Lunatone

DALI-2 Expander 3



Datasheet

DALI-System Extension

Device for DALI-line expansion
with integrated bus power supply
for 3 DALI sub-circuits

Art. Nr. 89452937-3

Datenblatt Deutsch:
www.lunatone.com/wp-content/uploads/2026/06/89452937-3_DALI-2_Expander3_GER_D0148.pdf

DALI-2 Expander 3 DALI System Extension

Overview

- Device for DALI-line expansion
- Control of several DALI-devices via 3 DALI-addresses
- 3 DALI outputs (DALI A,B,C) with integrated DALI power supply (50mA each) for powering control gear and control devices
- For the superordinate DALI circuit the DALI expander acts like 3 separate DALI control gear – 3 DALI addresses, one for each subnet (A, B, C)
- Forwarding commands received at the input (DALI IN) to the corresponding output (DALI A, B, C) broadcast
- Alternative control options of the DALI-output circuits via Switch&Dim-inputs (Broadcast).
- Group commands are passed from one to the other output circuits (cross function)
- Galvanic isolation between DALI-input and DALI-outputs
- Independent control gear for remote ceiling an integration in luminaires

Specification, Characteristics

type	**DALI-2 Expander3**
article number	89452937-3

input: L, N	
input type	supply, mains-voltage
marking terminals	L, N
input voltage range	120Vac … 240Vac
max. input supply current	40mA (@120Vac), 20mA (@240Vac)
input supply frequency	50Hz / 60Hz
max. power consumption	5,3W
startup time	250ms

input: DA, DA	
input type	DALI control input
marking terminals	DA, DA
input voltage range	9,5V … 22,5V
max. current consumption DALI	2mA

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input: L'A, L'B, L'C, N	
input type	SwitchDim - control input
marking terminals	L'A, L'B, L'C, N
input voltage range	230Vac
input supply frequency	50Hz/60Hz
control impulse length min.	40ms
control impulse length long press	500ms
max. wire length	10m - 15m depending on type of installation and interference fields.

output: DA+, DA-A, DA-B, DA-C	
output type	3x DALI supply
marking terminals	DA+, DA-A, DA-B, DA-C
output voltage range	12Vdc … 20,5Vdc
guaranteed DALI supply current	3x50mA
open circuit proof	yes
short circuit proof	yes

insulation data	
impulse voltage category	II
pollution degree	2
rated insulation voltage	250V
insulation DALI-output (DA+,DA-A,B,C) / supply (L,N) DALI-input / DALI output (DA+,DA-A,B,C) DALI-input / supply (L,N)	reinforced isolation
insulation test voltage DALI-output/mains	3000Vac

environmental conditions	
storing and transportation temperature	-20°C … +75°C
operational ambient temperature	-20°C … +60°C
rel. humidity, none condensing	15% … 90%

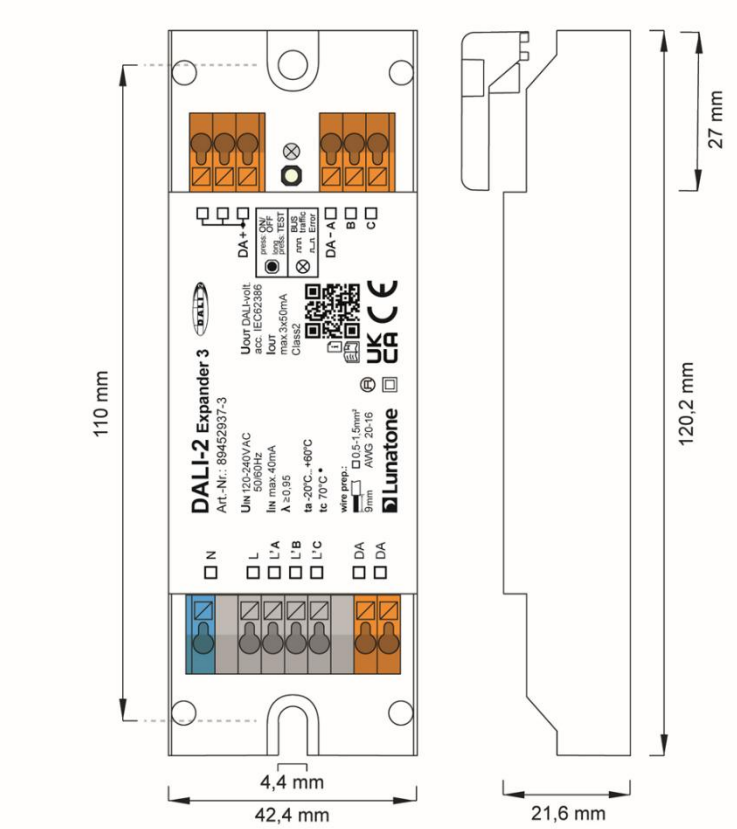
general data	
dimensions (l x w x h)	120mm x 42mm x 22mm
mounting	remote ceiling integration in class II devices
rated max. temperature tc	70°C
expected life time @tc	50.000 h
protection class	II in intended use
protection degree	IP20

terminals	
connection type	spring terminal connector
wire size solid core	0,5 … 1,5 mm^2 (AWG20 … AWG16)
wire size fine wired	0,5 … 1,5 mm^2 (AWG20 … AWG16)
wire size using wire end ferrule	0,25 … 1 mm^2
stripping length	8,5 … 9,5mm / 0,33 … 0,37inch
release of wire	push button

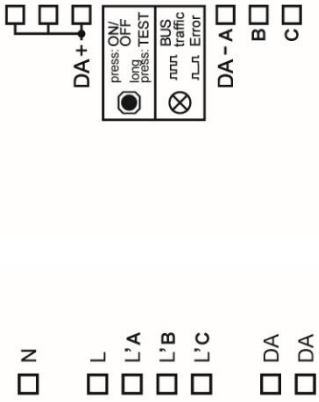
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standards

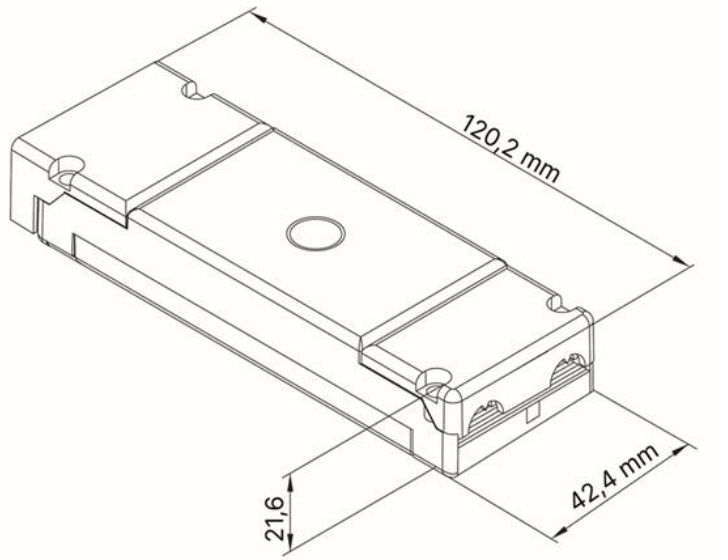
DALI	EN 62386-101
EMC	EN 61547 EN 50015 / IEC CISPR15
safety	EN 61347-2-11 EN 61347-1
markings	DALI-2, CE, UKCA

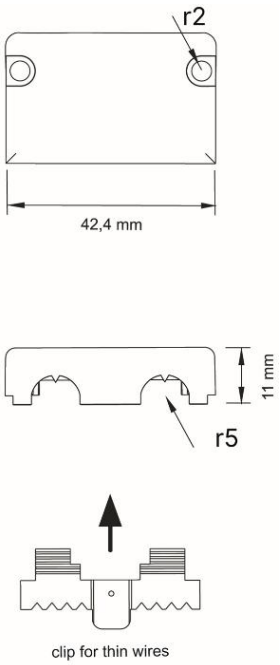


dimensions



connection plan





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Factory Default Settings

Ignore broadcast	disabled
Repeat last light level	disabled
DALI device type selection	none
behavior on system failure input side	output side also bus power off
Repeat configuration	disabled

Output specific settings	Output A	Output B	Output C
DALI groups	none		
Min Level	0.1%		
Max Level	100%		
Power On Level	MASK		
Fade time	1s		
Fade rate	89.4 steps/s		
Scenes 0-15	inactive (MASK)		

Installation

- The DALI-2 Expander-3 is intended for remote installation in the ceiling or in an enclosure, ensure proper cable relief for installation in protection class II devices
- Wiring as fixed installation in a dry and clean environment
- Installation only by qualified person when no voltage is applied
- Attend regulations regarding electrical installations of national authorities
- connect power supply terminals L and N to mains voltage
- the polarity of the output voltage is marked on the housing (DA+, DA- (A,B,C))
- The DALI-line may be installed within the same cable or as single conductors within the same tube as mains supply
- The DALI-line must not be connected to the mains or other extra low voltage systems
- DALI-line wiring with standard low voltage installation material
- Wiring topology of the DALI-line: Line, Tree, Star
- Wiring check by pressing the test button:

  short press: recalls MAX broadcast, DALI-2 Expander's LED flashes.
  Another short press sends broadcast OFF, the LED on the DALI-2 Expander turns on and indicates bus traffic (normal operation).

  long press: all luminaires connected to the DALI system will be controlled by a test sequence (on, off, dimming). The LED on the DALI-2 Expander flashes as long as the test sequence is active. The test sequence can be stopped with a short press of the test button. The test mode is automatically stopped when a DALI command is received on the DALI bus input side. (periodic repetitions (see section "Command repetition" page 9) are deactivated while the test mode is active) With ending the test mode the LED on the DALI-2 Expander goes back to normal operation (= on[Error! Bookmark not defined.] and s hortly flashing on bus traffic).

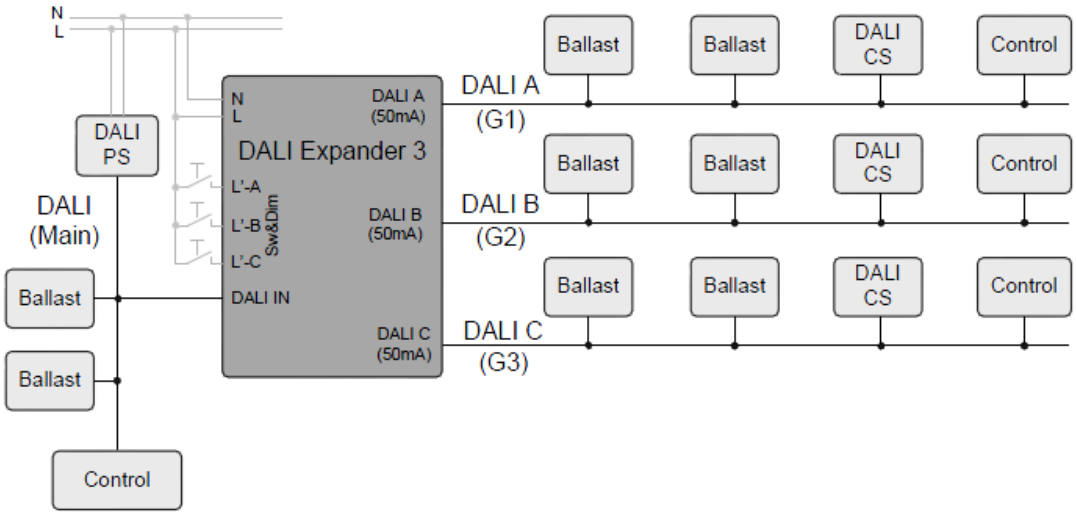
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Attention: an unsuitable DALI power supply can cause damage of the DALI devices!
Do not use standard DC power supplies on the DALI-line, since they do not meet the requirements for DALI communication.

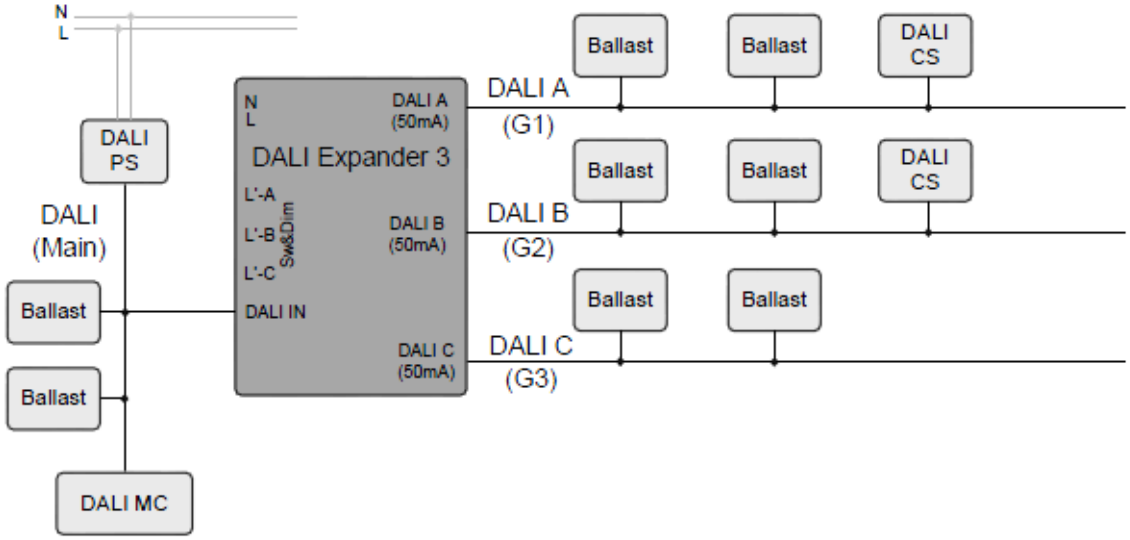
Attention: The DALI-signal is not classified as SELV circuit (Safety Extra Low Voltage). Therefore, the installation regulations for low voltage apply.

The voltage drop on the DALI line must not exceed 2V at maximum length (300m) and maximum bus load (250mA).

Typical Application

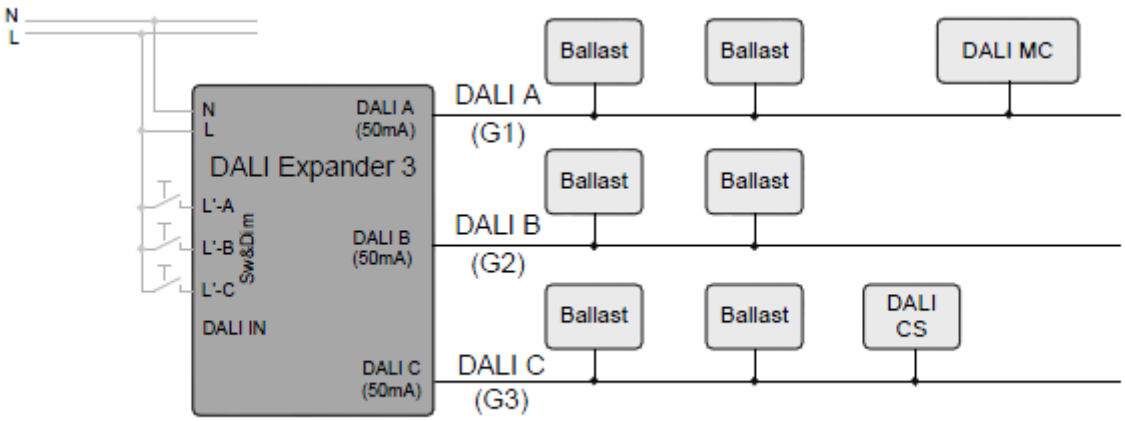


Expansion of a DALI-circuit (Main) with up to three DALI-sub-circuits



DALI input circuit available (separate DALI PS required). Control of DALI-sublines via short addresses from the DALI-Main-circuit as well as with controls (e.g. DALI-2 CS) across the output circuits via groups

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Stand Alone solution without DALI-circuit at the input. Control of the DALI output lines with Switch&Dim inputs or with controls in the output circuits (e.g. DALI MC or DALI CS) – if the DALI CS sends control commands to Group 5, per factory default line A and line C will receive this command broadcast

Commissioning

- After installation the DALI-2 Expander 3 is ready for operation.
- It must be ensured that the maximum current consumption of the DALI devices on the output side does not exceed the guaranteed output current (50mA per line) of the DALI-2 Expander 3.
- The SwitchDim inputs and DALI-Broadcast commands can be used to control the device immediately (note: maximum cable lengths for SwitchDim: 10-15m (depending on the version and interference fields)).
- The DALI-2 Expander 3 can be addressed with the DALI Cockpit PC Software. When using the DALI Cockpit Software, the PC must be connected to the DALI bus via a suitable interface module (DALI-2 USB; DALI USB, DALI-2 WLAN, DALI-2 Display, DALI-2 IoT, DALI 4Net, DALI SCI RS232). The DALI-2 Expander 3 is automatically recognised by the DALI Cockpit during the addressing process and listed in the device overview.
- Scene values, groups and other DALI settings of the devices at the output sub-line can be configured in the DALI Cockpit via the DALI-2 Expander 3 device page. Also, settings of the DALI-2 Expander 3 itself are available, see section “Function” page 8.
- Status-LED:
  - On, briefly lighting up during bus traffic/activity: normal operation Error! Bookmark not defined.
  - flashing 50% on: test-mode active
  - flashing 90% on: error (e.g. bus short, no bus supply) on output and/or input side

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Function

The DALI-2 Expander 3 can be used for DALI-line expansion. For each of the three DALI-outputs the device provides an integrated DALI power supply (50mA).

Each of the 3 DALI subnets is represented by a DALI short address at the input and commands sent to these addresses are forwarded to the corresponding output broadcast. Hence all connected ballasts on an output-circuit can be controlled simultaneously via a single short address.

For command forwarding there are no device type specific restrictions. DALI-2 commands such as “Go to Last Active Level” are also supported.

The test button can be used to start and stop a test sequence for testing the DALI sub-lines.

Switch Dim Functionality

An alternative for control of the output circuits are the Switch&Dim inputs (short press: On/Off, long press: Dim), as a result the device can be used as stand-alone solution without DALI-circuit on the input.

With Switch Dim a short press toggles between OFF and the last active light level, a long press allows dimming up and down the light level.

DALI Functionality

The DALI parameters: scenes, min level, max level etc. can be defined on the device pages of the DALI-2 Expander 3 for each output. By saving, the DALI settings are broadcast to all devices at the output. Without saving, the DALI-2 Expander 3 does not overwrite the dimmer settings. During operation, commands are forwarded; with the settings in the dimmers defining the output.

Group Connection between outputs
For the transmission of DALI commands between the output lines group commands can be used, e.g. for controlling 2 of the output lines with one DALI CS sensor on the third output line only.

A group command is forwarded broadcast as listed below:

G1 -> DALI A
G2 -> DALI B
G3 -> DALI C
G4 -> DALI A + DALI B
G5 -> DALI A + DALI C
G6 -> DALI B + DALI C
G7 -> DALI A + DALI B + DALI C
G8-15 -> no forwarding

Assigned DALI Group
When DALI groups are assigned to an expander output, these groups apply to the input side. DALI commands sent to this assigned DALI group on the input side are broadcast to the corresponding output side.

Periodic Sending of Device Settings
With the option “periodic sending of device settings”, the DALI device settings entered (scenes, min. level, max. level, power-on level, system failure level, fade time, fade rate) are transmitted periodically (10 minutes) to the DALI output side. Therefore, devices on the DALI output side can be easily replaced
(As delivery default the feature is not enabled)

Behaviour on System Failure on input side
The behaviour on the DALI output side (secondary) in case of a system failure on the input side (primary) can be configured. Following options are available:

- output side also bus power off
- output side bus power off for 650 msec
- output side bus power remains on

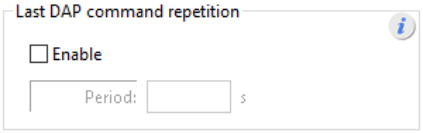
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- send RECALL MAX (after 600 msec)
- send RECALL MIN (after 600 msec)
- send configured system failure level DAP (after 600 msec)

If SwitchDim operation is detected, the bus supply is always switched on.

Command repetition

The last sent light level command (DAP) can be repeated on the output sides with a defined period. This feature ensures that after a phase failure and voltage recovery the luminaires return to the desired light level and do not remain at the power-on level.



Ignore Broadcast commands

It can be set that the DALI-2 Expander 3 does not listen to or forward broadcast commands. If enabled the DALI-2 Expander 3 will only forward commands that are sent to his own address or groups.

DALI device type

It can be set with which DALI device type the Expander answers to the DALI query “QUERY DEVICE TYPE” on the input side. There are no restrictions regarding forwarding of device-type specific control commands. However, the DALI-2 Expander 3 does not support feedback on device type specific queries, e.g. querying DT8 values (color, color temperature).

Queries – query lamp failure

A LAMP FAILURE of the DALI sub-lines can be queried. Because of the strict DALI-Timing the answer from the DALI sub-line is not received in time - to get a valid response, the query must be sent twice in a row.

DALI commands:

Query	Answer on Lamp Failure
Query Actual Level	255
Query Status	Bit [1] =1
Query Lamp Failure	YES

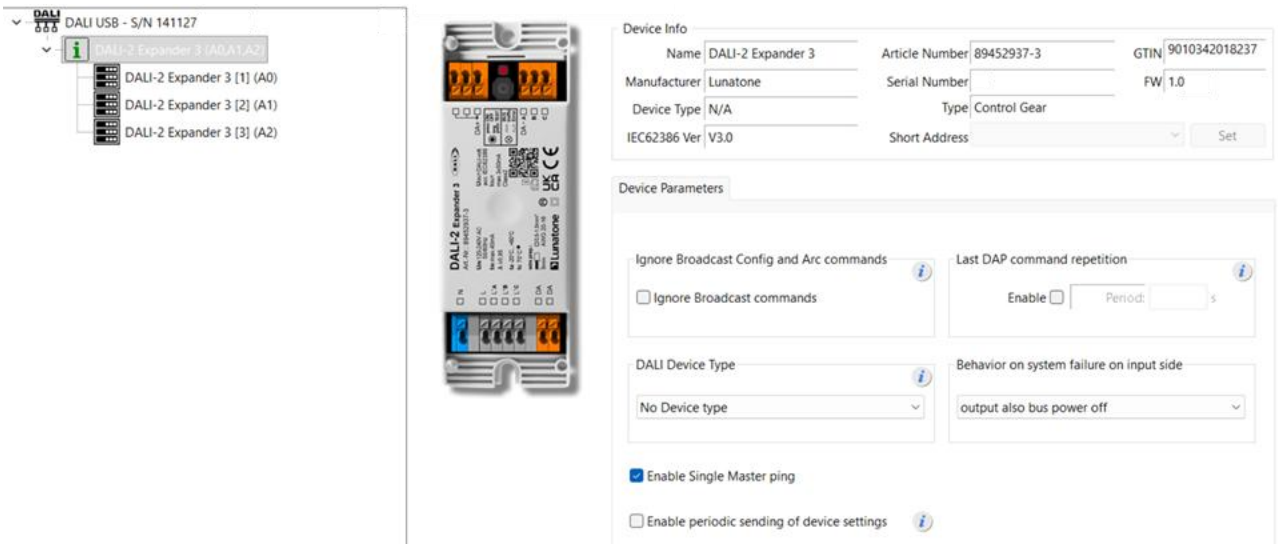


Figure 1 DALI Cockpit Configuration, overview device page - common settings

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Figure 2 DALI Cockpit Configuration output specific settings (same settings for each output)

Purchase Order Information

ArtNr. 89452937-3: DALI-2 Expander 3, device for DALI-line expansions with 3 subnets and integrated 50mA bus power supply for each line

Additional Information and Equipment

DALI-Cockpit – DALI system configuration tool, free when using a Lunatone interface device
https://www.lunatone.com/en/product/dali-cockpit/

Lunatone datasheets, manuals and software
http://www.lunatone.com/en/downloads-a-z/

Lunatone DALI products
http://www.lunatone.com/en

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Disclaimer

Subject to change. Information provided without guarantee. The datasheet refers to the current delivery.

The compatibility with other devices must be tested in advance to the installation.

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