QUICK START GUIDE

Protection and Power Management
PPM 300
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1. Introduction

1.1 About the quick start guide

1.1.1 General purpose

This is the quick start guide for DEIF’s Protection and Power Management controller, PPM 300. The guide provides the basic information to install and configure the PPM 300 controllers.

Refer to the Designer's handbook, Installation instructions, Commissioning guidelines, Operator's manual and PICUS manual for more information.

1.1.2 Software versions

The information in this document corresponds to the following software versions.

<table>
<thead>
<tr>
<th>Software</th>
<th>Details</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCM APPL</td>
<td>Controller application</td>
<td>1.0.8.x</td>
</tr>
<tr>
<td>DU APPL</td>
<td>Display unit application</td>
<td>1.0.9.x</td>
</tr>
<tr>
<td>PICUS</td>
<td>PC software</td>
<td>1.0.8.x</td>
</tr>
</tbody>
</table>

1.2 Warnings and safety

1.2.1 Safety during installation and operation

Installing and operating the equipment may require work with dangerous currents and voltages. The installation must only be carried out by authorised personnel who understand the risks involved in working with electrical equipment.

DANGER!
Hazardous live currents and voltages. Do not touch any terminals, especially the AC measurement inputs and the relay terminals. Touching the terminals could lead to injury or death.

1.2.2 Controller power supply

The controller must have a reliable power supply, which must include a backup power supply. In addition, the switchboard design must ensure that the system is sufficiently protected if the controller power supply fails.

If the controller has no power supply, it is OFF and does not provide any protection. The controller cannot enforce any trips, shutdowns or latches when it is off. The controller does not provide any control or power management. All the controller relays de-energise.
1.2.3 Factory settings

The controller is delivered pre-programmed from the factory with a set of default settings. These settings are based on typical values and may not be correct for your system. You must therefore check all parameters before using the controller.

1.2.4 Reset to factory settings

The controller's I/O and parameter configuration is reset to the default factory settings if the controller type is changed in the single-line diagram.

1.2.5 Automatic and remote-controlled starts

The power management system automatically starts gensets when more power is needed. It can be difficult for an inexperienced operator to predict which gensets will start. In addition, gensets can be started remotely (for example, by using an Ethernet connection, or a digital input). To avoid personal injury, the genset design, the layout, and maintenance procedures must take this into account.

1.2.6 Electrostatic discharge

You must protect the equipment terminals from electrostatic discharge when not installed in a grounded rack. Electrostatic discharge can damage the terminals.

1.2.7 Data security

To minimise the risk of data security breaches DEIF recommends:

- As far as possible, avoid exposing controllers and controller networks to public networks and the Internet.
- Use additional security layers like a VPN for remote access, and install firewall mechanisms.
- Restrict access to authorised persons.

1.3 Legal information

1.3.1 Trademarks

DEIF is a trademark of DEIF A/S.

Bonjour® is a registered trademark of Apple Inc. in the United States and other countries.

CANopen® is a registered community trademark of CAN in Automation e.V. (CiA).

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Modbus® is a registered trademark of Schneider Automation Inc.

Windows® is a registered trademark of Microsoft Corporation in the United States and other countries.

All trademarks are the properties of their respective owners.
1.3.2 Disclaimer

DEIF A/S reserves the right to change any of the contents of this document without prior notice.

The English version of this document always contains the most recent and up-to-date information about the product. DEIF does not take responsibility for the accuracy of translations, and translations might not be updated at the same time as the English document. If there is a discrepancy, the English version prevails.

1.3.3 Copyright

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2. Installation and wiring

2.1 Mount the hardware

2.1.1 Controller mounting

1. Check the available space at the vertical mounting position. There should be a minimum of 80 mm (3.16 inches) of free space above and below the controller for ventilation and cable installation.

2. Mount the rack at the mounting position with the PSM on the left and the PCM on the right when looking at the controller from the front.

3. One mounting position should be grounded. See Detail A.

INFO
The grounded position must have a toothed lock washer between the controller foot and the earth connection.
2.1.2 Display unit mounting

1. Check the available space at the vertical mounting position. There should be a minimum of 80 mm (3.16 inches) of free space above, below and to the left (seen from behind) of the display unit for ventilation and cable installation.

2. Slide the display unit into the mounting position.

3. Click in, and fasten the securing screws. See Detail A.
2.2 Wire the hardware

2.2.1 Wire the controllers

Connect the wires to the controller modules according to the system design.

⚠️ **CAUTION**
Do NOT connect the power cables at this time.

Refer to the Designer's handbook and Installation instructions for more information.

2.2.2 Wire the communication

**Figure 2.1** Example of how communication wires can be connected

Connect the communication wires according to the system design.
- The diagram shows a wiring example for a Network ring.
- The diagram shows the recommended default connection for the Ethernet cables.
- The service PC, SCADA, alarm management system (AMS) and Modbus TCP/IP connections can be connected to any controller in the network.

Refer to the Designer's handbook and Installation instructions for information on configuring the system communication.
2.2.3 Wire the power supplies

![Diagram of power supply connection]

**CAUTION**
Ensure the power supply is OFF before connecting the power supply to the controllers and display units.

1. Connect the wires from the power supply to the power terminal blocks for the controllers and the display units.
2. Insert the power terminal blocks into the power terminals of the controllers' modules.
3. Insert the power terminal blocks into the power terminals of the display units.
4. Turn on the power.
3. Using the display unit

3.1 Display unit overview

3.1.1 Display unit overview

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Screen</td>
<td>Displays the menus and status of the connected controller.</td>
</tr>
<tr>
<td>2</td>
<td>Navigation push buttons</td>
<td>Eight push buttons to navigate the menus and make configurations.</td>
</tr>
<tr>
<td>3</td>
<td>Help</td>
<td>Opens help for the screen that you are viewing.</td>
</tr>
<tr>
<td>4</td>
<td>Controller specific folio and push buttons</td>
<td>The layout, status LEDs and available push buttons can differ between controllers.</td>
</tr>
<tr>
<td>Number</td>
<td>Name</td>
<td>Function</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>5</td>
<td>Mode selection push buttons</td>
<td>The controller changes to AUTO mode.</td>
</tr>
<tr>
<td></td>
<td>AUTO mode</td>
<td><strong>Green LED</strong>: The controller is in AUTO mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF LED</strong>: The controller is not in AUTO mode.</td>
</tr>
<tr>
<td></td>
<td>SEMI mode</td>
<td>The controller changes to SEMI mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Green LED</strong>: The controller is in SEMI mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF LED</strong>: The controller is not in SEMI mode.</td>
</tr>
<tr>
<td></td>
<td>1ST First priority</td>
<td>The controller gives the genset the first priority in the genset start order in the power management system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Green LED</strong>: The genset has the first priority in the genset start order in the power management system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Yellow LED</strong>: The genset is next in the genset start order in the power management system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF LED</strong>: Another genset has first priority, or the power management system automatically calculates the genset priority, or the controller is under SWBD control.</td>
</tr>
<tr>
<td>6</td>
<td>Engine LED</td>
<td><strong>Green</strong>: There is running feedback. Oil pressure, RPM, frequency above configured limit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Green (flashing)</strong>: Engine is becoming ready.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong>: The engine is not running, or there is no running feedback.</td>
</tr>
<tr>
<td>7</td>
<td>Generator LED</td>
<td><strong>Green</strong>: The generator voltage and frequency are OK, and the controller can synchronise and close the breaker.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Green (flashing)</strong>: The generator voltage and frequency are OK, but the V&amp;Hz OK timer is still running. The controller cannot close the breaker.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Yellow</strong>: The generator voltage and frequency are measurable, but not OK. The controller cannot close the breaker.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong>: The generator voltage is too low to measure.</td>
</tr>
<tr>
<td>8</td>
<td>Breaker LED</td>
<td><strong>Green</strong>: The breaker is closed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Yellow</strong>: The breaker spring is charging (only applies to a compact breaker).</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Yellow (flashing)</strong>: The controller is synchronising or de-loading the breaker.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Red</strong>: The controller tripped the breaker, and the trip alarm is unacknowledged and/or the alarm condition is still present.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Red (flashing)</strong>: Any generator breaker trip alarm is active.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong>: The breaker is open.</td>
</tr>
<tr>
<td>9</td>
<td>Busbar LED</td>
<td><strong>Green</strong>: The busbar voltage and frequency are OK, and the controller can synchronise and close the breaker.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Green (flashing)</strong>: The busbar voltage and frequency are OK, but the V&amp;Hz OK timer is still running. The controller cannot close the breaker.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Yellow</strong>: The busbar voltage and frequency are measurable, but not OK.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Red</strong>: The busbar voltage is too low to measure (for example, during a blackout). The controller can close the breaker.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Red (flashing)</strong>: The blackout detection timer is running and the controller is checking the busbar.</td>
</tr>
<tr>
<td>10</td>
<td>Generator breaker close and open</td>
<td>Sends command to close or open the generator breaker in SEMI mode.</td>
</tr>
<tr>
<td>11</td>
<td>Genset start and stop</td>
<td>Sends command to start or stop a genset in SEMI mode.</td>
</tr>
<tr>
<td>12</td>
<td>Silence horn</td>
<td>Stops the horn output immediately.</td>
</tr>
<tr>
<td>Number</td>
<td>Name</td>
<td>Function</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>13</td>
<td>Alarm LED</td>
<td><strong>Red (constant)</strong>: Alarm(s) active, and all alarms acknowledged.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Red (flashing)</strong>: Unacknowledged alarm(s).</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Yellow</strong>: Unlatched alarms can be reset (when no other alarms require action).</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Yellow (flashing)</strong>: Unacknowledged latched alarms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Green (flashing)</strong>: Only unacknowledged alarm(s) where the alarm condition has cleared.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Green (constant)</strong>: No alarms.</td>
</tr>
<tr>
<td>14</td>
<td>Controller status LEDs</td>
<td><strong>Display unit power OK</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Green (constant)</strong>: The display unit power is OK.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong>: The display unit power is not OK.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Self-check OK</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Green (constant)</strong> The controller self-check is OK.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong>: The controller self-check is not OK, or there is no connection to the controller.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Ready for operation</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Green (constant)</strong>: The controller is not under switchboard control, and there is no alarm action (for example, shutdown, trip or block) that prevents the source from supplying power.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong>: The controller is under switchboard control, or there is an alarm action that prevents the source from supplying power.</td>
</tr>
</tbody>
</table>
4. Getting started

4.1 Initial configuration

4.1.1 Pair to the controller

The first time that a display unit is powered on, the operator must select a controller to pair with. Use Configure > Pair to change the pairing.

![Pairing, select controller](image)

**Pairing, select controller**

<table>
<thead>
<tr>
<th>ID</th>
<th>Label</th>
<th>Host name</th>
<th>Hops</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DG 2</td>
<td>defi-mi300-017928</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>DG 1</td>
<td>defi-mi300-017900</td>
<td>2</td>
</tr>
</tbody>
</table>

**Pair to a controller**

1. Highlight the controller you wish to pair with, by pressing Up or Down and select the controller by pressing OK.

   **INFO**
   The number of hops shown indicate how close the controller may be to the display unit. 1 hop indicates the controller that the display unit is actually plugged in to.

2. Confirm the controller pairing by pressing OK. The display unit restarts automatically.

   **INFO**
   If a display unit fails the controller can be paired with any display unit available in the network.

4.1.2 Configure the controller ID

The factory default Controller ID for a controller is 0 (zero). For each controller in the system, use the display unit to configure a unique Controller ID:

1. From the Home menu, select Log on.
2. Select the Admin user (default password: 00000004) and log on.
3. From the Home menu, select Tools > Communication.
4. Highlight Controller ID, and press OK to edit.
5. Use the virtual keyboard and OK to configure the Controller ID (the range is 1 to 64).
6. Select Next, and then select Write on the Communication screen.

Controller ID can also be configured using the PICUS software. Refer to the PICUS manual for more information.

4.2 PICUS

4.2.1 Download and install

Downloading PICUS
2. Scroll to Software downloads and choose Multi-line 300 PICUS ver. 1.x.x. software.
3. Submit your email address to receive a download link.
4. Follow the link to download PICUS.

Installing PICUS
1. Launch the PICUS installer from your computer.
2. Follow the instructions in the installer program.

See the PICUS manual for further information on how to download and install PICUS.

CAUTION
You must install Bonjour, if you do not already have this installed on your computer. This service is used for the network detection on the DEIF network. PICUS uses Bonjour to detect all controllers that are connected to the same network. No additional configuration is required.

4.2.2 First time log on

Logon
1. Use an Ethernet cable to connect your computer to a free Ethernet port (PCM port 3) on any controller in the system.
2. Launch PICUS from the installed folder.
3. Select all the controllers from the list and select the Connect icon at the bottom right.
4. Select the Admin user (default password: 00000004) from the available list.
5. Log on using the default password.
Change the administrator password
1. Go to Tools > Advanced > Permissions > Users.
2. Select the Admin user and select Edit.
3. Confirm the Old password, then enter and confirm the New password. Select Save.
4. To change the password of the controller that PICUS is logged on to, select Write from the right side panel.
5. To change the password for all the other controllers that PICUS is connected to, select Broadcast from the right side panel. Select all the controllers and select OK.

Change the date and time
For each controller:
1. Use PICUS to log on to the controller.
2. Go to Configure > Time settings.
3. Enter the correct time, date and time zone.
4. Select Write from the right side panel.
4.3 Application configuration

4.3.1 Create the single-line diagram

2. Create the system single-line diagram by dragging components to the single-line area.
3. For each controller: Select the correct Controller ID under Component configuration.
4. Select Broadcast from the right side panel. Select all the controllers and select OK.
   - If required, override the controller(s) status by selecting the override box.
**DANGER!**
Do not override controller(s) status on a live system.

**CAUTION**
Changing controller type in the single-line diagram will reset I/O and parameter configuration to default factory settings.

### 4.3.2 Configure the inputs and outputs

1. Go to **Configure > Input/output**.
2. Select the controller module to configure.
3. Select the terminal to configure.

4. Configure the terminal and select **Save** when the configuration is complete.
   - Some I/Os must be configured in more than one page. For example, for analogue outputs first configure the function on the **Function** page, then configure the output on the **Output setup** page.

5. Repeat step 3 and step 4 for the remaining terminal configurations.
6. Select **Write** from the right side panel.

**INFO**
You only configure the controller that you are **Logged on** and **Connected** to.

### 4.3.3 Configure the parameters

1. Go to **Configure > Parameters**.
2. Select the parameter group that you want to configure from the list.
3. Select and configure the parameter. Additional information about the parameter that you are configuring is displayed under **Info**.
4. Repeat step 2 and step 3 for the remaining parameters.
5. Select **Write** from the right side panel.
INFO
You only configure the controller that you are *Logged on* and *Connected* to.