

# SINAMICS S120: Control of the Safety Integrated Basic Functions via onboard terminals

SINAMICS S120

[Application example](#) • November 2012

## Applications & Tools

Answers for industry.

**SIEMENS**

## Siemens Industry Online Support

This article is taken from the Siemens Industry Online Support. The following link takes you directly to the download page of this document:

<http://support.automation.siemens.com/WW/view/en/65569732>

### Caution

The functions and solutions described in this article confine themselves to the realization of the automation task predominantly. Please take into account furthermore that corresponding protective measures have to be taken up in the context of Industrial Security when connecting your equipment to other parts of the plant, the enterprise network or the Internet. Further information can be found under the Item-ID 50203404.

<http://support.automation.siemens.com/WW/view/de/50203404>

If you have any questions about this document, please send an e-mail to the following address:

[safety.team.motioncontrol.i-dt@siemens.com](mailto:safety.team.motioncontrol.i-dt@siemens.com)

You can also actively use our Technical Forum from the Siemens Industry Online Support regarding this subject. Add your questions, suggestions and problems and discuss them together in our strong forum community:

<http://www.siemens.de/forum-applikationen>



## SINAMICS S120

### Control of the Safety Integrated Basic Functions via onboard terminals

Application example

Task

1

Solution

2

Basics about the Safety  
Functions

3

Configuration and Project  
Engineering

4

Commissioning the  
application

5

Operating the Application

6

References

7

Contact

8

History

9

## Warranty and liability

### Note

The Application Examples are not binding and do not claim to be complete regarding the circuits shown, equipping and any eventuality. The Application Examples do not represent customer-specific solutions. They are only intended to provide support for typical applications. You are responsible for ensuring that the described products are used correctly. These application examples do not relieve you of the responsibility to use safe practices in application, installation, operation and maintenance. When using these Application Examples, you recognize that we cannot be made liable for any damage/claims beyond the liability clause described. We reserve the right to make changes to these Application Examples at any time without prior notice. If there are any deviations between the recommendations provided in these application examples and other Siemens publications – e.g. Catalogs – the contents of the other documents have priority.

We do not accept any liability for the information contained in this document.

Any claims against us – based on whatever legal reason – resulting from the use of the examples, information, programs, engineering and performance data etc., described in this Application Example shall be excluded. Such an exclusion shall not apply in the case of mandatory liability, e.g. under the German Product Liability Act (“Produkthaftungsgesetz”), in case of intent, gross negligence, or injury of life, body or health, guarantee for the quality of a product, fraudulent concealment of a deficiency or breach of a condition which goes to the root of the contract (“wesentliche Vertragspflichten”). The damages for a breach of a substantial contractual obligation are, however, limited to the foreseeable damage, typical for the type of contract, except in the event of intent or gross negligence or injury to life, body or health. The above provisions do not imply a change of the burden of proof to your detriment.

Any form of duplication or distribution of these Application Examples or excerpts hereof is prohibited without the expressed consent of Siemens Industry Sector.

# Table of contents

<b>Warranty and liability.....</b>	<b>4</b>
<b>1 Task.....</b>	<b>6</b>
1.1 Overview .....	6
<b>2 Solution.....</b>	<b>8</b>
2.1 Overview of the overall solution .....	8
2.2 Hardware and software components used.....	12
<b>3 Basics about the Safety Functions.....</b>	<b>13</b>
<b>4 Configuration and Project Engineering.....</b>	<b>14</b>
4.1 Basic commissioning of the SINAMICS drives (without safety) .....	14
4.2 Parameterization of the safety functions .....	25
4.3 Acceptance test.....	27
<b>5 Commissioning the application .....</b>	<b>28</b>
5.1 Requirements for operation.....	28
5.2 Commissioning .....	28
<b>6 Operating the Application.....</b>	<b>29</b>
6.1 Overview .....	29
6.2 Description .....	30
<b>7 References .....</b>	<b>31</b>
7.1 Related literature .....	31
7.2 Internet links specifications .....	31
<b>8 Contact.....</b>	<b>32</b>
<b>9 History.....</b>	<b>32</b>

# 1 Task

## 1.1 Overview

### Introduction

The implementation of safety concepts is facilitated significantly through the use of drive-integrated safety engineering and its use also simplifies the verification of the required safety category for a machine.

The user is also supported by the [Safety-Evaluation-Tool](#).

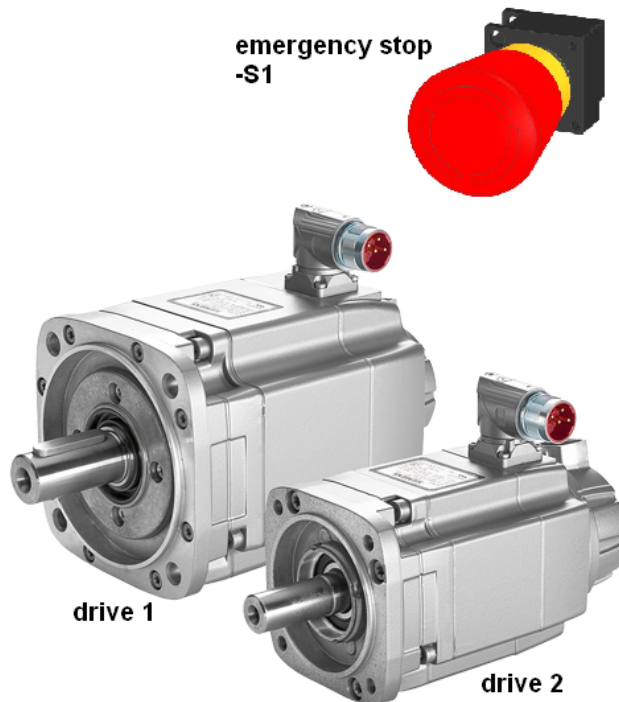
In the following application example, the drive-integrated safety functions are controlled via the onboard terminals.

Other variants for the control of the drive-integrated safety functions when using a TM54F terminal expansion module, as well as the control via PROFIsafe are described in further application examples.

### Overview of the automation task

The following figure provides an overview of the automation task.

Fig. 1-1 Overview of the automation task

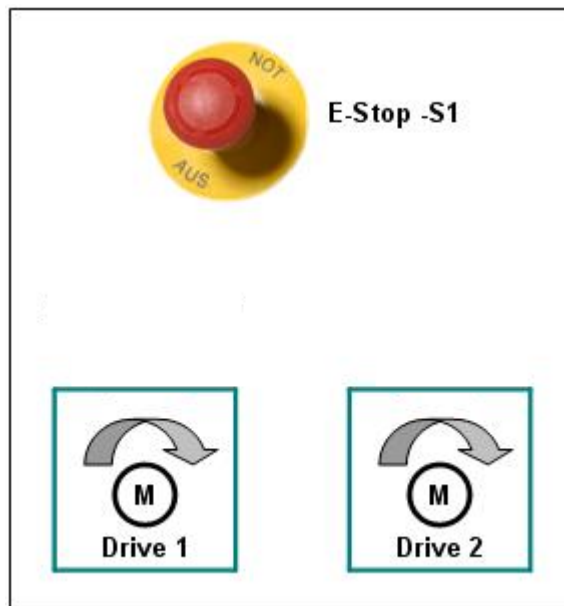


### Description of the automation task

A plant is to be safely shut down after actuation of the emergency stop button, whereby each drive is to be switched torque-free.

This is to be implemented with the safety functions integrated in the SINAMICS S120, which can be controlled without additional hardware.

Fig. 1-2 Description of the automation task



When the -S1 emergency stop button is actuated, the drive-integrated Safe Torque Off (STO) safety function is to be triggered on drive 1 and the Safe Stop 1 (SS1) safety function on drive 2. The pulses are suppressed immediately on drive 1 and it then coasts to a standstill. After actuation of the -S1 emergency stop button, drive 2 is braked along the configurable OFF3 ramp (to standstill) and then switches to the STO state after a parameterizable time.

**Note**

The EP terminals of the Double Motor Module and a common digital input of the Control Unit for both drives (grouping) are used for the two-channel control of the STO and SS1 Basic Functions.

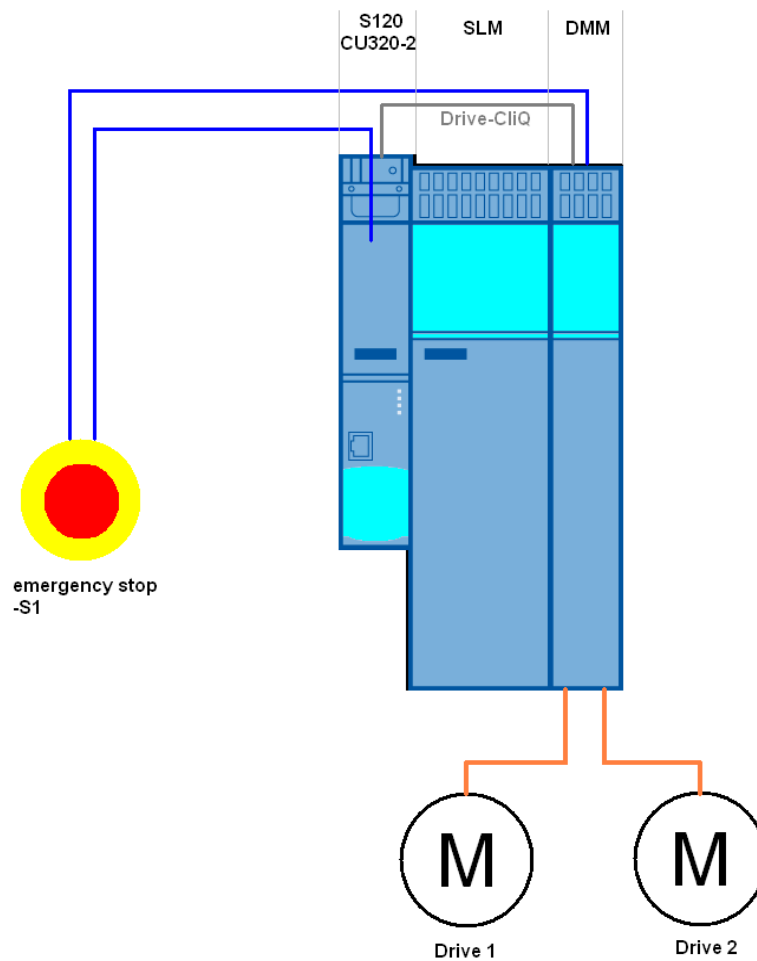
## 2 Solution

### 2.1 Overview of the overall solution

#### Schematic diagram

The following schematic figure shows the most important components of the solution:

Fig. 2-1 Overview

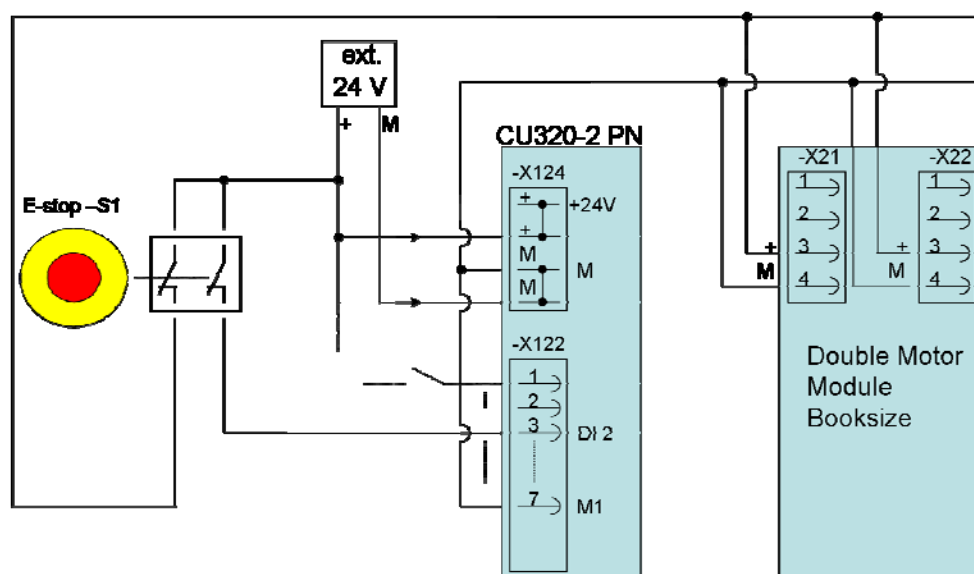


The control of the STO and SS1 Basic Functions on a SINAMICS S120 drive line-up is shown in this function example.

The drive line-up in the booksize format comprises an infeed and a Double Motor Module. The two servomotors, which are independent of one another, are controlled from the Double Motor Module. A Smart Line Module is used as infeed.



Fig. 2-2 Wiring of the emergency stop button

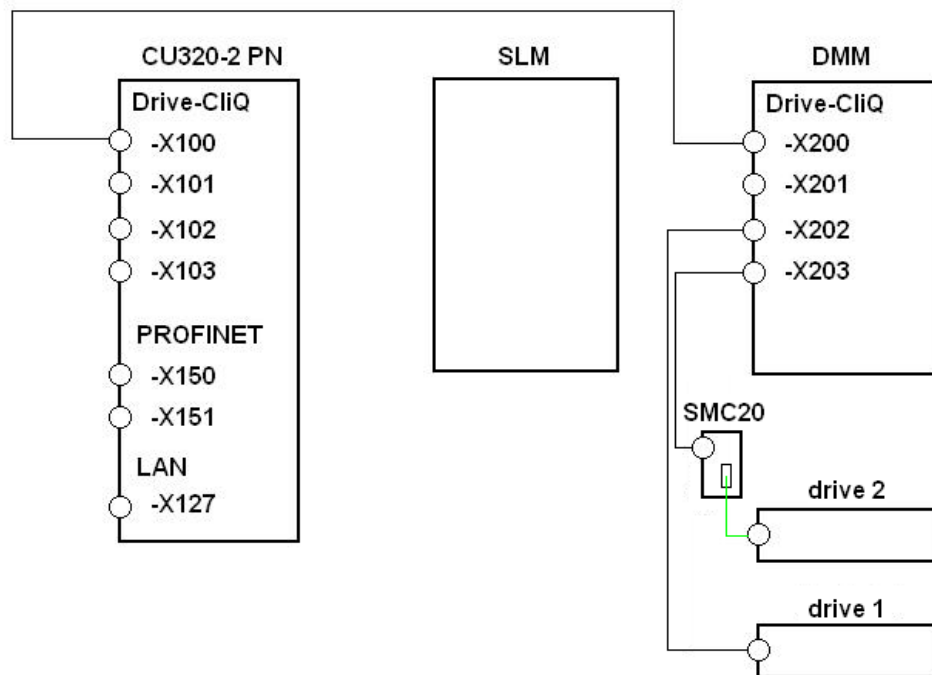


The -S1 two-channel emergency stop mushroom pushbutton is connected to the Control Unit and the EP terminals of the Double Motor Module (-X21 and -X22). To do this, one channel is connected to an arbitrary digital input of the Control Unit, e.g. to DI 2. The other channel is connected to the EP terminals of the Motor Module (terminals 3 and 4). This wiring ensures two independent shutdown paths, which guarantees the safety category SIL2, PL d, Cat. 3.

When an emergency stop (-S1) is required, drive 1 is shut down with the drive-integrated STO function and drive 2 with SS1.

**DRIVE-CLiQ connection**

Fig. 2-3 DRIVE-CLiQ wiring

**Note**

In this function example, the PROFINET interface (-X150 / -X151) of the CU320-2 PN is used exclusively for the commissioning of the SINAMICS.

**Advantages**

The application described here offers you the following advantages:

- Simple control of the safety functions integrated in the drive.
- Simple design using standard technology.
- The existing system can be quickly and simply expanded.
- Space-saving and favorably-priced design using integrated safety functions – additional hardware is not required.
- User-specific safety concepts can be implemented on this basis.

**Differentiation**

This application does not contain a description of:

- The safety functions of the SINAMICS S120
- The general drive functions of the SINAMICS S120 and
- The hardware interfaces of the CU320-2

It is assumed that readers have basic knowledge of these topics.

Information on these topics can be found in the documents in the references.

**Required knowledge**

It is assumed that readers have basic knowledge of the configuration of SINAMICS S120 drives with the STARTER or SIMOTION SCOUT engineering software.

## 2.2 Hardware and software components used

The application was created with the following components:

### Hardware components

Table 2-1 Hardware used

Component	Qty	Order number	Note
SIMOTION training case	1	6ZB2470-0AE00	As an alternative, a SINAMICS S120 training case can also be used.
CompactFlash card	1	6SL3054-0ED00-1AB0	
Control Unit CU320-2 PN	1	6SL3040-1MA01-0AA0	As an alternative, a CU320-2 DP can also be used.

### Note

The function example was tested with the hardware components listed here. Alternatively, other components with the same function may be used. In such a case, a different parameter assignment and different wiring of the components may be required.

### Standard software and firmware components

Table 2-2 Hardware used

Component	Qty	Order number	Note
STARTER V4.3.1.0	1		Alternatively, SIMOTION SCOUT can also be used.

Table 2-3 Firmware used

Component	Qty	Order number	Note
SINAMICS firmware V4.5	1		

### Sample files and projects

The list below contains all the files and projects used in this example.

Table 2-4 Documents and files

Component	Note
65569732_MC_FE_I_015_V10.zip	This zipped file contains the STARTER project.
65569732_MC_FE_I_015_V10.pdf	This document.
65569732_MC_FE_I_015_en62061_V10.set	SET project in accordance with IEC 62061.
65569732_MC_FE_I_015_iso13849_V10.set	SET project in accordance with IOS 13849.

### 3 Basics about the Safety Functions

The safety functions integrated in the SINAMICS S120 are in accordance with IEC 61800-5-2. The Safety Integrated Basic Functions that are freely available with all SINAMICS S120 drives contain the following safety functions.

The following safety functions are contained in the Basic Functions:

Name	Function	Description
STO	Safe Torque Off	<ul style="list-style-type: none"> <li>Safe disconnection of the torque-generating power supply to the motor.</li> <li>The "Switching On Inhibited" condition prevents the drive from restarting. (Stop function, Category 0 according to EN 60204-1)</li> </ul>
SBC	Safe brake control	<ul style="list-style-type: none"> <li>SBC is only used when there is a motor brake; the motor brake is connected to the power connector through the outputs.</li> <li>SBC always responds in conjunction with STO or when internal safety monitoring functions respond with safe pulse suppression.</li> </ul>
SS1	Safe Stop 1	<ul style="list-style-type: none"> <li>Quick shutdown of the drive along the OFF3 ramp.</li> <li>Quick shutdown is also possible through braking from a higher-level controller (e.g. SIMOTION) (SS1E).</li> <li>After a delay time has expired, transition to STO. (Stop function, Category 1 according to EN 60204-1)</li> </ul>

Control of these Safety Basic Functions can be via PROFIsafe, via a fail-safe input of a CU310-2 as well as via the onboard terminals of the CU320-2.

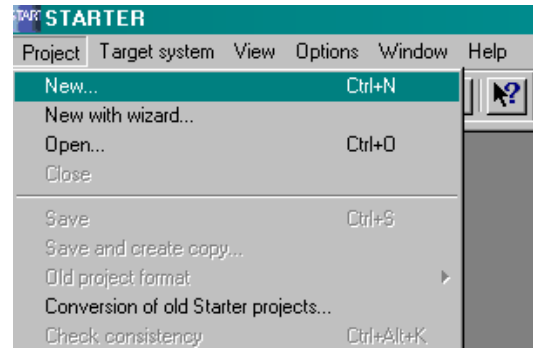
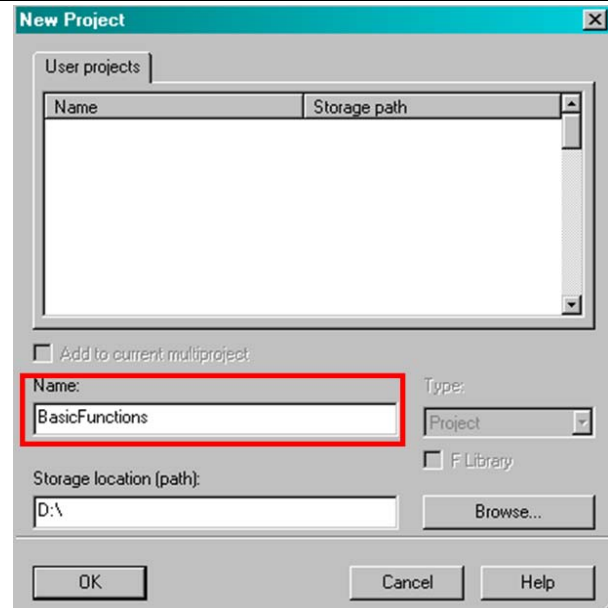
In the following application example, the drive-integrated Safety Basic Functions are controlled via the onboard terminals.

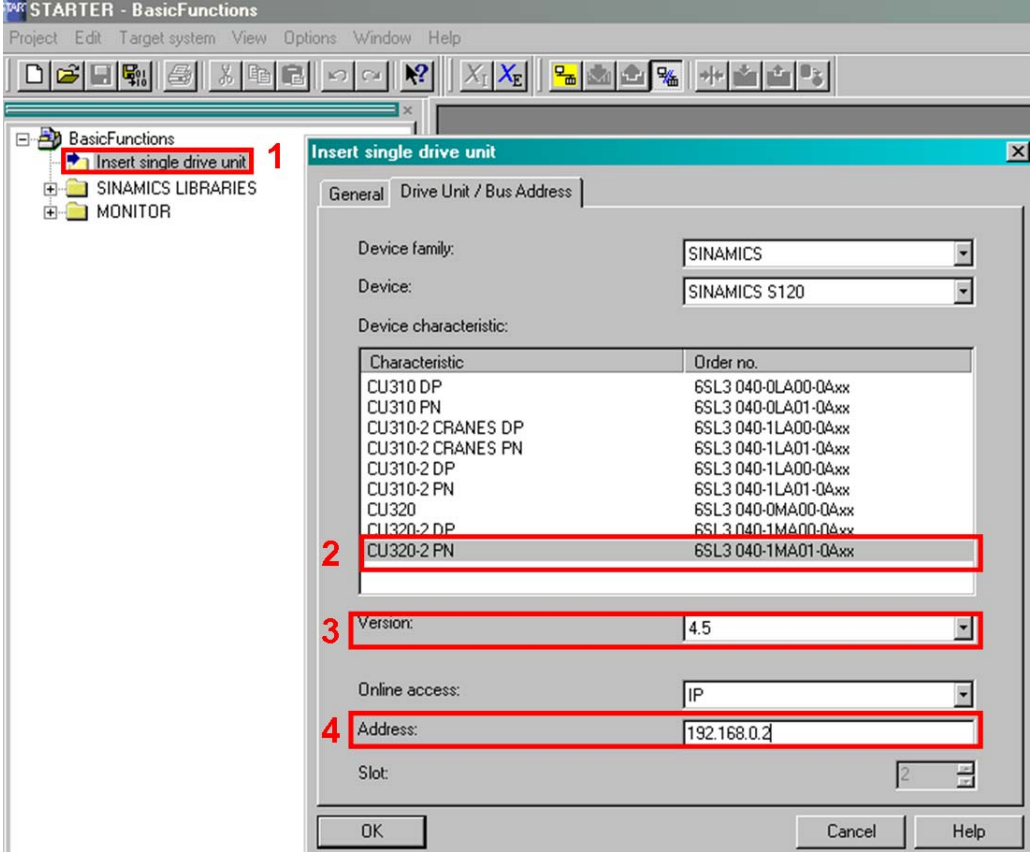
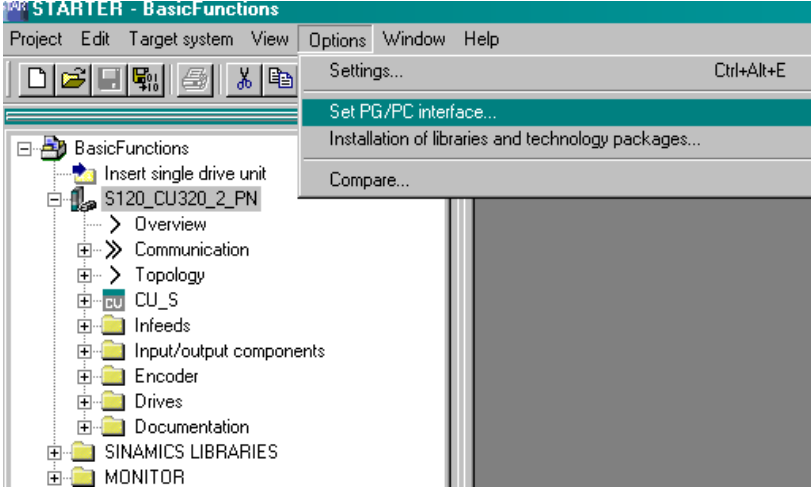
# 4 Configuration and Project Engineering

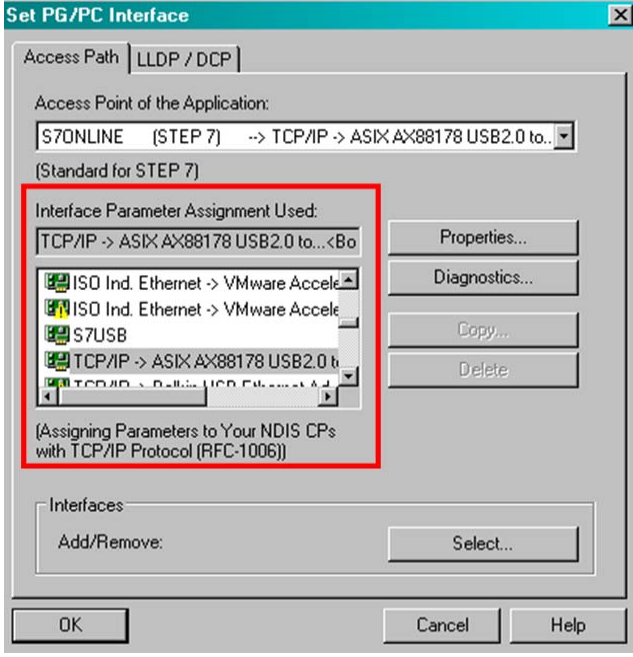


## 4.1 Basic commissioning of the SINAMICS drives (without safety)

Before the drive-integrated safety functions can be parameterized, the drives must be commissioned so far that they can be traversed.

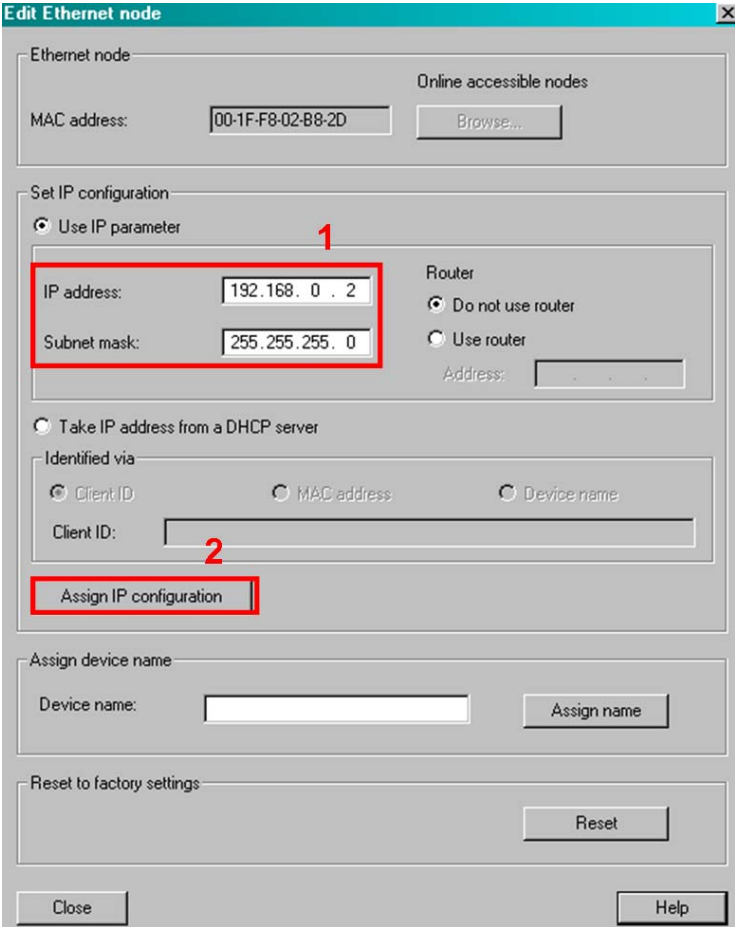

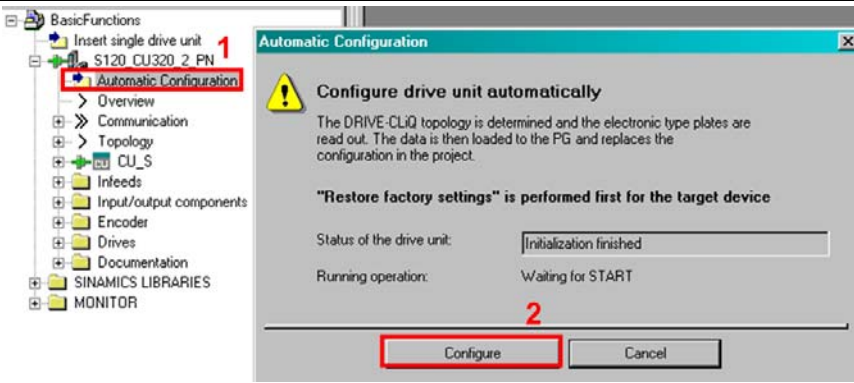
Table 4-1:

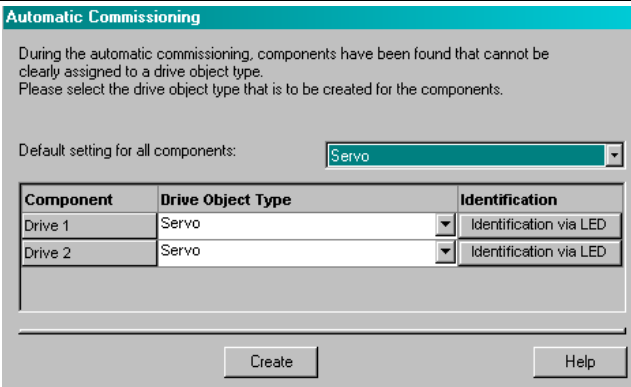
No.	Action	
1.	Open STARTER and create a new project with "Project > New".	
2.	You can now assign an arbitrary project name.	

No.	Action
3.	 <p>The SINAMICS is then inserted in the project. To do this, click "Insert single drive unit" (1) and select the appropriate Control Unit (2) with firmware version (3) and IP address (4). In this example, a SINAMICS S120 CU320-2 PN with firmware V4.5 and IP address 192.168.0.2 has been created.</p>
4.	 <p>The interface of your programming device is set to go online on the Control Unit. To do this, click "Options &gt; Set PG/PC interface...".</p>

No.	Action	
5.	The adjacent window then opens. Select the interface with which you want to establish an online connection.	
6.	To assign the required IP address to the Control Unit, click the "Accessible node" button.	
7.	 <p>All the nodes that are accessible online are found and displayed. When the required Control Unit is found, click "Edit Ethernet node...".</p>	



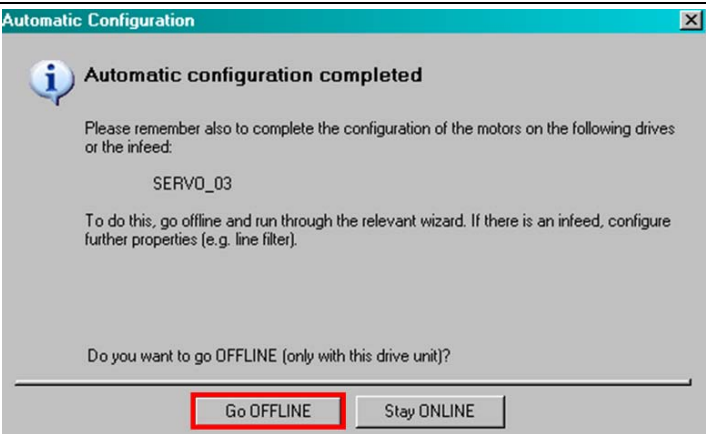
8. 
- Now assign the IP address and the subnet mask (1).  
The IP address that is set here is identical to that from your project. In this case: 192.168.0.2  
The IP configuration is then accepted (2).
9. Now establish an online connection with your programming device on the SINAMICS. 
10. 
- When you are connected online with your project, you can start the "Automatic Configuration" (1).  
The DRIVE-CLiQ nodes are then read out (2).

11. 

During the automatic commissioning, components have been found that cannot be clearly assigned to a drive object type.  
Please select the drive object type that is to be created for the components.

Default setting for all components: Servo

Component	Drive Object Type	Identification
Drive 1	Servo	Identification via LED
Drive 2	Servo	Identification via LED

Create Help
- Select the "Servo" control mode for both drives.
12. 

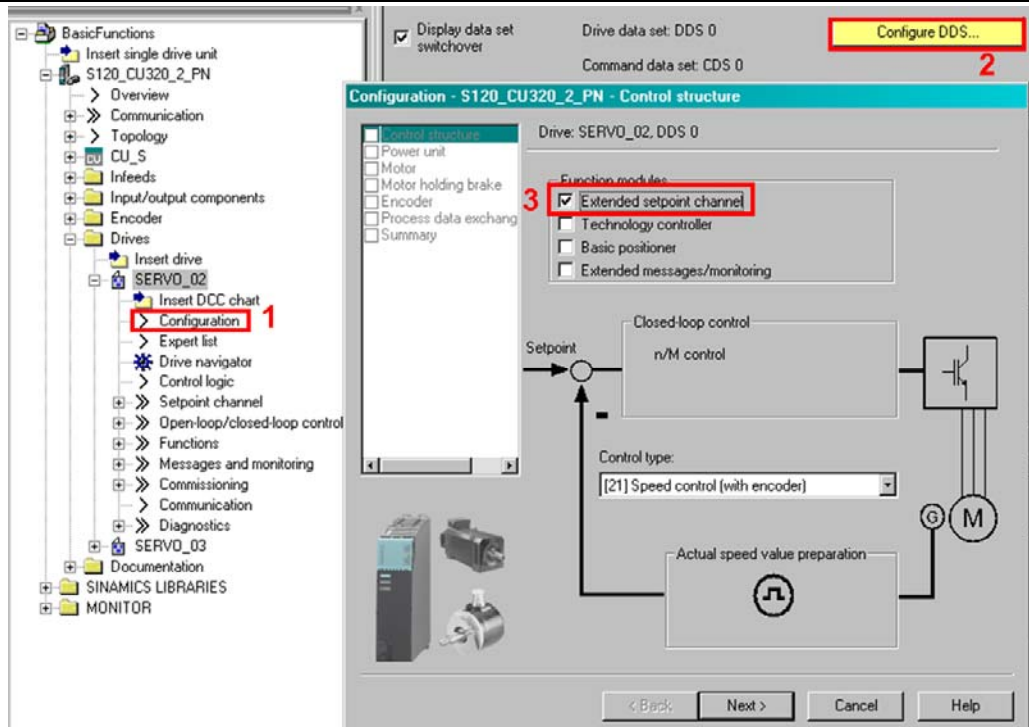
**Automatic configuration completed**

Please remember also to complete the configuration of the motors on the following drives or the infeed:

SERV0\_03

To do this, go offline and run through the relevant wizard. If there is an infeed, configure further properties (e.g. line filter).

Do you want to go OFFLINE (only with this drive unit)?

Go OFFLINE Stay ONLINE
- Since some of the settings still have to be reconfigured, go offline again after the automatic configuration.
13. 

BasicFunctions

  - Insert single drive unit
    - S120\_CU320\_2\_PN
      - Overview
      - Communication
      - Topology
      - CU\_S
      - Infeeds
      - Input/output components
      - Encoder
      - Drives
        - Insert drive
          - SERV0\_02
            - Insert DCC chart
            - Configuration** 1
            - Expert list
            - Drive navigator
            - Control logic
            - Setpoint channel
            - Open-loop/closed-loop control
            - Functions
            - Messages and monitoring
            - Commissioning
            - Communication
            - Diagnostics
          - SERV0\_03
        - Documentation
      - SINAMICS LIBRARIES
      - MONITOR

Display data set switchover Drive data set: DDS 0 Configure DDS... 2

Command data set: CDS 0

**Configuration - S120\_CU320\_2\_PN - Control structure**

Drive: SERV0\_02, DDS 0

**Control structure**

  - ☒ Power unit
  - ☒ Motor
  - ☒ Motor holding brake
  - ☒ Encoder
  - ☒ Process data exchange
  - ☐ Summary

**Function modules**

  - ☒ Extended setpoint channel 3
  - ☐ Technology controller
  - ☐ Basic positioner
  - ☐ Extended messages/monitoring

Setpoint → Closed-loop control n/M control → Motor (M)

Control type: [21] Speed control (with encoder)

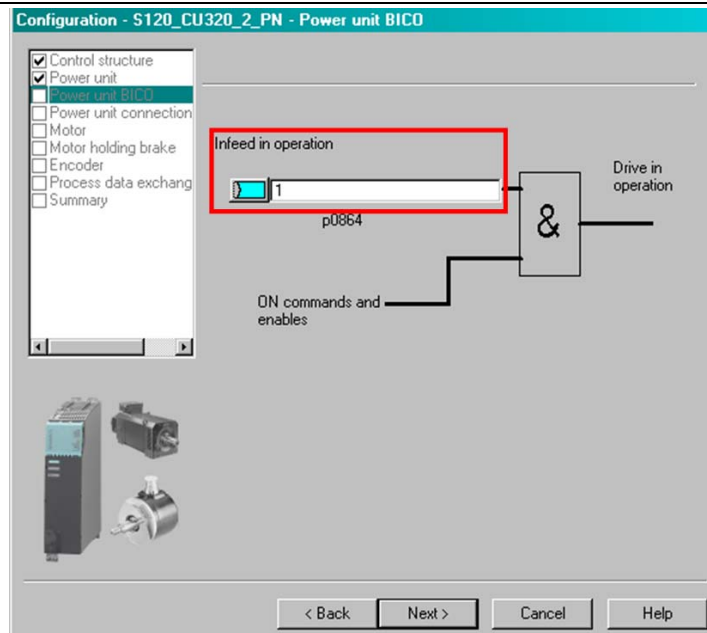
Actual speed value preparation

< Back Next > Cancel Help

**Post configuration of both drives:**

First click "Configuration" (1) below each drive object and then "Configure DDS..." (2). The extended setpoint channel is used to specify the speed of the drive. Therefore, enable the "Extended setpoint channel" function.

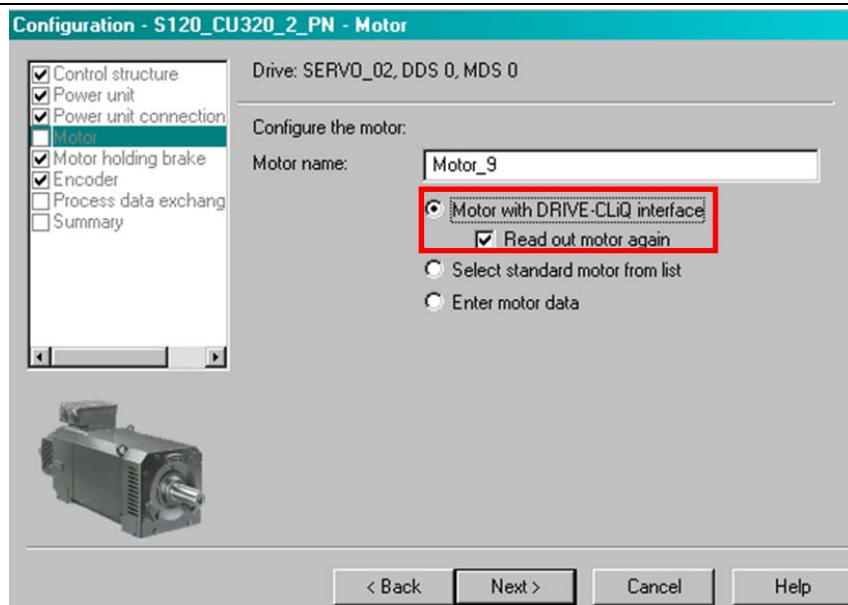
14.

**Post configuration of both drives:**

Fixed binector 1 is used for the "Infeed in operation" (p0864).

**Note:** In a real application, fixed binector 1 should not be used as signal for the "Infeed in operation" (p0864).

15.

**Post configuration of drive 1:**

Since a motor with DRIVE-CLiQ interface is used, this should be read out. To do this, activate the "Read out motor again" checkbox.

16.

**Configuration - S120\_CU320\_2\_PN - Motor**

Drive: SERVO\_03, DDS 0, MDS 0

Configure the motor:

Motor name:

☐ Motor with DRIVE-CLiQ interface  
☐ Read out motor again  
☒ Select standard motor from list  
☐ Enter motor data

Motor type:

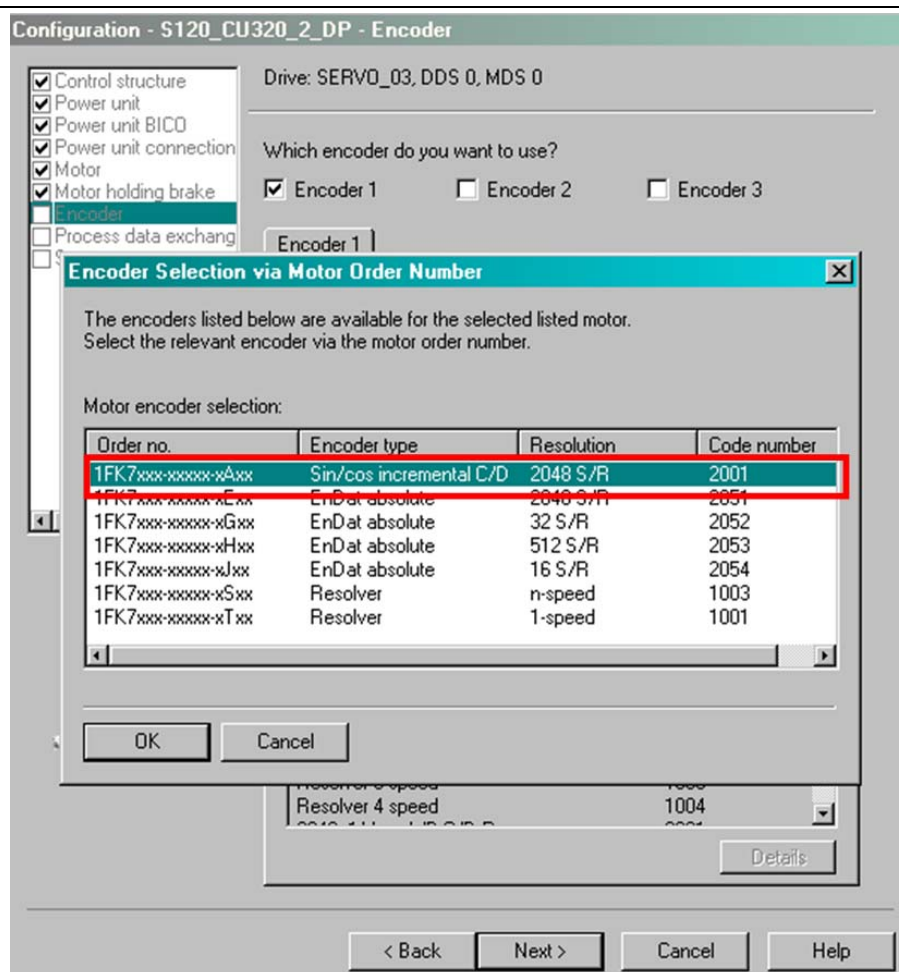
Motor selection:

Order no.	Rated sp...	Rated tor...	Rated cur...
1FK7011-xAK2x-xxxx	6000 U/min	0.08 Nm	0.5 A
1FK7011-xAK7x-xxxx	6000 U/min	0.08 Nm	0.85 A
1FK7015-xAK2x-xxxx	6000 U/min	0.16 Nm	0.5 A
1FK7015-xAK7x-xxxx	6000 U/min	0.16 Nm	0.85 A
1FK7022-xAK2x-xxxx	6000 U/min	0.6 Nm	1.4 A
<b>1FK7022-xAK7x-xxxx</b>	<b>6000 U/min</b>	<b>0.6 Nm</b>	<b>1.4 A</b>
1FK7024-xAK7x-xxxx	6000 U/min	0.6 Nm	1 A
1FK7032-xAF2x-xxxx	3000 U/min	1 Nm	1.6 A
1FK7032-xAK7x-xxxx	6000 U/min	0.8 Nm	1.3 A
1FK7033-xAF2x-xxxx	3000 U/min	1.2 Nm	2 A
1FK7033-xAK7x-xxxx	6000 U/min	0.9 Nm	1.5 A
1FK7033-xCF2x-xxxx	3000 U/min	1.2 Nm	2.05 A
1FK7033-xCK7x-xxxx	6000 U/min	0.9 Nm	1.6 A
1FK7034-xAF2x-xxxx	3000 U/min	1.45 Nm	1.8 A

**Post configuration of drive 2:**

Drive 2 however does not have a DRIVE-CLiQ interface. The motor data is therefore selected with the aid of the motor MLFB.

17.

**Post configuration of drive 2:**

The motor encoder must also be manually selected by the user. In this example, a sin/cos incremental encoder has been used.

18.

The screenshot displays the configuration of a drive unit. On the left, the project tree shows the hierarchy: BasicFunctions > Insert single drive unit > S120\_CU320\_2\_PN > Drives > Insert drive > SERVO\_02 > Setpoint channel > Fixed setpoints (highlighted with a red box and labeled 1). On the right, the 'Fixed setpoint interconnection' table is shown. Bit 0 is set to 1 (highlighted with a red box and labeled 2). The fixed value 1 is set to 500.000 rpm (highlighted with a red box and labeled 3). The resulting binary value 0001 is shown in the table.

Fixed value	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
500.000	rpm	0.000	rpm	0.000	rpm	0.000	rpm	0.000	rpm	0.000	rpm	0.000	rpm	0.000	rpm
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Post configuration of both drives:**

The required speed setpoint is specified in this screen form. Click "Setpoint channel > Fixed setpoints" (1).

Binary logic (bit 0-3) can be implemented here which allows a switchover to various speed setpoints.

In this example, bit 0 (2) was interconnected to a static "1" signal and 500 rpm specified as fixed setpoint (3).

19.

**Post configuration of both drives:**

In order to switch the drive on with switch S2, the appropriate digital input is interconnected to the ON/OFF1 enable.

To do this, click "Control logic" below the drive object (1). Digital input 0 is then wired to parameter p840 (2).



20.

### Post configuration of drive 2:

The SS1 safety function is used for drive 2, i.e. when SS1 is selected, the drive brakes along the OFF3 ramp. This OFF3 ramp is defined via the maximum speed (p1082) and the OFF3 ramp-down time (p1135).

The maximum speed has already been determined for the configuration of the drive and only the OFF3 ramp has to be set here.

First click "Setpoint channel > Ramp-function generator" (1) and then the button with the red frame (2). The "Simple ramp generator" window is now opened and you can enter 5 s, for example, for the "OFF3 ramp-down time" (3).

In this example, this means that a drive at maximum speed (p1082) reaches standstill five seconds (p1135) after an emergency stop is triggered.

21. Now save your configuration, go online and perform a download.



22.	p210	Drive unit line supply voltage	345	V
	p1244[0]	DC link voltage threshold upper	401	V
	p1248[0]	DC link voltage threshold lower	230	V

### Post configuration of both drives:

The supply voltage of the drives is adapted here. To do this, open the expert lists of the individual drives and adapt the following parameters:

p210 = 345 V

p1244 = 401 V

p1248 = 230 V




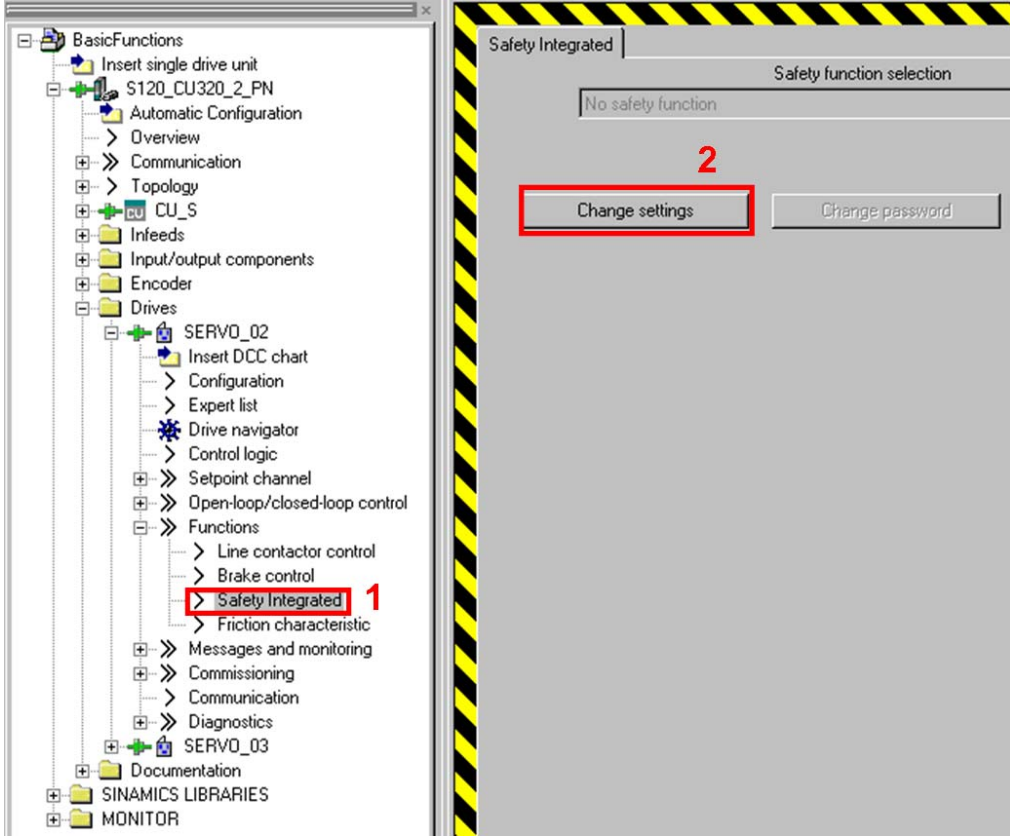
## 4.2 Parameterization of the safety functions

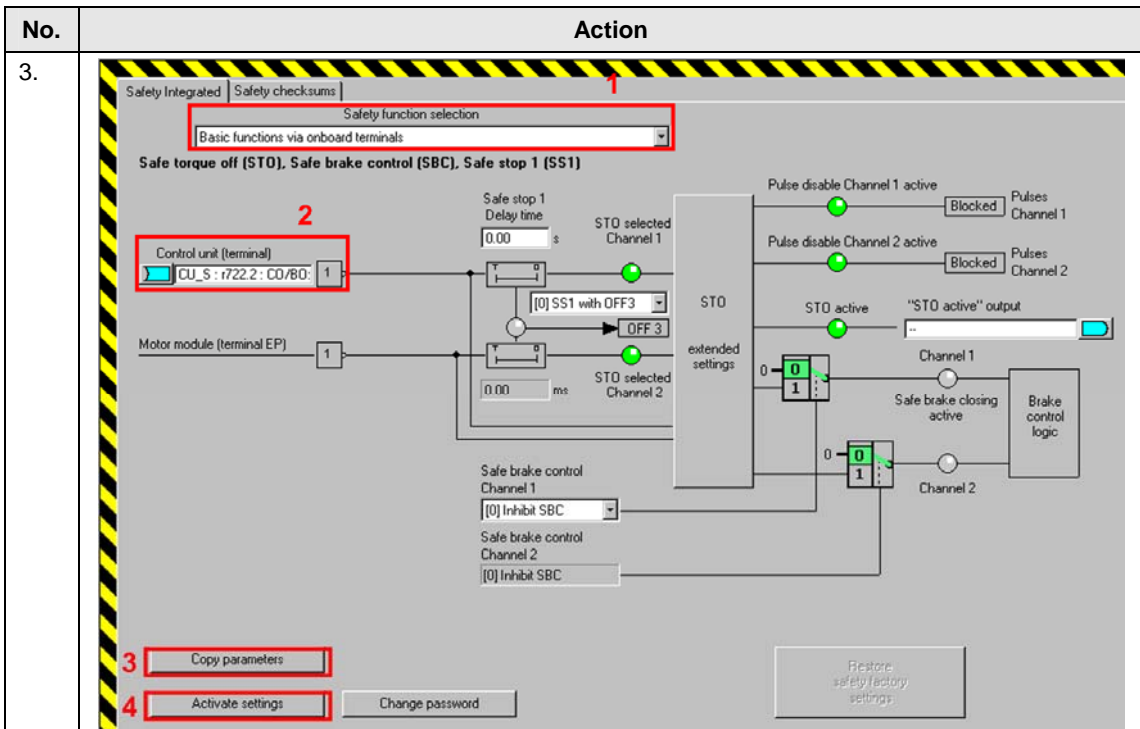
After completion of the basic commissioning, the STO and SS1 safety functions are commissioned.

### Note

The safety functions on the drives can be configured offline and online.  
Only those windows are described in which parameter changes are required.

Table 4-2:

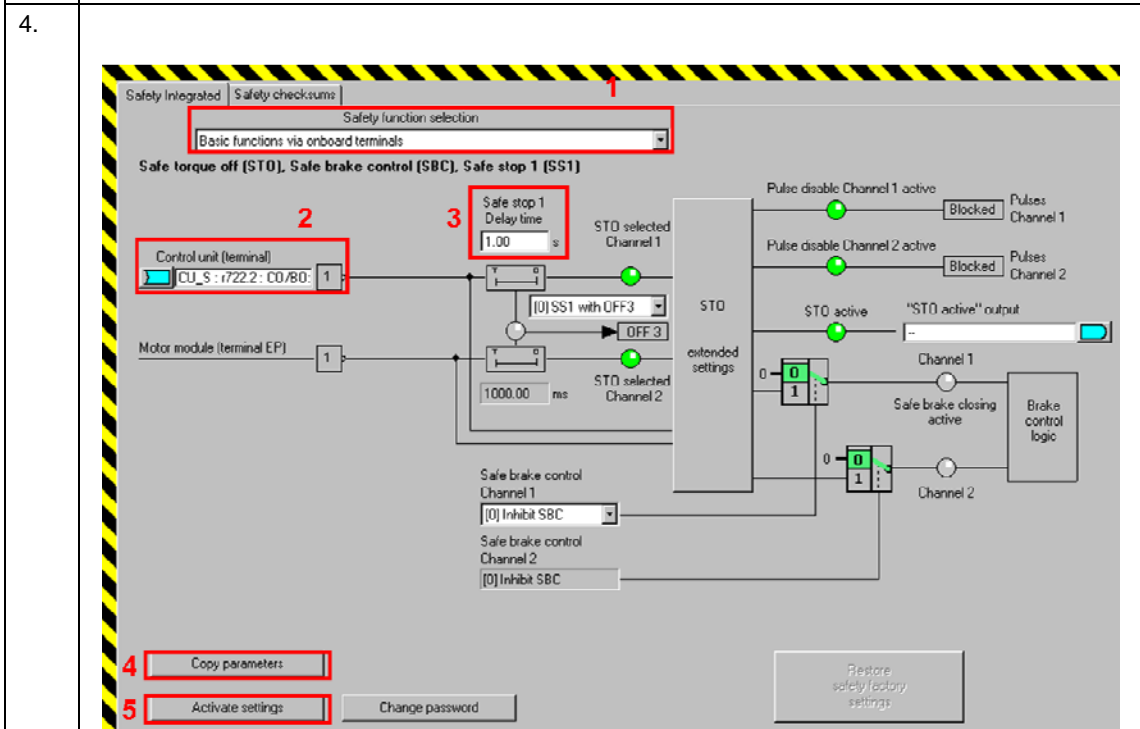
No.	Action
1.	In this example, the safety functions are configured online. 
2.	 <p><b>Safety settings of both drives:</b> First click "Functions &gt; Safety Integrated" (1) and then change the "Change settings" safety settings (2).</p>



**Safety settings of drive 1:**

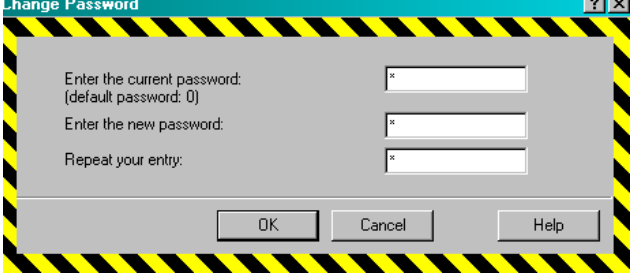


The type of the safety function control is then selected. The "Basic functions via onboard terminals" is selected here (1). The digital input of the Control Unit to which the -S1 emergency stop button is connected is then selected. In this example, digital input DI 2 is used (2).

Finally, the parameters are copied with "Copy parameters" (3) and the settings activated (4).



**Safety settings of drive 2:**

The same -S1 emergency stop button, i.e. digital input 2, is used for the selection of the SS1 safety function. A time of 1 s is entered for the "Safe Stop 1 Delay time" (3), i.e. the STO state is triggered one second after

No.	Action
	the selection of SS1, irrespective of whether the drive has reached standstill or not. Further parameter assignments are made on the basis of the previous line.
5.	 <p><b>Safety settings of both drives:</b> The safety password can be changed to protect the safety settings against illegal access. Click "Change password" in the Safety Integrated screen form. Password "1" was used in this example.</p>
6.	Copy RAM to ROM at the end and perform a Power On reset. 
7.	Go online, load your project to the PG and save your parameterization. 

### 4.3 Acceptance test

To verify safety-oriented parameters, an acceptance test must be performed after the machine has been commissioned for the first time and also after changes are made to safety-related parameters. The acceptance test must be appropriately documented. The acceptance reports must be adequately stored and archived.

The acceptance test must be carried out after parameterization has been completed and a Power On reset.

Information about the acceptance test, the acceptance report and an example of an appropriate acceptance report is provided in the "Function Manual SINAMICS S120 Safety Integrated" (FHS) in the Chapter "Acceptance test and acceptance report".

To make it easier to handle the acceptance test, a script has been generated that can be ordered at no charge from the [Application database](#) of the APC. This script takes the user step-by-step in a user-friendly way through the acceptance test..

## 5 Commissioning the application

Until now, the configuration of the application example has been described step-by-step. The following steps should now be followed if the sample project is to be directly downloaded to the hardware.






### 5.1 Requirements for operation

Table 5-1:

No.	Action
1.	The DRIVE-CLiQ topology of the SINAMICS components has been maintained.
2.	The motors have been connected to the Motor Module using power cables.
3.	The Motor Module is correctly connected with the infeed (DC link and 24 V DC control voltage).
4.	The infeed is connected to the line supply.
5.	The components are supplied with 24 V DC.
6.	The -S1 mushroom pushbutton has been wired in accordance with the specifications in Section 2.1.

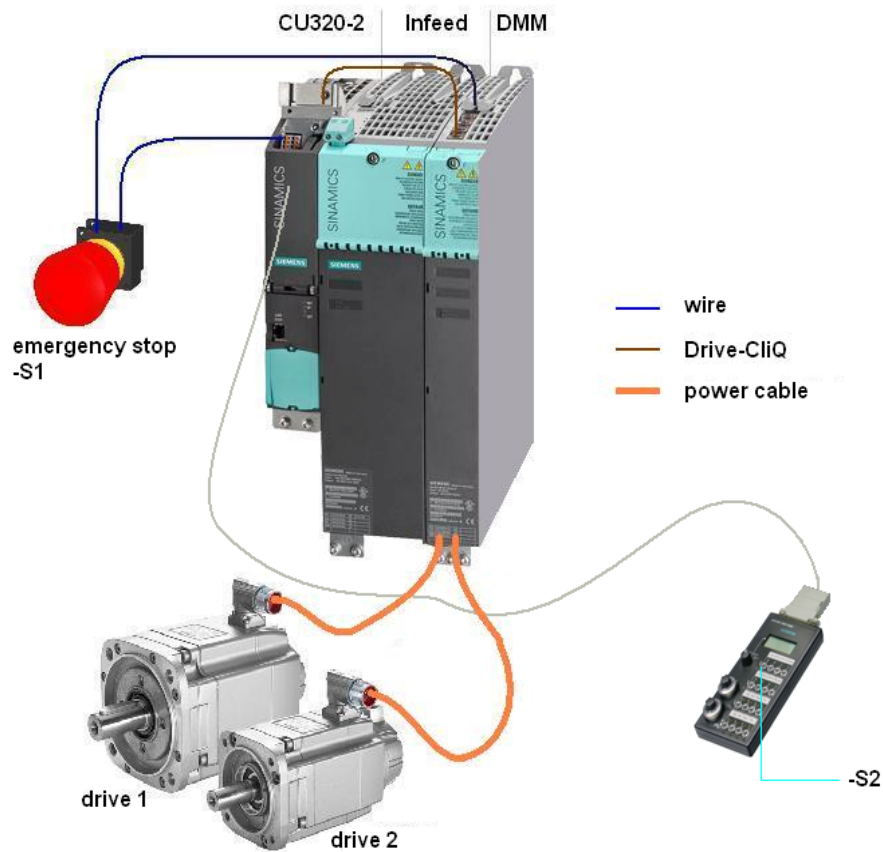
### 5.2 Commissioning

Table 5-2:

No.	Action
1.	Start the STARTER engineering system.
2.	Dearchive and open the supplied project.
3.	Then find the CU320-2 under "Accessible nodes"  .
4.	Now assign the drive IP address 192.168.0.2 in subnet 255.255.255.0.
5.	Go online with STARTER  .
6.	Then reset the SINAMICS S120 to the factory settings  .
7.	Now perform a download  and then copy RAM to ROM  .

## 6 Operating the Application

### 6.1 Overview



#### Note

For reasons of clarity, the encoder cables have not been shown in this figure. More detailed information can be found in Section "Wiring of the hardware components".

The STO and SS1 safety functions are controlled via the -S1 emergency stop button.

Switch -S2 is located on a switchbox that belongs to the SIMOTION training case. The drives are switched on and a speed setpoint specified with this switch.

## 6.2 Description

### Switch-on/switch-off

The -S1 emergency stop button must be released to traverse the drives. Both drives are switched on with the -S2 switch (OFF1). The speed of both drives is 500 rpm.

### Emergency stop

Drive 1 is shut down with the STO safety function and drive 2 with SS1 by actuating the -S1 mushroom pushbutton. After releasing the -S1 mushroom pushbutton, the OFF1 enable must be set again to traverse the drives.

### Test stop

The test stop is performed automatically after every Control Unit ramp-up or when STO is deselected (through actuation of the -S1 emergency stop button).

### Note

The drives can only be operated when the infeed is activated and the DC link charged.

## 7 References

### 7.1 Related literature

This list does not claim to be complete and only provides a selection of suitable references.

Table 7-1:

	Topic	Title
/1/	SINAMICS S120	Safety Function Manual Edition 01/2012 <a href="http://support.automation.siemens.com/WW/view/en/59734511">http://support.automation.siemens.com/WW/view/en/59734511</a>
/2/	SINAMICS S120	Manual Edition 01/2012 <a href="http://support.automation.siemens.com/WW/view/en/59715084">http://support.automation.siemens.com/WW/view/en/59715084</a>
/3/	SINAMICS S120	List Manual Edition 01/2012 <a href="http://support.automation.siemens.com/WW/view/de/59750648">http://support.automation.siemens.com/WW/view/de/59750648</a>

### 7.2 Internet links specifications

This list is not complete and only represents a selection of relevant information.

Table 7-2:

	Topic	Title
\1\	Reference to the article	<a href="http://support.automation.siemens.com/WW/view/de/65569732">http://support.automation.siemens.com/WW/view/de/65569732</a>
\2\	Siemens Industry Online Support	<a href="http://support.automation.siemens.com">http://support.automation.siemens.com</a>

## 8 Contact

Siemens AG  
Industry Sector  
I DT MC PMA APC  
Frauenauracher Strasse 80  
91056 Erlangen, Germany  
E-mail: [safety.team.motioncontrol.i-dt@siemens.com](mailto:safety.team.motioncontrol.i-dt@siemens.com)

## 9 History

Table 9-1:

Version	Date	Modification
V1.0	11/2012	First edition