



**digitalSTROM**

**System Architecture**  
**4<sup>th</sup> Developer Day**

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# Architecture Topics - Overview

- AKM Terminal Block & States
- Device Object & Terminology
- Identification Numbers
- Light & Color
- Heating

# AKM Terminal Block and States

## Input Types

- Motion detector
- Wind monitor
- Rain monitor
- Smoke detector
- Twilight switch
- Sunlight switch
- Presence detector
- Window and door contacts
- Frost monitor
- Room thermostat



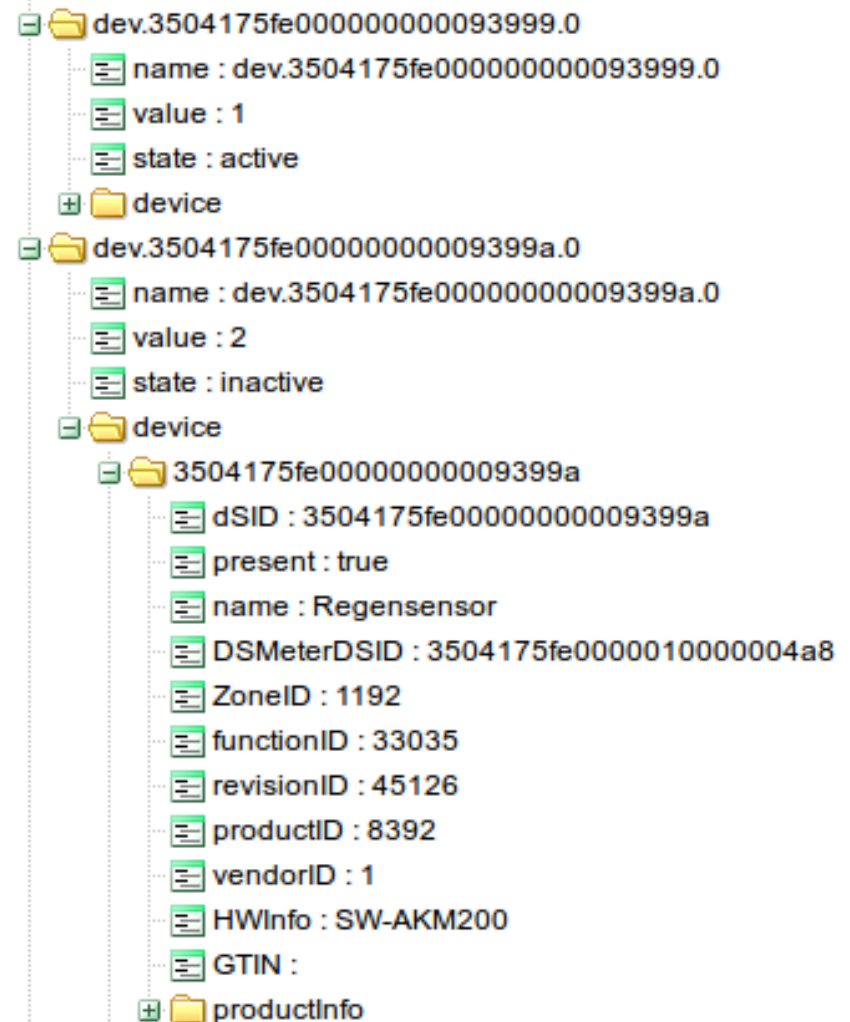
Eine SW-AKM220 mit Bewegungsmelder



Rauchmelder PROTEKTOR K 230V

# AKM Terminal Block and States

- Binary input:  
state active or inactive
- digitalStrom Server:  
reflects Device Input State
- Designed for automation –  
not manual interaction
  - Synchronization
  - Defined input types
  - Wind, rain, smoke, motion



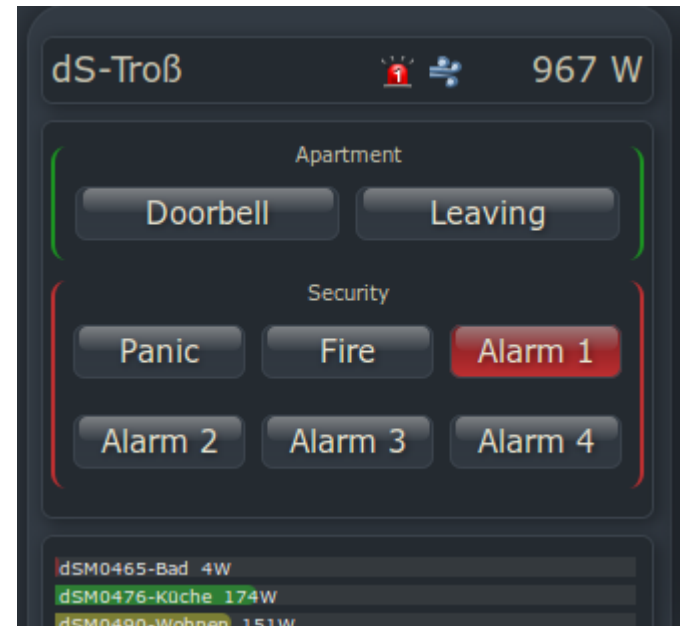
# Alarm States

System standard actions for binary inputs events from:

- Wind monitor
- Rain monitor
- Smoke detector: Fire

Additional states provided for:

- Presence
- Panic
- Alarm
- Hail



# Alarm States

- Category of actions: manual, timer, algorithm
- Fire Alarm -> !(timer | algorithm) actions
- Wind Alarm -> !(timer | algorithm) actions for group shadow
- Blocking of command execution in certain states, Decision about command execution within dSS
- Future - devices decide on their own ...

# Alarm States - Priority Levels

Level	Description	Example
1	Direct user interaction	Push button tip, smart phone activity
2	Protection of life and limb	Fire alarm, Panic scenario
3	Protection of material and equipment	Wind-, rain or hail alarms
4	Privacy	Visual Cover, user closed blinds explicitly
5	Convenience	Timer controlled action
6	Energy efficiency	Algorithms for heating control

# Device - Terminology

- Native Device

- Terminal Block



- dS-Device = Native Device + Terminal Block

- Integrated logic on dS-Devices:  
Input, Output, Sensor Functions = Submodule



# Device - Logic

- Native Device  
**physical properties**
- Terminal Block   
**integrated control and processing logic**
- dS-Device = Native Device + Terminal Block  
**standard behavior and orchestration**
- Integrated logic on dS-Devices:  
Input, Output, Sensor Functions = Sub Module  
**logical binding to applications**



# Identification Numbers

- Serial Number
- Standards:
  - GS1: GTIN (formerly EAN)
  - Ethernet IEEE OUI
  - RFC4122 Universally Unique Identifier (UUID)
- Product + Vendor -> GTIN
- Serial Number + GTIN -> SGTIN



# Native and dS-Device - Numbers

## Articles:

- Native Devices have a GTIN
- Terminal Blocks have a GTIN
- dS-Devices support the Native Devices GTIN

## Applications:

- Device recognition
- New product services
- Support

## Device Tagging:

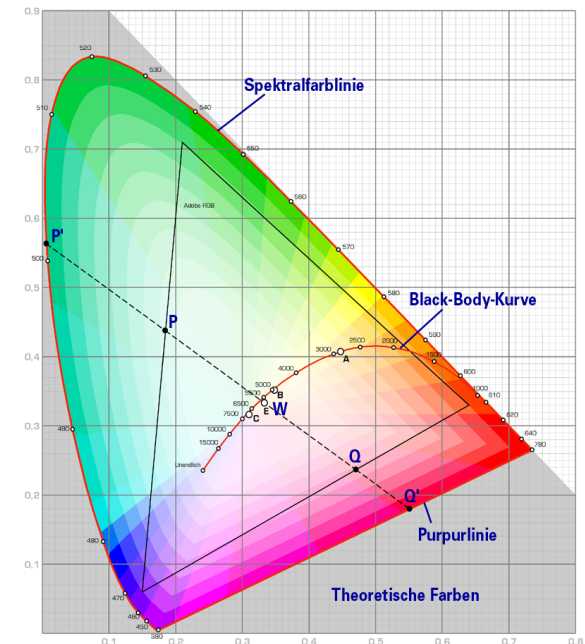
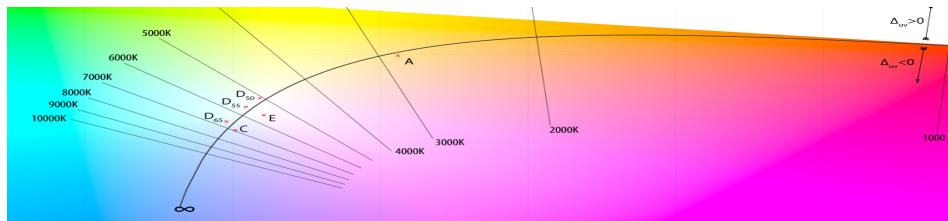
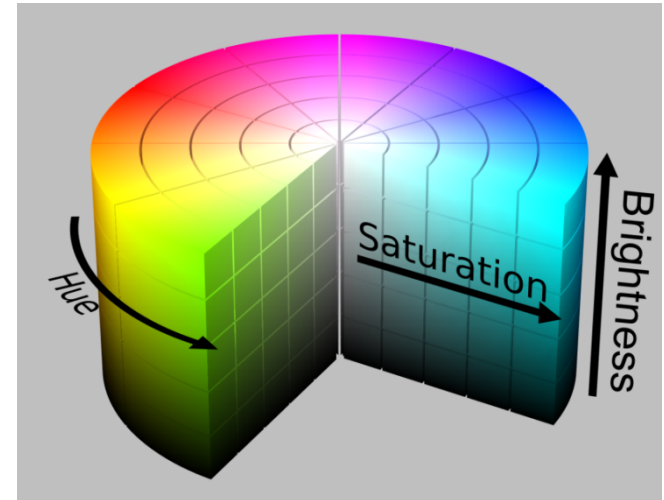
Meta data from Production, Logistics, Installation, Usage, ...



# Light & Color

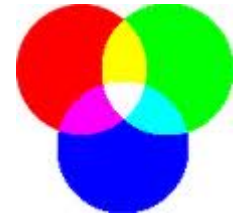
## Color spaces

- HSB:  
Hue / Saturation / Brightness
- CIE 1931 XYZ color space
- Color Temperature



# Light & Color

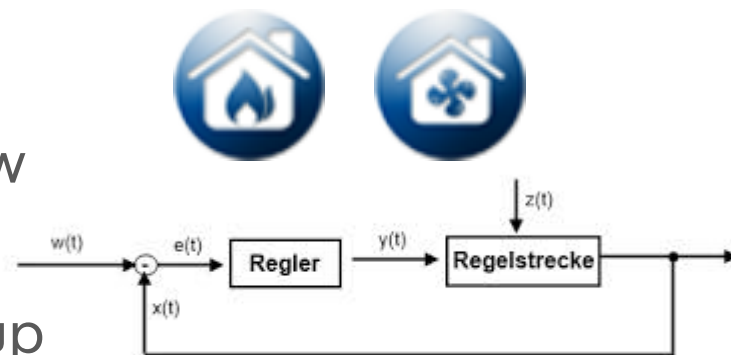
- digitalStrom supports for colored light
- New dimensions for output functions - multi dimension scene tables
- Standard behavior will be extended
- New functions: color push button, dimming of hue and color temperature, selection of absolute color value



# Heating



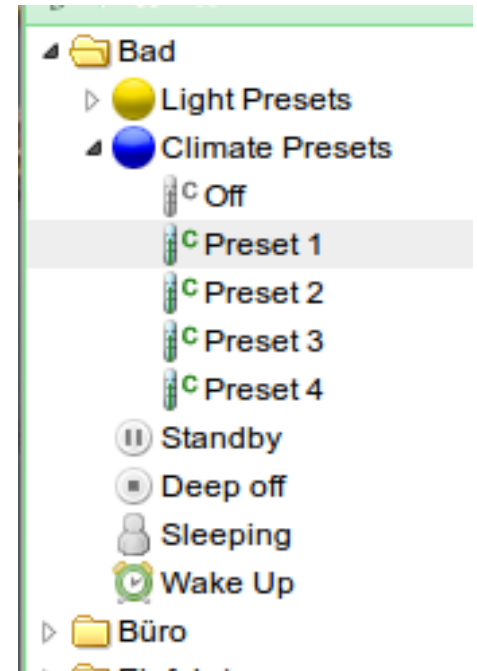
- Heating ....
- New dS system functions to support heating
- Two operation modes:  
group-scene based vs. set-point controller
- Climate groups:  
heating, cooling, ventilation, window
- Plus: room temperature control group



# Heating

## Room Groups

- “Classical” orchestration
- No set point support
- Control logic manually or in room thermostat



## Control Group

- control algorithm for room temperature
- External controller - interface to external service

# Heating

## Device Types?

- dS Terminal Blocks
- EnOcean
- IP Devices



## Sensors?

- Room temperature
- Outdoor temperature
- Humidity
- More: Brightness, ...





# Questions



**Ready.**

# Integration & Virtual Devices

- dS Power Line, Ethernet/Wifi TCP/IP, Radio EnOcean, ...
- One system - different network technologies
- Example: products measuring room temperature
  - Based on dS Tiny Module
  - NetAtmo Wifi Weatherstation
  - EnOcean Sensor
- One API for all
- Common data model

# Integration & Virtual Devices

Standard compliance?

Yes, virtual devices have to fulfill the dS Standard Behavior

Implementation:

- Legacy: dSS simulation ...
- Today: Virtual dSM (vdSM) & Virtual Device Connector(vDC)

Examples:

enOcean, DALI

Phillips Hue, NetAtmo Weatherstation, Logitech Squeezebox