vDC API - vdSD properties

Contents

Basics

- This document is based on the "vdSM vDC API" specification. Please refer to the corresponding document.
- This document specifies the properties specific to virtual devices (vdSD) managed by a virtual device controller (vDC).

Virtual digitalSTROM device (vdSD) properties

- The following table applies to entities which have a value of "vdSD" for the "type" property.
- All vdSDs must also support the basic set of properties as described under "Common properties" in the "vdSM vDC API" document:
  - dSID
  - type (value is always "vdSD" for virtual devices"
  - model
  - hardwareVersion
  - hardwareGUID
  - oemGuid
  - name

Properties related to the entire device

property name	acc	Type/range	description	R105 mapping
primaryGroup	r	integer, dS group number 1..8	basic group (color) of the device	Function ID Bits 15...12
isMember[groupNo]	r/w	boolean	array of boolean flags, array index represents dS group number	Bank 1 - 0x10..0x11
progMode	r/w	boolean	enables local programming mode (for those devices that have it)	

property name	acc	Type/range	description	R105 mapping
numDevicesInHW	r	optional integer	Number of separate vdSDs that represent the same hardware device (which MUST have the same *hardwareGUID*) Present only if a unambiguous statement can be made about the number of devices per hardware. Devices that are *usually* grouped in one chassis, but can be taken apart should not report this property.	
deviceIndexInHW	r	optional integer	only if *numDevicesInHW* exists, this enumerates the devices within the same hardware	

Button Inputs

property name	acc	Type/range	description	R105 mapping
buttonInputDescriptions[]	r	object	array of object, representing capabilities of button inputs	Bank 1 - 0x40..0x57
name	r	string	human readable name/ number for the input (e.g. matching labels for hardware connectors)	
supportsLocalKeyMode	r	boolean	can be local button	hardware
buttonID	r	integer 0..n (optional)	ID of physical button. No ID means no fixed assignment to a button. All elements of a multi-function hardware button must have the same buttonID.	hardware
buttonType	r	integer enum (inputs with buttons supported only)	Type of physical button 0: undefined 1: single pushbutton 2: 2-way pushbutton 3: 4-way navigation button 4: 4-way navigation with center button 5: 8-way navigation with center button 6: on-off switch	hardware

property name	acc	Type/range	description	R105 mapping
buttonElementID	r	integer (inputs with buttons supported only)	Element of multi-contact button: 0: center 1: down 2: up 3: left 4: right 5: upper left 6: lower left 7: upper right 8: lower right Note: For undefined *buttonType*, *buttonElement* just enumerates the elements (0..numElements-1)	hardware
buttonInputSettings[]	r/w	object	array of objects, representing configuration settings of buttons and binary inputs	Bank 3 - 0x01 Bank 1 - 0x40..0x57
group	r/w	integer	dS group number 1..8	Bank 3 - 0x01 Bank 1 - 0x40..0x57
function	r/w	integer 0..15	see LTNUM descriptions (0: device, 5: room, ...)	LTNUM
mode	r/w	integer	255: inactive 0: standard 2: presence 5..8 : button1..4 down 9..12 : button1..4 up	LTMODE
setsLocalPriority	r/w	boolean	button should set local priority	
callsPresent	r/w	boolean	button should call present (if system state is absent)	
buttonInputStates[]	r	object	representation of the current state of the button	Bank 64 - 0x01
value	r	integer enum	0=inactive, 1=active, 2=undefined	

property name	acc	Type/range	description	R105 mapping
clickType	r	integer enum	Most recent click state of the button: 0: tip_1x 1: tip_2x 2: tip_3x 3: tip_4x 4: hold_start 5: hold_repeat 6: hold_end 7: click_1x 8: click_2x 9: click_3x 10: short_long 11: local_off 12: local_on 13: short_short_long 14: local_stop 255: idle (no recent click)	
age	r	double	age of the state shown in the *value* and *clickType* fields in seconds.	
error	r	integer enum	0: ok 1: open circuit 2: short circuit 4: bus connection problem 5: low battery in device 6: other device error	

Binary Inputs

property name	acc	Type/range	description	R105 mapping
binaryInputDescriptions[]	r	object	array of object, representing capabilities of binary inputs	Bank 1 - 0x40..0x57
name	r	string	human readable name/ number for the input (e.g. matching labels for hardware connectors)	
inputType	r	integer (inputs with binary functions supported only)	0: poll only 1: detects changes	
hardwareSensorFunction	r	integer enum	hardwired function of this input if it is not freely configurable. See sensorFunction in binaryInputSettings[] below for possible values. 0 means generic input with no hardware-defined functionality.	

property name	acc	Type/range	description	R105 mapping
updateInterval	r	double	how fast the physical value is tracked, in seconds	
binaryInputSettings[]	r/w	object	array of objects, representing configuration settings of buttons and binary inputs	Bank 3 - 0x01 Bank 1 - 0x40..0x57
group	r/w	integer	dS group number 1..8	Bank 3 - 0x01 Bank 1 - 0x40..0x57
binaryMode	r/w	integer enum	0 disabled (no push) 0x10 standard 0x11 inverted 0x12 rising edge on 0x13 falling edge on 0x14 rising edge off 0x15 falling edge off 0x16 rising edge 0x17 falling edge	
sensorFunction	r/w	integer enum	0x00 App Mode (no system function) 0x01 Presence (Präsenz) 0x02 Light (Helligkeit) – aktuell noch nicht in Verwendung 0x03 Presence in darkness (Präsenz bei Dunkelheit) – aktuell noch nicht in Verwendung 0x04 Twilight (Dämmerung) 0x05 Motion detector (Bewegung) 0x06 Motion in darkness (Bewegung bei Dunkelheit) – aktuell noch nicht in Verwendung 0x07 Smoke detector (Rauchmelder) 0x08 Wind monitor (Windwächter) 0x09 Rain monitor (Regenwächter) 0x0a Solar radiation (Sonneneinstrahlung) 0x0b Thermostat (Thermostat)	
binaryInputStates[]	r	object	representation of the current state of the inputs	Bank 64 - 0x01
value	r	integer enum	0=inactive, 1=active, 2=undefined	
age	r	double	age of the state shown in the *value* field in seconds.	

property name	acc	Type/range	description	R105 mapping
error	r	integer enum	0: ok 1: open circuit 2: short circuit 4: bus connection problem 5: low battery in device 6: other device error	

Outputs

property name	acc	Type/range	description	R105 mapping
outputDescriptions[]	r	object	array of objects, representing hardware capabilities of output	
name	r	string	human readable name/ number for the output (e.g. matching labels for hardware connectors)	
function	r	integer enum	0: on/off only 1: dimmer 2: positional	hardware
variableRamp	r	boolean	supports variable ramps	Function-ID Bit 5
maxPower	r	integer	max output power in Watts. If absent, power capability is undefined	hardware
minDim	r	integer	minmum brightness that hardware supports (for dimming outputs)	hardware
outputSettings[]	r/w	object	array of objects, representing operation mode of output	
group	r/w	integer	dS group number 1..8	Bank 3 - 0x01 Bank 1 - 0x40..0x57
mode	r/w	integer enum	0: disabled, inactive 1: binary 2: gradual	
pushChanges	r/w	boolean	if set, locally generated changes in the output value will be pushed	
dimTimeUp	r/w	integer	dim up time in ms	Bank 3 - 0x06
dimTimeDown	r/w	integer	dim down time in ms	Bank 3 - 0x07
dimTimeUpAlt1	r/w	integer	alternate 1 dim up time in ms	Bank 3 - 0x08

property name	acc	Type/range	description	R105 mapping
dimTimeDownAlt1	r/w	integer	alternate 1 dim down time in ms	Bank 3 - 0x09
dimTimeUpAlt2	r/w	integer	alternate 2 dim up time in ms	Bank 3 - 0x10
dimTimeDownAlt2	r/w	integer	alternate 2 dim down time in ms	Bank 3 - 0x11
outputStates[]	r/w	object	array of output states	Bank 64 - 0x00
value	r/w	integer	current output value (brightness, blind position, on/off)	
age	r	double	age of the state shown in the *value* field in seconds. This indicates when the value was last **applied** to the actual device hardware, or when an actual output status was last received from the device. *age* is NULL when a new value was set, but not yet applied to the device	
error	r	integer enum	0: ok 1: open circuit / lamp broken 2: short circuit 3: overload 4: bus connection problem 5: low battery in device 6: other device error	

Sensors

property name	acc	Type/range	description	R105 mapping
sensorDescriptions[]	r	object	description of sensor capabilities	Bank 1 - 0x20..0x3f
name	r	string	human readable name/number for the sensor	

property name	acc	Type/range	description	R105 mapping
sensorType	r	integer enum	0 : none 1 : temperature in °C 2 : relative humitity in % 3 : illumination in lux 4 : supply voltage level in V 5 : CO concentration in ppm 6 : Radon activity in Bq/m3 7 : gas type sensor 8 : particles <10μm in µg/m3 9 : particles <2.5μm in µg/m3 10 : particles <1μm in µg/m3 11 : room operating panel set point, 0..1 12 : fan speed, 0..1 (0=off, <0=auto) 13 : wind speed in m/s	
min	r	double	min value	
max	r	double	max value	
resolution	r	double	resolution (size of LSB of actual HW sensor)	
updateInterval	r	double	how fast the physical value is tracked, in seconds	
sensorSettings[]	r/w	object	sensor configuration	
group	r/w	integer	dS group number 1..8	
minPushInterval	r/w	double	minimum interval between pushes of changed state in seconds	
Note: trigger related fields are draft only - details tbd.				
triggerLevel	r/w	double	trigger level for sensor action	ET[] Byte 1/2
triggerPushDelta	r/w	double	minimum change in sensor value (in sensor units) required to trigger a state push or sensor action	ET[] Byte2/3
triggerCondition	r/w	integer enum	0: equal 1: sensor below trigger 2: sensor above trigger	
triggerScene	r/w	integer (optional if trigger should call scene)	scene number to call on action	ET[] Byte 5, Byte0.Bit0/1
triggerButtonID	r/w	integer (optional if trigger should simulate button press)	button ID to use for simulated button action	ET[] Byte 5, Byte0.Bit0/1

property name	acc	Type/range	description	R105 mapping
triggerButtonClick	r/w	integer (only when triggerButtonID is set)	clickType to use for simulated button action	ET[] Byte 5, Byte0.Bit0/1
sensorStates[]	r	object	sensor states	Bank 1 - 0x40 ff Bank 6
value	r	double	current sensor value in the unit specified in SensorCapabilities.unit	
age	r	double	age of the state shown in the *value* field in seconds.	
error	r	integer enum	0: ok 1: open circuit 2: short circuit 4: bus connection problem 5: low battery in device 6: other device error	

Scenes

property name	acc	Type/range	description	R105 mapping
scenes[]	r/w	object	array of saved device states that can be recalled via callScene. Index is scene number	Bank 128ff
value	r/w	optional integer (or NULL when writing to actively delete the value from the scene)	primary output value for this scene (usually brightness). If value is not present, calling scene does not affect corresponding output value (Note that scene-level *dontCare* flag can be used to prevent applying any scene values)	SCE, SCE_LO, SCECON
valueN	r/w	optional integer (or NULL when writing to actively delete the value from the scene)	with N=1..x - secondary values, like blind angle etc., depending on device types. If value is not present, calling scene does not affect corresponding output value (Note that scene-level *dontCare* flag can be used to prevent applying any scene values)	Bank130, ScnAngle

property name	acc	Type/range	description	R105 mapping
dontCare	r/w	boolean	calling this scene does not apply the stored output values	SCECON
ignoreLocalPriority	r/w	boolean	calling this scene overrides local priority	SCECON
other_scene_value			scenes might contain additional device specific scene values not currently used by the dS system	

digitalSTROM 1.0 mapping compatibility

An important design goal for the vDC API and the vdSD property set was to avoid carrying over dS 1.0 specific limitations.
On the other hand, the vDC API was designed to support capabilities current dSS 1.x architecture can't support yet, but are likely to be implemented in future dS versions.

Still, the vDC + vdSM needs to be compatible with existing dSS 1.x installations.

To achieve this, vDC devices (vdSDs) that provide functionality similar or equal to existing hardware digitalSTROM devices (dSDs), must have **sensible default settings that make them mappable into existing dSS 1.x installations**.

This chapter lists the conventions that must be followed for certain device types to make them mappable into dSS 1.x environments.

2-way buttons

2-way buttons (rockers) like present in many enOcean devices must conform to the following default behaviour:

1. the vdSD must have two button inputs (represented by 2 array elements in the *buttonInputDescriptions/Settings/States* property arrays)
2. the buttonInput with index = 0 must represent the "down" button
3. the buttonInput with index = 1 must represent the "up" button
4. buttonInputSettings[0].mode must be 6 (down button paired with second input)
5. buttonInputSettings[1].mode must be 9 (up button paired with first input)
6. in the dSID space, the dSID following the dSID of the device (device's dSID + 1) must be guaranteed unused. This means that the *idBlockSize* property must be 2 to document that the next dSID is guaranteed unused. This *allows* the vdSM to virtually split the device into two separate dSIDs to mimic for example a SW-TKM210 towards the dSS 1.x environment. The vdSM *may* also choose to represent the device as a single dSID with a inseparable 2-way button instead, like a GR-TKM210.

Multiple vdSDs in a single hardware device

Some hardware devices contain more than one instance of a certain functional unit. Usually, these are represented as a separate vdSD each, to allow maximum flexibility in the way the functional units can be used.
For example, a dual 2-way button enOcean device will be represented as 2 entirely separate vdSDs, because despite the physical proximity, each button might conrol a different zone, group or function. By default, such a device will be represented as 2 separate SW-TKM210 (dual input) devices. However, the vdSM might want to represent it as a single SW-TKM200 (quad input) device. To allow the vdSM to find out which and how many vdSDs are in the same hardware device, the vdSD *should* expose this information in the *numDevicesInHW* and *deviceIndexInHW* properties as follows:

1. *numDevicesInHW* contains the number of vdSDs in the same hardware device
2. *hardwareGUID* identifies the hardware device of which the vdSD is part of

3. *deviceIndexInHW* contains an index, 0..*numDevicesInHW-1* that enumerates the vdSDs in the same hardware device
4. This association of vdSDs to a containing hardware device must only be made when the number of grouped vdSDs and enumeration is unambiguous and permanent. So just 3 modules that usually ship mounted on a common frame, but can be easily separated and used independently should not have *numDevicesInHW* and *deviceIndexInHW* properties.