SINAMICS S120 Demo and training case

6ZB2480-0CN01/ 6ZB2480-0CT00

https://support.industry.siemens.com/cs/ww/en/view/109772205

Siemens Industry Online Support

Legal Information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

 **DANGER**	**indicates that death or severe personal injury will result if proper precautions are not taken.**

 **WARNING**	**indicates that death or severe personal injury may result if proper precautions are not taken.**

 **CAUTION**	**indicates that minor personal injury can result if proper precautions are not taken.**

NOTICE	**indicates that property damage can result if proper precautions are not taken.**

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

 **WARNING**	**Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.**

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Table of contents

1 Preliminary information

1.1 Purpose of this documentation

This product information/documentation gives you an overview of all important points regarding demo systems. The supplied documentation must be read before commissioning and operation.

1.2 Aim of the demo system - target group

The demo system corresponds to a switchgear combination according to EN 61439-1 in maintenance and commissioning mode. It is intended for qualified electrotechnical personnel from the target groups of:

- Planners
- Installers
- Commissioning engineers
- Service and maintenance personnel
- Operators

1.3 Operating the demo system

The system may only be operated in Contamination Class 2 environments.

The degree of soiling is described in IEC 61010:
Only lightly conductive soiling. However, occasionally a temporary conductivity caused by condensation must be expected.

In addition, demo systems and/or exhibits may be connected and operated by experts or specially trained personnel.

The units are not to be used for unsupervised continuous operation.

1.4 EMC / Radio Interference

CAUTION	**This system is intended for use in industrial environments. Operation in residential environments may cause radio interferences. If this happens, the system owner may be required to take appropriate measures.**

2 Technical specifications

Table 2-1

Property	Value
Degree of protection according to DIN VDE 0470 Part 1/EN 60529/IEC 529	IP20
Supply voltage	1 AC 230 V / 50 Hz via grid adapter 1 AC 115 V (USA) (not included in scope of delivery)
Temperature range	0 - 60 °C
Dimensions in mm (W x H x D)	500 x 300 x 300
Weight	approx. 28 kg
Transport case Dimensions in mm (W x H x D)	680 x 380 x 430
Transport case (empty) Weight	approx. 12 kg

3 Variants

The case with article number 6ZB2480-0CN01 has been populated with the SIMATIC S7 CPU 1513F-1 PN.

The case with article number 6ZB2480-0CT00 has only been prepared for the installation of a SIMATIC S7 CPU. Any S7-1500 CPU with simple width (34 mm) can be installed.

4 Functions

- Control box
  The control box can be connected either to the SINAMICS CU 320-2 or to the SIMATIC ET 200SP. To do this, the 25-pin plug on the rear of the case must be moved accordingly. On the left, the control box is connected to the CU, and on the right to the ET 200.
- SINAMICS CU connection
  The signals from the CU320-2 within the case are wired to the 37-pin plug. If a different CU, drive controller or a SIMOTION D CPU are used, the connector plug can be released and the plug from the other assembly can be plugged in.
- Light gate
  Each motor is provided with a light gate whose light beam is interrupted by the teeth of the rotary wheels.
  The signals from the light gates can be used, for example, for referencing the axes. For this purpose, they are installed on the CU320-2 (DIDO14 and DIDO15) and also on the TM timer DIDQ (DI1 and DI2). See chapter 8.
- LED
  Both rotary discs overlap one another and have one hole each. The two holes in the rotary discs line up when correctly positioned, opening a line of sight to a permanently lit blue LED.
  This makes it possible to visualize the synchronization, as the LED is only visible when both discs are in the correct position simultaneously.

5 Construction

Figure 5-1 Front side

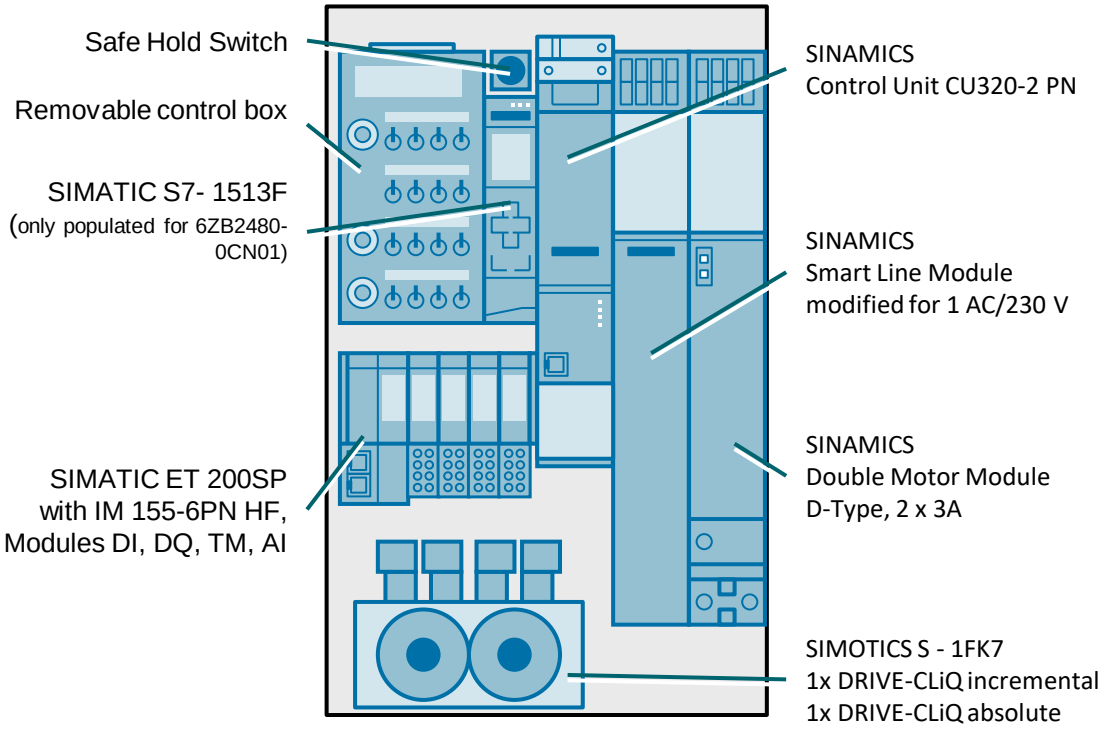


Figure 5-2 Rear side

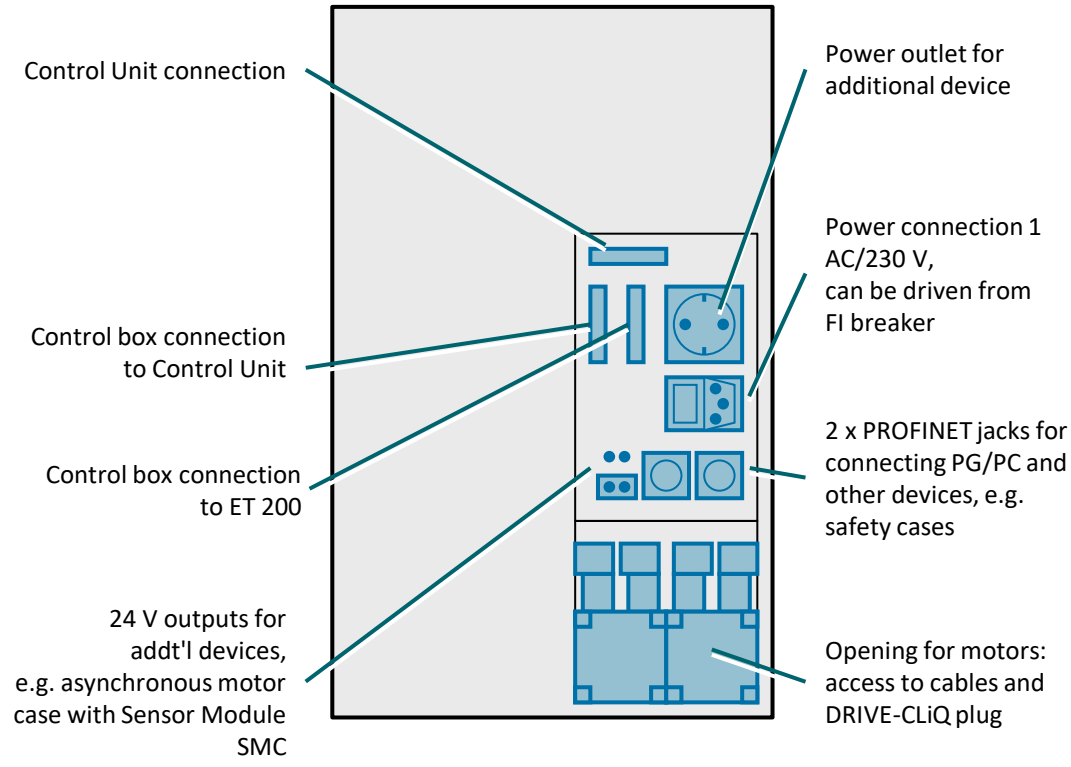


Figure 5-3 Front side

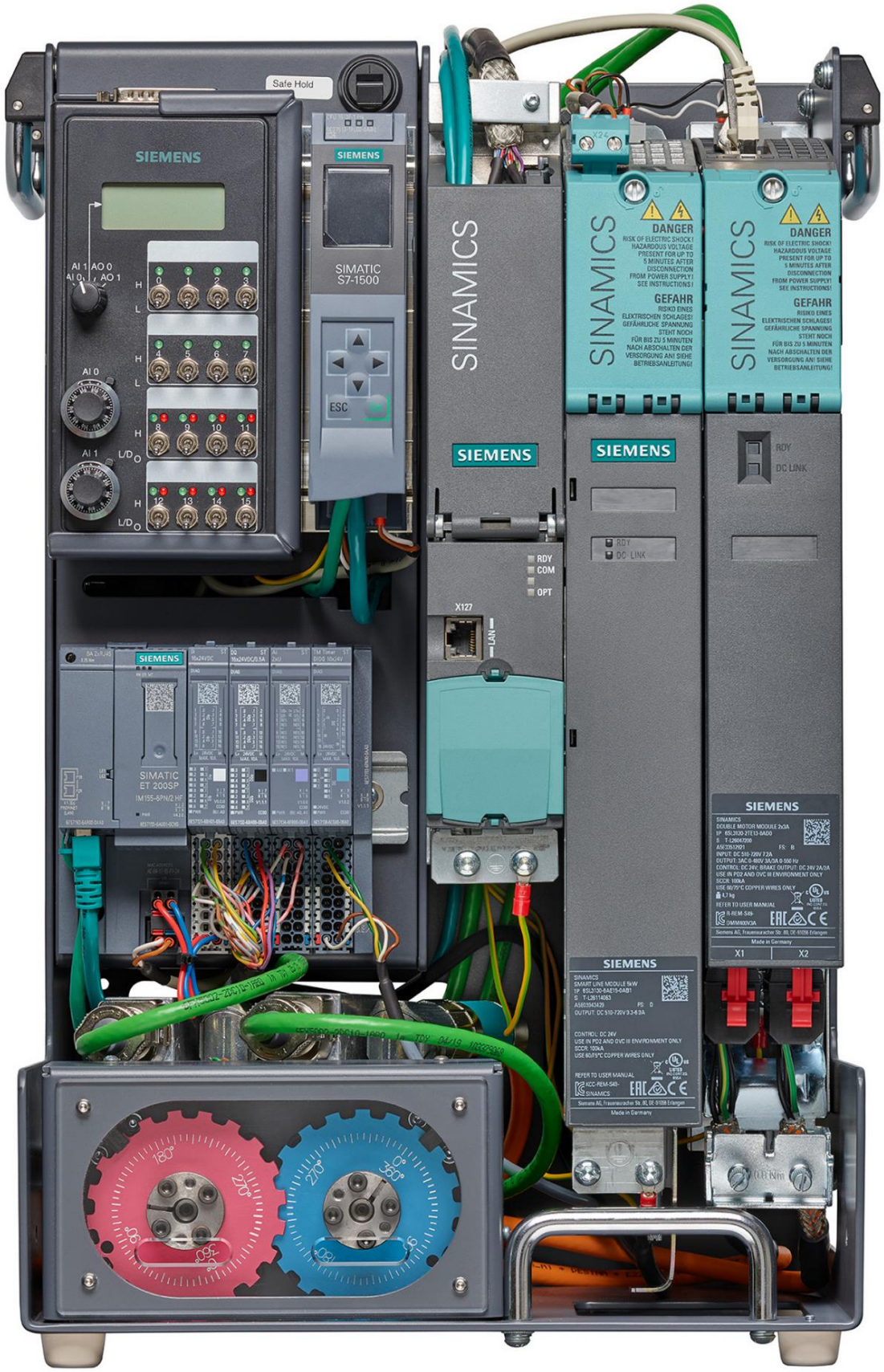
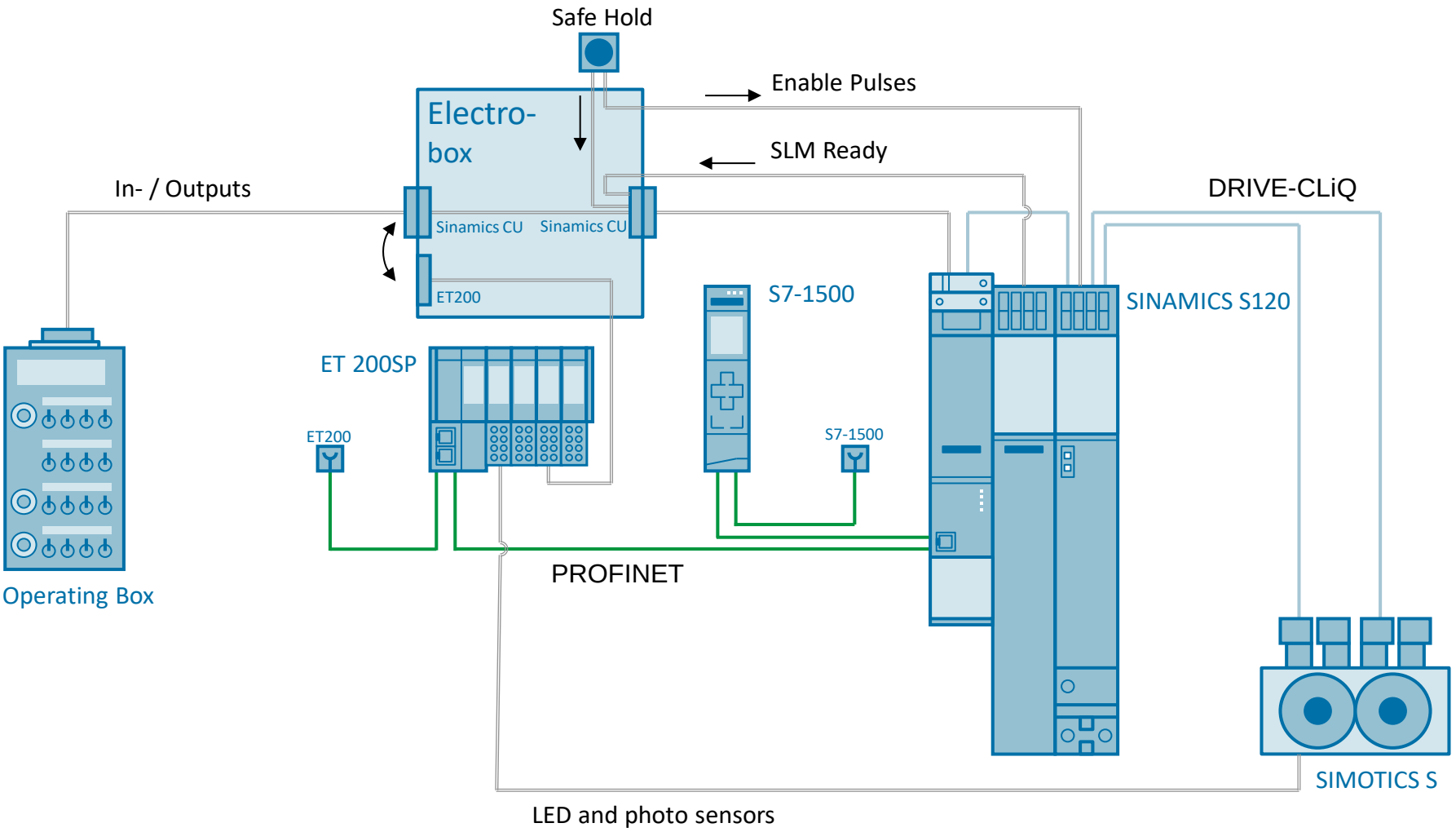


Figure 5-4 Rear side

Figure 5-5 Signal flow



6 Commissioning

ACHTUNG	• The Smart Line Module has been modified for operation with 230 V AC 50 Hz. A standard line module cannot be used. If a replacement is necessary, please contact the address listed in chapter 10.1. • See chapter 6.1 if you are re-figuring the case. • The demo and training cases described are designed to be connected to a 230 V AC 50 Hz outlet. Connecting to a different electrical grid (e.g. USA/Canada) is only possible with a transformer.

6.1 Preparing the SINAMICS S120 demonstration and training case

The SIMATIC modules are not used in the delivery state of the demonstration and training case.

You can download this project from Siemens Industry Online Support:
https://support.industry.siemens.com/cs/ww/en/view/109772205

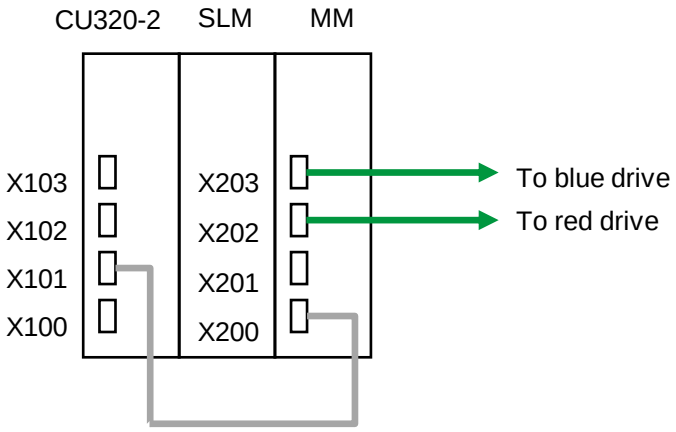
You can also download a simple project with SIMATIC S7. The functionality is identical to the project without SIMATIC, the control box is read in via the ET 200SP and the SINAMICS is controlled via PROFINET.

- If you want to use the project without SIMATIC, plug the vertical 25-pin plug into the left jack bar "Sinamics CU" as shown in Figure 5-4 and continue to chapter 6.2.
- If you want to use the project with SIMATIC, you must do the following:
  - Download the program into the SIMATIC S7 CPU 1513F 1 PN and the SINAMICS S120 with TIA Portal
  - Insert the vertical 25pole. plug into the right jack bar "ET 200" and continue to chapter 6.2.

6.2 Switching on the SINAMICS S120 demonstration and training case

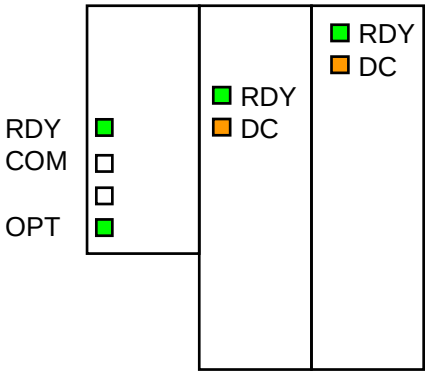
1. Before switching on, check the DRIVE-CLiQ wiring of the demonstration and training case, see Figure 6-1

Figure 6-1



2. Once switched on, the demonstration and training case will start up. This process can take up to 60 seconds.
3. Pay attention to the color of the LEDS on the components. SINAMICS has successfully started up and is ready for operation if the LEDs show the following colors:

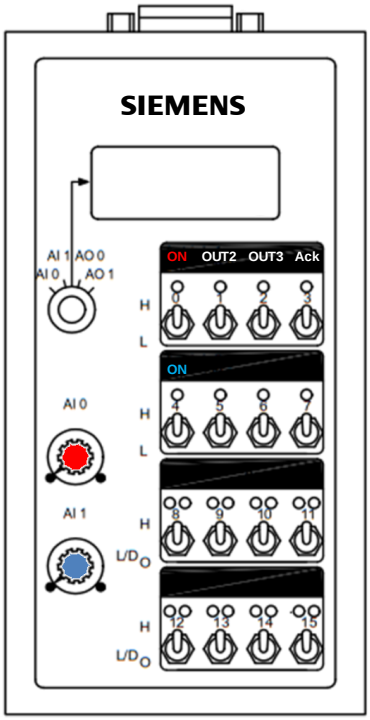
Figure 6-2



The LED "COM" may be off or is lit green.

6.3 Running a function test with the operating box

Figure 6-3



- Enable the axes by setting the switches 1 (OUT 2) and 2 (OUT 3) to "high".
- Acknowledge any error by setting switch 3 to "high" and back to "low"

- Switch the red drive on and off with switch 0 (OUT1/ON)
- Change the RPM of the red axis with the upper potentiometer (AI 0).

- Switch the blue drive on and off with switch 4 (OUT1/ON)
- Change the RPM of the blue axis with the lower potentiometer (AI 1).

6.1 Reconfiguration of the motor module

In order to make the training case as compact and easy to use as possible, special settings are necessary:

Feed-in module without DRIVE-CLiQ

Since the used line module does not have a DRIVE-CLiQ connector, the signal "ready to feed" of the feed (X21.1) is wired to the input DI 16 (X122.5) of the CU. Therefore, when parameterizing the axes, you must set p864 = r722.16:

- Set the parameter p864 of the first axis to r722.16
- Set the parameter p864 of the second axis to r722.16
- Write off the parameters in non-volatile memory (RAM to ROM) by setting parameter p977 to 1.

Reduced intermediate circuit voltage

To allow the case to operate at 230V AC 50 Hz, the Smart Line module is modified, and the DC voltage is lower than usual.

Therefore, in order to avoid corresponding error messages of the axes, you must perform the following steps online after each factory reset of the CU320-2 PN (These changes cannot be made offline):

- Set the p210 parameter of the first axis to 380
- Set the parameter p278 of the first axis to -80
- Set the parameter p340 of the first axis to 1
- Set the parameter p210 of the second axis to 380
- Set the parameter p278 of the second axis to -80
- Set the parameter p340 of the second axis to 1
- Write off the parameters in non-volatile memory (RAM to ROM) by setting parameter p977 to 1.

These settings allow you to use the two axes of the case without any additional restrictions.

Saving the project

- Upload the SINAMICS to your PG/PC and save the project.

Note These changes are already included in the original project with which the suitcase is delivered and the downloadable projects in the Siemens Industry Online Support: (https://support.industry.siemens.com/cs/ww/en/view/109772205).

7 Parts list

Table 7-1

Quantity	Item number	Name
1	6SL3040-1MA01-0AA0	SINAMICS S120 CONTROL UNIT CU320-2 PN
1	6SL3054-0FB00-1BA0	SINAMICS CompactFlash Card V5.1 without perf. extension
1	6SL3055-0AA00-2TA0	SINAMICS TERMINAL BOARD TB30
1	6SL3130-6AE15-0AB1	SINAMICS S120 SMART LINE MODULE 5KW (Modified by SIDEMO)
1	6SL3120-2TE13-0AD0	SINAMICS Double Motor Module, 2x 3A/9A, D-Type
1	1FK7022-5AK71-1LG0	SIMOTICS 1FK7 with absolute encoder, smooth shaft, not coated
1	1FK7022-5AK71-1DG0	SIMOTICS 1FK7 with incremental encoder, smooth shaft, not coated
2	6FX5002-5CN06-…	MOTION-CONNECT 500 power cable(s) 4x 1.5 C, Speed-Connect Gr. 1
2	6FX5002-2DC10-....	MOTION-CONNECT 500 signal cable(s) DRIVE-CLiQ, IP20/IP67, with 24V
1	6ES7590-1AB60-0AA0	S7-1500 rail, shortened to 120 mm
1 [1)]	6ES7513-1FL02-0AB0	SIMATIC S7 CPU 1513F-1 PN
1 [1)]	6ES7954-8LF03-0AA0	SIMATIC S7 Memory Card, 24 MB
1	6ES7155-6AU00-0CN0	SIMATIC ET 200SP Interface Module IM 155-6PN High Feature
1	6ES7131-6BH01-0BA0	SIMATIC ET 200SP Dig. Input module DI 16x 24V DC Std.
1	6ES7132-6BH00-0BA0	SIMATIC ET 200SP Dig. Output module DQ 16x 24VDC/0.5A Std.
1	6ES7138-6CG00-0BA0	SIMATIC ET 200SP TM Timer DI DQ 10x 24V (Time-based IO)
1	6ES7134-6FB00-0BA1	SIMATIC ET 200SP analog input module AI 2xU Standard
1	6ES7193-6AR00-0AA0	SIMATIC Bus Adapter 2xRJ45 for interface module
1	6ES7193-6BP00-0DA0	SIMATIC Base Unit Type A0, push-in separate (for I/O module 1)
1	6ES7193-6BP00-0BA0	SIMATIC Base Unit Type A0, Push-in bridged (for I/O module 2-4)

8 IP-Addresses

In delivery state (project without SIMATIC) the following IP addresses and PROFINET names are set:

- X150
  192.168.111.120 with 255.255.255.0
  The PROFINET name is set to **s120** .
- X127
  169.254.11.22 with 255.255.0.0

[1)] only populated for 6ZB2480-0CN01

9 Circuit diagram

Figure 9-1

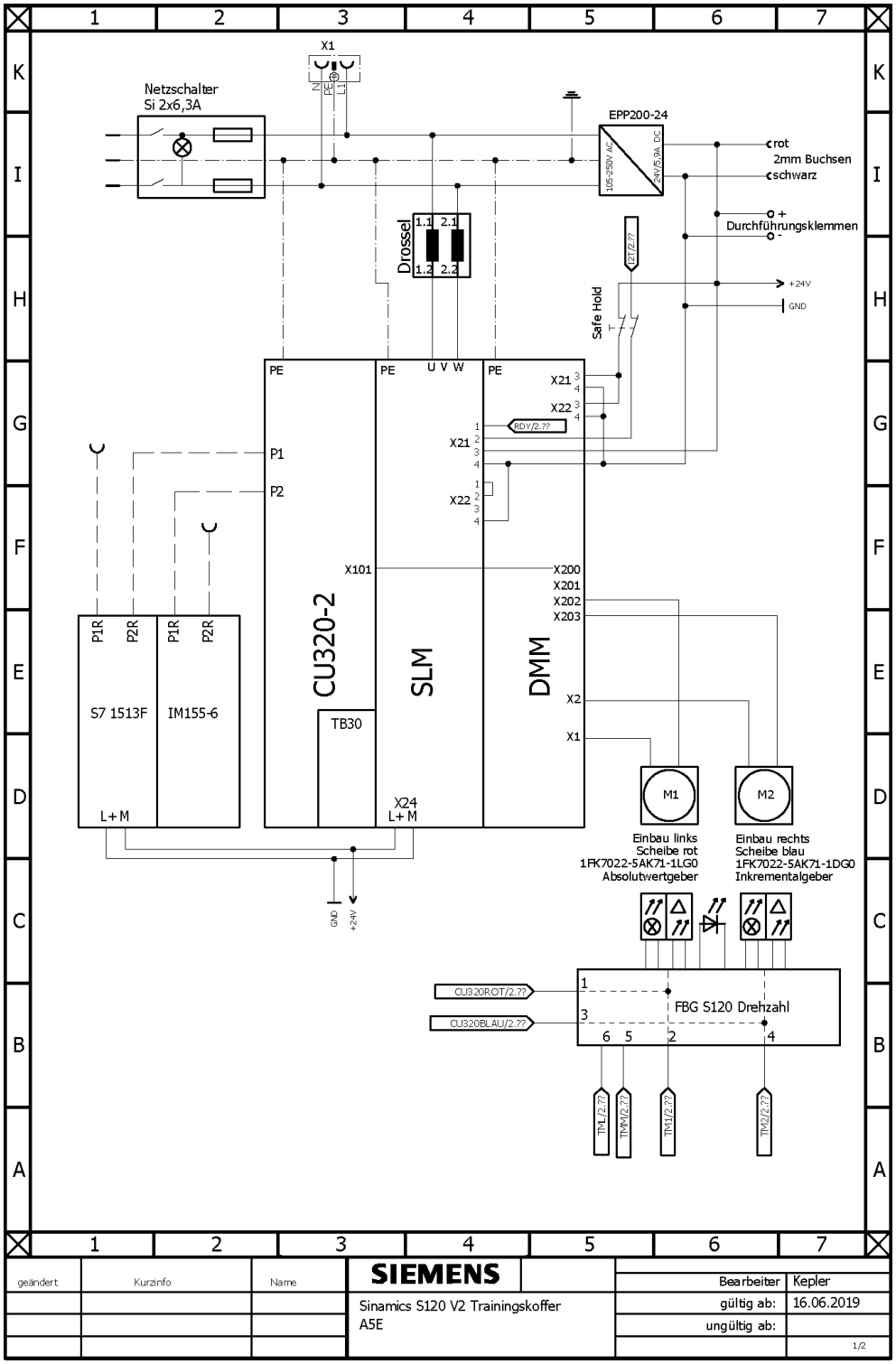


Figure 9-2

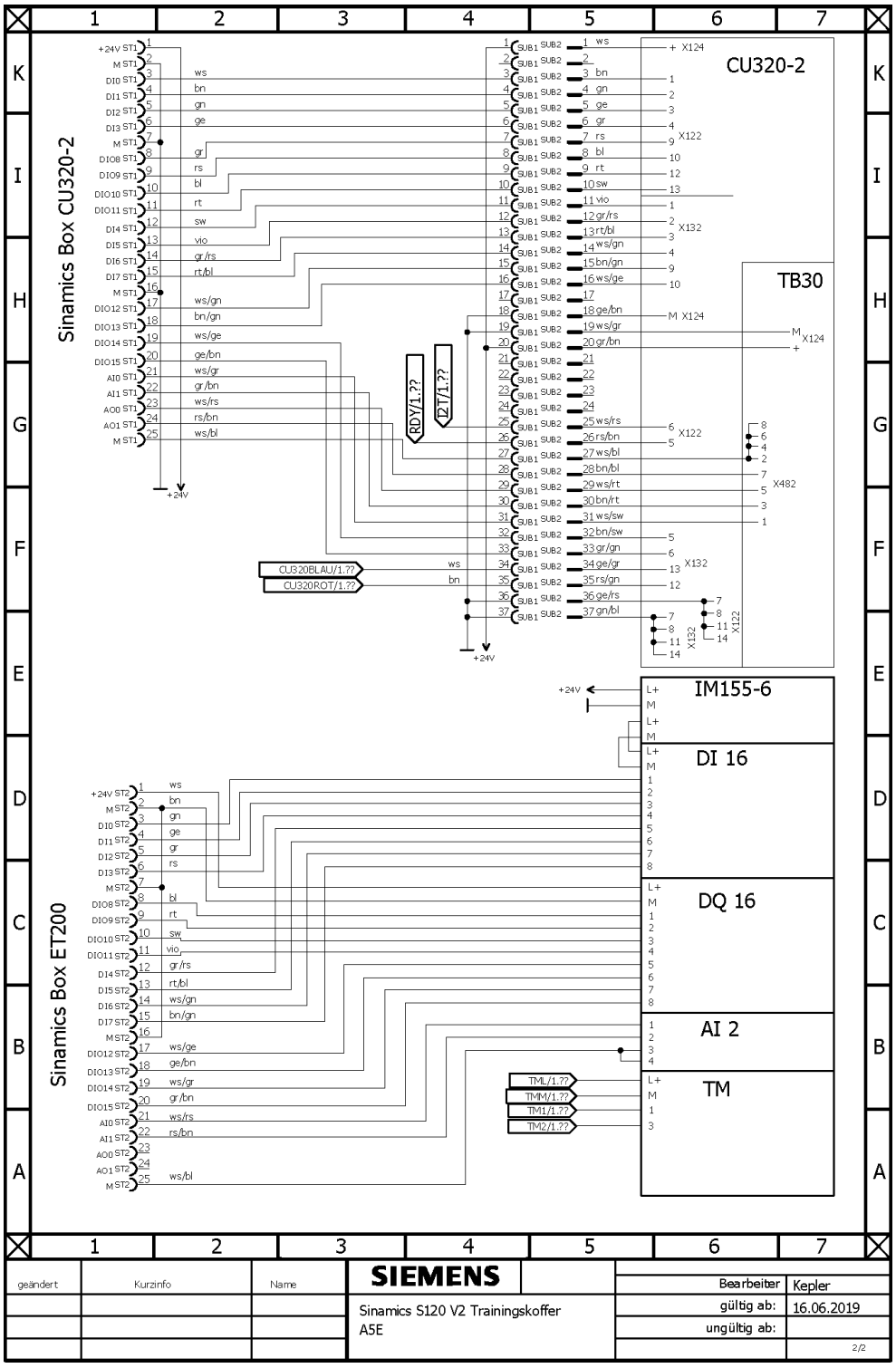
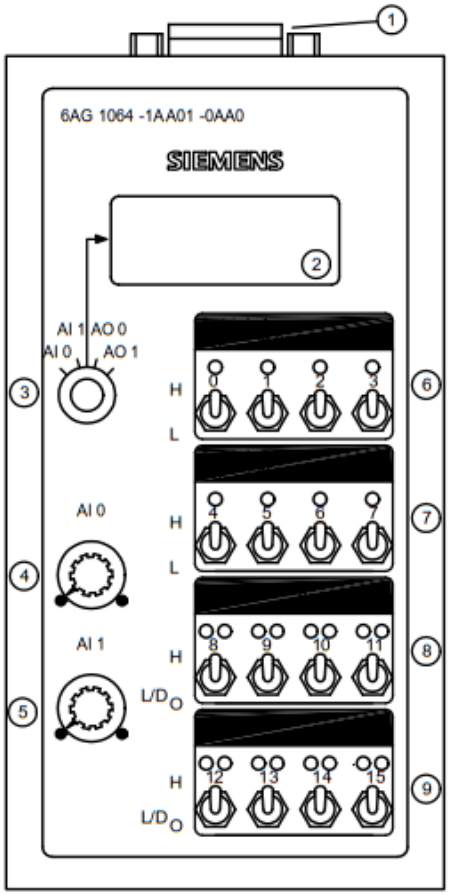


Figure 9-3



Bedienbox
operator box

	Pin	Aderfarbe	color of conductor
+24V	1	rt	rd
M	2	bl	bl
DI0	3	ge /bn	ye /bn
DI1	4	sw	bk
DI2	5	rt /ws	rd /wh
DI3	6	rs	pk
M	7	gr	gr
DIO8	8	ge	ye
DIO9	9	gn	gn
DIO10	10	bn	bn
DIO11	11	ws	wh
DI4	12	gn /ws	gn /wh
DI5	13	bn /gn	bn /gn
DI6	14	bn /bl	bn /bl
DI7	15	vio	vio
M	16	gr /rs	gr /pk
DIO12	17	ws /ge	wh /ye
DIO13	18	bn /gr	bn /gr
DIO14	19	sw /ws	bk /wh
DIO15	20	rt /bl	rd /bl
AI 0	21	rs /bn	pk /bn
AI 1	22	bn /rt	bn /rd
AO 0	23	ws /bl	wh /bl
AO 1	24	rs /ws	pk /wh
M	25	ws /gr	wh /gr
M	Geh.	Geh.	box

① 25-pol. SUB-D-Stiftstecker
25-pol. SUB-D-plug (male)

② Digitalanzeige
digital display

③ Wahlschalter für Digitalanzeige
selection switch for digital display

④ ZG-Poti -10V...+10V Analogeingang 0
ten-turn poti -10V...+10V analog input 0

⑤ ZG-Poti -10V...+10V Analogeingang 1
ten-turn poti -10V...+10V analog input 1

⑥ Schaltbare Digitaleingänge 0...3
Switchable digital inputs 0...3

⑦ Schaltbare Digitaleingänge 4...7
Switchable digital inputs 4...7

⑧ Schaltbare Digitalein-/ausgänge 8...11
Switchable digital in-/outputs 8...11

⑨ Schaltbare Digitalein-/ausgänge 12...15
Switchable digital in-/outputs 12...15

10 Repair and Return

10.1 Repair

Device repairs may only be performed by specialists authorized by Siemens.

If a malfunction occurs, contact us to discuss the actions to be taken.
www.siemens.com/sidemo/systems

10.2 Returns

Customer

As a customer, please get in touch with your Siemens contact partner:
https://www.industry.siemens.com/aspa_app.

Siemens employees

Please send the defective device to the OrgID address found in the PMD. This can be found under SERVICE/Reparatur/RepLief.

Please also enclose or arrange the following:

- Delivery note containing your Org-ID and a valid purchase order (purchase order must be allocated to Org-ID AV000085!)
- Detailed problem description (what must be done)
- Original delivery note (if available)

A purchase order with account assignment to Org-ID AV000085 is **necessary** for the transaction!

11 Manufacturer

Siemens AG
Digital Industries
Factory Automation
Breslauer Strasse 5
90766 Fuerth, Germany

www.siemens.com/sidemo/systems

12 Appendix

12.1 Service and support

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

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https://support.industry.siemens.com

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- Repair services
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- Service programs and contracts

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https://support.industry.siemens.com/cs/sc

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for iOS and Android :
https://support.industry.siemens.com/cs/ww/en/sc/2067

12.2 Links and literature

Table 12-1

No.	Subject
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to the article page of the Application Example https://support.industry.siemens.com/cs/ww/en/view/109772205
\3\	

12.3 Change documentation

Table 12-2

Version	Date	Change
V1.0	122019	First edition