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1. Delimitation

1.1 Scope of Application notes, Getting started - USW 3.x

This document covers the following products:

- AGC 100 from SW version 4.xx.x
- AGC 200 from SW version 3.5x.x
- AGC-3 from SW version 3.40.0
- AGC-4 from SW version 4.xx.x
- CGC 200 from SW version 1.xx.x
- CGC 400 from SW version 1.xx.x
- ECU 100 from SW version 1.xx.x
- GCU 100 from SW version 1.xx.x
- GC-1F from SW version 1.00.0 and 2.0x.x
- GPC-3 from SW version 3.0.x.x
- GPU-3 from SW version 3.0.x.x
- GPU-3 REC from SW version 3.0.x.x
- PPM-3 from SW version 3.0.x.x
- PPU-3 from SW version 3.0.x.x

Utility Software USW version 3.36.0 and later.
2. General information

2.1 Warnings, legal information and safety

2.1.1 Warnings and notes

Throughout this document, a number of warnings and notes with helpful user information will be presented. To ensure that these are noticed, they will be highlighted as follows in order to separate them from the general text.

Warnings

DANGER!
Warnings indicate a potentially dangerous situation, which could result in death, personal injury or damaged equipment, if certain guidelines are not followed.

Notes

INFO
Notes provide general information, which will be helpful for the reader to bear in mind.

2.1.2 Legal information and disclaimer

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the engine/generator controlled by the Multi-line 2 unit, the company responsible for the installation or the operation of the set must be contacted.

DANGER!
The Multi-line 2 unit is not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

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.

2.1.3 Safety issues

Installing and operating the Multi-line 2 unit may imply work with dangerous currents and voltages. Therefore, the installation should only be carried out by authorised personnel who understand the risks involved in working with live electrical equipment.

DANGER!
Be aware of the hazardous live currents and voltages. Do not touch any AC measurement inputs as this could lead to injury or death.

2.1.4 Electrostatic discharge awareness

Sufficient care must be taken to protect the terminal against static discharges during the installation. Once the unit is installed and connected, these precautions are no longer necessary.
2.1.5 Factory settings

The Multi-line 2 unit is delivered from factory with certain factory settings. These are based on average values and are not necessarily the correct settings for matching the engine/generator set in question. Precautions must be taken to check the settings before running the engine/generator set.

2.2 About the Application Notes

2.2.1 General purpose

This document includes application notes for DEIF’s Multi-line 2 unit. It mainly includes examples of different applications suitable for the unit.

INFO
For functional descriptions, the procedure for parameter setup, parameter lists, and so on, see the Designer's Reference Handbook.

The general purpose of the application notes is to offer the designer information about suitable applications for the Multi-line 2 unit.

DANGER!
Make sure to read this document before starting to work with the Multi-line 2 unit and the genset to be controlled. Failure to do this could result in human injury or damage to the equipment.

2.2.2 Intended users

The Application Notes are mainly intended for the person responsible for designing Multi-line 2 systems. In most cases, this would be a panel builder designer. Naturally, other users might also find useful information in this document.

2.2.3 Contents and overall structure

This document is divided into chapters, and in order to make the structure simple and easy to use, each chapter will begin from the top of a new page.
3. Cable connections between PC and DEIF controller

3.1 General information

Different cables are used for connection, depending on type of the ML-2 unit.

The section "Connection table - Flashing" describes which connections that can be used to flash new application software into the unit.

The section "Connection table - Setting up" describes which connections that can be used to set up and change different functions and parameters in the unit.

3.2 Connection table - flashing

This table gives an overview of the different connection possibilities if flashing of the unit is desired.

<table>
<thead>
<tr>
<th>Product name</th>
<th>TTL service port: option J9</th>
<th>USB service port: option J7</th>
<th>Ethernet service port: option N cable: option J4</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGC 100</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>AGC 200</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>AGC-3</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>AGC-4</td>
<td></td>
<td>X</td>
<td>X&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>CGC 200</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>CGC 400</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ECU 100</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>GCU 100</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>GC-1F</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>GPC-3</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>GPU-3</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>GPU-3 REC</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PPM-3</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PPU-3</td>
<td></td>
<td>X</td>
<td>X&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>1</sup>To be able to flash on a TCP-IP connection, the following must be fulfilled:
• SW version: AGC-4: 4.40.0 or later; PPU-3: 3.10 or later
• Option N SW version: 2.20.0 or later
• Boot SW version: 1.03.0 or later

INFO
If the boot SW version is prior to 1.03, only 0 will be shown in Identifiers.

The boot SW version can only be found by connecting to the unit and opening the "Identifiers" window as shown below.
### 3.3 Connection table - setting up

This table gives an overview of the different connection possibilities if change of parameters or other settings in the unit are desired.

<table>
<thead>
<tr>
<th>Product name</th>
<th>TTL service port cable: option J9</th>
<th>USB service port cable: option J7</th>
<th>Modbus RTU on RS-485 option H2</th>
<th>Ethernet service port: option N cable: option J4</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGC 100</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>AGC 200</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>AGC-3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>AGC-4</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CGC 200</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CGC 400</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ECU 100</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GCU 100</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GC-1F</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPC-3</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>GPU-3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>GPU-3 REC</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PPM-3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PPU-3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
4. PC utility software

4.1 General information

The PC utility software (hereafter called USW) is a software programme that can be used for configuration of the Multi-line 2 products. There are two versions, 1.x and 3.x. This document will only be dealing with USW 3.x.

INFO
The utility software is the software that is installed on the PC, notebook or desktop computer.

4.2 Supported Windows systems

The supported Windows versions are (32 and 64 bit variants):

- Windows 10
- Windows 8/8.1
- Windows 7

4.3 Obtain USW from DEIF

4.3.1 USW

The USW is normally obtained from DEIF via the internet. Visit www.deif.com.
Select "Software" from the top line on the webpage:

Scroll down and Click on "Multi-line 2 Utility Software v.3.x"

Scroll down to the field where you can enter your Email address

Enter Email address and click "Download"
Information about changes in the recent software compared with the previous version is also found on this page.

The entire changelog can be found on the top of this page also.

After clicking "Download", an Emaí is sent with a download link.
Thank you for downloading the Multi-line 2 Utility Software v.3.x software from DEIF A/S

To install the software do the following:

The Multi-line 2 will not be able to perform any control actions during the download procedure and no protection functions will be active.

All outputs will become de-energised during download, because of this, precautions must be taken to ensure that it does not influence your equipment.

MULTI-LINE 2 - UTILITY SOFTWARE

This is important information. We recommend that you read this in its entirety.

Connection cable can be USB or RS232 dependent on the product in question.

If RS232 connection is required, a null-modem cable is needed: -- SERIAL CABLE 9 pin female in both ends.

Pin 3 to 2
Pin 2 to 3
Pin 5 to 5

SOME HELP INFORMATION

To communicate with Mi-2 you must select connection on the menu bar.

Port number etc. can be set under 'Settings' in the menu bar. Some items is not available if a port is not selected.

Download the software by clicking this link:
https://www.deif.com/483/software/multi-line-2-utility-software-v3y/3-44-1

Having trouble using the software? Please contact support@deif.com

Follow the instructions in this e-mail carefully.

When the USW has been saved to your PC, the software can be installed by executing the file you just downloaded. Follow the instructions on the screen.

INFO

If you do not receive the Email, please check your spam folder.

4.4 Getting connected

4.4.1 Getting connected

Connect the service port to the USB on the computer.

Click the utility software 3 icon on the desktop or in the Windows Start menu.
The below window appears.

Open the application settings by clicking this icon:

In the connection window, you can choose between different types of communication: Service port is USB port or TTL port, Serial port is for an RS-485 connection, and TCP-IP is for an Ethernet connection.

In this case choose Service port.

Press Scan ports to scan the system for new COM ports. Note that this may take some time.

Choose the COM port of the desired DEIF controller on the drop-down menu.

Click OK.

Click the "Connect" icon:

You are now online with the unit.
The USW has an integrated help function. To reach the help function, press F1.

4.4.2 Password

The unit typically includes three password levels: Customer, Service and Master. The passwords corresponding to these levels can be adjusted in the PC software.

INFO
CGC 200 only has one password level, and GC-1F/2 only has two password levels.

Available password levels:

<table>
<thead>
<tr>
<th>Password level</th>
<th>Factory setting</th>
<th>Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>2000</td>
<td>X</td>
</tr>
<tr>
<td>Service</td>
<td>2001</td>
<td>X, X</td>
</tr>
<tr>
<td>Master</td>
<td>2002</td>
<td>X, X, X</td>
</tr>
</tbody>
</table>

An example of the use of password levels is that a parameter cannot be changed with a password level that is ranking too low. But the settings can be displayed without password entry.

Each parameter can be protected by a specific password level. To do so, the PC utility software must be used. Enter the parameter to be configured and select the required password level.

In the following steps of this guide, it can be necessary to acquire project-specific passwords to access the different functions.
5. Multi-line 2 application software

5.1 General information

INFO
The application software (hereafter called ASW) is the software that is written in the ML-2 device.

When you receive the unit from the factory (DEIF A/S), ASW software has already been downloaded, so it is ready to be parameterised with all necessary set points and adjustments.

5.2 Reason for upgrade

5.2.1 Main reasons

There are various reasons for upgrading the ML-2 device. The main reasons are:

1. To get new functions available in the latest ASW version.
2. The software has an error (bug) that needs to be fixed for cosmetic or functional reasons.
3. To prepare several ML-2 units with the same software, so they are identical prior to forwarding.

Information about functions and bugs can be found on www.deif.com.

INFO
In most cases, it is not necessary to upgrade the units.

5.3 Precautions

5.3.1 Warning

DANGER!
Read this section carefully before attempting to upgrade your units.

5.3.2 Genset condition

All software downloading to the ML-2 device must be carried out while the genset is at standstill.

5.3.3 Protection

All protections are deactivated during download.

5.3.4 Relay status

All relays are de-energised during download. Check your diagrams carefully to understand the effect of this.

Status relay

Check relay on terminals 3 and 4 (AGC 100, AGC-3, AGC-4, GC-1F, CGC400, GPC, GPU and PPU only).

Check relay on terminals 16 and 17 (AGC 200).
5.4 Application software

5.4.1 How to obtain ASW from DEIF

Follow the description in the section "Obtain USW from DEIF".
6. Before writing new application software

6.1 General information

During an installation of new application software (hereafter called ASW), the configuration of the unit will be lost. So if the configuration is to be reused, a manual procedure is to be followed. The following steps describe how to prepare upgrading of ASW.

1. Save the configuration to a project file before the installation of new ASW
2. Flash the controller with the new ASW
3. After installation, the configuration can then be written back to the unit, and in that way the unit will have the same configuration as before the installation.

6.2 How to get a project file for backup

In order to keep track of the project file from the Multi-line 2, it is recommended to save it somewhere logical/easy to remember – this could typically be together with other project files.

Open the USW and connect to your device with the "connect" button in the menu "Connection".

Read parameters from the unit using the "batch job" function.

Select "Read from device":

![Diagram of DEIF Multi-line 2](image-url)
Select the parameters to be saved in the USW project file (file.usw):

Choose file name and where to save the project file on the PC:
7. Upgrading application software

7.1 General information

Before attempting to download application software to the device, read chapter 6 "Before writing new application software" for instructions about how to save the present configuration.

**DANGER!**
If you fail to save the parameters prior to SW download, they will be lost. They cannot be restored when the software has been downloaded.

7.2 Download of new ASW to unit

Click the "firmware update" icon and select new application software.

Find the new ASW located on the PC.

**INFO**
File type: AGC 100 = file.1ax, AGC 200 = file.2xx, AGC-3/4 = file.a37, CGC 400 = file.4cx, ECU 100 = file.1ax, GCU 100 = file.1ax GC-1F = file.a79, GPC-3 = file.a37, GPU-3 = file.a37, PPM-3 = file.a37 and PPU-3 = file.a37.

This will force the DEIF unit into boot mode.
INFO
If the programming is interrupted, disconnect the aux. voltage, connect the aux. voltage, and the unit is in boot mode. Restart the download procedure, the USW will now ask you to choose which product you have.

INFO
GC-1F: If the programming is interrupted, you can force the unit back into boot mode by disconnecting the aux. voltage. Press and hold the "Stop" button. Connect the aux. voltage, and the unit is in boot mode.

After download of new firmware, parameters saved in the project file (file.usw) can be downloaded to the unit.

Open a saved project file from the PC.

Click the "batch job" icon and select "Write to device".

Select the parameters you want to download to the unit.
When the programming is completed, the unit will make a reset after which it is operational again.