

IRO – Integrated room operation

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1 Flexible room unit

1.1 Description

Introduction

The QAX50.1 and QAX51.1 flexible room units are used in the DESIGO RXC room management system to measure the room temperature and for integrated operation of HVAC, lighting and window blinds. The flexible room unit is connected to the DESIGO RXC controllers via the LON bus.

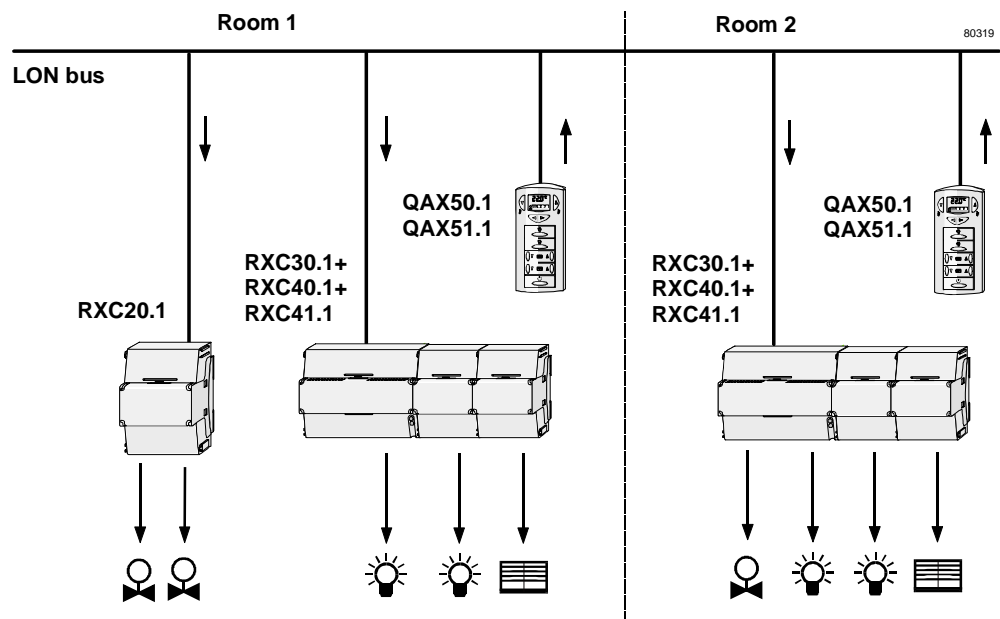
The functional scope of the flexible room unit is defined by software applications matched to the room requirements or to the DESIGO RXC controllers. These applications are described in this section. The flexible room unit is either supplied with an application already loaded, or the application can be selected with the RXT10.1 commissioning and service tool and downloaded into an unconfigured room unit.

The hardware of the flexible room unit is described in data sheet CA2N1648.

Communication with the DESIGO RXC controllers

The flexible room unit incorporates LONMARK-compatible bus communication. The functions of the pushbuttons and switches on the flexible room unit are transmitted via LONMARK bindings to the DESIGO RXC controllers. The bindings are created with the RXT10.1 commissioning and service tool (see the RXT10.1 user manual, document CA2B3808). The RXT10.1 commissioning and service tool includes a range of binding templates which make the creation of bindings very easy (see the section headed "LONMARK binding templates"). The network variables used for the bindings are listed for each application in the section headed "LONMARK network variables".

Integrated operation of HVAC, lighting and blinds



Operation of HVAC, lighting and blinds with the flexible room unit

As will be seen from the diagram, the flexible room unit can be connected to more than one DESIGO RXC device. In Room 1, the HVAC control functions have bindings to the RXC20.1 fan-coil controller, while operation of lighting and blinds is bound to the RXC30.1 controller and the associated RXC40.1 and RXC41.1 extension modules.

Operating the HVAC functions

For the operation of HVAC functions such as setpoint resets and the selection of operating mode and fan stages, the flexible room unit is fitted with pushbuttons, switches and an LCD display. The functions are identical to those available with the QAX34.1 room unit.

Refer to the data sheet for the flexible room unit for CA2N1648.

Operation of lighting and blinds

The keypad on the lower section of the front plate is used to operate the lighting and blinds, with buttons and switches which are fitted individually to match the selected configuration (see "Switch functions" for details).

1.2 Type summary

The flexible room unit is available from the factory either pre-configured or unconfigured.

Configured units

These are supplied from the factory pre-loaded with an application and with the buttons and rocker switches already fitted. The available applications and standard configurations are described under "Applications and configurations".

The configured devices are ordered by quoting the basic room unit type code and the required configuration.

Example: **QAX50.1 / C011P**

Minimum quantity: 10 units

Unconfigured units

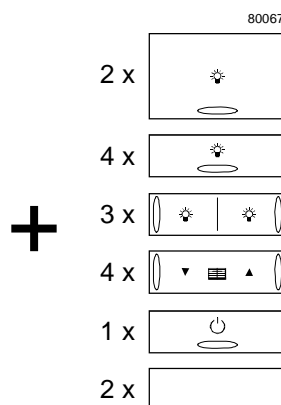
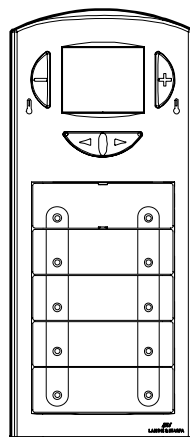
Unconfigured units are available in two basic forms, distinguished by the type and number of buttons and rocker switches enclosed. They are always delivered with a complete set of switches. The room units are then configured by the purchaser who fits the required buttons/switches and downloads the application with the RXT10.1 commissioning and service tool.

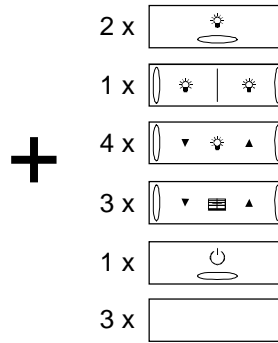
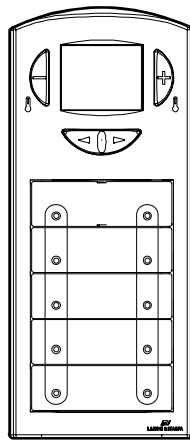
When ordering, please state the basic room unit type code and specify configuration code C000.

Example: **QAX51.1 / C000**

Basic type codes

QAX50.1



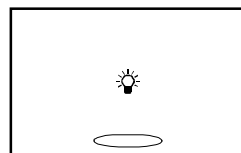


Type QAX50.1 is used for all applications involving on/off lighting control. Type QAX51.1 is required for dimming control.

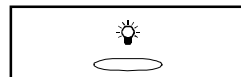
1.3 Button/rocker switch functions

On/off lighting

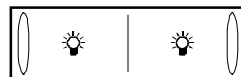
Each operation of the switch turns the associated lighting group from On to Off, or vice versa.



Large button for on/off control of lighting



Standard button for on/off control of lighting



Rocker switch for on/off control of 2 lighting groups

Dimming control

Each dimmer-controlled lighting group is operated by a rocker switch: ▲ (On/Brighter) and ▼ (Off/Dimmer).

- If the lighting is off, pressing either switch briefly (<0.5 s) switches the lighting on at the preset dimming value (see the "INT – Integrated applications" section).
- If the lighting is on, pressing the ▲ switch briefly (<0.5 s) causes it to switch to the maximum value (100 %).
- If the lighting is on, pressing the ▼ switch briefly (<0.5 s) causes it to switch off (0 %) or dims it to the minimum value, if defined (see the "INT – Integrated applications" section).
- Sustained pressure (>0.5 s) on the ▲ switch increases the dimming value continuously until the pressure is released or until the maximum value is reached (100 %).
- Sustained pressure (>0.5 s) on the ▼ switch reduces the dimming value continuously until the pressure is released or until the minimum value is reached.



Rocker switch for dimming control

Control of blinds

Each blind motor is controlled by two switches: ▲ (up) and ▼ (down). The way in which these operate depends on the type of blind (with or without slats).

Blinds without slats

- Pressing one of the switches briefly (< 0.5 s) when the blind is stationary causes the blind to move in the corresponding direction for approximately 1 s, and then stop.
- Sustained pressure (> 0.5 s) on one of the switches when the blind is stationary, drives the blind in the corresponding direction. The blind will continue to open or close when the switch is released.
- While the blind is moving up or down, it can be stopped by brief pressure (< 0.5 s) on the switch pointing in the opposite direction.
- While the blind is moving up or down, sustained pressure (> 0.5 s) on the switch pointing in the opposite direction will stop the blind and drive it in the direction indicated.

Blinds with slats

In addition to the up/down functions described above, the two switches are also used to adjust the angle of rotation of the slats.

- Normally the slats are closed while the blinds move downwards and open while the blinds move upwards.
- When the blinds are stationary, the two switches can be used to open or close the slats in steps. Each step corresponds to an opening of approximately 15 °.
- Brief pressure on a switch (< 0.5 s) opens or closes the slats by one step.
- Sustained pressure (> 0.5 s) opens or closes the slats in continuous steps.
- When the blind is fully closed, the slats then open automatically to a predefined angle (anti-dazzle position). This can be prevented by briefly pressing the ▼ switch again while the blind is closing.

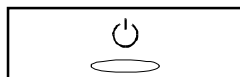


Rocker switch for control of blinds

Occupancy function

In configurations with an OFF button, the following occupancy function is available:

- When the room status is *Occupied* (central control etc.), pressing the OFF button switches off all the room lighting and causes the associated temperature controller to switch to *Stand-by* or *Economy* mode.



OFF button

- If the connected room temperature controller is in *Stand-by* or *Economy* mode, pressing any switch returns the controller to *Comfort* mode.

2 Applications and configurations

2.1 Definitions

Application

This refers to the application software, which is held in the applications library of the RXT10.1 commissioning and service tool, ready for downloading into the flexible room units. The applications are identified by the letters IRO (Integrated Room Operation) and an application number, e.g. **IRO23**

Note

Unconfigured room units are supplied with application IRO20 downloaded.

Configuration

Each application covers a variety of different button/rocker-switch combinations (type, number and arrangement). A “configuration” consists of the application software and the button/rocker switch combination. A configuration is defined in the RXT10.1 commissioning and service tool by the application (e.g. IRO23), product type code (e.g. QAX51.1) and front-plate combination.

The configurations are identified with the letter C and a consecutive number, e.g. **C011**. Configurations which include an “Off” button are identified by the suffix “P”, e.g. **C011P**.

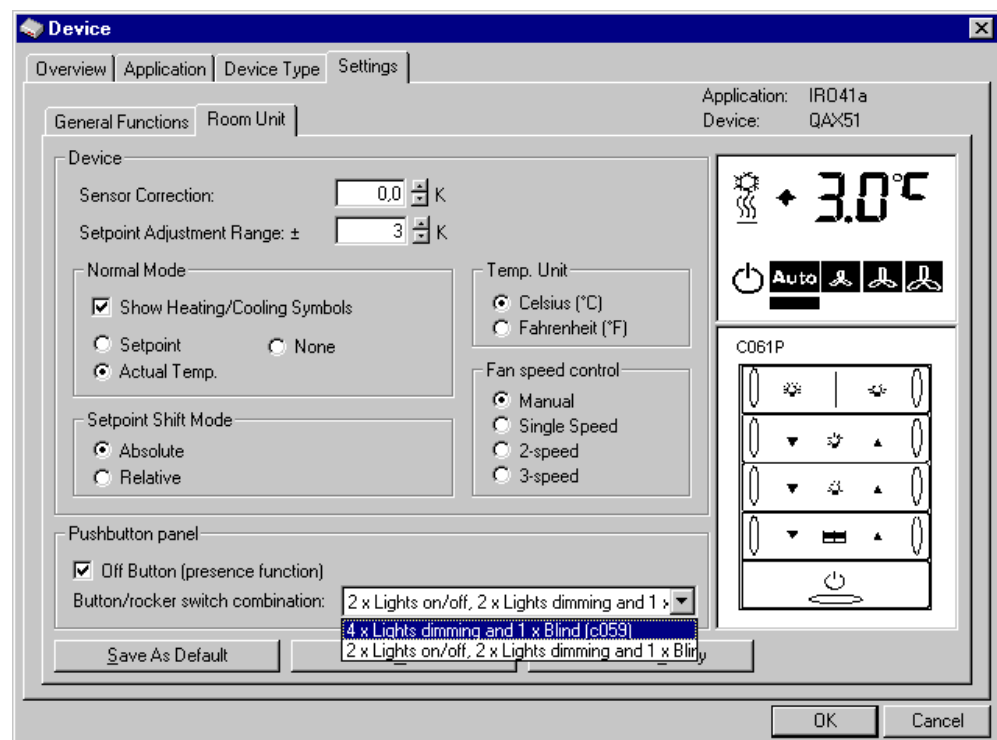
2.2 Settings



DESIGO RXT10.1

Room unit

After selecting the application and device type, go to the **Device** menu, and click the *Room Unit* tab under **Configuration, Settings**. Select the required button/rocker switch combination in the *Pushbutton panel* field and define whether an “Off” button is required. The parameters for the HVAC-specific functions of the flexible room unit are defined in the same way as the HVAC applications themselves (see the “FNC – Fan-Coil applications” section, for example).



Under **Settings, General Functions** the send and receive heartbeat can be adjusted.

In a LONMARK network, network variables are exchanged between the individual devices. The receive interval defines the period of time during which all the network variables required by a device must be received at least once. If a network variable is not received during this time, it will take on a predefined value and an error message is generated. This ensures that any communication breakdowns is noticed in good time. The send interval defines the period in which all the required network variables must be sent at least once.

The time intervals are determined according to the size of the network. Normally the default setting can be retained. For smaller networks, or for test purposes, shorter times may be selected. The receive interval must always be longer than the send interval.

Parameter	Default setting	Range	Resolution
<i>Receive heartbeat</i>	60 min	0 ... 180 min	1 min
<i>Send heartbeat</i>	45 min	0 ... 180 min	1 min

2.3 Overview

Basic unit type QAX50.1 Standard configurations with the basic unit type QAX50.1:

Configuration	Application	Function		
		Lighting On/Off	Dimming control	Blinds, Up/Down
C001 / C001P	IRO20	2 x		
C002 / C002P	IRO21	2 x		1 x
C003 / C003P	IRO22	2 x		2 x
C004 / C004P	IRO23	2 x		3 x
C005	IRO24	2 x		4 x
C006 / C006P	IRO30	3 x		
C007 / C007P	IRO31	3 x		1 x
C008 / C008P	IRO32	3 x		2 x
C009	IRO33	3 x		3 x
C010 / C010P	IRO40	4 x		
C011 / C011P	IRO41	4 x		1 x
C012 / C012P	IRO42	4 x		2 x
C013	IRO43	4 x		3 x
C014 / C014P	IRO50	5 x		
C015 / C015P	IRO51	5 x		1 x
C016	IRO52	5 x		2 x
C017 / C017P	IRO60	6 x		
C018 / C018P	IRO61	6 x		1 x
C019	IRO62	6 x		2 x

Basic unit type QAX51.1 Standard configurations with the basic unit type QAX51.1:

Configuration	Application	Function		
		Lighting On/Off	Dimming control	Blinds, Up/Down
C051 / C051P	IRO20		2 x	
C052 / C052P	IRO21		2 x	1 x
C053 / C053P	IRO22		2 x	2 x
C054	IRO23		2 x	3 x
C055 / C055P	IRO30		3 x	
C056 / C056P	IRO31		3 x	1 x
C057	IRO32		3 x	2 x
C058 / C058P	IRO40		4 x	
C059	IRO41		4 x	1 x
C060 / C060P	IRO40	2 x	2 x	
C061 / C061P	IRO41	2 x	2 x	1 x
C062	IRO42	2 x	2 x	2 x

2.4 Configurations

C001	2 lighting groups on/off	
	Without "Off" button	With "Off" button
Button/rocker switch combination	<p style="text-align: right;">80173</p>	<p style="text-align: right;">80174</p>
Order number	QAX50.1 / C001	QAX50.1 / C001P
Application	IRO20	
Suitable controller configuration	RXC30.1 with application INT01	

C002	2 lighting groups on/off and control of 1 blind	
	Without "Off" button	With "Off" button
Button/rocker switch combination	<p style="text-align: right;">80175</p>	<p style="text-align: right;">80176</p>
Order number	QAX50.1 / C002	QAX50.1 / C002P
Application	IRO21	
Suitable controller configuration	RXC30.1 + RXC41.1 with application INT04	

C003		2 lighting groups on/off and control of 2 blinds	
	Without "Off" button	With "Off" button	
Button/rocker switch combination			
Order number	QAX50.1 / C003	QAX50.1 / C003P	
Application	IRO22		
Suitable controller configuration	RXC30.1 + RXC41.1 with application INT04		

C004		2 lighting groups on/off and control of 3 blinds	
	Without "Off" button	With "Off" button	
Button/rocker switch combination			
Order number	QAX50.1 / C004	QAX50.1 / C004P	
Application	IRO23		
Suitable controller configuration	RXC30.1 + 2 x RXC41.1 with application INT05		

C005	2 lighting groups on/off and control of 4 blinds	
	Without "Off" button	
Button/rocker switch combination		
Order number	QAX50.1 / C005	
Application	IRO24	
Suitable controller configuration	RXC30.1 + 2 x RXC41.1 with application INT05	

C006	3 lighting groups on/off	
	Without "Off" button	With "Off" button
Button/rocker switch combination		
Order number	QAX50.1 / C006	QAX50.1 / C006P
Application	IRO30	
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT02	

C007	3 lighting groups on/off and control of 1 blind	
	Without "Off" button	With "Off" button
Button/rocker switch combination	<p style="text-align: center;">80184</p>	<p style="text-align: center;">80185</p>
Order number	QAX50.1 / C007	QAX50.1 / C007P
Application	IRO31	
Suitable controller configuration	RXC30.1 + RXC40.1 + RXC41.1 with application INT06	

C008	3 lighting groups on/off and control of 2 blinds	
	Without "Off" button	With "Off" button
Button/rocker switch combination	<p style="text-align: center;">80186</p>	<p style="text-align: center;">80187</p>
Order number	QAX50.1 / C008	QAX50.1 / C008P
Application	IRO32	
Suitable controller configuration	RXC30.1 + RXC40.1 + RXC41.1 with application INT06	

C009	3 lighting groups on/off and control of 3 blinds	
	Without "Off" button	
Button/rocker switch combination	<div style="text-align: right; margin-bottom: 5px;">80188</div>	
Order number	QAX50.1 / C009	
Application	IRO33	
Suitable controller configuration	RXC30.1 + RXC41.1 with application INT04 and RXC30.1 + RXC41.1 with application INT04	

C010	4 lighting groups on/off	
	Without "Off" button	With "Off" button
Button/rocker switch combination	<div style="text-align: right; margin-bottom: 5px;">80189</div>	<div style="text-align: right; margin-bottom: 5px;">80190</div>
Order number	QAX50.1 / C010	QAX50.1 / C010P
Application	IRO40	
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT02	

C011		4 lighting groups on/off and control of 1 blind	
	Without "Off" button	With "Off" button	
Button/rocker switch combination	<p style="text-align: center;">80191</p>	<p style="text-align: center;">80192</p>	
Order number	QAX50.1 / C011	QAX50.1 / C011P	
Application	IRO41		
Suitable controller configuration	RXC30.1 + RXC40.1 + RXC41.1 with application INT06		

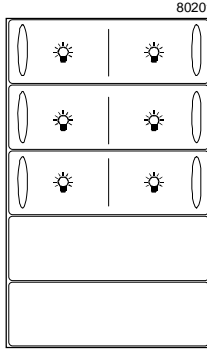
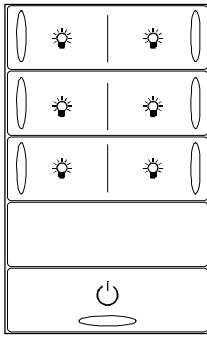
C012		4 lighting groups on/off and control of 2 blinds	
	Without "Off" button	With "Off" button	
Button/rocker switch combination	<p style="text-align: center;">80193</p>	<p style="text-align: center;">80194</p>	
Order number	QAX50.1 / C012	QAX50.1 / C012P	
Application	IRO42		
Suitable controller configuration	RXC30.1 + RXC40.1 + RXC41.1 with application INT06		

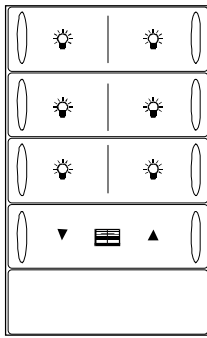
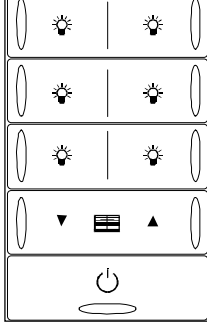
C013	4 lighting groups on/off control of 3 blinds	
	Without "Off" button	
Button/rocker switch combination		
Order number	QAX50.1 / C013	
Application	IRO43	
Suitable controller configuration	RXC30.1 + RXC41.1 with application INT04 and RXC30.1 + RXC41.1 with application INT04	

C014	5 lighting groups on/off	
	Without "Off" button	With "Off" button
Button/rocker switch combination		
Order number	QAX50.1 / C014	QAX50.1 / C014P
Application	IRO50	
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT02 and RXC30.1 with application INT01	

C015	5 lighting groups on/off and control of 1 blind	
	Without "Off" button	With "Off" button
Button/rocker switch combination	<p style="text-align: center;">80198</p>	<p style="text-align: center;">80199</p>
Order number	QAX50.1 / C015	QAX50.1 / C015P
Application	IRO51	
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT02 and RXC30.1 + RXC41.1 with application INT04	

C016	5 lighting groups on/off and control of 2 blinds	
	Without "Off" button	
Button/rocker switch combination	<p style="text-align: center;">80200</p>	
Order number	QAX50.1 / C016	
Application	IRO52	
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT02 and RXC30.1 + RXC41.1 with application INT04	

C017	6 lighting groups on/off	
	Without "Off" button	With "Off" button
Button/rocker switch combination		
Order number	QAX50.1 / C017	QAX50.1 / C017P
Application	IRO60	
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT02 and RXC30.1 with application INT01	

C018	6 lighting groups on/off and control of 1 blind	
	Without "Off" button	With "Off" button
Button/rocker switch combination		
Order number	QAX50.1 / C018	QAX50.1 / C018P
Application	IRO61	
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT02 and RXC30.1 + RXC41.1 with application INT04	

C019	6 lighting groups on/off and control of 2 blinds	
	Without "Off" button	
Button/rocker switch combination		
Order number	QAX50.1 / C019	
Application	IRO62	
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT02 and RXC30.1 + RXC41.1 with application INT04	

C051	Dimming control of 2 lighting groups	
	Without "Off" button	With "Off" button
Button/rocker switch combination		
Order number	QAX51.1 / C051	QAX51.1 / C051P
Application	IRO20	
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT03	

C052	Dimming control of 2 lighting groups and control of 1 blind	
	Without "Off" button	With "Off" button
Button/rocker switch combination	<p>80208</p>	<p>80209</p>
Order number	QAX51.1 / C052	QAX51.1 / C052P
Application	IRO21	
Suitable controller configuration	RXC30.1 + RXC40.1 + RXC41.1 with application INT07	

C053	Dimming control of 2 lighting groups and control of 2 blinds	
	Without "Off" button	With "Off" button
Button/rocker switch combination	<p>80210</p>	<p>80211</p>
Order number	QAX51.1 / C053	QAX51.1 / C053P
Application	IRO22	
Suitable controller configuration	RXC30.1 + RXC40.1 + RXC41.1 with application INT07	

C054	Dimming control of 2 lighting groups and control of 3 blinds	
	Without "Off" button	
Button/rocker switch combination		
Order number	QAX51.1 / C054	
Application	IRO23	
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT03 RXC30.1 + 2 x RXC41.1 with application INT05	

C055	Dimming control of 3 lighting groups	
	Without "Off" button	With "Off" button
Button/rocker switch combination		
Order number	QAX51.1 / C055	QAX51.1 / C055P
Application	IRO30	
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT03 and RXC30.1 + RXC40.1 with application INT03	

C056	Dimming control of 3 lighting groups and control of 1 blind	
	Without "Off" button	With "Off" button
Button/rocker switch combination		
Order number	QAX51.1 / C056	QAX51.1 / C056P
Application	IRO31	
Suitable controller configuration	RXC30.1 + RXC40.1 + RXC41.1 with application INT07 and RXC30.1 + RXC40.1 with application INT03	

C057	Dimming control of 3 lighting groups and control of 2 blinds	
	Without "Off" button	
Button/rocker switch combination		
Order number	QAX51.1 / C057	
Application	IRO32	
Suitable controller configuration	RXC30.1 + RXC40.1 + RXC41.1 with application INT07 and RXC30.1 + RXC40.1 with application INT03	

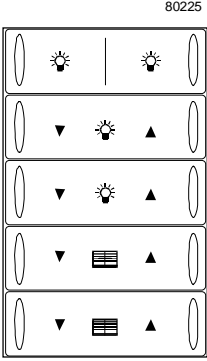
C058		Dimming control of 4 lighting groups	
	Without "Off" button	With "Off" button	
Button/rocker switch combination			
Order number	QAX51.1 / C058	QAX51.1 / C058P	
Application	IRO40		
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT03 and RXC30.1 + RXC40.1 with application INT03		

C059		Dimming control of 4 lighting groups and control of 1 blind	
	Without "Off" button		
Button/rocker switch combination			
Order number	QAX51.1 / C059		
Application	IRO41		
Suitable controller configuration	RXC30.1 + RXC40.1 + RXC41.1 with application INT07 and RXC30.1 + RXC40.1 with application INT03		

C060	2 lighting groups on/off and 2 lighting groups with dimming control	
	Without "Off" button	With "Off" button
Button/rocker switch combination	<p style="text-align: center;">80221</p>	<p style="text-align: center;">80222</p>
Order number	QAX51.1 / C060	QAX51.1 / C060P
Application	IRO40	
Suitable controller configuration	RXC30.1 + RXC40.1 with application INT03	

C061	2 lighting groups on/off , 2 lighting groups with dimming control, 1 blind	
	Without "Off" button	With "Off" button
Button/rocker switch combination	<p style="text-align: center;">80223</p>	<p style="text-align: center;">80224</p>
Order number	QAX51.1 / C061	QAX51.1 / C061P
Application	IRO41	
Suitable controller configuration	RXC30.1 + RXC40.1 + RXC41.1 with application INT07	

C062**2 lighting groups on/off ,
2 lighting groups with dimming control,
2 blinds**

	Without "Off" button	
Button/rocker switch combination		
Order number	QAX51.1 / C062	
Application	IRO42	
Suitable controller configuration	RXC30.1 + RXC40.1 + RXC41.1 with application INT07	