

Room Automation Solution I/O Interfaces and Modules Product Bulletin

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Introduction

Input/Output (I/O) interfaces and modules products are part of the Johnson Controls® Room Automation Solution. I/O interfaces and modules products include DALI gateways, fan coil controllers, universal modules, I/O interfaces, dimmers, and heating modules.

Product list

- GRDALI-TWGW-KNX
- GRFCU-PR-KNX
- GRBO-xxCH-KNX
- GRIO-0xCH-KNX
- GRBO-16CHxx-KNX
- GRIO-16CHxx-KNX
- GRTEI8CH4RT-KNX
- GRIO-xCH-SI-KNX
- GRUDM-KNX-x
- GRDM-xCH-KNX-M
- GRHA-0xCH-KNX
- GRUDM4CH110-KNX

Contact your Johnson Controls sales representative to order a product listed in Table 14.

Features and benefits

GRDALI-TWGW-KNX DALI-KNX Gateway

The Digital Addressable Lighting Interface (DALI) Gateway is an interface between a KNX® installation and a DALI lighting system. Use the DALI Gateway to switch and dim a maximum of 64 lights with a DALI operating device. Up to six different addressing types of the DALI Gateway permit group-orientated and individually-addressed control of DALI lights through KNX communication. This enables the integration of room-specific light controls, for example, of open-plan offices, multipurpose spaces, production facilities, training and conference rooms into the higher-level of KNX building management.

Depending on the configuration, up to 32 independent DALI groups are available for group addressing. For alternative control, supplement these with 64 individually-addressable DALI device channels, as necessary. Optionally, broadcast master control of all connected DALI components is possible. This means that there is no need to commission DALI. Instead, you can start up the lighting systems with few functions quickly and easily with a simplified configuration without DALI commissioning. The main voltage connection supplies the DALI gateway and makes the DALI system voltage of DC 16 V available. You can mount the device on DIN rails.



EIB-programming only possible with mains supply connected

EIB-Programmierung nur bei ngeschlossener Netzspg. möglich

Figure 1: GRDALI-TWGW-KNX DALI-KNX Gateway

Product features

- Control of up to 64 DALI devices
- Master control of all connected DALI components
- · Automatic ECG replacement
- Individual or group addressing
- Emergency light management
- Effect control for dynamic lighting and color effects
- Manual operation of the DALI groups
- Disabling functions for each DALI group
- · Operating hours counter
- DALI: 16 VDC

Technical specifications

Table 1: GRDALI-TWGW-KNX technical specifications

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Specification	Description
Dimensions (H x W x D)	90 mm x 72 mm x 58 mm
Mounting	4 DIN modules
Connections	2 screw connectors by channel,
	maximum 4 mm²
Power supply	From KNX bus 21 VDC to 32 VDC SELV 110 VAC to 240 VAC (50/60 Hz), 110 VDC to 240 VDC

GRFCU-PR-KNX Fan Coil Unit controller

Use the Fan Coil Unit (FCU) controller to control fan coil units, floor heating, or switch actuators. Depending on the design of the device, use fan coil units in 2-pipe or 4-pipe systems. The FCU controls up to three fan speeds (relay or 0 V to 10 V outputs) as well as heating or cooling valves, proportional or electro-thermal valve, respectively. The mode of control is based on two-step control or a time-discrete PI controller with set-point or actual value comparison. Regulate valves and the fan directly by devices through the closed loop of this controller. In floor heating, the FCU controller can control up to seven channels. The floor heating channel control uses a time-discrete PI controller with setpoint or actual value comparison.

Figure 2: GRFCU-PR-KNX Fan Coil Unit controller



Product features

- · Three fan speeds
- Heating and cooling control
- · Control seven channels of floor heating
- Time-discrete Proportional Integral (PI) controller with setpoint or actual value comparison

Technical Specifications

Table 2: GRFCU-PR-KNX technical specifications

Specification	Description
Dimensions (H x W x D)	90 mm x 72 mm x 66 mm
Mounting	4 DIN modules
Connections	Screw terminal slotted head 0.2 mm ² to
	4 mm ²
Power supply	From KNX bus 21 VDC to 30 VDC SELV Dynamic current consumption: <20 mA Static current consumption: <5 mA
Input temperature	Local sensor: digital sensor, maximum
sensor	7 sensors, maximum cable length of
	50 m KNX: 1 or 2 group objects
Outputs	5 relay outputs: 10 A cos diameter, 1 VAC to 230 VAC 2 analog outputs: 0 VDC to 10 VDC, 10 mA for each channel

GRBO-xxCH-KNX universal module

GRBO are Din Rail two, eight, or twelve outputs 16 A actuators. Use to control four, eight, or twelve independent loads or lights, or control two, four, or six independent blinds or roller shutters with mechanical end position. Install this device on DIN rails.

Figure 3: GRBO-08CH-KNX universal module

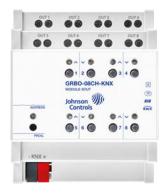


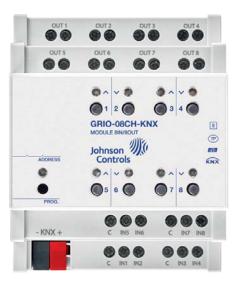
Table 3: GRBO-xxCH-KNX technical specifications

Specification	Description
Dimensions (H x W x D)	GRBO-04CH-KNX and GRBO-08CH-
	KNX : 90 mm x 72 mm x 58 mm GRBO-12CH-KNX : 90 mm x 159 mm x 58 mm
Mounting	GRBO-04CH-KNX and GRBO-08CH-
	KNX: 4 DIN modules
	GRBO-12CH-KNX: 9 DIN modules
Connections	2 screw connectors for channel
	maximum 4 mm²
Power supply	From KNX bus 21-32 VDC SELV
Specific outputs	Resistive loads: maximum 16 A
	Incandescent lamps: maximum 10 A
	Motors and motoreductor: maximum 10 A
	Fluorescent light electronic
	transformer: maximum 4 A
	Fluorescent lamps: maximum 140 μF, maximum 3A (700W)

GRIO-0xCH-KNX universal module

GRIO-04CH-KNX and GRIO-08CH-KNX are EIB/KNX DIN rail mounting devices that you can use to interface commands, for example, buttons, or loads for lamps, or any kind of application. The devices have four or eight binary inputs with clean contacts, and four or eight binary relay outputs. Connect the inputs to conventional switching devices, for example, buttons, switches, floating contacts, or to switch functions with pulse edge evaluation, rising or falling edge, or toggle. Configure inputs with ETS SW, configure as output to drive LEDs. Use inputs for on or off commands, dimming, shutter control, scenarios. Use outputs for switching function, scenarios, and control logic function.

Figure 4: GRIO-08CH-KNX universal module



Technical specifications

Table 4: GRIO_0xCH-KNX technical specifications

Specification	Description
Dimensions (H x W x D)	90 mm x 72 mm x 58 mm
Mounting	4 DIN modules
Connections	Inputs: 3 screw terminals every 2 inputs
	maximum 4 mm ² Outputs: 2 screw connectors for channel maximum 4 mm ²
Power supply	From KNX bus 21 VDC to 32 VDC SELV
Specific inputs	4 or 8 binary inputs for dry contacts Maximum length 30 m twisted cables
Specific outputs	Resistive loads: maximum 16 A Incandescent lamps: maximum 10 A Motors and motoreductor: maximum 10 A Fluorescent light electronic transformer: maximum 6 A Fluorescent lamps: maximum 140 µF, maximum 3 A (700W)

GRBO-16CHxx-KNX universal module 16 OUT PLUS

The DIN RAIL 16 Output Module is an EIB/KNX DIN rail mounting device with 16 relay outputs 16 A to 230 VAC. Connect digital inputs to free potential contacts to interface with sensors as well as conventional buttons. The device includes manual buttons for local relays switching and LEDs for operation indication.

Figure 5: GRBO-16CH-KNX universal module



Product features

You can configure the following outputs for the devices:

- Up to 16 independent load or light controls
- Up to 16 independent PWM electric valve controls, solenoid actuators
- Up to eight independent shutter or venetian controls
- Up to eight solenoid valves with 3-point control or ventilating grille
- Up to four independent 2-pipe fan coil actuators
- Up to two independent 4-pipe fan coil actuators

Table 5: GRBO_16CH-KNX technical specifications

Specification	Description
Dimensions (H x W x D)	90 mm x 144 mm x 60 mm
Mounting	8 DIN modules
Power supply	From KNX bus 21 VDC to 32 VDC SELV
Inputs	16 binary inputs for potential free contacts 4 inputs configurable as analog
Relay outputs	Resistive loads: maximum 16 A Incandescent lamps: maximum 10 A Motors and motoreductor: maximum 10 A Fluorescent light electronic transformer: maximum 6 A Fluorescent lamps: maximum 140 µF, maximum 3 A (700W)

GRIO-16CHxx-KNX universal module

The DIN RAIL 16 input or output module is an EIB/KNX DIN rail mounting device with 16 potential free and 16 relay outputs 16 A to 230 VAC. Inputs are for potential free dry contacts and can connect to buttons, switches, or as output LEDs. Use inputs for on or off commands, dimming, shutter control, scenes, sequences, or logic control functions. Configure four of the 16 inputs as analog to connect to NTC temperature probes and achieve up to four temperature sensor modules. It is also possible to combine two or three relays together with interlock to achieve 4-pipe or 3-speed fan coil actuators. The device includes manual buttons for local relays switching and LEDs for operation indication.

Figure 6: GRIO-16CHxx-KNX universal module



Product features

You can configure the following outputs for the devices:

- Up to 16 independent load or light controls
- Up to 16 independent PWM electric valve controls, solenoid actuators
- · Up to eight independent shutter or venetian controls
- Up to eight solenoid valves with 3-point control or ventilating grille
- · Up to four independent 2-pipe fan coil actuators

Technical specifications

Table 6: GRIO-16CHxx-KNX technical specifications

Specification	Description
Dimensions (H x W x D)	90 mm x 144 mm x 60 mm
Mounting	8 DIN modules
Power supply	From KNX bus 21 VDC to 32 VDC SELV
Inputs	16 binary inputs for potential free contacts 4 inputs configurable as analog
Relay outputs	Resistive loads: maximum 16 A Incandescent lamps: maximum 10 A Motors and motoreductor: maximum 10 A Fluorescent light electronic transformer: maximum 6 A Fluorescent lamps: maximum 140 µF, maximum 3 A (700W)

GRTEI8CH4RT-KNX analog-digital module

The module includes four digital inputs to interface dry contacts and four analog or digital inputs for dry contacts or temperature sensors and four LED outputs.

Digital inputs can interface sensors, and buttons, while four low voltage or current outputs channels drive LED signal indicators. Use configurable analog inputs for temperature controls and sensors. Inputs five to eight, set as analog inputs, enable up to two temperature probes with on or off threshold, and two thermostats to control heating and cooling systems valves, 2-pipe and 4-pipe fan coils.

Figure 7: GRTEI8CH4RT-KNX analog-digital module



Product features

- Four low voltage output channels to drive LED signal indicators
- Up to two temperature probes with on or off threshold
- Up to two thermostats to control heating and cooling systems
- · 2-pipe and 4-pipe fan coils

Table 7: GRTEI8CH4RT-KNX technical specifications

Specification	Description
Dimensions (H x W x D)	43 mm x 36 mm x 24 mm
Digital inputs	8 channels for dry contacts Channels 1 to 4 : maximum length 30 m twisted wires Wired with 0.2 mm² to 18 cm length Channels 5 to 8 : maximum length 10 m twisted wires Connection through 6-pin screw terminal
Analog inputs	Channels 5 to 8: configurable as temperature sensor with NTC Channels 5 to 6: configurable as thermostat
Digital outputs	4 outputs for driving LED 0.3 mA per channel Use with LED
Heating and cooling modes	Controls with HVAC mode or setpoint Setpoint modification through KNX bus 2-points on or off and PWM control algorithm 3-speed fan coil control Off mode on window open detection

GRIO-xCH-SI-KNX switch interface

The device interfaces to dry contacts with two or four input channels, for example, sensors, buttons, and two or four low voltage or current outputs for LED signal indicator lamps. These devices are extremely compact in size, 34 mm x 34 mm x 11 mm, for use in installations with reduced in-wall space. The digital inputs can interface sensors and buttons, the four low voltage output channels can drive LEDs for synoptic panels or switches. Outputs can drive low voltage LEDs. There are also eight blocks of logic functions freely configurable by ETS. The device contains a KNX communication interface.

Figure 8: GRIO-xCH-SI-KNX 2 and 4CH switch interface



Product features

- Two to four low voltage output channels to drive LED signal indicators
- Eight blocks of freely configurable functions
- KNX communication

Technical specifications

Table 8: GRIO-xCH-SI-KNX technical specifications

Specification	Description
Dimensions (H x W x D)	34 mm x 34 mm x 11 mm
Mounting	Flush-mounted wall box
Power	From bus KNX 21 VDC to 32 VDC SELV
Connections	Input and output: 12-pin cable
	connector 0.25 mm ²
Specific inputs	2 or 4 digital inputs for dry contacts Maximum length 10 m twisted cables Reading voltage: 3.3 VDC, internally generated
Specific outputs	2 or 4 outputs for driving LED Current or voltage for LEDs: 0.5 mA or 3.3 V

GRUDM-KNX-x universal dimmer

GRUDM is a KNX on or off dimmer 1-channel that acts as a master dimmer. Connect up to two subordinate modules with identical characteristics to the master on or off dimmer, that connects through a local 2-wire bus. Dimmers turn off part of the waveform of the input voltage, which results in reduced lamp output.

Figure 9: GRUDM-KNX-S universal dimmer



Product features

Use the GRUDM dimmer in one of the following configurations:

- Trailing Edge: the dimmer turns off part of the final part of the waveform of the input voltage to reduce lamp output. Use this load regulation for resistive or capacitive loads. For example, halogen lamps with electronic transformer or incandescent lamps.
- Leading Edge: the dimmer turns off part of the initial part of the waveform of the input voltage to reduce lamp output. Use this load regulation for inductive loads. For example, ferromagnetic transformers or toroidal. The three channels are independent and can operate on different phases of the same three phase systems to respect the limit of 230 VAC between phase and neutral.

Table 9: GRUDM--KNX-x technical specifications

Specification	Description
Dimensions (H x W x D)	90 mm x 72 mm x 58 mm
Mounting	4 DIN modules
Power supply	From bus KNX 21 VDC to 30 VDC SELV
	230 VAC 50/60 Hz
Specific outputs	Incandescent or halogen lamps: 20 W
	to 700 W Ferromagnetic transformer: 20 VA to 700 VA
	Electronic transformer: 20 VA to 700 VA Dimmable LED lamps: maximum 160 W Compact flouorescent lamps, ESL or CFL: maximum 160 W

GRDM-xCH-KNX-M dimmer

GRDM-2CH-KNX-M and GRDM-4CH-KNX-M are KNX universal on or off dimmers, 2-channels or 4-channels with automatic identification of load type and adjustable parameters to optimize control of different lamps such as LED, incandescent, halogen, and CFL dimmable lights, low voltage lamps with electronic or ferromagnetic transformer. Dimmers turn off part of the waveform of the input voltage to reduce lamp output and load control is possible in leading and trailing edge.

Figure 10: GRDM-2CH-KNX-M dimmer



Table 10: GRDM-xCH-KNX-M technical specifications

Specification	Description
Dimensions (H x W x D)	GRDM-2CH-KNX-M : 90 mm x 72 mm x 58 mm GRDM-4CH-KNX-M : 90 mm x 142 mm x 62 mm
Mounting	GRDM-2CH-KNX-M: 4 DIN modules GRDM-4CH-KNX-M: 8 DIN modules
Connections	Power supply or load cable: maximum 4 mm ² or AWG 11
Power supply	From EIB/KNX bus: 21 VDC to 32 VDC Current consumption from KNX: 10 mA From mains: 230 VAC 50/60 Hz GRDM-2CH-KNX-M: Dissipated on or off: 3.5W GRDM-4CH-KNX-M: Dissipated on or off: 6.8W maximum, 1.7W x channel
Allowed loads	Incandescent or halogen lamps: 300 W maximum to 230 VAC 50/60Hz Ferromagnetic transformer suitable for dimming with secondary winding closed on resistive load
	Halogen lamps 12 or 24V: 200 VA maximum to 230 VAC 50/60Hz, electronic transformers with secondary winding closed on resistive load Halogen lamps 12 or 24V: 300 VA maximum to 230 VAC 50/60Hz Dimmable LED lamps: 230 VAC to maximum 60 W
	Compact fluorescent lamps, ESL or CFL: 230 VAC to maximum 60 W

GRHA-0xCH-KNX electrothermal valves

The GRHA-04CH-KNX and GRHA-08CH-KNX devices are EIB/KNX DIN rail modules for electrothermal valves with four or eight Triac outputs at 24 VAC to 230 VAC. The devices include four or eight inputs for dry, potential-free contacts. Each thermostat module manages two stages with an integrated PI controller to control heating and cooling equipment, valves, and 2-pipe or 4-pipe fan coils. Configure the outputs as channels for valve control in on or off or PWM, or channels for 3-point valve control. The device contains KNX communication interface for installation on DIN rails in LV distribution cabinets.

Configure the outputs as:

- Four or eight channels for valve control in on or off or PWM
- Two or four channels for 3-point valve control

Figure 11: GRHA-08CH-KNX electrothermal valves



Product features

- Connect inputs to buttons or potential-free switches for on or off commands, dimming, shutters or blinds scenarios, sequences, or step commands
- Configure inputs 1 to 4 as outputs to activate single signaling LEDs or as analog inputs to connect NTC temperature probes to send temperature measurements on the bus, or to manage four complete thermostat modules
- Each thermostat module manages four stages with an integrated PI controller to control heating and cooling equipment, valves, 2-pipe and 4-pipe fan coils.
- The device includes four additional thermostat modules for a total of eight
- Use eight logic blocks to implement simple expressions with logical or threshold operator or complex expressions with algebraic and conditional operators
- Use predefined algorithms as proportional controls of temperature and humidity or dew point calculation
- The device contains KNX communication interface for installation on DIN rails in LV distribution cabinets

Technical specifications

Table 11: GRHA-0xCH-KNX technical specifications

Specification	Description
Dimensions (H x W x D)	90 mm x 72 mm x 58 mm
Mounting	4 DIN modules
Connections	Maximum wire gauge solid and
	stranded: 2.5 mm²
Power supply	From KNX bus 21 VDC to 32 VDC SELV
Specific inputs	For free potential contacts, dry
	contacts, maximum length of twisted
	cables: 30 m
Specific outputs	Voltage 24 VAC to 230 VAC 50/60Hz Rated current per output: 500 mA Inrush current, every group of 4 outputs: 4 A Maximum valves at 24 VAC: ≤3 Maximum valves at 230 VAC: ≤4

GRUDM4CH110-KNX channel dimmer

The GRUDM-4CH-1-10-KNX is a KNX 4-channel dimmer with switching and brightness settings for lamps that operate with 110 V interface.

Figure 12: GRUDM4CH110-KNX channel dimmer



Product features

- Manual switching of the relays is independent of the bus
- Switching of capacitive loads and the resulting high switch-on currents
- Flexible assignment of control inputs to switching outputs, for example, to control RGBW lamps
- Operation of the switching outputs as a switching actuator
- Connection of external conductors
- No additional on or off supply necessary
- Feedback of switching state and brightness value
- Switch position display
- Burn-in function for fluorescent lamps
- · Set switch-on and dimming behavior
- Time functions: switch-on delay, switch-off delay, staircase lighting timer with run-on time
- Operating hours counter

Technical specifications

Table 12: GRUDM4CH110-KNX technical specifications

Specification	Description
Dimensions (H x W x D)	86 mm x 72 mm x 66 mm
Mounting	4 DIN modules
Connections	Power supply and load cable: 2.5 mm ²
Power supply	From EIB/KNX bus 21 VDC to 32 VDC Constant consumption from KNX: maximum 6 mA
Allowed loads	Lamp loads: Incandescent lamps 3680 W HV halogen lamps 3680 W LV halogen lamps with inductive transformer 2000 VA LV halogen lamps with tronic transformer 2500 W Fluorescent lamps T5/T8 uncompensated 3680 W, parallel compensated 2500 W/200 µF, twin-lamp circuit 3680 W / 200 µF Compact fluorescent lamps uncompensated 3680 W, parallel compensated 2500 W/200 µF Mercury vapor lamps uncompensated 3680 W, parallel compensated 3680 W, parallel compensated 3680 W, parallel compensated

Related documentation

Refer to the installation guides in Table 13 for details on how to install and operate the products.

Table 13: Installation guides

Document number	Document title	
LIT-12013586	GRBO-4CH-KNX GRBO-8CH- KNX GRBO-12CH-KNX Universal DIN Module 4 – 8 - 12 Output	
LIT-12013588	GRDALI-TWGW-KNX DALI Gateway Plus TW	
LIT-12013590	GRDM-2CH-KNX-M Universal Dimmer DIN Module 2 Channels – 2 x 300W	
LIT-12013592	GRFCU-PR-KNX Fancoil Controller Unit	
LIT-12013593	GRIO-4CH-KNX Din Rail 4 Input/4 Output Module	
LIT-12013594	GRIO-16CH-KNX GRIO-16CH- SD-KNX Universal Actuator 16 Inputs/16 Outputs Plus and GRBO-16CH- KNX GRBO-16CH-SD-KNX Universal Actuator 16 Outputs Plus	

Table 13: Installation guides

Document number	Document title	
LIT-12013595	GRIO-2CH-SI-KNX Inwall 3 Input/2 Output Module KNX	
LIT-12013596	GRIO-2CH-SI-KNX Inwall 2 In/2 Led Out module KNX and GRIO-4CH-SI-KNX Inwall 4 In/ 2 Led Out module KNX	
LIT-12013602	GRUDM-4CH-1-10-KNX Dimmer 4 channels x 1-10V	

Repair information

If a product fails to operate within its specifications, replace the unit. For replacements, contact your Johnson Controls representative.

Ordering information

Contact your Johnson Controls sales representative to order a product listed in the following table.

Table 14: Selection chart

Product order code	Description	
GRDALI-TWGW-KNX	KNX DALI Gateway plus tunable, white	
GRFCU-PR-KNX	Fancoil Controller Unit proportional 0 V to 10 V	
GRBO-04CH-KNX	Universal module 4 OUT PLUS	
GRBO-08CH-KNX	Universal module 8 OUT PLUS	
GRBO-08CHSD-KNX	Universal module 8 OUT PLUS + SD CARD	
GRBO-12CH-KNX	Lights, shutters, manual control	
GRIO-04CH-KNX	Universal module 4 IN 4 OUT PLUS	
GRIO-08CH-KNX	Universal module 8 IN 8 OUT PLUS	
GRIO-08CHSD-KNX	Universal module 8 IN 8 OUT PLUS + SD CARD	
GRBO-16CH-KNX	Universal module 16 OUT PLUS	
GRBO-16CHSD-KNX	Universal module 16 OUT PLUS + SD card	
GRIO-16CH-KNX	Universal module 16 IN or 16 OUT PLUS	
GRIO-16CHSD-KNX	Universal module 16 IN or 16 OUT PLUS + SD card	
GRTEI8CH4RT-KNX	Analog or digital module 8 IN or 4 LED OUT with 4 thermostats	
GRTE-SEN	Temperature probe	
GRTE-SEN-2	External temperature probe	
GRIO-4CH-SI-KNX	4 channels switch interface, LED outputs	
GRIO-2CH-SI-KNX	2 channels switch interface, LED outputs	
GRUDM-KNX-M	Universal dimmer master, DIN 1 OUT, 700 W	
GRUDM-KNX-S	Universal dimmer subordinate, DIN 1 OUT, 700W	
GRDM-4CH-KNX-M	Dimmer 4 OUT 300 W or 2 OUT 300 W	
GRDM-2CH-KNX-M	Dimmer 2 OUT 300 W or 1 OUT 300 W	
GRHA-04CH-KNX	Electrothermal valves actuator 4 IN 4 OUT	
GRHA-08CH-KNX	Electrothermal valves actuator 8 IN 8 OUT	
GRUDM4CH110-KNX	Dimmer 4 CH 1 V to 10 V	

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/ buildingswarranty.

Software terms

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Patents

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