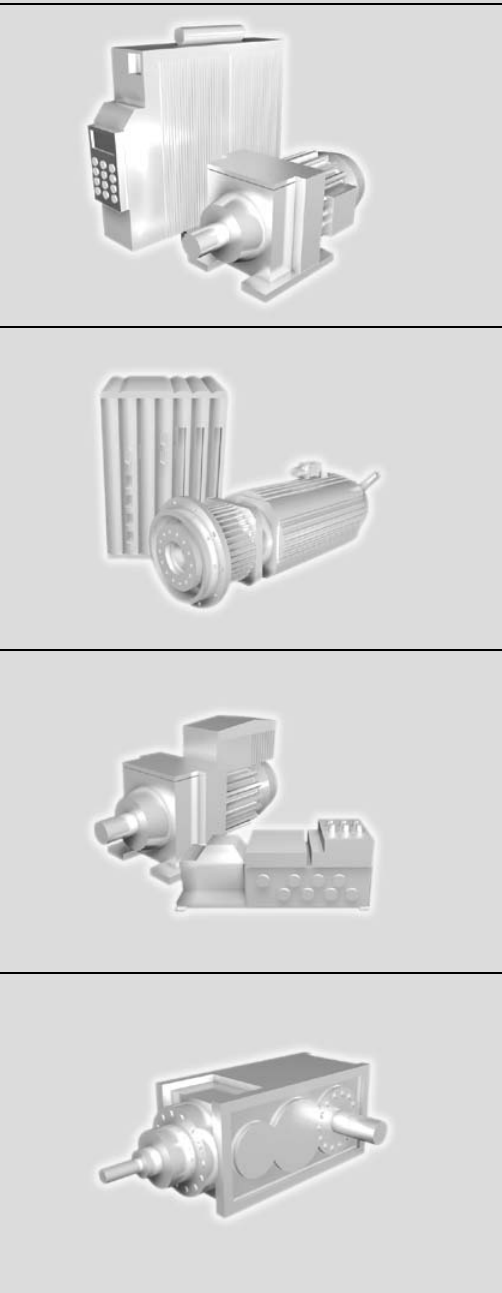




SEW
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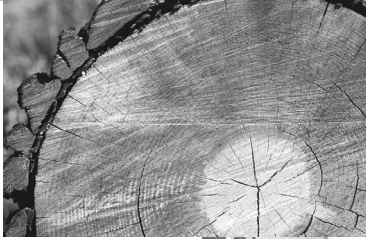
DOP11A Operator Terminals

GE410000

Edition 05/2006

11424613 / EN

Operating Instructions





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1 Important Notes

1.1 Safety and warning instructions

Always observe the safety and warning instructions in this documentation.



Hazard

Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.



Warning

Indicates an imminently hazardous situation caused by the product which, if not avoided, WILL result in death or serious injury. You will also find this signal to indicate the potential for damage to property.



Caution

Indicates a potentially hazardous situation which, if not avoided, MAY result in minor injury or damage to products.



Note

Indicates a reference to applications, for example for startup, or other useful information.



Documentation reference

Indicates a reference to a document, such as operating instructions, catalog or a data sheet.

You must adhere to the operating instructions to ensure:

- Fault-free operation
- Fulfillment of any rights to claim under limited warranty

Consequently, read the operating instructions before you start working with the unit!

The operating instructions contain important information on servicing. Therefore, keep the operating instructions close to the unit.



Important Notes

Notes on terminology

1.2 Notes on terminology

The operator terminals of the DOP11A series (Drive Operator Panel) can communicate with SEW frequency inverters and selected programmable logic controllers (PLC) via different communication paths at the same time.

For simplicity sake, we will be referring to **both units (PLC and inverter)** as **controller** in this document.

1.3 Designated use



The operator terminals of the DOP11A series are units for operation and diagnostics of industrial and commercial systems.

Do not start up the unit (take it into operation in the designated fashion) until you have established that the machine complies with the EMC Directive 89/336/EEC and that the conformity of the end product has been determined in accordance with the Machinery Directive 98/37/EC (with reference to EN 60204).

1.4 Operational environment

The following uses are prohibited unless the units are expressly designed for the purpose:



- Use in potentially explosive areas.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc. You will find a list of the approved materials in the appendix.
- Use in non-stationary applications that are subject to mechanical vibration and shock loads in excess of the requirements in EN 50178.

1.5 Safety functions



The operator terminals of the DOP11A series may not execute any safety functions without master safety systems.

Use higher-level safety systems to ensure protection of equipment and personnel.



1.6 Liability for defects

Incorrect handling or any action performed that is not specified in these operating instructions could impair the properties of the product. In this case, you lose any right to claim under limited warranty against SEW-EURODRIVE GmbH & Co KG.

1.7 Product names and trademarks

The brands and product names in these operating instructions are trademarks or registered trademarks of the titleholders.

1.8 Disassembly and waste disposal



- Complete or partial recycling of the operator terminal is subject to local regulations.
- Note that the following components contain substances that may represent a health hazard and cause environmental pollution: Lithium battery, electrolyte condensers and display.



2 Safety Notes

2.1 General information

- Read the safety notes carefully.
- Check the delivery for transport damage. If damage is found, advise your supplier.
- The terminal fulfills the requirements of article 4 of EMC directive 89/336/EEC.
- Do not use the terminal in an environment with high explosive hazard.
- SEW-EURODRIVE is not liable for modifications, changes, additions and / or alterations to the product.
- Use only spare parts and accessories manufactured according to SEW-EURODRIVE specifications.
- Read the installation and operating instructions completely and carefully prior to installation, use or repair of the terminal.
- Never allow fluids to penetrate the slots or holes in the terminal. This may lead to a fire or cause the equipment to become live.
- Operation of the terminal is restricted to qualified personnel.

2.2 Installation and startup

- The terminal has been designed for stationary installation.
- Place the terminal on a stable base during installation. The terminal may be damaged if it is dropped.
- Install the terminal according to the accompanying installation instructions.
- The unit must be grounded according to the accompanying installation instructions.
- The installation must be performed by qualified personnel.
- Route high-voltage cables, signal cables and supply cables separately from one another.
- Make sure that the voltage and polarity of the electrical power source are correct before you connect the terminal to the power supply.
- The openings in the housing are designed to allow air to circulate and must not be covered over.
- Do not install the terminal in locations where it will be exposed to a powerful magnetic field.
- **Do not install or operate the terminal where it will be exposed to direct sunlight.**
- The peripheral equipment must be suitable for the application.
- On certain terminal models, the display glass is covered with a laminated foil to protect it from scratches. Pull off the foil carefully following installation to prevent static electricity causing damage to the terminal.



- Make sure that **preventive measures** and **protection devices** correspond to the **applicable regulations** (e. g. EN 60204 or EN 50178).

Required preventive measures: Ground the unit

Required protection devices: Overcurrent protective devices

2.3 *Transportation/storage*

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately. Do not operate the operator terminal if it is damaged.

Use suitable, sufficiently rated handling equipment if necessary.



Possible damage caused by incorrect storage!

Store the operator terminal in a dry, dust-free room if it is not to be installed straight away.

2.4 *Operating notes*

- Always keep the terminal clean.
- **Emergency stop and other safety functions should not be controlled from the terminal.**
- Do not touch the keys, displays, etc. with sharp objects.
- Bear in mind that the terminal is ready to operate even if the backlighting no longer functions. This means keyboard and touchscreen inputs will still be registered.

2.5 *Service and maintenance*

- The agreed limited warranty applies.
- Clean the display and face of the terminal with a soft cloth and mild detergent.
- Repairs must be performed by qualified personnel.



3 Unit Information, Installation and Hardware

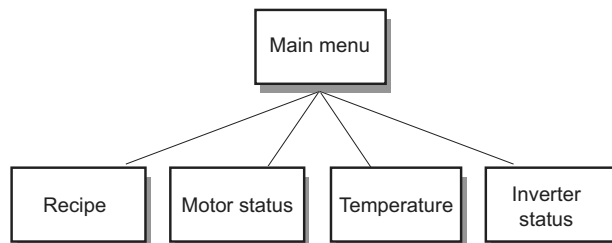
3.1 Introduction

Requirements in modern industrial environments are steadily increasing and operator tasks at machines or on production lines are becoming increasingly more complex and involve more responsibility. The operator must be able to obtain information on the current status quickly and easily, and be able to influence the operation of the machine immediately. The functions in control systems are also increasing and becoming more advanced, enabling more complicated processes to be controlled efficiently. The operator terminals make human-machine communication simple and safe even for the most advanced processes.

The graphical operator terminals have been developed to meet the requirements for human-machine communication when controlling or monitoring different applications in the manufacturing and process industries, etc. They simplify the operators work since they can easily be adapted to the working environment, This means the operator can continue to use the concepts her or she is familiar with.

Projects can be built up as menu hierarchies or sequences in the terminal. A menu hierarchy consists of a main menu (with, for example, an overview) and a number of underlying menus with more detailed information on special sections. The operator normally selects which menu is to be shown.

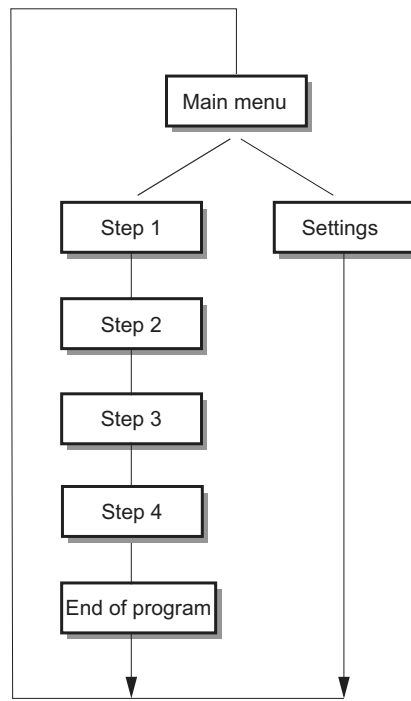
The menus in the operator terminals are called blocks.



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A sequence is also based on a main menu, from which the operator selects a sequence showing the blocks in a predetermined order. The program in the controller is usually used to control the block display.



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The functions of the operator terminals enable the process to be displayed as graphics or as text. There are also functions for

- Alarm handling
- Printing
- Trends
- Recipe management
- Time control

The functions are not only easy to use in the panel, they are also cost-effective in comparison with conventional solutions with buttons, indicator lamps, time relays, preset counters and seven-day clocks. There are also functions to improve the application of the drive electronics.



3.1.1 Programming

You program the operator terminal using a PC and the HMI-Builder software.



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The operator terminal is to a large extent object-oriented, i.e. an object is selected first and the function of the object is then assigned. All types of signals are defined on this principle.

The programmed project is stored in the operator terminal.

3.1.2 Connecting the terminal to SEW frequency inverters

There are many advantages in using a terminal together with the controller system:

- The user does not need to make any changes or additions in the existing controller programs
- and the terminal does not block any of the inputs or outputs in the controller system.
- Overview of controller functions will be optimized, e.g. time control and alarm handling.



3.1.3 Status display and control

The operator is familiar with indicator lamps as well as analog and digital display instruments since these are used in the majority of applications today. The same applies to push buttons and rotary and thumbwheel switches for controlling a system. The terminal enables the operator to have all status displays and controls in one unit.

The operator can easily see and influence information in the controller system. Moreover, it is possible to clearly see and influence all the signals affecting a specific object, e.g. a pump or a drive unit, which further simplifies the work.

This is possible thanks to the fact that the interchange of all information takes place through the so-called blocks in the terminal. Blocks can be text blocks, with only text information, or graphic blocks, with full graphical presentation.

The operator terminals are equipped with function keys for direct control. Maneuvering is controlled by linking different commands to the function keys. This optimizes the control process.

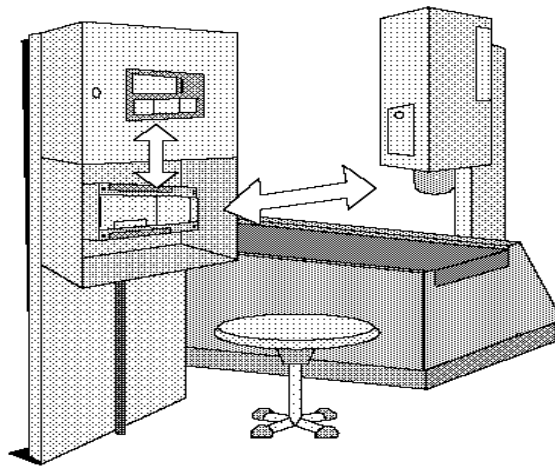
If several blocks are used, the operator can jump between the different blocks by using jump commands. This creates a menu hierarchy, which produces a structured application.



3.1.4 Setting up the operator terminal

The terminal should be placed at the workplace to ensure maximum usability. This will enable the operator to receive all necessary information and work effectively. Set up the terminal at the correct height so that the user can see and operate it without problems. Visibility of the screen is influenced by distance, height, angle, light and color selection.

Monitoring, control and maintenance are remote functions and can be executed, for example, from a different location in the building or a different city. In such instances communication can take place via LAN (Local Area Network), Internet or modem. If there is a long production line with a large number of workplaces several terminals can be connected to one or more controller systems in the network.



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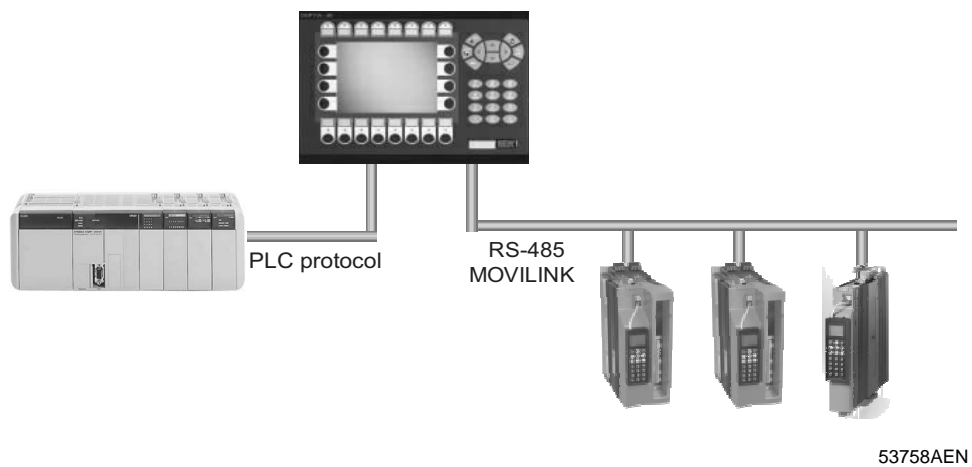


3.1.5 Compact solutions

External units such as barcode scanners, weighing machines, modems, etc. can be connected through the terminal to the controller system. All that is required is for the unit to be connected to an RS-232 interface, and that communication is made through ASCII protocol. Data entering the terminal is written directly to the controller register.

It is also possible to connect a unit working in parallel, such as an additional terminal or a PC with the MOVITOOLS[®] programming software for the inverter. The terminal then makes it possible to program the controller system while also communicating with the controller system.

When the PLC and the inverter are connected to one terminal (two drivers in the terminal), data can be exchanged between the two units (analog and digital signals).





3.2 Unit designation, nameplates and scope of delivery

3.2.1 Example unit designation

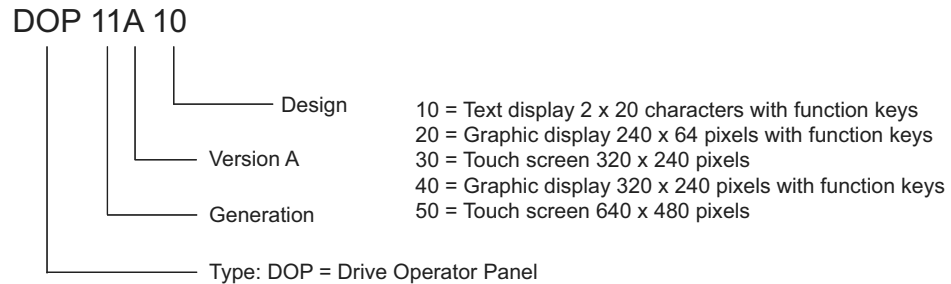


Figure 1: Unit designation

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3.2.2 Example nameplate

The unit nameplate is attached to the side of the unit.

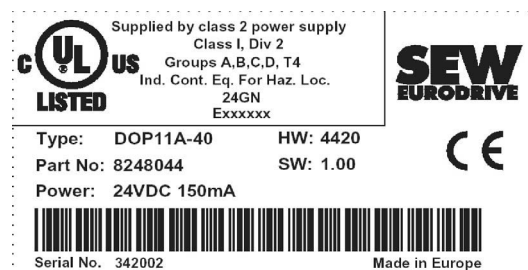


Figure 2: Unit nameplate

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3.2.3 Scope of delivery

Included in the scope of delivery:

- DOP11A operator terminals
- Installation equipment and installation template
- Operating instructions with assembly and installation notes
- Phoenix COMBICON connector for DC 24 V, 5 mm, 3-pin (exception: DOP11A-50)



3.3 DOP11A-10 unit design

Part number: 8248001



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Figure 3: DOP11A-10:

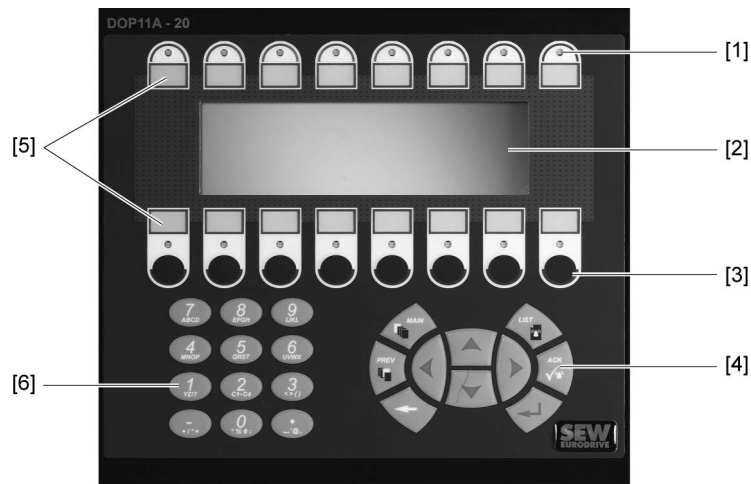
- [1] Display
- [2] Function keys
- [3] Navigation keys
- [4] Numerical keys

- 2 x 20 character LCD text display (monochrome) with background illumination
- Voltage supply: DC 24 V, 200 mA
- 3 serial interfaces (RS-232, RS-422 and RS-485); two can be used simultaneously
- IP65 membrane keypad with navigation keys, numeric keypad and 3 function keys
- 64 KByte Flash-EEPROM
- Outer dimensions 142 x 90 x 46.5 mm



3.4 DOP11A-20 unit design

Part number: 8248028



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Figure 4: DOP11A-20

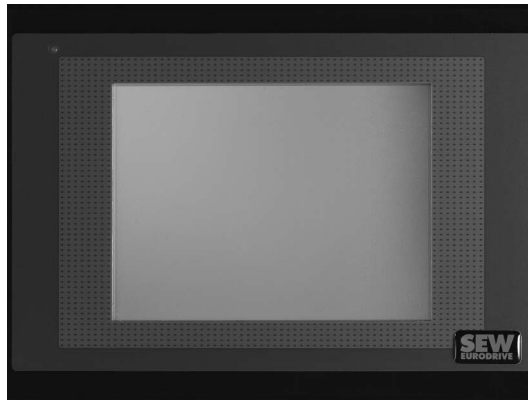
- [1] LEDs red / green
- [2] Display
- [3] Function keys
- [4] Navigation keys
- [5] Labeling tiles
- [6] Numerical keys

- 240 x 64 pixel LCD graphic display (monochrome) with background illumination
- Voltage supply: DC 24 V, 450 mA
- Two serial interfaces (RS-232 and RS-422); two can be used simultaneously
- IP65 membrane keypad with navigation keys, numeric keypad and 8 function keys
- 16 LEDs (two colors red / green)
- 1 expansion slot
- 400 Kbytes Flash EEPROM
- Outer dimensions 214 x 194 x 75 mm



3.5 DOP11A-30 unit design

Part number: 8248036



10367AXX

Figure 5: DOP11A-30

- 320 x 240 pixels, ¼ VGA touch screen (256 colors, STN, 5.7") with background illumination
- Voltage supply: DC 24 V, 450 mA
- Three serial interfaces (RS-232, RS-422 and RS-485); two can be used simultaneously
- IP65
- Horizontal or vertical installation
- 1 expansion slot
- 400 Kbyte Flash EEPROM
- Outer dimensions 200 x 150 x 74 mm



3.6 DOP11A-40 unit design

Part number: 8248044

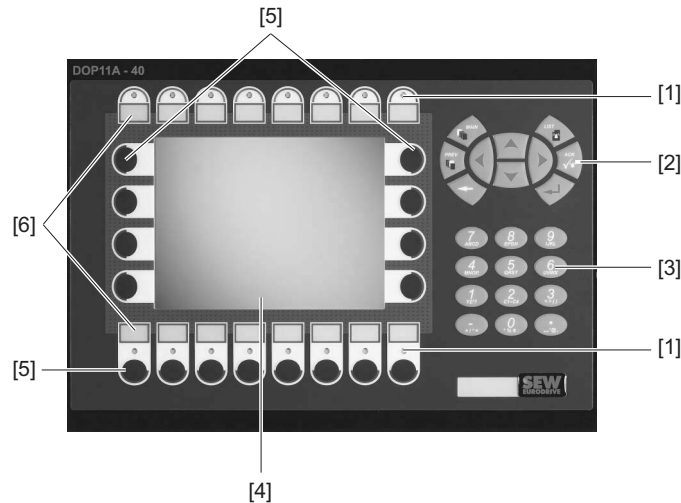


Figure 6: DOP11A-40

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- [1] LEDs red / green
- [2] Navigation keys
- [3] Numerical keys
- [4] Display
- [5] Function keys
- [6] Labeling tiles

- 320 x 240 pixels, ¼ VGA graphic display (256 colors, STN, 5.7") with background illumination
- Voltage supply: DC 24 V, 550 mA
- Two serial interfaces (RS-232 and RS-422); two can be used simultaneously
- IP65 membrane keypad with navigation keys, numeric keypad and 16 function keys
- 16 LEDs (two colors red / green)
- 2 expansion slots
- 400 Kbytes Flash EEPROM
- Outer dimensions 276 x 194 x 92.3 mm



3.7 DOP11A-50 unit design

Part number: 8248052



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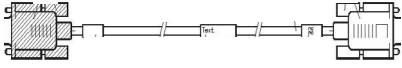
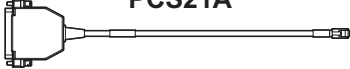
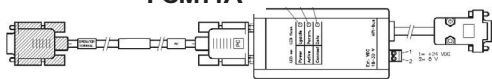
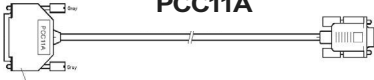
Figure 7: DOP11A-50

- 640 x 480 pixels, VGA touch screen (256 colors, 10.4") with background illumination
- Voltage supply: AC 100 ... 240 V, 350 mA
- 2 serial interfaces (RS-232 and RS-422); two can be used simultaneously
- IP65
- 2 expansion slots
- 1600 Kbyte Flash EEPROM
- 290 x 247 x 114 mm



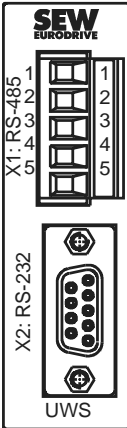


3.8 Accessories and options

Cables for programming of the DOP11A operator terminal and communication between operator terminal and MOVIDRIVE®.

<p>PCS11A (Panel Cable Serial)</p>	<p>Connection cable between operator terminal (RS-232, max. 57.6 Kbit/s) and PC (RS-232) for programming the operator terminal. Set length of 3 m (10 ft.).</p> <p style="text-align: center;">PCS11A</p> 	<p>8248087</p>
<p>PCS21A (Panel Cable Serial)</p>	<p>Communication cable between the operator terminal (RS-485, max. 57.6 Kbit/s) and SEW frequency inverters (RS-485, RJ-10). Set length of 5 m (10 ft.).</p> <p style="text-align: center;">PCS21A</p> 	<p>18206328</p>
<p>PCM11A (Panel Cable MPI)</p>	<p>Communication cable between the operator terminal (RS-232, max. 57.6 Kbit/s) and SIMATIC S7 via MPI (max. 12 Mbit/s). Set length of 3 m (10 ft.).</p> <p style="text-align: center;">PCM11A</p> 	<p>8248303</p>
<p>PCC11A (Panel Cable Converter)</p>	<p>Communication cable between operator terminal (RS-422, max. 57.6 Kbit/s) and UWS11A or USS21A (RS-232) interface converters. For communication with SEW frequency inverters. Set length of 3 m (10 ft.).</p> <p style="text-align: center;">PCC11A</p> 	<p>8248095</p>



<p>PFE11A (ETHERNET panel field-bus)</p>	<p>Option card ETHERNET TCP/IP (10 Mbit/s)</p> <p>To connect the DOP11A operator terminal to the customer's PC network. The following functions become available by using the ETHERNET option:</p> <ul style="list-style-type: none"> • Operation of the HMI-Builder software for programming the operator terminal via ETHERNET (projects can be uploaded and downloaded more quickly). • Use of the integrated WEB server for operation and control of the operator terminal via Internet Explorer. • For operation of MOVITOOLS® via ETHERNET and using the pass-through function. Additional software is required for rerouting the PC communication port (Com 1 to Com 9) to the ETHERNET IP address of the operator terminal. 		<p>8248079</p>
<p>PFP11A (PROFIBUS panel field-bus)</p>	<p>PROFIBUS DP interface</p> <p>To connect the DOP11A operator terminal to the customer's PROFIBUS fieldbus interface.</p> <p>The operator terminal serves as a slave in PROFIBUS and is linked to the PLC process image.</p> <ul style="list-style-type: none"> • I/O range: 32 ... 200 bytes • Baud rate: 9.6 Kbit/s ... 12 Mbit/s • Identity code: 1002 <p>PLC-independent option for data exchange between controller and operator terminal.</p> <p>You can communicate with the drive components at the same time via the serial interface.</p>	<p>PROFI-BUS DP option card</p> 	<p>8248060</p>
<p>UWS11A</p>	<p>Interface converter for DIN rail mounting RS-232 ↔ RS-485</p> 	<p>822689X</p>	



4 Installation

4.1 Installation instructions for the basic unit



It is essential to comply with the safety notes in section 2 during installation.

4.1.1 Separate cable ducts

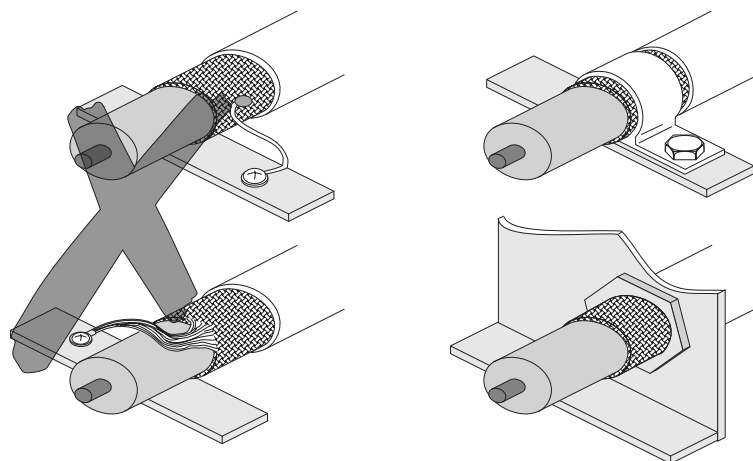
Route **power cables** and **electronics cables** in **separate cable ducts**.

4.1.2 Cross sections

- Voltage supply: **Cross section according to rated input current.**
- Electronics cables:
 - 1 conductor per terminal 0.20 ... 0.75 mm² (AWG 20 ... 17)
 - 2 conductors per terminal 0.20 ... 0.75 mm² (AWG 20 ... 17)

4.1.3 Shielding and grounding

- Use **shielded control cables** only.
- Apply the **shield by the shortest possible route and make sure it is grounded over a wide area at both ends**. You can ground one end of the shield via a suppression capacitor (220 nF / 50 V) to avoid ground loops. If using double-shielded cables, ground the outer shield on the controller end and the inner shield on the other end.



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Figure 8: Example of correct shield connection with metal clamp (shield clamp) or metal cable gland



- **Shielding** can also be achieved by laying the cables in **grounded sheet metal ducts or metal pipes**. In this case, the **power cables and control cables** should be **routed separately**.
- The unit is grounded via the connector for 24 V or 240 V voltage supply.

4.2 UL-compliant installation

Note the following points for UL-compliant installation:

Use only copper conductors with a temperature range of 60 / 75 °C as connection cables.



Electrical connection according to the methods described in class 1, paragraph 2 (article 501-4(b) according to National Electric Code NFPA70).



Only use tested units with a **limited output voltage** ($V_{max} = DC 30 V$) and **limited output current** ($I \leq 8 A$) as an **external DC 24 V** voltage source.



UL certification does not apply to operation in voltage supply systems with a non-grounded star point (IT systems).



Installation

Connecting basic units DOP11A-10 to DOP11A-50

4.3 Connecting basic units DOP11A-10 to DOP11A-50

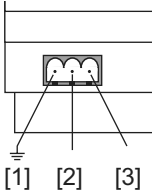
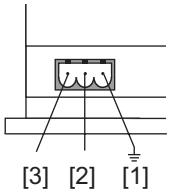
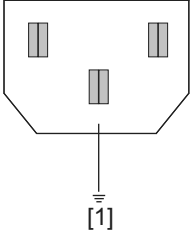
4.3.1 Voltage supply



Ensure correct polarity when connecting the terminal. Incorrect polarity will damage the unit.



Make sure that the operator terminal and the controller system have the same electrical grounding (reference voltage value). Communication errors may occur if this is not the case.

<p>DOP 11A-10, DOP11A-20 & DOP11A-40</p>  <p>[1] [2] [3]</p>	<p>DOP 11A-30</p>  <p>[3] [2] [1]</p>	<p>DOP 11A-50</p>  <p>[1]</p>
<p>Voltage supply for DOP11A-10 to DOP11A-40</p>		<p>Voltage supply DOP11A-50 (AC 100 ... 240 V)</p>
<p>53031AXX</p>		<p>53630AXX</p>

- [1] Ground
- [2] 0 V
- [3] +24 V



4.4 Connection to a PC

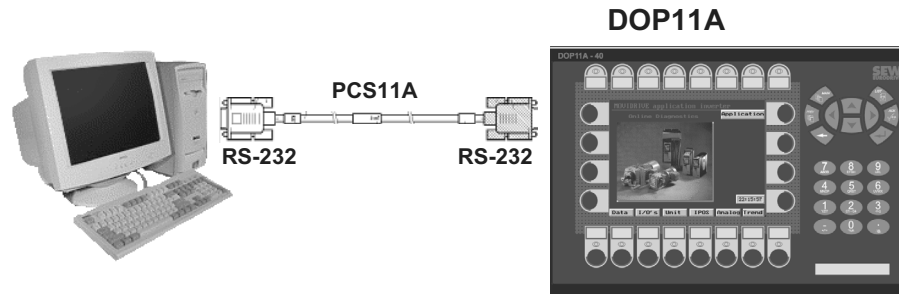


Figure 9: Connection to a PC

53040AXX

The operator terminal is programmed using the HMI-Builder software.
You need the PCS11A communication cable to program the operator terminal.



The power must be switched off when connecting the units.



Installation

Connecting RS-485 (only for DOP11A-10, DOP11A-20 from HW1.10 and

4.5 Connecting RS-485 (only for DOP11A-10, DOP11A-20 from HW1.10 and DOP11A-30)

You can connect up to 31 MOVIDRIVE® units to one operator terminal with the RS-485 interface.

Connecting the DOP11A unit to a MOVIDRIVE® frequency inverter directly via RS-485:

- DOP11A-10 via 25-pin Sub-D connector
- DOP11A-20 via 25-pin Sub-D connector (from HW 1.10)
- DOP11A-30 via Phoenix plug-in terminal strip

4.5.1 Wiring diagram: RS-485 interface

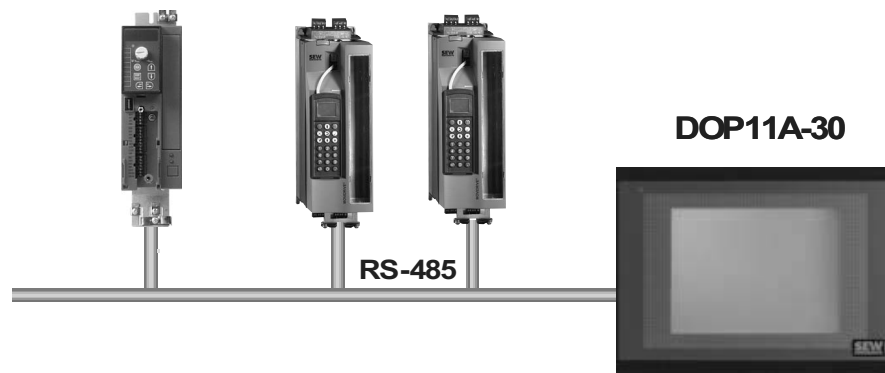
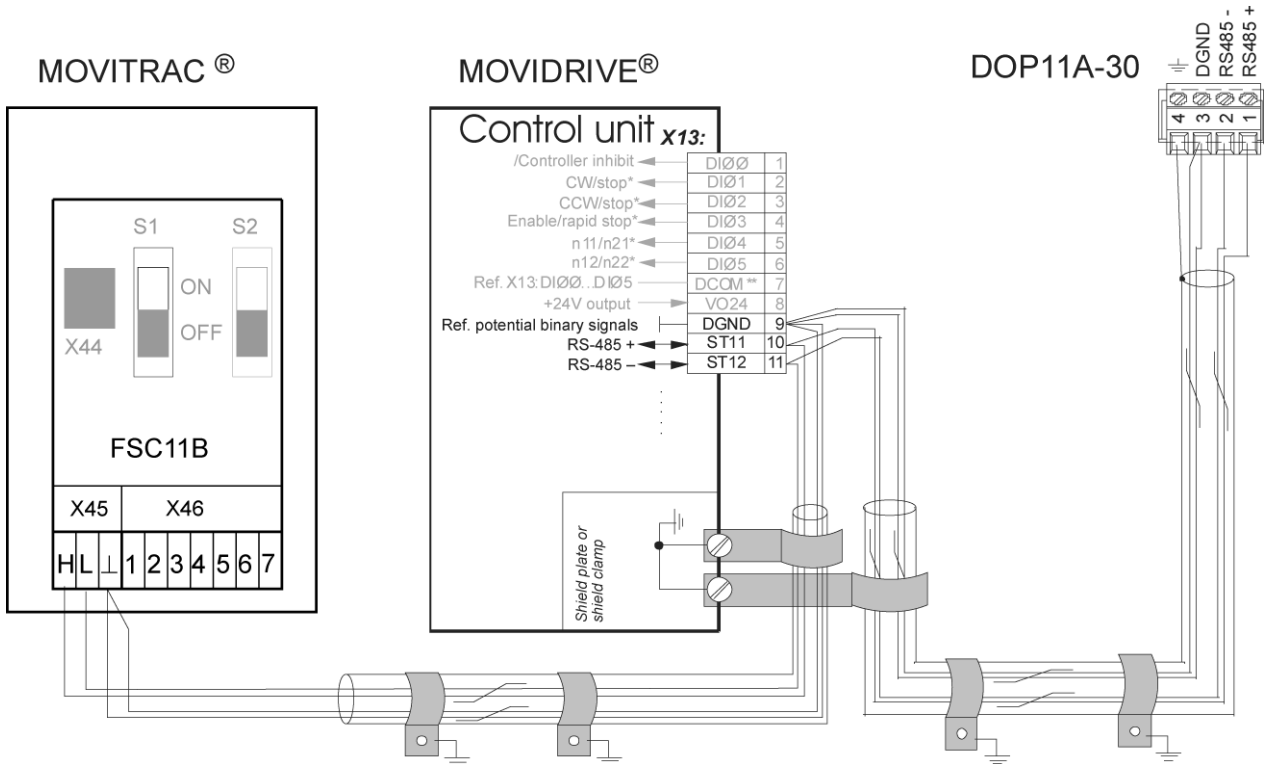


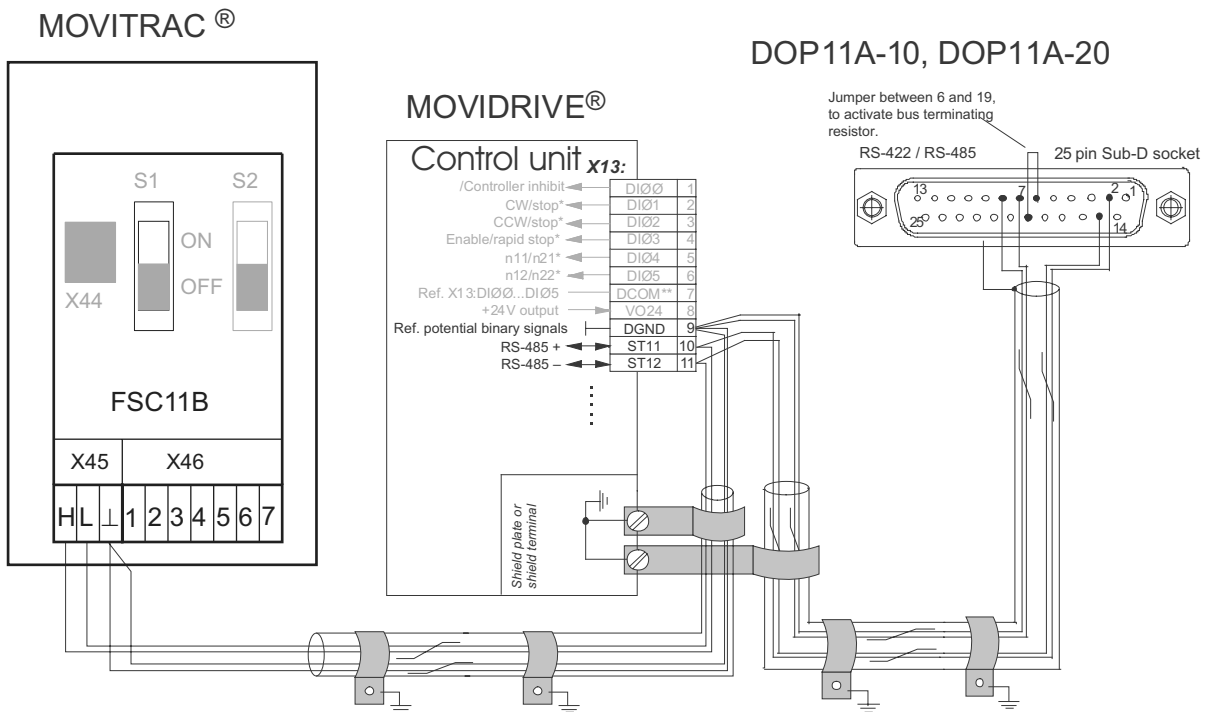
Figure 10: RS-485 connection

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Figure 11: DOP11A-30 terminal assignments



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Figure 12: DOP11A-10 pin assignments



Installation

Connecting RS-485 (only for DOP11A-10, DOP11A-20 from HW1.10 and

Cable specification

Use a 2x2 core twisted and shielded copper cable (data transmission cable with braided copper shield). The cable must meet the following specifications:

- Core cross section 0.5 ... 0.75 mm² (AWG 20 ... 18)
- Cable resistance 100 ... 150 Ω at 1 MHz
- Capacitance per unit length ≤ 40 pF/m (12 pF/ft) at 1 kHz

For example, the following cable is suitable:

- Lappkabel, UNITRONIC® BUS CAN, 2 x 2 x 0.5 mm².

Shielding

Apply shield on both ends over large area at the controller electronics shield clamp and in the housing of the 25-pin Sub-D connector of the operator terminal.

Do not connect the shield ends with DGND!

Cable length

The permitted total cable length is 200 m (660 ft).

Terminating resistor

The controller and the UWS11A interface converter come equipped with dynamic terminating resistors. Do not connect **any external terminating resistors** in this instance!

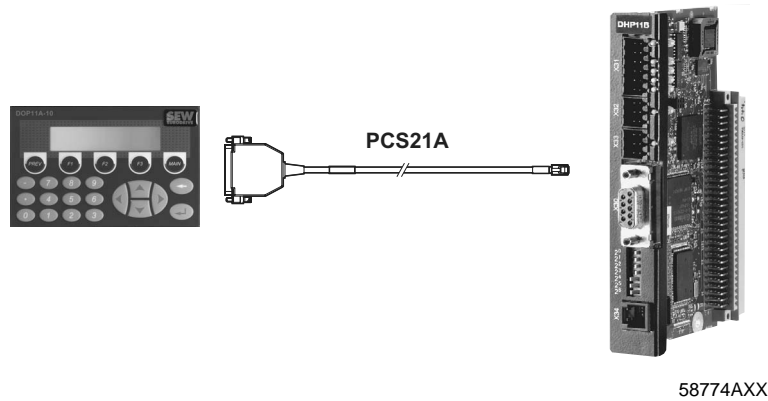
If the DOP11A-10 operator terminal is connected to the frequency inverters via RS-485, activate the terminating resistor in the 25-pin Sub-D connector of the DOP11A-10 (jumper between pin 6 and pin 19) if the operator terminal is the first or last station.



There must not be any difference of potential between the units connected using the RS-485. Take suitable measures to avoid a potential displacement, for example, by connecting the unit grounds (GND) with a separate cable, connecting the voltage supply (24 V) etc.



4.6 Connecting RS-485 to PCS21A



4.6.1 Shielding

Connect the shield to the electronics shield clamp of the controller and make sure it is connected over a wide area. The shielding is already connected in the housing of the 25-pin Sub-D connector of the PCS21A.



Do not connect the shield ends to DGND!

4.6.2 Terminating resistor

The controller comes equipped with dynamic terminating resistors. Do not connect **any external terminating resistors!**

The terminating resistor in the 25-pin sub-D connector of the DOP11A is already activated by a jumper between pin 6 and pin 19.



There must not be any difference of potential between the units connected using the RS-485. Take suitable measures to avoid a potential displacement, for example, by connecting the unit grounds (GND) with a separate cable, connecting the voltage supply (24 V) etc.



4.7 Connecting RS-422 via UWS11A

Connecting the DOP11A to a MOVIDRIVE® frequency inverter via UWS11A.

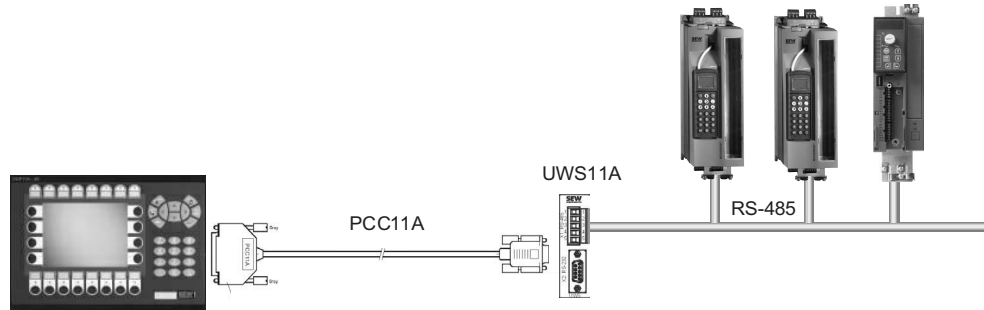


Figure 13: Connection via serial connection (UWS11A)

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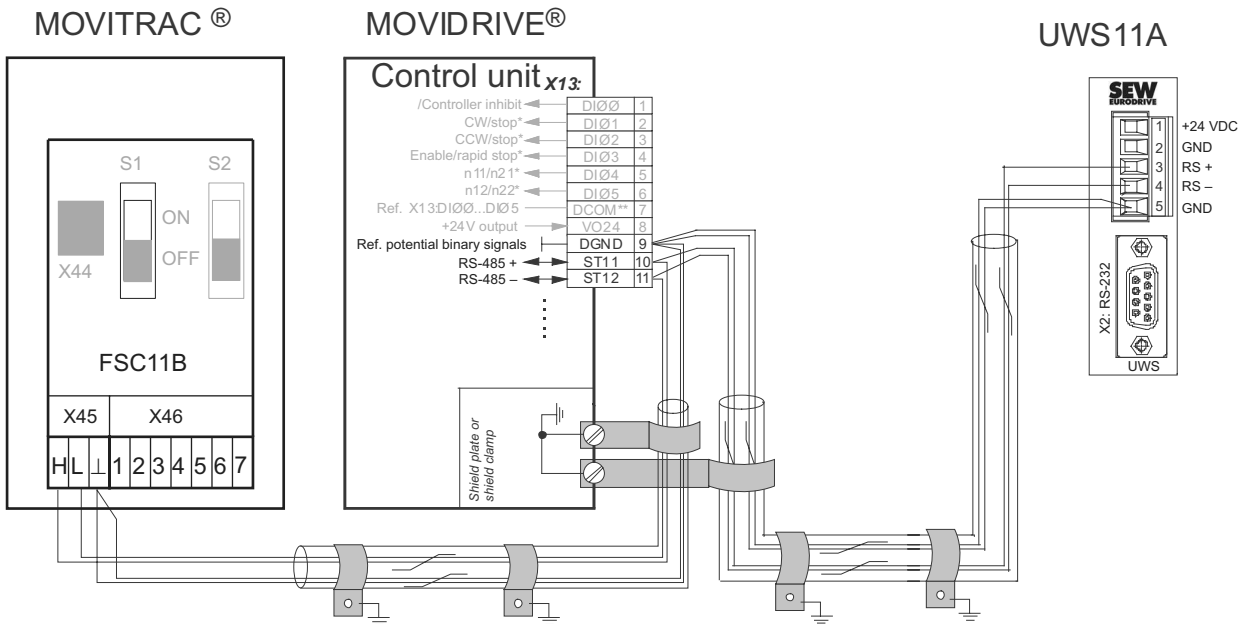


Figure 14: UWS11A terminal assignments

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4.7.1 RS-485 connection

See section 4.5, "Connecting RS-485 (only DOP11A-10 and DOP11A-30 from HW 1.10 and DOP11A-30)" for the cable specification.



4.8 Connecting option PFE11A ETHERNET

Connection of DOP11A with PFE11A ETHERNET option card (not available with DOP11A-10) to a PC for programming and remote maintenance via ETHERNET and TCP / IP.

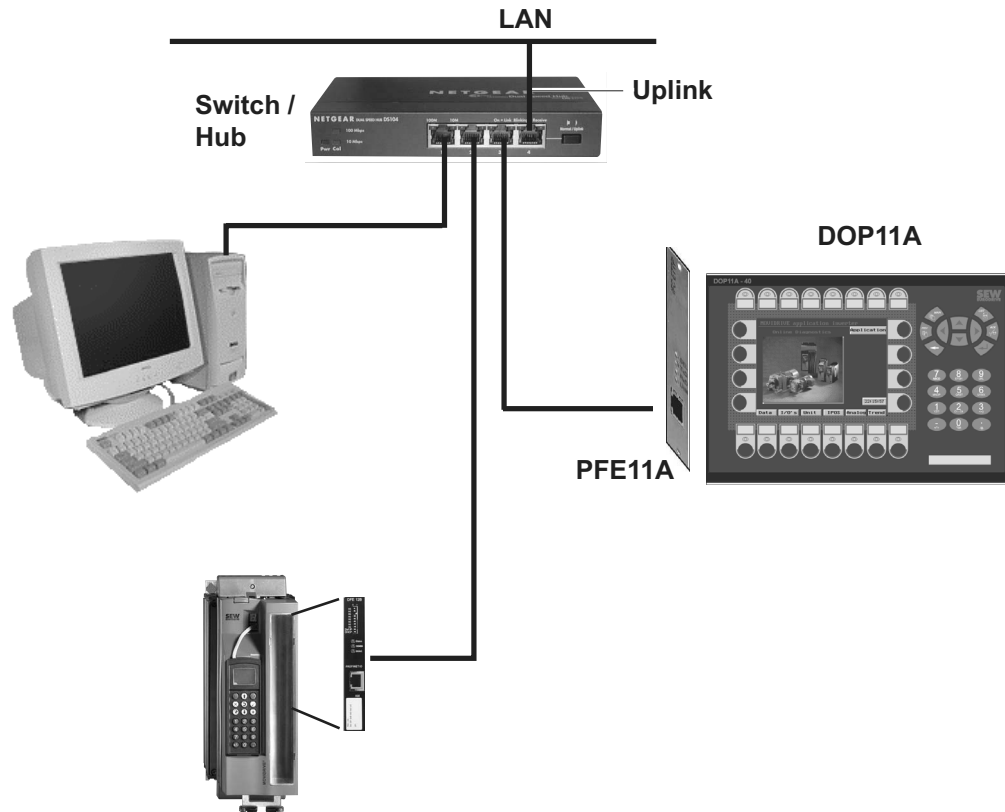


Figure 15: Connecting the PFE11A ETHERNET option

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There are four LEDs on the front of the PFE11A expansion card. These LEDs have the following functions:

Function	Color	Description
SEL	Yellow	This LED will light up if there is a contact between terminal processor and expansion card connection.
TxD	Yellow	This LED lights up when you send ETHERNET data.
RxD	Yellow	This LED lights up when you receive ETHERNET data.
LINK	green	This LED lights up when the ETHERNET cable (twisted pair cable) has been connected correctly.



Installation

Connecting option PFP11A PROFIBUS-DP

4.8.1 Cable specification

Use a shielded standard ETHERNET cable with shielded RJ45 connectors and cables according to specification CAT5. The maximum cable length is 100 m (300 ft.).

For example, the following cable is suitable:

- Lappkabel, UNITRONIC® LAN UTP BS flexible 4 x 2 x 26 AWG



For a description of how to determine the Ethernet (MAC) address of the option card, see section 5.2 in the paragraph "Configuration mode (SETUP)".

4.9 Connecting option PFP11A PROFIBUS-DP

Data exchange between a PLC with a DOP11A via PFP11A and PROFIBUS DP. (See section 3.8 "Accessories and options" for a description of the PFP11A.)

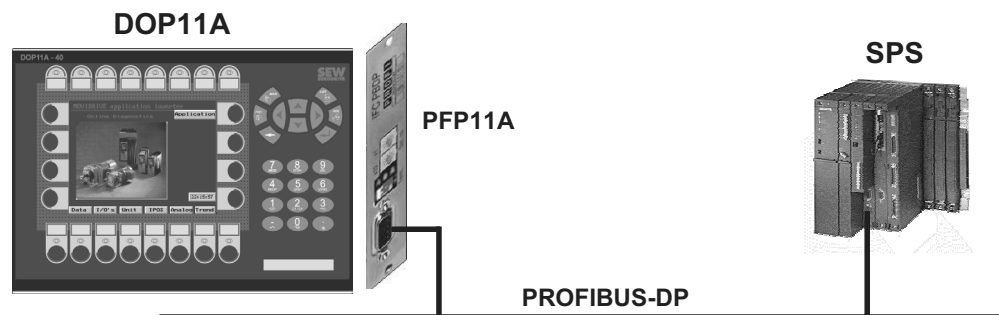


Figure 16: Connecting option PFP11A PROFIBUS

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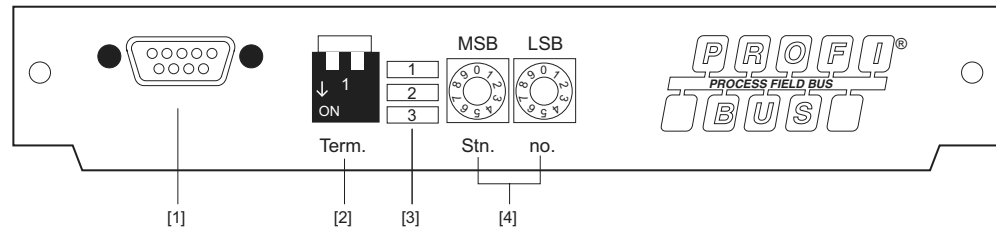


Figure 17: Connecting option PFP11A PROFIBUS

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- [1] 9-pin Sub-D socket
- [2] **PROFIBUS terminating resistor**
If the terminal is located at the start or end of a PROFIBUS segment and if only one PROFIBUS cable is connected, either activate the terminating resistor in the connector (if present) or set the switch on the PFP11A card to "On."
Never activate both terminating resistors in the connector and card at the same time!
- [3] The LEDs on the expansion card have the following functions:

1:ERR	Red	Displays configuration or communication errors. The LED lights up red until the unit is configured and indicates a time violation.
2:PWR	green	Displays a voltage supply with DC 5 V.
3:DIA	green	Displays a diagnostics error in the PROFIBUS network. Is not used by the panel.
- [4] The PROFIBUS station address is set using two rotary switches.

The GSD type files required for configuration of the PROFIBUS are available on the HMI-Builder software ROM or at www.sew-eurodrive.de in the Software tab.

4.9.1 Cable specification

Use a two-core, twisted and shielded copper cable to PROFIBUS specification for conductor type A to EN 50170 (V2).

For example, the following cable is suitable:

- Lappkabel, UNITRONIC® BUS L2/F.I.P.



Installation

Connection to a Siemens S7 via MPI and PCM11A

4.10 Connection to a Siemens S7 via MPI and PCM11A

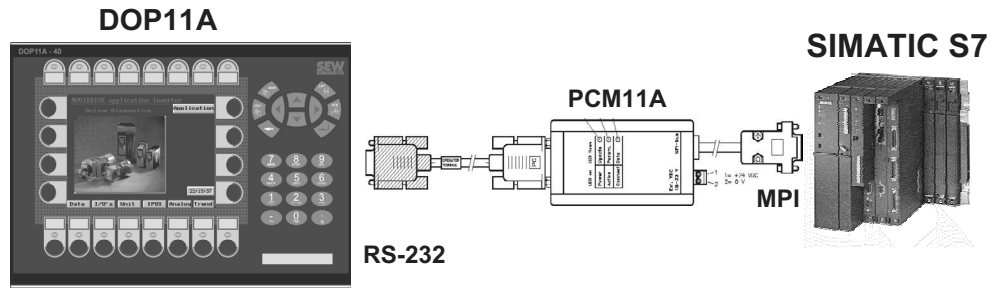
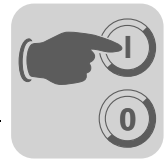


Figure 18: Connection to a Siemens S7 via MPI and PCM11A

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5 Startup



It is essential to comply with the safety notes during startup!

5.1 General startup instructions

Requirement for a successful startup is the correct electrical connection of the operator terminal.

The functions described in this section enable users to upload a project to the operator terminal and establish the unit in the necessary communication pathways.



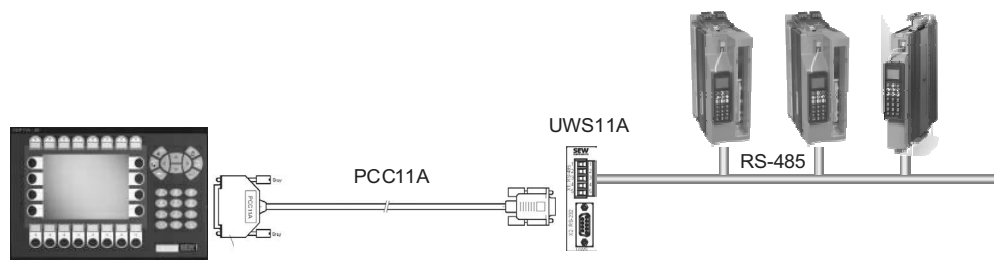
Do not use the DOP11A operator terminals as safety devices for industrial applications. Use monitoring systems or mechanical protection devices as safety equipment to avoid possible damage to property or injury to people.

5.2 Preliminary work and resources

- Check the installation
- Take suitable measures to prevent the motor from starting up unintentionally via the connected frequency inverter.
 - Remove the electronics input X13.0/controller inhibit in MOVIDRIVE® or
 - Disconnect the supply voltage (24 V backup voltage must still be applied)
 - Remove terminals "CW operation" and "Enable" in MOVITRAC® 07

Furthermore, additional safety precautions must be taken depending on the application to avoid injury to people and damage to machinery.

- Connect the operating terminal to MOVIDRIVE® or MOVITRAC® 07 using an appropriate cable.



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Figure 19: Connection between operator terminal and MOVIDRIVE® MDX60B/61B



Startup

Preliminary work and resources

- Connect the operator terminal to the PC using the PCS11A (RS-232) programming cable. Operator terminal and PC must be de-energized when you do this, otherwise undefined states may occur. Switch on the PC. If the HMI-Builder project planning software is not already installed on the PC, install it now and then start the software.

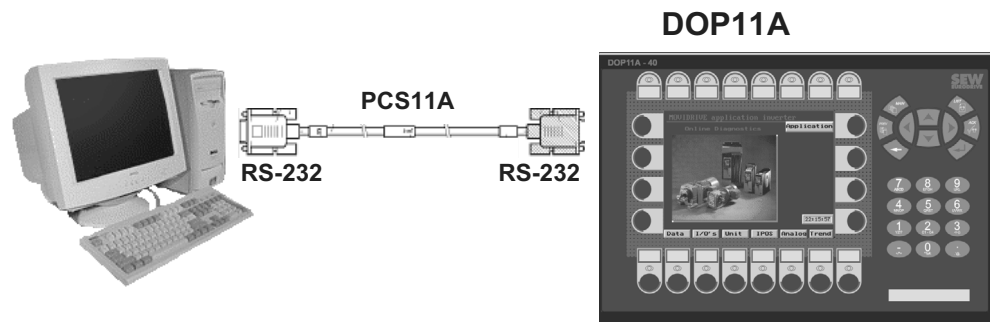


Figure 20: Connection between PC and operator terminal

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- Activate the supply (24 V) for the operator terminal and connected frequency inverters.



5.3 Initial operation



Units are delivered without a loaded project.

Units with a membrane keypad (DOP11A-10, DOP11A-20 and DOP11A-40) will report the following information when they are initially taken into operation:

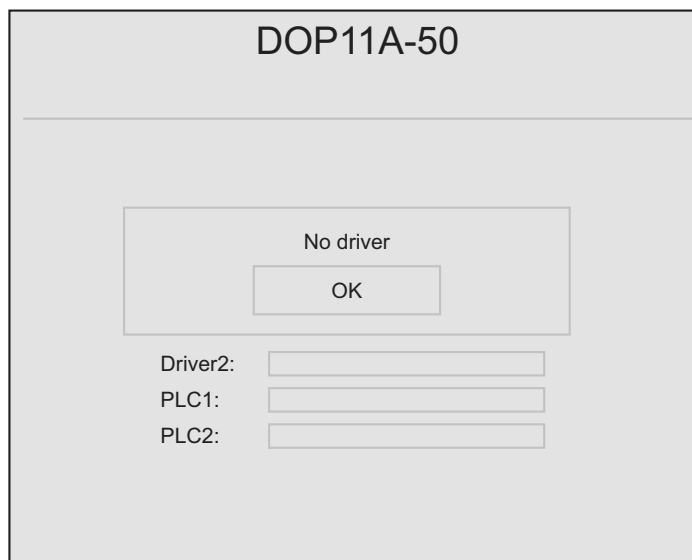


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Figure 21: DOP11A-10 initial screen in delivery state

Units with a membrane keypad (DOP11A-10, DOP11A-20 and DOP11A-40) will remain in [Edit] / [Transfer] mode. The following section describes the individual functions.

The DOP11A-30 and DOP11A-50 touchscreen units indicate that an inverter or PLC communication driver has not been loaded.



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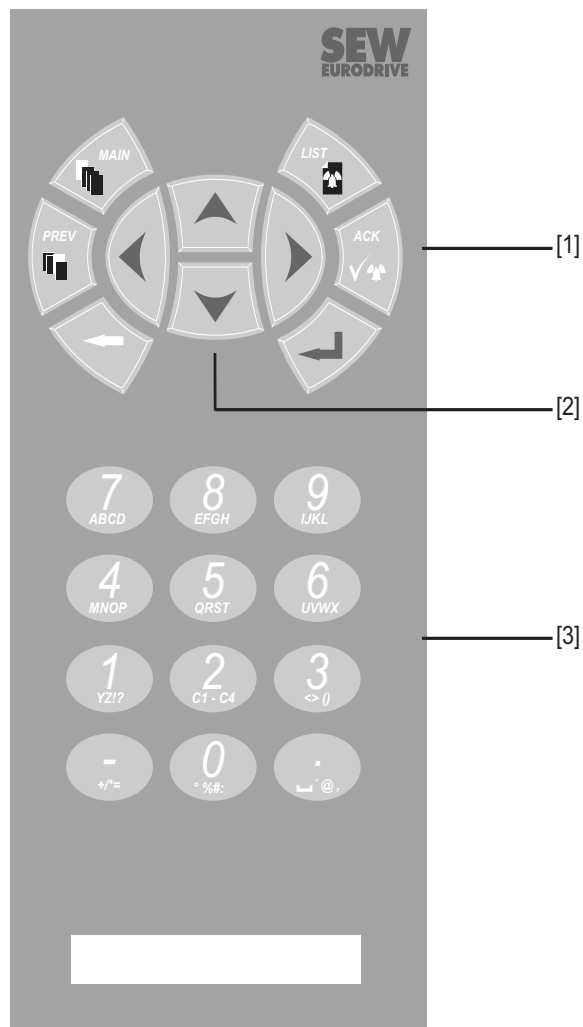
Figure 22: DOP11A-50 initial screen in delivery state



5.4 Terminal functions

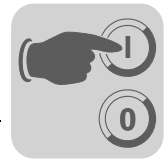
This chapter describes the different modes in the operator terminal, the keyboard and the information page in the terminal.

5.4.1 Terminal keypad



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- [1] Integrated function keys (not DOP11A-10)
- [2] Arrow keys
- [3] Alphanumeric keys

**Alphanumeric keys**

The following characters can be entered in dynamic text and numerical objects during the run mode in the terminal using the alphanumeric keyboard.

0-9

A-Z

a-z

! ? < > () + / * = ° % # : ' @

National characters



You cannot enter characters via the keyboard of the DOP11A-10 terminal because it is not equipped with alphanumeric keys.

Numeric values are entered by pressing the respective key once.

Enter capital letters (A to Z) by pressing the respective key two to five times.

Enter lower case letters (a to z) by pressing the respective key six to nine times.

A time interval between pressing can be set. If the key is not pressed within the specified time interval the cursor moves to the next position.

Enter national characters by pressing key <2> (C1C4) two to nine times. This option offers characters that are not included in the standard character set of the alphanumeric terminal keyboard.



You can use all characters of the selected character set in the HMI-Builder except those characters reserved for static text. Enter the required character by pressing the <ALT>+<0> (zero) key combination on the numeric keyboard of the PC; then enter the character code. You select the used character set in the HMI-Builder.

Reserved characters

The ASCII characters 0-32 (Hex 0-1F) and 127 are reserved for internal terminal functions and must not be used in projects or files in the terminal. The characters are used as control characters.

Arrow keys

Use the arrow keys to move the cursor in a menu or dialog box.



Startup Terminal functions

Integrated function keys

Not all the keys are available on all terminals.

Key	Description
Enter key	Use the ENTER key to confirm the setting made and to go to the next line or level.
<PREV>	Use this key to return to the previous block.
<LIST>	Use this key to display the alarm list.
<ACK>	Use this key to acknowledge alarms in the alarm list.
<MAIN>	Use this key to jump to block 0 in run mode.
<<->	Use this key to delete characters to the left of the cursor.



When the main block (block number 0) has been display, the <PREV> key will not work, since the block history is deleted when the main block is shown.

Key combinations

The terminal has key combinations for the following functions:

Key combination	Function
<<-> <MAIN>	Switch between SETUP and RUN.
<<-> <F1>	Hold this key combination pressed during startup to activate the mode for downloading the system program (see section 4, "Installation").
<<-> <PREV>	Open information window.
◀ + ▶	Hold this key combination pressed during start up to activate the self-test function.

Operator terminal	Function			
	Sysload	Self-test	Switch between SETUP and RUN	Diagnostics window
DOP11A-10	<<-> + <F1>	◀ + ▶	<<-> + <ENTER>	<<-> + ▶
DOP11A-20	<<-> + <F1>	◀ + ▶	<<-> + <MAIN>	<<-> + <PREV>
DOP11A-40	<<-> + <F1>	◀ + ▶	<<-> + <MAIN>	<<-> + <PREV>



*Switches on
DOP11A-30 and
DOP11A-50
terminals*

Interrupt power supply to the terminal to call up individual modes for DOP11A-30 and DOP11A-50.

Turn the rotary switch on the side or back of the terminal to the position shown in the following table. You can now turn on the power supply again.

Switch position	Function
0	Run mode (RUN, standard operation)
1	Sysload
2	Calibrate touch
3	Cursor
4	Configuration mode (SETUP)
5	Transfer mode, TRANSFER
8	Activates self-test function
9	Erases the clock memory

5.4.2 Operating modes RUN and SETUP

The terminal has two operating modes.

- **Configuration mode (SETUP):** All basic settings are made in this mode, such as selection of controller system and menu language.
- **Run mode (RUN):** This mode is for running the application.

Transfer

Here you manually set the terminal to transfer mode. When the terminal is in transfer mode it is possible to transfer projects between the terminal and the programming software. By using the automatic terminal switching function [RUN] / [TRANSFER] in the programming software, the software automatically sets the terminal to transfer mode.

Switching between operating modes

Switch between RUN and SETUP

Press <←> and <MAIN> simultaneously to enter configuration mode (SETUP). You can now press any key when the start-up menu is shown to enter the configuration mode (SETUP). To return to run mode, press <←> and <MAIN>.

In DOP11A-30 and DOP11A-50 set the switch on the side/back of the terminal in position 4 to access the configuration mode (Setup). The switch should be in position 0 for standard operation.



Configuration mode (SETUP)

This section contains a description of functions that cannot be carried out with the HMI-Builder.

Erasing the memory

The [setup] menu in the terminal includes the function [Erase Memory]. Use this function to erase the application memory of the terminal. All blocks and definitions for alarms, time channels, function keys and system signals are erased.

Parameters	Description
Enter key	Memory is erased. The configuration menu is shown automatically when the erasure is completed.
<PREV>	Return to previous level without erasing the memory.



When the memory is erased all data stored in the terminal will be lost. The language selection parameter is not affected by this function. All other parameters will be erased or reset to their default values.

Contrast setting

Operator terminal	Contrast setting
DOP11A-10	The contrast is set using a rotary regulator on the back of the terminal.
DOP11A-20	Contrast is set in operating mode by jumping to system block 997. You can increase the brightness of the monitor by pressing the <+> function key. You can reduce the brightness by pressing the <-> function key. Press <EXIT> to return to the previous level.
DOP11A-30	
DOP11A-40	
DOP11A-50	The color intensity of the display can be controlled using a data register and the [DIM] command, specified in the command line under [Setup] / [System signals] of the programming software.

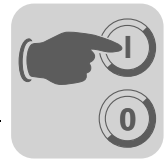


The contrast is affected by the ambient temperature. If the terminal is programmed at a room temperature far below the one at the installation site, you will have to adjust the contrast in the actual ambient temperature after 15 - 30 minutes.

Determining the ETHERNET MAC address:

The ETHERNET address of the PFE11A option card is displayed in configuration mode (SETUP). Use the key combination <←> <MAIN> (DOP11A-20 and DOP11A-40) or switch position 4 (DOP11A-30 and DOP11A-50) to enter configuration mode.

The physical ETHERNET address is displayed in the menu item [Expansion Cards - Slot 1 - PFE.]

**Run mode (RUN)**

The application is executed in run mode. Block 0 will automatically be displayed on the screen when changing to run mode.

The integrated keyboard is used to highlight and change values in run mode.

If a communication error occurs between the terminal and the controller system, an error message will be shown on the screen. The terminal starts automatically once communication is reestablished. If you press an I/O key combination while a communication error is active, the combination will be stored in the terminal buffer and transferred to the controller system once communication resumes.

The terminal clock can continuously send data to a register in the controller to activate a monitoring function. The controller can use this monitoring function to detect a communication error. The controller system checks if the register has been updated, if not an alarm indicating a communication error is activated in the controller system.

The functional principle of individual objects and functions in operating mode will be explained in connection with the description of the respective objects and functions.

5.4.3 Setting the real-time clock

The real-time clock of the terminal is set in the [Setup] menu under [Date / Time].

Select the option [Set terminal clock]. The date and time will now be displayed. Press <SET to change the settings. Enter the required date and time. Move the cursor with the arrow keys in editing mode. Press <NEXT> to return to the previous menu or cancel the setting before you press the <Enter> key.

The real-time clock can also be set in run mode using a maneuverable clock object and when transferring projects from a PC to the terminal.



A digital signal set by a command can let operators know when it is time to change the battery for the real-time clock.



5.4.4 Information page

The terminal contains an information page. The information page is activated by pressing the key combination <<-> and <PREV> simultaneously in run mode. A function or touch key can also be used or configured to call up the information page.

The current terminal, system program version and hardware version are shown at the top of the information page.

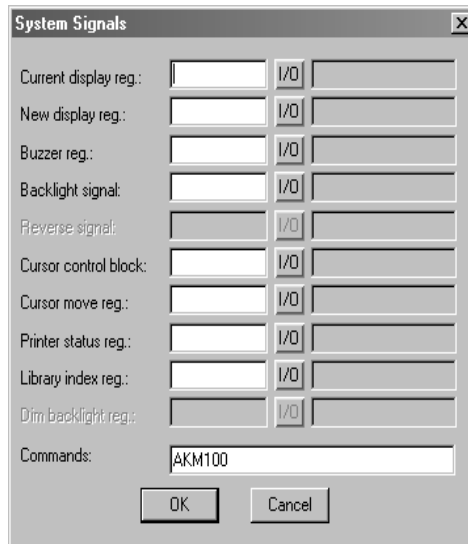
Parameters	Description
STARTS	Number of terminal starts
RUN	Number of terminal operating hours
CFL	Number of hours the backlighting has been switched on
32°C MIN: 21 MAX: 38 (example)	Current operating temperature, lowest and highest temperature measurement
DYNAMIC MEMORY	Available RAM memory (working memory) in number of bytes.
FLASH MEM PROJ	Available Flash memory (project memory) in number of bytes.
FLASH MEM BACK	Reserved
FLASH CACHEHITS	Percentage of block / allocation cache hits in the file system.
FLASH ALLOCS	Maximum percentage of used or active allocations per block in the file system.
DRIVER 1	Current driver and driver version
DIGITAL I/Os	The number of digital signals linked to controller 1 continuously monitored (STATIC) and the number in the current block (MONITOR)
ANALOG I/Os	The number of analog signals linked to controller 1 continuously monitored (STATIC) and the number in the current block (MONITOR)
I/O POLL	The time in ms between 2 readings of the same signal in controller 1
PKTS	The number of signals in each package transferred between the terminal and controller 1
TOUT1	The number of timeouts in communication with controller 1
CSUM1	The number of checksum errors in communication with controller 1
BYER	The number of byte errors in the communication
DRIVER 2	Current driver and driver version. The parameters for Driver 2 are only shown if controller 2 is defined in the project.
DIGITAL I/Os	The number of digital signals linked to controller 2 continuously monitored (STATIC) and the number in the current block (MONITOR).
ANALOG I/Os	The number of analog signals linked to controller 2 continuously monitored (STATIC) and the number in the current block (MONITOR)
I/O POLL	The time in ms between 2 readings of the same signal in controller 2
PKTS	The number of signals in each package transferred between the terminal and controller 2
TOUT2	The number of timeouts in communication with controller 2
CSUM2	The number of checksum errors in communication with controller 2
1 / 2 / 3	Current port for FRAME, OVERRUN and PARITY. 1 = RS-422 port, 2 = RS-232 port and 3 = RS-485 port.
FRAME	The number of frame errors in each port
OVERRUN	The number of overrun errors in each port
PARITY	The number of parity errors in each port



5.4.5 Joystick functions

Only applies to DOP11A-20 and DOP11A-40.

This function makes it possible to use the arrow keys as function keys. Enter the command "AK" and an address in the command line under [system signals.] Example: "AKM100" (command AK and memory cell M100).



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Figure 23: System signals

Memory cell M100 is the enable signal and the following four memory cells have functions according to the following control block:

Memory cell	Description
Mn0	Enabled = Joystick function. Disabled = Normal function.
Mn1	LEFT ARROW
Mn2	DOWN ARROW
Mn3	UP ARROW
Mn4	RIGHT ARROW

If you press an arrow when the enable signal is active, the memory cell corresponding to the key you press will be activated. When the enable signal is issued, the arrow keys will not perform their normal functions.

**Example**

Use the following example to switch between joystick function and normal function.

Perform the following steps:

- Use the DEMO driver.
- Enter the text "AKM1" under [System signals] / [Commands].
- Generate a text block.
- Enter the static text "JOYSTICK."
- Create a digital object with the following settings:
 - Digital signal: M1
 - Text 0: OFF
 - Text 1: ON
 - Activate input: YES
- Create four additional digital objects to monitor the memory contents of M2, M3, M4 and M5.

Display of text block according to sample settings:

JOYSTICK # - - -

M2#

M3 #

M4 #

M5 #



6 Operation and Service

6.1 Transferring projects with PC and HMI-Builder

You need the HMI-Builder software to start up the operator terminal with your PC.

1. Start the HMI-Builder program.
2. Select the language in the [Settings] / [Menu language] selection field.



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Operation and Service

Transferring projects with PC and HMI-Builder

- Use the [File] / [Open] function to open the project file you would like to transfer to the operator terminal.



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- In the menu item [Transfer] / [Communication Properties], select the communication connection [Use serial transfer] and enter the necessary parameters:



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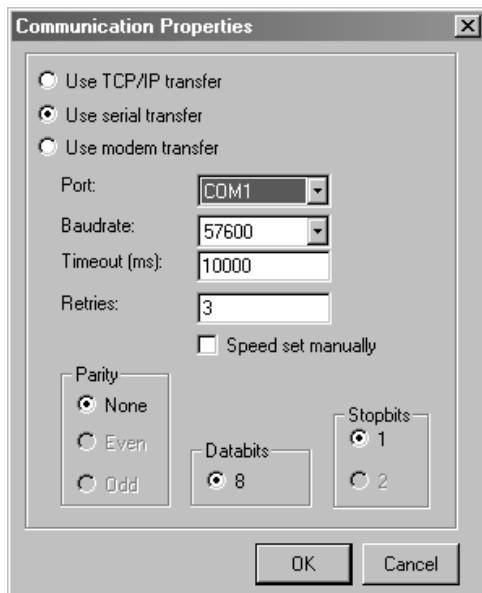
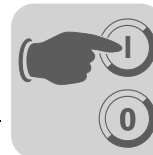
Serial transfer when using the PCS11A programming cable.

Enter the following information:

- Communication port of the PC (e.g. Com1)
- Data transfer rate (default 57600)
- Timeout period (free entry, default 10,000 ms)
- Number of retries in case of communication problems (default 3)



If a project is transferred to the terminal for the first time, the transfer will take place via serial connection and the PCS11A programming cable.



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5. The project can now be transferred to the terminal by using the selection field [Transfer] / [Project].

The following functions are active as standard and must remain in this setting.

- Test project on send
- Send complete project
- Automatic terminal RUN/TRANSFER switching
- Check terminal version



Press the [Send] button to download the data.

Project Transfer

Percent complete: 0%

Byte count (KB): 0

Time elapsed:

Status:

Info:

Retries: 0

Terminal Version:

Send

Receive

Verify

Stop

Settings...

Test project on send Automatic terminal RUN/TRANSFER switching

Send complete project Check terminal version

Partial send options:

Blocks:

None

All

From: 0 To: 0

Alarms Message library/
multiple languages

Data loggers

Symbols Setup

Time channels Function keys

LEDs Passwords

Macros Data exchange

Fonts

Delete

Trend data

Recipe data

Download driver

Never

Always

Automatic

Set terminal clock

Force file delete
in terminal

Exit

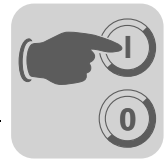
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The following steps will be executed one after the other:

- Switch the terminal to transfer mode (TRANSFER)
- Transfer the communication driver for inverter and PLC
- Transfer project data
- Switch the terminal to RUN mode

The individual steps will be displayed during transfer in the terminal display.

After transfer is completed, exit the dialog window using the [Exit] button and close the HMI-Builder.



6.2 Create a project

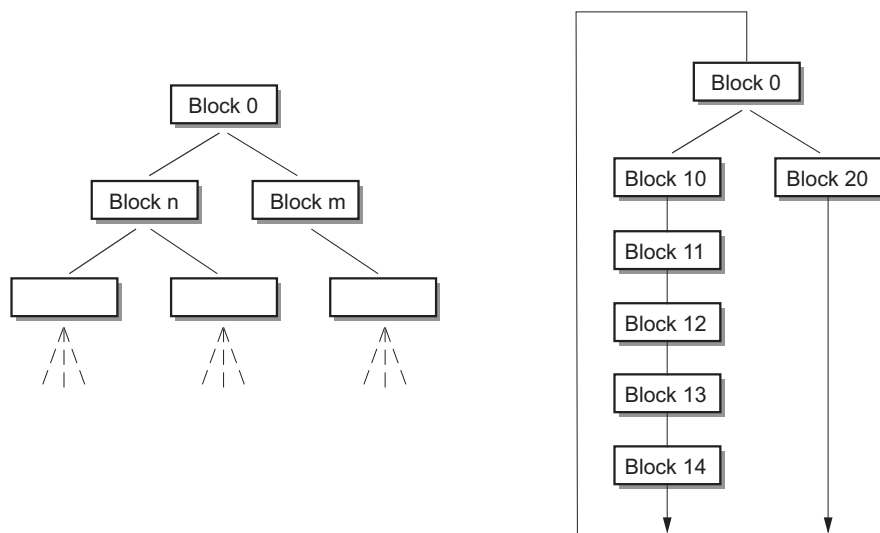
6.2.1 Basics

This section describes the system structure of the terminal and its basic functions. There is also an explanation of the general principles, object parameters and joint functions applicable in the terminal.

Method for programming a project

The graphical structure of the application in the terminal means that the monitoring tool is easy to use for the operator. It is important to organize the application well and to consider which functions are necessary. Start with the overall view, and then work down to the detailed level. When a project is programmed you start with the functions in your application. Each function corresponds to one or more blocks, depending on the complexity of the function. A project can contain both graphic and text blocks, and each block can contain static and dynamic objects. The blocks should be arranged in hierarchies to achieve a structured application, and to simplify work procedures for the machine operator. The application can also be organized as sequence controls.

The application can be tested in full or in part prior to startup.



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Figure 24: Block structure



Effective communication

Read the following notes on signal transmission and their optimization for fast and effective communication between terminal and controller.

Signals that influence the communication time

Only signals for objects in the current block will be read continuously. These include dynamic object signals. Signals for objects in other blocks will not be read. The number of blocks does not affect the communication time.

In addition to signals for objects in the current block, the terminal continuously receives the following signals from the controller:

- Display signals (block header)
- Block print signals (block header)
- LED register
- Alarm signals
- External confirmation signals for alarms and alarm groups
- Login signal (password)
- Logout signal (password)
- Trend curve register
- Register for column objects when min. / max. indicators are used
- New display register
- Buzzer register
- Backlight signal
- Cursor control block
- Recipe control block
- Library index register
- Index register
- Register for PLC clock if it was used in terminal
- List erase signal (alarm settings)
- No protocol mode control register
- No protocol signal

Signals that do not influence the communication time

The following signals do not affect the communication time:

- Signals for function keys
- Time channels
- Objects in alarm texts



Optimize communication

Grouping controller signals

The signals from the controller (see list in previous paragraph) will be read the fastest if they are bundled in one group, such as: If you have defined 100 signals you will reach the highest reading speed by grouping them (e.g. H0-H99). If the signal transfer takes place in individual steps (e.g. P104, H17, H45, etc.), then the update will take much longer.

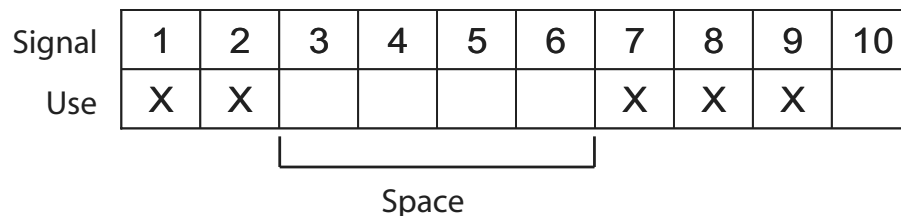
Effective block change

You will reach an optimum block change by using the block jump function of the function keys or via the jump object. The display signal in the block header may only be used if the controller is to enforce the opening of another block. If the controller is to change the display, you can use the new display register. This option affects the communication less than a larger number of display signals.

Signal packages

Transfer of signals between terminal and controller does not take place for all data at the same time. The information is separated into packages that contain several signals each. The number of signals in each package depends on the selected driver.

A minimization of the number of packages is necessary to have the communication take place as quickly as possible. Grouped signals require merely a minimum number of packages. Such programming is not possible in all cases. There may be spaces in between two signals in such cases. A space represents the maximum distance between two signals that are part of the same package. The size of the space depends on the selected driver.



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Figure 25: Signal packages

User interface

Use graphic blocks for the user interface.

Text blocks are mainly for printout of reports. They are slower and require more memory than graphic blocks.

Use 3D effects for an appealing user interface.

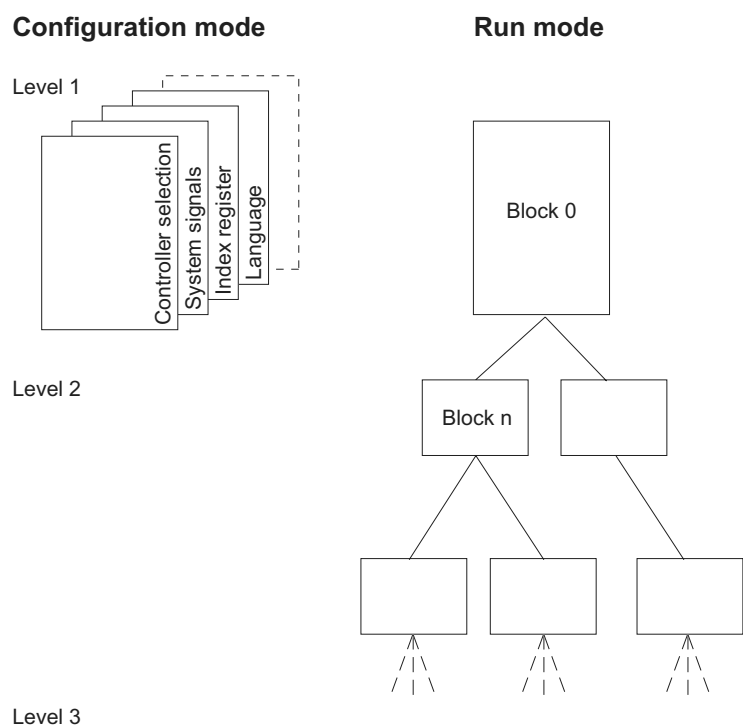
You can accomplish a visually impressive design by combining objects with frame and 3D rectangles. Such a design emulates a light incidence from top left. Such an angle creates shadow effects at the lower and right side of raised objects as well as on the upper and left side of lowered objects.



Menu structure

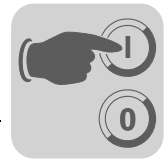
The terminal is divided into two modes: "configuration mode" and "run mode". In each respective mode there are a number of different levels, depending on the function. Each level consists of a menu where you make a selection or enter parameters before going to the next level (menu).

The application is built up of blocks, graphic blocks and /or text blocks (primarily for report printouts). Values from the controller system are shown and changed in the blocks. Each block has a number between 0 and 989 allocated by the programmer. The blocks 990-999 are reserved for special purposes, so-called system blocks. The terminal is object oriented, which means that a block can contain all the signals linked to an object for the control and monitoring of, for example, a pump.



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Figure 26: Configuration mode and run mode



Blocks

A block header is defined for each block. The header contains the block number, block type, status word, etc. The following functions can also be invoked as blocks:

- Alarms
- Time channels
- System monitor
- E-mail
- Contrast setting

These are designated system blocks.

150 blocks are permitted for the DOP11A-10. In the other terminals a maximum of 990 blocks can be defined.



The block type cannot be changed for a defined block.

Signal formats

The following signal formats are available in the dialog for each object, on the assumption that the selected driver supports the signal format.

Format type	Range
Signed 16-bit	-32768 – +32767
Unsigned 16-bit	0 – +65535
Signed 32-bit	-2147483648 – +2147483647
Unsigned 32-bit	0 – +4294967295
Float with exponent, 32-bit	±3.4E38, numbers larger than 1,000,000 are shown with exponent (not with MOVILINK driver).
Float without exponent, 32-bit	Parameter positions (including decimal point and characters) and decimals indicate the available area. As a result, 8 positions and 3 decimal places result in ±999.999 (not with MOVILINK® driver).
BCD Float	0 – 9999.9999 (not with MOVILINK® driver)
BCD 16-bit	0 – 9999 (not with MOVILINK® driver)
BCD 32-bit	0 – 99999999 (not with MOVILINK® driver)
HEX 16-bit	0 – FFFF
HEX 32-bit	0 – FFFF FFFF
Seconds 16-bit	The object Analog numeric can be displayed in the time format. Syntax: <Hours:Minutes:Seconds> (not with MOVILINK® driver).
Seconds 32-bit	The object Analog numeric can be displayed in the time format. Syntax: <Hours:Minutes:Seconds> (not with MOVILINK® driver).
Character string	Character string which can be used in the [dynamic] function for graphic objects in DOP11A-20 to DOP11A-50. Example: In the objects [Static symbol], [Digital symbol] and [Multisymbol], the dynamic property Symbol can be linked to a register with the Character string format.
Array 16-bit	Table format which can be used for an event in the dynamic function for graphic objects in DOP11A-20 to DOP11A-50. Example: A group of registers is to be allocated different values when the value entered is equal to 99. The first value in the field [Value 9] will then be entered in the register [D21] in the [Signal] field. If the [Value] field appears as follows <1,2,3,4>, the value 2 will be entered in the subsequent register [D22], etc.



6.2.2 HMI-Builder installation

Programming software

The HMI-Builder is a programming software used to develop projects for operator terminals of the DOP11A series. The functions in the HMI-Builder depend on the selected terminal.

We recommend using a mouse as the input device for the programming software. Refer to the Windows Users Guide for information on key combinations.

A project is created with graphic blocks and text blocks in the programming software, which are then transferred to the operator terminal. You will find a description of the programming steps in the DOP11A operator terminal system manual.

An online help is available for all functions. To call up the help text for each function, press the <F1> key. Information on the function is shown by pressing the help button in the toolbox and then clicking on a function.

System requirements

HMI-Builder needs a PC with at least 55 MB of available memory and the Microsoft Windows 95/98/NT/2000/XP operating system. The programming software can be used on either a color or monochrome screen.

Installing the HMI-Builder

The programming software is supplied on a CD. When you place the CD in your CD ROM drive the installation will start automatically. If not, select [Run] in the Start menu and enter the command `D: /setup.exe` (where D stands for the CD ROM drive). Install the programming software by clicking on the name and following the instructions.

The installation wizard creates an icon for the programming software in the program group of the programming software. To start the programming software, click on [Start] and select [Programs] / [Drive Operator Panels DOP] / [HMI-Builder]. The manual can be read directly from the CD by clicking on [Manuals].



Menu

From the menu bar you can reach a number of drop-down menus.

Menu	Description
File	Contains functions that affect the entire project.
Processing	Contains, among others, the following functions: <ul style="list-style-type: none"> • Cut • Copy • Paste
View	This allows the following functions to be carried out: <ul style="list-style-type: none"> • Block manager • Alarm handling • Symbol manager
Functions	In this menu you can configure the function keys, LEDs, passwords and macros. Alarm texts are entered and alarm groups are defined in this menu as well.
Setup	Here you will set the basic configuration for the terminal.
Object	Is available in the managers only and holds all objects. The objects are also included in the toolbox.
Layout	Is available in graphic block manager only and includes functions for positioning of objects in graphic blocks.
Block manager	Settings for visual representation of block manager
Transfer	The functions in the Transfer menu are used to transfer projects between the programming software and the terminal.
Window	Contains all general Windows functions. You can also make grid settings and define the search path to external programs, such as Paintbrush.
Help	Contains the help functions for the program.

Status bar

The status bar is located at the bottom of the HMI-Builder program window. In the [View] menu there is a function to show / hide the status bar.

The left part of the status bar describes the menu function selected in the menu. A short description of the function the cursor points to is shown for the functions in the toolbox.

The right part of the status bar indicates which of the following keys are activated:

OVR Overwrite (Paste key)

CAP Caps Lock

NUM Num Lock

Coordinates, line and column, in the block manager are also shown.

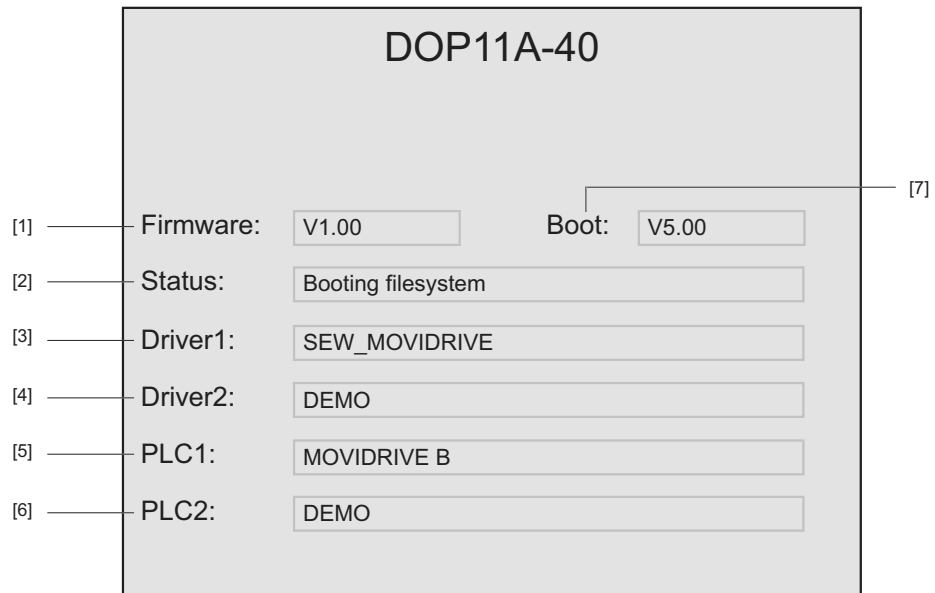


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Figure 27: Status bar



6.3 Operating display at unit start



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- [1] Firmware version of the operator terminal
- [2] Status of the boot process
e.g.:
PROJECT STATUS
TCP/IP ADDRESS
CHECKING PLC 1
CHECKING PLC 2
...
- [3] Communication driver loaded in Controller 1
e.g.:
DEMO
SEW_MOVIDRIVE
...
- [4] Communication driver loaded in Controller 2
e.g.:
DEMO
SEW_MOVIDRIVE
...
- [5] Communication status of Controller 1
e.g.:
NO CONNECTION
DEMO
MOVITRAC 07
MOVIDRIVE A
MOVIDRIVE B
...
- [6] Communication status of Controller 2
e.g.:
NO CONNECTION
DEMO
MOVITRAC 07
MOVIDRIVE A
MOVIDRIVE B
...
- [7] Version of operator terminal boot routine



6.4 Error messages

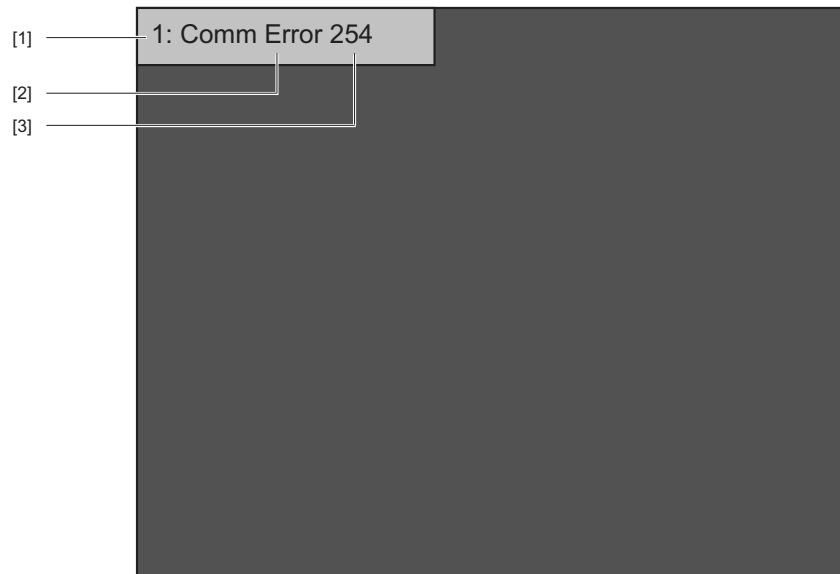
Errors in RUN mode will be displayed in the upper left hand corner of the display as error messages.

They are divided into two groups:

- Boot error (no inverter connected)
- Operation errors - Comm errors (error list)

6.4.1 Boot error (no inverter found)

Boot error "1: Comm Error 254" means: no communication with connected inverters.



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- [1] Controller where the communication error occurs.
e.g 1 or 2
- [2] Error type
e.g. operation error - Comm Error
- [3] With RS-485 address:
e.g.
01 - 99
254 (= point to point!)



6.4.2 Operating errors - Comm errors (error list)

Message from operator terminal	Error code	Description
no error	00 00	No error
invalid parameter	00 10	Illegal parameter index
fct. not implement	00 11	Function / parameter not implemented; <ul style="list-style-type: none"> Controller does not know parameter addressed by the operator terminal. Check selection of MOVILINK[®] driver. Individual parameters of the MOVITRAC[®] 07, MOVIDRIVE[®] A and MOVIDRIVE[®] B controllers are slightly different. Another reason for this error may be the controller firmware. Recently added parameters may not be included in older versions of the unit firmware.
read only access	00 12	Read access only <ul style="list-style-type: none"> No write access to addressed parameter. Deactivate [Activate input] function in project of operator terminal.
param. lock active	00 13	Parameter lock is active <ul style="list-style-type: none"> The [Parameter block] function was activated via parameter P803 in the addressed controller. Set parameter P803 to "OFF" by using the controller keypad or the PC software MOVITOOLS[®] to deactivate the parameter lock.
fact. set active	00 14	Factory setting is active <ul style="list-style-type: none"> Controller is performing a factory setting. Parameter change option is locked for a few seconds. Communication will be automatically reactivated once factory setting is complete.
value too large	00 15	Value for parameter too large <ul style="list-style-type: none"> Operator terminal is trying to write a value to a parameter that is not within the permitted value range. Adapt the minimum and maximum input values in the [Access] area in the project of the operator terminal. You will find the respective limit values in the parameter list of the controller.
value too small	00 16	Value for parameter too small <ul style="list-style-type: none"> Operator terminal is trying to write a value to a parameter that is not within the permitted value range. Adapt the minimum and maximum input values in the [Access] area in the project of the operator terminal. You will find the respective limit values in the parameter list of the controller.
option missing	00 17	Required option card missing for this function / this parameter.
system error	00 18	Error in system software of controller <ul style="list-style-type: none"> Contact SEW service.
no RS485 access	00 19	Parameter access via RS-485 process interface on X13 only
no RS485 access	00 1A	Parameter access via RS-485 diagnostic interface only
access protected	00 1B	Parameter is access-protected <ul style="list-style-type: none"> No read or write access to this parameter; parameter not suitable for use in operator terminal.
inhibit required	00 1C	Controller inhibit required <ul style="list-style-type: none"> The addressed parameter can only be altered with inhibited controller. Activate the controller inhibit status by removing the terminal X13.0 or via fieldbus (control word 1/2 basic block = 01hex).
incorrect value	00 1D	Incorrect value <ul style="list-style-type: none"> Some parameters can only be programmed to certain values. You will find the respective limit values in the parameter list of the controller.
fact. set active	00 1E	Factory setting was activated.
not saved in EEPROM	00 1F	Parameter was not saved in EEPROM <ul style="list-style-type: none"> Power-failure save failed.
inhibit required	00 20	Parameter cannot be changed with enabled output stage <ul style="list-style-type: none"> The addressed parameter can only be altered with inhibited inverter. Activate the controller inhibit status by removing the terminal X13.0 or via fieldbus (control word 1/2 basic block = 01hex).



6.5 SEW Electronics Service

6.5.1 Send in for repair

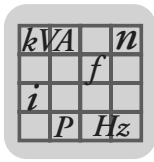
Please contact the **SEW Electronics Service** if a fault cannot be rectified.

When contacting the SEW electronics service, always quote the digits of the unit designation so that our service personnel can assist you more effectively.



Please provide the following information when sending the unit in for repair:

- Serial number (→ nameplate)
- Unit designation
- Brief description of the application
- Nature of the error
- Accompanying circumstances
- Your own presumptions as to what has happened
- Any unusual events preceding the problem, etc.

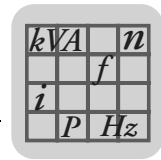


7 Technical Data and Dimension Drawings

7.1 General technical data

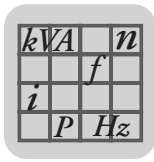
7.1.1 Display

	DOP11A-10	DOP11A-20	DOP11A-30	DOP11A-40	DOP11A-50
Graphics resolution (pixels)	No graphics	240 x 64	320 x 240	320 x 240	640 x 480
Line x characters text	2 x 20	Graphic			
Active screen size, W x H	73.5 x 11.5 mm	127.2 x 33.9 mm	115.2 x 86.4 mm	115.2 x 86.4 mm	211.2 x 158.4 mm
Backlight	50,000 h at an ambient temperature of +25 °C. LED.		50,000 h at an ambient temperature of +25 °C. Touchscreen. CFL.	50,000 h at an ambient temperature of +25 °C. CFL.	50,000 h at an ambient temperature of +25 °C. Touchscreen.
Contrast setting	Via slide rule; position: Upper right hand corner on terminal back.	Via system block			
Screen	LCD screen (liquid cristal), monochrome, 2 lines with 20 characters each, 5 mm character size	LCD screen (liquid cristal), 240 x 64 pixels, monochrome, 4 lines with 20 characters each or 8 lines with 40 characters each.	LCD screen (liquid cristal), 320 x 240 pixels, 256 colors (graphics and text)	LCD screen (liquid cristal), 320 x 240 pixels, 256 colors (graphics and text)	TFT screen, 640 x 480 pixels, 256 colors (graphics and text)



7.1.2 Technical data

	DOP11A-10	DOP11A-20	DOP11A-30	DOP11A-40	DOP11A-50
Keyboard	<ul style="list-style-type: none"> Numeric keypad Navigation keypad Three function keys No LEDs 	<ul style="list-style-type: none"> Numeric keypad Navigation keypad Eight function keys 16 LEDs (red / green) 	Touch resistive	<ul style="list-style-type: none"> Numeric keypad Navigation keypad 16 function keys 16 LEDs (red / green) 	Touch resistive
Keyboard material / Material for unit face	Membrane keypad with polyester caps Overlay autotex F207 with back print 1 million operations	Membrane keypad with polyester caps Overlay autotex F207 with back print 1 million operations	Touchscreen Polyester on glass 1 million operations	Membrane keypad with polyester caps Overlay autotex F207 with back print 1 million operations	Touchscreen Polyester on glass 1 million operations
Graphical objects	No	Yes			
Real-time clock	±10 PPM + error display through ambient temperature and supply voltage. Max. total error display: 1 minute/month = 12 minutes/year. The real-time clock battery has a rating life of ten years.				
Supply voltage	DC 24 V (DC 20 ... 30 V), 3-pin terminal contact CE				AC 100 ... 240 V, 50/60 Hz, 3-pin terminal contact CE
	The voltage supply has to meet requirements for SELV according to IEC 950 or IEC 742. UL: Supply voltage according to guidelines for voltage supply class 2.				
Current consumption at operating voltage	Max. 200 mA	Without load: 300 mA Max. load: 450 mA	Max. 400 mA	Without load: 300 mA Max. load with expansion card: 550 mA	Max. 0,17 ... 0.35A (AC 240 ... 100 V)
Ambient temperature	0 to +50°C				
Storage temperature	-20 to +70°C				
Humidity	Max. 85 % (non-condensed)				
Dimensions W x H x D	142 x 90 x 3.5 mm	214 x 194 x 6 mm	200 x 150 x 5 mm	276 x 198 x 5.7 mm	290 x 247 x 6 mm
Installation depth	29 mm without sub D connector and 96.5 mm with sub D connector	69 mm without sub D connector and 110 mm with sub D connector	70 mm without sub D connector and 70 mm with sub D connector	87 mm without sub D connector and 110 mm with sub D connector	109 mm without sub D connector and 130 mm with sub D connector
Enclosure front	IP65, NEMA 4, NEMA 4X (indoor use only)				IP65, NEMA 4
Enclosure back	IP20				
Protection material back	Galvalume	Yellow-chromatized sheet metal			
Weight	Without sub D connector: 0.5 kg	Without sub D connector: 1.5 kg	Without sub D connector: 1.5 kg	Without sub D connector: 1.7 kg	Without sub D connector: 3.3 kg
Memory	Flash memory: 64 kB for application	Flash memory: 400 kB for application			Flash memory: 1600 kB for application
EMC tests on terminal	The terminal conforms with the essential protection requirements in article 4 of the EMC directive 89/336/EEC. Tested according to: EN 50081-1 (emission) and EN 50082-2 (interference immunity).				
UL approval	UL 508, UL 1604 (class I div 2)				
DNV approval	Approval by Det Norske Veritas Typgodkännande in classes temperature A, relative humidity B, vibration A, protection cover C (front cover only).				
Expansion slots	None	1 expansion slot	1 expansion slot	2 expansion slots	2 expansion slots

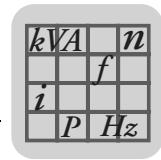


7.1.3 Functions

	DOP11A-10	DOP11A-20	DOP11A-30	DOP11A-40	DOP11A-50
Alarm handling	No	Yes			
Intervals per time channel	4				
Recipe management	Yes				
Passthrough mode	Yes				
Dual protocol	Yes				
Web server	No	Yes, with ETHERNET option			
Printer function	Yes				

7.1.4 Communication

	DOP11A-10	DOP11A-20	DOP11A-30	DOP11A-40	DOP11A-50
Serial interfaces	Separate interface for programming and inverter communication. <ul style="list-style-type: none"> • RS-232 • RS-485/RS-422 Two interfaces can be used at the same time.	Separate interface for programming and inverter communication. <ul style="list-style-type: none"> • RS-232 • RS-422 • RS-485 from HW1.10 Two interfaces can be used at the same time.	Separate interface for programming and inverter communication. <ul style="list-style-type: none"> • RS-232 • RS-422 • RS-485 Two interfaces can be used at the same time.	Separate interface for programming and inverter communication. <ul style="list-style-type: none"> • RS-232 • RS-422 Two interfaces can be used at the same time.	Separate interface for programming and inverter communication. <ul style="list-style-type: none"> • RS-232 • RS-422 Two interfaces can be used at the same time.
Fieldbus via option slot	No options	PROFIBUS DP or ETHERNET		<ul style="list-style-type: none"> • PROFIBUS DP and / or • ETHERNET 	<ul style="list-style-type: none"> • PROFIBUS DP and / or • ETHERNET
Serial port RS-422	25-pin sub D connector, installed socket with standard retaining screws 4-40 UNC.				
Serial port RS-232	9-pin sub D connector, installed plug with standard retaining screws 4-40 UNC.				
Serial port RS-485	RS-422 and RS-485 are combined in 25-pin sub-D connector. Installed socket with standard retaining screws 4-40 UNC.		4-pin contact, installed plug		



7.2 Pin assignment

7.2.1 RS-232

D-sub 9-pin connector	Terminal no.	Designation	Signal direction operator terminal ↔ XXX	
	1	+5 V >200 mA ¹⁾	←	
	2	TxD	→	
	3	RxD	←	
	5	0V		
	7	CTS	←	
	8	RTS	→	
	9			

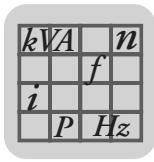
1) not connected

7.2.2 RS-485

Applicable for DOP11A-10 and DOP11A-20 from HW 1.10 only.

D-sub 25-pin socket	Terminal no.	Designation	Signal direction operator terminal ↔ XXX
	2	Tx/Rx+	↔
	15	Tx/Rx-	↔
	6	Tx/Rx - / 120 Ω ¹⁾	
	19	Tx/Rx+ ¹⁾	
	7,8	0V	

1) Jumper between 6 and 19 active 120 Ω terminating resistor of RS-485 bus.



Technical Data and Dimension Drawings

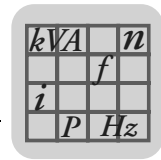
Pin assignment

For DOP11A-30 only.

COMBICON 4-pin socket	Terminal no.	Designation	Signal direction operator terminal ↔ XXX
	1	Tx/Rx+	↔
	2	Tx/Rx-	↔
	3	0V	
	4	⊕	

Only applies to PCS21A.

RJ10 4-pin connector	Terminal no.	Designation	Signal direction operator terminal ↔ XXX
	1	Do not assign	Reserved
	2	Tx/Rx+	↔
	3	Tx/Rx-	↔
	4	⊕	



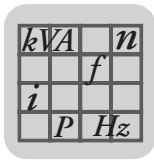
7.2.3 RS-422

D-sub 25-pin socket	Terminal no.	Designation	Signal direction operator terminal ↔ XXX
	2	+TxD	→
	15	-TxD	
	3	+RxD	←
	16	-RxD	
	4	+RTS	→
	17	-RTS	
	5	+CTS	←
	18	-CTS	
	20	1)	
	21	1)	
	7,8	0V	
	14	+5 V <50 mA	→
	12,13, 24,25	2) +5 V >200 mA	←
	9	3) TxD	→
	10	3) RxD	←
	22	3) CTS	←
	23	3) RTS	→

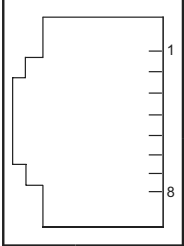
- 1) Terminal no. 20 connected internally to terminal no. 21
- 2) For DOP11A-10 only:
- 3) Reserved

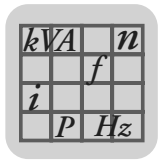
7.2.4 PROFIBUS-DP (option card)

D-sub 9-pin socket	Terminal no.	Designation	Signal direction operator terminal ↔ XXX	
	1			
	2			
	3	RxD / TxD-P	↔	
	5	DGND		
	7			
	8	RxD/TxD-NS	↔	
	9			

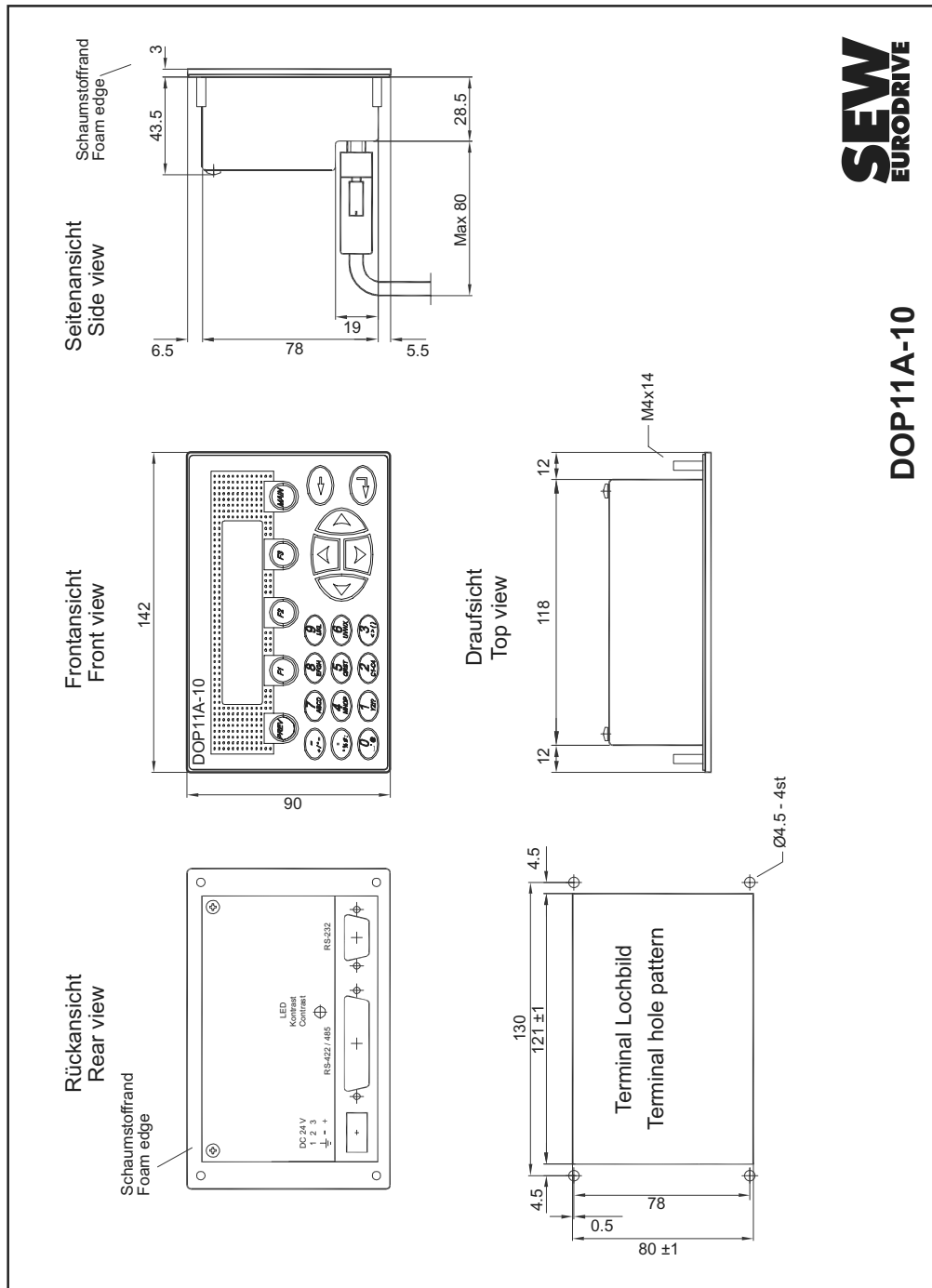


7.2.5 ETHERNET 10 Base T (option card)

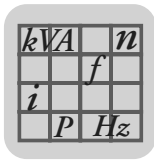
RJ45 socket	Terminal no.	Designation	Signal direction operator terminal ↔ XXX
	1	Tx+	→
	2	Tx-	→
	3	Rx+	←
	6	Rx-	←



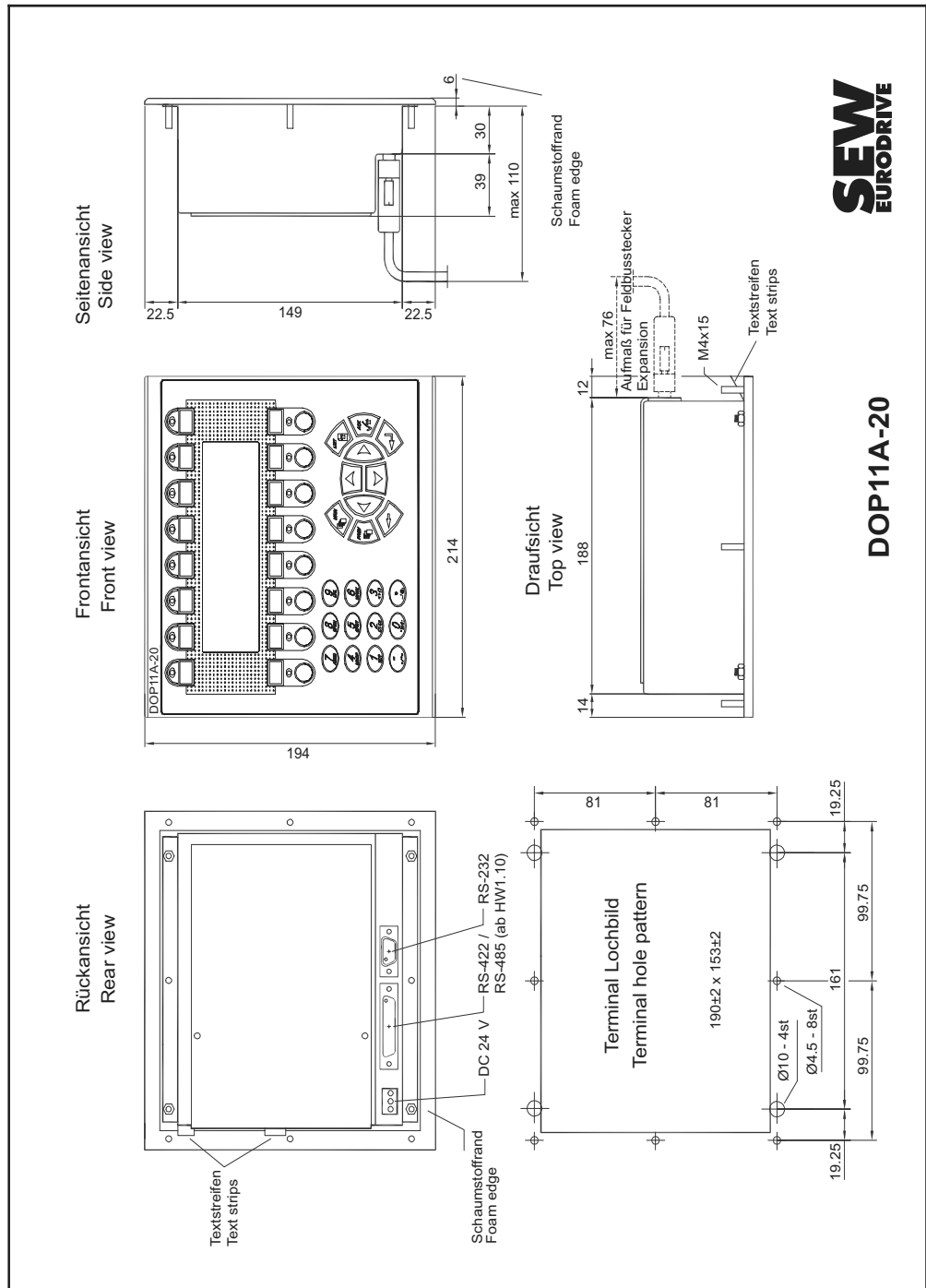
7.3 DOP11A-10



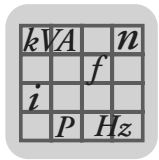
53454AXX



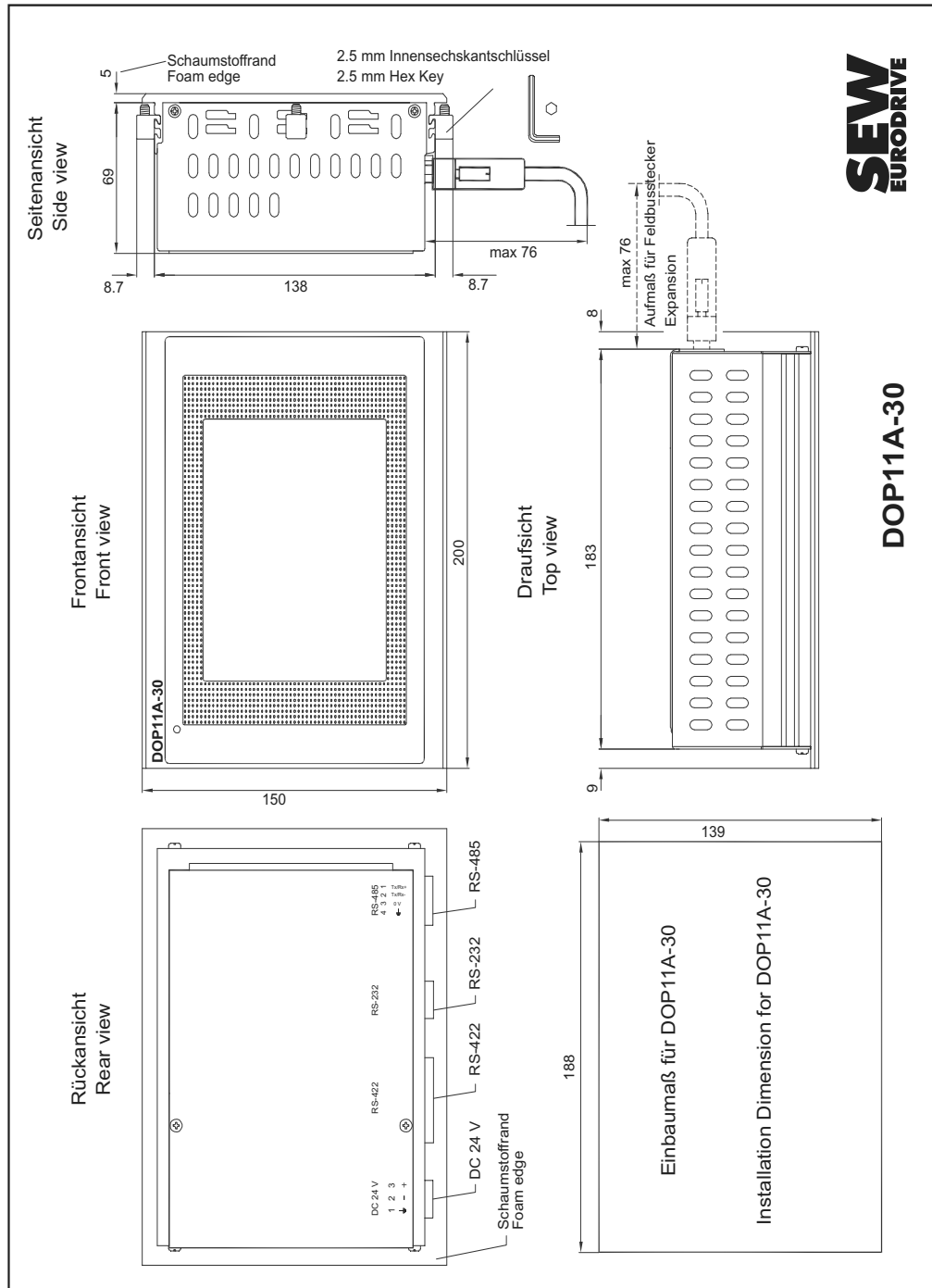
7.4 DOP11A-20



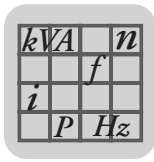
53455AXX



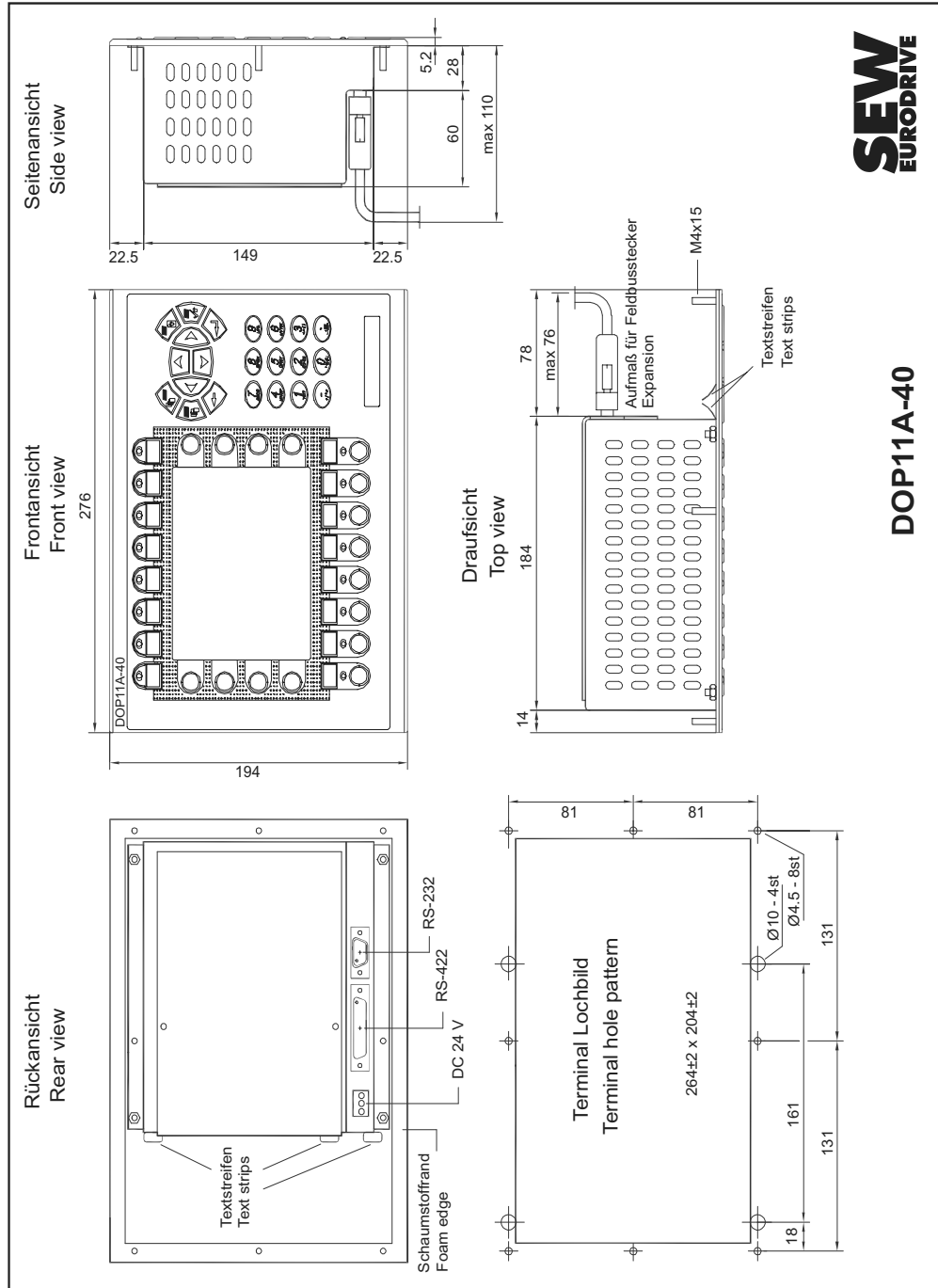
7.5 DOP11A-30



53458AXX

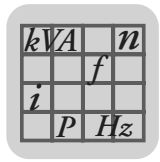


7.6 DOP11A-40

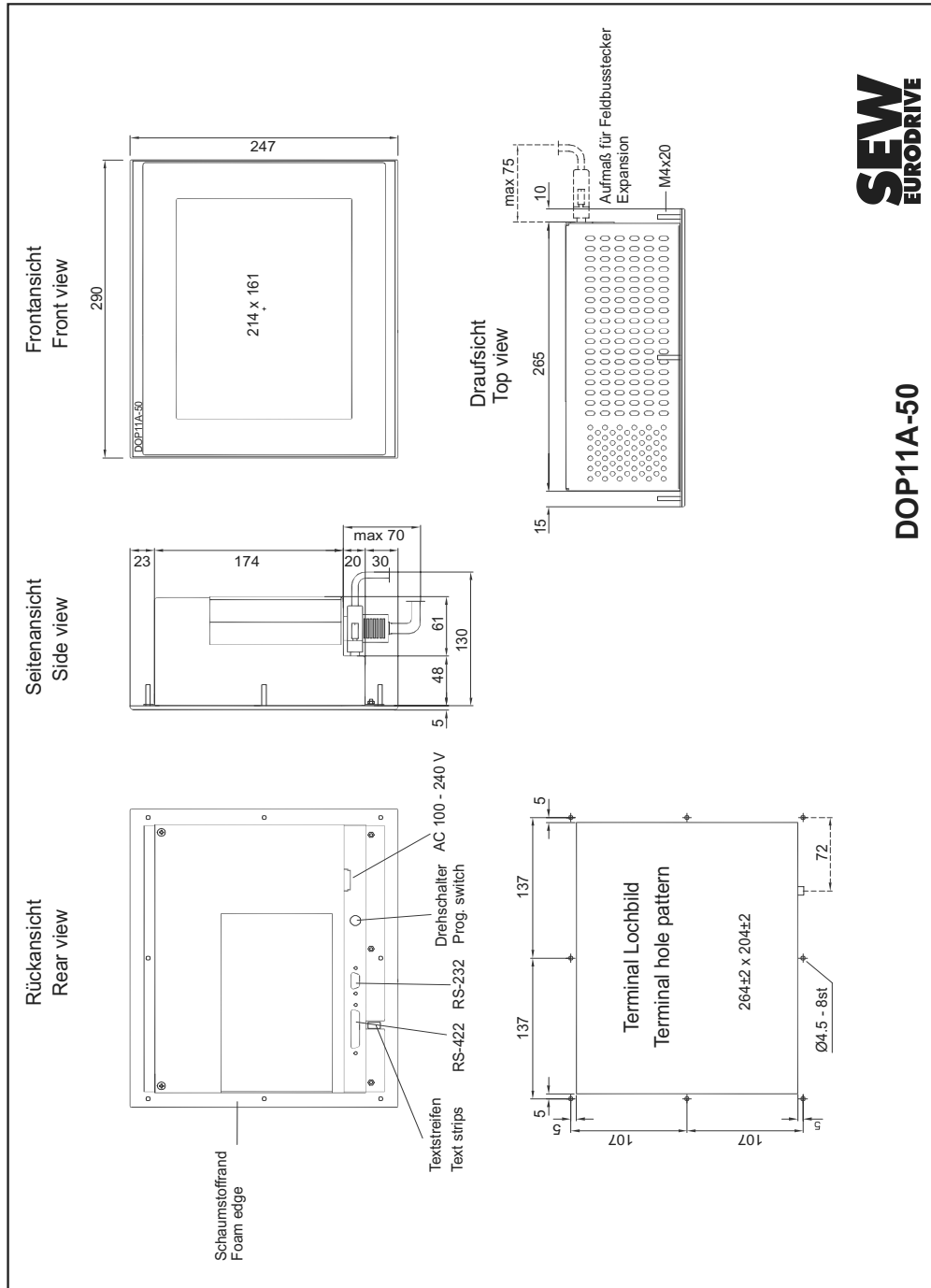


DOP11A-40

53459AXX



7.7 DOP11A-50



DOP11A-50

53459AXX



8 Appendix

8.1 Membrane keypad

8.1.1 Resistance to solvents for Autotex 2

Acceptable substances

The Autotex 2 material of the operator terminal can be exposed to the following substances according to DIN 42 115 part 2 for more than 24 hours without showing any noticeable changes:

- Ethanol
- Cyclohexanol
- Diacetone alcohol
- Glycol
- Isopropanol
- Glycerine
- Methanol
- Triacetin
- Dowanol DRM/PM
- Acetone
- Methyl ethyl ketone
- Dioxan
- Cyclohexanone
- Methylisobutylcetone
- Isophorone
- Ammonia <40%
- Caustic soda <40%
- Caustic potash <30%
- Alkaline carbonate
- Bicarbonate
- Potassium ferricyanide
- Acetonitrile
- Sodium bisulphate
- 1.1.1 Trichloroethane
- Ethyl acetate
- Diethyl ether
- n-butyl acetate
- Amyl acetate
- Ethylene glycol monobutyl ether
- Ether
- Sodium hypochloride <20%
- Hydrogen peroxide <25%
- Potassium carbonate
- Gasolin
- Formaldehyde 37% - 42%
- Ethanal
- Aliphatics
- Toluene
- Xylene
- Mineral spirit
- Formic acid <50%
- Acetic acid <50%
- Phosphoric acid <30%
- Hydrochloric acid <36%
- Nitric acid <10%
- Trichloroacetic acid <50%
- Sulfuric acid <10%
- Cutting oil
- Diesel oil
- Linseed oil
- Parrafin oil
- Blown castor oil
- Silicone oil
- White spirit
- Universal brake oil
- Decon
- Aviation gasoline
- Laundry detergent
- Fabric softener
- Ferrous (III) chloride
- Ferrous (II) chloride
- Dibutyl phthalate
- Diethyl phthalate
- Soda
- Fresh water
- Salt water
- Teepol

Autotex did not show any signs after being exposed to pure acetic acid for less than one hour according to DIN 42 115 part 2.



Harmful substances



The operator terminal may not get in contact with the following substances.

- Strong mineral acids
- Strong caustic solutions
- High pressure vapor with a temperature of more than 100 °C
- Benzyl alcohol
- Dichloromethane

Substances that do not change colors

Autotext will not change colors when being exposed to the following substances for 24 hours at a temperature of 50 °C:

- | | | |
|------------------------------|-------------------------|-----------------------------|
| • Top Job | • Grape juice | • Ariel (laundry detergent) |
| • Ajax | • Jet Dry | • Milk |
| • Persil (laundry detergent) | • Vim (cleansing agent) | • Gumption |
| • Coffee | • Wisk | • Domestos |
| • Fantastic | • Lenor | • Vortex |
| • Formula 409 | • Downey | • Windex |

Substances that may change colors



Closer examination showed slight discolorations due to contact with the following substances:

- Tomato juice
- Ketchup
- Lemon juice
- Mustard



9 Index of Changes

9.1 *Changes compared to the previous version*

The following section lists the changes made to the individual sections from edition 09/2004, publication number 11276916.

Important Notes

- The following subsections have been added to this section:
 - "Liability for defects"
 - "Product names and trademarks"

Safety Notes

- The following subsections have been added to this section:
 - "Transportation/storage"

**Unit Information,
Installation and
Hardware**

- Cable PCS21A has been added to the subsection "Accessories and options."

Installation

- The subsection "Connecting RS-485 to PCS21A" has been added.

**Operation and
Service**

- The subsection "Transferring projects with PC and HMI-Builder" has been revised.

**Technical Data
and Dimension
Drawings**

- The subsection "Pin assignment" has been revised.



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Address List

Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
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	Zilina	SEW-Eurodrive SK s.r.o. ul. Vojtecha Spanyola 33 SK-010 01 Zilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovska cesta 85 SK-97411 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. Ul. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net
South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za dross@sew.co.za

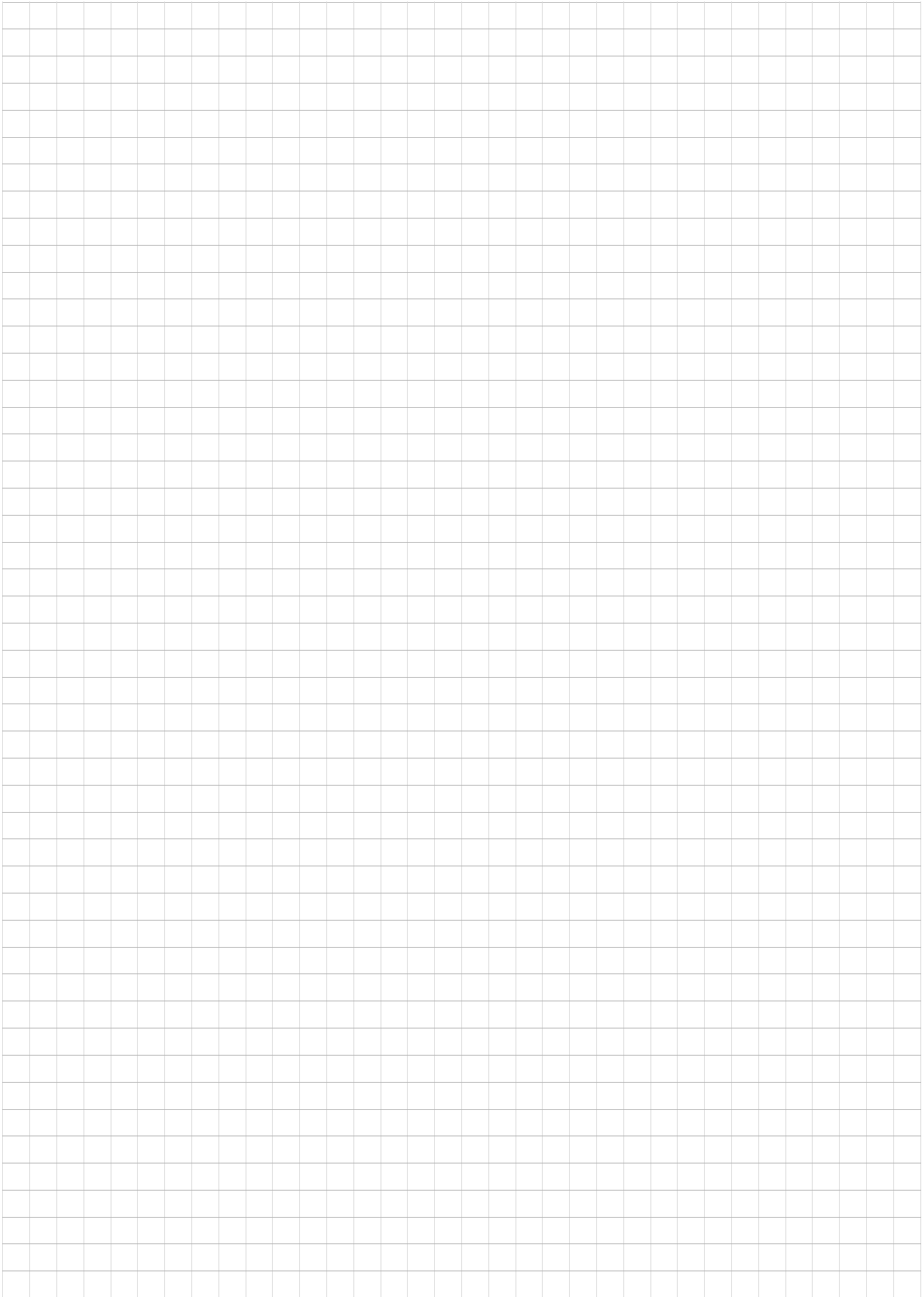


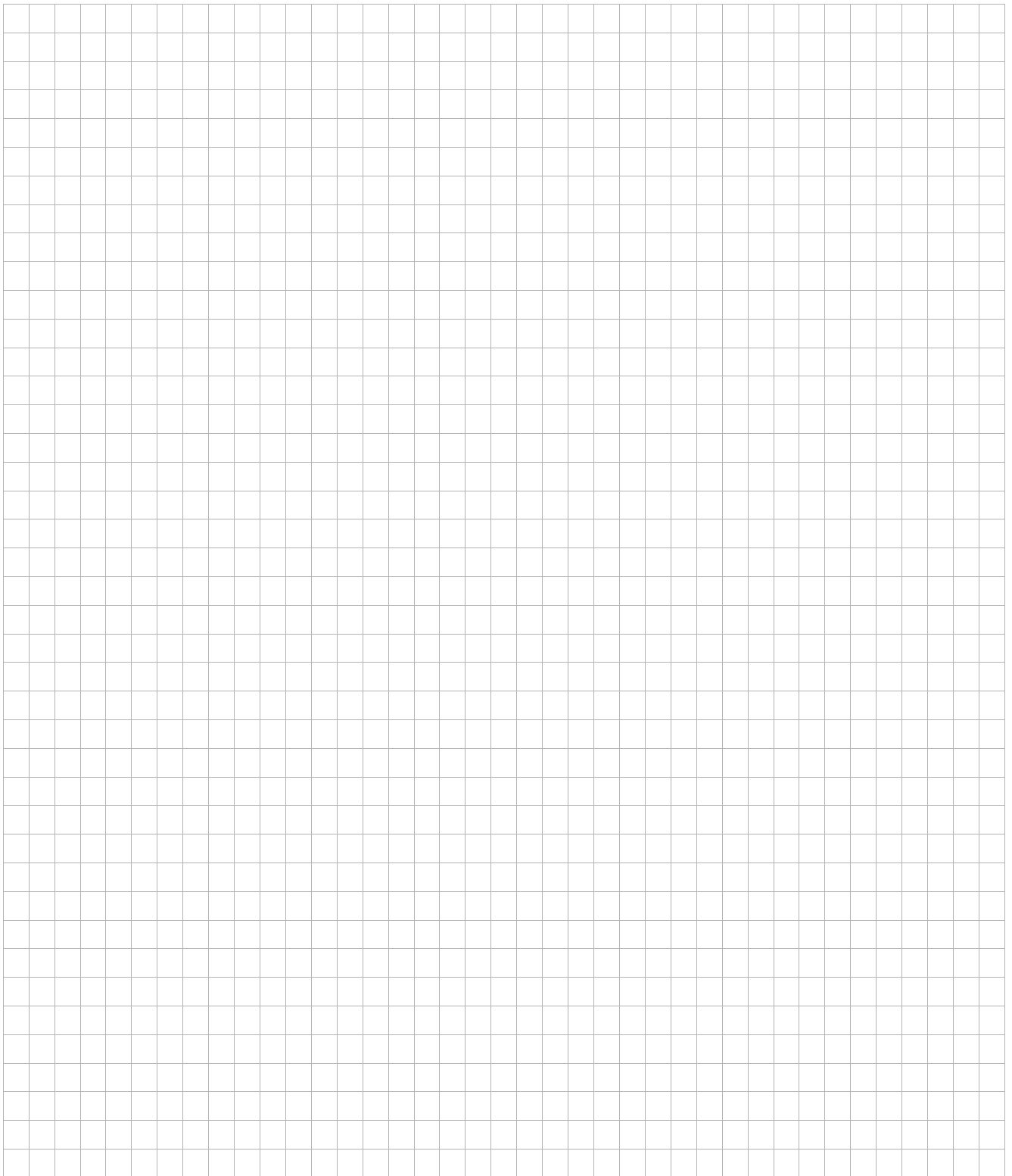
South Africa			
	Capetown	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 dswanepoel@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 9 4431 84-70 Fax +34 9 4431 84-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442-00 Fax +46 36 3442-80 http://www.sew-eurodrive.se info@sew-eurodrive.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Thailand			
Assembly Sales Service	Chon Buri	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, Moo.7, Tambol Donhuaroh Muang District Chon Buri 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com
Tunisia			
Sales	Tunis	T. M.S. Technic Marketing Service 7, rue Ibn El Heithem Z.I. SMMT 2014 Mégrine Erriadh	Tel. +216 1 4340-64 + 1 4320-29 Fax +216 1 4329-76 tms@tms.com.tn
Turkey			
Assembly Sales Service	Istanbul	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 / 164 3838014/15 Fax +90 216 3055867 sew@sew-eurodrive.com.tr
Ukraine			
Sales Service	Dnepropetrovsk	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
USA			
Production Assembly Sales Service	Greenville	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manuf. +1 864 439-9948 Fax Ass. +1 864 439-0566 Telex 805 550 http://www.seweurodrive.com cslyman@seweurodrive.com



Address List

USA			
Assembly Sales Service	San Francisco	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 510 487-3560 Fax +1 510 487-6381 cshayward@seweurodrive.com
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
Additional addresses for service in the USA provided on request!			
Venezuela			
Assembly Sales Service	Valencia	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve sewventas@cantv.net sewfinanzas@cantv.net





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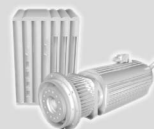
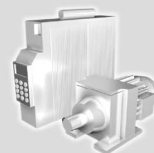
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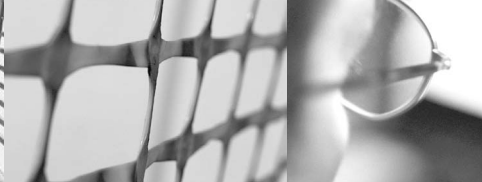
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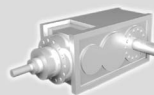
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