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**SINAMICS**

**SINAMICS G130**
Terminal Board 30 (TB30)

Operating Instructions

Control version V4.3 SP2
**Legal information**

**Warning notice system**

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

<table>
<thead>
<tr>
<th><strong>DANGER</strong></th>
<th>indicates that death or severe personal injury <strong>will</strong> result if proper precautions are not taken.</th>
</tr>
</thead>
<tbody>
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<td><strong>WARNING</strong></td>
<td>indicates that death or severe personal injury <strong>may</strong> result if proper precautions are not taken.</td>
</tr>
<tr>
<td><strong>CAUTION</strong> with a safety alert symbol,</td>
<td>indicates that minor personal injury can result if proper precautions are not taken.</td>
</tr>
<tr>
<td><strong>CAUTION</strong> without a safety alert symbol,</td>
<td>indicates that property damage can result if proper precautions are not taken.</td>
</tr>
<tr>
<td><strong>NOTICE</strong></td>
<td>indicates that an unintended result or situation can occur if the corresponding information is not taken into account.</td>
</tr>
</tbody>
</table>

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

**Qualified Personnel**

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

**Proper use of Siemens products**

Note the following:

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

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**Disclaimer of Liability**

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

1.1 Warnings

**WARNING**

Hazardous voltages are present when electrical equipment is in operation. Severe personal injury or substantial material damage may result if these warnings are not observed. Only qualified personnel are permitted to work on or around the equipment. This personnel must be thoroughly familiar with all the warnings and maintenance procedures described in these operating instructions. The successful and safe operation of this device is dependent on correct transport, proper storage and installation, as well as careful operation and maintenance. National safety guidelines must be observed.

**DANGER**

Five safety rules

When carrying out any kind of work on electrical devices, the "five safety rules" defined in EN 50110 must always be observed:

1. Disconnect the system.
2. Protect against reconnection.
3. Make sure that the equipment is de-energized.
4. Ground and short-circuit.
5. Cover or enclose adjacent components that are still live.

**NOTICE**

For a UL-approved system use 60/75°C copper conductors only.
1.2 Safety and operating instructions

DANGER

This equipment is used in industrial high-voltage installations. During operation, this equipment contains rotating and live, bare parts. For this reason, they could cause severe injury or significant material damage if the required covers are removed, if they are used or operated incorrectly, or have not been properly maintained.

When the machines are used in non-industrial areas, the installation location must be protected against unauthorized access (protective fencing, appropriate signs).

Prerequisites

Those responsible for protecting the plant must ensure the following:

- The basic planning work for the plant and the transport, assembly, installation, commissioning, maintenance, and repair work is carried out by qualified personnel and/or checked by experts responsible.
- The operating manual and machine documentation are always available.
- The technical specifications regarding the applicable installation, connection, environmental, and operating conditions are always observed.
- The plant-specific assembly and safety guidelines are observed and personal protection equipment is used.
- Unqualified personnel are forbidden from using these machines and working near them.

This operating manual is intended for qualified personnel and only contain information and notes relating to the intended purpose of the machines.

The operating manual and machine documentation are written in different languages as specified in the delivery contracts.

Note

We recommend engaging the support and services of your local Siemens service center for all planning, installation, commissioning and maintenance work.
1.3 Components that can be destroyed by electrostatic discharge (ESD)

⚠️ CAUTION

The board contains components that can be destroyed by electrostatic discharge. These components can be easily destroyed if not handled properly. If you do have to use electronic boards, however, please observe the following:

- You should only touch electronic boards if absolutely necessary.
- When you touch boards, however, your body must be electrically discharged beforehand.
- Boards must not come into contact with highly insulating materials (such as plastic parts, insulated desktops, articles of clothing manufactured from man-made fibers).
- Boards must only be placed on conductive surfaces.
- Boards and components should only be stored and transported in conductive packaging (such as metalized plastic boxes or metal containers).
- If the packaging material is not conductive, the boards must be wrapped with a conductive packaging material (such as conductive foam rubber or household aluminum foil).

The necessary ESD protective measures are clearly illustrated in the following diagram:

- a = conductive floor surface
- b = ESD table
- c = ESD shoes
- d = ESD overall
- e = ESD wristband
- f = cabinet ground connection
- g = contact with conductive flooring

Figure 1-1 ESD protective measures
Safety information

1.3 Components that can be destroyed by electrostatic discharge (ESD)
General

Description

The TB30 Terminal Board supports the addition of digital inputs/digital outputs and analog inputs/analog outputs to the Control Unit.

The following are located on the TB30 Terminal Board:

- Power supply for digital inputs/digital outputs
- 4 digital inputs
- 4 digital outputs
- 2 analog inputs
- 2 analog outputs

The TB30 Terminal Board plugs into the option slot on the Control Unit.

A shield connection for the signal cable shield is located on the Control Unit.
CAUTION

The Option Board should only be inserted and removed when the Control Unit and Option Board are disconnected from the power supply.

Figure 3-1  Mounting the Option Board
Electrical installation

Interface overview

X424
Power supply for Digital outputs

X481
Digital inputs/outputs

X482
Analog inputs/outputs

Figure 4-1 Interface description of the TB30
Connection overview

Figure 4-2 Connection overview TB30
X424 power supply, digital outputs

Table 4- 1 Terminal block X424

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Function</th>
<th>Technical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>Power supply</td>
<td>Voltage: 24 V DC (20.4 V - 28.8 V)</td>
</tr>
<tr>
<td>+</td>
<td>Power supply</td>
<td>Current consumption: Max. 4 A (per digital output max. 0.5 A)</td>
</tr>
<tr>
<td>M</td>
<td>Chassis ground</td>
<td>Max. current via jumper in connector:</td>
</tr>
<tr>
<td>M</td>
<td>Chassis ground</td>
<td>20 A at 55 °C</td>
</tr>
</tbody>
</table>

Max. connectable cross-section: 2.5 mm²

Note
The two "+" and "M" terminals are jumpered in the connector. This ensures that the supply voltage is looped through.

This power supply is required for the digital outputs only. The electronic power supply and the power supply for the analog inputs/outputs are drawn via the option slot of the Control Unit.

Note
The power supply of the digital outputs and the electronics power supply of the Control Unit are optically isolated.

Note
If a the 24 V supply is briefly interrupted, then the digital outputs are deactivated during this time.
Digital inputs/outputs X481

Table 4-2 Terminal strip X481

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Designation</th>
<th>Technical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DI 0</td>
<td>Voltage: -3 V to 30 V</td>
</tr>
<tr>
<td>2</td>
<td>DI 1</td>
<td>Current consumption: 10 mA at 24 V DC</td>
</tr>
<tr>
<td>3</td>
<td>DI 2</td>
<td>Ground reference: X424. M</td>
</tr>
<tr>
<td>4</td>
<td>DI 3</td>
<td>Input delay:</td>
</tr>
<tr>
<td>5</td>
<td>DO 0</td>
<td>- for &quot;0&quot; to &quot;1&quot;: 20 μs</td>
</tr>
<tr>
<td>6</td>
<td>DO 1</td>
<td>- for &quot;1&quot; to &quot;0&quot;: 100 μs</td>
</tr>
<tr>
<td>7</td>
<td>DO 2</td>
<td>Level (incl. ripple)</td>
</tr>
<tr>
<td>8</td>
<td>DO 3</td>
<td>High level: 15 V to 30 V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low signal level: -3 V to 5 V</td>
</tr>
</tbody>
</table>

Max. connectable cross-section: 0.5 mm²

1) DI: Digital input, DO: Digital output

Note
An open input is interpreted as "low".
The power supply and the digital inputs/outputs are optically isolated from the Control Unit.

Note
If a the 24 V supply is briefly interrupted, then the digital outputs are deactivated during this time.
Analog inputs/outputs X482

Table 4-3 Terminal strip X482

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Designation</th>
<th>Technical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AI 0+</td>
<td>Analog inputs (AI)</td>
</tr>
<tr>
<td>2</td>
<td>AI 0-</td>
<td>Voltage: -10 V to +10 V</td>
</tr>
<tr>
<td>3</td>
<td>AI 1+</td>
<td>Inner flow resistance: 65 kΩ</td>
</tr>
<tr>
<td>4</td>
<td>AI 1-</td>
<td>Resolution: 13 bit + sign</td>
</tr>
<tr>
<td>5</td>
<td>AO 0+</td>
<td>Analog outputs (AO)</td>
</tr>
<tr>
<td>6</td>
<td>AO 0-</td>
<td>Voltage range: -10 V to +10 V</td>
</tr>
<tr>
<td>7</td>
<td>AO 1+</td>
<td>Load current: max. -3 mA to +3 mA</td>
</tr>
<tr>
<td>8</td>
<td>AO 1-</td>
<td>Resolution: 11 bit + sign</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continuously short-circuit proof</td>
</tr>
</tbody>
</table>

Max. connectable cross-section: 0.5 mm²

1) AI: Analog input, AO: Analog output

Note
An open input is interpreted as approximately "0 V".
The power supply of the analog inputs/outputs is drawn via the option slot of the Control Unit and not via X424.
The shield is connected to the Control Unit.

CAUTION
The common-mode range must not be violated.
The analog differential voltage signals can have a maximum offset voltage of +/-30 V with respect to the ground potential. If the range is violated, incorrect results may occur during analog/digital conversion.
Shield connection of the TB30 on the Control Unit CU320

The permissible bending radii for the cables must not be exceeded when the cables are being installed.
Technical specifications

General technical specifications

Table 5-1 General technical specifications

<table>
<thead>
<tr>
<th>Product standard</th>
<th>EN 61800-5-1</th>
</tr>
</thead>
</table>

Technical specifications

Table 5-2 Technical data

<table>
<thead>
<tr>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic power supply</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>Vdc</td>
</tr>
<tr>
<td>Current via the option slot of the CU (without digital outputs)</td>
<td>Adc</td>
</tr>
<tr>
<td>Power loss</td>
<td>W</td>
</tr>
<tr>
<td>Reaction time</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
</tr>
</tbody>
</table>