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# SINAMICS G120XA: Speed Control with S7-1200 via USS

SINAMICS G120XA / V1.0

<https://support.industry.siemens.com/cs/ww/en/view/109770390>

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# 1 Task

**NOTICE** This reference only can be used in China and India.

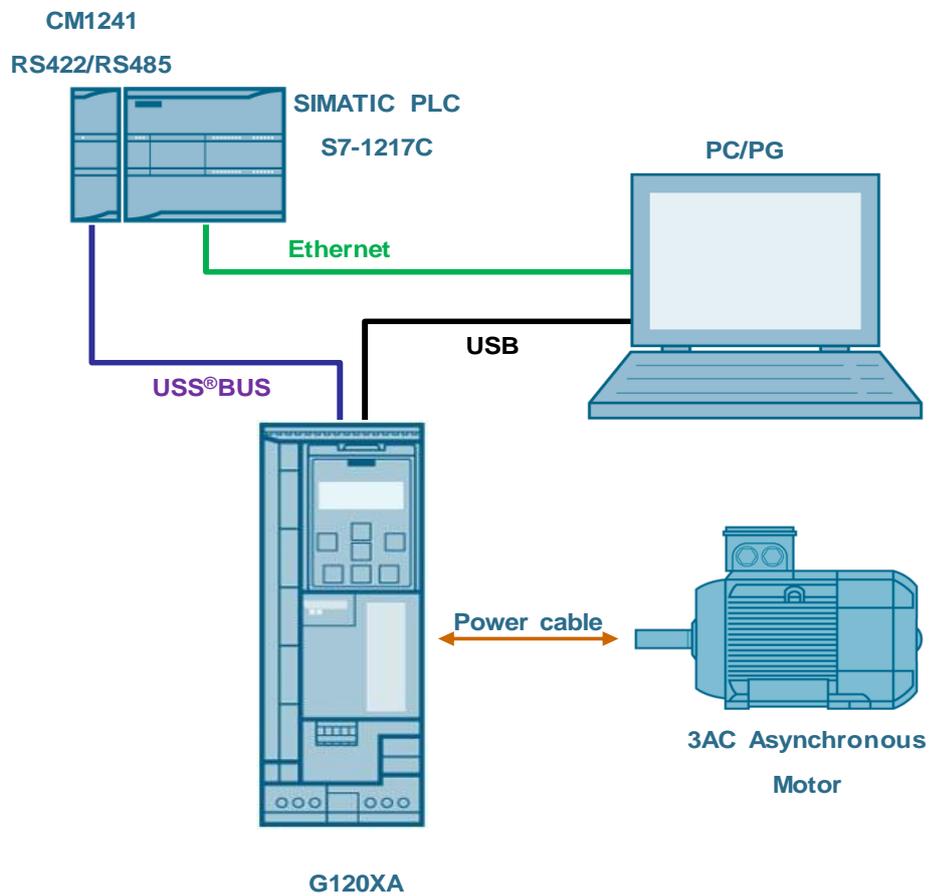
## Introduction

SINAMICS G120XA drives are able to exchange data via the RS485 interface and via USS with a SINAMICS S7-1200 controller.

## Overview of the automation task

The figure below provides an overview of the automation task.

Figure 1-1: Overview of the automation task



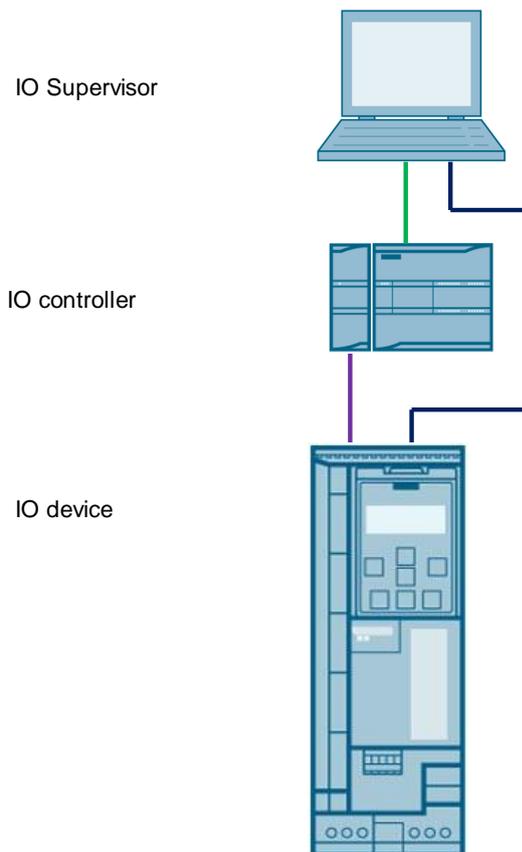
## 2 Solution

### 2.1 Solution overview

#### Schema Display

The following figure displays the most important components of the solution:

Figure 2-1: Overview of the most important components



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#### Delimitation

This application does not include a description of

- SINAMICS G120XA version
- BOP-2, IOP-2 and Smart Access Module operation of SINAMICS G120XA

Basic knowledge of these topics is assumed.

#### Required knowledge

Basic knowledge on TIA Portal is assumed.

## 2.2 Hardware and Software Components

### 2.2.1 Validity

This application example is valid for

- TIA Portal V15 SP1
- S7-1200 CPU V4.1
- SINAMICS G120XA V4.7.11

### 2.2.2 Used Components

The application was generated with the following components:

#### Hardware components

Table 2-1: Hardware components

Component	No.	Article number	Note
SIMATIC S7-1200 1217C DC/DC/DC	1	6ES7217-1AG40-0XB0	V4.1
CM1241 RS422/RS485	1	6ES7 241-1CH32-0XB0	V2.1
SINAMICS G120XA	1	6SL3220-1YD16-0CB0	V4.7.11
Smart Access Module	1	6SL3255-0AA00-5AA0	V01.02.06.01

#### Standard software components

Table 2-2: Standard software components

Component	No.	Article number	Note
TIA Portal	1	6AV2103-0AA05-0AA7	V15 SP1

#### Sample files and projects

The following list includes all files and projects that are used in this example.

Table 2-3: Sample files and projects

Component	Note
109770390_Sinamics_G120XA_with_S7-1200_via_USS.pdf	Project file
109770390_Sinamics_G120XA_with_S7-1200_via_USS.zip	Reference document

## 3 Basics

### 3.1 Basics of USS introduction

The USS protocol uses a master/slave network for communication via a serial bus. The master (SIMATIC controller) sends the message to the selected slave (SINAMICS G120XA). A slave cannot send without having received a request for sending. Direct information transmission between the slaves is not possible. USS communication takes place in half duplex operation.

#### Implementation with SIMATIC S7-1200

Use the following system instructions:

- USS\_PORT  
To process communication via the USS network
- USS\_DRV  
To prepare the send data and evaluate the response data

These system instructions can be found in the *Instructions* task card,

Figure 3-1: USS instructions for S7-1200

Communication		
Name	Description	Version
S7 communication		V1.3
GET	Read data from a remote CPU	V1.3
PUT	Write data to a remote CPU	V1.3
Open user communication		V4.1
TSEND_C	Establishing a connection and sending data	V3.0
TRCV_C	Establishing a connection and receiving data	V3.0
TMAIL_C	Send e-mail	V3.0
Others		
WEB Server		V1.1
WWW	Synchronizing user-defined web pages	V1.1
Others		
MODBUS TCP		V4.2
Communication processor		
PtP Communication		V2.4
USS communication		V3.1
MODBUS (RTU)		V3.1
Point-to-point		V1.0
USS		V1.1
USS_PORT	Edit communication via USS network	V1.1
USS_DRV	Swap data with drive	V1.1
USS_RPM	Readout parameters from the drive	V1.1
USS_WPM	Change parameters in the drive	V1.1
MODBUS		V2.2
GPRComm: CP1242-7		V1.3
TeleService		V1.9

## 3.2 USS system instructions

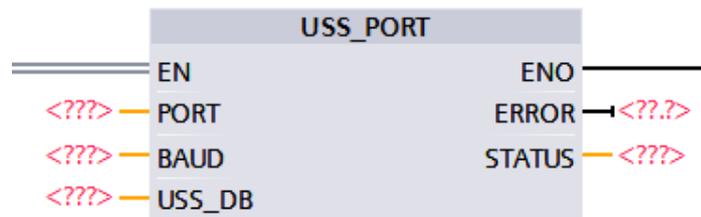
### USS\_PORT (S7-1200)

#### Description

The *USS\_PORT* instruction handles communication over the USS network. In the program, use one *USS\_PORT* instruction per PtP communications port to control the transmission.

All USS instructions that are assigned to the same USS network and same PtP communications port must use the same instance data block.

Figure 3-2: *USS\_PORT* system instruction



#### Parameters

The following table shows the parameters of the *USS\_PORT*

Table 3-1: Parameter list of *USS\_PORT*

Parameter	Declaration	Data type	Memory area	Description
PORT	Input	PORT	D,L or constant	PtP communication port identifier. Constant that can be referenced within the <i>Constants</i> tab of the default tag table.
BAUD	Input	DINT	I,Q,M,D,L or constant	Baud rate for USS communication. For example: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200
USS_DB	InOut	USS_BASE	D	Reference to the instance DB of the <i>USS_DRIVE</i> instruction.
ERROR	Output	BOOL	I,Q,M,D,L	ERROR is set to TRUE if an error occurs.
STATUS	Output	WORD	I,Q,M,D,L	Status value of the request. Additional information is available in the <i>USS_Extended_Error</i> tag for some status codes.

## USS\_DRV (S7-1200)

### Description

The *USS\_DRV* instruction exchanges data with the drive. A separate instruction must be used for each drive, but all USS instructions assigned to the same USS network and same PtP communications module must use the same instance data block. You must create the DB name when you call the first *USS\_DRV* instruction.

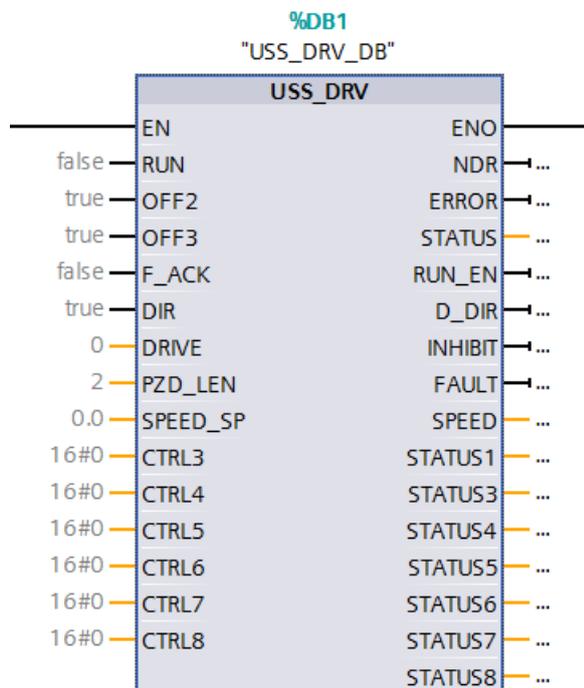
When the *USS\_DRV* instruction is executed the first time, the drive indicated by the USS address (parameter DRIVE) is initialized in the instance DB. After this initialization, subsequent *USS\_PORT* instructions can start communication with the drive at this drive number.

You can control the drive direction of rotation using either the DIR (BOOL) input or using the sign (positive or negative) at the SPEED\_SP (REAL) input. The following table explains how these inputs work together to determine the drive direction, assuming the motor is wired for forward rotation.

Table 3-2: Drive direction

SPEED_SP	DIR	Direction of rotation of drive
Value > 0	0	Reverse
Value > 0	1	Forward
Value < 0	0	Forward
Value < 0	1	Reverse

Figure 3-3: *USS\_DRV* system instruction



## Parameters

The following table shows the parameters of the *USS\_DRV* instruction:

Table 3-3: Parameter list of *USS\_DRV*

Parameter	Declaration	Data type	Memory area	Description
RUN	Input	BOOL	I,Q,M,D,L or constant	Drive start, On/OFF1
OFF2	Input	BOOL	I,Q,M,D,L or constant	Coast stop
OFF3	Input	BOOL	I,Q,M,D,L or constant	Fast stop
F_ACK	Input	BOOL	I,Q,M,D,L or constant	Fault acknowledge
DIR	Input	BOOL	I,Q,M,D,L or constant	Drive direction
DRIVE	Input	USINT	I,Q,M,D,L or constant	Drive address
PZD_LEN	Input	USINT	I,Q,M,D,L or constant	Word length
SPEED_SP	Input	REAL	I,Q,M,D,L or constant	Speed setpoint
ERROR	Output	BOOL	I,Q,M,D,L	Error occurred
STATUS	Output	WORD	I,Q,M,D,L	Status value of the request
RUN_EN	Output	BOOL	I,Q,M,D,L	Run enabled
D_DIR	Output	BOOL	I,Q,M,D,L	Drive direction
INHIBIT	Output	BOOL	I,Q,M,D,L	Drive inhibited
FAULT	Output	BOOL	I,Q,M,D,L	Drive fault
SPEED	Output	REAL	I,Q,M,D,L	Drive actual speed

### 3.3 Details of G120XA USS function

#### 3.3.1 Control word 1 (STW1)

Table 3-4: Control word 1 (STW1)

Bit	Significance	Explanation	Signal interconnection in the inverter
0	Reversed		
1	Reversed		
2	0 = Quick stop (OFF3)	Quick stop: The motor brakes with the OFF3 ramp-down time p1135 down to standstill.	p0848[0]=r2090.2
	1 = No quick stop (OFF3)	The motor can be switched on (ON command)	
3	0 = Inhibit operation	Immediately switch-off motor (cancel pulses).	p0852[0]=r2090.3
	1 = Enable operation	Switch-on motor (pulses can be enabled).	
4	0 = Disable RFG	The inverter immediately sets its ramp-function generator output to 0.	p1140[0]= r2090.4
	1 = Do not disable RFG	The ramp-function generator can be enabled.	
5	0 = Stop RFG	The output of the ramp-function generator stops at the actual value.	p1141[0]=r2090.3
	1 = Enable RFG	The output of the ramp-function generator follows the setpoint.	
6	0 = Inhibit setpoint	The inverter brakes the motor with the ramp-down time p1121 of the ramp-function generator	p1142[0]=r2090.6
	1 = Enable setpoint	Motor accelerates with the ramp-up time p1120 to the setpoint.	
7	Reserved		
8	Reserved		
9	Reserved		
10	0 = No control via PLC	Inverter ignores the process data from the fieldbus.	p0854[0]=r2090.10
	1 = Control via PLC	Control via fieldbus, inverter accepts the process data from the fieldbus.	
11	1 = Direction reversal	Invert setpoint in the inverter.	p1113[0]=r2090.11
12	Reserved		
13	1 = MOP up	Increase the setpoint saved in the motorized potentiometer.	p1035[0]=r2090.13
14	1 = MOP down	Reduce the setpoint saved in the motorized potentiometer	p1036[0]=r2090.14
15	Reserved		

### 3.3.2 Status word 1 (ZSW1)

Table 3-5: Status word 1 (ZSW1)

Bit	Significance	Remarks	Signal interconnection in the inverter
0	1 = Ready for switching on	Power supply switched on; electronics initialized; pulses locked.	p2080[0]=r0899.0
1	1 = Ready	Motor is switched on (ON/OFF = 1), no fault is active. With the command "Enable operation" (STW1.3), the inverter switches on the motor.	p2080[1]=r0899.1
2	1 = Operation enabled	Motor follows setpoint. See control word 1, bit 3.	p2080[2]=r0899.2
3	1 = Fault active	The inverter has a fault. Acknowledge fault using STW1.7.	p2080[3]=r2139.3
4	1 = OFF2 inactive	Coast down to standstill is not active.	p2080[4]=r0899.4
5	1 = OFF3 inactive	Quick stop is not active.	p2080[5]=r0899.5
6	1 = Switching on inhibited active	It is only possible to switch on the motor after an OFF1 followed by ON.	p2080[6]=r0899.6
7	1 = Alarm active	Motor remains switched on; no acknowledgement is necessary.	p2080[7]=r2139.7
8	1 = Speed deviation within the tolerance range	Setpoint / actual value deviation within the tolerance range.	p2080[8]=r2197.7
9	1 = Master control requested	The automation system is requested to accept the inverter control.	p2080[9]=r0899.0
10	1 = Comparison speed reached or exceeded	Speed is greater than or equal to the corresponding maximum speed.	p2080[0]=r2199.1
11	1 = Torque limit not reached	Comparison value for current or torque has been fallen below.	p2080[11]=r0056.13 /r1407.7
12	Reserved		p2080[12]=r0899.12
13	0 = Alarm, motor over temperature	--	p2080[13]=r2135.14
14	1 = Motor rotates clockwise	Internal inverter actual value > 0	p2080[14]=r2197.3
	0 = Motor rotates counterclockwise	Internal inverter actual value < 0	
15	0 = Alarm, inverter thermal overload		p2080[15]=r2135.15

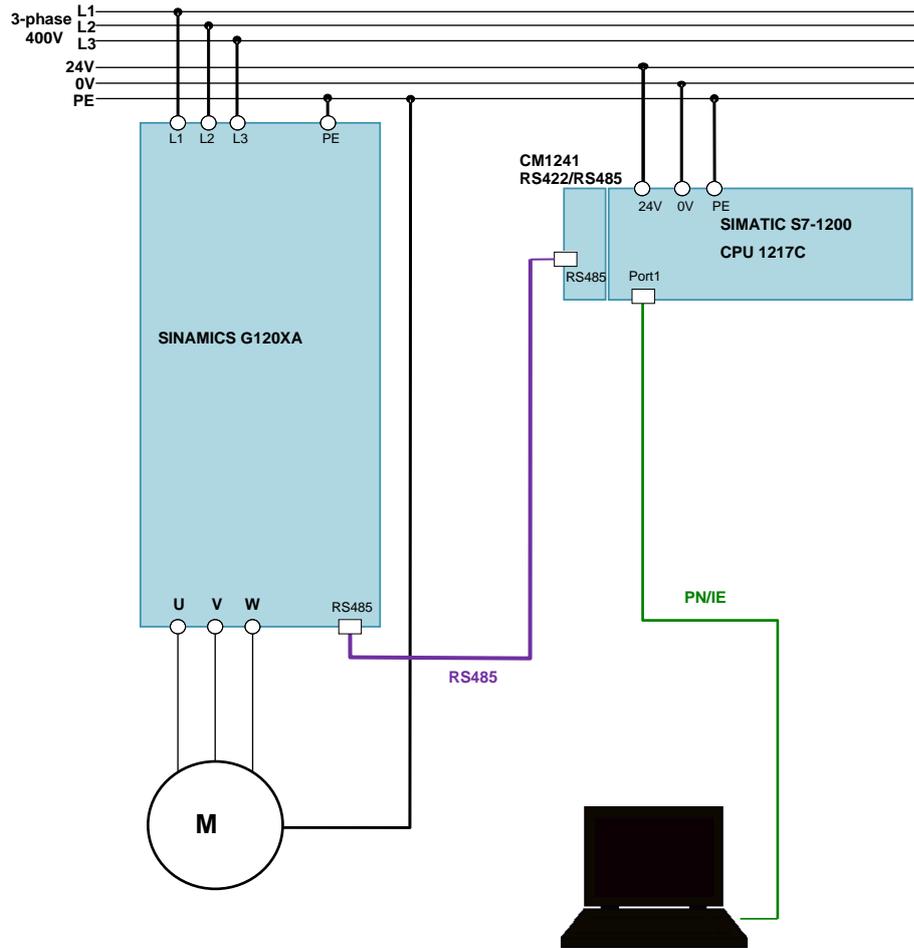
### 3.4 Installation

#### 3.4.1 Hardware configuration

The figure below shows the hardware configuration of the application:

<b>CAUTION</b>	<b>Wrong wiring can damage the drive!</b> In this application, the three phase 400V power supply is used. It is must for you to check the supply voltage; otherwise, the drive can be damaged!
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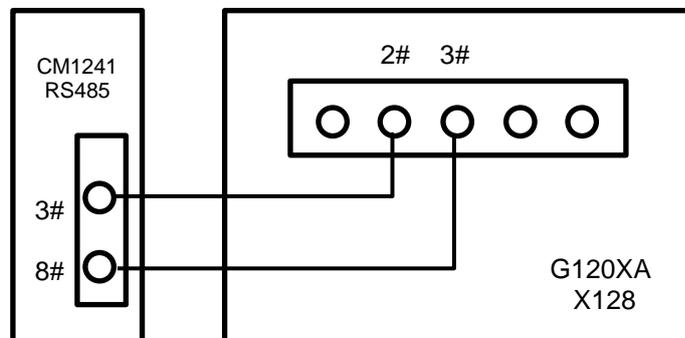
Figure 3-4:



### 3.4.2 USS configuration

The figure below is the wiring configuration for the USS communication.

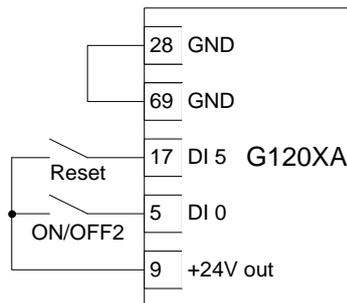
Figure 3-5:



### 3.4.3 I/O configuration

The figure below is the I/O wiring for the USS communication macro.

Figure 3-6



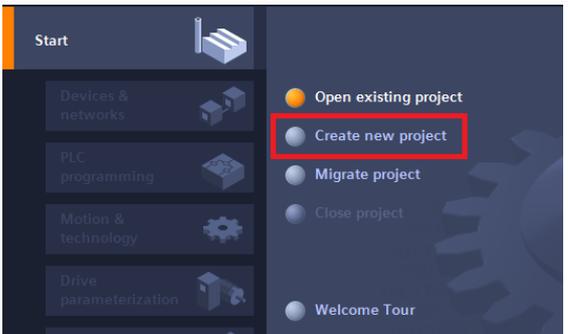
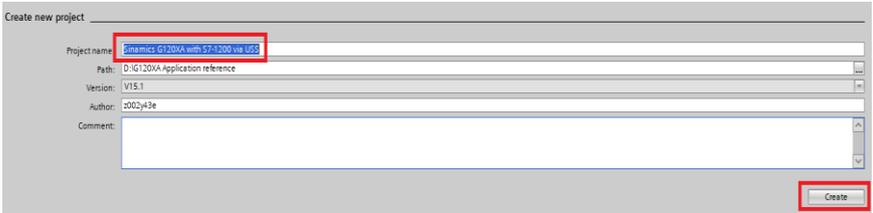
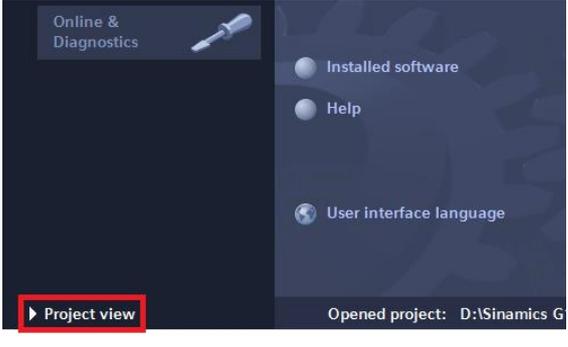
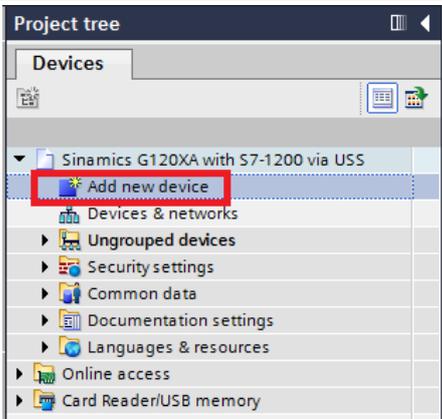
**NOTE** Due to the default USS communication macro control, the ON/OFF2 and Reset command is from digital input, not from the USS communication. And other control command and setpoint is from the USS communication.

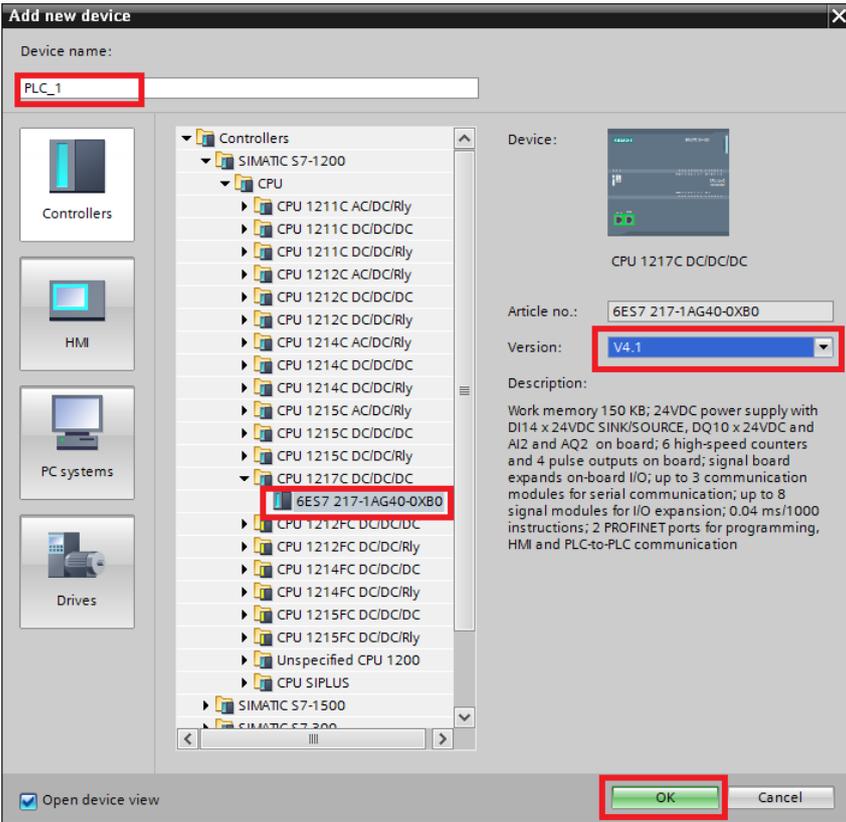
# 4 Configuration

## 4.1 Configure PLC project

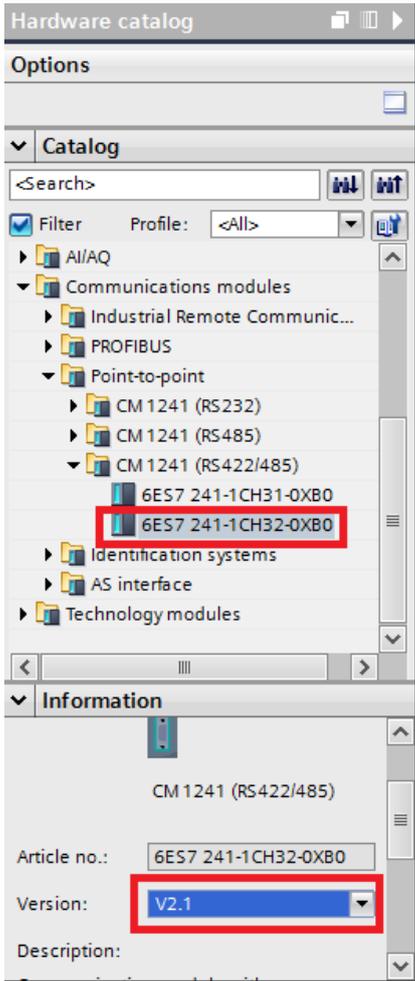
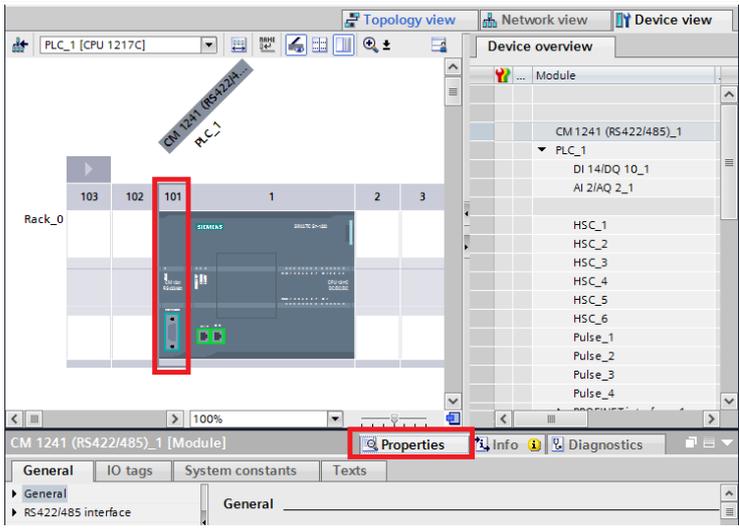
Create the PLC project and configure the PLC as table 4-1.

Table 4-1: Creation of new project and configuration of the PLC

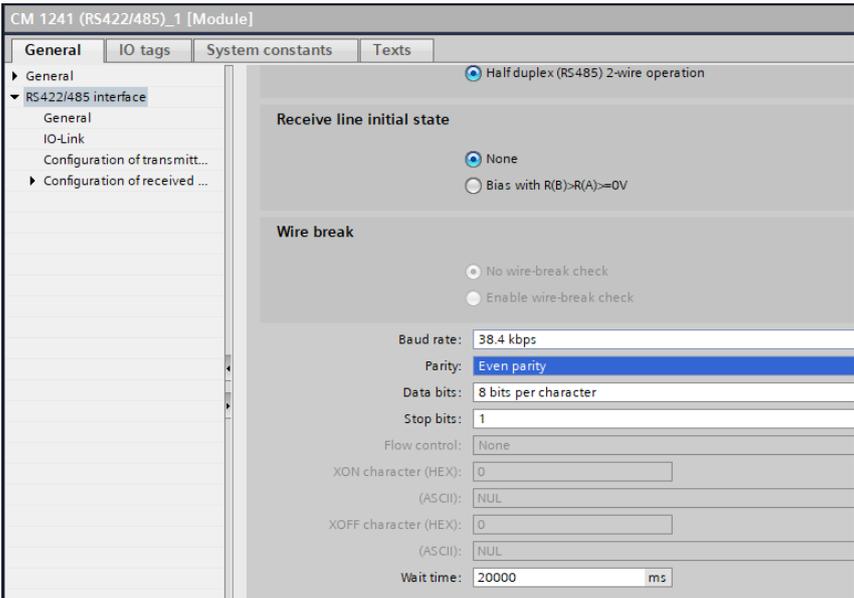
No.	Picture	Remarks
1.		<p>Open TIA Portal V15 SP1 in your PC and then click "Create new project".</p>
2.		<p>Input the project name and then press "Create" to create project.</p>
3.		<p>Press the "Project view" to open the project.</p>
4.		<p>Double click "Add new device" to add the target CPU to this project.</p>

No.	Picture	Remarks
5.	 <p>The screenshot shows the 'Add new device' dialog box. The 'Device name' field contains 'PLC_1'. The device tree on the left shows the following structure:</p> <ul style="list-style-type: none"> <li>Controllers             <ul style="list-style-type: none"> <li>SIMATIC S7-1200                     <ul style="list-style-type: none"> <li>CPU                             <ul style="list-style-type: none"> <li>CPU 1211C AC/DC/Rly</li> <li>CPU 1211C DC/DC/DC</li> <li>CPU 1212C AC/DC/Rly</li> <li>CPU 1212C DC/DC/DC</li> <li>CPU 1214C AC/DC/Rly</li> <li>CPU 1214C DC/DC/DC</li> <li>CPU 1215C AC/DC/Rly</li> <li>CPU 1215C DC/DC/DC</li> <li>CPU 1217C DC/DC/DC (Selected)</li> <li>CPU 1212FC DC/DC/DC</li> <li>CPU 1212FC DC/DC/Rly</li> <li>CPU 1214FC DC/DC/DC</li> <li>CPU 1214FC DC/DC/Rly</li> <li>CPU 1215FC DC/DC/DC</li> <li>CPU 1215FC DC/DC/Rly</li> <li>Unspecified CPU 1200</li> <li>CPU SIPLUS</li> </ul> </li> </ul> </li> </ul> </li> </ul> <p>The 'Device' section on the right shows 'CPU 1217C DC/DC/DC' with 'Article no.: 6ES7 217-1AG40-0XB0' and 'Version: V4.1'. The 'Description' field contains: 'Work memory 150 KB; 24VDC power supply with DI14 x 24VDC SINK/SOURCE, DQ10 x 24VDC and AI2 and AQ2 on board; 6 high-speed counters and 4 pulse outputs on board; signal board expands on-board I/O; up to 3 communication modules for serial communication; up to 8 signal modules for I/O expansion; 0.04 ms/1000 instructions; 2 PROFINET ports for programming, HMI and PLC-to-PLC communication'. The 'OK' button is highlighted.</p>	<ol style="list-style-type: none"> <li>1. Find the target CPU.</li> <li>2. Modify the device name.</li> <li>3. Select the correct version.</li> <li>4. Press "OK" to add this CPU to the project.</li> </ol>

## 4 Configuration

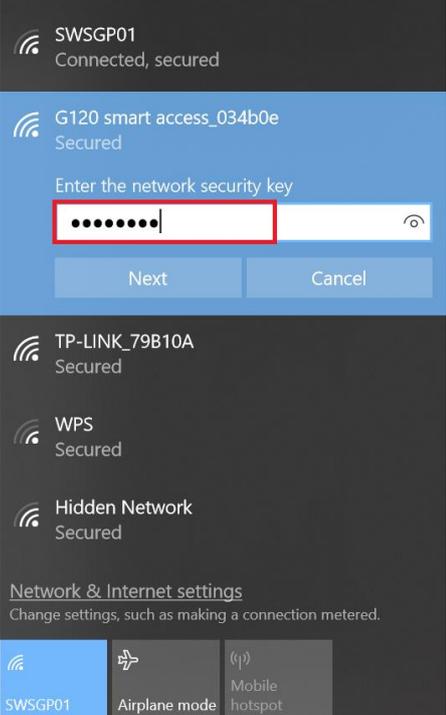
No.	Picture	Remarks
6.		<ol style="list-style-type: none"> <li>1. In the hardware catalog, find the target communication module.</li> <li>2. Select the correct version.</li> <li>3. Then double click to add this module to the project.</li> </ol>
7.		<p>Click the communication module and then select the "Properties".</p>

## 4 Configuration

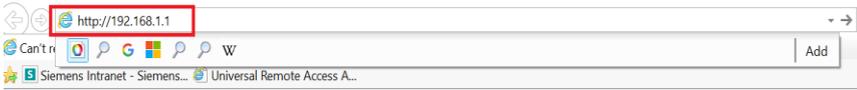
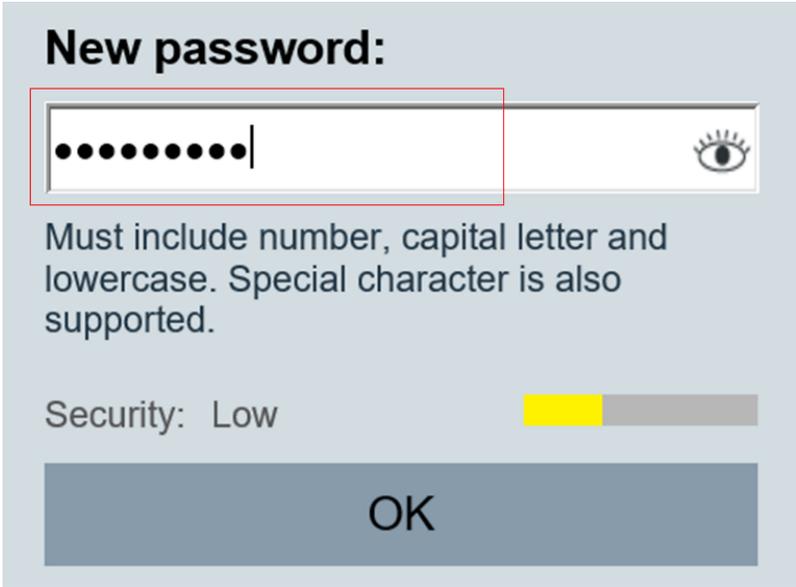
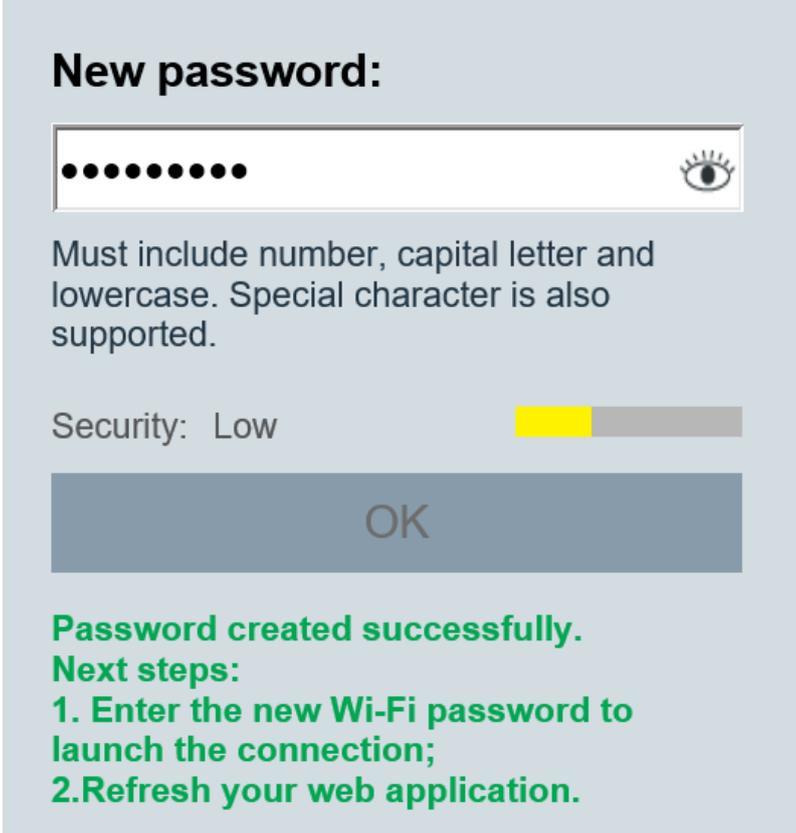
No.	Picture	Remarks
8.		<p>Set the communication properties and make it the same as the PLC logic in the following.</p>

## 4.2 G120XA configuration

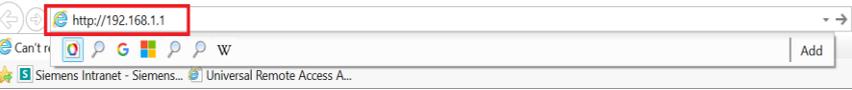
Table 4-2 Quick Commissioning via Smart Access Module

No.	Description	Remarks
1.		<p>Select the G120 smart access module and then click “Connect” to connect the wifi.</p> <p><i>Note: If the default password is already changed, then skip to step 6.</i></p>
2.		<p>Input the original password “12345678” and then click the “Next” button.</p>

## 4 Configuration

No.	Description	Remarks
3.	 <p>Open the browser and input the address <a href="http://192.168.1.1">http://192.168.1.1</a> or <a href="https://192.168.1.1">https://192.168.1.1</a> to visit the website.</p>	
4.	 <p>Input the new password and then press “OK”.</p>	
5.	 <p>After the password changed successfully, press “OK”.</p>	

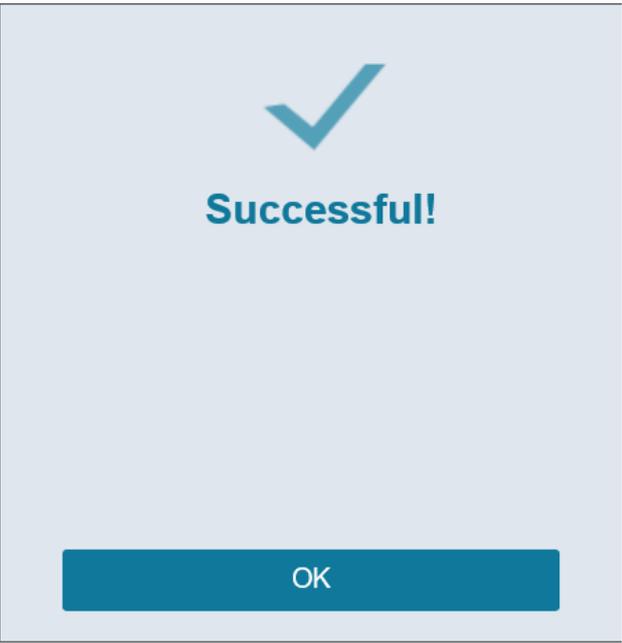
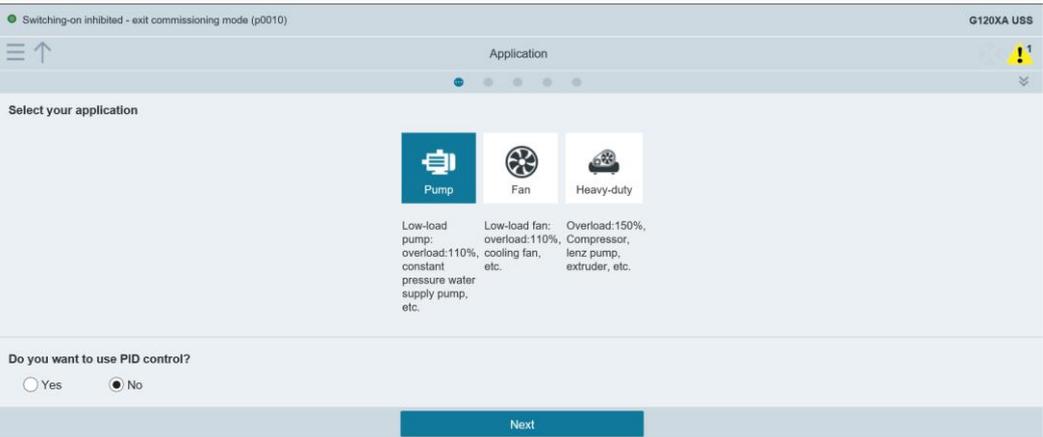
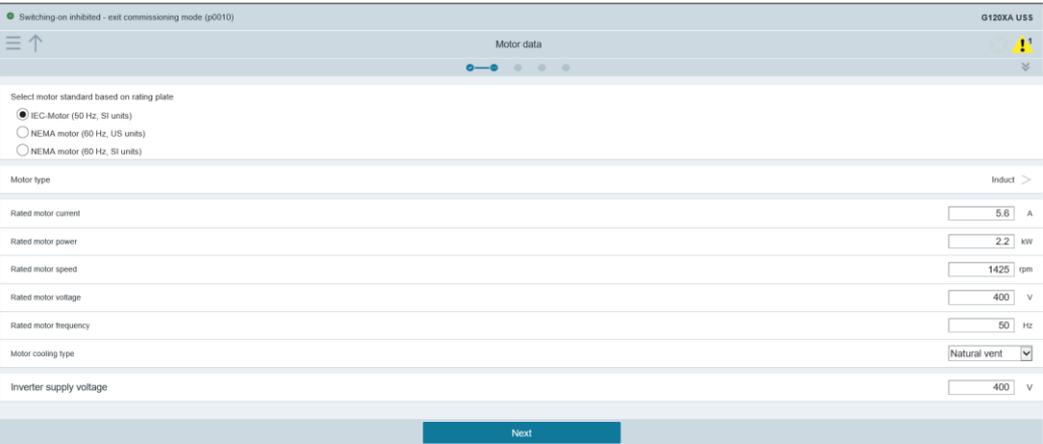
## 4 Configuration

No.	Description	Remarks
6.		<p>Select the G120 smart access module and then click "Connect" to connect the wifi.</p>
7.		<p>Input the new password created before and then press "Next".</p>
8.		<p>Open the browser and input the address <a href="http://192.168.1.1">http://192.168.1.1</a> or <a href="https://192.168.1.1">https://192.168.1.1</a> to visit the website.</p>

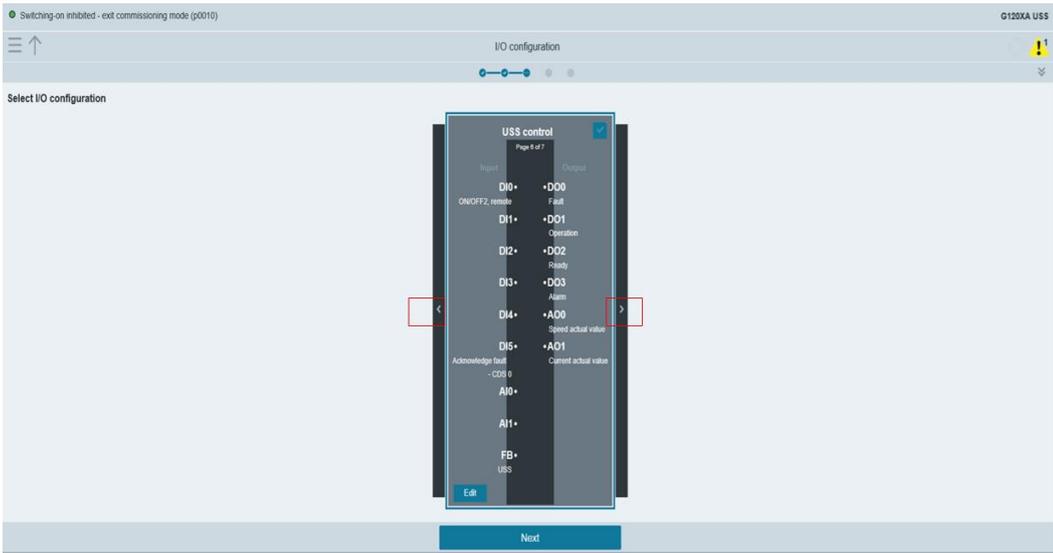
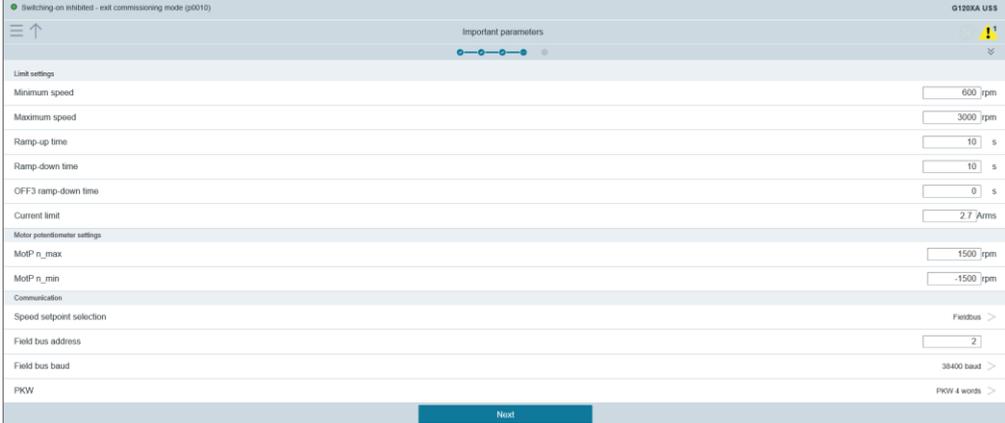
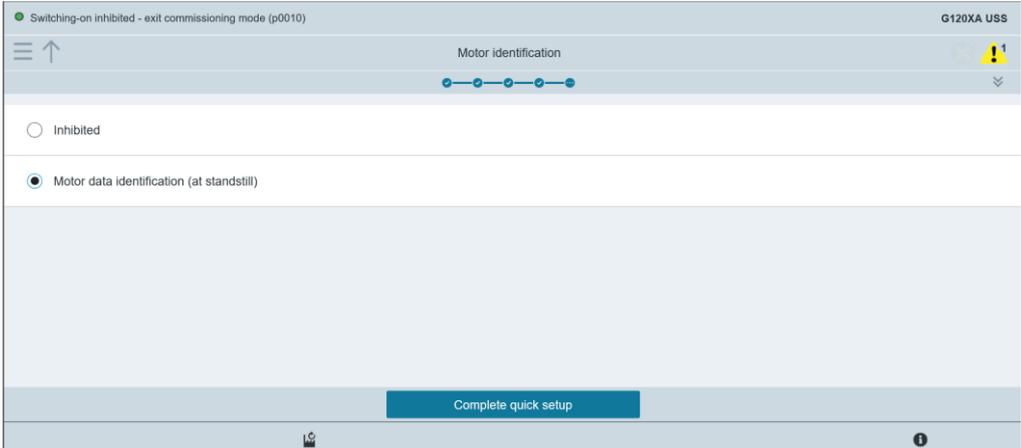
## 4 Configuration

No.	Description	Remarks
9.		<p>Press the “Quick Setup” to start the quick commissioning.</p>
10.		<p>Click the “New configuration”. This step will do the factory reset first.</p>
11.		<p>Waiting for the factory setting.</p>

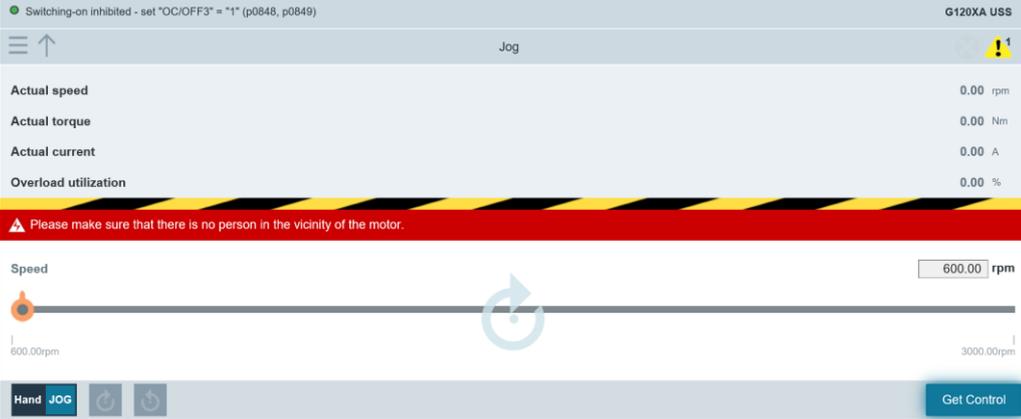
## 4 Configuration

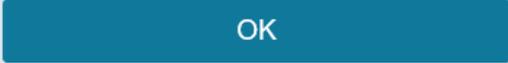
No.	Description	Remarks
12.	 <p>A screenshot of a confirmation screen. At the top center is a large blue checkmark. Below it, the word "Successful!" is written in a bold, blue, sans-serif font. At the bottom center, there is a wide, dark blue rectangular button with the word "OK" in white, centered text.</p>	<p>When factory setting finished, press "OK".</p>
13.	 <p>A screenshot of the "Application" selection screen in the USS interface. The title bar shows "Switching-on inhibited - exit commissioning mode (p0010)" and "G120XA USS". The main area is titled "Select your application" and features three selectable options: "Pump", "Fan", and "Heavy-duty". Each option has an icon and a list of typical applications. Below these options, there is a question "Do you want to use PID control?" with radio buttons for "Yes" and "No", where "No" is selected. A "Next" button is at the bottom.</p>	<ol style="list-style-type: none"> <li>1. Select the "Pump" application and do not use the PID control.</li> <li>2. Then press "Next".</li> </ol>
14.	 <p>A screenshot of the "Motor data" configuration screen. It shows various motor parameters with input fields and dropdown menus. The parameters include: Motor standard (IEC-Motor selected), Motor type (Induct), Rated motor current (5.8 A), Rated motor power (2.2 kW), Rated motor speed (1425 rpm), Rated motor voltage (400 V), Rated motor frequency (50 Hz), Motor cooling type (Natural vent), and Inverter supply voltage (400 V). A "Next" button is at the bottom.</p>	<p>Input the motor data and then press "Next".</p>

## 4 Configuration

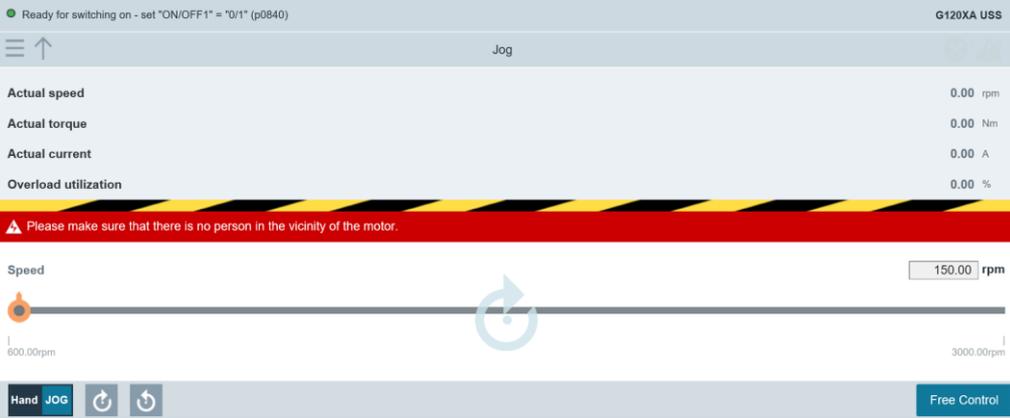
No.	Description	Remarks
15.		<ol style="list-style-type: none"> <li>1. Click the left arrow or the right arrow to find the target I/O configuration to “USS control”.</li> <li>2. Then Press “Next”.</li> </ol>
16.		<ol style="list-style-type: none"> <li>1. Input the important parameters, especially for the communication parameters.</li> <li>2. Then press “Next”.</li> </ol>
17.		<p>Select the “Motor data identification” for the motor identification and press “Complete quick setup”.</p> <p><i>Note:</i> The default control mode is vector control. Need motor ID identification.</p>

## 4 Configuration

No.	Description	Remarks
18.	<p><b>Quick setup successfully finished!</b></p> <p> <input checked="" type="radio"/> Save quick setup settings to permanent memory  <input type="radio"/> Do not save quick setup settings to permanent memory         </p> <p>Go to Jog to do Motor Test</p> <p>Back to main menu</p>	<p>Select the "Save quick setup settings to permanent memory" and then click "Go to Jog to do Motor Test".</p>
19.	 <p>Switching-on inhibited - set "OC/OFF3" = "1" (p0848, p0849) <span style="float: right;">G120XA USS</span></p> <p style="text-align: center;">Jog <span style="float: right;">⚠ 1</span></p> <p>Actual speed 0.00 rpm</p> <p>Actual torque 0.00 Nm</p> <p>Actual current 0.00 A</p> <p>Overload utilization 0.00 %</p> <p style="background-color: red; color: white; padding: 2px;">⚠ Please make sure that there is no person in the vicinity of the motor.</p> <p>Speed 600.00 rpm</p> <p>600.00rpm   3000.00rpm</p> <p>Hand JOG [Stop] [Start] <span style="float: right;">Get Control</span></p>	<p>Press "Get Control"</p>

No.	Description	Remarks
20.	<p><b>Attention</b></p> <p>You can use this function only when strictly observing the safety instructions for operating inverters.</p> <p>Failure to observe may cause risks of personal injury or device damage.</p> <p>Before switching on the motor, make sure that there is no person in the vicinity of the motor.</p> <p style="text-align: center;">    </p>	
21.	<p> Please make sure that there is no person in the vicinity of the motor.</p> <p><b>Speed</b></p> <p></p> <p>600.00rpm</p> <p>     </p>	<p>Press "OK".</p> <p>Press the CW command or CCW command until the motor ID identification finished.</p>

## 4 Configuration

No.	Description	Remarks
22.	 <p>Press the "Free Control".</p>	G120XA USS
23.	<p><b>Attention</b></p> <p>Returning the control to the normal setpoint and command sources may lead to dangerous situations, if the safety instructions are not strictly observed.</p> <p>To avoid unintentional motor start, make sure that before terminating the control function, no ON-commands are active from other command sources.</p> <p>OK</p> <p>Cancel</p> <p>Press "OK".</p>	

### 4.3 Program PLC logic

In this application example, the SINAMICS G120XA drive is controlled by S7-1217 CPU via USS communication. To achieve this control, the following instructions have been added to the program:

- USS\_DRV(FB1071)
- USS\_PORT(FC1070)

This FB and FC are called in the "USS\_Communication"(FB1) function block. The figure 4-1 shows the program structure.

Figure 4-1 Program structure

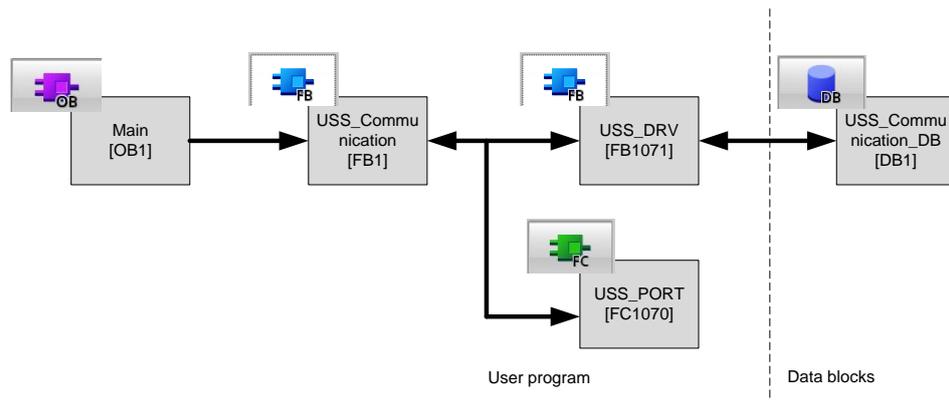
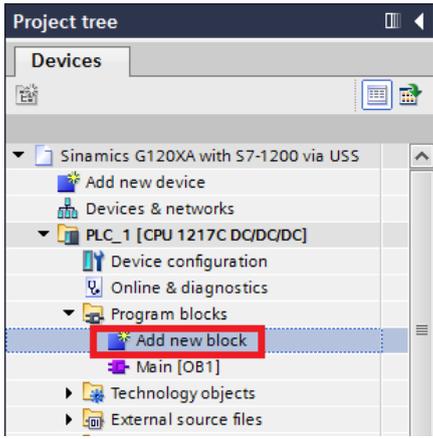
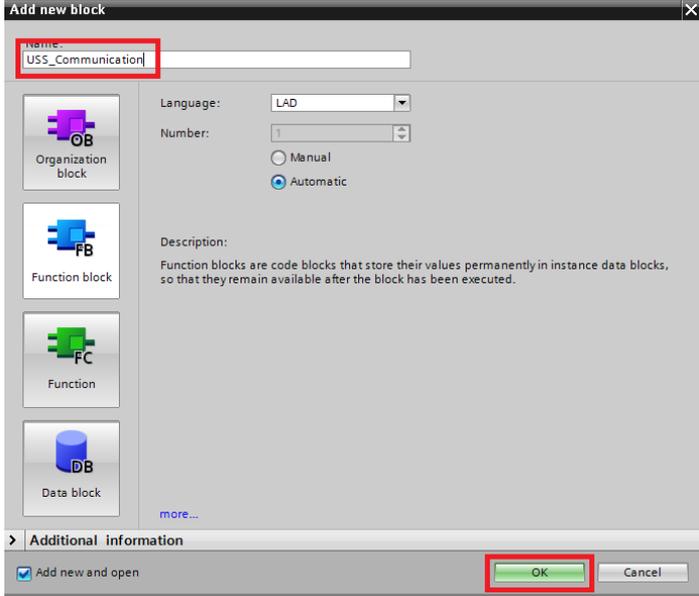
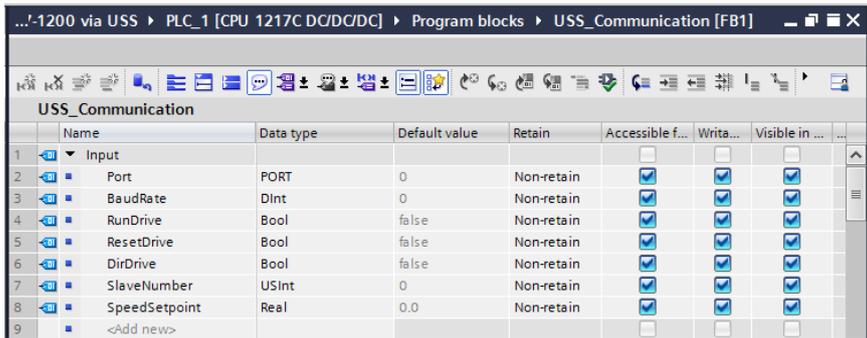
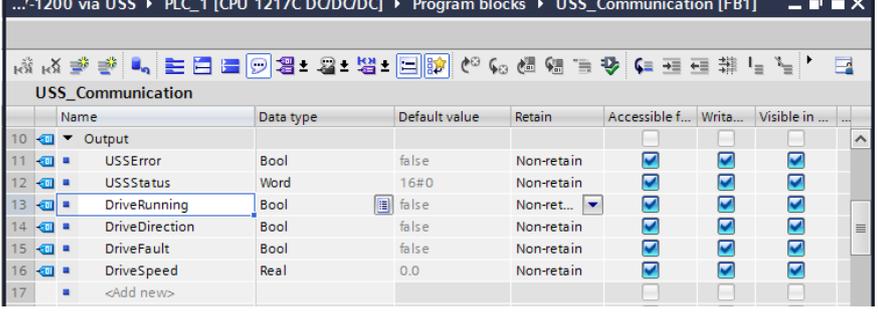
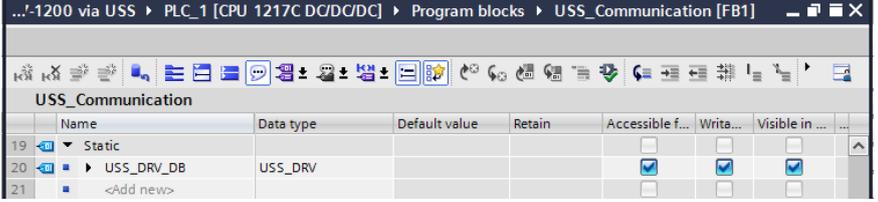
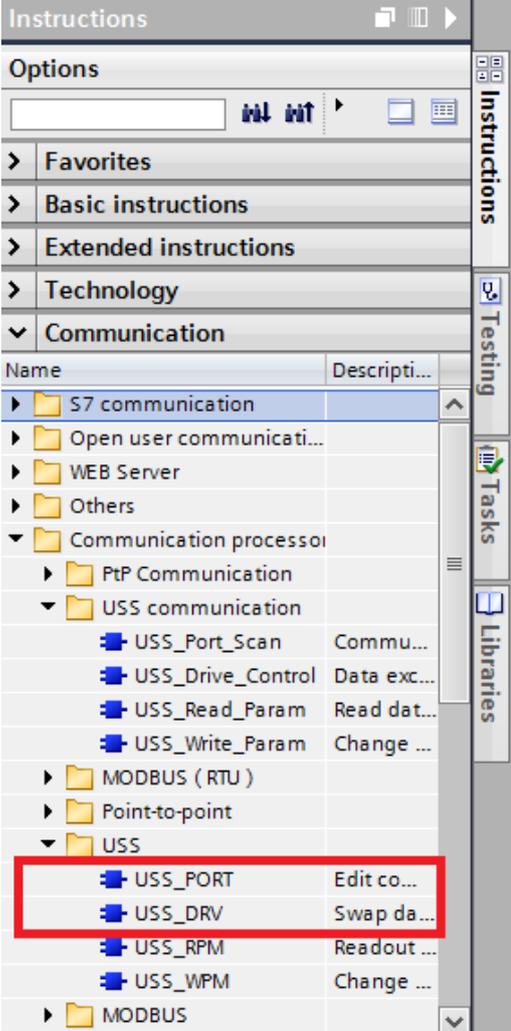


Table 4-3 is the details about the PLC logic programming.

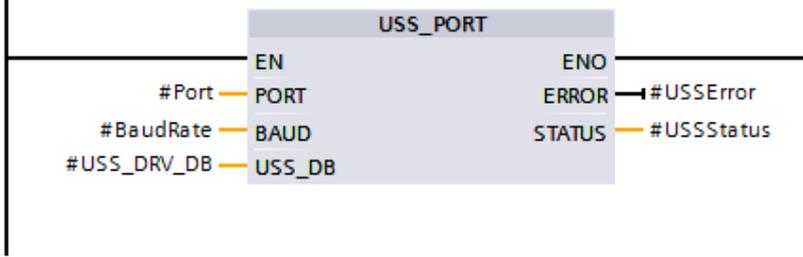
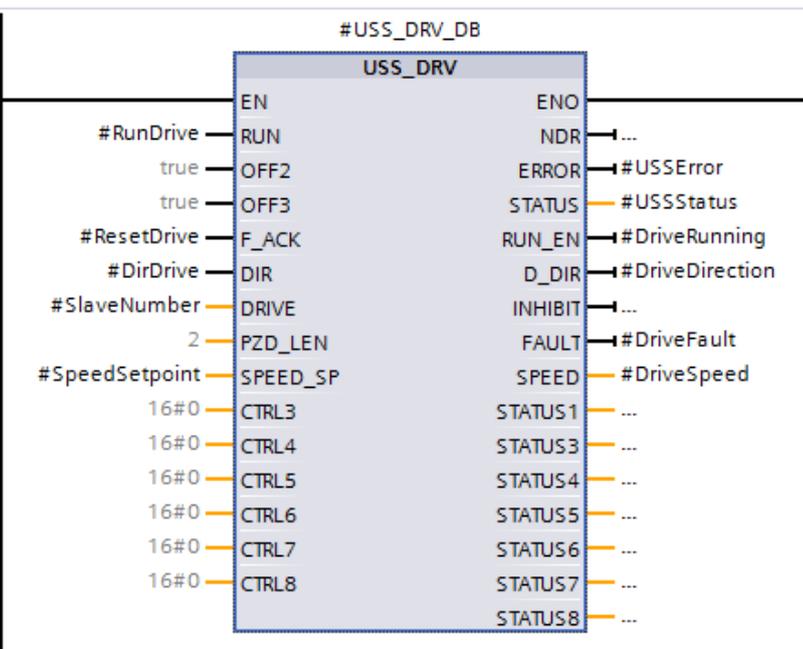
Table 4-3 PLC Program

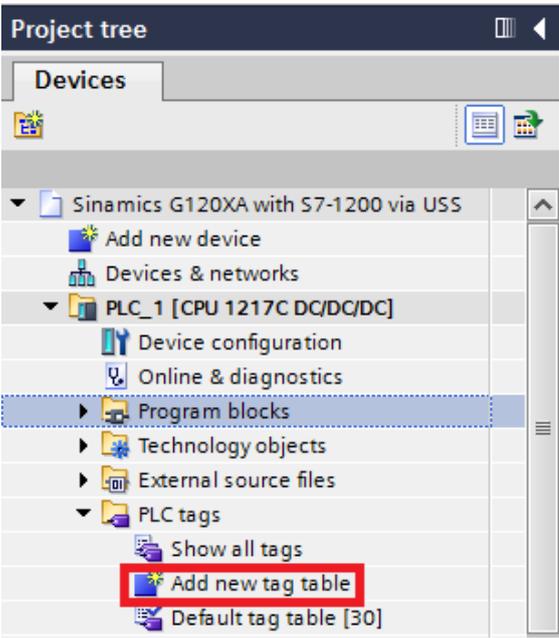
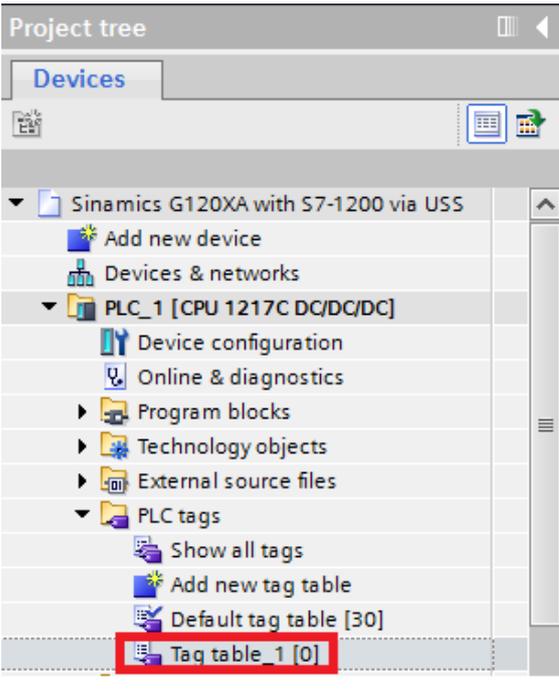
## 4 Configuration

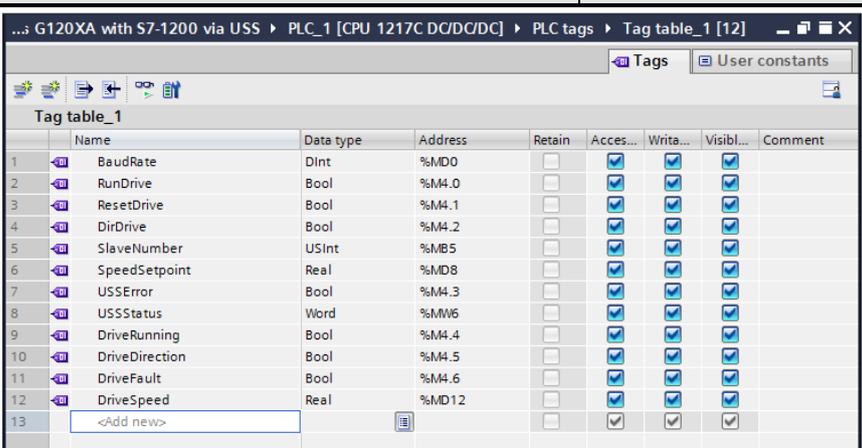
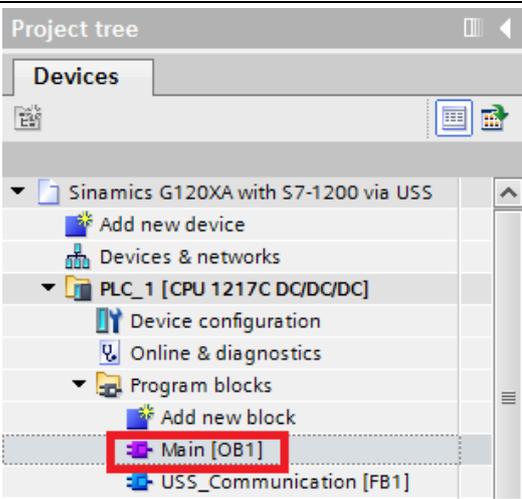
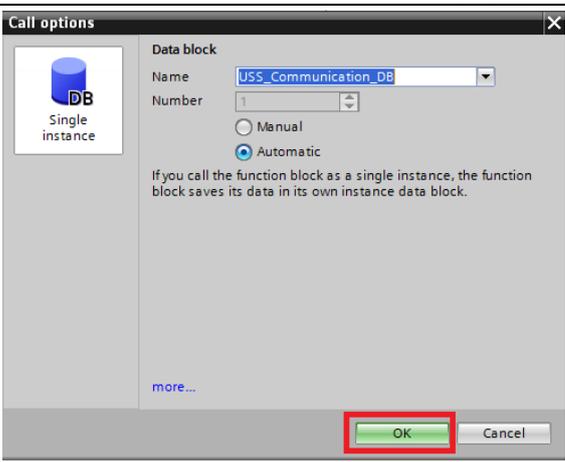
No.	Picture	Remarks																																																																																
1.		<p>Double click the "Add new block" to add one new FB.</p>																																																																																
2.		<p>Input the function block name and then press "OK" to create it.</p>																																																																																
3.	 <table border="1" data-bbox="467 1464 1334 1688"> <thead> <tr> <th></th> <th>Name</th> <th>Data type</th> <th>Default value</th> <th>Retain</th> <th>Accessible f...</th> <th>Writa...</th> <th>Visible in ...</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Input</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Port</td> <td>PORT</td> <td>0</td> <td>Non-retain</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>3</td> <td>BaudRate</td> <td>Dint</td> <td>0</td> <td>Non-retain</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>4</td> <td>RunDrive</td> <td>Bool</td> <td>false</td> <td>Non-retain</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>5</td> <td>ResetDrive</td> <td>Bool</td> <td>false</td> <td>Non-retain</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>6</td> <td>DirDrive</td> <td>Bool</td> <td>false</td> <td>Non-retain</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>7</td> <td>SlaveNumber</td> <td>USInt</td> <td>0</td> <td>Non-retain</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>8</td> <td>SpeedSetpoint</td> <td>Real</td> <td>0.0</td> <td>Non-retain</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>9</td> <td>&lt;Add new&gt;</td> <td></td> <td></td> <td></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		Name	Data type	Default value	Retain	Accessible f...	Writa...	Visible in ...	1	Input							2	Port	PORT	0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3	BaudRate	Dint	0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4	RunDrive	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5	ResetDrive	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6	DirDrive	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7	SlaveNumber	USInt	0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8	SpeedSetpoint	Real	0.0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	9	<Add new>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>Edit the input variables of this function block.</p>
	Name	Data type	Default value	Retain	Accessible f...	Writa...	Visible in ...																																																																											
1	Input																																																																																	
2	Port	PORT	0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																																																											
3	BaudRate	Dint	0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																																																											
4	RunDrive	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																																																											
5	ResetDrive	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																																																											
6	DirDrive	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																																																											
7	SlaveNumber	USInt	0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																																																											
8	SpeedSetpoint	Real	0.0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																																																											
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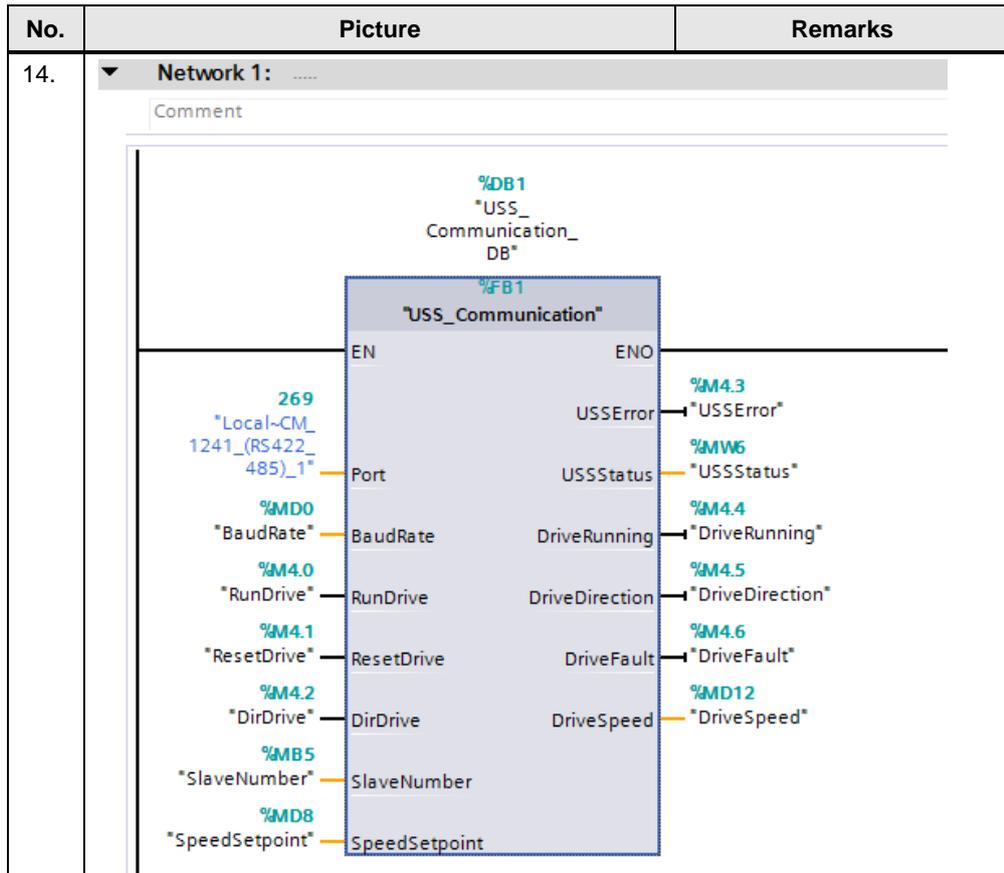
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4.	 <table border="1" data-bbox="470 380 1348 593"> <thead> <tr> <th>Name</th> <th>Data type</th> <th>Default value</th> <th>Retain</th> <th>Accessible f...</th> <th>Writa...</th> <th>Visible in ...</th> </tr> </thead> <tbody> <tr> <td>USSError</td> <td>Bool</td> <td>false</td> <td>Non-retain</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>USSStatus</td> <td>Word</td> <td>16#0</td> <td>Non-retain</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>DriveRunning</td> <td>Bool</td> <td>false</td> <td>Non-ret...</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>DriveDirection</td> <td>Bool</td> <td>false</td> <td>Non-retain</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>DriveFault</td> <td>Bool</td> <td>false</td> <td>Non-retain</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>DriveSpeed</td> <td>Real</td> <td>0.0</td> <td>Non-retain</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </tbody> </table>	Name	Data type	Default value	Retain	Accessible f...	Writa...	Visible in ...	USSError	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	USSStatus	Word	16#0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DriveRunning	Bool	false	Non-ret...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DriveDirection	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DriveFault	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DriveSpeed	Real	0.0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Edit the output variables of this function block.</p>
Name	Data type	Default value	Retain	Accessible f...	Writa...	Visible in ...																																													
USSError	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																													
USSStatus	Word	16#0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																													
DriveRunning	Bool	false	Non-ret...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																													
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DriveFault	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																													
DriveSpeed	Real	0.0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																													
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Name	Data type	Default value	Retain	Accessible f...	Writa...	Visible in ...																																													
USS_DRV_DB	USS_DRV			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																																													
6.		<p>Insert the "USS_PORT" and "USS_DRV" into the function block.</p>																																																	

## 4 Configuration

No.	Picture	Remarks
7.	<div data-bbox="470 264 1321 649"> <p>Network 1: USS_PORT Control</p> <p>Comment</p>  </div>	<p>Edit the instruction "USS_PORT" as it.</p>
8.	<div data-bbox="470 694 1321 1444"> <p>Network 2: USS_DRV Control</p> <p>Comment</p>  </div>	<p>Edit the "USS_DRV" as it.</p>

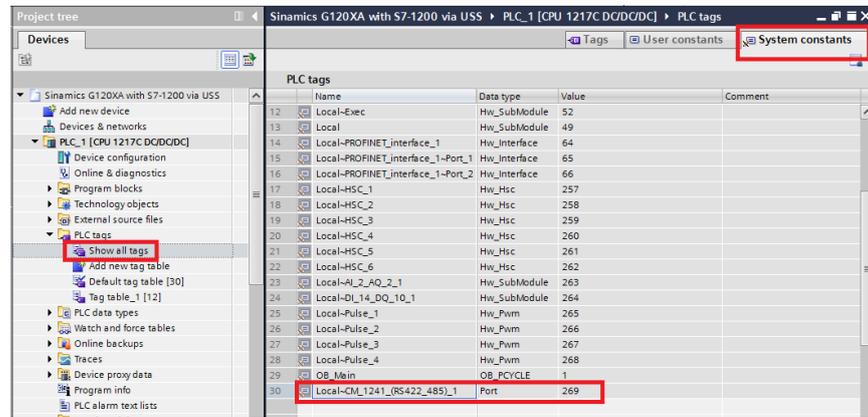
No.	Picture	Remarks
9.	 <p>The screenshot shows the 'Project tree' window. Under the 'PLC_1 [CPU 1217C DC/DC/DC]' folder, the 'PLC tags' sub-folder is expanded. The 'Add new tag table' option is highlighted with a red rectangle.</p>	<p>Double click the "Add new tag table" to add a new PLC tag table.</p>
10.	 <p>The screenshot shows the 'Project tree' window after a new tag table has been created. Under the 'PLC tags' sub-folder, the newly created 'Tag table_1 [0]' is highlighted with a red rectangle.</p>	<p>Double click the created PLC tag table to open it.</p>

No.	Picture	Remarks
11.		<p>Create the tags as it.</p>
12.		<p>Double click "OB1" to open it.</p>
13.		<p>Call the function block "USS_Communication" and press "OK" to create the data block automatically.</p>



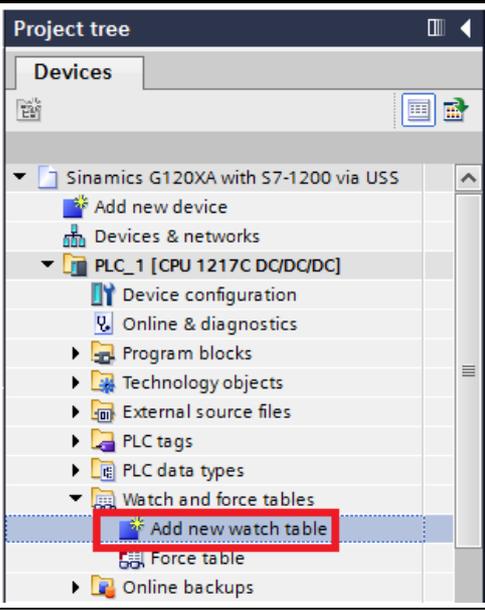
Create the logic as it.

**Note:**



Click "Show all tags", select "System constants", and then find the port number of the communication module.

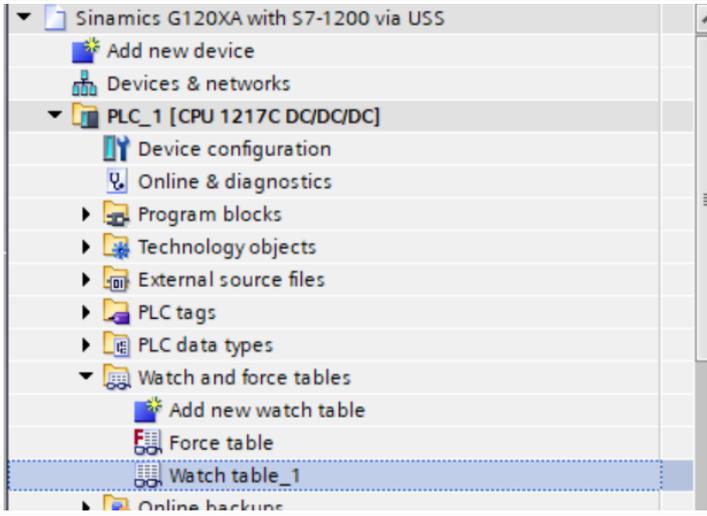
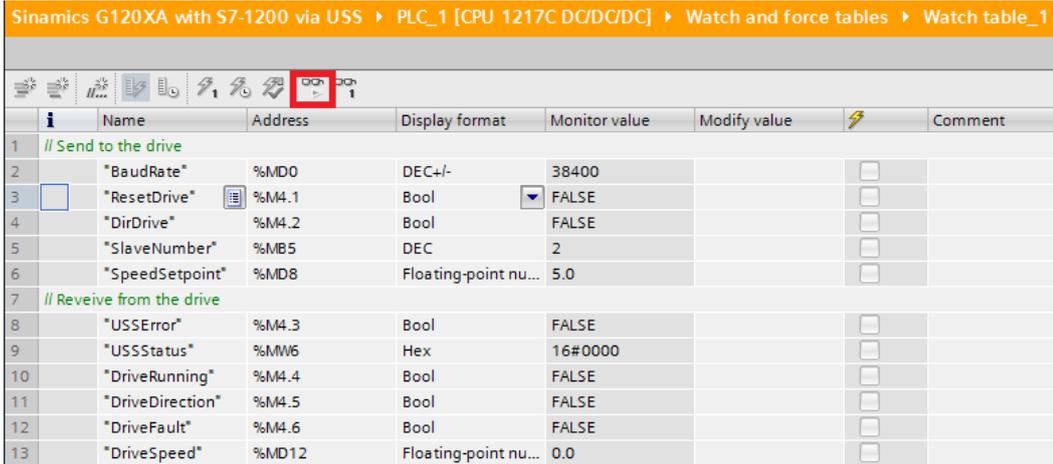
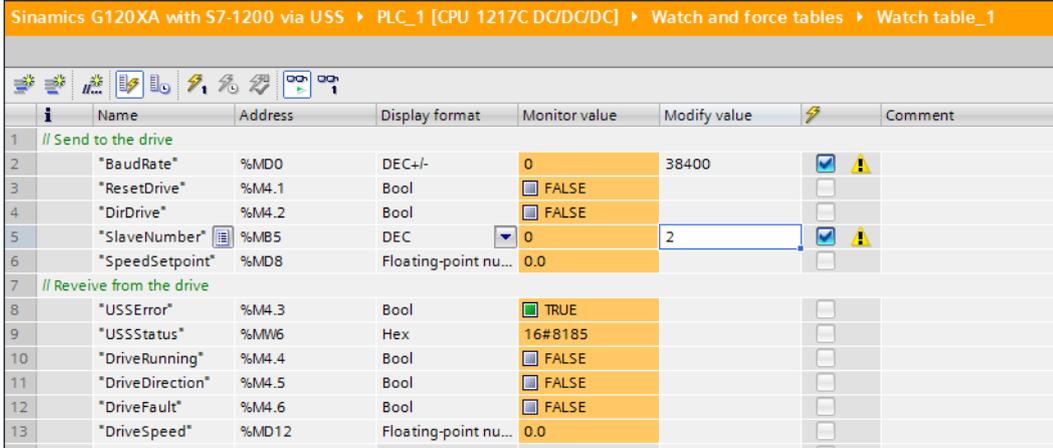
## 4 Configuration

No.	Picture	Remarks																																																																																																		
15.		<p>Double click "Add new watch table" to add a new watch table.</p>																																																																																																		
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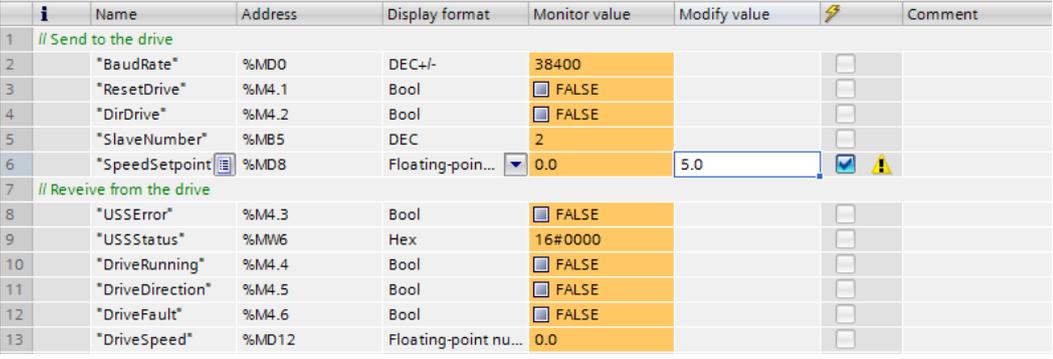
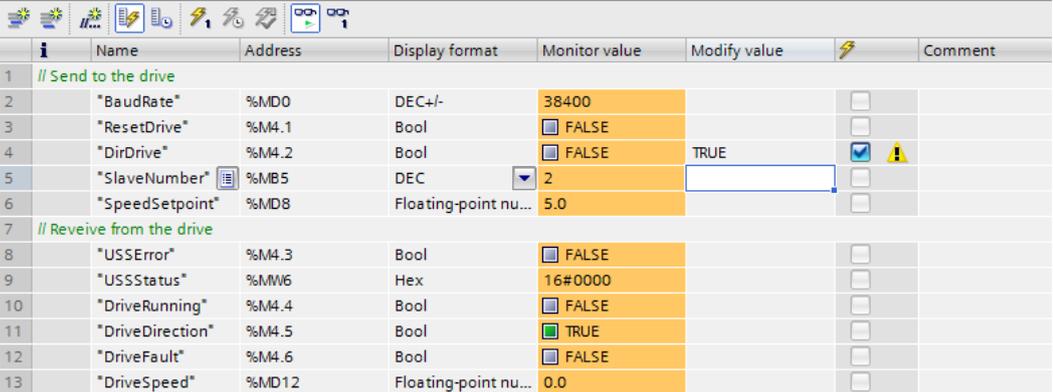
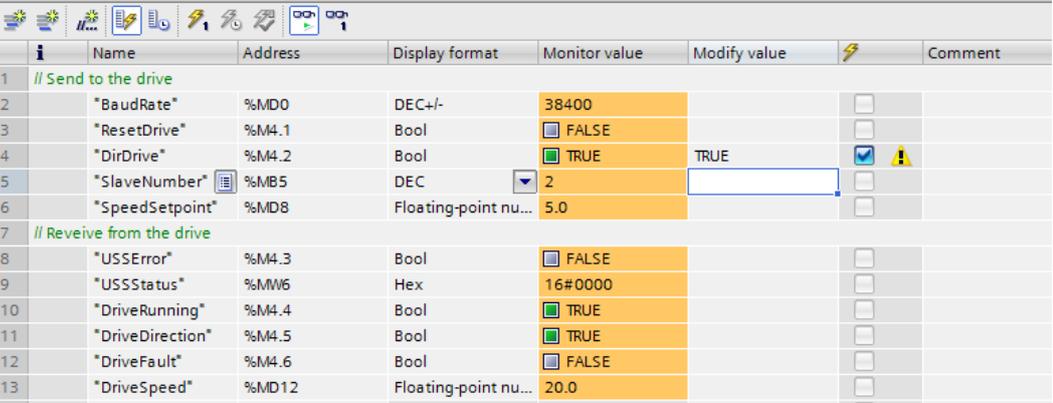
## 4.4 Operation

Table 4-4 describes how to use the project to run the motor.

Table 4-4

No.	Description	Remark
1.		Double click the "Watch table_1" to open the watch table.
2.	 <p>Monitor the watch table.</p>	
3.	 <p>Modify the value of "BaudRate" and "SlaveNumber" to active the USS communication.</p>	

#### 4 Configuration

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11	*DriveDirection*	%M4.5	Bool	<input checked="" type="checkbox"/> TRUE		<input type="checkbox"/>																																																																																																												
12	*DriveFault*	%M4.6	Bool	<input type="checkbox"/> FALSE		<input type="checkbox"/>																																																																																																												
13	*DriveSpeed*	%MD12	Floating-point nu...	20.0		<input type="checkbox"/>																																																																																																												

## 5 Related literature

Table 5-1 Reference documents

	Topic	Title / Link
\1\	Siemens Industry Online Support	<a href="http://support.industry.siemens.com">http://support.industry.siemens.com</a>
\2\	Download page of this entry	<a href="https://support.industry.siemens.com/cs/ww/en/view/109770390">https://support.industry.siemens.com/cs/ww/en/view/109770390</a>

## 6 Contact

Siemens Ltd., China  
DF MC GMC-G

No. 18 Siemens Road  
Jiangning Development Zone  
Nanjing, 211100  
China  
mailto: [mc\\_gmc\\_mp\\_asia.cn@siemens.com](mailto:mc_gmc_mp_asia.cn@siemens.com)

## 7 History

Table 7-1

Version	Date	Modifications
V1.0	03/2019	First version