JULY 2020

Busch-ControlTouch® KNX - Scripts

Online Learning Session – Competence Center Europe – Smart Buildings

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Online Learning Session – Competence Center Europe - Smart Buildings

From home office to home office

ABB STOTZ-KONTAKT GmbH
Heidelberg / Germany
Agenda

Introduction
  - Basics
  - Script Management
  - Script editor

Commands

Values, variables, calculation and functions

Control structures

Examples
Busch-ControlTouch® KNX - Scripts

Introduction
Busch-ControlTouch® KNX - Scripts

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**Busch-ControlTouch® - 6136/APP-500**

- KNX visualization for iOS and Android smartphones, Apple smart watch, tablets and Windows computers (desktop)
- Easy control using intuitive navigation concept
- Display of individual control pages with room images controls
- Fully web-based commissioning with wizard function
- Home automation, switching, dimming, blind control, RTC control, scene/sequences, week timer, TCP & HTTP commands, diagrams, **Creation of own scripts (e.g. if – then – else) and more**
- Integration of IP cameras, SONOS (UPnP) and Philips hue
- KNXnet/IP Tunnel
- Local user (roles and rights)
- Send alarm/malfunction messages over push notifications and/or e-mails including a picture from an IP camera
- ...

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July 6, 2020 | Slide 5
The basics

- With scripts you can create your own small programs within the Busch-ControlTouch®
- Scripts are very flexible and can be used to add a wide variety of features to a home automation installation
- You can create logic functions, delay actions, extend your scenarios with RGB sequences and much more
- Scripts can be activated using a scenario, a schedule, an action (trigger) or another script
- Scripts must be created with an expert account
**Typical use-cases**

- Wake-up scenarios in the morning
- Switch off/on delays
- Activate UPnP devices
- Decoding status information
- Read status of valves
- Alarm signals (flashing light on/off)
- Light and music scenes (Sonos, Philips HUE, etc.)
- Logic functions
- ...and much more
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General setup

- Busch-ControlTouch® scripts are written programs that consist of one or more lines.
- Each line should contain only one specific command (you cannot put multiple commands on one line).
- You can add comments to a script by writing a “#” character. This can be done on a separate line or at the end of a command.
- Scripts can be started and stopped by many means, for example by a scenario or a schedule.
- Scripts can be "unending" scripts that perform certain actions in repeating intervals or can be defined as a sequence of commands that are executed only once, whenever the script is started.

```
1 #Example No 1
2 #This line sets the dimmer 1 to 50%
3 SET BYTE(7/Dimmer 1) TO 50
4
```
Script management

- Busch-ControlTouch® scripts can be created and updated using the editor
- This editor can be found in the project configuration of “MyBuildings”
- Select the project for which you want to manage the scripts and select “Scripts” in the menu bar
- All existing scripts will be shown here and can be edited and deleted
- Important: When you add or edit a script, this has to be loaded onto the Busch-ControlTouch® before it can be used
Script management – local access

- Some settings can only be made via direct access (local IP address, e.g. 192.168.0.89) to the device
- These settings (e.g. network settings, location, firmware update) are then available only specially for this device
Script management – local access

- Some settings can only be made via direct access (local IP address, e.g. 192.168.0.89) to the device
- These settings (e.g. network settings, location, firmware update) are then available only specially for this device
- Further options:
  - Scenes can be created and administered via “Scenes”
  - Time programs can be created and administered via “Time switch”
  - On the “Presence simulation” page, the simulation status can be modified (using the play/record/stop buttons)
  - The available scripts can be viewed via “Scripts”
    Scripts can also be deactivated/activated via the overview list
  - Display of existing alarm messages via “Alarm messages”
Script management – local access

- When you are logged in on the device, you can see the loaded scripts by clicking the “Scripts” option in the menu
- Here a script can also be manually started, restarted or stopped for testing purposes
Script editor

- When you add or edit a script, you can select whether it should be enabled and you can select whether the script should be available for the end user, to use in scenarios or the scheduler.
- You can also select if the script should be started automatically, whenever the Busch-ControlTouch® device is (re)started.
- IMPORTANT: Disabled scripts cannot be executed and will not be triggered when included in a scenario, action or scheduler. This can be useful for testing and troubleshooting proposes. However, keep in mind that a script can be enabled or disabled by another script!
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Script editor - Setup

– The line numbers that are displayed next to the script are informational only and are not used in the scripts themselves
Script editor - Setup

- Commands can be added by typing them in directly or by using the command selection tool, located at the right hand side top corner.
Script editor - Setup

- When adding a command with the commands tool, the appropriate fields regarding your configuration will be added as links automatically.
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Script editor - Setup

- When adding a command with the commands tool, the appropriate fields regarding your configuration will be added as links automatically
Script editor - Setup

- After you have added one or more commands in the editor, you can verify if they are valid by clicking the "Save and check" button.
- All lines that are correct will be displayed in black.
- All lines in red indicate it contains an error somewhere on that line. Comment will always be displayed in green.

```
1 #Example No 1
2 #This line will dim the light to 50%
3 SET BYTE(7/DIMMER 1) TO [0 - 255]

DPT 5.001 = 0 – 100%
```

![Valid Command Example]

```
1 #Example No 1
2 #This line will dim the light to 50%
3 SET BYTE(7/DIMMER 1) TO 50
```

![Invalid Command Example]
Script editor – Activation

- Scripts have to be activated by a trigger...
Script editor – Activation

- ...by a scene, a time program or another script

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td>06:00:00</td>
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</tr>
</tbody>
</table>
Busch-ControlTouch® KNX - Scripts
Commands
# Busch-ControlTouch® KNX - Scripts
## Online Learning Session

## Commands – Controlling components

<table>
<thead>
<tr>
<th>Type</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlling components</td>
<td>SET [component] TO [value]</td>
<td>With this command you can set bit, byte and float (2byte) components to a specified value. Use the &quot;.&quot; character as separator for floating point values. You can also use other components as the value part of this command. This allows you to set one component to the value of another.</td>
</tr>
<tr>
<td>Controlling components</td>
<td>SET [RGB component] TO [red],[green],[blue]</td>
<td>This command lets you set a RGB component to a specified colour. The colour must be described with the red, green and blue values, all using a range of 0-255. Instead of using static values, you can replace any of the three primary colour parts with a BYTE component. You can also replace all the component parts together with a single other RGB component. This allows you to set a RGB component to another RGB components colour.</td>
</tr>
<tr>
<td>Controlling components</td>
<td>FADE [component] TO [value] IN [time]</td>
<td>This command is quite similar to the two commands above; you can use it on bytes, floats and RGB values. Instead of setting the value directly, this command changes the values in steps from the current value to the value specified. You can specify the time as a static value or use the value of a component. Possible time units are MSEC/SEC/MIN/HOUR/DAY. If no units are specified for the time value, milliseconds are assumed. This command changes the value of the component every second. Similar to the SET command, you can also use this command in combination with RGB components.</td>
</tr>
<tr>
<td>Controlling components</td>
<td>FADE [component] TO [value] in [time] STEP [time]</td>
<td>This command is similar to the command above; it just adds the specification of the step time. When the step time is not specified, the FADE command changes the value every second. By specifying the step time, you can change this to for example every 30 minutes, or 100 milliseconds. The minimum value is 100 milliseconds. Similar to the SET command, you can also use this command in combination with RGB components.</td>
</tr>
<tr>
<td>Controlling components</td>
<td>READ [component]</td>
<td>With this command you can request the current status of the component on the bus. You can also use the command for scenarios. This will perform a READ for every component that is included in the scenario.</td>
</tr>
</tbody>
</table>

```
1  FADE BYTE(7/Dimmer 1) TO 10 IN 11 SEC
2  FADE BYTE(7/Dimmer 1) TO 30 IN 11 SEC
3  FADE BYTE(7/Dimmer 1) TO 50 IN 11 SEC
4  FADE BYTE(7/Dimmer 1) TO 100 IN 11 SEC
5  FADE BYTE(7/Dimmer 1) TO 0 IN 11 SEC
```
## Busch-ControlTouch® KNX - Scripts

### Online Learning Session

### Commands – Controlling (other) scripts

<table>
<thead>
<tr>
<th>Type</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlling (other) scripts</td>
<td>STOP</td>
<td>This command simply stops the current script.</td>
</tr>
<tr>
<td>Controlling (other) scripts</td>
<td>RESTART</td>
<td>This command restarts the current script. In other words it starts running again from the beginning. IMPORTANT: restarting a script without using a WAIT command (see next section) will bring the script in a direct infinite loop, which should be avoided.</td>
</tr>
<tr>
<td>Controlling (other) scripts</td>
<td>START [script]</td>
<td>This will start another script if it is not running at the moment. Replace [script] with the actual script you wish to start.</td>
</tr>
<tr>
<td>Controlling (other) scripts</td>
<td>START AT BEGIN [script]</td>
<td>This will start another script if it is not running. If it is running it will tell the script to start over again from the beginning (restart). Replace [script] with the actual script you wish to (re)start.</td>
</tr>
<tr>
<td>Controlling (other) scripts</td>
<td>STOP [script]</td>
<td>This will stop another script if it is running. Replace [script] with the actual script you wish to stop.</td>
</tr>
<tr>
<td>Controlling (other) scripts</td>
<td>SET [script] TO [on/off]</td>
<td>This command allows you to enable or disable a script. Replace [script] which the actual script you wish to enable/disable. All values greater than 0 are interpreted as ON, all values of 0 or below are interpreted as OFF. This can be helpful when using a certain component to activate/deactivate scripts.</td>
</tr>
</tbody>
</table>

```plaintext
1. SET SCRIPT(4161/CONFORT) TO 0
2. SET SCRIPT(4160/dim to 50) TO 0
3. SET SCRIPT(4163/Turn off delay) TO 0
4. SET SCRIPT(4162/wake Up Light) TO 0
```
# Busch-ControlTouch® KNX - Scripts

## Online Learning Session

## Commands – Using delays / Scenarios, alerts and schedulers

<table>
<thead>
<tr>
<th>Type</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using delays</td>
<td>WAIT [time] or WAIT [time] MSEC/SEC/MIN/HOUR/DAY</td>
<td>This command will put the script on hold for the given period of time. If no time units are supplied, milliseconds are assumed. The maximum waiting time is approximately 20 days. Instead of entering a static value, you can use a value from a component as well. (BYTE or 2BYTE)</td>
</tr>
<tr>
<td>Using delays</td>
<td>WAIT [time] RANDOM [time]</td>
<td>This command is similar to the previous command, however, this command waits for the given time with an addition of a random generated time in the interval given as the second time range. For example: WAIT 1 HOUR RANDOM 30 MIN will wait somewhere between 1 hour and 1.5 hours. Every time the command is executed, this will be recalculated with a different result.</td>
</tr>
<tr>
<td>Scenarios, alerts and schedulers</td>
<td>CALL [scenario]</td>
<td>This will call the specified scenario. Replace [scenario] with the actual scenario you wish to call.</td>
</tr>
<tr>
<td>Scenarios, alerts and schedulers</td>
<td>LEARN [scenario]</td>
<td>This will modify the scenario. All components in the scenario will be set to their current state in the home automation installation.</td>
</tr>
<tr>
<td>Scenarios, alerts and schedulers</td>
<td>CALL [alert] or CALL [alert] WITH [value]</td>
<td>This allows you to use the alert service from within scripts. If no value is specified, 0 is used. Replace [alert] with the actual alert you wish to call.</td>
</tr>
<tr>
<td>Scenarios, alerts and schedulers</td>
<td>SET [scheduler] TO [on/off]</td>
<td>This command allows you to enable of disable a scheduler. Replace [scheduler] with the actual scheduler you wish to activate or deactivate. All values greater than 0 are interpreted as ON, all values of 0 or below are interpreted as OFF. Keep in mind this will only work on schedulers that can be manually enabled or disabled. Schedulers that are automatically enabled or disabled based on a component cannot be enabled or disabled by a script.</td>
</tr>
</tbody>
</table>

```
1  WAIT 5 MIN
2  SET BIT(2/Light 1) TO 0
3
```
**Busch-ControlTouch® KNX - Scripts**

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**Commands – Using delays / Scenarios, alerts and schedulers**

<table>
<thead>
<tr>
<th>Type</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commands</td>
<td>EXECUTE [network command]</td>
<td>This allows you to use a network command from within scripts. Replace [network command] with the actual command you wish to use.</td>
</tr>
<tr>
<td>Commands</td>
<td>EXECUTE ON [upnp device] [upnp command]</td>
<td>This allows you to use a command on a uPnP device from within scripts. Replace [upnp device] with the desired uPnP device and [upnp command] with the actual command you wish to use.</td>
</tr>
</tbody>
</table>

```plaintext
1. EXECUTE ON UPNPDEVICE(UPNPUUID:RINCON_7828CAF3045201400 MR$/Wohnzimmer - Sonos One Media Renderer) PLAY
```
Busch-ControlTouch® KNX - Scripts

Values, variables, calculation and functions
Values

- When you insert a command through the script command list, values and components are displayed in [ ] brackets. These are displayed to indicate what you should enter at the appropriate location.
- When possible the editor will make a link to the right listing of components, scripts, alerts, schedules or scenarios.
- Valid components are written for example as SCENARIO(123/nname). In this example a scenario is intended with the identifier “123”. The name is displayed for readability only.
- For many commands you will normally use a static value, for example WAIT 20 SEC. However, in some circumstances it might be useful to use the value of a component instead. With all commands you can replace the static value with a component.
- Time values are assumed in milliseconds if no time unit is specified. Valid units are: MSEC, SEC, MIN, HOUR and DAY.

```
1 #Timer function: 2 byte value variable seconds can be used to define a timer
2 WAIT 2BYTE(17/Variable Seconds) SEC
3 CALL ALERT(10936/Martin Wichary (Masterproject) - Example Alert)
4 SET BIT(18/Start Timer) TO 0
```
Variables

- You can define your own variables in scripts, which are defined as global variables, usable across all different scripts on the device.
- A variable starts with a dollar sign “$”, for example: $AVERAGE
- The name of the variable can consist of alphanumerical characters (A-Z and 0-9)
Calculation

- You can use variables to calculate values using arithmetic operators.
- Floating-point values can be used by using the “.” as a separator, for instance 2.42

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>plus</td>
</tr>
<tr>
<td>-</td>
<td>minus</td>
</tr>
<tr>
<td>*</td>
<td>multiply</td>
</tr>
<tr>
<td>/</td>
<td>divide</td>
</tr>
<tr>
<td>%</td>
<td>modulo (division remainder)</td>
</tr>
<tr>
<td>^</td>
<td>power</td>
</tr>
<tr>
<td>&amp;</td>
<td>and</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>=</td>
<td>is equal to</td>
</tr>
<tr>
<td>&lt;</td>
<td>is smaller than</td>
</tr>
<tr>
<td>&gt;</td>
<td>is greater than</td>
</tr>
<tr>
<td>&lt;&gt;</td>
<td>is not equal to</td>
</tr>
</tbody>
</table>

(result = 1 if both values greater than 0, 0 if not)
(result = 1 if one of the values is greater then 0, 0 if not)
(result = 1 if true, 0 if not)
(result = 1 if true, 0 if not)
(result = 1 if true, 0 if not)
(result = 1 if true, 0 if not)
## Functions – Mathematical functions

<table>
<thead>
<tr>
<th>Type</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematical functions</td>
<td>ROUND (value) or ROUND (value, precision)</td>
<td>Returns the rounded value of the given value. When no precision is specified, a precision of 0 is used. For example ROUND(4.3) = 4 and ROUND(4.321, 1) = 4.3.</td>
</tr>
<tr>
<td>Mathematical functions</td>
<td>FLOOR (value) or FLOOR (value, precision)</td>
<td>Returns the floored (rounded down) value of the given value. When no precision is specified, a precision of 0 is used. For example FLOOR(4.7) = 4 and FLOOR(4.987, 1) = 4.9.</td>
</tr>
<tr>
<td>Mathematical functions</td>
<td>CEIL (value) or CEIL (value, precision)</td>
<td>Returns the ceiled (rounded up) value of the given value. When no precision is specified, a precision of 0 is used. For example CEIL(4.3) = 5 and CEIL(4.321, 1) = 4.4.</td>
</tr>
<tr>
<td>Mathematical functions</td>
<td>ABS (value)</td>
<td>Returns the absolute value of the given value, so ABS(-4) = 4 and ABS(6.13) = 6.13.</td>
</tr>
<tr>
<td>Mathematical functions</td>
<td>MIN (value, value, value, ..)</td>
<td>Returns the minimum value of all the parameters given. Requires a minimum of one parameter.</td>
</tr>
<tr>
<td>Mathematical functions</td>
<td>MAX (value, value, value, ..)</td>
<td>Returns the maximum value of all the parameters given. Requires a minimum of one parameter.</td>
</tr>
<tr>
<td>Mathematical functions</td>
<td>AVG (value, value, value, ..)</td>
<td>Returns the average value of all the parameters given. Requires a minimum of one parameter.</td>
</tr>
<tr>
<td>Mathematical functions</td>
<td>RANDOM (max value)</td>
<td>Returns a random value between 0 and the given maximum value.</td>
</tr>
</tbody>
</table>
### Functions – Time functions

<table>
<thead>
<tr>
<th>Type</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time functions</td>
<td><code>NOW()</code></td>
<td>Returns the current time as a timestamp in seconds since January 1st 1970 (unix date). This timestamp can be compared to an earlier value to determine how much time has passed.</td>
</tr>
<tr>
<td>Time functions</td>
<td>DAYTIME() of DAYTIME(timestamp)</td>
<td>Returns a 1 if the sun is up and a 0 if the sun is down. When a timestamp is given, this time is used, otherwise the current time is used.</td>
</tr>
<tr>
<td>Time functions</td>
<td>SECOND() of SECOND(timestamp)</td>
<td>Returns the amount of seconds (0-59). When a timestamp is given, this time is used, otherwise the current time is used.</td>
</tr>
<tr>
<td>Time functions</td>
<td>MINUTE() of MINUTE(timestamp)</td>
<td>Returns the amount of minutes (0-59). When a timestamp is given, this time is used, otherwise the current time is used.</td>
</tr>
<tr>
<td>Time functions</td>
<td>HOUR() of HOUR(timestamp)</td>
<td>Returns the amount of hours (0-23). When a timestamp is given, this time is used, otherwise the current time is used.</td>
</tr>
<tr>
<td>Time functions</td>
<td>DAYOFWEEK() of DAYOFWEEK(timestamp)</td>
<td>Returns the day of the week (1-7). When a timestamp is given, this time is used, otherwise the current time is used. 1 = Sunday, 2 = Monday, .. 7 = Saturday.</td>
</tr>
<tr>
<td>Time functions</td>
<td>DAYOFMONTH() of DAYOFMONTH(timestamp)</td>
<td>Returns the day of the month (1-31). When a timestamp is given, this time is used, otherwise the current time is used.</td>
</tr>
<tr>
<td>Time functions</td>
<td>DAYOFYEAR() of DAYOFYEAR(timestamp)</td>
<td>Returns the day of the year (1-366). When a timestamp is given, this time is used, otherwise the current time is used.</td>
</tr>
<tr>
<td>Time functions</td>
<td>MONTH() of MONTH(timestamp)</td>
<td>Returns the month (1-12). When a timestamp is given, this time is used, otherwise the current time is used.</td>
</tr>
<tr>
<td>Time functions</td>
<td>YEAR() of YEAR(timestamp)</td>
<td>Returns the year, for example &quot;2015&quot;. When a timestamp is given, this time is used, otherwise the current time is used.</td>
</tr>
</tbody>
</table>
## Functions – Text functions

<table>
<thead>
<tr>
<th>Functions</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Text functions</strong></td>
<td>CONCAT(&quot;abc&quot;, &quot;def&quot;, ...)</td>
<td>Concatenates texts together, for example CONCAT(&quot;abc&quot;, &quot;def&quot;, &quot;ghi&quot;) results in &quot;abcdefghi&quot;. Alternatively you can use the dot (&quot;.&quot;) as a text operator to concatenate text's, for example &quot;abc&quot;.&quot;def&quot;.&quot;ghi&quot; results in &quot;abcdefghi&quot;.</td>
</tr>
</tbody>
</table>
| **Text functions** | FORMAT(format, parameters....) | Can be used to format text. The format field describes how, afterwards parameters can be added to be used. Standard text will be copied directly, additionally the following special format options are available: - Use %s to include a value as text, for example: FORMAT("Now it is %s.", "dry") results in "Now it is dry." - Use %d to include an integer value in the text, for example: FORMAT("It is %d degrees.", 10) results in "It is 10 degrees."
 - Use %f to include a floating point value in the text, for example: FORMAT("It is %f degrees.", 10.12345) results in "It is 10.12345 degrees."
 - %f has an optional parameter for decimal precision, use %.xd as format parameter where x is the number of decimals. Pay attention to the "." After the % sign. For example: FORMAT("It is %.2f degrees.", 10.12345) results in "It is 10.12 degrees." - use %% to display a % symbol, for example: FORMAT("The window is %d%% closed.", 10) results in "The window is 10% closed." |
| **Text functions** | SUBSTR(text, startindex) or SUBSTR(text, startindex, length) | Can subtract a portion of another text. Note that the start index starts at 0. You can use this function with or without length. Without the length parameter, the text part will be used till the end of the text. For example: SUBSTR("abcdef", 3) results in "def" For example: SUBSTR("abcdef", 3, 1) results in "d" |
| **Text functions** | STRLEN(text) | This function returns the length of the text given, for example STRLEN("abcdef") results in 6. |
Busch-ControlTouch® KNX - Scripts
Control structures
IF and else

- IF statements and WHILE loops can be used to execute specific actions only if a condition is met. The condition can be defined using all arithmetic operators as explained above.
- The action that is written on the second line is only executed when the calculation behind the IF statement is TRUE (greater than 0). The action will be skipped if the result is FALSE (0 or below).
- If an IF statement is used, an ELSE statement can be added as well.
- The ELSE statement should always be on a separate line, directly below the command to execute when the condition of the IF statement is met.

```
25 IF $MOD3 = 1
26 SET BIT(21/Status Bit 3) TO 1
27 ELSE
28 SET BIT(21/Status Bit 3) TO 0
```
While

- Apart from the IF statement, a WHILE statement can also be used. The difference between an IF statement and a WHILE statement is that an IF statement is performed once and a WHILE statement will be repeated until the condition is no longer met.
- The example above will increase the variable COUNT until it is 10 or greater. How to execute multiple commands will be explained in the next section.

```plaintext
1 $COUNT = 0
2 WHILE $COUNT < 10
3 $COUNT = $COUNT + 1
4
```
Begin and end

- If more than one command needs to be executed after an IF, WHILE or ELSE statement, BEGIN and END statements can be used.

```plaintext
1 $X = 0
2 WHILE $X < 11
3 BEGIN
4  $Y = $X^10
5  SET BYTE(7/dimmer 1) TO 50
6  $X = $X+1
7 END
```
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Examples – Wake up

– Dim the light in the morning in 4 steps to 100%

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
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<tbody>
<tr>
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</tbody>
</table>

1. `FADE BYTE(7/Dimmer 1) TO 10 IN 2 MIN`
2. `FADE BYTE(7/Dimmer 1) TO 30 IN 3 MIN`
3. `FADE BYTE(7/Dimmer 1) TO 50 IN 2 MIN`
4. `FADE BYTE(7/Dimmer 1) TO 100 IN 3 MIN`
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Examples – UPnP

- uPnP audio support
- Devices, which are supporting UPNP (Universal Plug and Play) can be controlled via scripts
- Scripts can be used to create scenes or to be used in combination with scenes

```
1. EXECUTE ON UPNPDEVICE(UPNPURLID:RINCON_7828CAF3045201400_MR5/wohnzimmer - Sonos One Media Renderer) PLAY
2. EXECUTE ON UPNPDEVICE(UPNPURLID:RINCON_7828CA342B3E01400_MR5/küche - Sonos Play:1 Media Renderer) PLAY
3. EXECUTE ON UPNPDEVICE(UPNPURLID:RINCON_7828CAF3045201400_MR5/wohnzimmer - Sonos One Media Renderer) VOLUME TO 20
4. EXECUTE ON UPNPDEVICE(UPNPURLID:RINCON_7828CA342B3E01400_MR5/küche - Sonos Play:1 Media Renderer) VOLUME TO 20
5. FADE BYTE(7/dimmer 1) TO 20 IN 30 SEC
6. SET BIT(2/Light 1) TO 0
7. SET BIT(3/Light 2) TO 0
8. SET BIT(4/Light 3) TO 0
9. SET BIT(5/Light 4) TO 1
```
Examples – Decoding status information

<table>
<thead>
<tr>
<th>139</th>
<th>Status Information</th>
<th>Channel A: Shutter</th>
<th>monDPT</th>
<th>1 byte</th>
</tr>
</thead>
<tbody>
<tr>
<td>This group object can be used to output status information about the output's operating state. The sending behavior can be defined in the \texttt{Send value of group object} parameter. If the &quot;On request&quot; or &quot;After change or on request&quot; the status is sent each time abit value is changed.</td>
<td></td>
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</tr>
<tr>
<td>Bit 0: Manual operation Telegram value: 1 = active 0 = inactive Bit 1: Disable Telegram value: 1 = active 0 = inactive Bit 2: Forced operation Telegram value: 1 = active 0 = inactive Bit 3: Front alarm Telegram value: 1 = active 0 = inactive Bit 4: Rain alarm Telegram value: 1 = active 0 = inactive Bit 5: Wind alarm Telegram value: 1 = active 0 = inactive Bit 6: Automatic sun protection Telegram value: 1 = active 0 = inactive Bit 7: i-bus® Tool Telegram value: 1 = active 0 = inactive 0 = inactive</td>
<td></td>
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</tr>
</tbody>
</table>

More information → Code table for 8-bit status byte (Shutter), Page 248.
### Examples – Decoding status information

<table>
<thead>
<tr>
<th>Fault messages</th>
<th>Error code: 00100110</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual operation</td>
<td>0</td>
</tr>
<tr>
<td>Disable</td>
<td>1</td>
</tr>
<tr>
<td>Forced Operation</td>
<td>1</td>
</tr>
<tr>
<td>Frost Alarm</td>
<td>0</td>
</tr>
<tr>
<td>Rain Alarm</td>
<td>0</td>
</tr>
<tr>
<td>Wind Alarm</td>
<td>1</td>
</tr>
<tr>
<td>Automatic sun protection</td>
<td>0</td>
</tr>
<tr>
<td>i-bus® Tool</td>
<td>0</td>
</tr>
</tbody>
</table>
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Examples – Decoding status information

![Diagram showing trigger and action settings for decoding status information.](image-url)
Examples – Decoding status information

Example:
Actuator sends 1 byte status information: „38“
Or „$26“

\[
\begin{align*}
38 & : 2 = 19 \text{ Rest: 0} \\
19 & : 2 = 9 \text{ Rest: 1} \\
9 & : 2 = 4 \text{ Rest: 1} \\
4 & : 2 = 2 \text{ Rest: 0} \\
2 & : 2 = 1 \text{ Rest: 0} \\
1 & : 2 = 0 \text{ Rest: 1}
\end{align*}
\]
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Examples – Decoding status information

```plaintext
1 # byte in bit
2 $BYTE0BITS = $BYTE(31/Faultmessage)+1
3 #1 bit calculation
4 $MOD = $BYTE0BITS% 2
5 IF $MOD = 1
6 SET BIT(19/Status Bit 1) TO 1
7 ELSE
8 SET BIT(19/Status Bit 1) TO 0
9 $BYTE0BITS2 = FLOOR($BYTE0BITS/ 2)
10 #2 bit finished
11 #2 bit2 finished
12 #3 bit3 finished
13 #4 bit4 finished
14 $MOD2 = $BYTE0BITS2% 2
15 IF $MOD2 = 1
16 SET BIT(20/Status Bit 2) TO 1
17 ELSE
18 SET BIT(20/Status Bit 2) TO 0
19 $BYTE0BITS3 = FLOOR($BYTE0BITS2/ 2)
20 #3 bit3 finished
21 #4 bit4 finished
22 #5 bit5 finished
```

Fault messages

- Manual operation: 0
- Disable: 1
- Forced Operation: 1
- Frost Alarm: 0
- Rain Alarm: 0
- Wind Alarm: 0
- Automatic sun protection: 0
- I-bus® Tool: 0
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Examples – Decoding status information

```plaintext
$BIT1 = BIT(19,statusBIT1)
$BIT2 = BIT(20,statusBIT2)
$BIT3 = BIT(21,statusBIT3)
$BIT4 = BIT(22,statusBIT4)
$BIT5 = BIT(23,statusBIT5)
$BIT6 = BIT(24,statusBIT6)
$BIT7 = BIT(25,statusBIT7)
$BIT8 = BIT(26,statusBIT8)

$BITSTRING = CONCAT($BIT8, $BIT7, $BIT6, $BIT5, $BIT4, $BIT3, $BIT2, $BIT1)

2020-06-19 09:44:41 - Script [Byte to bit] setting variable ($BIT1) to 1.000000
2020-06-19 09:44:41 - Script [Byte to bit] setting variable ($BIT1) to "1"

Fault messages
SAHS - Blind error code
Error code: 00100110

ControlTouch 09:44
Status information SAH/S - 19-06-2020, 09:44:43, 11..
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→ Training Calendar
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