3927-DaliControlSC64-01-0120

Using the application program

Application program:

Program name: 3927-DaliControlSC64-01-0120
Product family: Lighting
Product type: Gateways
Manufacturer: IPAS

suitable for:

Product name: DaliControl SC64IP
                   KNX-DALI Gateway
Art. no.:   3927-145-52

Function description

The DaliControl SC64IP brings together the cross-functional KNX installation bus and the lighting control specific DALI-Bus.

Lights with cost-effective digital DALI ECGs can therefore be integrated into an overall KNX architecture and operated via the multitude of existing KNX devices.
The DaliControl SC64IP serves both as DALI-Master and power supply for up to 64 connected ECGs.

The ECGs can be switched, dimmed or set to a defined value in up to 16 groups per Gateway. The current lighting value or error status of each group (lamp, ECG error status within the group) can be exported to e.g. a visualisation via KNX.

In addition to the group control, the SC64IP also enables the individual control of up to 64 ECGs. In the latter case, one object is available per ECG. A parameter determines whether the individual ECG is to be switched, dimmed or set to a defined value.

An error status object is available for each ECG. This makes it possible to locate exactly lamp and ECG errors. Full control of all connected ECGs via Broadcast (no DALI commissioning is necessary in this case) is also possible via three objects.

In addition, the individual groups can be used to program and load up to 16 light scenes. The scene control is performed via a 1Byte object.

Using the SC64IP, the DALI can be commissioned (assignment of DALI ECGs to the various groups and changes in configuration) in three different ways.

1. Commissioning via the device

The DALI can be commissioned entirely on the device by using the integrated display and programming buttons without KNX and previous ETS programming. Commissioning on the device is particularly recommended for DALI installations performed by an electrician and where the ETS is programmed subsequently by a system integrator.

2. Commissioning via the **DaliControl Service and Commissioning Wizard**

In addition, an easy-to-use and free commissioning tool is available. Using this tool, the DALI can be commissioned via an interface connected to the KNX-Bus (RS-232, USB, IP). This method is particularly recommended for installations where the Gateways are located separately from the lights or where the lights are not visible to the Gateways. Using this tool enables the identification of the lights locally at the place of installation.

3. Commissioning via integrated web server

In addition to the KNX and DALI interface, the DaliControl SC64IP also has an RJ-45 interface, which makes it possible to connect the device with an existing IP network. The integrated web server ensures easy DALI commissioning via any web browser. The IP address, which will have been programmed with ETS or assigned by a DHCP server, is entered in a browser. Web access is also possible via WLAN. The commissioning website is designed in such a way that the display is possible on a portable PDA. This gives the commissioning technician the opportunity to move around the installation freely

In addition, two binary inputs are available on the device. Via simple pushbuttons, which are connected to the device, switch functions can be performed directly. The pushbutton function is available without an existing KNX Bus and is particularly advantageous for the installation phase (construction site operation).

As an REG device (6TE) the DaliControl SC64IP is suitable for DIN Rail mounting in standard sub-distributions. Connection to the bus is via a standard bus coupler. The DALI, power supply and pushbuttons are connected using screw connectors.

The application program 3927-DaliControlSC64-01-0120 is available to operate the device.

Communication objects

A maximum of 252 communication objects is available for communication of the device via the KNX. The objects are, in parts, displayed or hidden, depending on how the parameters are set. The communication objects can be connected to 255 group addresses via 255 associations.

5 objects are assigned to each of the 16 DALI groups.
The objects for group 1 are:

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Obj	Function	Object name	Type	Flags
0	On/Off	Switch, group 1	1 bit	CWT

The lamps assigned to DALI group 1 are switched to the set switch ON or switch OFF value using this object. Whether switching is to be carried out immediately or whether dimming is to be performed to the final value when the object is received, can be set in the parameters. The dimming time can be set independently of the time on receipt of a dim telegram.

1	Brighter/Darker	Dimming, group 1	4 bit	CWT

The lamps assigned to DALI group 1 are dimmed up or down using this object. The dimming time required to dim from 0% to 100% can be set in the parameters.

2	Value	Value, group 1	1 byte	CWT

The lamps assigned to DALI group 1 are set to a brightness value using this object. Whether the value is accepted immediately or dimmed to the final value when the object is received can be set in the parameters. The dimming time can be set independently of the time on receipt of a dim telegram.

3	On/Off	Status, group 1	1 bit	CRT
	Value	Status, group 1	1 byte	CRT

The status of the lamps assigned to DALI group 1 can be made available using this object. Whether a 1 bit status (On/Off) or a 1 byte value status (0…100%) is transmitted, can be set in the parameters. The object type changes depending on the parameter settings. The requirement for sending the object can be adjusted.
Attention: When parameters are set as value status, the value during the dimming process is sent immediately on modification. This results in an in increased burden on the bus during dimming.

4	Failure	Error status, group 1	1 bit	CRT

This object is used to inform about the error status within a DALI group. Whether only a lamp malfunction, only an ECG malfunction or both types result in an error status can be set in the parameters. An object value of 0 means that no error has occurred within the group. A value of 1 means that at least one error has been detected within the group. The requirement for sending the object can be adjusted.

Like objects 0 to 4 for DALI group 1, objects 7 to 11 are assigned to DALI group 2, objects 14 to 18 to DALI group 3 etc. up to objects 105 to 109 for DALI group 16.

Using the DaliControl SC64IP all 64 ECGs / lamps can also be controlled individually. However, in this case only one object is available per ECG. The type of control and thus the object type can be set via a corresponding parameter (see below). Individual control is performed via the objects 112 to 175:

Obj	Function	Object name	Type	Flags
112	On/Off	Switch, ECG 1	1 bit	CWT
	Brighter/Darker	Dim, ECG1	4 bit	CWT
	Value	Set Value, ECG 1	1Byte	CWT

Using this object, the lamp controlled by ECG1 can be switched, dimmed or set to a lighting value (depending on parameters) individually and independent of belonging to a group.

Attention: Inconsistency between the actual set lighting value of a lamp and the status value of the group can occur when both individual control and group assignment of ECGs are used. We therefore recommend that when using individual control you do not assign the corresponding ECG to a group or use it via group control. This is the only way to avoid erroneous status reports.

Like object 112 for ECG 1, objects 113 to 175 are used for ECGs 2 to 64.

The DaliControl SC64IP offers the possibility to make the error status of each connected ECG available individually via one communication object on the KNX Bus. Objects 176 to 239 are used for this purpose.

Obj	Function	Object name	Type	Flags
176	Failure	Error status, ECG1	1 bit	CRT
			1 byte	CRT

This object is used to inform about the error status of ECG 1. Whether the object is set only for a lamp malfunction, only for an ECG malfunction or for both types, can be set in the parameters. If an error has occurred, the 1 bit object has the value 1, if no error has occurred, it has the value 0. An error status can also still be configured as a 1Byte object. In this case the object values are as follows:

No error: 0
Lamp error: 1
ECG error: 2

Like object 176 for ECG 1, objects 177 to 239 are used for ECGs 2 to 64.

In addition to group and individual control, the application can also be used for the complete control of all ECGs. Communication in this case is via DALI Broadcast telegrams and no new installation of the DALI is required. For complete control, use objects 240 to 242.

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Obj	Function	Object name	Type	Flags
240	On/Off	Switch, Broadcast	1 bit	CWT

This object is used to switch all lamps that are connected to the Dali segment to the set Switch ON or OFF value via DALI Broadcast telegrams. For Broadcast switching always use the parameters of group 1.

Obj	Function	Object name	Type	Flags
241	Brighter/Darker	Dimming, Broadcast	4 Bit	CWT

This object is used to dim all lamps that are connected to the Dali either up or down via DALI Broadcast telegrams. For Broadcast dimming always use the parameters of group 1.

Obj	Function	Object name	Type	Flags
242	Value	Value, group 1	1 Byte	CWT

This object is used to set all lamps that are connected to the Dali to a lighting value via DALI Broadcast telegrams. For Broadcast value setting always use the parameters of group 1.

By using objects 243 and 244, the signal of the potential-free pushbutton can also be made available to the KNX. The pushbutton function is set on the device itself via the operating menu (see Operating and Assembly Manual). It is important to remember that even when the pushbutton is configured as a dim button for Dali groups, only the switch object (short key press) is available for the KNX. If the parameters of the pushbutton are set to call up a Dali scene, the corresponding object has no function.

Obj	Function	Object name	Type	Flags
243	On/Off	Switch, Input 1	1 Bit	CRWT

A switch signal is provided via this object, which depends on the set pushbutton function of the potential-free input 1.

Obj	Function	Object name	Type	Flags
244	On/Off	Switch, Input 2	1 Bit	CRWT

A switch signal is provided via this object, which depends on the set pushbutton function of the potential-free input 2.

Objects 245 to 248 are used to inform about the status of errors within the entire Dali segment. Objects are sent whenever there is a change. However, they can also be requested. The following error objects for the entire segment are available:

Obj	Function	Object name	Type	Flags
245	Error	Error status, all errors	1 Bit	CRT

This object is used to inform about the error status of the Dali segment, independent of the error type. The value 0 means that no error has occurred. The value 1 means that an error has occurred in the segment.

Obj	Function	Object name	Type	Flags
246	Error	Error status, DALI Bus	1 Bit	CRT

This object is used to inform about the error status Dali short-circuit. The value 0 means that no error has occurred. The value 1 means that a Dali short-circuit has occurred.

Obj	Function	Object name	Type	Flags
247	Error	Error status, total Lamp error	1 Bit	CRT

This object is used to inform about any lamp error status in the Dali segment. The value 0 means that no error has occurred. The value 1 means that an error has occurred in at least one lamp in the segment.

Obj	Function	Object name	Type	Flags
248	Error	Error status, total ECG error	1 Bit	CRT

This object is used to inform about any ECG error status in the Dali segment. The value 0 means that no error has occurred. The value 1 means that an error has occurred in at least one ECG in the segment.

Object 252 is required to program and call up set lighting scenes. Please remember that individual Dali groups are assigned to the different scenes on the device itself by using the operating menu (see Operating and Assembly Manual).

Attention: Lighting values of scenes are saved on the ECGs during programming. Please remember therefore to ensure that all ECGs are connected and ready for use during programming. If a scene is programmed and the required ECG is not connected, there can be inconsistencies between the actual set value and the status reported by the Gateway.

Obj	Function	Object name	Type	Flags
252	Invoke / save scenes	Scenes 1-16	1 Byte	CW

This object is used to invoke scenes 1 -16 on receipt of a telegram with values 0-15. If the highest significant bit is also set (meaning a value from 128 to 143) the set lighting state is saved in the corresponding scene:

	Invoke	Save
Scene 1	0	128
Scene 2	1	129
Scene 3	2	130
.....		
Scene 14	13	141
Scene 15	14	142
Scene 16	15	143

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Parameters

For the purpose of clarity, the parameters are spread over several pages. The following parameters are available:

General page:

Parameters	Settings
Sending condition of status object	Sending on request only **Sending on change**
This sets the send condition for the light status of the DALI groups (4th communication object of each group)	
Behaviour on KNX bus voltage failure	**No change** Change to failure value Switch off
This determines which lighting condition is to be set in the event of KNX bus voltage failure.	
Behaviour on KNX bus voltage recovery	**No change** Change to last value Change to failure value Switch off
This determines which lighting condition is to be set on return of KNX bus voltage.	
Behaviour on recovery after DALI failure	No change **Change to last value** Switch off
This determines which lighting condition is to be set on return following a DALI error (short-circuit or ECG error)	
Sending condition failure object	Sending on request only **Sending on change**
This sets the send condition for the error status of the DALI groups (5th communication object of each group). The entire error statistics (objects no. 245 to 248) are always sent when a change occurs.	

Light value on DALI and KNX failure	No change 0 % 5 % 10 % .... (continued in steps of 5%)... 90 % 95 % **100 %** Adjustment per group
This determines which lighting value is to be set in case of a DALI or KNX error. In case of the "Setting per group" parameter, two additional pages appear, on which the error values can be chosen individually per group.	
Start of DALI new and post installation by pushbuttons:	**Enabled** Disabled
This sets whether a new or additional DALI installation can be performed via the pushbuttons on the device. The device can thus be protected against unauthorised access.	

One page is available for each group on which the group-specific parameters can be set.

Page **Group 1 - 16**:

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Parameters	Settings
Switch on value:	0 % 5 % 10 % .... (continued in steps of 5%)... 90 % 95 % **100 %** Last value
This sets the parameter for the lighting value which is to be set in the corresponding DALI group on receipt of a 1-telegram. If the parameter setting "last value" is selected, the value switched on receipt of a 1-telegram, is the value that was set via dimming or value setting before the last 0 telegram was received.	
Dimming time	2.5 seconds 5 seconds **10 seconds** 15 seconds 20 seconds 30 seconds 1 minute ….. 30 minutes 1 hour
This sets the time it should take to dim from 0% to 100% on receiving a dim telegram (dimming speed).	
Minimum value for dimming:	0% **5%** 10% 15% 20% 25% 30%
This sets the minimum dimming value. The setting 0% means that the dimmer can also be used to switch off the light. The light can always be switched on using the dimmer.	
Maximum value for dimming	50% 55% 60% .... (continued in steps of 5%)... 90% 95% **100%**
This sets the maximum dimming value.	
Behaviour when receiving on	**Accept value immediately** Dim to the value
This determines whether to apply the switch ON value immediately or whether to dim up to it when a 1-telegram is received.	
Behaviour when receiving off	**Accept value immediately** Dim to the value
This determines whether to apply the switch OFF value immediately or whether to dim down to it when a 0-telegram is received.	

Behaviour when receiving value	**Accept value immediately** Dim to the value
This determines whether to apply the light value immediately or whether to dim up or down to it when a 1 Byte telegram is received.	
Dimming time for On, Off, Set Value	2.5 seconds 5 seconds **10 seconds** 15 seconds 20 seconds 30 seconds 1 minute ….. 30 minutes 1 hour
This sets the time for dimming from 0% to 100% on receiving an 'On', 'Off' or 'Set value' telegram if the parameter was set to "Dim to value".	
Type of status object	**Switch status, 1 bit** Value status, 0..100%
This determines whether the status object should only make the ON/OFF switch status for the corresponding DALI group available or also the value status 0..100%.	
Type of recognized failures:	No error status **Only lamp error** Only ECG error Lamp and ECG error
This determines the error types for which the error object of each group makes an error status available.	

If on the General Page the parameter "Lighting value in the event of DALI and KNX errors" is set to "Setting per group", two additional pages will appear on which the error values can be selected individually.

Page **Failure values group 1 - 8:**

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Parameters	Settings
Value Group 1: ... Value Group 8:	No change 0 % 5 % 10 % .... (continued in steps of 5%)... 90 % 95 % **100 %**
The user can set here which lighting value will be set in the corresponding group in the event of a DALI or KNX error.	

The function of the page "Error Values Groups 9 – 16", is analogue to the one described on the previous page.

In addition to group control, the DaliControl SC64IP also offers individual control of ECGs. Whether individual control is possible as well as the type of individual control can be set on a separate page.

Page **ECG individual control:**

Parameters	Settings
ECG individual control feasible:	**No** Yes
The user can set here whether ECGs should be controlled individually. If the parameter "Yes" is selected, additional parameters will appear to set the individual control.	
Detectable failure types:	**No failure status** Only lamp failures by 1Bit object Only ECG failures by 1Bit object Lamp and ECG failures by 1Bit object Lamp and/or ECG failures by 1Byte object
The user can set here whether errors are to be detected individually for each ECG and which error type is to be detected. The error objects 176 to 239 will appear depending on the parameter.	

ECG 1 ..... ECG 64	**No Individual Control** Switch only via 1 Bit object Dim only via 4 Bit object Set value only via 1 Byte object
The user can set here which object type is to be used for the individual control of the ECG. Only one object is available for each ECG in this case. The object type appears depending on the parameter.	

In addition to group and individual control, the application also offers complete control of all connected ECGs at the same time. Communication in this case is via DALI Broadcast Telegrams and no new installation of the DALI is required.

Page **Common control:**

Parameters	Settings
Common control by DALI broadcast feasible	**No** Yes
The user can set here whether complete control of all ECGs should be possible. If the answer is yes, the group 1 parameters (dimming time, max. dim value, etc) are applied to all ECGs.	

Attention: In case of total control via DALI Broadcast, the parameters in group 1 apply (e.g. switch on value, dimming time, etc). They can be set on the corresponding parameter page.

The DaliControl SC64IP also enables DALI commissioning via a permanent or temporary IP network. The operations necessary for the commissioning process can be performed via the web pages of the integrated web server. The IP address is usually assigned by the DHCP service of a DHCP server on the network. If no DHCP server is available, the settings need to be performed manually.

The required network configurations are set via parameters.

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Page **IP configuration**

Parameters	Settings
Device name (max. 30 characters)	**DaliControl**
The device name (User Friendly Name) for IP identification of the device can be entered here.	
IP adress assignment	**by DHCP Service** manually
The user can set here whether the address will be assigned automatically by a DHCP server on the network or whether a fixed IP address will be entered manually.	
IP address:byte 1	**0** [0..255]
If the address is assigned manually, the 1. Byte of the IP address can be set here. The settings of Bytes 2...4 are analogue.	
IP subnet mask: Byte 1	**255** [0..255]
If the address is assigned manually, the 1. Byte of the IP subnet mask can be set here. The settings of Bytes 2...4 are analogue. The settings of the subnet mask must correspond to the settings of the commissioning PC.	
IP standard gateway: Byte 1	**0** [0..255]
If the address is assigned manually, the 1. Byte of the IP Standard Gateway can be set here The settings of Bytes 2...4 are analogue. A Standard Gateway is only required for connection via a Router (e.g. Internet). Normally, no settings are required.	

Attention: Please agree the IP settings with the network administrator. If no DHCP service is available on the network, the IP settings need to be performed manually. It is therefore important to ensure that the selected settings are admissible on the network.

Behaviour in the event of voltage failure and voltage return

The different scenarios for voltage failure and voltage return can be set via the parameters on the General Page.

The behaviour of the connected lamps can be set via the parameters "Behaviour in the event of KNX bus voltage failure and return of KNX bus voltage". If the setting "No change" is selected, the lighting value that was set last, is retained. If the setting "Switch to error value" is selected, the value set on the lamp is the one that was set under „Lighting value in the event of DALI or KNX errors". The setting "Switch to last value" is only possible for the return of KNX bus voltage. If the error value has been activated in the event of bus voltage failure, this parameter setting will cause the lighting values to be automatically re-set to the values before the failure once the voltage returns. Please remember that the correct last value can only be set, if during the bus voltage failure no other power failure of the Gateway has occurred. In the event of a Gateway power failure, the lights will be switched off on return of the voltage if the parameter was set to "Switch to last value" (Value 0). If the parameter "Switch Off" is set, the lamps will be switched off in any case.

A Dali error can occur in the event of a short circuit or when the DALI line is interrupted. If an error occurs, the error lighting value that is saved in the ECGs (Setting via lighting value in the event of DALI and KNX error) will be set. If the parameter for the behaviour after the occurrence of a DALI error is set to "Switch to last value" or "Switch Off", a safe and correct lamp setting can only be ensured if the error has occurred for at least 1-2 minutes (depending on the number of connected ECGs). In order for the Gateway to be able to recognise the error, all ECGs are contacted cyclically. Depending on the number, this process can take up to 2 minutes. It is therefore possible that in the event of a very brief error, the Gateway will not yet have detected the error and will not perform the desired function. In this case inconsistencies can occur between the set lighting value and the displayed status. This problem is inherent in the Dali system.

A failure of the Gateway power supply always leads to a complete re-set of the device. The behaviour after a device re-set is also determined by the parameter Behaviour on return of bus voltage. Please remember that, if "Switch to last value" is set, the device is switched off, as the internal memory is deleted during the device re-set.

Please also remember another characteristic in the event of simultaneous return of Gateway power supply and ECG voltage. Principally all DALI ECGs are switched on as soon as the power is switched on. If the parameter for behaviour on return of bus voltage is set to "Switch Off", the switch off command needs ca. 1 second to take effect after the system is re-started. On return of the voltage, the ECGs will have initially been switched on automatically and only then switched off. As a result the lamps will be lit briefly when the respective parameters are set. This behaviour is also system-inherent and cannot be prevented.