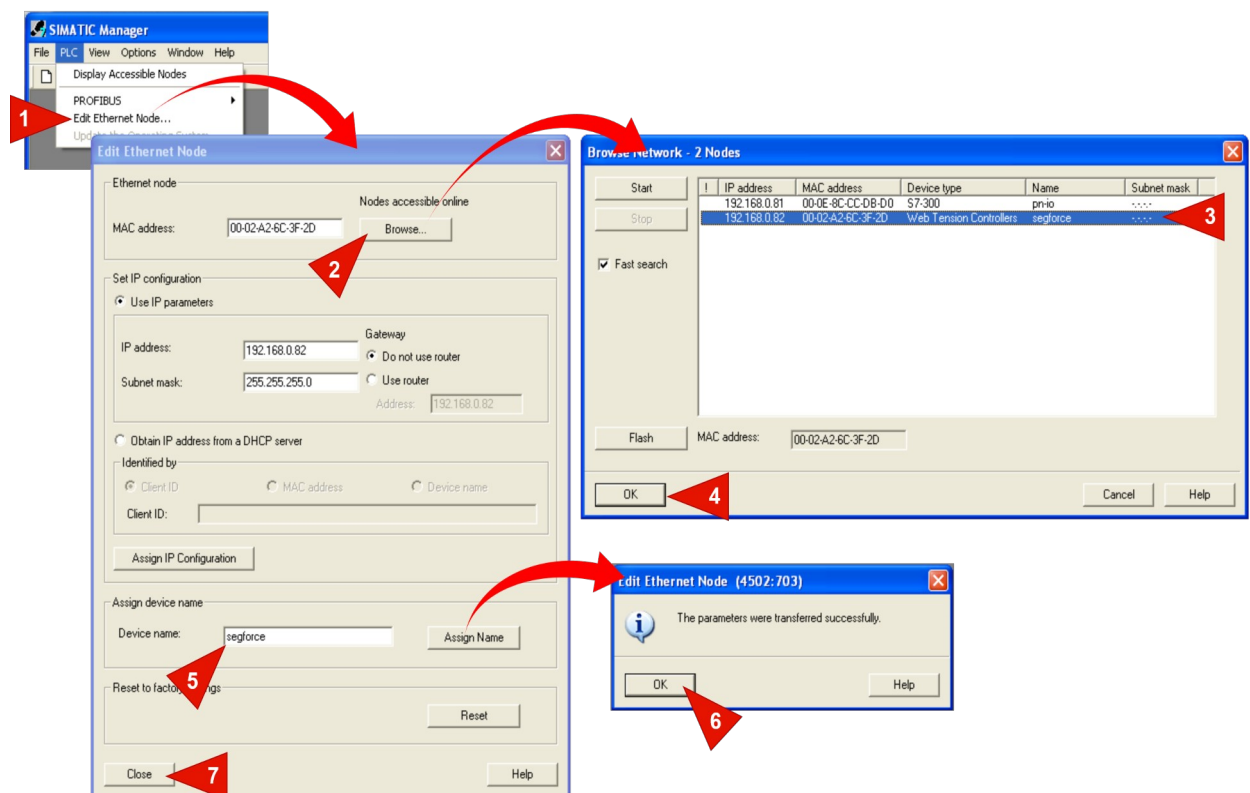
- Execute the **TIA Portal** program.
- The program normally starts with the portal view. Switch to the project view by clicking the **Project view** menu at the bottom left.
- Open the Online access tree **1** and the Ethernet interface card **2**, over which the PC is connected to the network.
- Double-click on the item **Update accessible devices** **3**. After a while, all PROFINET devices on the same network emerge.
- Open the tree of your PLC. The shown IP address may differ from yours **4**.
- Double-click on the item **Online & diagnostics** **5**. That action opens the diagnostics panel right of the tree panel.
- On the diagnostics panel, open the **Functions** tree **6** and select the item **Reset to factory settings** **7**. That action opens the appropriate entry form on the right.
- Finally, click on the button **Reset** **8**. That action takes a moment. You can observe flashing LEDs at the PLC front.



1.3.2 How to assign the PROFINET device name

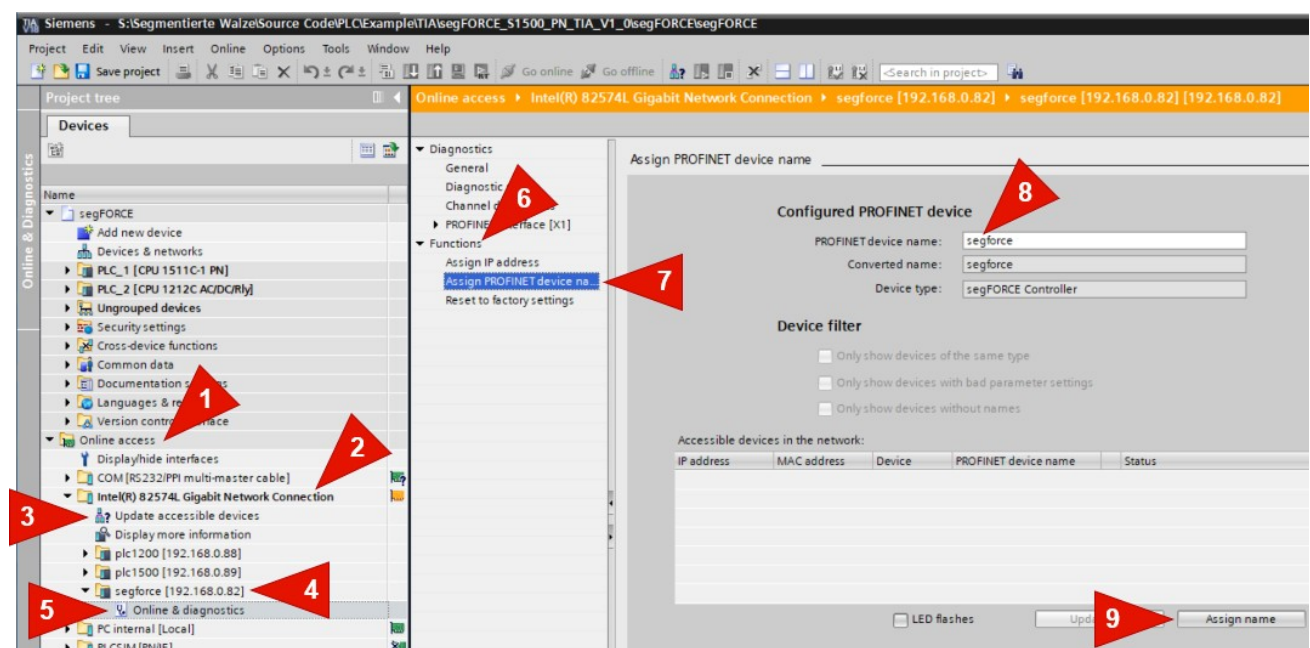
1.3.2.1 Name assignment with Step 7 SIMATIC Manager

- Execute the **SIMATIC Manager** program.
- Select the **PLC ->Edit Ethernet Node 1** menu in the main window. A project doesn't need to be open; if so, the PLC menu contains several more entries. Just select the appropriate menu. This action opens the dialog Edit Ethernet Node.
- Click on **Browse 2** which opens the dialog Browse Network. The search for PROFINET devices starts automatically after roughly 3 seconds. Just be patient until the list is filled with the found devices.
- Select the EMGZ49x from the list **3** you want to assign the device name to. If it is not listed, a network problem could be why, e.g., the cabling is wrong, a router is in between, or the EMGZ49x is not powered on.
- Click **OK 4** to confirm the selection and return to the previous dialog in which the properties of the chosen EMGZ49x are filled up in the entry fields.
- Finally, click **Assign Name 5** and confirm the action on the popped-up dialog with **OK 6**.
- All work is done, therefor leave the dialog by clicking on **Close 7**.



1.3.2.2 Name assignment with TIA Portal

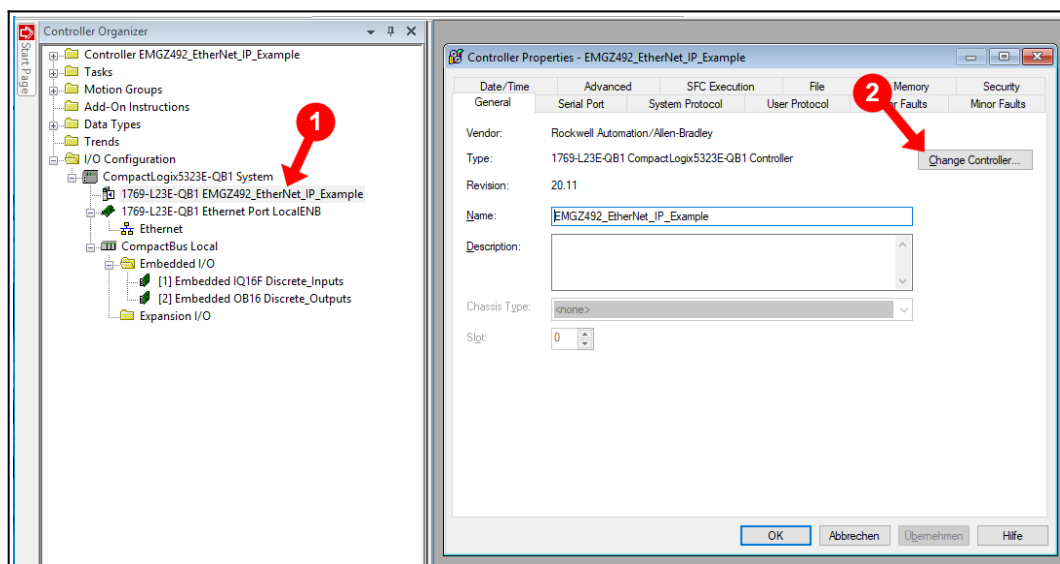
- Execute the **TIA Portal** program.
- The program normally starts with the portal view. Switch to the project view by clicking the **Project view** menu at the bottom left.
- Open the Online access tree **1** and the Ethernet interface card **2**, over which the PC is connected to the network.
- Double-click on the item **Update accessible devices** **3**. After a while, all PROFINET devices on the same network emerge.
- Open the tree of your EMGZ49x. The shown name and IP address might differ **4**.
- Double-click on the item **Online & diagnostics** **5**. That action opens the diagnostics panel right of the tree panel.
- On the diagnostics panel, open the **Functions** tree **6** and select the item **Assign PROFINET device name** **7**. That action opens the appropriate entry form on the right.
- Type the PROFINET device name **EMGZ491** or **EMGZ492** into the entry field **8**. Note that the name must be all lowercase.
- Finally, click on the button **Assign name** **9**.



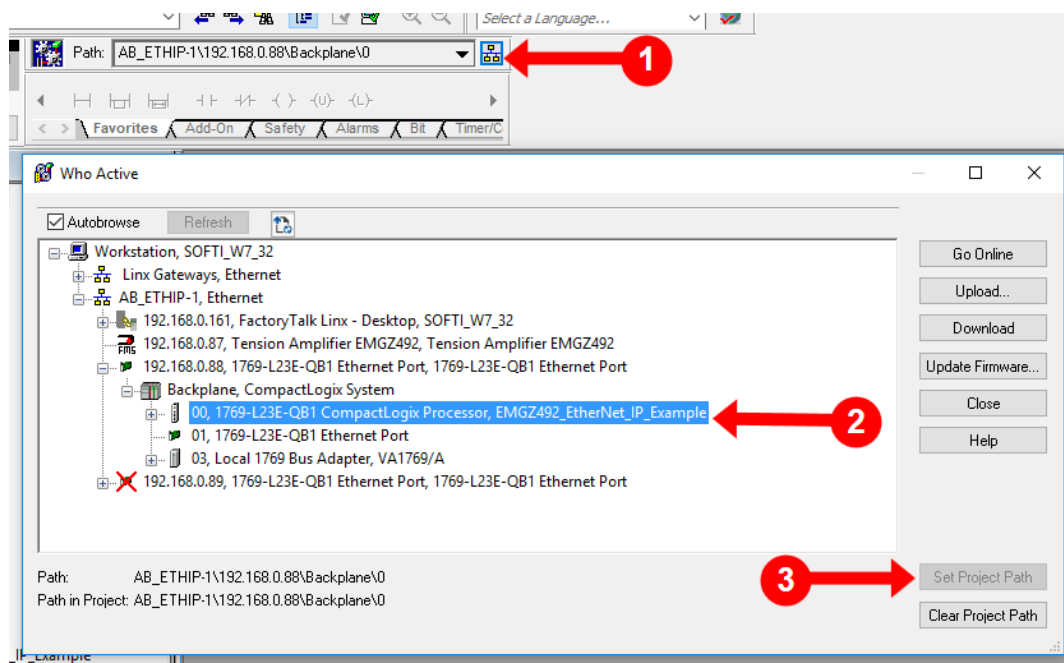
2 RSLogix 5000 EtherNet/IP

2.1 Setting up the project

- Copy the project to the PC on which the RSLogix 5000 development software is installed.
- Open the example project EMGZ49x_EIP_Vy_y (x stands for the utilized device, y stands for the example program version).
- Change the controller that it matches your utilized controller.



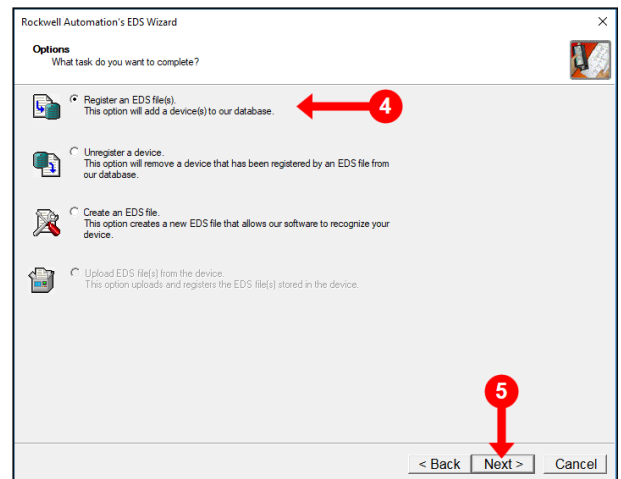
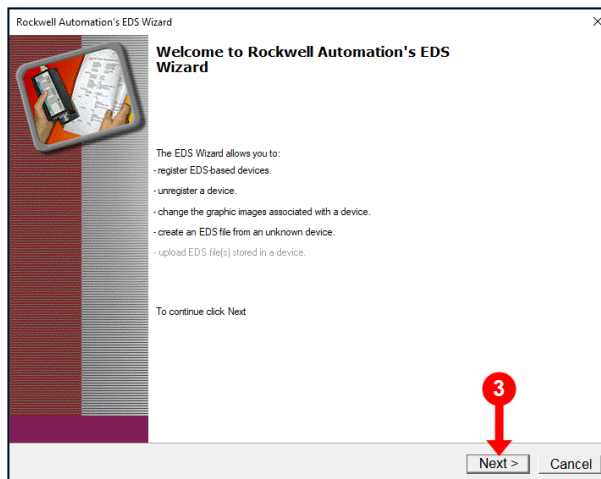
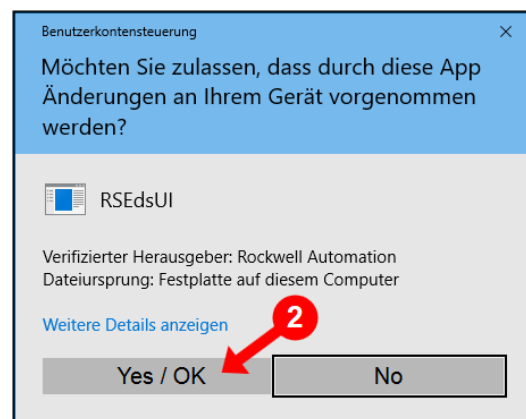
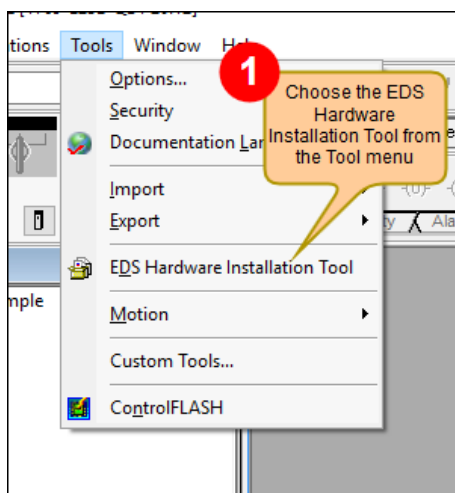
- Change the Path to the controller that you would like to use for the example program. If you have difficulty to change the path, use the Allen Bradley documentation for a further description.

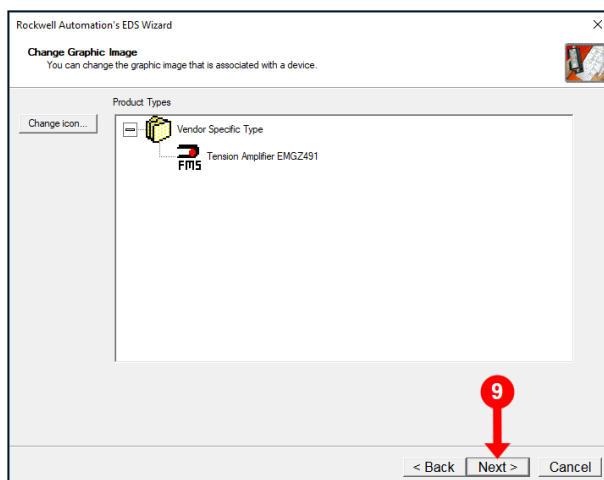
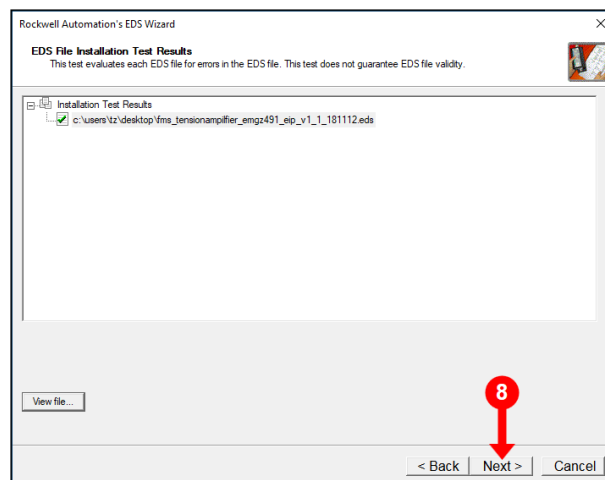
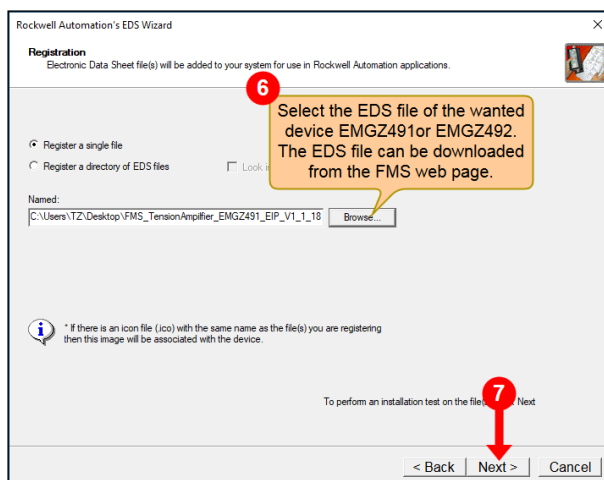


- To add the EMGZ491 or EMGZ492 to the project using the appropriate EDS file. Follow the steps on the below screenshots. After choosing the tool, there might appear a warning dialog to inform you about possible changes in the device configuration. Click on OK to accept changes. **2**

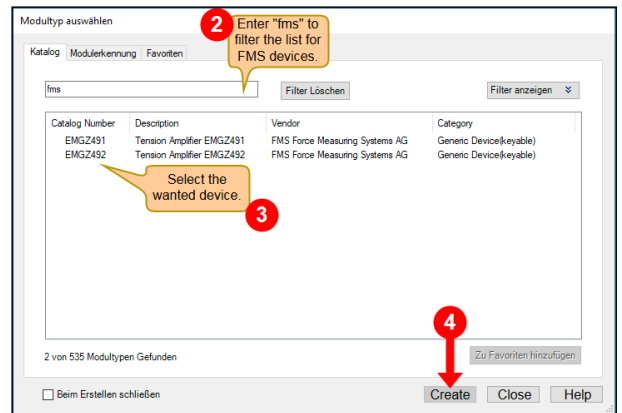
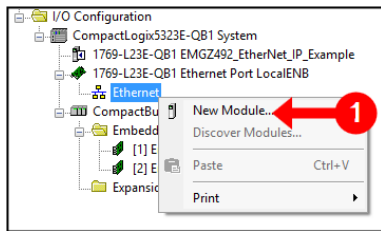


Depending on the software version the EMGZ49x is on, a different EDS version must be taken. EMGZ49x with software version up to 2.0.3, the EDS version 1.1 must be used. EMGZ49x with software version from 2.0.4 or higher, the EDS version 2.1 must be used. If both variants are in operation in your environment, you can install both EDS versions and choose the correct versions for the particular device. In that case repeat steps 1 to 11 for each EDS file.





- Add the wanted device EMGZ491 or EMGZ492 to the project. Follow the steps on the below screenshots.

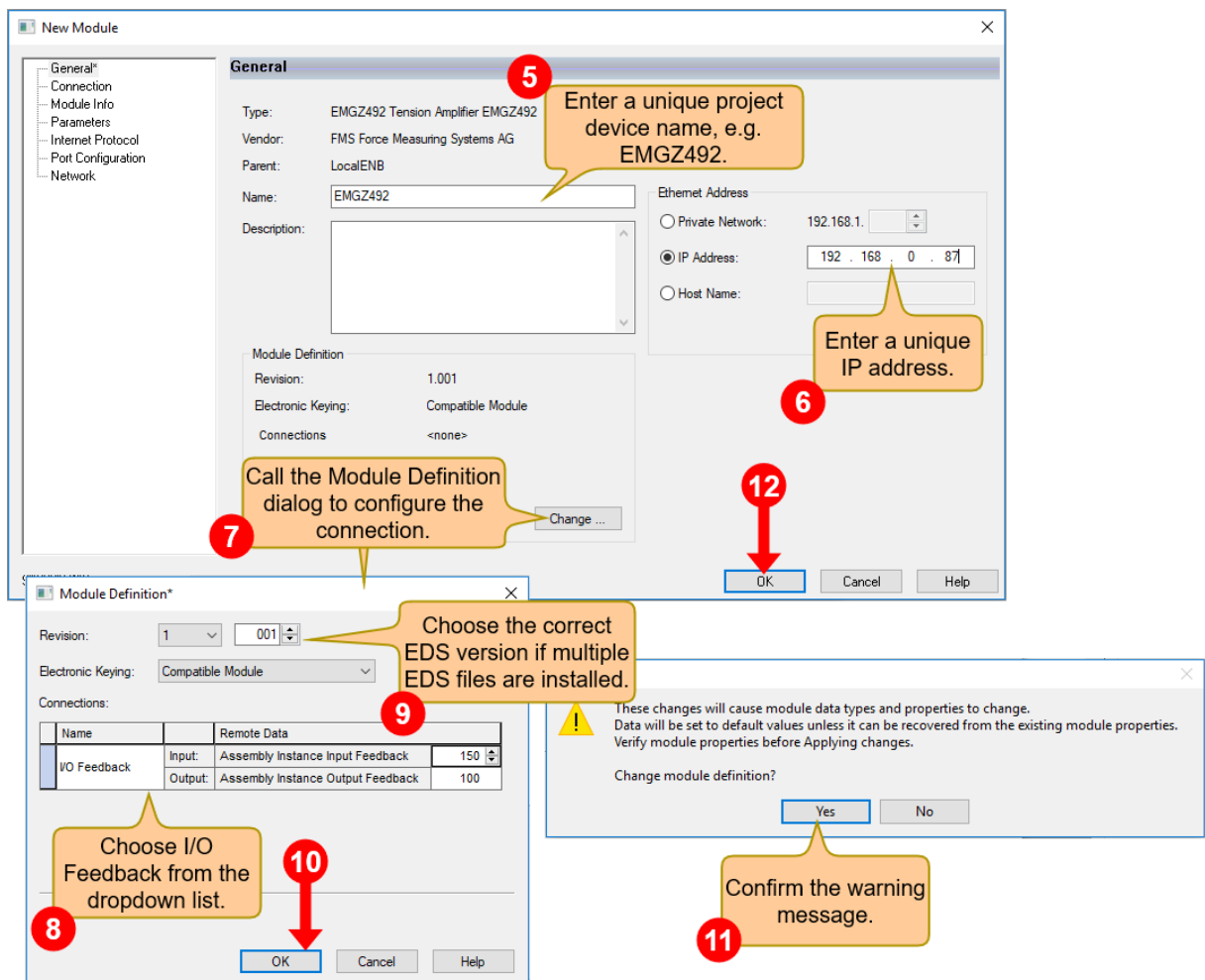




Be careful when entering the IP. If you enter a wrong IP by accident, then the device can not be recognized by the RSLinx tool anymore. Therefore, before acknowledging the change by clicking on the button OK, double-check the entered IP and write it down on a piece of paper.



The device has got the default IP of 192.168.0.90. If you don't know the assigned IP to the device and the RSLinx tool doesn't list it then use the Hilscher tool **Ethernet Device Configuration**. Refer to chapter **Find Out the Device IP** the get further information.



The screenshot shows the 'New Module' dialog box with the 'General' tab selected. The 'Name' field is set to 'EMGZ492'. The 'Ethernet Address' section shows the 'IP Address' field set to '192.168.0.87'. The 'Module Definition' section shows the 'Revision' set to '1.001'. The 'Connections' section shows '<none>'. The 'OK' button is highlighted with a red arrow and the number 12.

The 'Module Definition*' dialog box is also shown, with the 'Revision' set to '1' and '001'. The 'Electronic Keying' is set to 'Compatible Module'. The 'Connections' table is shown with the following data:

Name	Input	Remote Data
I/O Feedback	Assembly Instance Input Feedback	150
	Assembly Instance Output Feedback	100

The 'OK' button is highlighted with a red arrow and the number 10. A warning message dialog box is also shown, asking 'Change module definition?' with 'Yes' and 'No' buttons. The 'Yes' button is highlighted with a red arrow and the number 11.

Numbered callouts in the image:

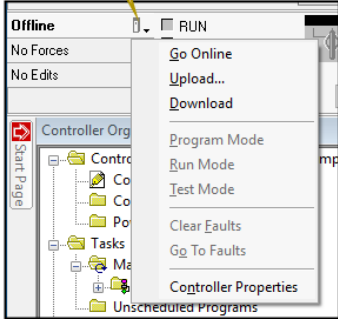
- 5: Enter a unique project device name, e.g. EMGZ492.
- 6: Enter a unique IP address.
- 7: Call the Module Definition dialog to configure the connection.
- 8: Choose I/O Feedback from the dropdown list.
- 9: Choose the correct EDS version if multiple EDS files are installed.
- 10: OK button in the Module Definition dialog.
- 11: Confirm the warning message.
- 12: OK button in the New Module dialog.

- After point 12 the origin dialog "Select Module Type" shows up again. It can be closed by now. The device is now displaying in the Controller Organizer tree under the item Ethernet.

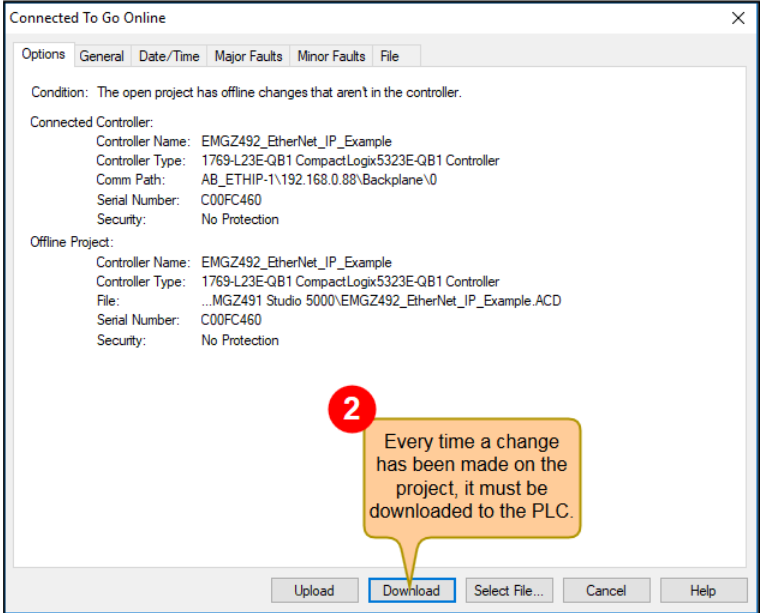
2.2 Using of the example program

- Establish a connection with the PLC.

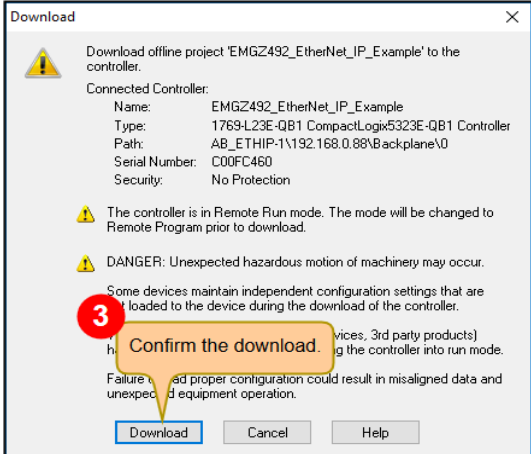
1 Click on the dropdown list and choose "Go Online".



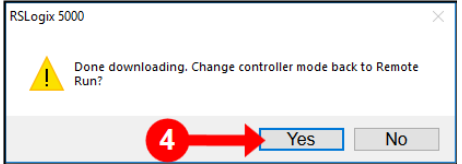
2 Every time a change has been made on the project, it must be downloaded to the PLC.



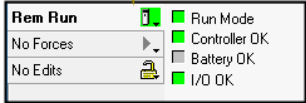
3 Confirm the download.



4

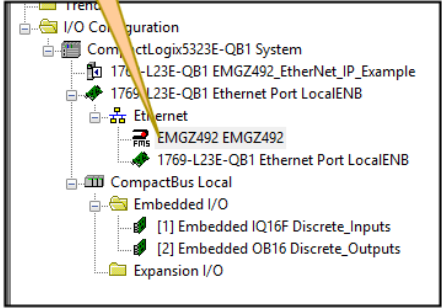


5 After a successful download, the controller goes online. The controller status must look like that.

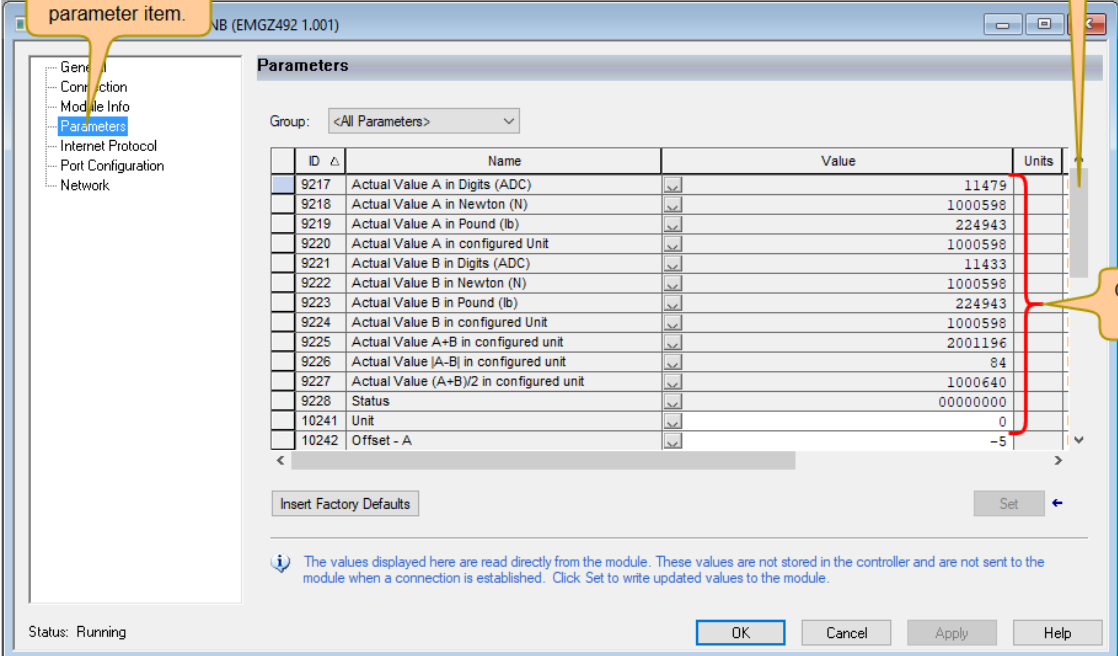


- Open the Module Properties dialog.

1 Double click on the wanted FMS device.



2 Choose the parameter item.



4 To see the acyclic data scroll down. The acyclic data are the configuration parameter of the device.

3 Cyclic data are shown here.

ID	Name	Value	Units
9217	Actual Value A in Digits (ADC)	11479	
9218	Actual Value A in Newton (N)	1000598	
9219	Actual Value A in Pound (lb)	224943	
9220	Actual Value A in configured Unit	1000598	
9221	Actual Value B in Digits (ADC)	11433	
9222	Actual Value B in Newton (N)	1000598	
9223	Actual Value B in Pound (lb)	224943	
9224	Actual Value B in configured Unit	1000598	
9225	Actual Value A+B in configured unit	2001196	
9226	Actual Value A-B in configured unit	84	
9227	Actual Value (A+B)/2 in configured unit	1000640	
9228	Status	00000000	
10241	Unit	0	
10242	Offset - A	-5	

The values displayed here are read directly from the module. These values are not stored in the controller and are not sent to the module when a connection is established. Click Set to write updated values to the module.

Status: Running

OK Cancel Apply Help

- To change device configuration parameters scroll down the parameter list box until the desired parameter is visible.

Module Properties: LocalENB (EMGZ492 1.001)

- General
- Connection
- Module Info
- Parameters
- Internet Protocol
- Port Configuration
- Network

Parameters

Group: <All Parameters>

ID	Name	Value	Units
10241	Unit	0	
10242	Offset - A	-5	
10243	Gain - A	1036	
10244	System Force - A	1000000	
10245	Low Pass Filter Actual Value Active - A	1	
10246	Cutoff Frequency Low Pass Filter Actual Value - A	100	
10247	Offset Adjust - A		
10248	Calibration - A		
10249	Offset - B	-19	
10250	Gain - B	1039	
10251	System Force - B	1000000	
10252	Low Pass Filter Actual Value Active - B	1	
	Cutoff Frequency Low Pass Filter Actual Value - B	100	

To adjust the offset, write the value 1.

To calibrate the amplifier with a defined weigh, hang a weight with a rope into the system. Then enter the weight into the entry field and send it to the PLC. The calibration weight must always be specified in Newton with three decimal digits, e.g., 1000000 is 1000.000 N.

To send the changes to the PLC, click on the button Set.

To change a parameter click into value field and edit the value.

Module Properties: LocalENB (EMGZ492 1.001)

General
Connection
Module Info
Parameters
Internet Protocol
Port Configuration
Network

Parameters

Group: <All Parameters>

ID	Name	Value	Units
10247	Offset Adjust - A		
10248	Calibration - A		
10249	Offset - B	-19	
10250	Gain - B	1039	
10251	System Force - B	1000000	
10252	Low Pass Filter Actual Value Active - B	1	
10253	Cutoff Frequency Low Pass Filter Actual Value - B	100	
10254	Offset Adjust - B		
10255	Calibration - B		
10273	Output Value	3	
10274	Scale Analog Output	1000000	
10275	Low Pass Filter Analog Output Active	1	
10276	Cutoff Frequency Low Pass Filter Analog Output	100	

Insert Factory Defaults

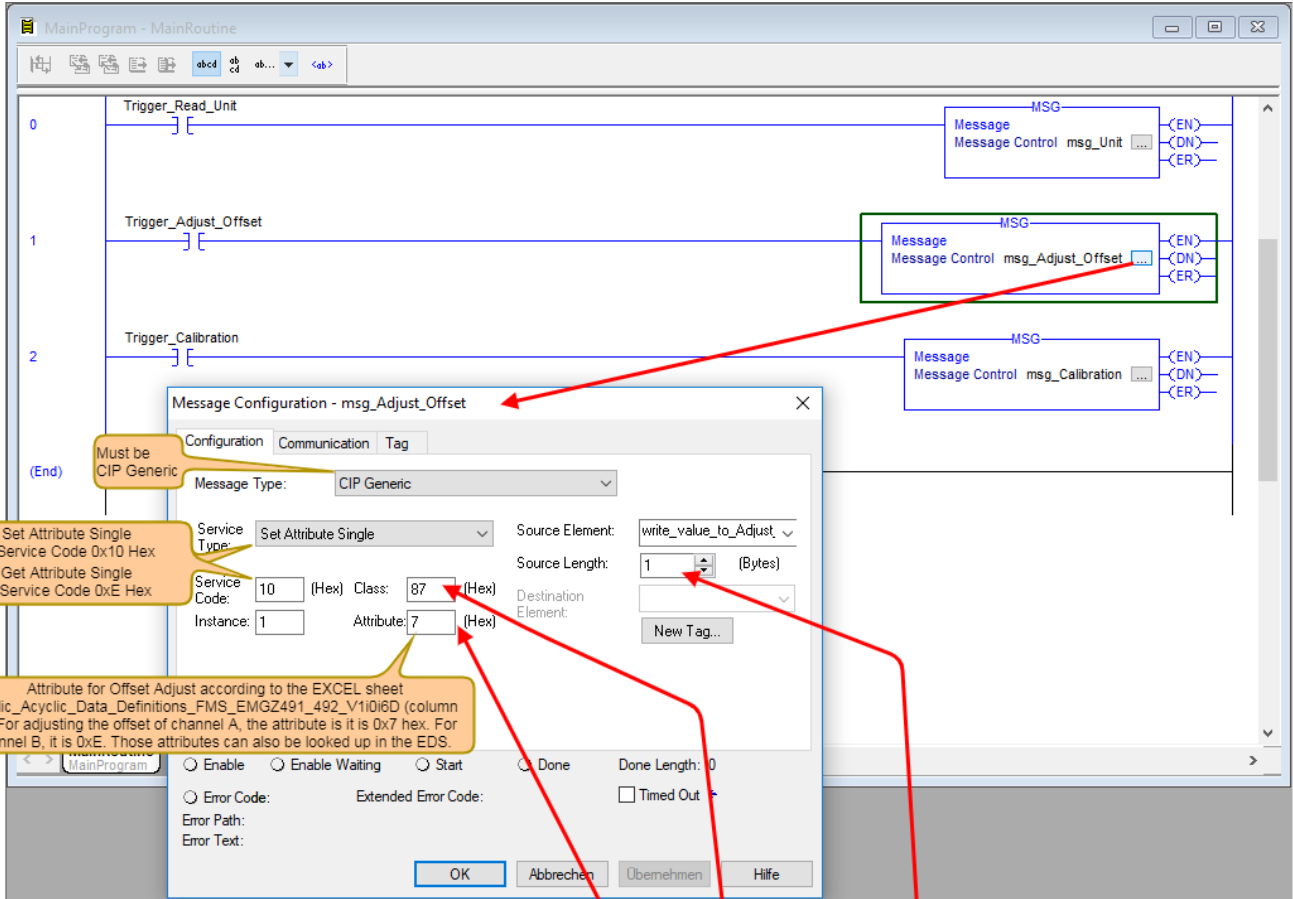
Set

The values displayed here are read directly from the module. These values are not stored in the controller and are not sent to the module when a connection is established. Click Set to write updated values to the module.

2.3 Writing Parameters from a PLC Program

This chapter shows how to write parameters from a PLC program. It is an example of adjusting the offset of channel A. All other parameters are handled in the same manner.

In general, for reading and writing parameters, messages must be used.



Message Configuration - msg_Adjust_Offset

Configuration Communication Tag

Message Type: CIP Generic

Service Type: Set Attribute Single

Service Code: 10 (Hex) Class: 87 (Hex) Attribute: 7 (Hex)

Instance: 1

Source Element: write_value_to_Adjust

Source Length: 1 (Bytes)

Destination Element:

New Tag...

Enable Enable Waiting Start Done Done Length: 0 Timed Out

Error Code: Extended Error Code: Error Path: Error Text:

OK Abbrechen Übernehmen Hilfe

Extract of the EDS file

```

404 Param10247 =
405 0, $ reserved, shall equal 0
406 6,"20 87 24 01 30 07", $ Link Path Size, Link Path
407 0x0000, $ Descriptor
408 0xC2, $ Data Type
409 1, $ Data Size in bytes
410 "Offset Adjust - A", $ name
411 "", $ units
412 "", $ help string
413 0,0x7F,0, $ min, max, default data values
414 ,,, $ mult, div, base, offset scaling
415 ,,, $ mult, div, base, offset links
416 ; $ decimal places

```

Annotations:

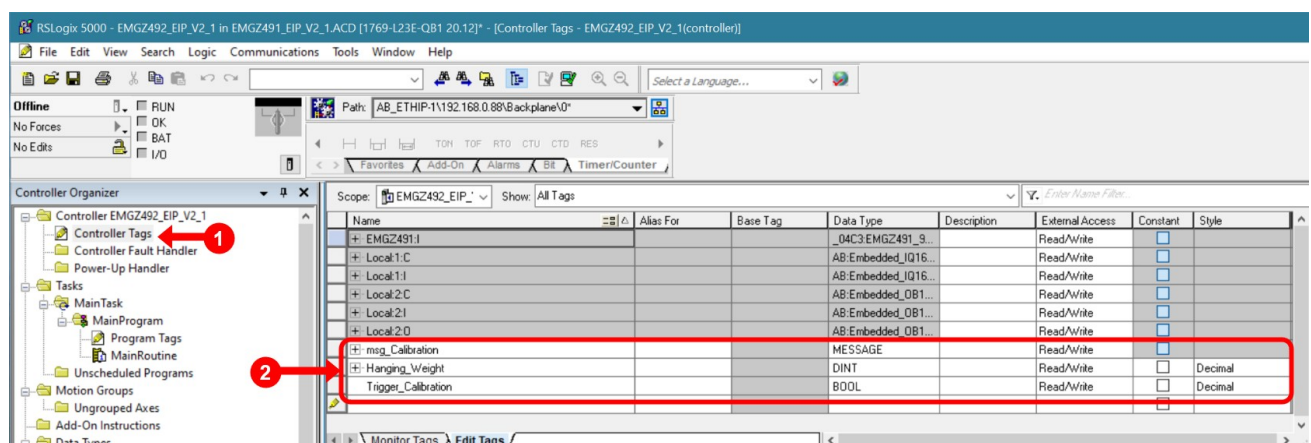
- Must be CIP Generic
- Set Attribute Single -> Service Code 0x10 Hex
- Get Attribute Single -> Service Code 0xE Hex
- Attribute for Offset Adjust according to the EXCEL sheet Cyclic_Acyclic_Data_Definitions_FMS_EMGZ491_492_V10i6D (column S). For adjusting the offset of channel A, the attribute is it is 0x7 hex. For channel B, it is 0xE. Those attributes can also be looked up in the EDS.

2.4 Calibration from a PLC Program

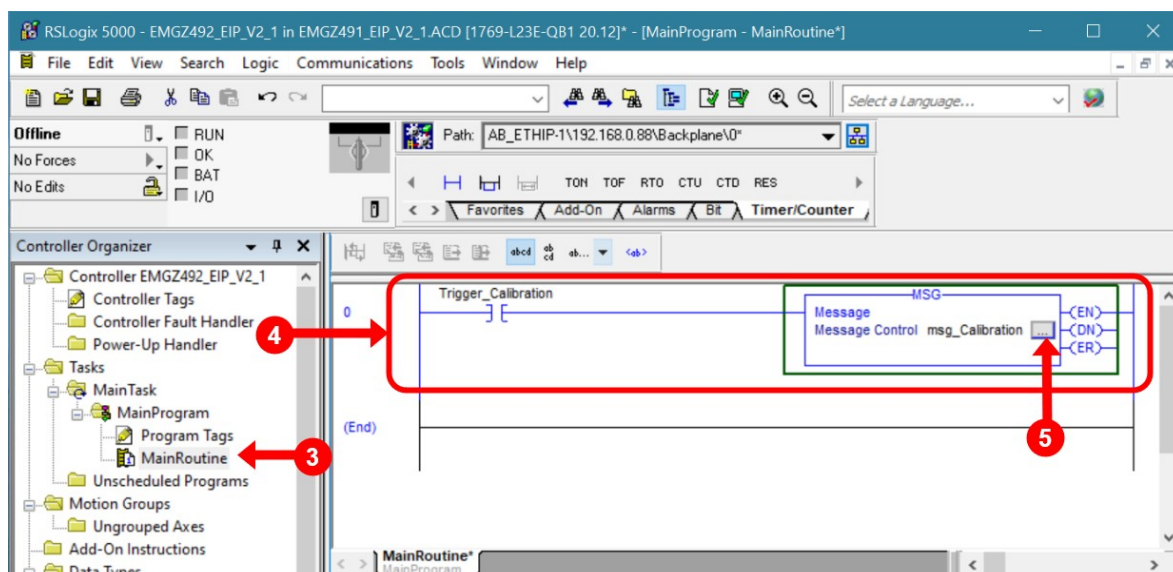
The programmatic calibration of the amplifier is the same procedure as writing a parameter. The parameter in that particular case is the value of the hanging weight in Millinewton. So if the hanging weight is 10kg (22.0462lb), you must write the value 98100 mN.

Follow the detailed description that shows how to do that from a program.

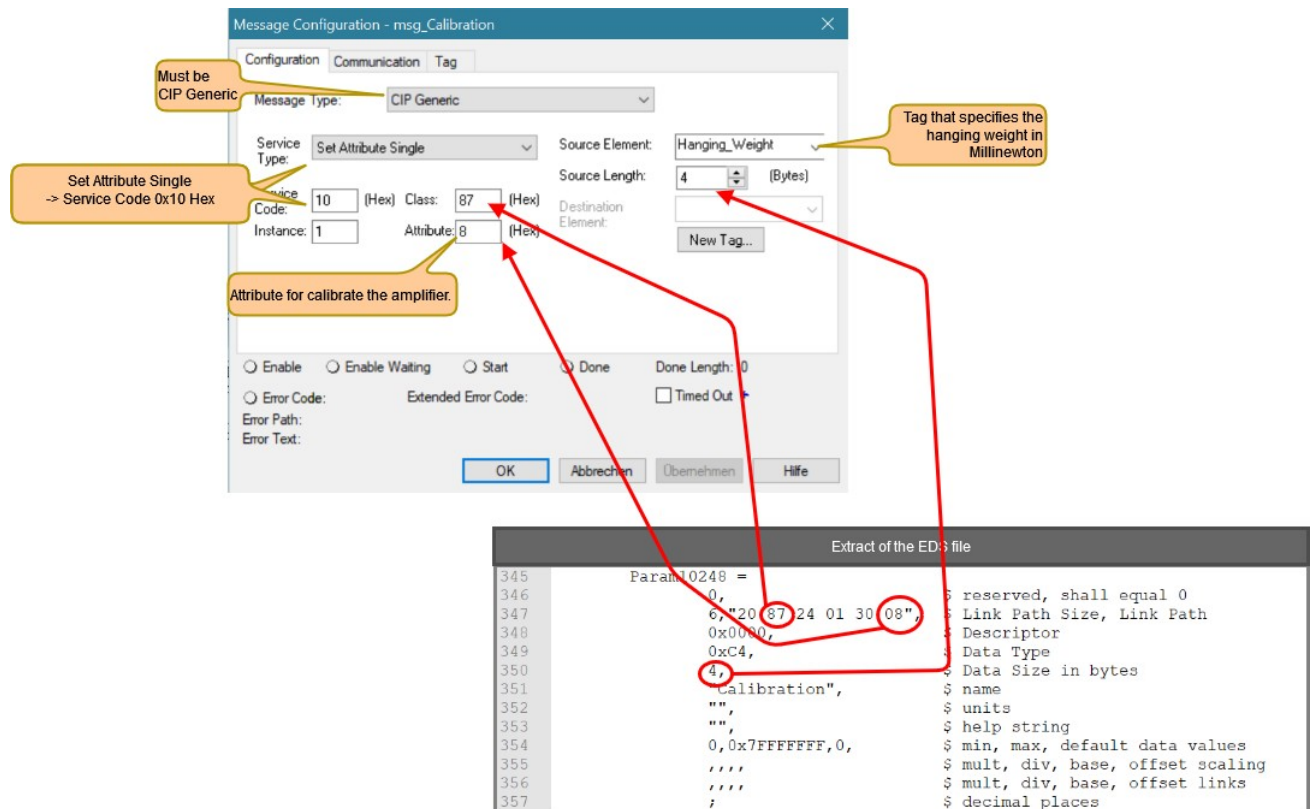
1. Go to the Controller Tags section.
2. Create the three controller tags as beneath picture shows.



3. Go to the MainRoutine section.
4. Create a Rung and insert the Examine On and MSG into it using the above-defined tags.



5. When creating the message, specify the parameters shown in the dialog Message Configuration.



Must be CIP Generic

Set Attribute Single
-> Service Code 0x10 Hex

Attribute for calibrate the amplifier.

Tag that specifies the hanging weight in Millinevton

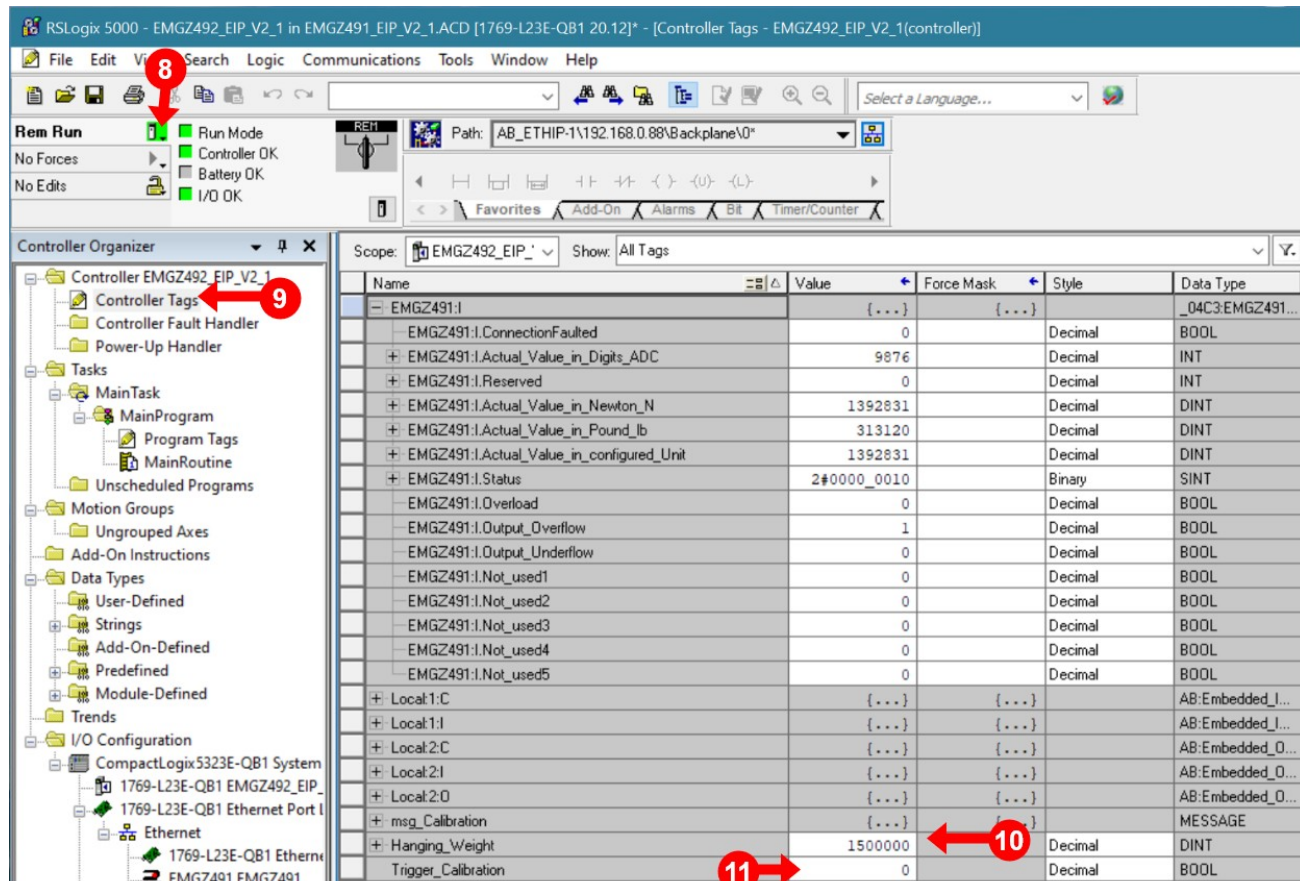
Extract of the ED\$ file

```

345 Param10248 =
346 0, $ reserved, shall equal 0
347 6, "20 87 24 01 30 08", $ Link Path Size, Link Path
348 0x0000, $ Descriptor
349 0xC4, $ Data Type
350 4, $ Data Size in bytes
351 "Calibration", $ name
352 "", $ units
353 "", $ help string
354 0, 0x7FFFFFFF, 0, $ min, max, default data values
355 , , , $ mult, div, base, offset scaling
356 , , , $ mult, div, base, offset links
357 ; $ decimal places
    
```

6. On the communications tab, enter or browse the amplifier device name and put it in the field Path.
7. Download the program to the PLC.

8. Go online
9. Go to the Controller Tags section by double-clicking it.
10. Enter the hanging weight in Millinewton.
11. Toggle the trigger calibration from 0 to 1 and back to 0. That action sends the message with the weight to the amplifier. The amplifier calculates the gain and saves the result to the parameter Gain.
Make sure that the system force is configured correctly before the calibration. You can do that either with the web interface or by writing the parameter from the PLC.



RSLogix 5000 - EMGZ492_EIP_V2_1 in EMGZ491_EIP_V2_1.ACD [1769-L23E-QB1 20.12]* - [Controller Tags - EMGZ492_EIP_V2_1(controller)]

File Edit View Search Logic Communications Tools Window Help

Path: AB_ETHIP-1\192.168.0.88\Backplane\0*

Rem Run Run Mode Controller OK Battery OK I/O OK

Controller Organizer

Scope: EMGZ492_EIP_V2_1 Show: All Tags

Name	Value	Force Mask	Style	Data Type
EMGZ491:I	{...}	{...}		_04C3:EMGZ491...
EMGZ491:I.ConnectionFaulted	0		Decimal	BOOL
EMGZ491:I.Actual_Value_in_Digits_ADC	9876		Decimal	INT
EMGZ491:I.Reserved	0		Decimal	INT
EMGZ491:I.Actual_Value_in_Newton_N	1392831		Decimal	DINT
EMGZ491:I.Actual_Value_in_Pound_lb	313120		Decimal	DINT
EMGZ491:I.Actual_Value_in_configured_Unit	1392831		Decimal	DINT
EMGZ491:I.Status	2#0000_0010		Binary	SINT
EMGZ491:I.Overload	0		Decimal	BOOL
EMGZ491:I.Output_Overflow	1		Decimal	BOOL
EMGZ491:I.Output_Underflow	0		Decimal	BOOL
EMGZ491:I.Not_used1	0		Decimal	BOOL
EMGZ491:I.Not_used2	0		Decimal	BOOL
EMGZ491:I.Not_used3	0		Decimal	BOOL
EMGZ491:I.Not_used4	0		Decimal	BOOL
EMGZ491:I.Not_used5	0		Decimal	BOOL
Local:1:C	{...}	{...}		AB:Embedded_I...
Local:1:I	{...}	{...}		AB:Embedded_I...
Local:2:C	{...}	{...}		AB:Embedded_O...
Local:2:I	{...}	{...}		AB:Embedded_O...
Local:2:O	{...}	{...}		AB:Embedded_O...
msg_Calibration	{...}	{...}		MESSAGE
Hanging_Weight	1500000		Decimal	DINT
Trigger_Calibration	0		Decimal	BOOL

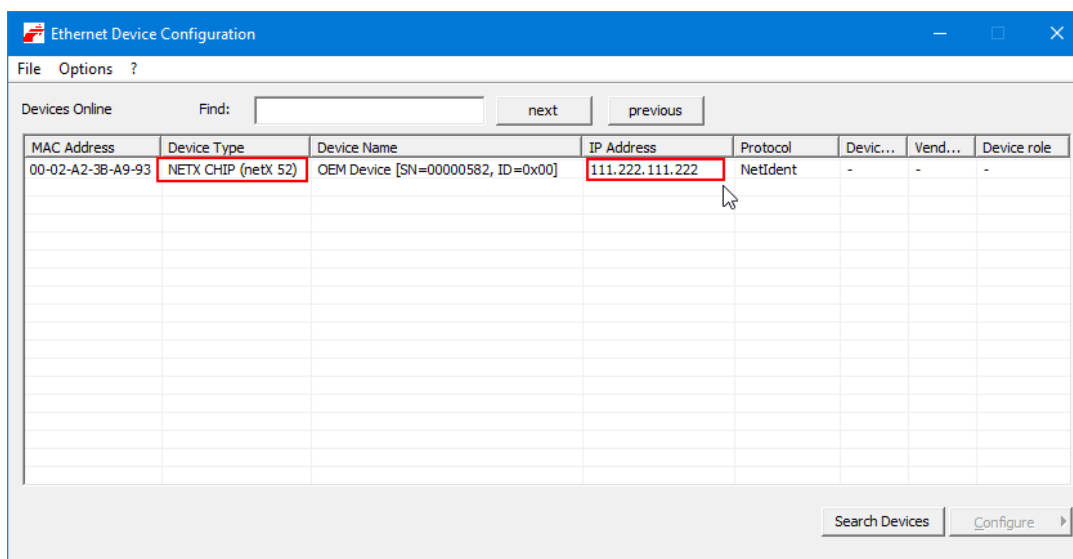
2.5 Find Out the Device IP

In case you don't know the IP of a device because of entering a wrong IP by accident, and the RSLinx tool cannot find it either, then you can use the Hilscher tool **Ethernet Device Configuration**. Follow the steps below to use the tool.

1. Download the Ethernet Device Configuration tool from the FMS website.
On the page, scroll down until you see the title Ethernet Device Configuration and click on EthernetDeviceConfiguration.zip.

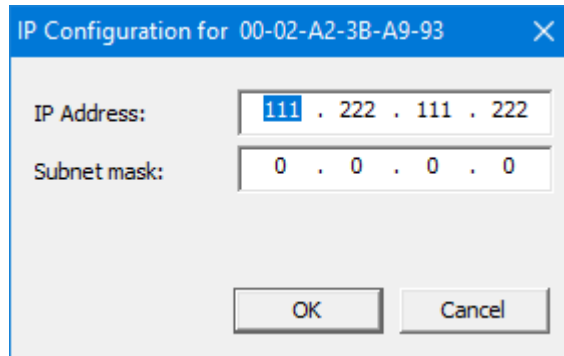
<https://www.fms-technology.com/en/downloadcenter/profinet>

2. Unzip the contains of the EthernetDeviceConfiguration.zip archive to a temporary directory.
3. Installing the tool by double-clicking on the file **EthernetDeviceConfiguration Vx.x.x.x Setup.msi** and follow the instructions.
4. Start the tool and changing the language to your preferences.
5. Make sure that the PC and the device are connected to the Ethernet and powered up.
Click on button Search Devices. The tool finds all devices on the network that uses a Fieldbus protocol. In our case EtherNet/IP.
Usually, you should only see a few devices. The device that we are looking for has got the Device Type NETX CHIP (netX 52). If you are not sure which device should be selected, unplug all other devices, and repeat the search.
6. Select the line that shows the wanted device. In our example, the device has got the wrong IP 111.222.111.222.



7. Click on button **Config** and choose **Set IP Address...**

In the called dialog, enter the correct IP Address and Subnet mask. Afterward, the tool RSLinx must list the device correctly.



2.6 Device Replacement in an Existing System

Depending on the firmware version are two different replacement scenarios necessary when a faulty device must be replaced in an existing system.

The following table shows which replacement scenario must be applied.

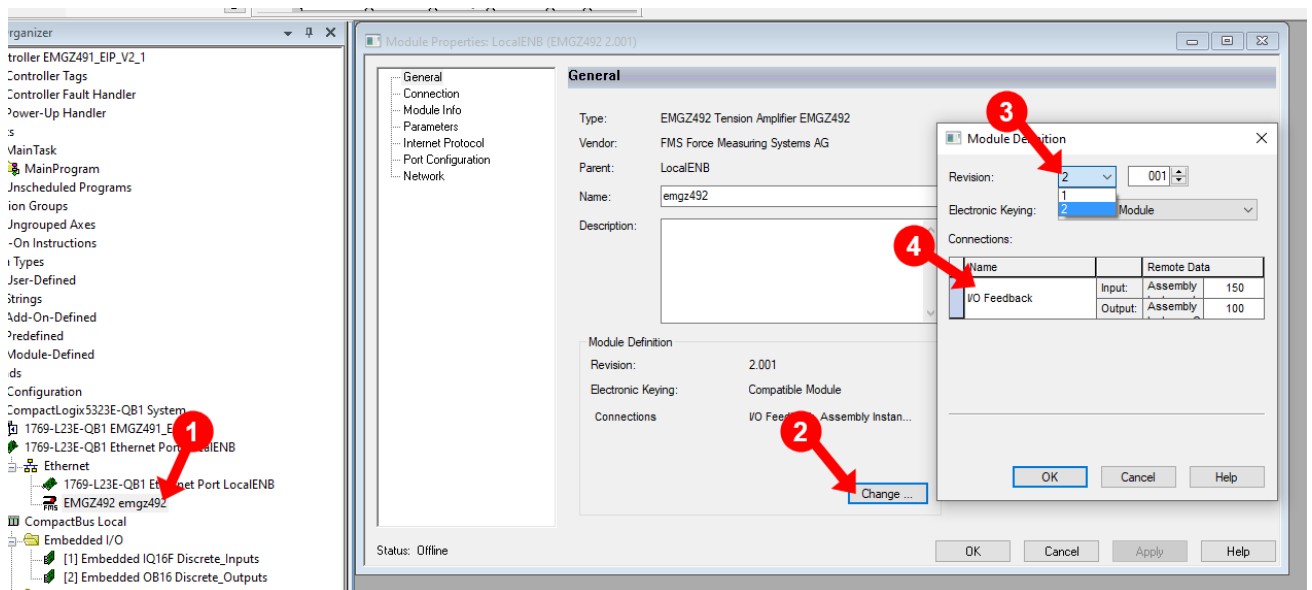
Identify the replacement scenario		
Version of the old device	Version of the new device	
	smaller or equal 2.0.3	equal or greater 2.0.4
smaller or equal 2.0.3	A	B
equal or greater 2.0.4	n/a	A

Scenario A:

- Configure the device parameter the same as of the predecessor.
- No further action is needed.

Scenario B:

- Configure the device parameter the same as of the predecessor.
- Download the EDS files for the EMGZ491 and EMGZ492 version 2.001 from the FMS home page menu *Download Center* → *EtherNet/IP*.
- Install the needed EDS in your RSLogix 5000 project as described above in chapter Setting up the project using the EDS Hardware Installation Tool.
- Open the module properties by double-clicking the device. ❶
- Click on button Change. ❷
- Select revision 2. ❸
- Select another connection than I/O Feedback, e.g., Listen Only Feedback and click on button OK. ❹
- Acknowledge the changes in the next dialog.
That action is necessary because of a bug in the RSLogix software. The connection must be set back to I/O Feedback later on.
- Download the project to the PLC.
- Open the module properties again and click the button change. ❶ and ❷
- Select the connection I/O Feedback and click on button OK. ❹
- Acknowledge the changes in the next dialog.
- Download the project to the PLC.



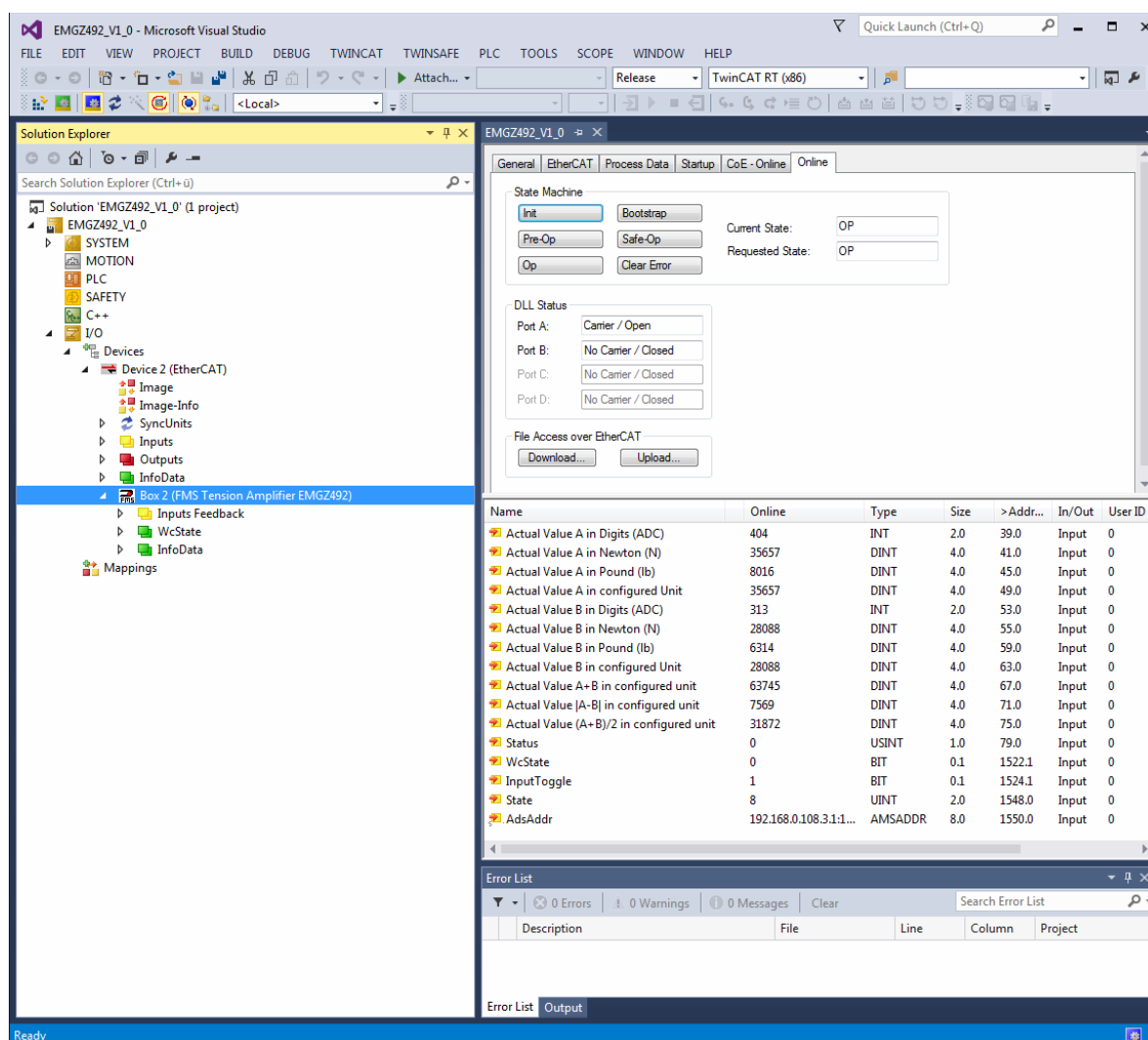
3 TwinCAT 3 - EtherCAT

The example projects for the EMGZ491 or EMGZ492 contains the appropriate device integrated into the project. It shows the live data from the cyclic data and explains how parameters can be changed. It does not show and use any programming code as that is part of the EtherCAT developer, and we can not give support in that area too.

3.1 Setting up the project

- Copy the project to the PC on which the TwinCAT 3 development software is installed.
- Open the example project EMGZ49x_ECAT_Vy_y (x stands for the utilized device, y stands for the example program version).

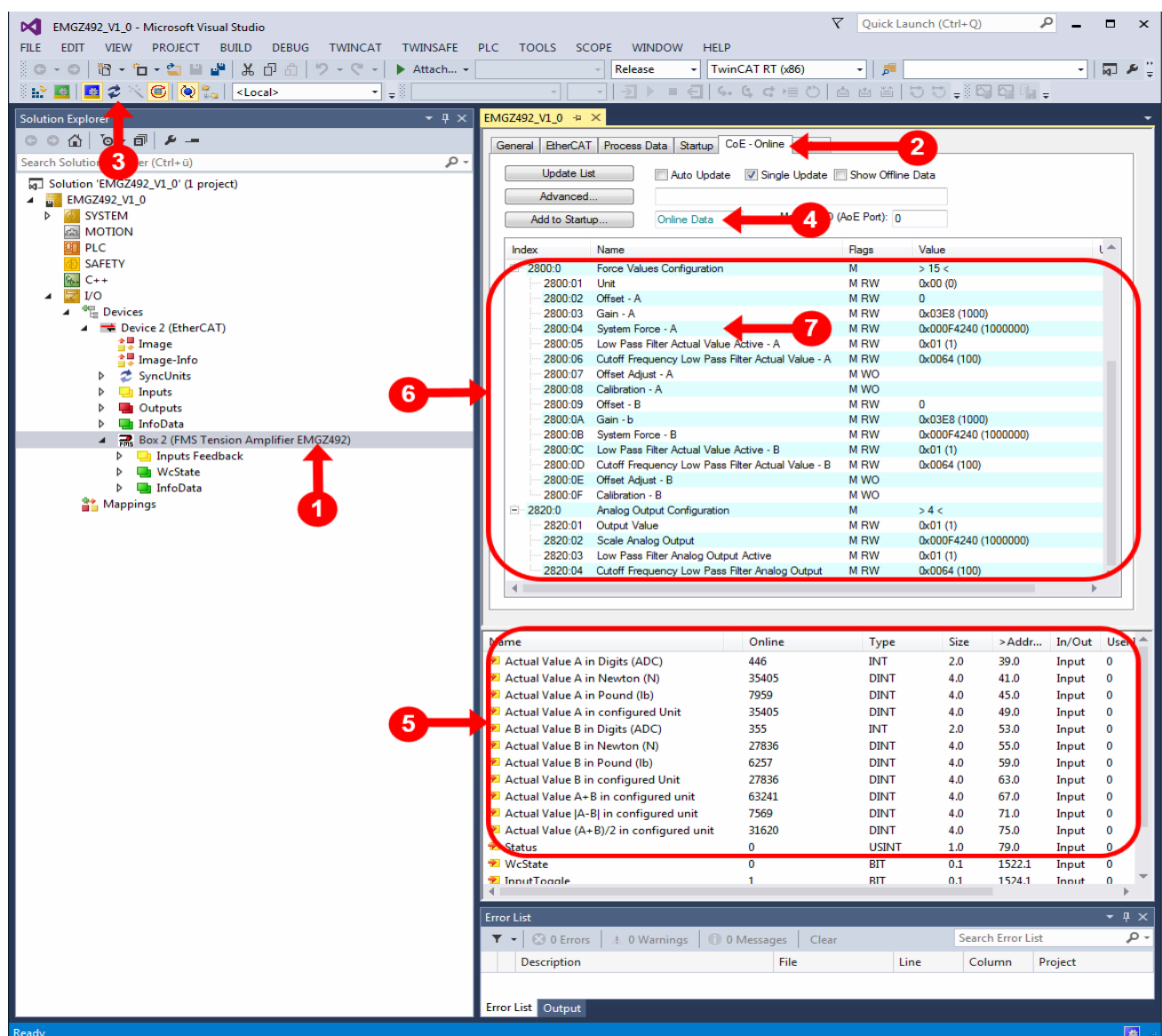
The screen should now show the project similar to the following picture.



3.2 Using of the example program

3.2.1 Show cycle data

1. Double click on the appropriate device EMGZ491 or EMGZ492 from the Solution Explorer tree.
2. Select the CoE- Online tab.
3. Click on the Reload Devices button.
4. The status must now show Online Data. If that is not the case, then check if the loaded project corresponds with the device EMGZ491 or EMGZ492. Is the device connected to the PC properly or powered up at all. If all seems correct, consult the TwinCAT documentation what the problem might be.
5. The cycle data will be shown here.



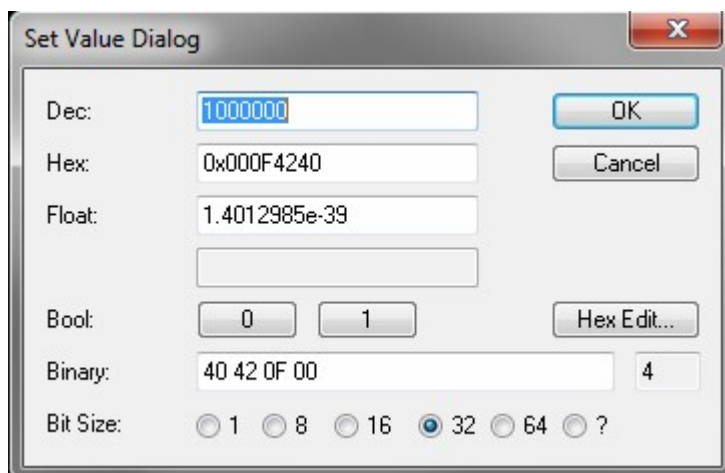
The screenshot shows the TwinCAT 3 software interface. The Solution Explorer on the left displays the project structure, with 'Box 2 (FMS Tension Amplifier EMGZ492)' selected. The main window shows the 'CoE - Online' tab, which displays a table of online data. The table has columns for Index, Name, Flags, and Value. The data is organized into sections for Force Values Configuration (2800.0) and Analog Output Configuration (2820.0). The bottom section of the table lists various actual values and their online status.

Index	Name	Flags	Value
2800.0	Force Values Configuration	M	> 15 <
2800.01	Unit	M RW	0x00 (0)
2800.02	Offset - A	M RW	0
2800.03	Gain - A	M RW	0x03E8 (1000)
2800.04	System Force - A	M RW	0x000F4240 (1000000)
2800.05	Low Pass Filter Actual Value Active - A	M RW	0x01 (1)
2800.06	Cutoff Frequency Low Pass Filter Actual Value - A	M RW	0x0064 (100)
2800.07	Offset Adjust - A	M WO	
2800.08	Calibration - A	M WO	
2800.09	Offset - B	M RW	0
2800.0A	Gain - b	M RW	0x03E8 (1000)
2800.0B	System Force - B	M RW	0x000F4240 (1000000)
2800.0C	Low Pass Filter Actual Value Active - B	M RW	0x01 (1)
2800.0D	Cutoff Frequency Low Pass Filter Actual Value - B	M RW	0x0064 (100)
2800.0E	Offset Adjust - B	M WO	
2800.0F	Calibration - B	M WO	
2820.0	Analog Output Configuration	M	> 4 <
2820.01	Output Value	M RW	0x01 (1)
2820.02	Scale Analog Output	M RW	0x000F4240 (1000000)
2820.03	Low Pass Filter Analog Output Active	M RW	0x01 (1)
2820.04	Cutoff Frequency Low Pass Filter Analog Output	M RW	0x0064 (100)

Name	Online	Type	Size	>Addr...	In/Out	Used
Actual Value A in Digits (ADC)	446	INT	2.0	39.0	Input	0
Actual Value A in Newton (N)	35405	DINT	4.0	41.0	Input	0
Actual Value A in Pound (lb)	7959	DINT	4.0	45.0	Input	0
Actual Value A in configured Unit	35405	DINT	4.0	49.0	Input	0
Actual Value B in Digits (ADC)	355	INT	2.0	53.0	Input	0
Actual Value B in Newton (N)	27836	DINT	4.0	55.0	Input	0
Actual Value B in Pound (lb)	6257	DINT	4.0	59.0	Input	0
Actual Value B in configured Unit	27836	DINT	4.0	63.0	Input	0
Actual Value A+B in configured unit	63241	DINT	4.0	67.0	Input	0
Actual Value [A-B] in configured unit	7569	DINT	4.0	71.0	Input	0
Actual Value (A+B)/2 in configured unit	31620	DINT	4.0	75.0	Input	0
Status	0	USINT	1.0	79.0	Input	0
WcState	0	BIT	0.1	1522.1	Input	0
InputTonnale	1	RIT	0.1	1574.1	Input	0

3.2.2 Change parameters

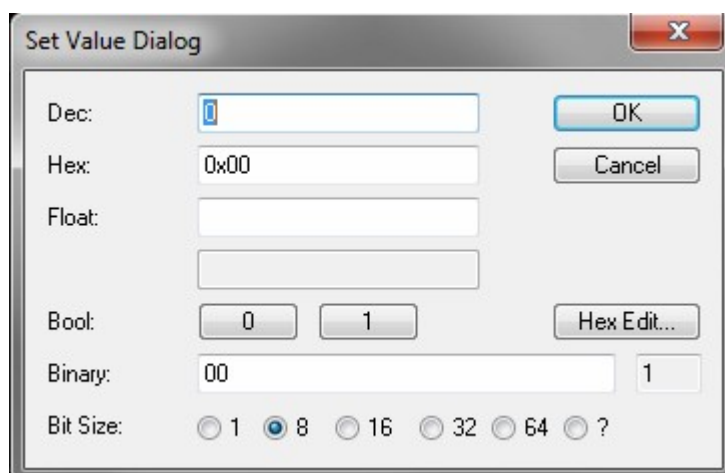
6. The parameters can be changed here. Open the tree index 2800 and 2820. After that, all parameters will be visible.
7. As an example double click on System Force. That opens the window Set Value Dialog. Enter a new value in the entry field Dec, e.g., 2000000 (that is interpreted as 2000.000N) and click on OK. A new system force has been set.



What the value ranges of the individual parameters are and how they will be interpreted can be seen in the manuals.

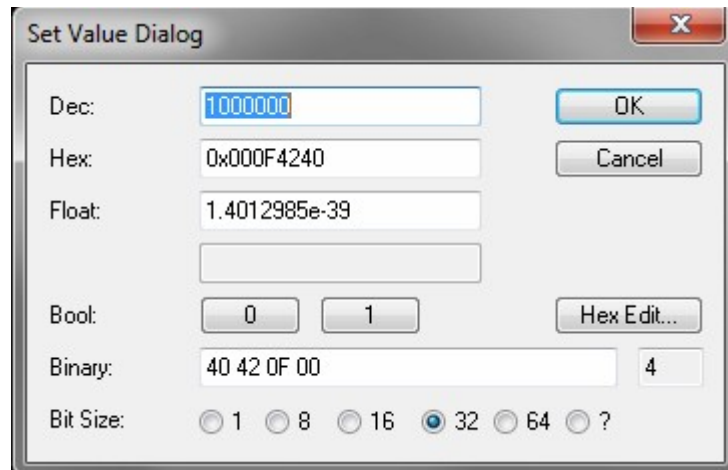
Example to adjust the offset

Double click on the parameter Offset Adjust. In the Set Value Dialog click on button 1 and OK. Be sure that the load call sensor is not loaded.



Example to calibrate with a defined weight

Double click on the parameter Calibration. In the Set Value Dialog enter the value of the loaded weight into the entry field Dec, e.g., 250000 (that is interpreted as 250.000N) and click on OK. That calculates the gain and saves it.



Caution: All weight values must independent from the configured unite be entered in Newton (N).

4 Firmware Update



Firmware updates for EtherCAT devices are not supported.

The EMGZ49x devices provide a firmware update over the web interface. The procedure is identical for all variants. Follow the instruction below to carry out an update.

1. Call the web interface by entering the IP address of the device into the web browser. Usually, the IP for a device is defined by the PLC. But when the device is not part of an industrial environment, hence no PLC is giving the device an IP, then you first must assign a not in the network used IP to the device. For that purpose, utilize the tool Ethernet Device Configuration from Hilscher. If you don't have and know how to use that tool, look at chapter Find Out the Device IP.
2. Choose from the menu of the web interface the entry System Settings. On this page, select the firmware file that you have got from FMS. The filename looks roughly like that EMGZ491_APP_Web_Update_V2.0.4.bin depending on the device variant and software version. Make sure that you have the right file for your device. The first part starting from the left, describes the variant (EMGZ491 or EMGZ492). The last part denotes the firmware version (Vx.x.x).
3. Enter the password 3231 and click on the button Upload Firmware. The upload starts as soon as you have clicked on the button.
4. Follow the instructions on the web page and don't power off the device while the process hasn't been finished. The update is over when either the device home page shows up or the browser reports that this page could not be found.
5. Check if the device has got the new firmware. Call the device home page, as described in point 1. Refresh the page by hitting the keys ctrl+F5 simultaneously. It is important to refresh the page exactly that way. This ensures that no cached values will be displayed and maybe shows a wrong version number.

When the showed version corresponds with the new firmware, the update was successful and the device can be used. Otherwise, repeat the whole update procedure.