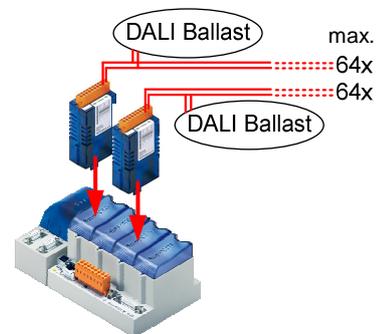
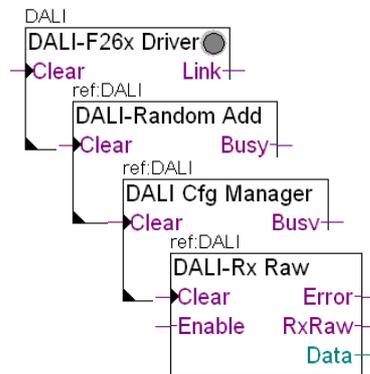




DALIF26x Driver

- Backup to Flash
- Configuration Manager
- DALIF26x Driver
- Edit Groups
- Edit Scene Levels
- Exchange addresses
- Get Status Range
- Query numeric
- Random addressing
- Read Memory
- Read Status
- Read Status Range
- Receive Commands
- Receive Raw
- Send Command Inputs
- Send Command Online
- Send Power Control
- Send Raw
- Send Scene
- Write Memory



First steps with the “DALI F26x” Multimaster Library

Projekt History

Date	Author	Modification
10.07.2012	TPM / DK	Creation of documentation (version 1) and project for PG5 V2.0.220 with instructions relevant to version \$2.6.010
09.01.2013	TPM / DK	Extend and customize the documentation (version 2) for PG5 V2.0.220 and library \$2.7.014 Including with Web project for addressing and configuration, Range FBoxen, Backup to Flash and other small adaptations
27.01.2014	TPM / DK	Update documentation <ul style="list-style-type: none">• update for PG5 V2.1.300 and Library V2.7.300• new Corporate identity design (Logo change, Name,...)• new FBoxen (Write Memory, Read Memory, Send Raw)• and other small adaptations

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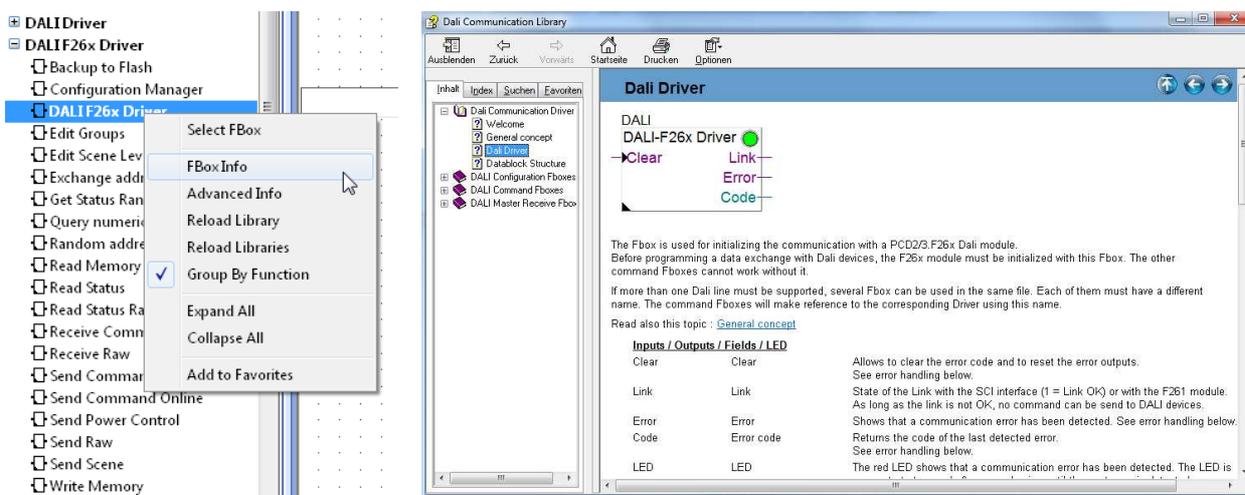
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1 Introduction

This document is intended to provide an easy start for new users of the Saia PG5® "Multimaster DALI F26x Driver" library. With the corresponding PG5 project, it serves as a guide for an initial implementation. For additional information to this document, refer to the relevant supplementary documentation (see "[References](#)" section).

2 Functions of FBox library

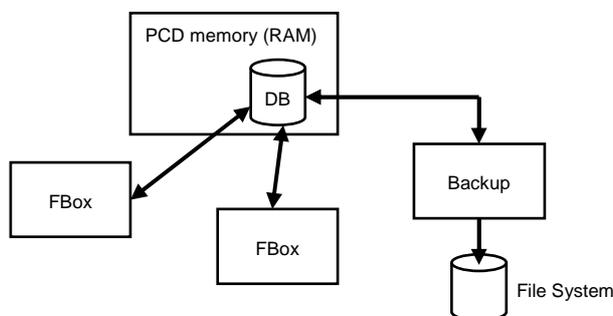
The structure of the new library and the FBoxes it contains is briefly set out below. More detailed information can be obtained from the PG5 Online Help (FBox Info).



The "DALI F26x Driver" FBox library comprises not only FBoxes to control all parameters and associated devices on a DALI line, but also FBoxes for the configuration and commissioning of DALI devices. This means that commissioning them does not require any external PC software or gateways.

2.1 General concept

The general concept of the "DALI F26x Driver" library is based on a data block (DB) stored in the PCD memory (RAM). In this data block all parameters of all devices on the DALI bus (line) are stored. All configuration FBoxes draw on this DB. In so doing, one DB is created for each DALI line.



Additional information is provided in the course of this document.

2.2 Introducing the FBoxes

All the FBoxes in the "DALI F26x Driver" library are presented below, including pictures and brief information. In the project example described later, all the FBoxes in this family are used at least once.

2.2.1 Communications driver FBox



DALI F26x Driver

This FBox is responsible for initializing communication with a PCD2/3.F26x Dali communications module.

Other command FBoxes reference this FBox. A correct reference is always indispensable.



If more than one DALI line must be supported, several "driver" FBoxes can be used in the same FUPLA file. If so, each "driver" FBox must have a different name. The respective command FBoxes will then reference the corresponding driver with this name.

2.2.2 Configuration FBoxes



Configuration Manager

This FBox allows all parameters of DALI devices on a DALI line to be configured and read. All parameters are saved to a DB.



For a better overview of all groups and scene settings, it is advisable to use FBoxes "Edit Scene Levels" and "Edit Groups" in addition to the "Configuration Manager" FBox. All FBoxes will access the same DB.



Edit Scene Levels

For processing the scene settings of all DALI stations.



Edit Groups

For processing the group settings of all DALI stations.



Note that the FBoxes "Edit Scene Levels" and "Edit Groups" only affect the DB. In order to pass the changes to the DALI bus, the "Configuration Manager" FBox is also used.



Backup to Flash

FBox to backup and restore the parameters of all DALI lines in the project. This involves saving the parameters to the flash memory of the Saia PCD® controller. To use this FBox, a "Memory Management" FBox from the file system library is also needed.

The real reference to the DALI F26x FBox is also necessary.



Random addressing

This FBox can be used to perform a clean install. It is used to automatically default a random short address for all DALI devices on a referenced DALI line.



Note that the "Random addressing" FBox can only be used if current addressing can be changed. When the Addressing Mode is set to "All", all devices on the DALI bus are automatically assigned a new short address. In so doing, group settings remain unchanged.



Exchange addresses

This FBox is used to exchange the short addresses of two DALI devices. It also offers on/off commands to identify devices.

2.2.3 Command FBoxes

The following "Command FBoxes" offer address type selection and setting options for sending and receiving a command.

Type of addressing

- Short = sends commands to a short address (0 to 63)
- Group = sends commands to a group address (0 to 15)
- Broadcast = sends commands to the broadcast address (all devices on bus)



Send Command Inputs

FBox for sending commands to DALI devices. This takes place across the various predefined inputs on the FBox. Each command is sent when there is a positive edge at the input.



Send Command Online

This FBox is used to send commands to DALI devices by means of online adjustment. It has been designed for the manual testing of devices.



Send Scene

This FBox can be used to call the "Scene program" of a DALI device, group of devices, or of all devices.

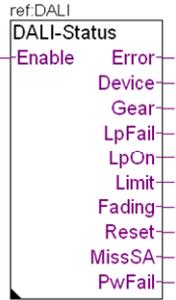


Send Power Control

This FBox is used to send a "Direct Arc Power" command to a DALI device, group of devices, or to all devices.

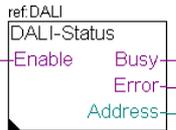


Note that the Direct Arc Power Level 0 is invalid. For Switching Off please use the Off Command!



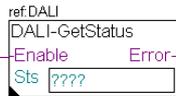
Read Status

Use this FBox to check the presence of a DALI station and read back its status. The address type here is accordingly "short" only.



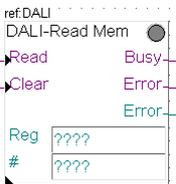
Read Status Range

This FBox can be used to check the presence and read back status of a range of Dali devices.



Get Status Range

This FBox can be used to read back from the internal data block, status of a range of Dali devices.



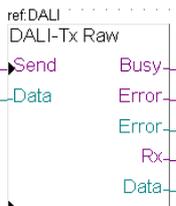
Read Memory

This FBox can be used to read the internal memory of a Dali device.



Write Memory

This FBox can be used to write the internal memory of a Dali device.

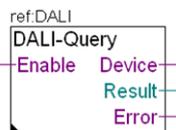


Send Raw

This FBox can be used to send a message to a Dali device as raw data (2 bytes).



Please use the "Send Raw" FBox only when you have a deep knowledge of Dali protocol!



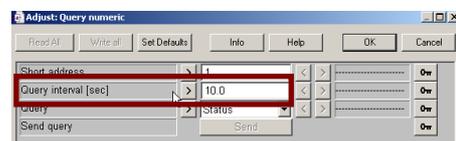
Query numeric

This FBox can send any DALI query, by prior selection of the query in the "Adjust parameters" window. The "device" output indicates whether the DALI station has responded to the request or not. The "Result" output returns the value of the selected query. The address type here is therefore "short" only.



Be careful not to send queries too quickly. If they are, this may affect the reaction to the required commands.

The default setting "Query interval [sec] = 10.0" should be retained.



2.2.4 DALI Master Receive FBoxes

The FBoxes "Receive Commands" and "Receive Raw" can be used to receive commands from a DALI master device on the bus. All three types of addressing are supported (short, group and broadcast).



Receive Commands

FBox for receiving commands from a predefined standard DALI master unit.

When a command is received for a selected address and the "enable" input is high, the corresponding output will emit one short pulse from a cycle. If the command is a "Direct Arc Power Level" command, the value received will be sent to the corresponding FBox output.



Receive Raw

FBox for receiving non-standard commands or a specific decoding of a DALI master device. The data is displayed briefly as a 2-byte value on the "data" output.

3 Hardware and Software required

Software

To program the Saia PCD® controllers, the following software versions are required, which may need prior updating:

- PG5 Version 2.0.220 or later (PG5 2.1.xxx)
- DALI F26x Driver library (min. V 2.7.300)
- Possibly, File System library, for backup (min. V 2.7.200)

Hardware

PCD Type	PCD1.M2110R1	PCD1.M2xx0	PCD2.M5xx0	PCD3.Mxxx0	PCD3.T666
Up to xx DALI modules	1x	2x	4x	4x	4x
Max ballasts	64	128	256	256	256
Interface	PCD2.F2610	PCD2.F2610	PCD2.F2610	PCD3.F261	PCD3.F261

The following hardware configurations are supported:

CPU:

- PCD1.M2110R1 Firmware 1.20.xx or higher
- PCD1.M2xx0 Firmware 1.20.xx or higher
- PCD2.M5xx0 Firmware 1.20.xx or higher
- PCD3.Mxxx0 Firmware 1.20.xx or higher

RIO:

- PCD3.T666 Firmware 1.20.15 or higher

DALI communications module:

- PCD2.F2610 Firmware 1.02.09 or higher
- PCD3.F261 Firmware 1.02.09 or higher



DALI communications modules already have an integral power supply for the DALI Bus, so this means there is no need for external components. If the DALI power supply is not needed, for example in an existing system, the internal supply can be turned off with a jumper on the DALI module.

Note that, when a DALI communications module uses the internal supply, no additional power supply should be connected to the DALI bus.

4 Steps for producing the sample project

The following sample project consists of a power supply, a PCD1.M2160 controller with a PCD2.F2610 DALI communications module in slot "I/O 0", and other DALI devices on the DALI bus.

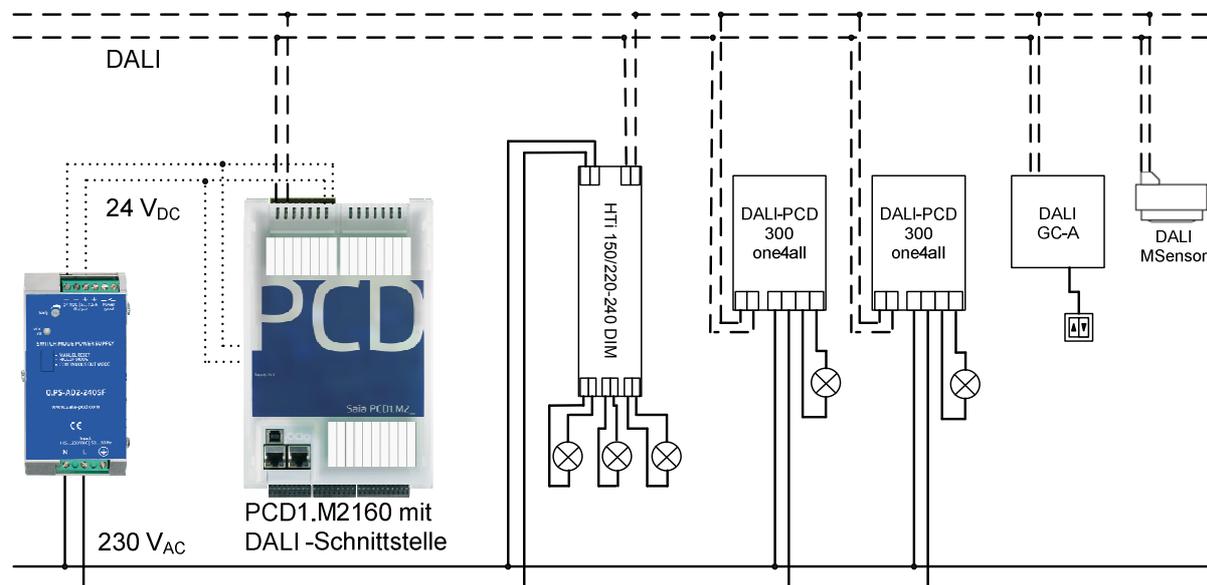
List of all components

- 1x PCD1.M2160 firmware 1.20.xx
- 1x PCD2.F2610 firmware 1.02.09
- 1x Q.PS-AD2-2405F power supply 230V_{AC} / 24V_{DC}
- 1x HTi DALI 150/220-240 DIM from OSRAM for connection of halogen lamps (3 x 12V halogen lamps connected)
- 2x DALI-PCD 300 one4all from Tridonic for connection of ohmic lighting (one light bulb each connected)
- 1x DALI GC-A interface from Tridonic for connection of probes (one probe connected to interface connection T2)
- 1x DALI MSensor 02 from Tridonic for lighting control
- 1x USB cable for commissioning and additional installation material



It is also possible to operate this project with other hardware. Depending on the hardware, specific adjustments will be required to the configuration (hardware configuration in PG5, software settings, ...).

Structure of the sample project



The sample project was wired and prepared according to the above drawing. Please follow the operating instructions for individual components.

How to program the project is explained step-by-step in subsequent pages.

4.1 Configure PCD

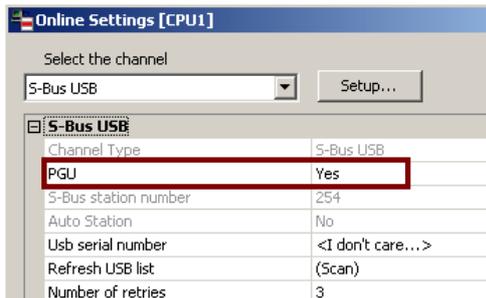
The following steps are necessary to prepare the PCD:

Establish online connection from PC to PCD

Before a connection can be established, the PG5 must "know" what medium/cable is to be used to access the PCD. This is defined in the "online settings", located under Project Structure in the PG5 Project Manager:



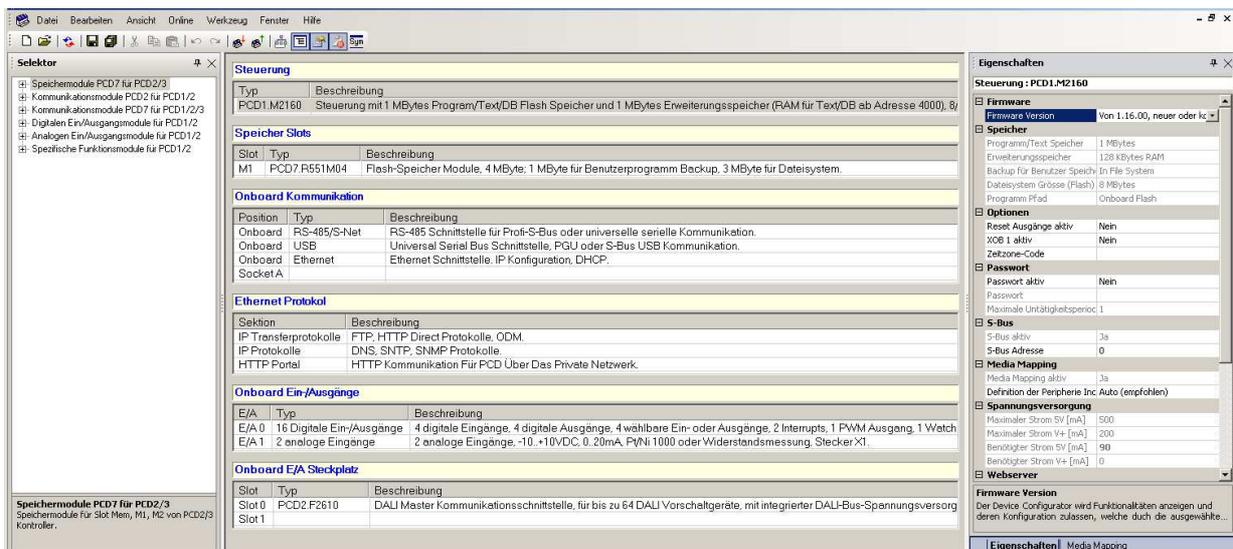
The channel selected here is "S-Bus USB." The "PGU" option is enabled.



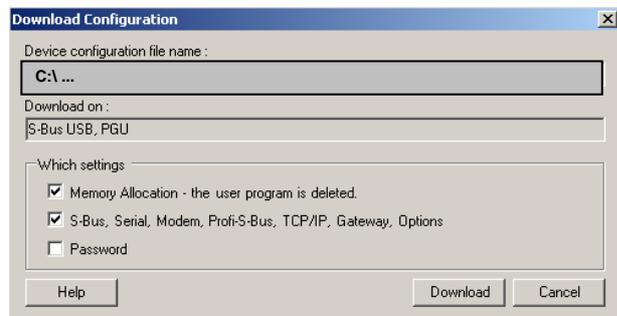
After these settings, the "Online Configurator" can be used to check whether communication is working.

Configure hardware

The "Device Configurator" is used to configure such settings as IP address (the PCD1 in the sample project has address 168.168.2.101), memory use and activation of the PCD "Run/Stop" switches. The necessary DALI communications module (PCD2.F2610) at slot 0 is also incorporated here. The PCD "Device Configurator" will also be found on the PG5 project tree, right under the 'Online Settings'.



To download the configuration onto the PCD controller, simply click on the "Download Configuration" button  in the "Device Configurator" window. During an initial download, when asked what to load onto the controller, the "Memory Allocation" option must also be selected for correct configuration of memory.



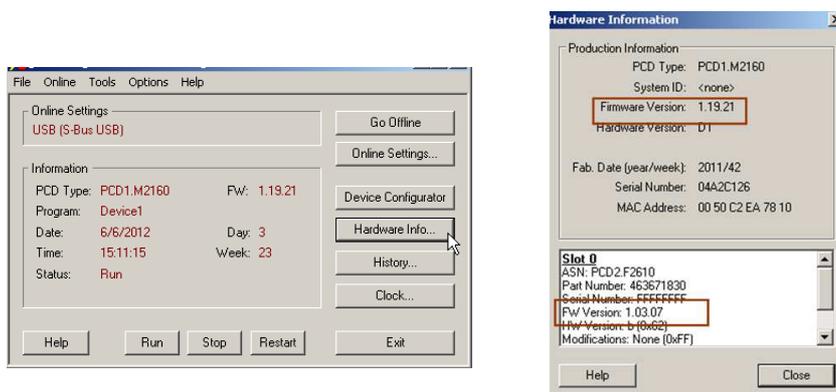
If the exact type of PCD is not known, or if no change is to be made to the existing hardware configuration, the "Upload" button  in the "Device Configurator" can also be used. This transfers the current configuration of the PCD to the PG5 project.

The hardware settings are on the PCD controller; which to use must be adapted accordingly.

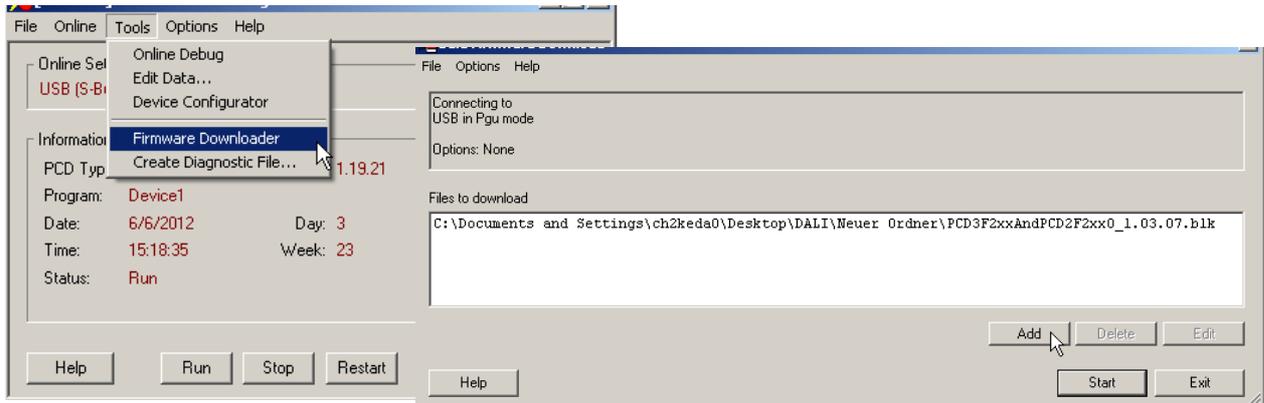
Update firmware

It is important that the firmware of individual components meets minimum version requirements, as described under [Hardware and software required](#). The following shows briefly how firmware can be updated.

However, the first step must be to verify the current firmware version of the PCD1.M2160 and attached PCD2.F2610 DALI communications module. This can be achieved with the "Online Configurator" button  in the Project Manager. Use it to call up "Hardware Info".



Updating the firmware version also takes place in the "Online Configurator". The "Firmware Downloader" is located under Tools.



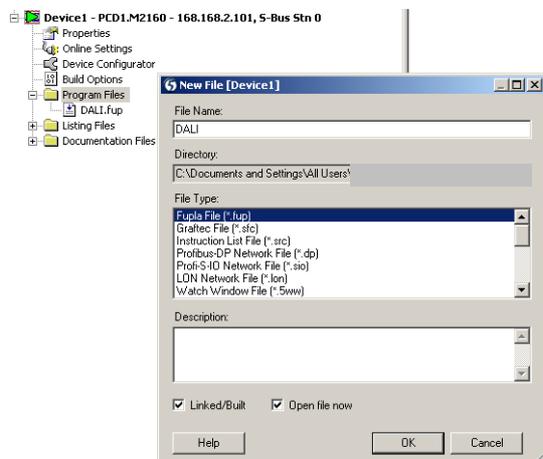
The "Add" button is used to select the desired firmware from the directory and the "Start" button is then used to update it. After the update, 'Hardware Info' can be used for verification.

4.2 Program PCD

How to create an initial project with the FUPLA "DALI F26x Driver" library is set out below step-by-step. Some of the most important steps and instructions are indicated. The project shows how a PCD1.M2160 connection can be constructed with DALI and what possibilities there are.

Brief summary of subsequent steps:

- Initialization of DALI interface
- Addressing DALI stations
- Configuring the DALI line
- Sending commands to the DALI Bus
- Receiving commands from the DALI Bus
- Data protection by backup to flash (backup parameters on FLASH)
- Additional possibilities through DB structure

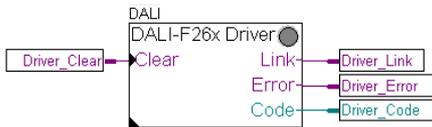


The first step is to set up a new project and make the required adjustments as described in [Configure PCD](#). A new FUPLA project can then be created.

The name "Getting Started DALI" was assigned in the sample project.

4.2.1 Initialization of DALI interface

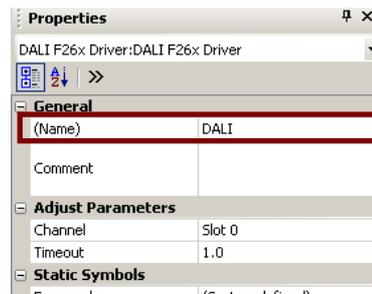
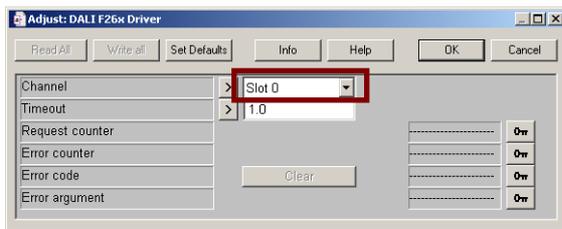
To initialize and adjust settings for communication with the DALI bus, an open FUPLA page is given the name "Init". Onto this page is then placed FBox "DALI F26x Driver" from the DALI F26x driver library.



For all input and output parameters, define symbol names either beforehand in the "Symbol Editor window" or directly on the inputs/outputs with the "Add Connector" button and label. For example, at the "Clear" FBox input define a "Driver_Clear" flag symbol.

Symbol Name	Type	Address/Value	Comment	Actual Adre...	Tags	Scope
DALI.fup						
Driver_Clear	F					Public
Driver_Link	F					Public
Driver_Error	F					Public
Driver_Code	R					Public
COB_0	CDB			0		Local

The appropriate I/O slot for communication with DALI is set in the "Adjust Parameters" window (found by pressing the right mouse button or in the "Properties" window, visible on the right in the FUPLA editor, depending on the setting). In the sample project, it is I/O slot 0 of the PCD1.M2160 to which the PCD2.F2610 DALI communications module is attached. In addition, the name of the "DALI F26x Driver" FBox can be assigned in the "Properties" window.



When choosing a name, make sure the corresponding command FBoxes use this name to reference the appropriate driver. When using multiple driver FBoxes, each must therefore have a different name.

In the sample project, the default name DALI has been retained. Subsequent FBoxes also have the default setting that references the driver named "DALI".

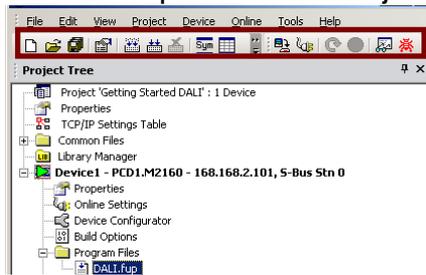


Interim saving of the project is recommended. It may also be helpful to view intermediate results of the program in Online/Run mode. For this purpose, the program must be compiled and downloaded into the PCD.



Compiling and downloading the program

This takes place in the Project Manager. First the program must be translated using the "Rebuild All" button . If errors have occurred they will become evident during this process. They must first be resolved. After the program "build" has taken place correctly, you can download it onto the PCD by clicking the button "Download Program" . This means that the PCD is now prepared. Depending on the setting of your PG5, after the download the controller will automatically go into RUN. If this is not the case, set the controller in RUN.



Tests in online mode

Start the Fupla Editor in online mode using the "Go On/Offline" button and then the "Run" button . Current values can now be seen at the inputs and outputs. The "Add Probe" button can be used to define what values are to be displayed directly on the interface. The driver FBox indicates that communication has been established with the green control LED and a status "1" at the "Link" output.

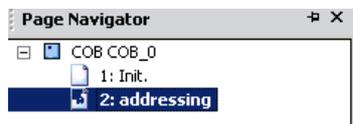


4.2.2 Addressing DALI stations

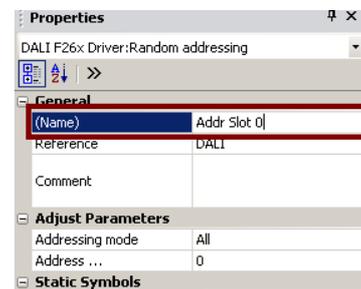


Note that the following example is valid only for a new installation. In the case of an existing system, check in advance whether it is both possible and permissible to change the current address.

For addressing, a new page is first created and given the name "addressing" with the help of the "Insert Page" button . Through the creation of new FUPLA pages a clear structure is generated, which provides an accurate picture in the Page Navigator.



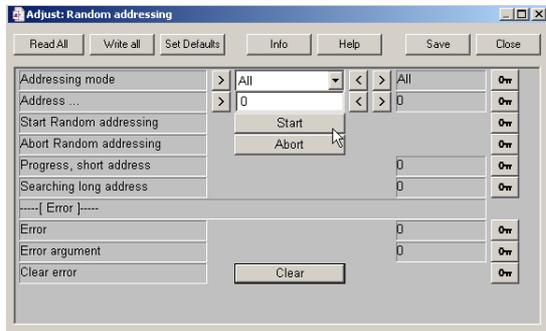
The FBoxes "Random Addressing" and "Exchange Addresses" can now be placed on this FUPLA page and symbols defined for the inputs and outputs.



The reference to the DALI driver does not have to be modified in this example, since the default setting "Reference DALI" is used here. An additional name can be assigned in the FBox "Properties" window, such as "addr slot 0" for the address of slot 0. This name will be directly visible via the FBox on the FUPLA page and is used for structural simplification.

The program can now be compiled, downloaded into the PCD and put into online mode, as already described in more detail in the [Initialization](#) section.

The next step is for all stations to receive a DALI short address. This takes place in



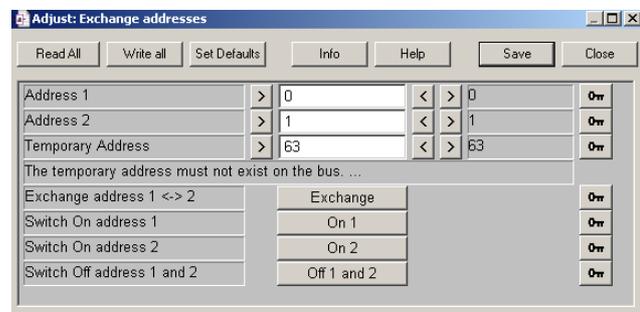
online mode (the FUPLA page), using the "Adjust parameters" window to set the "Random addressing" FBox to "Start". As a result, all devices on the DALI bus will be assigned a new short address automatically. Group settings remain unchanged.



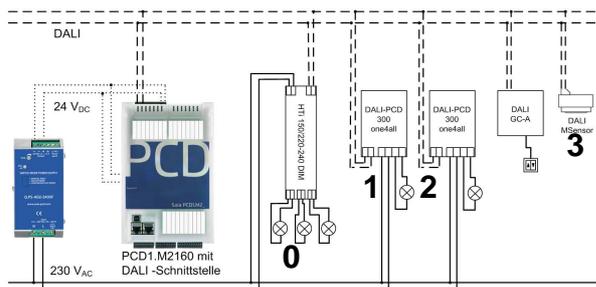
The automatic "Addressing" process may last several minutes. The addressing process is complete when the "Busy" output has value "0" and the "Progress" output has a value of "64 or 6.4".

The "Exchange addresses" FBox then allows the identification of DALI devices with on/off messages and the exchange of short addresses between two DALI devices. For more details, please see the online help for this FBox.

Settings can only be changed or called online. With the button " > " it is possible to move the required short address into the relevant register. Clicking the "On 1" or "On 2" button will switch on the selected short address and its corresponding DALI device. The "Exchange" button can be used to exchange the short addresses entered as "Address 1" and "Address 2".



The following point should be noted when using this FBox: Temporary address Bsp. 63 should not be used on the DALI bus. If it is used, please set and use a different short address! This address is used internally for readdressing. The value for "Address 1" is moved briefly to this address temporarily (internal process).



In this example, ballast devices for halogen lamps are assigned short address 0 and those for light bulbs are assigned addresses 1 or 2. The MSensor is assigned short address 3.

4.2.3 Configuring the DALI line

For this sub-task, first carry out the following steps, which have already been described more fully above:

- Create a new page (chosen name: " Config.")
- Place FBoxes "Configuration Manager" "Configuration Manager", "Edit Scene Levels" and "Edit Groups".
- Define symbols for inputs and outputs. If necessary add comments.
- Compile program and download into PCD.
- On the FUPLA page (Config.) go into RUN mode.

Page "Config."



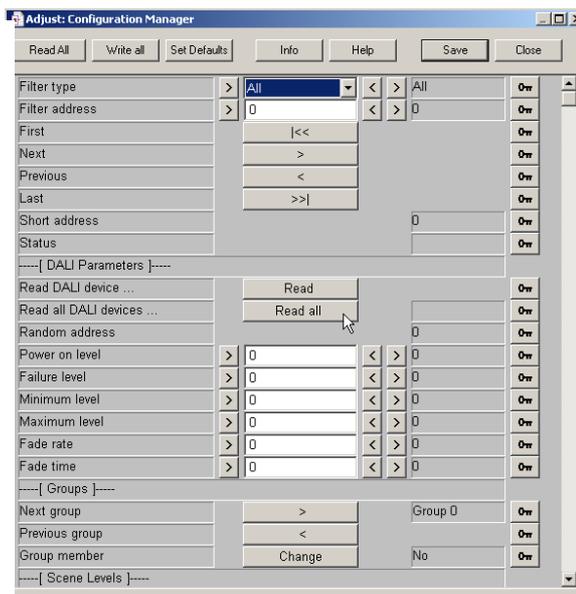
Konfigurieren und Auslesen aller Parameter der DALI- Geräte in einem DALI- Bus
 Configure and readout of all parameters of the DALI devices on a DALI bus



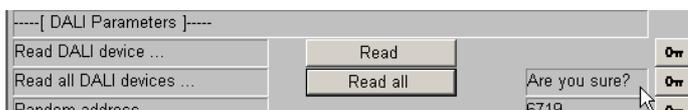
Szene Ebenen bearbeiten
 Edit Scene levels



Gruppeneinstellungen bearbeiten
 Edit Group Settings



All previously predefined or adjusted parameters in the DALI line can now be read using the "Configuration Manager" FBox. In the "Adjust Parameters" window the button "Read all" is pressed once. After the first click, the message "Are you sure?" will be displayed for 5 seconds. Click the button once again within this time to start the "read all" process.



This stores all values diagrammatically in a DB, as described in the [general design](#) section. Now or at a later stage, the FBoxes placed can be used to adjust or change the various parameters of DALI devices.



Note that the FBoxes "Edit Scene Levels" and "Edit Groups" only affect the DB and not the DALI bus directly. Changes are effective only after activation of the command "Update DALI device" or "Update all DALI devices" in the "Configuration Manager" FBox. This saves changes to the DB (if this has not already occurred) and transferred to the DALI device on the bus.

It is advisable to edit group and scene settings with the specific FBoxes provided: "Edit Scene Levels" and "Edit Groups", because they offer a clear structure.

Example for scene settings

The following is a small example of scene adjustment with the test structure:

- Scene 1: all devices to 50% brightness
- Scene 2: device with short address 0 off, devices 1 + 2 to 25%
- Scene 3: device 0 to 25%, devices 1 + 2 to 10%

Scene	Device with short address	Scene level
1	0	50 %
	1	50 %
	2	50 %
2	0	0 %
	1	25 %
	2	25 %
3	0	25 %
	1	10 %
	2	10 %

These settings can be made using the "Edit Scene Levels" FBox.



In the "Adjust Parameter" window, first select the device with the DALI short address "0". Selection is by means of the arrow keys.

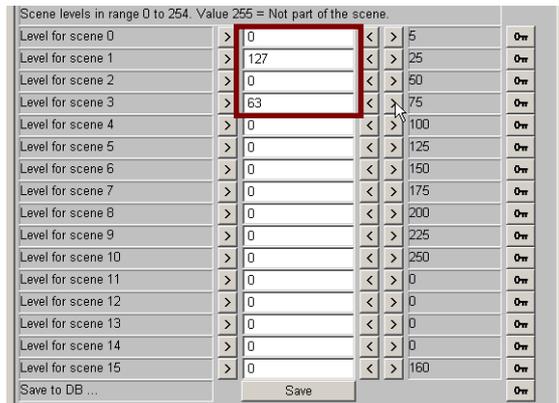


The scene levels can be entered next, i.e.:

- Level 0: unchanged
- Level 1: 127 for 50%
- Level 2: 0 for off
- Level 3: 63 for 25 %

Other levels remain unchanged at first. Values are transferred to the line with the arrow key.

The modification is saved to the DB when the "Save" button is pressed.

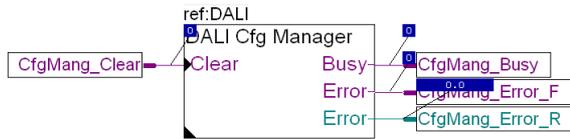


When saving to the DB is successfully completed, status "modified" is displayed.

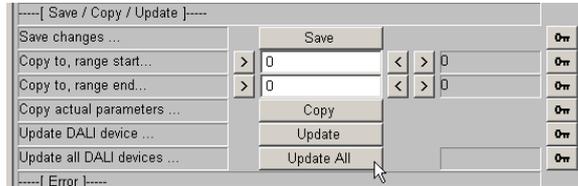


Make other scene adjustments in the same way.

The next step is to transfer the scene setting to the DALI bus.



The "Update All" button in the "Configuration Manager" FBox must then be pressed twice in succession within 5 seconds. This procedure will transfer all parameters to the DALI bus.



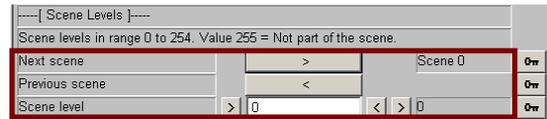
For a short time, the "Busy" output on the FBox may show "1".

All currently stored parameters can now be recalled with the "Read All" button.



be

They may also be found in the "Adjust Parameter" window of the "Configuration Manager" FBox.



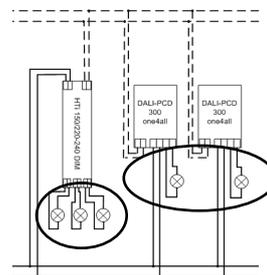
Example for group settings

For group setting, all lamps are placed in one group. In addition, halogen lamps are assigned to one group and light bulbs to another. The DALI MSensor 02 (short address 3) is at first disregarded.

Group assignment:

- Group 0: all lamps (stations 0-2)
- Group 1: halogen lamps to HTi DALI 150/220-240 DIM
- Group 2: both light bulbs, each to DALI-PCD 300 one4all

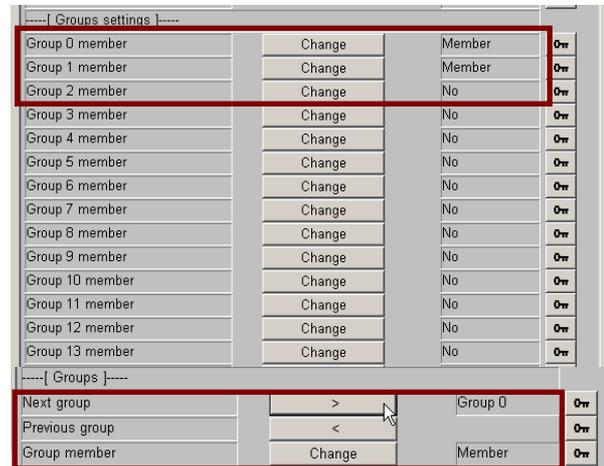
Group	Device with short address		
	0	1	2
0	x	x	x
1	x	-	-
2	-	x	x



Group settings can be edited with the "Edit Groups" FBox.



In the "Adjust Parameters" window, select the corresponding DALI device with short address "0". Group membership can be defined with the "Change" button. Then press "Save" button to save the change to the DB. All group memberships should be defined in this way. To transfer the change, use the "Configuration Manager" FBox as described already.



This group membership can also be tested again with the "Configuration Manager" FBox.

4.2.4 Sending commands to the DALI Bus

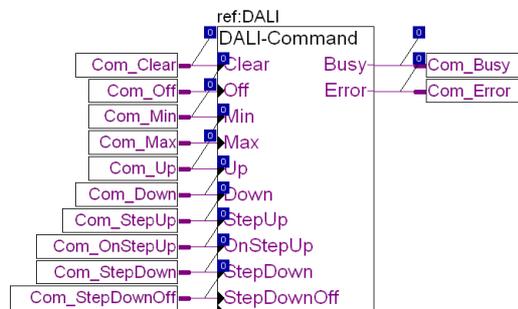
Steps:

- Set up a new page (chosen name "Send_1").
- Place FBoxes "Send Command Inputs" and "Send Command Online".
- Internal FBox parameters can remain unchanged at first and be adjusted in RUN mode.
- Define symbols for inputs and outputs and, if necessary, add comments.
- Compile program and download to the PCD.
- On the FUPLA page (Send_1) go into RUN mode.

Page "Send_1"

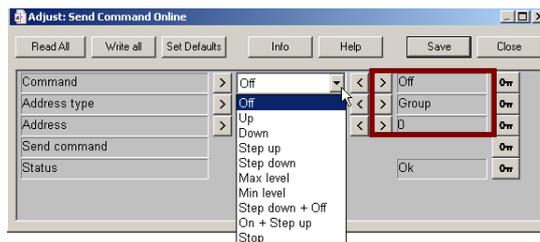


Befehle an DALI- Geräte mittels Online- Anpassung senden
 send commands to DALI devices via on-line adaptation

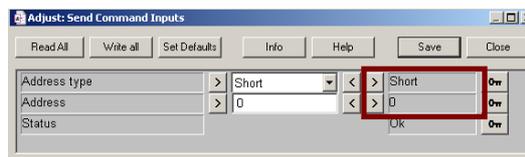


Senden von Befehle an DALI Geräte durch vordefinierte Eingänge
 Sending commands to DALI devices via predefined inputs

All settings can now be adjusted in the "Adjust Parameters" window of the "Send Command Online" FBox. The short address can be adjusted here and the command selected. The corresponding command is set with the right-arrow key. In the sample project, the chosen settings are: Command "Off", Address type "Group", and Address "0".



The "Send Command Inputs" FBox has been given the settings: Address type "Short", and Address "0".



These FBoxes can now be used to test the first functionalities.

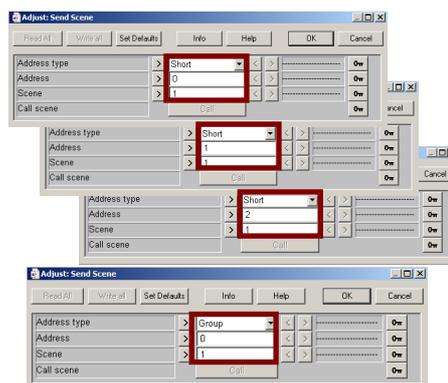
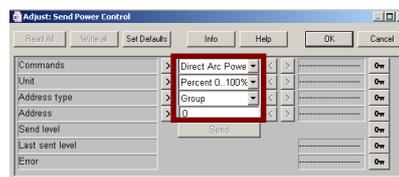


Note that the settings in the "Adjust Parameters" window in online mode are not transferred when a "Rebuild All" occurs. Please therefore save the changes. These will then be transferred with a re-compile.

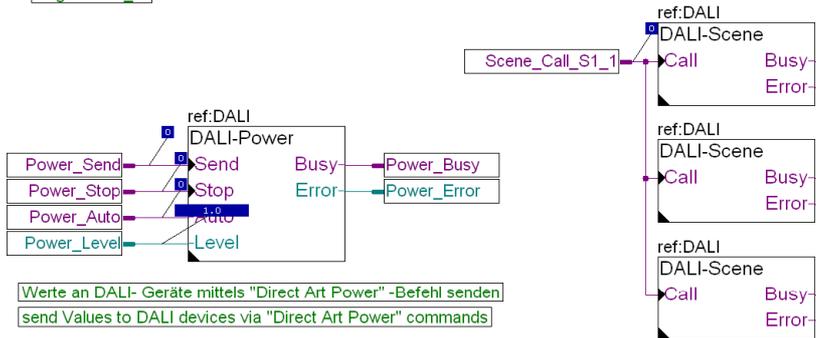
A new page is set up for the other Send FBoxes.

Steps:

- Set up a new page (chosen name "Send_2").
- Place FBoxes "Send Power Control" and four times "Send Scene".
- Configure the "Send Power Control" FBox with the settings: Commands "Direct Arc Power", Unit "Percent 0...100%", Address type "Group", and Address "0"
- "Send Scene" FBoxes should be selected with settings that ensure scene "1" is called. In the sample project, two ways of achieving the same goal have been shown. The first way uses three "Send Scene" FBoxes to call scene 1 via the short address of individual DALI stations. The second way uses a "Send Scene" FBox to call the scene via group addresses.
- Define symbols for inputs and outputs and, if necessary, add comments.
- Compile program and download to the PCD.
- On the FUPLA page (Send_2) go into RUN mode.

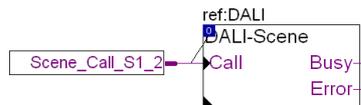


Page "Send_2"



Werte an DALI- Geräte mittels "Direct Art Power" -Befehl senden
 send Values to DALI devices via "Direct Art Power" commands

Möglichkeit I: Aufrufen der Szene 1 für die DALI -Teilnehmer 0-2
 Option I: call Scene 1 for the DALI devices 0-2



Möglichkeit II: Aufrufen der Szene 1 für die DALI -Teilnehmer 0-2
 Option II: call Scene 1 for the DALI devices 0-2

Functionalities can now be tested. For example, value "10" can be entered in the "Power_Level" input register and sent to the DALI bus with a subsequent edge at the "Power_Send" input. All the lights of group 0 now go to the appropriate value (here 10%).

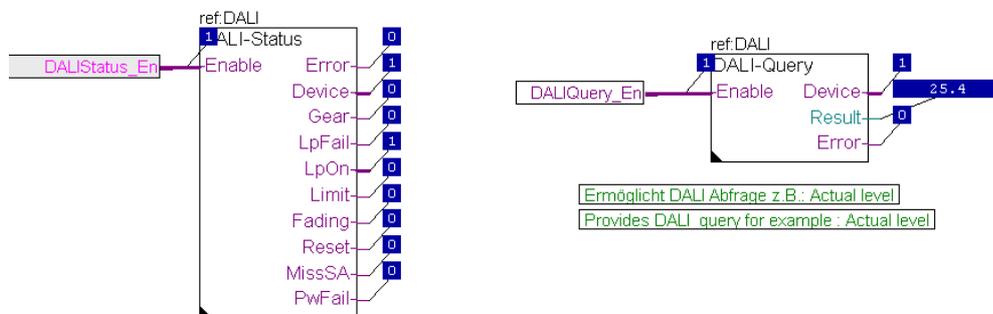
4.2.5 Receiving commands from the DALI Bus

General reception of DALI telegrams

First complete the following steps:

- Set up a new page (chosen name "RCV_1").
- Place FBoxes "Read Status" and "Query numeric".
- Internal FBox parameters can be adjusted as follows:
 "Read Status" FBox: Short address "0"
 "Query numeric" FBox: Short address "3" and Query "Actual level"
- Define symbols for inputs and outputs and, if necessary, add comments.
- Compile program and download to the PCD.
- On the FUPLA page (RCV_1) go into RUN mode.

Page "RCV_1"



Präsenz und Statusanzeige eines DALI Teilnehmers
 Presence and status of a DALI device

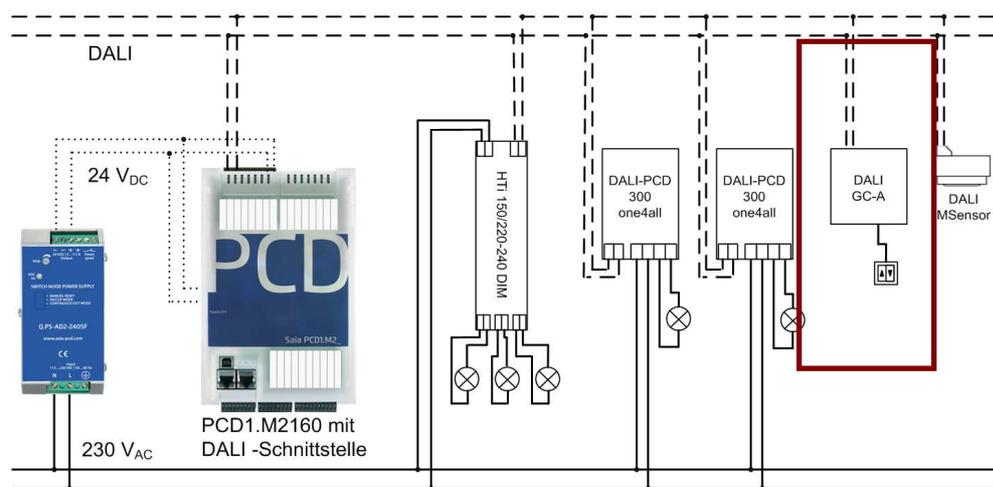
Ermöglicht DALI Abfrage z.B.: Actual level
 Provides DALI query for example : Actual level

By setting Enable flags, current values are read from the DALI line. With previously placed FBoxes (for example on the FUPLA page "Send_2") parameters can now be changed and will be displayed on the newly created page "RCV_1".

The "Query numeric" FBox in conjunction with the MSensor02 (in slave mode) for lighting control now allows for additional lighting control. This sensor is multi-master enabled.

Example: reception of DALI master telegrams

For this application, the test structure's Tridonic interface DALI GC-A must first be adjusted.



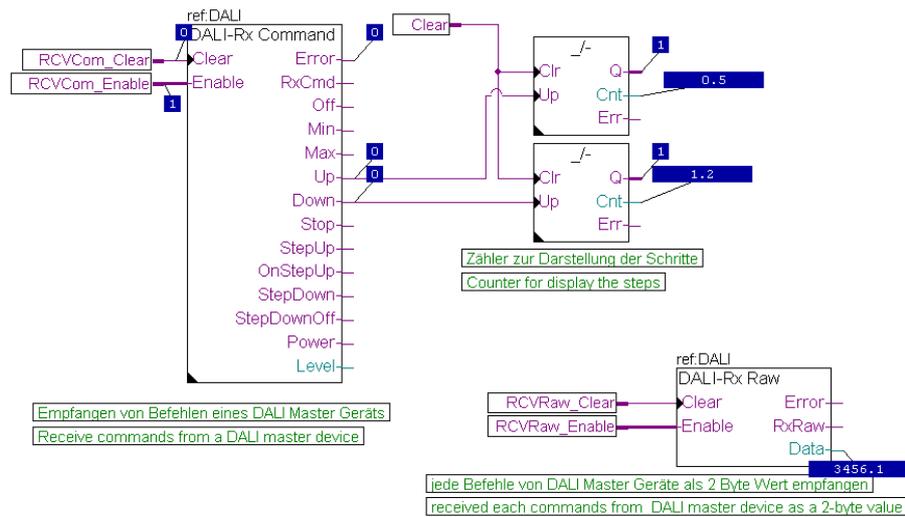
On this interface, a switch has been connected to input T2, as already mentioned in the section [Steps for producing the sample project](#). Input T1 remains unaffected. For test purposes, the interface is now adjusted to activate group address 3 (not yet used). This is adjusted with the rotary switch on the module, by turning it to position x. Please refer to the module description.

Another FUPLA page can now be created step-by-step:

Steps:

- Set up a new page (chosen name "RCV_2")
- Place FBoxes "Receive Commands" and two pulse counters (FBoxes) "Up with zero position" for subsequent display.
- Connect the "Up" and "down" outputs with the relevant pulse counter "Up" inputs.
- Place FBoxes "Receive Raw"
- Internal FBox parameters can be adjusted as follows:
 - "Receive Commands": Address type "Group" and Short address "3"
 - "Up with zero position": default settings can be left unchanged.
 - "Receive Raw": has no internal parameters; reads everything together.
- Define symbols for inputs and outputs and, if necessary, add comments.
- Compile program and download to the PCD.
- On the FUPLA page (RCV_2) go into RUN mode

Page "RCV 2"



Edges are only present at the outputs of DALI Master Receive FBoxes for one program cycle. If several PLC cycles are required for further processing, pulse information should be stored with additional logic. In the sample project this is achieved with the pulse counters.

By activating switches at the outputs, it is now possible to observe how the pulse counters increment. The "Receive Raw" FBox indicates the corresponding 2-byte value that has been sent to the DALI line by the DALI master module.

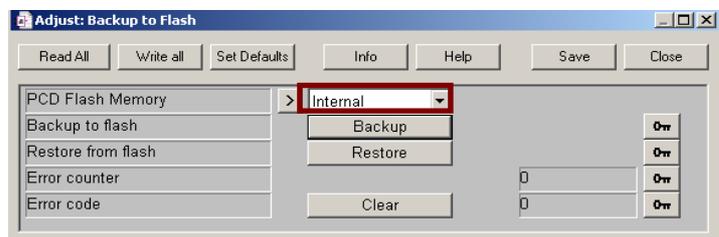
4.2.6 Data protection by backup to flash

This library also offers the possibility of backing up data and restoring all parameters of a connected DALI line. To do this, the following steps must first be completed:

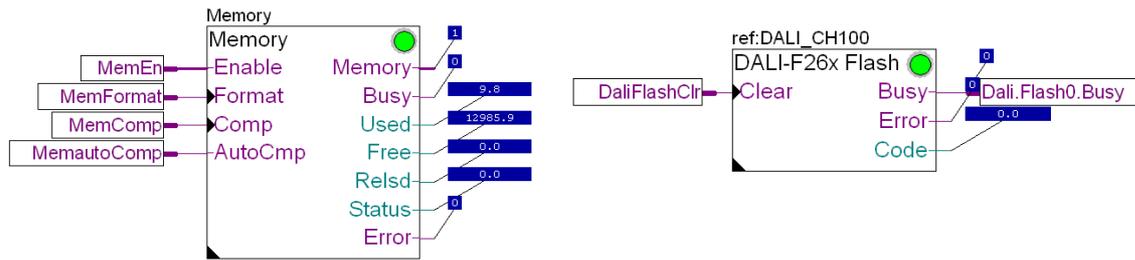
- Set up a new page (chosen name "Backup")
- Place FBox "Memory Management" from the File System library and FBox "Backup to Flash" from the DALI F26x Driver library
- Internal FBox parameters can be adjusted as follows:

"Memory Management": Default settings may be left unchanged.

"Backup to Flash": Here can the storage location be determined. In the sample project, "Internal" is selected. It is also critical to ensure the correct referencing to the DALI Driver! In the sample project, the ref DALI_CH100 is selected.



- Define symbols for inputs and outputs and, if necessary, add comments.
- Compile program and download to the PCD.
- On the FUPLA page (Backup) go into RUN mode



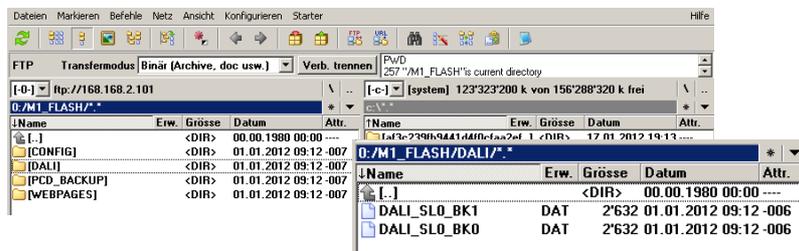
The first step is to set the "Enable" input of the "Memory Management" FBox to "1".

Then, by pressing the "Backup" button on the DALI "Backup to flash" FBox, all DALI parameters on the connected DALI line can be backed up.



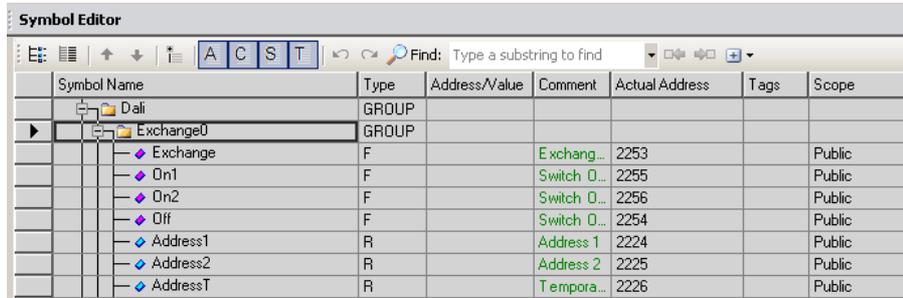
For a short time, "1" appears at the output of the "Backup to flash" FBox. This means that data has been backed up.

One way of checking is to access the Saia PCD® controller and with it the M1 flash by means of, for example, an FTP Client (FileZilla, Total Commander,...). The files can then be viewed there directly.



4.2.7 Additional possibilities through DB structure

The DB itself has not been made accessible to users for future adjustments to the library and to guarantee upward compatibility. Individual internal FBox data (flags and registers) is "public" and directly accessible in the Symbol Editor when FBoxes are placed.



Symbol Name	Type	Address/Value	Comment	Actual Address	Tags	Scope
Dali	GROUP					
Exchange0	GROUP					
Exchange	F		Exchang...	2253		Public
On1	F		Switch 0...	2255		Public
On2	F		Switch 0...	2256		Public
Off	F		Switch 0...	2254		Public
Address1	R		Address 1	2224		Public
Address2	R		Address 2	2225		Public
AddressT	R		Tempora...	2226		Public

All these parameters may be easily operated with a self-created web page, for example. It is thereby possible to design one's own tailor-made page template, e.g. to take charge of commissioning. A web template sample project for addressing and configuration is described in the next step.



The finished sample project can be found on the support homepage: <http://www.sbc-support.com/en/product-category/communication-protocols/dali/> under "example projects - Getting started". You will only need to make small adjustments to the project, such as for example the IP addresses of controllers and the file path. Further tests can now be conducted with the program.

5 Addressing and configuration via web

As friendly aid for the commissioning activities of a DALI line was been a web template project created which will be described in detail below. It involves addressing and configuration of a line and the backup to flash. The basics are described in the previous sample project. Send commands to the DALI bus or received are not a part.

- Load the project " DALI Getting Started with Web" in the controller and make the necessary adjustments (Correct choice of controller, the Channel from the DALI interface, path for data backup, ...)
- Establish an Ethernet connection between the PC and the PCD.
- Enter the following Path in a browser.
<http://192.168.12.227/DaliWebVisu.html>



- It opens the following start page



- When actuation the button "Dali Parameter" you go to the main window

On this page, the first options are shown.
 More details below.



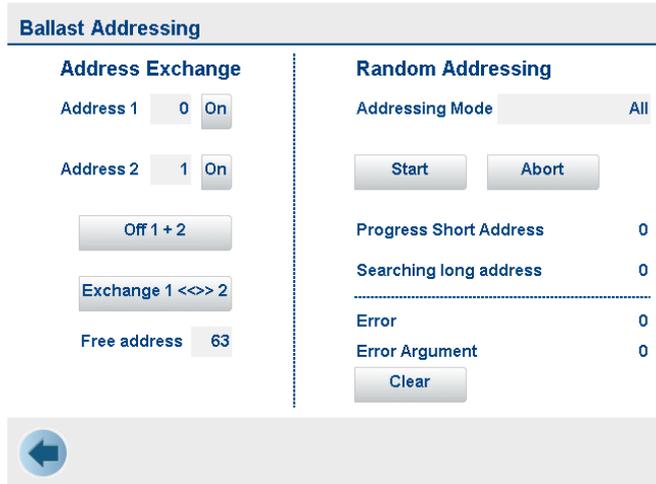
5.1 Addressing

In the bottom right is the button for addressing.



- Set the button "Addressing" and then you go to the next page

The right part of the view reflects the setting options for addressing. Here recourse to the parameters of the FBox "Random Addressing".



The left part is responsible for the identification and exchange of two addresses. FBox "Exchange addresses" and their functions stuck here behind.

- Settings can be made as required. It is self explaining.

For the choices, for example the address selection opens a new window. There is defined what can be selected.



This method is in almost all settings to assist you.

5.2 Data Backup

From the main window, at the bottom center are the buttons for backup.



- With the button "Backup" you start the backup.
- With the button „Restore“ you start to loaded the data from the memory of the PCD and subsequently restored.



Until the process is completed a symbolic feedback is given.



5.3 Configuration of the DALI line

The upper part of the main page is responsible for the configuration. All participants (0-63) can be selected individually. On the left side are different buttons for call to different actions.

The FBoxes „Configuration Manager“ „Edit Groups“ „Edit Scene Levels“ are operated.



- Selection of a device by clicking
 For example, device with address 0



- With the "Read" button, the parameters for the selected device will be read.
- With the "Update" button, the parameters are updated only for the selected device.
- With the button "Read all" and "Update all" all parameters are read or written to all devices. The action can take several minutes.
- With the button "Parameters" a new page "Ballast Configuration" opens.



- With this site you can be configured individual device. The configuration is also easy to understand. Declarations for this are already in the sample project in detail described.

Please think to actuation of the "Save" buttons!

Ballast Configuration									
Parameter		Group Settings					Scene Level		
Short Address	0	0	<input type="checkbox"/>	8	<input type="checkbox"/>	0	0	8	0
Random Addr.	1883453	1	<input checked="" type="checkbox"/>	9	<input type="checkbox"/>	1	100	9	0
Power On Level	10	2	<input checked="" type="checkbox"/>	10	<input type="checkbox"/>	2	200	10	0
Failure Level	50	3	<input checked="" type="checkbox"/>	11	<input type="checkbox"/>	3	30	11	0
Min Level	10	4	<input type="checkbox"/>	12	<input type="checkbox"/>	4	0	12	0
Max Level	250	5	<input type="checkbox"/>	13	<input type="checkbox"/>	5	0	13	0
Fade Rate	2	6	<input type="checkbox"/>	14	<input type="checkbox"/>	6	0	14	0
Fade Time	4	7	<input type="checkbox"/>	15	<input type="checkbox"/>	7	0	15	0

- With the button "Copy Param" on the main page can settings from the selected Users to another or several other Users will be copied.



6 Version-dependent notes and restrictions



In the "DALI F26x Driver" library Version 2.7.300 the following notes and restrictions should be taken into consideration.

6.1 Addressing

- When DALI master devices only are connected, which do not receive a short address, for example a switch interface, error message 3 is returned ("No devices found on the bus.").
- If you used the button "Update all" the process can last for up to 5 minutes. (Bussy output go to "0", when it is ready) The number of actually connected devices does not really major role.

6.2 Backup

When backing up for the first time with the DALI "Backup to flash" FBox, error "11" (Code 11 "Error deleting first file") is returned for the first backup and the error counter is incremented by 2. After a Clear the FBox will be operational. The backup can be executed again. This error occurs when the path / folder that is created does not exist in the controller. When the path / folder is created the error message does not appear.



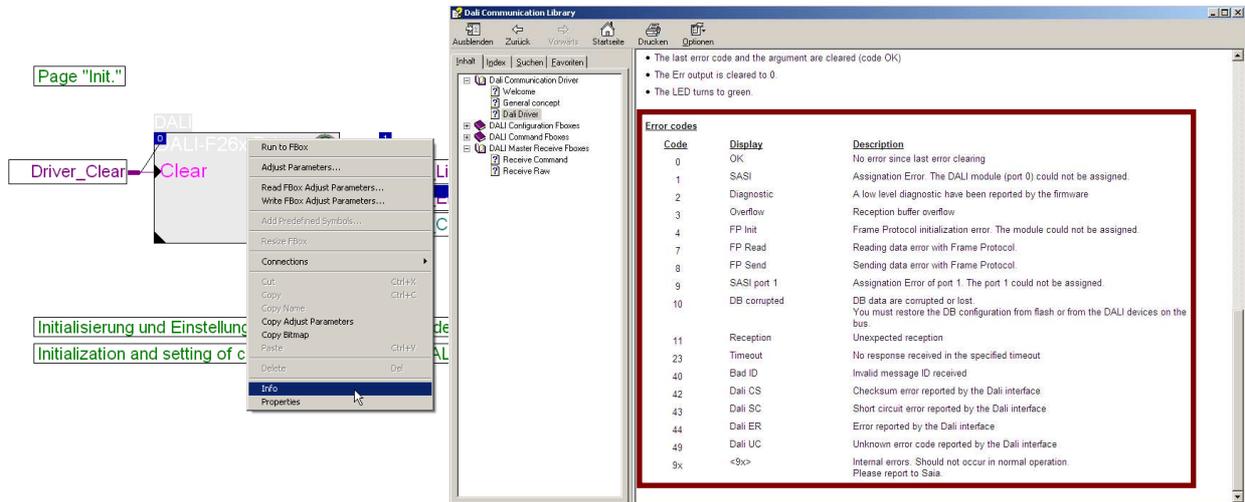
6.3 Old "DALI Library"

The "DALI Library" V2.6.220 can also be installed in parallel. For new projects in combination with PCD2/3F.26x modules a configuration with the new "Driver DALI F26x" library is recommended.

7 Error handling

Individual error messages are described in full in the “Saia PG5[®] DALI F26x” Driver library Help document.

Go to an existing FBox in the library and right-click to select “Info”. A window then opens with a description of the library, including error handling.



8 References

Subject	Document
Module and FBox library	Support site: http://www.sbc-support.com/en/product-category/communication-protocols/dali/
Miscellaneous	Online Help for PG5