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Concern: **How to replace a MicroSD memory card on the PCB of a PCD2.M4160 or PCD2.M4560**

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Version 1.0

This document describes the procedure to replace the Micro SD memory card on the PCD.
The replacement consists of the following steps:

- Disassembling of the PCD
- Localisation of the uSD card
- Removing the old uSD card
- Mounting the new uSD card
- Verification if the uSD card was inserted correctly
- Re-assembling of the PCD
- Reload the firmware to the PCD
- Reload the PG5 program to the PCD

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1 Remarks when handling with printed circuit boards (PCB)



ESD (Electrostatic Discharge):

Circuit board components are designed to operate within a specified range of voltage that is carefully calculated for their circuitry. On the other hand, static electricity can be created through a simple and unexpected action such as opening a plastic bag or rubbing articles of clothing together. If a circuit board is exposed to these unintended discharges of static electricity, the tolerance of some of the components can be exceeded, causing damage to those parts.



Physical damage: Although the circuit board is built to be tough in the application it is designed for, it can still be easily damaged if it is treated too roughly. The board can be broken if subjected to enough impact, like falling off a workbench, and soldered parts can snap off if hit with enough force. Metal traces and pads on the board can lift or crack if the board flexes too much.



Contamination: Moisture can cause a circuit board's metal traces and pads to tarnish, and even regular dirt and grime can add to the problem. These contaminants can affect the components' solderability, causing weak connections or disrupting the manufacturing process.

1.1 Rules for handling of printed circuit boards during processing



Based on the problems listed above, here are what we do recommend if you are handling the PCD's for exchanging the uSD memory cards:

ESD: Circuit boards are handled the most during PCB inspection and rework, and therefore all work must be done in properly designated work areas. These areas should be clean and neat with proper ventilation, and technicians should be grounded with a wrist strap connected to the earth-ground.

Physical handling: Workflows should be set up for lean manufacturing and strategically laid out to minimize the board's handling. Technicians should wear protective clothing and gloves, and circuit boards should be handled gingerly by their edges.

Moisture: Don't expose the PCB on moisture to avoid moisture contamination.

The following dos and don'ts will help provide the best handling protection for circuit boards:

- Protect the board from moisture by keeping it on the PCD or cabinet until needed.
- Technicians should be grounded with a wrist strap connected to the earth-ground.
- Keep your workstation clean of any materials or liquids that could contaminate the PCB.
- Make sure your workstation is designed to resist static electricity buildup.
- Handle the circuit board by its edges with a secure grip using as little pressure as possible.
- Don't touch unnecessary the components on the PCB with your hands or with tools.

2 Prerequisite for the new uSD card

The memory space on the new Micro SD card (uSD card) need to be empty and must be formatted as FAT16 to be used on the PCD.

We strongly recommend to use only uSD cards provided by SBC, since they will have an industrial standard and have been tested and approved by SBC to work on our PCD's.

2.1 How to check if the uSD card is empty and formatted as FAT16

Insert the uSD card in a uSD card holder and insert the uSD card holder into the PC.

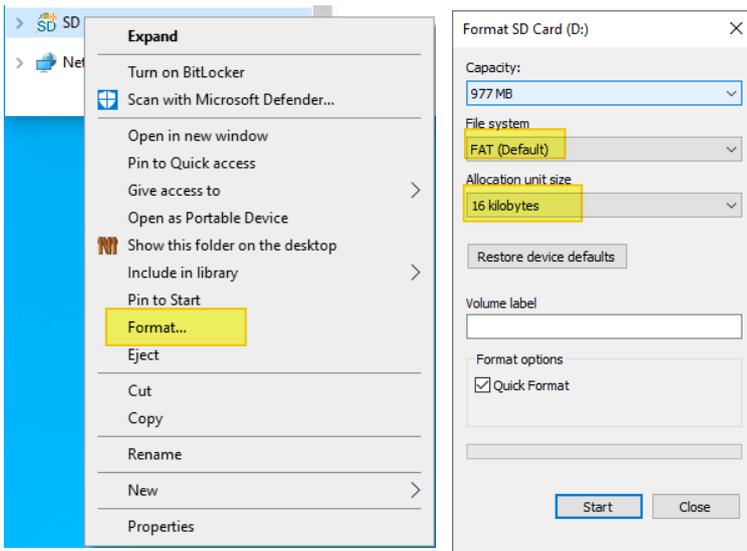


Browse with the File Explorer to the uSD card.

2.2 Check if the uSD card was formatted with FAT16

Right mouse click on Format, the properties shows the following.

- File system: FAT (Default)
- 'Allocation unit size': 16 kilobytes.



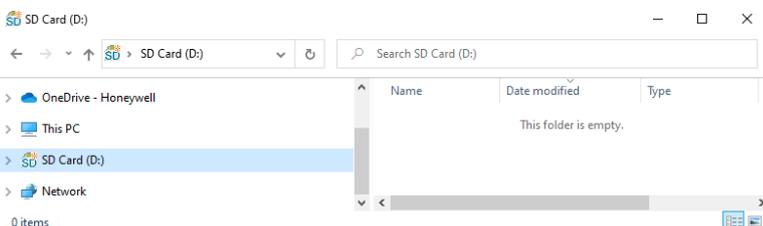
If the uSD card does not have:

- File system: FAT (Default) and
- 'Allocation unit size': 16 kilobytes

then it's needed to format the uSD card.

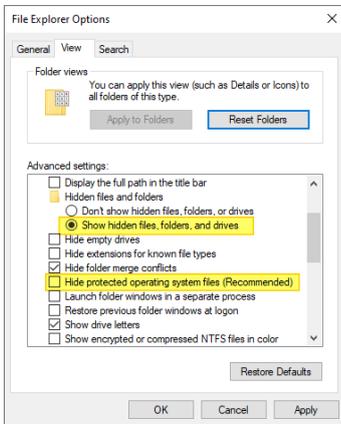
2.3 Empty uSD card

There should be no files stored on the uSD card.

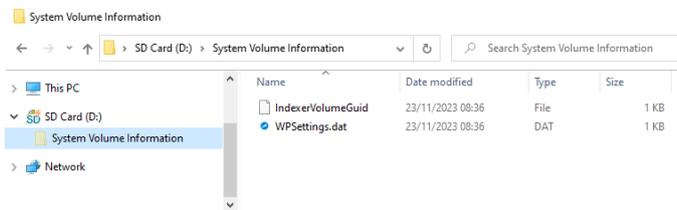


Replace uSD memory card on PCD2.M4160 and PCD2.M4560.docx

Remark: In case that the hidden files are displayed on your PC with these options:

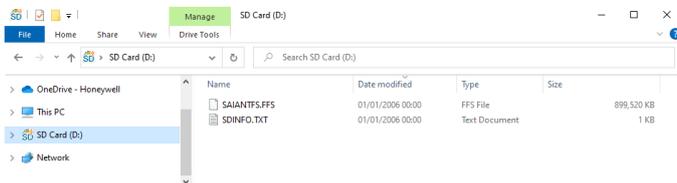


Then a 'System Volume Information' folder will be shown and there are some files on the folder.



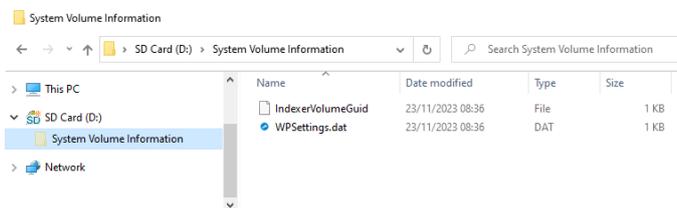
2.4 Not empty uSD card

Not empty uSD cards have some files or folders and could look like this.



If the uSD card is not empty, then it's needed to format the uSD card.

Please note that a formatting of the uSD card is not needed, if the uSD card contains only the 2 hidden files 'IndexerVolumeGuid' and 'WPSettings.dat' on the hidden folder 'System Volume Information'.

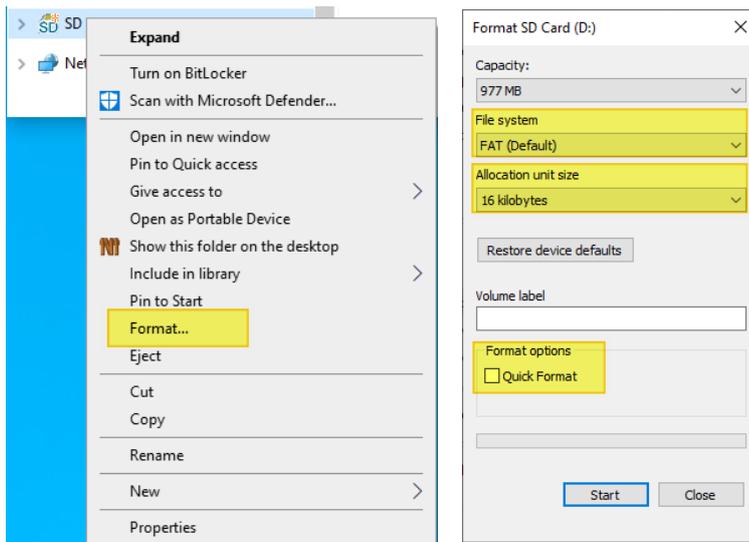


2.5 Formatting the uSD card as FAT16

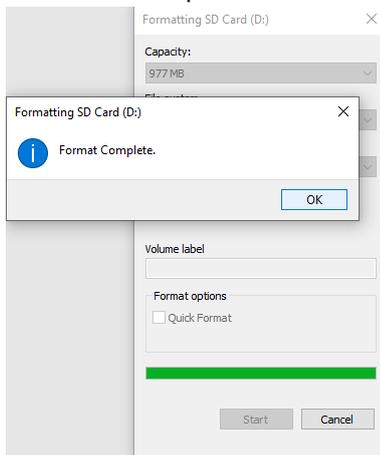
If the uSD card is not formatted as FAT16 or is not empty, then it's needed to format the uSD card. The formatting of the uSD card deletes all files stored on the uSD card, like PCD firmware, PG5 device configuration and PG5 application program, web-pages and log files created by the PG5 application program. To format the uSD card, insert the uSD card in a uSD card holder and insert the uSD card holder in the PC. Browse with the File Explorer to the uSD card.

Right mouse click on the uSD card and click on Format and select:

- File system: FAT (Default)
- 'Allocation unit size': 16 kilobytes
- **don't check** the option 'Quick Format'

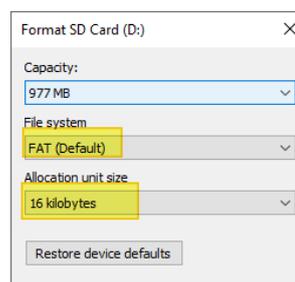


A 'Format Complete' information is shown at the end of the formatting of the uSD card



After formatting the uSD card, it's click again on the format option and then the information has to look like this:

- File system: FAT (Default)
- 'Allocation unit size': 16 kilobytes



3 Remove the old uSD card on the PCD2.M4160/M4560

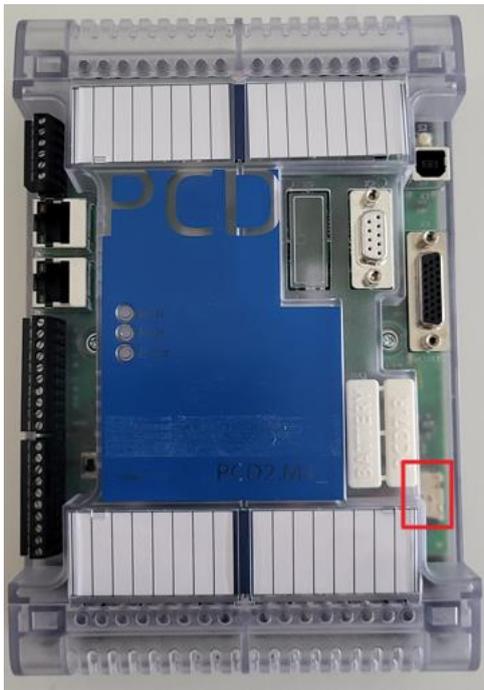
3.1 Needed tools

- Slotted head screwdriver 2.5 x 50
- Tweezers
- New uSD card



3.2 Localisation of the uSD card

The uSD card is located on the bottom right corner of the PCD2.M4160/M4560, marked with the red square on the below picture.



3.3 Disassembling of the PCD2.M4160/M4560

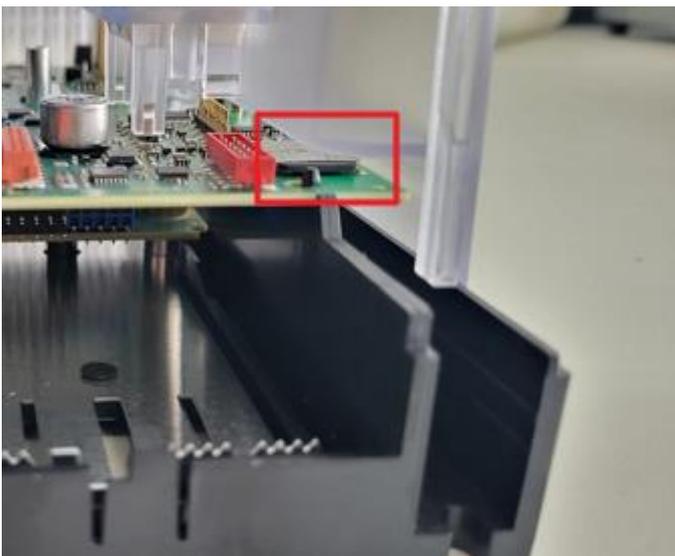
Power off the PCD.

Remove the cover located over the I/O slots 2 and 3.



3.4 Removing the uSD card from the PCB of the PCD2.M4160/M4560

The uSD card is now visible on the PCB of the PCD



There is a holding nose of the black lower part of the housing which holds the PCB and which prevent to extract the uSD card from the uSD card holder.

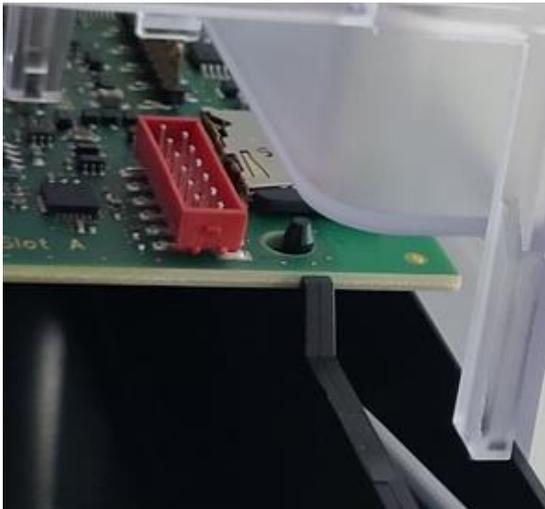
It's needed to lift the PCB of the PCD for about 3 mm to be able to extract the uSD card.

Push with a screwdriver the black lower part of the housing to the left side, so that the nose will move to the centre of the hole on the PCB.

Don't touch or scratch the with the screwdriver the PCB

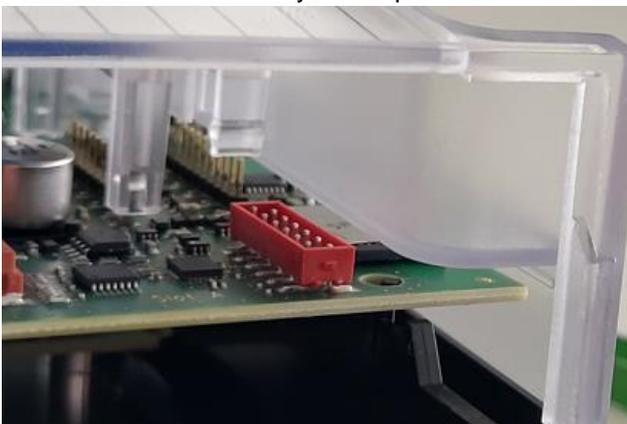


With the thumb of your left hand, lift the PCB for about 3 mm

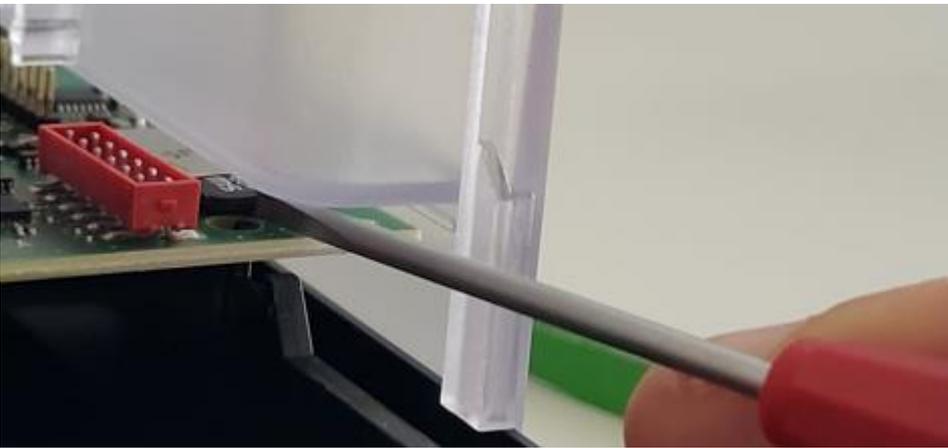


Release the PCB.

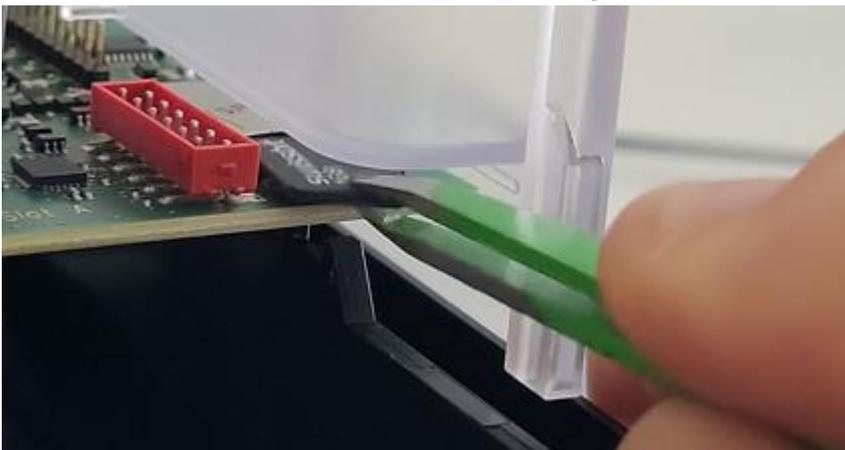
The PCB should now stay in this position.



With the screwdriver, push slightly the uSD card for about 1 mm in to the card holder to release the card from the card holder and release the screwdriver.



Pull the uSD card out of the uSD card holder using tweezers.



4 Mount the new uSD card to the PCD2.M4160/M4560

4.1 Mounting the uSD card from to PCB of the PCD2.M4160/M4560

Don't touch the contacts of the uSD card with your hands or with a tool.

Use the tweezers to insert the uSD card in to the uSD card holder.



The contacts on the uSD card must show to the PCB.
Release the tweezers

Push slightly with the screwdriver to the uSD card until the uSD card snaps in the uSD card holder



Release the screwdriver.
The uSD card will now snap into the card holder
The uSD card and the edge of the print are at the same height.



Push with a screwdriver the black lower part of the housing to the left side, so that the nose will move to the left and the PCB snaps again to the black lower part of the housing.



4.2 Assembling of the PCD2.M4160/M4560

Put the cover located over the I/O slots 2 and 3

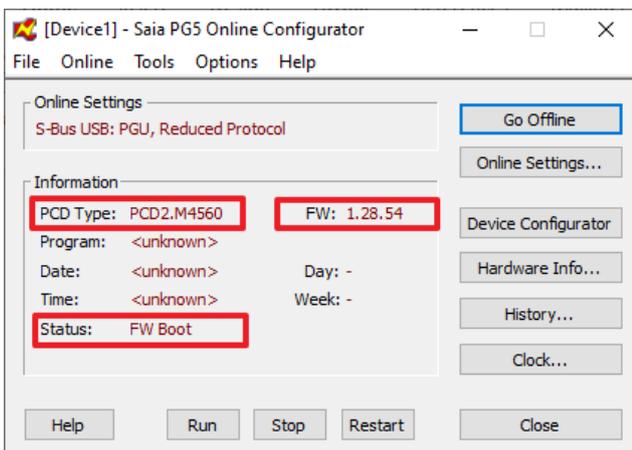
5 Verification if the uSD card was inserted correctly in to the PCD

Power on the PCD

If the uSD card **was inserted correctly** in to the uSD card holder **and the uSD card was formatted correctly**, then it's possible to go online over USB with PG5 the online configurator to the PCD.

The information on the online configurator looks like this:

- Status 'FW Boot' will be shown.
- PCD type will be displayed
- Booter firmware version will be



Close the PG5 Online configurator.

The Run, Halt, Error LED indicates, if the uSD card was inserted correctly, In this case the LED's are flashing in the following sequence with a frequency of 3 Hz.



Led	On/off							
Run	On	Off	Off	Off	On	Off	Off	And so on
Halt	Off	On	Off	On	Off	On	Off	
Error	Off	Off	On	Off	Off	Off	On	

If the uSD card was **not inserted correctly** in to the uSD card holder, or if the **uSD card was formatted wrongly then it's not possible to go online over USB with the PCD.**

In this case, the LED's are flashing in the following sequence with a frequency of 2 Hz.

Led	On/off				
Run	On	Off	On	Off	And so on
Halt	Off	On	Off	On	
Error	On	Off	On	Off	

6 Reload the firmware to the PCD

Load the firmware to PCD with the PG5 firmware downloader by connecting with USB to the PCD. The firmware can be loaded from the [support page](#).

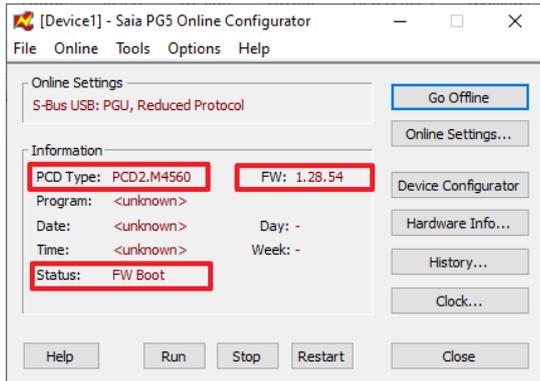
Power on the PCD.

The PCD is now in the 'Firmware download mode'

This is visible when connecting with the PG5 online configurator over USB to the PCD.

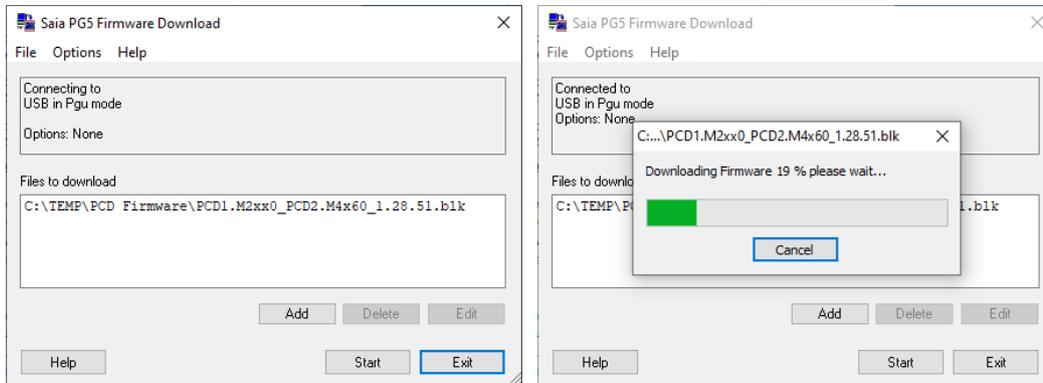
The Status 'FW Boot' will be shown.

The PCD type will be displayed and the booter firmware version will be displayed on the field 'FW'.



Close the PG5 Online configurator.

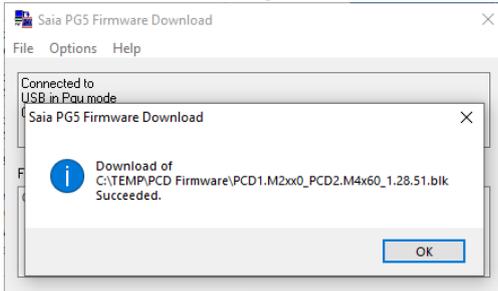
To download the firmware, use the PG5 Firmware Download tool and select the correct firmware which fits to the PCD.



During the download of the firmware the LED's are flashing in the following sequence with a frequency of 5 Hz.

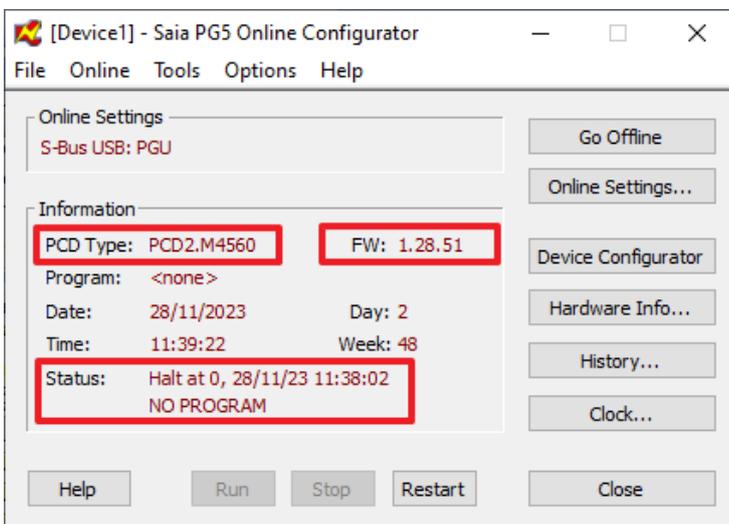
Led	On/off							
Run	On	Off	Off	On	Off	Off	On	And so on
Halt	Off	On	Off	Off	On	Off	Off	
Error	Off	Off	On	Off	Off	On	Off	

The successful loading of the firmware will be displayed with an information.



Wait to go online with the PCD until the Halt LED is switched on in solid red color.

On the PG5 Online configurator, the Status will be displayed as 'Halt'. The PCD Type indicates the PCD and the loaded firmware version will be displayed on the FW information.



Power off the PCD and power on again the PCD before loading the PG5 device configuration and the PG5 application program.

7 Reload the PG5 device configuration and the PG5 application program to the PCD

It's needed to load the PG5 device configuration, the PG5 application program and if needed, the Web-Editor pages to the PCD.