# Lunatone

# DALI Display 7"

## Customized Layout
### Control Device

Guide for creating custom pages

# DALI Display Customized Layout

## Versionhistory

| | |
|---|---|
| V07 | January 2020 <br><br> User  Defined Parameters |
| V06 | [ur] May 2016 <br><br> New Buttonfunction 7: Tunable White,  New Buttonfunction 17: Macros |
| V05 | [ur] November 2015 <br><br> New Buttonfunction 6: Switch; Changes on Sequence/Schedule/SDLL-Control; |
| V0.4 | [ur] July 2015 <br><br> Translating from German Version |
| V0.1 | [ur] 30.10.2014 <br><br> First version, under work,  just for information |

## Content

# 1. Customized Layouts - Basics

## 1.1 Function

Generation of custom sites is based on a simple concept, each customized layout and the according files can be uploaded to the device via Ethernet or USB.

Each site is assembled from 3 pics: the background and 2 pics, one with pressed and one with released buttons.

In a configuration file the coordinates of the buttons are defined. These coordinates are then used one hand to distinguish which button is pressed (human machine interaction), on the other hand to cut out the areas from pressed and released images and overlay them to the background image.

Besides the spatial representation of the keys the configuration file is also used to declare the function of each button. The function ranges from simple On/Off-switches up to controlling automatic sequences and custom macros.

Simple illustration example using 4 keys:
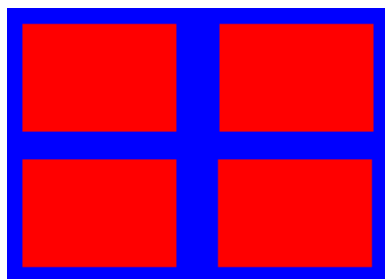
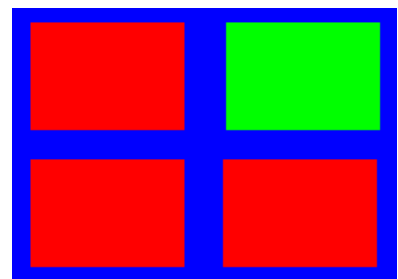| | | |
|---|---|---|
| background color | color for released buttons | color for pressed buttons |

If we define 4 keys with corresponding coordinates, the resulting image is based on the momentary pressed/released button situation:

layout with 4 released keys            layout with 1 pressed key

## 1.2 Upload

The user defined files can be uploaded to the display in 2 different ways. We recommend the use of the Ethernet connection, but it can also be done with the help of an USB-stick.

**Ethernet Network:**

Enter the IP-address of the DALI Display in your browser:
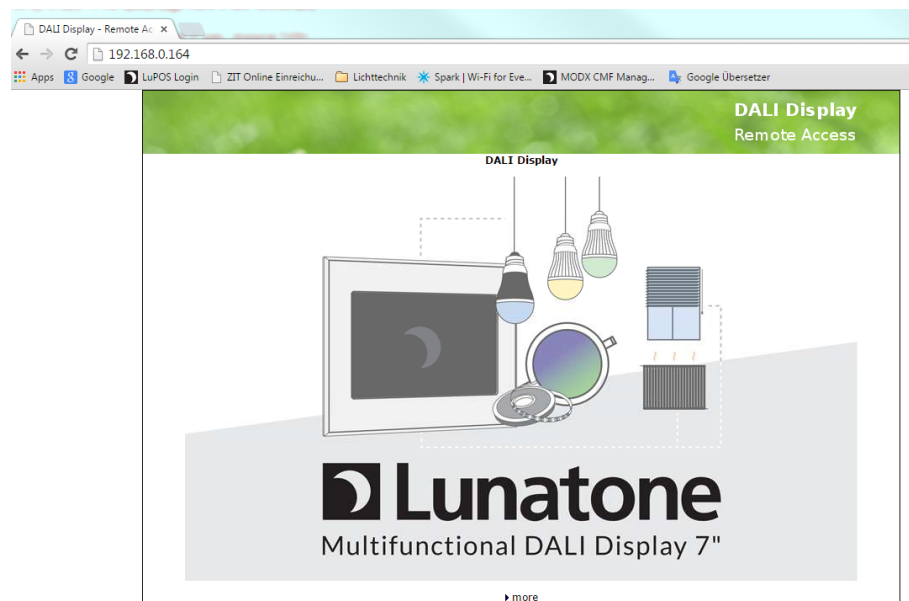


Press „>more" in order to get to the next page:
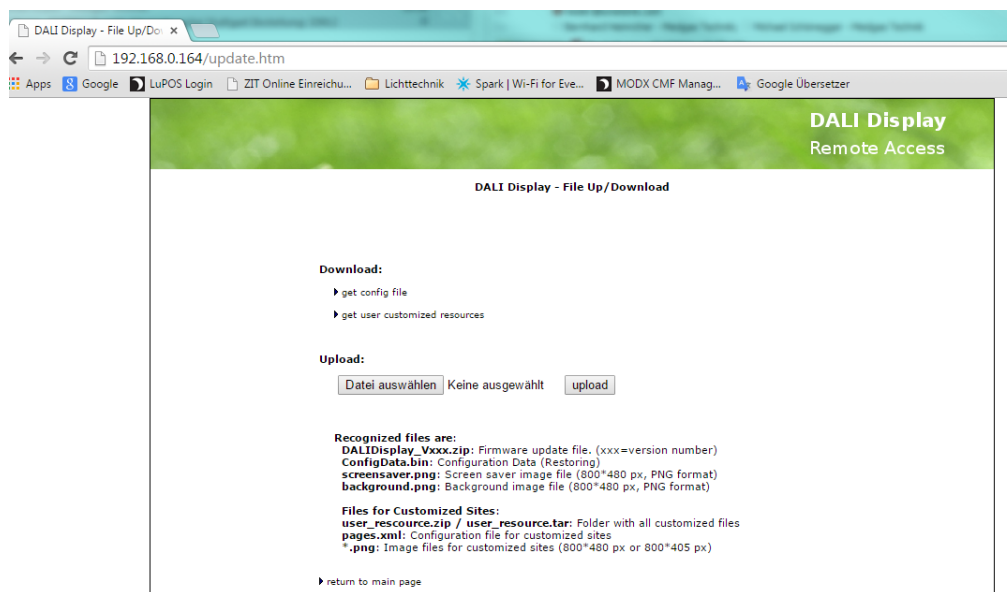


On this site you can then select the files on your computer for upload. For the user defined sites the following files are important:

- pages.xml … configuration file for user defined sites
- xxx.png ….images for background and buttons (filename: 20 characters max)
- user_resource.zip … Zip-File containing all images in png format and the pages.xml, with an empty user_resource.zip already existing resource-files can be removed from display

Please pay attention to the case-sensitivity of the file names (especially when using them in the pages.xml)!

## 2. File and Pic Requirements

background images: 800x480, file-format: png

pic with buttons: 800x405, file-format: png

configuration file: pages.xml or pageN.xml (N=1…16) if a separate file is used for each site. pages.xml has higher priority than pageN.xml

## 3. Supported Control Elements

In user defined sites various types of control elements are supported:

type 0:  momentary switch element – offers the possibility to define DALI-commands for switch on/off; This type can also be used for linking to another page

type 1: dim element – key for sending DALI-dimming commands

type 2: switchdim element – short key press for on/off, long key press for dimming, the DALI-commands can be defined

type 3: sequence control element – key for controlling sequences that are already stored in the display

type 4: schedule control element – key for controlling sequences that are already stored in the display

type 5: schedule list control element – key for controlling sequences that are already stored in the display

type 6: switch control element – sending one Command on key press and another one on key release

type 7: tunable white control element – control of DALI DT8 luminaires, Type Tc

Type 17: Start Macro

If there is defined one command only for type 0-2, this command will be sent if the key is pressed. If more than one command is defined for the key, a switch will send the OnCmd or OffCmd depending

on the actual state of the light, whereas the dimmer will send a repeated UpCmd or DownCmd, these cmds will alternate at each long press action.

## 4. XML-configuration file pages.xml

XML (Extensible Markup Language) is used for the configuration file, because with the help of tags the file does not only get a clear structure but also becomes readable and at least for part self-explaining.

File pages.xml can be edited with each standard text editor like notepad or similar, but we recommend to use a xml-editor like XML-notepad. XML is characterized that is organized in structures. Each of these structures starts and ends with a tag. For pages.xml these tags are:

<Configuration>          // start tag of configuration file

… sub structures …      // sub structures possible within the tags

</Configuration>         //end tag of configuration file

In pages.xml  <Site> is the uppermost structure. A configuration file defining 3 sites has the following structure (italic font is used for further substructures within the <Site>-tag):

```
<Configuration>      //Start
     <Site>          //Start Site 1
          <SiteNumber>1</SiteNumber>
          <SiteName> Customized Room 1 </SiteName>
          <ImageBgnd>userbgnd1.png</ImageBgnd>
          <Imagea> button1r.png </Imagea>
          <Imageb>button1p.png</Imageb>
          <Button>
          </Button>
          <Button>
          </Button>
          <Button>
          </Button>
     </Site>          //End Site 1
     <Site>           //Start Site 2
     </Site>          //End Site 2
     <Site>           //Start Site 3
     </Site>          //End Site e 3
</Configuration>      //End
```

At this point it gets clear that due to the growing structure the file will get unreadable in a standard text editor, whereas for example in XML-Notepad we see a clearly structure, with containers and folders similar to the well known windows explorer filesystem.
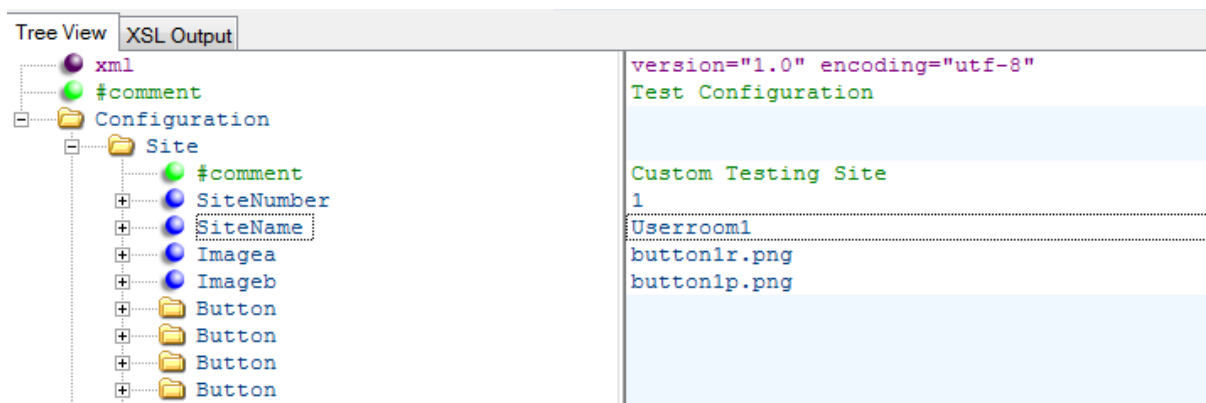
Figure 1: XML-editor view

For each site mandatory and optional tags can be defined, e.g. site number, sitename, used pics, etc. Each key can then be defined in detail within a separate structure marked by the <Button> tag. Tags, value ranges and parameters are listed below:

| Tag | Mandatory / Optional | Description |
|---|---|---|
| <Configuration> | M | marks begin and end of pages.xml |
| <Site> | M | Indicates a site definition |
| <SiteNumber> | M | sitenumber, value range 1…16, at the moment up to 16 user defined sites are supported. |
| <SiteName> | O | site name, optional |
| <ImageBgnd> | O | name of the background image *.png, if no image is defined the default background (defined in display setting) is used |
| <Imagea> | M | name of layout with released keys, *.png |
| <Imageb> | M | name of layout with pressed keys, *.png |
| <ShowClock> | O | Default="Yes", „No" does disable the clock on the upper right |
| <ShowDate> | O | Default="Yes", „No" does disable date on the upper right |
| <Button> | M | indicates a button definition |

Hint: Clock and Date will be shown in the upper right corner, hence a height of 32px and a width of 300px have to be reserved on new pages. Otherwise there can occur unlovely visual effects.

## 4.1. Button Definition via <Button>-tag

Button definition is similar to the site structure. Several sub categories are available to describe the whole button function. The basic structure is shown in the figure:
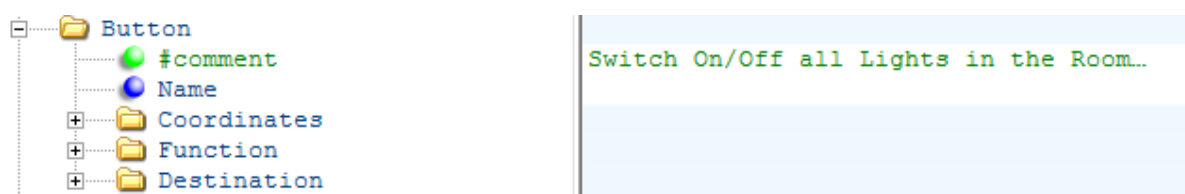


Figure 2: <Button>-structure

A button is defined by setting name (optional – name is shown on the button on the display) as well as the containers for coordinates, function and DALI destination address. Therefore the following structures are available:

The tags of the coordinates are self-explaining. A Button is always defined as rectangle with upper left and bottom right corner:
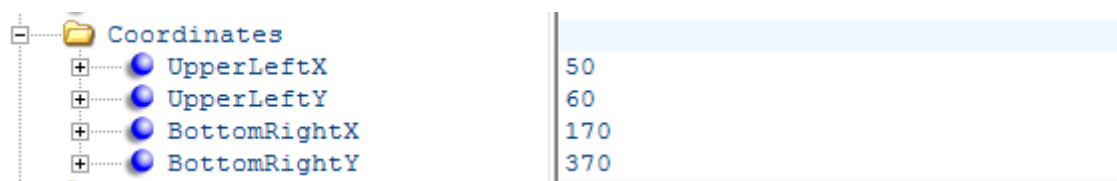


Figure 3: coordinates definition

In the function-container the control element type (see chapter 3) is defined. Furthermore the DALI-commands that should be used can be declared.
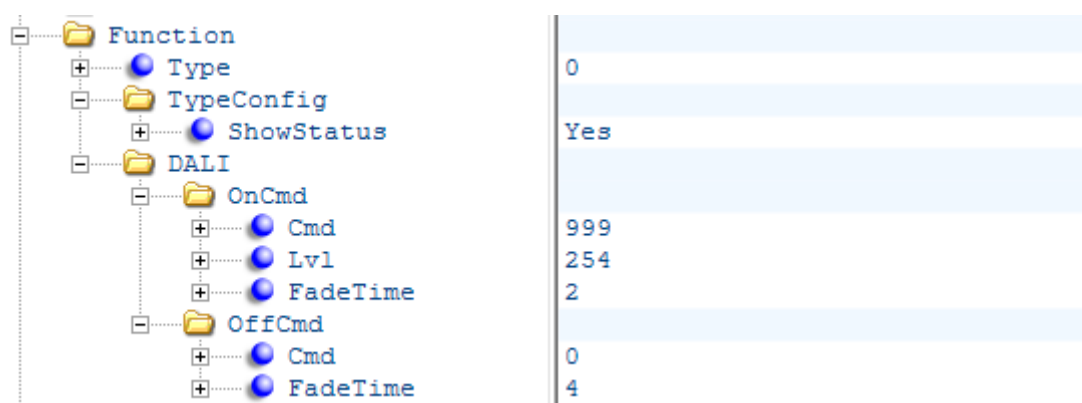


Figure 4: switch configuration

In Figure 4 a switch (type0) is configured. For switching function DALI commands are defined (OnCmd, OffCmd) within the DALI-tag. If we would have used a dimmer (type=1) UpCmd and/or DownCmd would have been defined. When using a switchdim element all 4 commands can be defined.

If there is only one command defined (e.g. OnCmd for a switch element) , then it sends the OnCmd on each button press. Dim elements can be configured this way for dimming down or dimming up only.

A DALI command consists of the DALI command number according to the DALI standard (e.g.: 0=OFF, 5=RECALL MAX, etc …), which is placed within the <Cmd>-tag. If a direct dim level should be sent, the value "999" has to be used as command number, and within the <Lvl>-tag the direct arc power level has to be specified (0…254). Additionally some parameters can be defined which should be send prior to the device. Supported parameters are FadeTime and FadeRate, if they have influence on the defined command depends on the command itself[1].

An example for a SDLL-control button is shown below:

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[1] This effect is caused by the DALI commands. The faderate has influence on the dim commands UP and DOWN but does not have any effect on direct arc power commands. Therefore the fade time has to be used. Some commands like OFF, RECALL MIN or RECALL MAX are not effected by these parameters at all. In Figure 4 the fadetime has no influence on the OFF-command defined within <OffCmd> but it is sent to the destination address before the OFF-commands is transmitted.
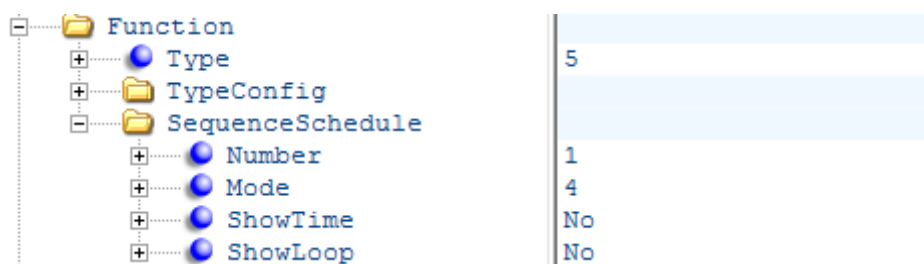
5: Defining a sequence control button

Finally the destination address has to be defined. At the moment only a single destination address (A0…A63, B0..B63, G0…G15, ALL) is supported.



Figure 6: Defining the destination address

The examples used here may be different to other buttons which use other control elements. A list of valid tags and there effect is given in the table below:

| Tag | Parent | M/O | Description |
|---|---|---|---|
| *<Name>* | *<Button>* | O | Button name, this name is shown on the key itself, omit tag if name is not required |
| *<Coordinates>* | *<Button>* | M | Container tag for rectangular key definition |
| *<UpperLeftX>* | *<Coordinates>* | M | x-coordinate upper left (0<UpperleftX<BottomRightX) |
| *<UpperLeftY>* | *<Coordinates>* | M | y-coordinate upper left (0<UpperleftY<BottomRightY), if clock is displayed a height of 30 has to be reserved |
| *<BottomRightX>* | *<Coordinates>* | M | x-coordinate bottomright (UpperleftX<BottomRightX<=800) |
| *<BottomRightY>* | *<Coordinates>* | M | y-coordinate bottomright (UpperleftY<BottomRightY<=405) |
| *<Function>* | *<Button>* | M | Container tag for the function |
| *<Type>* | *<Function>* | M | Definition of control element type<br>0 – momentary switch<br>1 – dimmer<br>2 – switchdim (short/long press)<br>3 - sequence control element<br>4 – schedule control element<br>5 – SDLL control element<br>6 – switch (OnCmd on Press, OffCmd on release)<br>7 – Tunable White<br>17 – Macro Control Element |
| *<TypeConfig>* | *<Function>* | O | Container tag for detailed type configuration |
| *<ShowStatus>* | *<TypeConfig>* | O | If ShowStatus is defined (=Yes) for type 0 or type 2 element the actual light state of the destination address is displayed. Ist he destination ON -> Area from Imageb is used, otherwise area from Imagea is used |
| *<Link>* | *<TypeConfig>* | O | Container tag for link to another page |
| *<EmbedPage>* | *<Link>* | O | 1…n (link to auf embedded page); 66 … Settings Site; 6 … reserved |

| | | | |
|---|---|---|---|
| *<UserPage>* | *<Link>* | O | 1…16 (link to custom page) |
| *<Action>* | *<Link>* | O | Short/Long – defines if a short or long press is required for executing the link |
| *<DALI>* | *<Function>* | O | Container tag for DALI commands |
| *<OnCmd>* | *<DALI>* | M/O | container for definition of the On-Cmd |
| *<Cmd>* | *<OnCmd>* | M | Command for Switch On<br>Valid values: 999 (DAP); 5 (RECALL MAX), 6 (RECALL MIN), 16-31 (GOTO SCENE 0-15) |
| *<OffCmd>* | *<DALI>* | M/O | container for definition of the Off-Cmd |
| *<Cmd>* | *<OffCmd>* | M | Command for Switch Off<br>Valid values: 999 (DAP); 0 (OFF), 16-31 (GOTO SCENE 0-15) |
| *<UpCmd>* | *<DALI>* | M/O | container for definition of the Up-Cmd |
| *<Cmd>* | *<UpCmd>* | M | Command for DIm Up<br>Valid values: 1 (UP), 3 (STEP UP), 8 (ON AND STEPUP) |
| *<OnAtStartUp>* | *<UpCmd>* | O | Yes/No; defines if ONANDSTEPUP should be used as start cmd of an UP-Sequence |
| *<DownCmd>* | *<DALI>* | M/O | container for definition of the Down-Cmd |
| *<Cmd>* | *<DownCmd>* | M | Command for DIm Down<br>Valid values: 2 (DOWN), 4 (STEP DOWN), 7 (STEPDOWN AND OFF) |
| *<Lvl>* | *<OnCmd>*<br>*<OffCmd>* | M/O<br>M/O | Required for direct arc power commands only (Cmd=999), dim value range:0…254,255 |
| *<FadeTime>* | *<OnCmd>*<br>*<OffCmd>* | O | Fadetime can be set before command is sent<br>Values: 0…15 correponding toDALI |
| *<FadeRate>* | *<UpCmd>*<br>*<DownCmd>* | O | Faderate can be set before command is sent<br><br>Values: 0…15 corresponding to DALI |
| *<Absolute>* | *<DALI>* | M/O | Container tag for sending absolute Tc-Value (only in case of Function = Tunable White) |
| *<Tc>* | *<Absolute>* | M/O | Tc Value in K |
| *<Relative>* | *<DALI>* | M/O | Container tag for a relativ change of the Tc- Value (only in case of Function = Tunable White) |
| *<Warmer>* | *<Relative>* | M/O | Number of STEP WARMER cmds |
| *<Cooler>* | *<Relative>* | M/O | Number of STEP COOLER cmds |
| *<SequenceSchedule>* | *<Function>* | O | container tag for sequences, schedules and SDLL |
| *<Number>* | *<SequenceSchedule>* | M | Sequence number, that should be controlled (1…99)<br>Schedule number, that should be controlled (1…7)<br>SDLL, that should be controlled (1)<br>The <Type>-Tag defines if it is a sequence, schedule or SDLL |
| *<Mode>* | *<SequenceSchedule>* | M | Defines the Type of Action<br>0 … Stop Sequence/Schedule<br>1 … Start Sequence/Schedule<br>2 … Pause Sequence/Schedule<br>3 … Start/Stop Alternating<br>4 … Start/Pause Alternating<br>5 … No Function (for visualising only) |
| *<ShowTime>* | *<SequenceSchedule>* | O | show sequence/schedule runtime (Yes/No) |

| *<ShowLoop>* | *<SequenceSchedule>* | O | show number of loops |
|---|---|---|---|
| *<MacroName>* | *<Button>* | M/O | Tag within the name of the macro that should be executed can be defined.  Markoname = macroN.xml<br>N=0 … 64 |
| *<Destination>* | *<Button>* | M/O | Container tag for destination address (necessary for DALI Cmds, sequences, schedules) |
| *<Address>* | *<Destination>* | M/O | Destination address (one address only)<br>Single address: A0-A63, B0-B63<br>Group address: G0-G15<br>Broadcast: ALL, All, B |

## 5. User Defined Command Lists macroN.xml

User defined command lists can be executed using button function 17. They are stored in an xml-file as well. At the moment a macro can be only started by a button, but it can whether be stopped nor can it be retriggered. After user defined list has been executed it can be started again.

Example for storing the actual value as scene 15 value (group2):
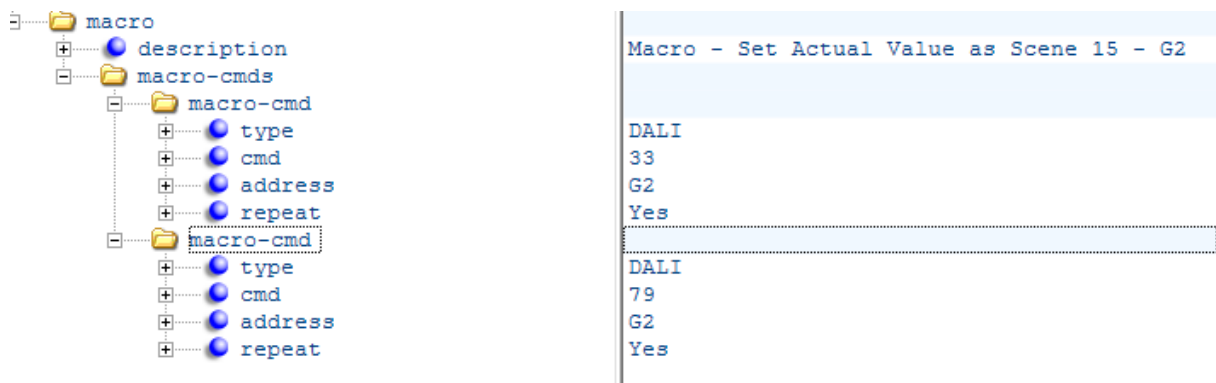


| Tag | Parent | M/O | Description |
|---|---|---|---|
| *<macro>* | - | M | Container tag, start and end of user defined cmdlist |
| *<description>* | *<macro>* | O | description |
| *<macro-cmd>* | *<macro>* | M | Container tag for a single cmd |
| *<type>* | *<macro-cmd>* | M | Defines the type of the cmd <br> - DALI <br> - eDALI (to be defined) |
| *<cmd>* | *<macro-cmd>* | M | Command number <br> - all known DALI cmds <br> - 999, if DAP cmd |
| *<address>* | *<macro-cmd>* | M | Address (destination) |
| *<repeat>* | *<macro-cmd>* | O | Yes/No, if there is need to send a cmd twice (e.g. DALI configuration commands) |
| *<data>* | *<macro-cmd>* | O | Data of the cmd, e.g. DAP-Cmd or the DTR |
| *<delay>* | *<macro-cmd>* | O | Delay in ms before the next command is executed, |

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## 6. User Defined Parameters

From version 1.08 onwards, it is possible to customize certain parameters e.g. the circadian curve. The data is stored in an XML file named **ConfigData.xml**

The file is transferred via the display web-interface (to access enter the IP of the DALI display in your browser).

### 6.1. Circadian Curve

The circadian curve can be set by defining the colour temperature at 24 time points, one per hour of the day. Additionally, the sunrise and sunset of the shortest and longest day in the year can be defined to account for the seasonal light changes. Following tags are used to define the circadian curve:
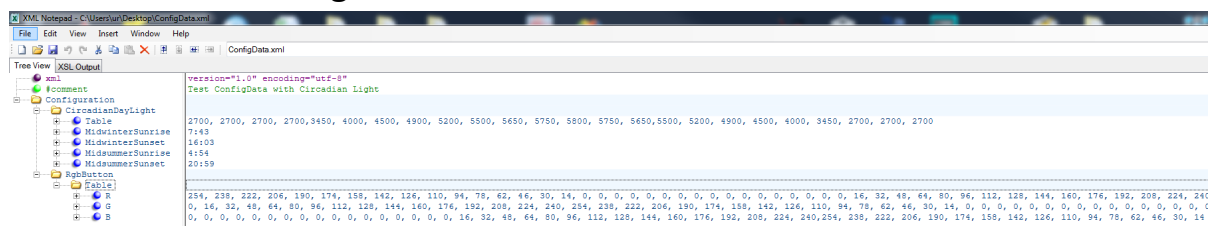
| Tag | Parent | M/O | Description |
|-----|--------|-----|-------------|
| *<Configuration>* | - | M | Container tag, marking the beginning and end |
| *<CircadianDayLight>* | *<Configuration>* | M | Container tag for the circadian curve |
| *<Table>* | *<CircadianDayLight>* | M | Container tag for the table containing the 24 hourly time points and the according light temperature values in Kelvin (starting at 0:00 to 23:00) |
| *<MidWinterSunrise>* | *<CircadianDayLight>* | M | Defining the sunrise on the 21$^{st}$ of December |
| *<MidWinterSunSet>* | *<CircadianDayLight>* | M | Defining the sunset on the 21$^{st}$ of December |
| *<MidSummerSunrise>* | *<CircadianDayLight>* | M | Defining the sunrise on the 21$^{st}$ of June |
| *<MidSummerSunSet>* | *<CircadianDayLight>* | M | Defining the sunset on the 21$^{st}$ of June |

### 6.2. RGB – Table

The RGB-Table consists of 48 colour values. A colour is made up of the R, G and B value with an equivalent index in the table. Navigation between the colour values is possible with the user defined Buttontype Nr9 "RGB-Step Button". Following tags are used to set the colour values in the RGB-Table:

| Tag | Parent | M/O | Description |
|-----|--------|-----|-------------|
| *<Configuration>* | - | M | Container tag, marking the beginning and end |
| *<RgbButton>* | *<Configuration>* | M | Container tag for the RGB step button colour table |
| *<Table>* | *<RgbButton>* | M | Container tag for the table |
| *<R>* | *<Table>* | M | 48 red colour values |
| *<G>* | *<Table>* | M | 48 green colour values |
| *<B>* | *<Table>* | M | 48 blue colour values |

### 6.3. ConfigData.xml Default Values



```
XML Notepad - C:\Users\un\Desktop\ConfigData.xml
File  Edit  View  Insert  Window  Help

ConfigData.xml

Tree View   XSL Output

xml                                version="1.0" encoding="utf-8"
#comment                           Test ConfigData with Circadian Light
Configuration
  CircadianDayLight
    Table                          2700, 2700, 2700, 2700,3450, 4000, 4500, 4900, 5200, 5500, 5650, 5750, 5800, 5750, 5650,5500, 5200, 4900, 4500, 4000, 3450, 2700, 2700, 2700
    MidwinterSunrise               7:43
    MidwinterSunset                16:03
    MidsummerSunrise               4:54
    MidsummerSunset                20:59
  RgbButton
    Table
      R                            254, 238, 222, 206, 190, 174, 158, 142, 126, 110, 94, 78, 62, 46, 30, 14, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 16, 32, 48, 64, 80, 96, 112, 128, 144, 160, 176, 192, 208, 224, 240
      G                            0, 16, 32, 48, 64, 80, 96, 112, 128, 144, 160, 176, 192, 208, 224, 240, 254, 238, 222, 206, 190, 174, 158, 142, 126, 110, 94, 78, 62, 46, 30, 14, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
      B                            0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 16, 32, 48, 64, 80, 96, 112, 128, 144, 160, 176, 192, 208, 224, 240,254, 238, 222, 206, 190, 174, 158, 142, 126, 110, 94, 78, 62, 46, 30, 14
```

# 7. Lunatone Examples

## 7.1. Example Lunatone 1

Layout: Switch 4 Groups, 3 Scenes and 2 Sequences. Broadcast Off and Broadcast Dim.

E.g. for dining room & bar, 3 scenes for evening, noon and morning, 2 sequences for ambient light in the evening and for the bar.

**Strategy**: 1 fixed background picture + 2 keylayouts (Image a und Image b)



**ImageBgnd**
(800*405_72ppi_png):

background – blue color
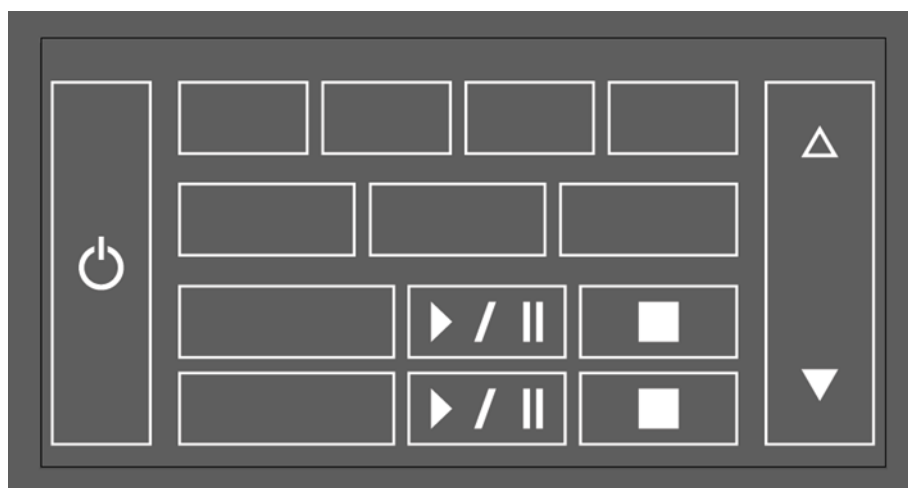, please find dimension beside the pic

Maximum key area:
800*405px



**Image a**
(800*405_72ppi):

All unpressed and inactive states. Border with 2.5px

**Transparent background**, for better visualisation the background is shown in grey

32px on the top are reserved for clock and date

![Lunatone]



**Image b**
(800*405_72ppi):

All pressed and active
states. White rectangles

**Transparent
background**, for better
visualisation the
background is shown in
grey

32px on the top are
reserved for clock and
date

**Coordinates:**

Reference lines for easy
definition oft he
buttons, 6px reserve to
the symbols

In pages.xml a function
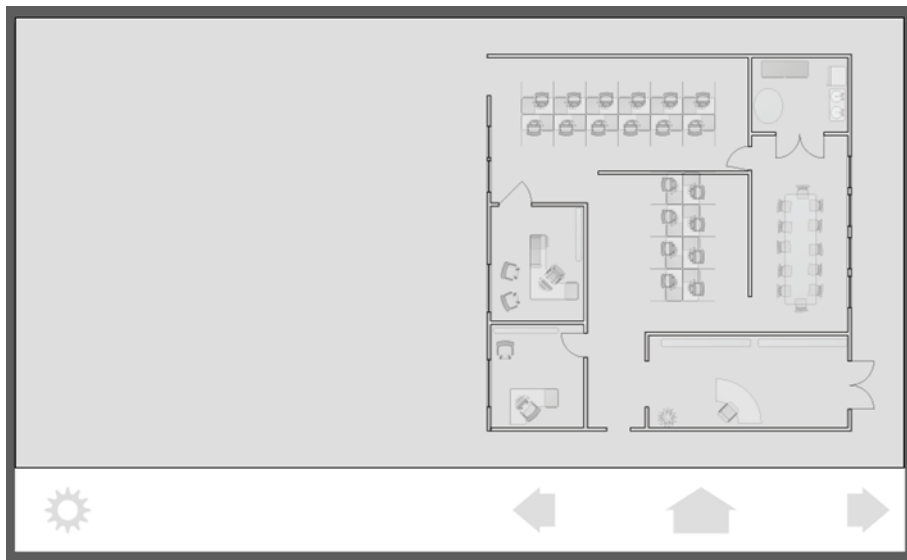will be assigned to each
field

**Result: Screenshot**

G1 and G2 are ON.

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## 7.2.    Example Lunatone 2

Layout: Switching of  7 Groups, 6 Scenes and a MAIN OFF.

E.g for 7 rooms of an office, 6 Scenen für evening, day, conference room, holiday, presentation, night/safety

**Strategy**: 1 background image + 2 keylayouts (Image a und Image b)



**ImageBgnd**
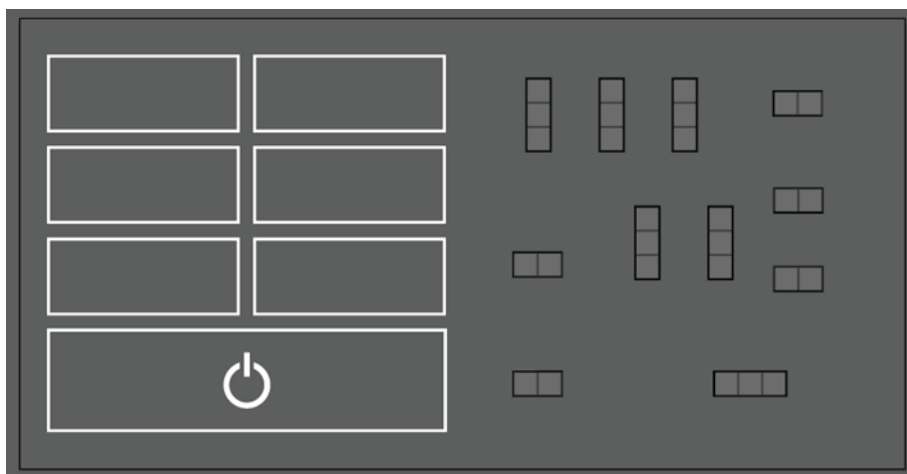(800*405_72ppi_png):

Background – office map with 7 rooms



**Image a**
(800*405_72ppi):

All unpressed and inactive states. 6 Scene buttons and OFF button with  border( 2.5px). Luminaires in state Off in map.

**Transparent background**, for better visualisation the background is shown in grey

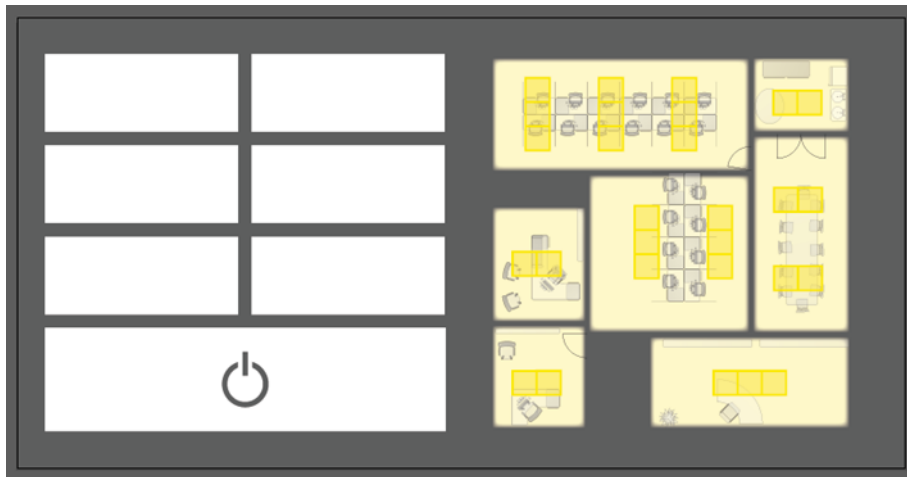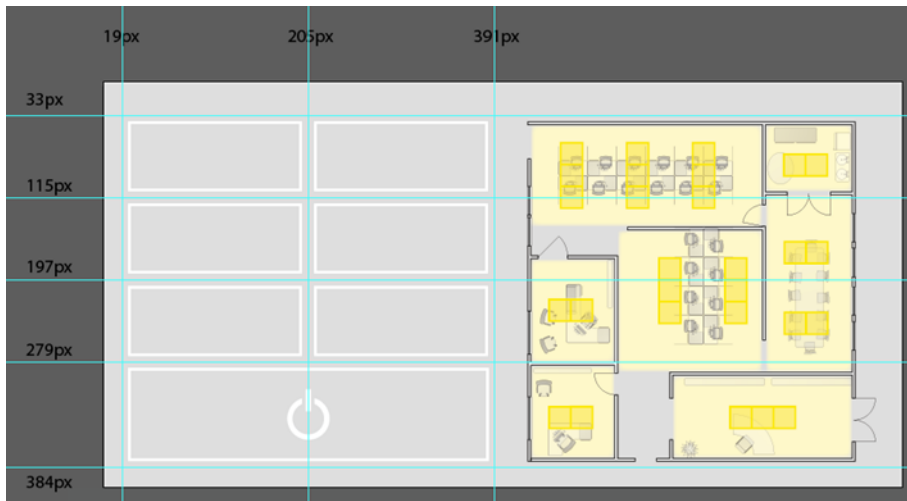32px on the top are reserved for clock and date

**Image b**
(800*405_72ppi):

All pressed and active states. White rectangles and highlighted rooms

**Transparent background**, for better visualisation the background is shown in grey

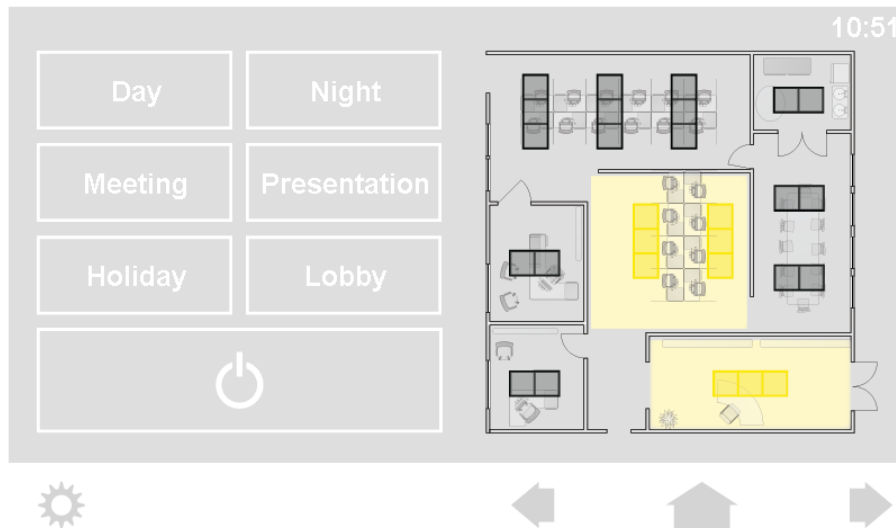32px on the top are reserved for clock and date



**Coordinates:**

Reference lines for easy definition oft he buttons, 6px reserve to the symbols

In pages.xml a function will be assigned to each field

**Result: Screenshot**

In 2 rooms the light is ON.

## 7.3. Example Lunatone 3

Layout: Group buttons for tables, ceiling and corridor, general off and direct activation of single luminaries by pressing on the luminaire itself (+optical feedback).

**Strategy**: 1 background image + 2 keylayouts (Image a und Image b)



ImageBgnd (800*405_72ppi_png):

Background image with all luminaires disabled.

Image a
(800*405_72ppi):

All unpressed and
inactive states. In this
case **completely
transparent** (grey for
better visualisation).
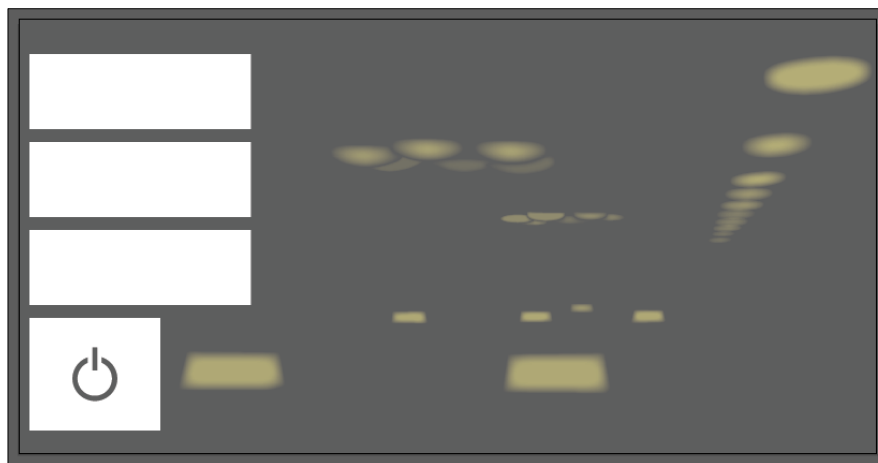Scene and Off-Button
only in different color
(inactive state)



Image b
(800*405_72ppi):

All activated luminaires
and pressed buttons
(white). This pic will but
over the background.

Yellow areas: 60%
transparency.



**Coordinates:**

Reference lines for easy
definition of the
buttons, 6px reserve to
the symbols

In pages.xml a function
will be assigned to each
field

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