# Overview

1. Overview

## Wiring rules

2. Wiring rules

## Wiring the mains connection plug

3. Wiring the mains connection plug

## Wiring the load current supply (PM) to the CPU

4. Wiring the load current supply (PM) to the CPU

## Potential bridge circuits

5. Potential bridge circuits

## Wiring the digital input module

6. Wiring the digital input module

## Wiring the digital output module

7. Wiring the digital output module

## Wiring front connectors

8. Wiring front connectors
Legal information

Warning notice system

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

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

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

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

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

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

Qualified Personnel

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

Proper use of Siemens products

Note the following:

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

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

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.
# Table of contents

1. Overview........................................................................................................................................... 5
2. Wiring rules......................................................................................................................................... 7
3. Wiring the mains connection plug .................................................................................................... 9
4. Wiring the load current supply (PM) to the CPU ............................................................................. 11
5. Potential bridge circuits .................................................................................................................... 13
6. Wiring the digital input module ......................................................................................................... 15
7. Wiring the digital output module ....................................................................................................... 17
8. Wiring front connectors ..................................................................................................................... 19
Overview

Wiring the assembly

You mount the assembly in this section.

⚠️ **DANGER**

The mains cable for the load current supply must not be connected to the power supply during wiring.
Wiring rules

Operation of an S7-1500 CPU in plants or systems is defined by special set of rules and regulations, based on the relevant field of application.

You can find the general rules and regulations for operating the S7-1500 in the S7-1500 system description [http://support.automation.siemens.com/WW/view/en/59191792].

Wiring rules for the CPU

<table>
<thead>
<tr>
<th>Wiring rules...</th>
<th>CPU</th>
<th>40-pin front connector (screw-type connection)</th>
<th>Load power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connectible wire cross-sections for solid wires</td>
<td>—</td>
<td>up to 0.25 mm²</td>
<td>—</td>
</tr>
<tr>
<td>Without wire end ferrule</td>
<td>0.25 to 2.5 mm²</td>
<td>0.25 to 1.5 mm²</td>
<td>1.5 mm²</td>
</tr>
<tr>
<td>With wire end ferrule</td>
<td>0.25 to 2.5 mm²</td>
<td>0.25 to 1.5 mm²</td>
<td>1.5 mm²</td>
</tr>
<tr>
<td>Connectible wire cross-sections for stranded wires</td>
<td>AWG’: 24 to 16</td>
<td>AWG’: 24 to 16</td>
<td>AWG’: 16</td>
</tr>
<tr>
<td>Without wire end ferrule</td>
<td>0.25 to 2.5 mm²</td>
<td>0.25 to 1.5 mm²</td>
<td>1.5 mm²</td>
</tr>
<tr>
<td>With wire end ferrule</td>
<td>0.25 to 2.5 mm²</td>
<td>0.25 to 1.5 mm²</td>
<td>1.5 mm²</td>
</tr>
<tr>
<td>Number of wires per connection</td>
<td>1</td>
<td>1 or a combination of 2 cables up to 1.5 mm² (total) in the same wire end ferrule</td>
<td>1</td>
</tr>
<tr>
<td>Length of stripped wires</td>
<td>10 to 11 mm</td>
<td>10 to 11 mm</td>
<td>7 to 8 mm</td>
</tr>
<tr>
<td>End sleeves according to DIN 46228</td>
<td>Without plastic sleeve</td>
<td>Design A, 10 mm long</td>
<td>Design A, 7 mm long</td>
</tr>
<tr>
<td>With plastic sleeve 0.25 to 1.5 mm²</td>
<td>Design E, 10 mm long</td>
<td>Design E, 10 mm and 12 mm long</td>
<td>Design A, 7 mm long</td>
</tr>
<tr>
<td>Sheath diameter</td>
<td>—</td>
<td>—</td>
<td>8.5 mm</td>
</tr>
<tr>
<td>Tool</td>
<td>3 to 3.5 mm Phillips screwdriver, conic design</td>
<td>3 to 3.5 mm Phillips screwdriver, conic design</td>
<td>3 to 3.5 mm Phillips screwdriver, conic design</td>
</tr>
<tr>
<td>Connection method</td>
<td>Push-in terminal</td>
<td>Screw terminal</td>
<td>Screw terminal</td>
</tr>
<tr>
<td>Tightening torque</td>
<td>—</td>
<td>from 0.4 Nm to 0.7 Nm</td>
<td>from 0.5 Nm to 0.6 Nm</td>
</tr>
</tbody>
</table>

* AWG: American Wire Gauge
Wiring the mains connection plug

Procedure

1. Pry off the connector cover using a suitable tool.

2. Connect the mains cable in the plug according to the connection diagram. You will find information on which voltage the plug is approved for on the side of the plug. You select the voltage by inserting the coding element accordingly on the back of the plug.
3. Close the cover.

4. Tighten the screw on the front of the mains connection plug.

Result

The mains connection plug is now wired.
Wiring the load current supply (PM) to the CPU

Procedure

1. Wire the 4-pin connector plug of the load current supply (PM).

2. Wire the 4-pin connector plug with the 4-pin mains connection plug of the CPU.
3. Connect the load current supply (PM) to the CPU.

Result

The load current supply is now wired to the CPU.
Potential bridge circuits

Application of the potential bridge circuits
If you want to supply the load groups with the same potential (non-isolated), use the potential circuit bridges supplied for the front connector. This means that you avoid having to wire a clamping unit with two wires.

Tip
Use the terminals 40 (M) and 39 (L+) on the front connector to loop the potential to the next module.
Wiring the digital input module

Procedure

1. Insert the front connector into the pre-wiring position. There is no electrical connection between the front connector and the module in the pre-wiring position.

2. Thread in the cable tie.
3. Connect the supply voltage 24 V DC to the terminals 20 (M) and 19 (L+).

4. Insert the potential circuit bridges between the two bottom terminals.

**Result**

The digital input module is now wired.
Wiring the digital output module

Procedure

1. Insert the front connector into the pre-wiring position.

2. Use terminals 40 (M) and 39 (L+) from the digital input module to feed the supply voltage DC 24 V from the digital input module to terminals 20 (M) and 19 (L+).
3. Connect the four potential circuit bridges.

4. Connect the terminals 30 and 40, as well as 29 and 39 to each other.

Result

The digital output module is now wired.
Wiring front connectors

Procedure

1. Connect the individual wires according to the connection diagram on the inner side of the front cover in the terminal and screw tight.

2. For strain relief, run the cable tie around the cable harness and pull tight.
3. Move the front connector from the pre-wiring position to its final position. By doing this, you create an electrical connection between the front connector and the module.

4. **Tip:** Pre-wired front connectors, e.g. for replacing modules, can be inserted directly.

**Result**

The front connectors are now wired.