

**Micro-SD Flash Memory Module**  
**PCD7.R610**  
**PCD7.R-MSD1024**

User Manual

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## 0.1 Document revisions

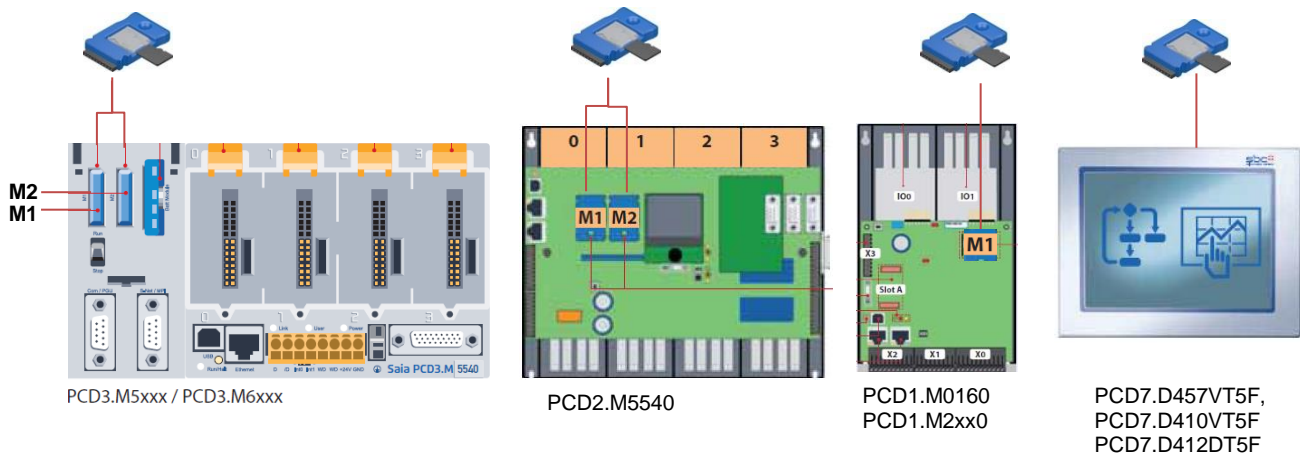
Revision	Published	Comments
EN01	2014-02-10	New document
EN02	2014-08-04	„BlockAccess“ → „Lock“ and new picture of the FBox „Memory“
EN03	2019-03-04	„2.1 Basic Module PCD3.R610“ → „2.1 Basic Module PCD7.R610“ „5 Contact“ → phone number and fax changed
ENG04	2020-10-07	Update the content

# 1 System overview

The basic module **PCD7.R610** has a card holder for receiving the **PCD7.R-MSD1024** Micro SD flash memory cards. This allows to use Micro SD Flash Card (1GByte) space-saving on the slots M1 and M2.



The module can be used in the systems PCD1.M2/M0, PCD2.M5, PCD3.M and on the programmable MB panel PCD7.D457VT5F, PCD7.D410VT5F and PCD7.D412DT5F.





The module PCD7.R610 is supplied without the Micro SD flash card. The flash card PCD7.R-MSD1024 must be ordered separately.

### Ordering information:

Order Type	Description	Weight
PCD7.R610	Basic module for uSD flash memory card, plug-in onto slot M1 or M2 (uSD card not included)	20 g
PCD7.R-MSD1024	Micro SD flash memory card 1024 MByte (incl. SD flash adapter)	2 g

## 2 Technical data and features

### 2.1 Basic Module PCD7.R610

<b>Technical data</b>	
<b>COMPATIBILITY</b>	Usable on slot M1 and/or M2 supported with PCD1.M0160, PCD1.M2xx0, PCD2.M5540, PCD3.M5/6xxx, PCD7.D457VT5F, PCD7.D410VT5F und PCD7.D412DT5F
<b>PG5</b>	From version 2.1.300
<b>COSinus version PLC controller</b>	From version 1.24.02
<b>COSinus version MB panel</b>	From version 1.24.02
<b>POWER</b>	
Module power supply voltage	
Current consumption	
Hot pluggable	Yes, write/read access must be disabled first
<b>LED display</b>	
 Red LED	Function as with a hard disk drive, flashes during data processing
 Green LED	Do not remove the module while this LED is on. LED is turned off when the module can be removed safely. If the module is removed while the LED is on, data may be lost.

The module may be removed during operation of the PCD controller and plugged again. To avoid possible data loss, the write and read accesses (by the user program and /or the operating system) must be disabled before removing the card. This is done with the "Lock" input of the Memory Management FBox (in preparation), a CSF instruction or a CGI-Tag (See Section 3.2). The green LED is turned off when all accesses are disabled and the module can be removed safely.

The card holder on the module is a **push-push** type, as know from other devices on the market.

The module PCD7.R610 is hot pluggable. First the module is removed from the controller and then the Micro-SD card from the card holder. During power-on of the controller, a module must be plugged in, otherwise it will not be detected during operation.

## 2.2 Micro SD Flash Memory Card PCD7.R-MSD1024

The Micro SD flash cards are specially selected industrial flash cards which meet with the high requirements. "Consumer" flash cards may not be used.

The industrial Micro SD flash cards PCD7.R-MSD1024 are available separately and can be easily plugged-in and replaced respectively in the basic module PCD7.R610.

The cards are supplied with an SD card adapter. In conjunction with the SD Flash Explorer data can be easily copied to a PC and processed or archived.

The SD Flash Explorer is available from the factory on the Micro SD card and can be copied from the card to the PC. The SD Flash Explorer is also available on the support page and in the PG5 Controls Suite.

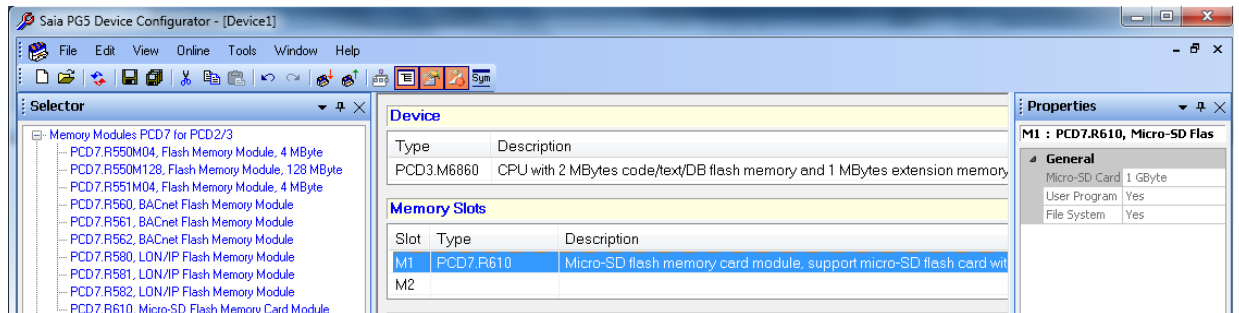


<b>Technical data</b>	
Industrial, high reliable	Designed for embedded industrial market. Voltage detector and power-loss management to prevent data corruption after power-down.
Wear Leveling	Write accesses are uniformly distributed to all cells so that they are used uniformly. Thus the life of the card is increased.
Single layer Flash memory technology (SLC)	for up to 100'000 write cycles
Data retention	10 years
MTBF	> 3'000'000 hours
Number of insertions	>10'000
Extended Temperature range	-25° up to 85°C

### 3 Use of the Micro SD Flash Modules

#### 3.1 Configuration in PG5 Device Configurator

The module can be configured as the other memory modules in the Device Configurator. The configuration is not mandatory and is for information.



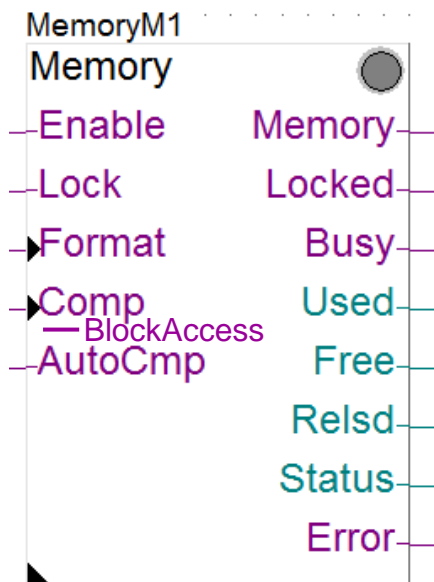
#### 3.2 Safely remove the Micro SD Flash Card

To avoid possible data loss, the write and read accesses (by the user program and /or the operating system) must be disabled before removing the card.

This is done via the input "Lock" of the FBox "Memory Management", a CSF instruction or a CGI tag.

##### Memory Management FBox:

With the input "Lock" accesses to the memory module can be blocked.



**Safely remove the Micro SD Flash Card**

**CSF instruction:**

```

CSF      S.SF.SYS.Library      ;Library number
         S.SF.SYS.WriteTag    ;Write Tag
         ;1 X|R IN, Device name
         ;2 X|R IN, Tag name
         ;3 K IN, Tag Value parameter type
         ;4 X|R IN, Tag Value
         ;5 R OUT, Status
    
```

No.	Type	Dir	Description
1	X   R	IN	Text holding the Device Name: "M1_FLASH", "M2_FLASH" or Register containing the number of the text holding the Registry Name
2	X   R	IN	Text holding the Tag Name "DeviceCoverOut" or Register containing the number of the text holding the Tag Name
3	K	IN	Tag Format has to be a constant = 0
4	R	IN	Tag Value "1" : Disable Write/Read Access to Device Tag Value "0" : eENABLE Write/Read Access to Device
5	R	OUT	Status

Status Value		
	0	Success
	-1	Invalid Tag Value
	-2	Tag not found
	-3	Registry not found
	-4	Interpret text error
	-5	Invalid text number (Text doesn't exist)
	-6	Invalid text (Text doesn't exist or has a null size)
	-7	Tag access denied
	-8	Tag doesn't support decimal value
	-9	Invalid registry name or tag name

Example:

```

CSF      S.SF.SYS.Library      ;Library number
         S.SF.SYS.WriteTag    ;Write Tag
         Text 1000             ;1 X IN, Device name "M1_FLASH"
         Text 1001             ;2 X IN, Tag name "DeviceCoverOut"
         K 0                    ;3 K IN, Tag Value parameter type
         R 1000                 ;4 R IN, Tag Value
         R 1001                 ;5 R OUT, Status

CSF      S.SF.SYS.Library      ;Library number
         S.SF.SYS.ApplyRegistry ;Apply Registry (all registry's Tags are applied)
         Text 1000             ;1 X IN, Device name "M1_FLASH"
         R 1001                 ;2 R OUT, Status
    
```

**CGI-Tag:**

Example for M1\_Flash

[http://172.23.3.80/cgi-bin/writeVal.exe?SYS-M1\\_FLASH,DeviceCoverOut=1](http://172.23.3.80/cgi-bin/writeVal.exe?SYS-M1_FLASH,DeviceCoverOut=1)

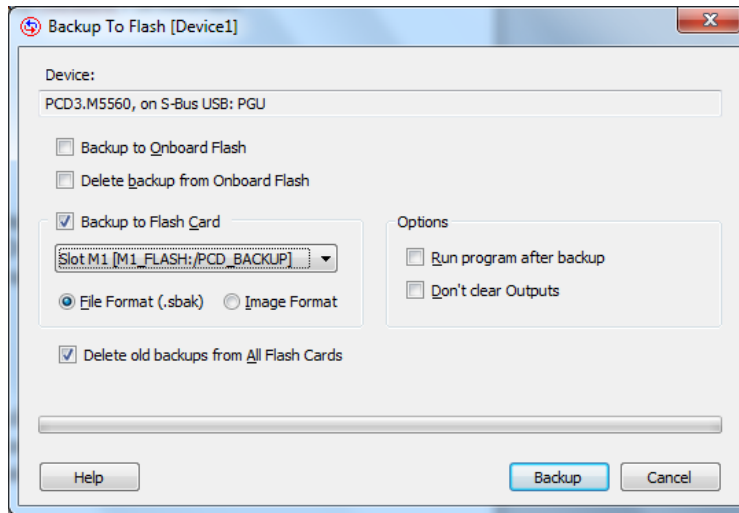


## 4 Backup/Restore functions

The module supports all in the PG5 available backup/restore functions. Detailed information can also be found in the PG5 Online Help.

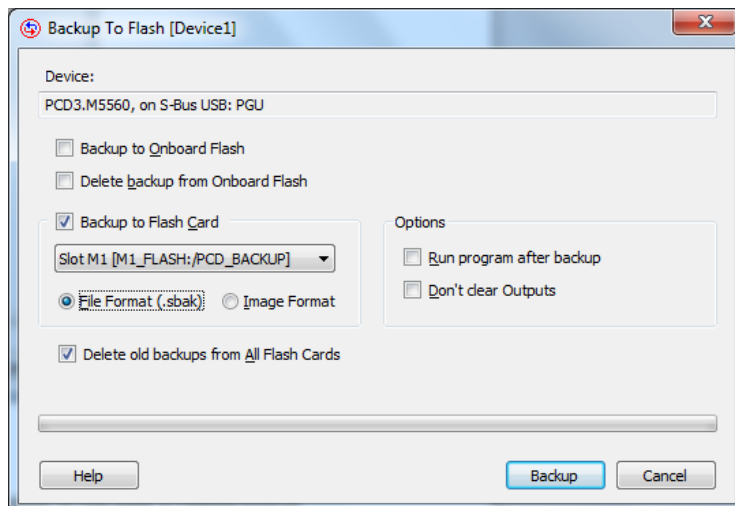
### 4.1 Backup to Flash

This creates a backup of the PCD's current user program on Onboard Flash and/or on a plug-in Flash Card. Depending on the selected options and/or the PCD firmware version, it will also backup the device configuration and a snapshot of the media values (R F T C, TEXT and DB), and delete old backups which may exist.



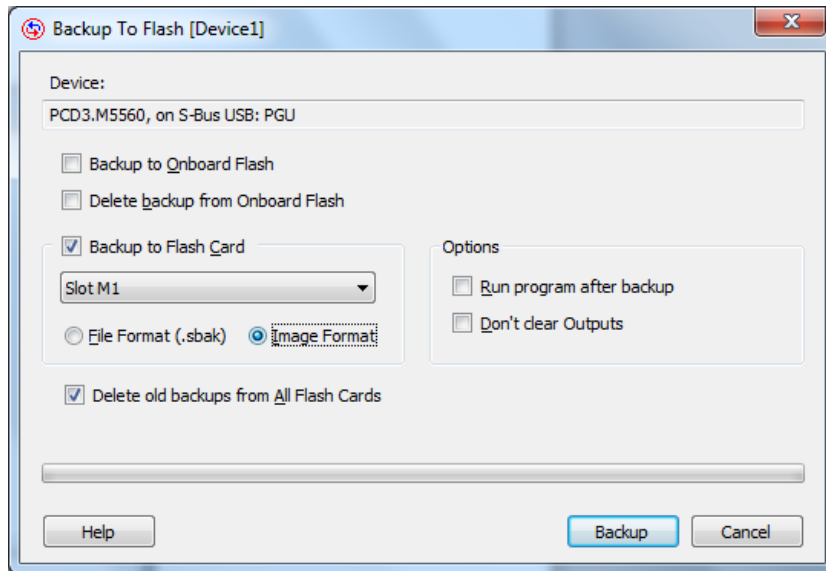
#### 4.1.1 File Format (.sbak)

Creates a '.sbak' file on flash which has a file system. The file name is the first 8 characters of the program name, followed by the date/time, e.g. "*progrname\_yymmddhhmm.sbak*". The file format also contains a snapshot of the media (R T C F), the RAM TEXTs and DBs, the RIO files and other configuration files (IP services, BACnet, LON etc). It also does not contain web pages or other files which have been downloaded into the Flash files system using FTP.



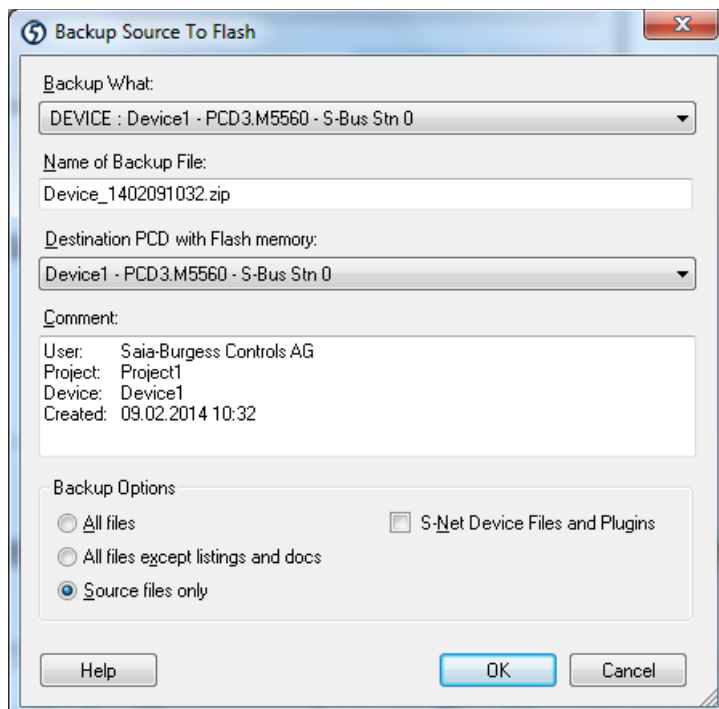
### 4.1.2 Image Format

This is the older backup format, for flash which contains a 'backup partition'. It is a byte-for-byte image of the program. It does not contain the configuration files or media values, but it does contain a snapshot of the TEXTs and DBs in data (extension) memory. It is not recommended to use this mechanism with new PCD systems.



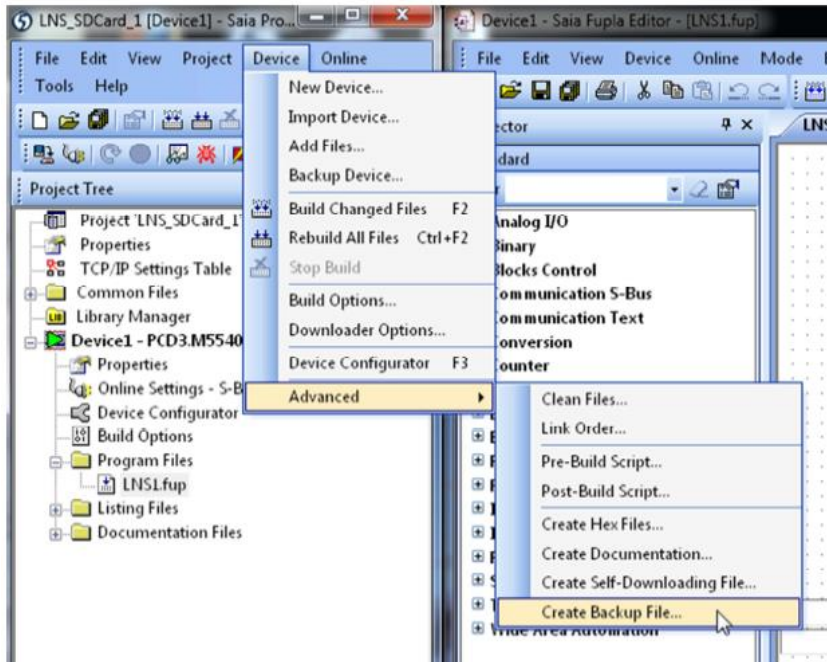
### 4.2 Backup Source to Flash

Creates a compressed backup file containing the **source files** of the entire project or a single device, and downloads it into the PCD's Flash File System memory using FTP.

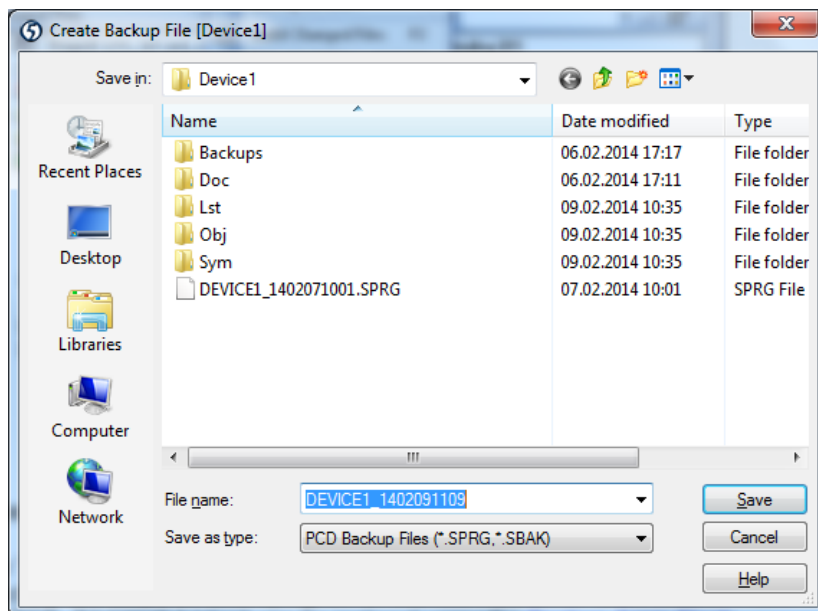


### 4.3 Create Backup File

This command creates a backup file which contains the user program, configuration and first-time initialization data values.

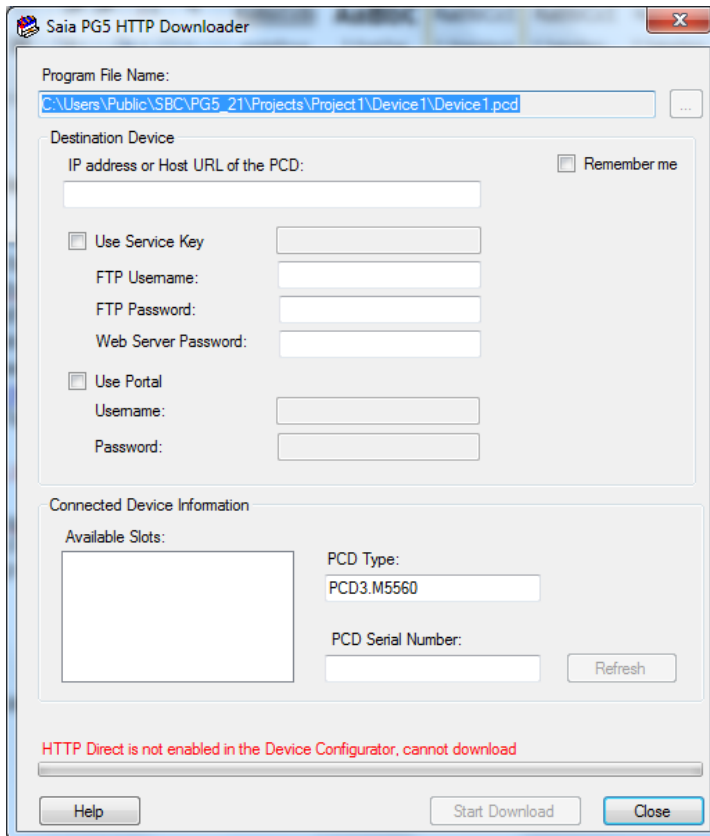


The file has the name '*device\_yymmddhhmm.sprg*' or '*device\_yymmddhhmm.sbak*' where *device* is the first 8 characters of the device name (or less if it is shorter), and '*yymmddhhmm*' is the date/time of the backup, e.g. '*device1\_1106271520.sprg*'. Special character like *\_* & *%* are not allowed! The '*.sbak*' file has the same format as a backup file created by the [Backup To Flash](#) command, except it does not contain all the media (Register, Flags, Counter) snapshot values.



### 4.3.1 Download the BackupFile into the PCD

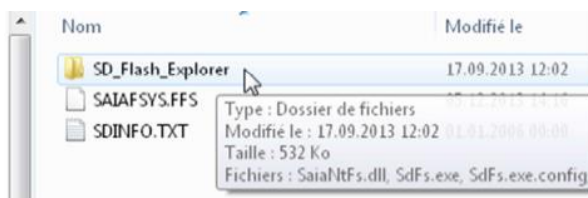
The '.sprg' resp. '.sbak' file can be downloaded into the PCD's \PCD\_BACKUP directory with any FTP client program or with the PG5 HTTP Downloader. From the PCD\_BACKUP folder it can be restored using the [Restore From Flash](#) command.



### 4.3.2 Copy the Backup File to the Micro SD Flash Card

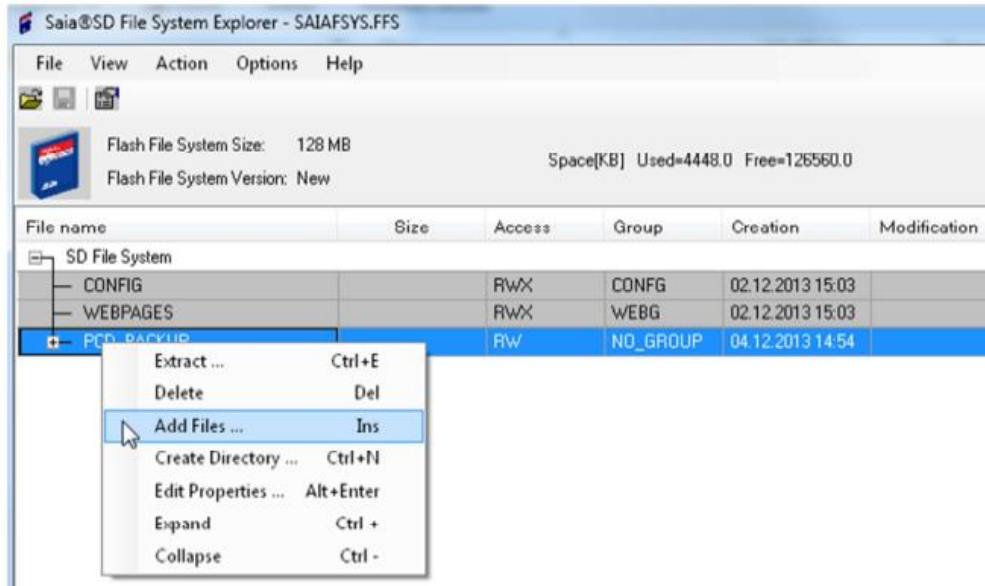
Another possibility is to copy the Backup File to the Micro SD Flash card using the SD Flash explorer tool.

By using a SD Card adapter, plug the micro SD card on your computer. Run the SD Card Explorer which is on the card.

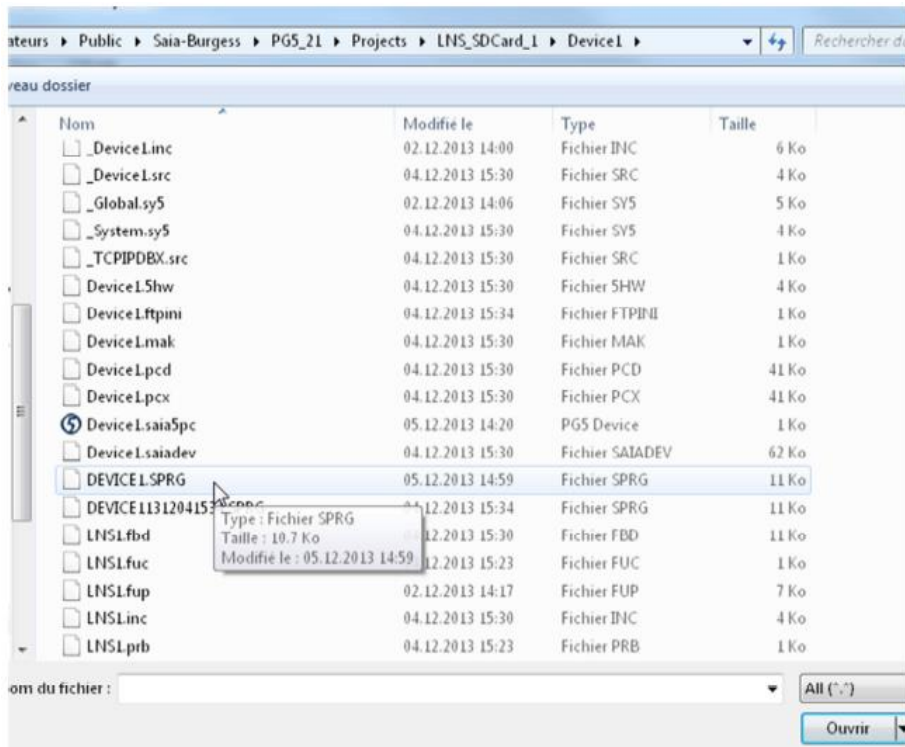


**Create Backup File**

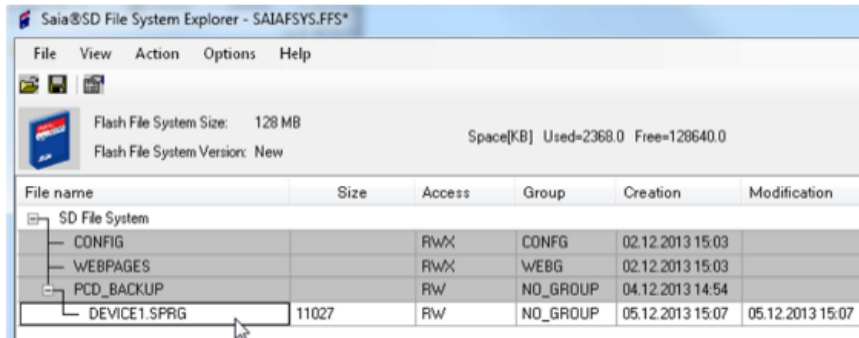
Once the SD Flash Explorer is open, right click on the PCD\_BACKUP directory and add a file.  
If the directory does not exist, create it with right click, create Directory and give RW access.



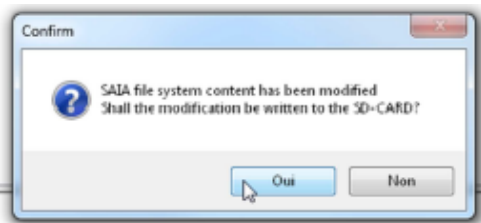
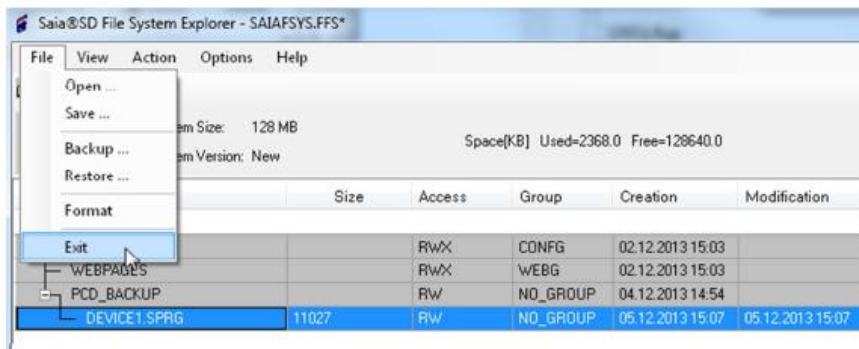
Select the .SPRG file which is located in your PG5 Project folder.



The file should appear in the PCD\_BACKUP directory.



Exit the SD File Explorer and don't forget to **save the file**, in order to write the SD card.



The Micro SD Flash card can now be removed from the computer and inserted in the PCD.

### 4.3.3 Copy PCD COSinus (Firmware) File to the Micro SD Flash Card

In the same way as described in the previous chapter the PCD COSinus (Firmware) file (\*.BLK) can be copied to the SD Flash Card.

For an firmware update a folder named “/FWUPDATE” has to be present on the R610. All kind of FW “.blk” files can be put to this folder:

- The PCD COSinus FW
- The BACnet / LON FW on additional cards
- The F2xx communication modules
- The extension boards (WAC, Compact, second Ethernet, DP extension, ...)

If an FW update for a specific Slot is needed, an additional folder of the Slot name can be added to this path, containing the FW to update. E.g. “/FWUPDATE/SLOT1”. This could be useful if different Firmware’s are needed for same F2xx communication modules.

## 4.4 Restore Backup File and PCD firmware

### 4.4.1 Restore user program backup

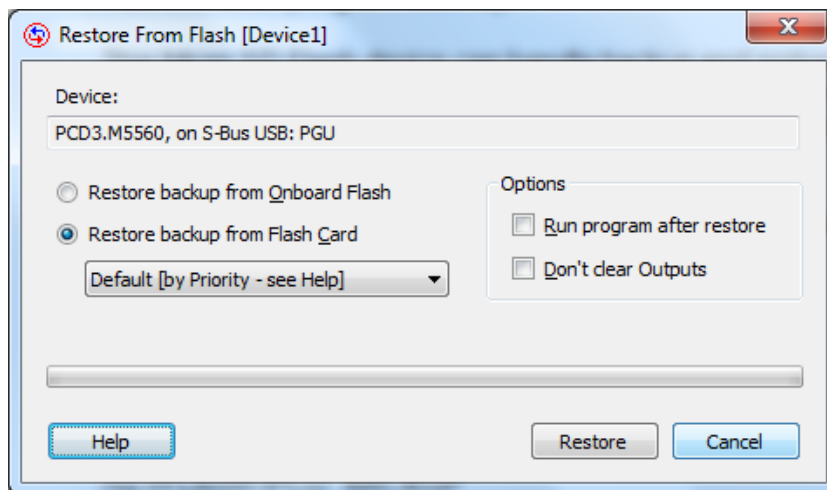
This Micro SD Flash device can handle backup and restore in exactly the same way as for PCD2/3.R600 devices. Image and/or file format restore on a power ON sequence with Run/Halt button pressed more than 3 seconds. Precedence is to restore from file system first if available.

In case there is no user program (SRAM deleted) the backup file is automatically restored during power-on of the PCD.

Restore search priority:

```
/M1_FLASH:/PCD_BACKUP
/M2_FLASH:/PCD_BACKUP
/SL0FLASH:/PCD_BACKUP
/SL1FLASH:/PCD_BACKUP
/SL2FLASH:/PCD_BACKUP
/SL3FLASH:/PCD_BACKUP
/INTFLASH:/PCD_BACKUP
```

The restore can also be initiated from PG5 using the “Restore From Flash” function from the Online menu.



### 4.4.2 Restore PCD Cosinus firmware

During power-up the files in the “/FWUPDATE” folder are checked. The BLK type files are extracted. For the known types, it is checked, if there is a correct hardware attached. In case of positive match, the versions (existing / new) will be compared and an update will be executed only if the versions are different.

After all updates have been executed, a complete reboot is executed to take over the new FW versions of the attached modules.

There is no cross BLK version check, i.e. it is the responsibility of the user to copy on the R610 module the correct / compatible FW.

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**Restore Backup File and PCD firmware**

This kind of FW update is also possible for other devices like the R600. The only requirement is the present file structure.

Priority:

/M1\_FLASH:/FWUPDATE

/M2\_FLASH:/FWUPDATE

/SL0FLASH:/FWUPDATE

/SL1FLASH:/FWUPDATE

/SL2FLASH:/FWUPDATE

/SL3FLASH:/FWUPDATE

Remark: for a FW update, it could take up to 3 minutes. **During the FW or program update, never remove the PCD power supply!** If you remove the power supply, the PCD will be in reduced mode and need a new download from the PG5. No possibility to use the R610 module anymore.



## 5 Contact

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International agencies and SBC subsidiaries: [www.saia-pcd.com/contact](http://www.saia-pcd.com/contact)

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