KNX Push Buttons
1 gang MD,
2 gang MD,
3 gang MD,
4 gang MD

Reference Manual

1 GANG 2M	WRKT6121-XXX
2 GANG 2M	WRKT6122-XXX
3 GANG 3M	WRKT6133-XXX
4 GANG 2M	WRKT6124-XXX
4 GANG 4M	WRKT6144-XXX

V 1.0

Contents

1 Functional characteristics

1 gang MD, 2 gang MD, 3 gang MD and 4 gang MD are KNX switches with up to 4 rockers and 1 LED per rocker.

They can be used to send commands to actuators, to dim or switch lights on/off, to move blinds up-down or to save/recall light scenes.

The following functions can be configured:

- Switching
- Dimmer control
- Blinds control
- Scene control
- Single button operations

Each LED can be controlled via an objet, display the actual status or remain permanently on or off
The telegram type (switching, priority, value, temperature value etc.) can be specified individually.

2 Technical data

General	
Power supply	Bus voltage.
Permitted operating temperature	-5 °C... + 45°C
Current draw from bus voltage	Max 10 mA
Bus connection	Bus terminal
Type of protection	IP 20 to EN 60529
Degree of pollution	2 to IEC 60664-1
Protection class	Class III to IEC 61140
Overvoltage class	Class III to IEC 60664-1

3 Application programs

3.1 Selection in the product database

Manufacturer	Panasonic
Product group	Push Buttons
Product type	Modular Series
Program names	1 Gang MD / 2 Gang MD / 3 Gang MD / 4 Gang MD
Program version	1.0 / 1.0 / 1.0 / 1.0

Table 1

Number of communication objects:	Max. 24
Number of group addresses:	60
Number of assignments:	60

3.2 Communication objects

Each channel-related object can assume various functions depending on its configuration.

Table 2: Object Overview

No	Object name	Function	Object size	Datapoint type	Flags			
					C	R	W	T
0	*Rocker 1, 1st object*	*Switch ON/OFF*	1 Bit	1.001 DPT_Switch	✓	✓	✓	✓
	Rocker 1, 1st object	*Priority*	2 Bits	2.001 DPT_Switch_Control	✓	✓		✓
	Rocker 1, 1st object	*Percentage*	1 Byte	5.001 DPT_Scaling	✓	✓		✓
	Rocker 1, 1st object	*HVAC operation mode*	1 Byte	20.102 DPT_HVACMode	✓	✓		✓
	Rocker 1, 1st object	*Send value (0..255)*	1 Byte	5.010 DPT_Value_1_Ucount	✓	✓		✓
	Rocker 1, 1st object	*Send temperature value*	2 Bytes	9.001 DPT_Value_Temp	✓	✓		✓
	Rocker 1, dimming	*Switch ON/OFF*	1 Bit	1.001 DPT_Switch	✓	✓	✓	✓
	Rocker 1, blinds	*Step / Stop*	1 Bit	1.007 DPT_Step	✓	✓		✓
	Rocker 1, scene number	*Recall / Save light scene*	1 Byte	18.001 DPT_SceneControl	✓	✓		✓
	Rocker 1, upper key toggle	*Switch ON/OFF*	1 Bit	1.001 DPT_Switch	✓	✓	✓	✓
	Rocker 1, upper key dimming	*Switch ON/OFF*	1 Bit	1.001 DPT_Switch	✓	✓	✓	✓
	Rocker 1, upper key blinds	*Step / Stop*	1 Bit	1.007 DPT_Step	✓	✓		✓
	Rocker 1, upper key sequencer	*1 byte value*	1 Byte	5.010 DPT_Value_1_Ucount	✓	✓		✓
1	*Rocker 1, 2nd object*	*Switch ON/OFF*	1 Bit	1.001 DPT_Switch	✓	✓	✓	✓
	Rocker 1, 2nd object	*Priority*	2 Bits	2.001 DPT_Switch_Control	✓	✓		✓
	Rocker 1, 2nd object	*Percentage*	1 Byte	5.001 DPT_Scaling	✓	✓		✓
	Rocker 1, 2nd object	*HVAC operation mode*	1 Byte	20.102 DPT_HVACMode	✓	✓		✓
	Rocker 1, 2nd object	*Send value (0..255)*	1 Byte	5.010 DPT_Value_1_Ucount	✓	✓		✓
	Rocker 1, 2nd object	*Send temperature value*	2 Bytes	9.001 DPT_Value_Temp	✓	✓		✓
	Rocker 1, dimming	*Lighter / Darker*	4 Bits	3.007 DPT_Control_Dimming	✓	✓		✓
	Rocker 1, blinds	*Up / Down*	1 Bit	1.008 DPT_UpDown	✓	✓	✓	✓
	Rocker 1, scene last operation	*1=Upper side, 0=Lower side*	1 Bit	1.002 DPT_Bool	✓	✓		✓
	Rocker 1, upper key dimming	*Lighter / Darker*	4 Bits	3.007 DPT_Control_Dimming	✓	✓		✓
	Rocker 1, upper key blinds	*Up / Down*	1 Bit	1.008 DPT_UpDown	✓	✓	✓	✓
	Rocker 1, upper key sequencer	*1 bit*	1 Bit	1.002 DPT_Bool	✓	✓		✓
2	*Rocker 1, led*	*Drive Led*	1 Bit	1.002 DPT_Bool	✓	✓	✓	
3	*Rocker 1, lower key toggle*	*Switch ON/OFF*	1 Bit	1.001 DPT_Switch	✓	✓	✓	✓
	Rocker 1, lower key dimming	*Switch ON/OFF*	1 Bit	1.001 DPT_Switch	✓	✓	✓	✓
	Rocker 1, lower key blinds	*Step / Stop*	1 Bit	1.007 DPT_Step	✓	✓		✓
4	*Rocker 1, lower key dimming*	*Lighter / Darker*	4 Bits	3.007 DPT_Control_Dimming	✓	✓		✓
	Rocker 1, lower key blinds	*Up / Down*	1 Bit	1.008 DPT_UpDown	✓	✓	✓	✓
5	Not Used							
					C	R	W	T

For Objects 6 to 23 : See below.

Table 3: Overview of object numbers

Device / Object name	TSA 8x4			
	TSA 6x3			
	TSA 4x2			
	TSA 2x1			
	Rocker 1	Rocker 2	Rocker 3	Rocker 4
-Rocker x, 1st object *-Rocker x, dimming* *-Rocker x, blinds* *-Rocker x, scene number* *-Rocker x, upper key toggle* *-Rocker x, upper key dimming* *-Rocker x, upper key blinds* *-Rocker x, upper key sequencer*	0	6	12	18
-Rocker x, 2nd object *-Rocker x, dimming* *-Rocker x, blinds* *-Rocker x, scene last operation* *-Rocker x, upper key dimming* *-Rocker x, upper key blinds* *-Rocker x, upper key sequencer*	1	7	13	19
-Rocker 1, led	2	8	14	20
-Rocker x, lower key toggle *-Rocker x, lower key dimming* *-Rocker x, lower key blinds*	3	9	15	21
-Rocker x, lower key dimming *-Rocker x, lower key blinds*	4	10	16	22
Not Used	5	11	17	23

3.2.1 Description of objects

Objects 0, 6, 12, 18

The function and the type of object are dependent on the *Function of rocker*, *Object type* and *Function upper key* parameters.

Table 4

Object Function	Description
Switch ON/OFF	Sends 1-bit switching commands in DPT_1.001 format
Priority	Sends priority telegrams in 2-bit format
Percentage	Sends a percentage value between 0 and 100 %
HVAC operation mode	Sends HVAC telegrams: 0 = auto 1 = comfort 2 = standby 3 = night 4 = frost/heat protection
Send value (0..255)	Sends a value between 0 and 255
Send temperature value	Sends a temperature value in 2-byte format
Step / Stop	Sends 1-bit "UP" or "DOWN" telegrams.
Recall / Save light scene	Recall / save light scene via 8-bit telegram
1 byte value	Sends a value between 0 and 255

Objects 1, 7, 13, 19

The function and the type of object are dependent on the *Function of rocker*, *Object type* and *Function lower key* parameters.

Table 5

Object Function	Description
Switch ON/OFF	Sends 1-bit switching commands in DPT_1.001 format
Priority	Sends priority telegrams in 2-bit format
Percentage	Sends a percentage value between 0 and 100 %
HVAC operation mode	Sends HVAC telegrams: 0 = auto 1 = comfort 2 = standby 3 = night 4 = frost/heat protection
Send value (0..255)	Sends a value between 0 and 255
Send temperature value	Sends a temperature value in 2-byte format
Lighter / Darker	4-bit dimming commands for the dimming actuator in DPT_3.007 format
Up / Down	1-bit motion commands for the blinds actuator in DPT_1.008 format
1=Upper side, *0=Lower side*	Sends a 1 bit telegram each time the switch is operated. This can be linked to the LED. Status: 1 when upper rocker side was struck. 0 when lower rocker side was struck.
1 bit	Sends a 1 bit boolean value.

Objects 2, 8, 14, 20

This object is only available when the parameter *Function of the LED* is set on *display object value* (parameter page *LED rocker X*).

Depending on the settings, the LED may be set ON and OFF either with a 1 or a 0 telegram.

Objects 3, 9, 15, 21

This object is only available when the parameter *Function of Rocker x* is set on *single button operations*.

Table 6

Object Function	Description
Switch ON/OFF	Sends 1-bit switching commands in DPT_1.001 format
Step / Stop	Sends 1-bit "UP" or "DOWN" telegrams.

Objects 4, 10, 16, 17

This object is only available when the parameter *Function of Rocker x* is set on *single button operations and Function lower key is set on dimming or blinds*.

Table 7

Object Function	Description
Lighter / Darker	4-bit dimming commands for the dimming actuator in DPT_3.007 format
Up / Down	1-bit motion commands for the blinds actuator in DPT_1.008 format

3.3 Parameters

3.3.1 Parameter pages

Table 8

Function	Description
General	Function of the rocker(s) and how to set the programming mode.
Rocker 1..4	Parameters for the relevant rocker
LED rocker 1..4	Behavior of the rocker LEDs

3.3.2 Parameter description

3.3.2.1 General

The first and most important parameter is *Function of Rocker X*.

Table 9

Designation	Values	Description
Function of rocker 1..4	***switching***	Rocker sends 6 possible telegram types: Switching (1-bit) Priority (2-bits) Percentage (1 byte) Hvac operation mode (1 byte) Value 0.. 255 (1-byte) Temperature value (2-bytes)
	dimming	To command a dimming actuator
	blinds	To command a blind actuator
	scenes	To program or recall scenes.
	single button operations	To use upper and lower button of the rocker separately.
Program mode operation		Activating of ETS programming mode:
	Only at bottom of device	only by pressing the programming button at the backside of the device.
	Display also via LED rocker 1	as described above, but while programming mode is active the LED of rocker 1 will be flashing.
	Operation and Display via rocker 1	Programming mode can be activated by entering a code through rocker 1. While programming mode is active, the LED of rocker 1 will be flashing.
Input sequence (within 5 sec.)	*upper-lower-lower- upper-upper-lower*	Code sequence for programming mode: Hit the upper and lower part of rocker 1 in this order to set or clear programming mode. **Important:** This sequence must be entered within a delay of max. 5 s.

3.3.2.2 Rocker 1..4, the "switching" function

The following functions are available:

Table 10

<table>
<tr><th>Designation</th><th>Values</th><th>Description</th></tr>
<tr><td>Object type for the 1st object of rocker</td><td>switching (1-bit)
priority (2-bit)
percentage (1 byte)
HVAC operation mode(1byte)

value 0.. 255 (1-byte)
temperature value (2-byte)</td><td>Channel sends:
Switching telegrams
Priority telegrams
A percentage value between 0 and 100 %
HVAC operation mode in DPT_20.102 format.
Any desired value between 0 and 255
A temperature value in DPT_xxx format</td></tr>
<tr><td rowspan="15">Upper key operation for 1st obj.</td><td colspan="2">For object type switching (1-bit)</td></tr>
<tr><td>No telegram
On
Off
Toggle</td><td>Ignore
Send ON telegram
Send OFF telegram
Reverse channel status</td></tr>
<tr><td colspan="2">For object type priority (2-bit)</td></tr>
<tr><td>Priority inactive (00)

Priority ON (11)

Priority OFF (10)</td><td>Table 6: Telegrams
<table>
<tr><th>Function</th><th>Value</th></tr>
<tr><td>Priority inactive
(no control)</td><td>0 (00_{bin})</td></tr>
<tr><td>Priority ON
(control: enable, on)</td><td>3 (11_{bin})</td></tr>
<tr><td>Priority OFF
(control: disable, off)</td><td>2 (10_{bin})</td></tr>
</table></td></tr>
<tr><td colspan="2">For object type percentage (1-byte)</td></tr>
<tr><td>0..100 %</td><td>Any value between 0 and 100 % can be sent.</td></tr>
<tr><td colspan="2">For object type HVAC operation mode (1-byte)</td></tr>
<tr><td>Auto

Comfort
Standby
Night mode
Frost/Heat protection</td><td>HVAC mode is set by the thermostat

Send a HVAC mode telegram to the thermostat.</td></tr>
<tr><td colspan="2">For object type Value 0..255(1-byte)</td></tr>
<tr><td>0..255</td><td>Any value between 0 and 255 can be sent.</td></tr>
<tr><td colspan="2">For object type temperature value (2 bytes)</td></tr>
<tr><td>0..40 °C</td><td>Any temperature between 0 and 40 °C can be sent.
For e.g. as set point value for a thermostat.</td></tr>
<tr><td>Lower key operation for 1st obj.</td><td colspan="2">See above, Upper key operation for 1st obj.</td></tr>
</table>

Continued:

Designation	Values	Description
Transmit on 1st object	***by pushing***	Telegram is sent: when button is pressed
	by releasing	when button is released
Required 2nd object	***No***	Second object is disabled
	Yes	Second object is enabled. This object has the same parameterization possibilities as 1st object of rocker. A second telegram with another value or function can be sent.

3.3.2.3 Rocker 1..4, the "dimming" function

Depending on the duration of the keystroke (short/ long key stroke), dimming or ON/OFF telegrams are sent to the dimmer. See below.

Table 11

Designation	Values	Description
Reaction at long/short keystroke	***Upper: Brighter/ON,***	Long stroke, upper rocker side = lighter
	Lower: Darker/OFF	Long stroke, lower rocker side = darker
		Short stroke, upper rocker side = ON
		Short stroke, lower rocker side = OFF
	Upper: Brighter /Toggle,	Long stroke, upper rocker side = lighter
	Lower: Darker/Toggle	Long stroke, lower rocker side = darker
		Short stroke, upper rocker side = toggle
		Short stroke, lower rocker side = toggle
	Upper: Darker/OFF,	Long stroke, upper rocker side = darker
	Lower: Brighter /ON	Long stroke, lower rocker side = lighter
		Short stroke, upper rocker side = OFF
		Short stroke, lower rocker side = ON
	Upper: Darker/Toggle,	Long stroke, upper rocker side = darker
	Lower: Brighter/Toggle	Long stroke, lower rocker side = lighter
		Short stroke, upper rocker side = toggle
		Short stroke, lower rocker side = toggle
Long keystroke starting at	*300 ms*	This function serves to clearly differentiate between long and short keystrokes. If the key is pressed at least as long as the set time, then a long keystroke will be registered.
	500 ms	
	400 ms	
	600 ms	
	700 ms	
	800 ms	
	900 ms	
	1000 ms	
Dimmer increment		With a long keystroke, the dimming value is:
	100 %	Increased (or decreased) until the key is released.
	50 %	Raised (or lowered) by the selected value
	25 %	
	12,5 %	
	6 %	
	3 %	
	1,5 %	

3.3.2.4 Rocker 1..4, the "blinds" function

Motion or step/stop commands are sent to the blinds actuator depending on the duration of the keystroke (short/ long key stroke). See below.

Table 12

Designation	Values	Description
Operation of keys	***Upper=UP, Lower=DOWN***	Long stroke, upper rocker = move up Long stroke, lower rocker = move down Short stroke, upper rocker = step up/stop Short stroke, lower rocker = step down/stop
	Upper=DOWN, Lower=UP	Long stroke, upper rocker = move down Long stroke, lower rocker = move up Short stroke, upper rocker = step down/stop Short stroke, lower rocker = step up/stop
Stop driving after	***releasing the key***	Blinds will move as long as the button remains pressed
	short keystroke	Blind must be stopped by a short keystroke
Long keystroke starting at	*300 ms* *400 ms* ***500 ms*** *600 ms* *700 ms* *800 ms* *900 ms* *1000 ms*	This function serves to clearly differentiate between long and short keystrokes. If the key is pressed at least as long as the set time, then a long keystroke will be registered.

3.3.2.5 Rocker 1..4, the " scene" function

Table 13

Designation	Values	Description
Scene number for Upper side	*scene 1 .. scene 64*	Scene number to be sent by pressing the upper side of the rocker
Scene number for Lower side	*scene 1 .. scene 64*	Scene number to be sent by pressing the lower side of the rocker
Save after long keystroke	*no*	Scenes can only be recalled, not saved
	yes	On long keystroke the switch will send scene save telegram

3.3.2.6 Rocker 1..4, the " single button operation" function

Upper and lower buttons of the rocker can be programmed separately for switching, dimming, blind control etc.

Table 14

Designation	Values	Description
Function upper key	***toggle***	Toggle related object status
	dimming	Distinguishes between a long and a short keystroke then performs below functions: Short keystroke = ON/OFF (toggle) Long keystroke = lighter /darker Release = stop dimming **Not**: Dimming direction to lighter or darker change with every keystroke.
	blinds	Distinguishes between a long and a short keystroke then performs below functions: Short keystroke = Step Long keystroke = Move **Not**: Direction changes with every long keystroke. The **stop command** is triggered either by releasing the button or pressing it briefly, depending on the configuration. See below: *Stop driving when release upper key*
	sequencer	Sends different values each time the button is pressed. For every step 1 byte and 1 bit values are sent. The number of steps can be adjusted. 1st Press: Value 1 2nd Press: Value 2 3rd Press: Value 3 .. See below: *Sequence type, Number of steps*

Designation	Values	Description
Stop driving when release upper key	*No* ***Yes***	Blinds will stop moving after a short keystroke. Blinds will stop moving by releasing the button
Sequence type	 ***cyclic*** *up-down* *cyclic with additional bit* *up-down with additional bit*	Available if sequencer is selected. Starts again from the beginning (from step 1) after the end of the first sequence. *For 3 step sequencer:* step1 > step2 > step3 > step1 > step2> step3 >… ----- 1st sequence----- ----- 2nd sequence----- After 1st sequence is finished return back from previous step. *For 3 step sequencer:* step1 > step2 > step3 > step2 > step1> step2 > step3 ------- 1st seq -------- --- 2nd seq. --- --- 3rd seq.--- Same with cyclic but 1 more step is added which only sends 1 bit object. **See below:** *Value of additional 1 bit object* Same with up-down but 1 more step is added which only sends 1 bit object. **See below:** *Value of additional 1 bit object*
Number of steps	***2*** *3* *4*	Select the number of steps for sequencer
Value for step 1-4	Value from 0 to 255	Set 1 byte object value for appropriate step number.
Value of 1 bit object for step 1-4	***0*** *1*	Set 1 bit object value for appropriate step number.
Value of additional1bit object	***0*** *1*	Set 1 bit object value for additional step number.
Function lower key	***toggle*** *dimming* *blinds*	Select lower key functions. Same options except sequencer. **See above**: *Function upper key*
Stop driving when release lower key	*No* ***Yes***	**See above:** *Stop driving when release upper key*

Designation	Values	Description
Long keystroke starting at	*300 ms* *400 ms* ***500 ms*** *600 ms* *700 ms* *800 ms* *900 ms* *1000 ms*	This function serves to clearly differentiate between long and short keystrokes. If the key is pressed at least as long as the set time, then a long keystroke will be registered.

3.3.2.7 LED rocker 1..4

Table 15

Designation	Values	Description
Function of LED	*fixed display*	The LED must always remain ON or OFF.
	display object value	The LED can be set ON or OFF through an object.
	feedback	The LED will light up when a key is pressed, depending on the parameter settings.
Function of LED = fixed display		
LED Behaviour	*always OFF*	LED remains always OFF.
	always ON	LED remains always ON.
Function of the LED = display object value		
LED Behaviour	*object value 1 = LED ON* *object value 0 = LED ON* *object value 1 = LED ON for 3 s* *object value 0 = LED ON for 3 s* *any obj. value = LED on for 3 s*	Reaction on received telegrams on the LED object.
Function of the LED = feedback		
LED Behaviour	*upper side = LED ON, lower side = LED OFF* *upper side = LED OFF, lower side = LED ON* *both sides = LED ON for 3 s* *upper side = LED ON for 3 s* *lower side = LED ON for 3 s*	Behavior of the rocker LED when a key is pressed.