

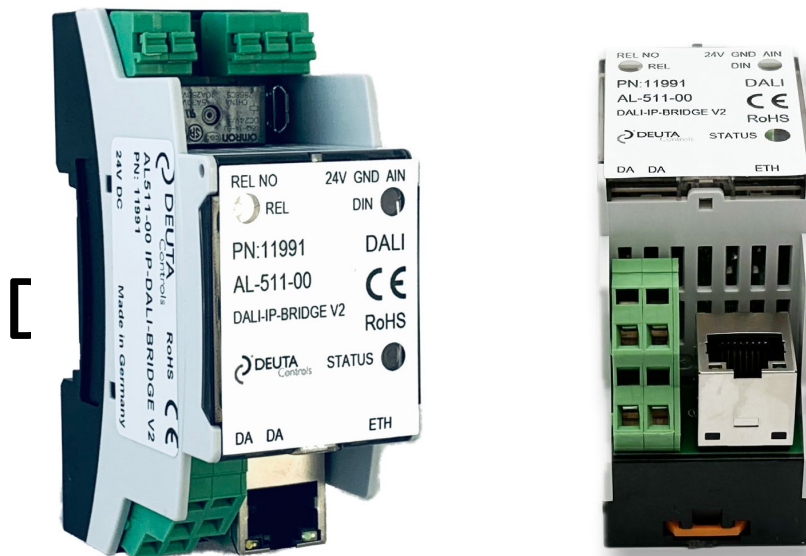
AL-511-00 IP-DALI-BRIDGE V2

Ethernet to DALI interface, between Ethernet (MODBUS TCP) and DALI (V1)

Article no.: 11991

Interfaces:

1x DALI Master, 1x Ethernet (10/100), RJ45, supply voltage: 24 V DC



The **AL-511-00 IP-DALI BRIDGE V2** is a universal module for the simplest communication between a DALI line and an Ethernet-based controller. MODBUS TCP is used as the data exchange protocol for writing and reading DALI commands and response telegrams.

The device is supplied with 24 V DC (+/- 10%) direct voltage.

The IP address of the AL-511-00 is set via the USB interface of the device and a PC tool, which can be downloaded free of charge from the homepage.

Technical data

Interfaces

Type	DALI Master
Quantity	1
Output current	-
Input voltage	Type. 16V DC (+/- 5%)
Galvanic isolation	Yes

Type	Relay output
Quantity	1 NO contact
Max. Current	5A
Max. Voltage	30 V DC / 250 V AC

Type	Analog input *1
Quantity	1
Input voltage	0...30 V DC
*1	Signal is also evaluated digitally ; threshold values freely adjustable via MODBUS registers

Type	Ethernet (10/100)
Quantity	1
Connection	RJ45
Default IP address	192.168.1.40

User interfaces

Reset button	Yes
Service LEDs	1x relay output status 1x digital input status 1x device status

Housing / connection technology

Connection technology	Spring clamps
Housing	UL-V0, light gray

Supply

Supply voltage	24 V DC (+/- 10%)
Power consumption	Type. 1.0 W, max 1.5 W

Ambient conditions

Operating temperature	0°..+40°C
Storage temperature	-40°..+70°C
Air humidity	10..95% relative humidity, non-condensing
Protection class	IP20

Dimensions and weight

Weight	72 g
Dimensions	94 x36 x 60 mm (2TE)

Standards / Approvals

CE	2014/53/EU RED Directive 2011/65/EU RoHS Directive
Standards	EN 62368-1:2014 + AC:2015 EN/IEC 61000-4-2 EN/IEC 61000-4-3 EN/IEC 61000-4-4 EN/IEC 61000-4-5 EN/IEC 61000-4-6

Brief description

Power supply

The **AL-511-00 IP-DALI-BRIDGE V2** is supplied with 24 V DC (+/- 10%) direct voltage.

DALI Master

The **AL-511-00 IP-DALI-BRIDGE V2** communicates bi-directionally with up to 64 connected DALI slaves / ballasts of a DALI line. Communication takes place in the send and receive direction via Ethernet / MODBUS TCP. There are 128 transmit and 128 receive registers available.

Note: The device does not have an internal DALI power supply unit. This is available, for example, under item number 12053 / AL-520-00 DALI POWER SUPPLY.

Analog input with additional digital evaluation / "DIN" status LED

The **AL-511-00 IP-DALI-BRIDGE V2** has an analog input with a measuring range of 0V to 30V DC. The analog value is available to the user via a MODBUS register.

A value in % is also available, which refers to an input measured value of 0..10V.

The analog value is pre-processed by the device and provided as digital / binary information (0/1). The switching thresholds are pre-assigned with Din = 0 with $U_{in} < 5,000\text{mV}$ and Din = 1 with $U_{in} > 15,000\text{mV}$.

The values for the two switching thresholds can be freely selected via two MODBUS registers.

Relay output / status LED "RELAY"

The **AL-511-00 IP-DALI-BRIDGE V2** has a universal relay switching contact. This is controlled via a MODBUS register. In addition, the status of the relay can also be operated in remanent mode, so that the last switching status is resumed even after voltage recovery.

RESET button / "SERVICE" status LED

The **AL-511-00 IP-DALI-BRIDGE V2** has a RESET button to restart the device if required.

IP address

The factory setting is **192.168.1.40**. This can be changed via the USB socket and the freely available configuration tool "DC Config".

Functional description / MODBUS register table

The **AL-511-00 IP-DALI-BRIDGE V2** serves as a bidirectional interface between an Ethernet-based control system and DALI-capable components of a DALI line, such as LED drivers, push-button couplers or switch actuators. The following register table enables communication with the IP-DALI-Bridge:

HOLDING-Reg., Generic Modbus (0-based)	HOLDING-Reg., Modicon Modbus (1-based)	Contents	r/w	Value range	Unit	Factory setting
400000	400001	Factory setting	rw		digit	0
400001	400002	HW Stand main	ro	0-99	digit	remains
400002	400003	HW Stand Next to	ro	0-99	digit	remains
400003	400004	SW Stand main	ro	0-99	digit	remains
400004	400005	SW Stand Next to	ro	0-99	digit	remains
400005	400006	Serial number LSB	ro	free	digit	remains
400006	400007	Serial number MSB	ro	free	digit	remains
400007	400008	Free field access	rw		digit	0
400008	400009	Free text	rw	ASCII	digit	remains
400009	400010	Free text	rw	ASCII	digit	remains
400010	400011	Free text	rw	ASCII	digit	remains
400011	400012	Free text	rw	ASCII	digit	remains
400012	400013	Free text	rw	ASCII	digit	remains
400013	400014	Free text	rw	ASCII	digit	remains
400014	400015	Free text	rw	ASCII	digit	remains
400015	400016	Free text	rw	ASCII	digit	remains
400016	400017	Free text	rw	ASCII	digit	remains
400017	400018	Free text	rw	ASCII	digit	remains
400018	400019	IP	rw	IP	digit	192.168
400019	400020	IP	rw	IP	digit	1.40
400020	400021	MAC	ro	MAC	digit	device
400021	400022	MAC	ro	MAC	digit	device
400022	400023	MAC	ro	MAC	digit	device
400023	400024	Analog input mV	ro	0-50000	mV	remains
400024	400025	Analog input percent	ro	0-100	Percent	remains
400025	400026	Di Threshold Low	rw	0-30000	mV	5000
400026	400027	Di Threshold High	rw	0-30000	mV	15000
400027	400028	Digital input	ro	0-1	digit	remains
400028	400029	Digital outputCurrent	rw	0-1	digit	0
400029	400030	Digital outputRemanent	rw	0-1	digit	0
400030	400031	Chip temperature	ro	-500-1500	1/10°C	Remains
400031	400032	Analog input offset	rw	-100-100	mV	Remains
400032	400033	Analog input gradient	rw	-500-500	digit	Remains
400033	400034	DALI bus voltage OK	ro	0-1	digit	Remains
400034	400035	NetMask	rw	Mask	digit	Remains
400035	400036	NetMask	rw	Mask	digit	Remains
400036	400037	Additional DALI Tx pause	rw	0-1000	ms	0
400037-400099	400038-400100	free				
400100	400101	DALI push-button 0				
400101	400102	DALI push-button 1				

HOLDING-Reg., Generic Modbus (0-based)	HOLDING-Reg., Modicon Modbus (1-based)	Contents	r/w	Value range	Unit	Factory setting
...	...					
400136	400137	DALI push-button 36				
400137-400998	400138-400999	free				
400999	401000	DALI Execute	rw	0-0xFFFF		
401000	401001	DALI command 0	w	0-0xFFFF		0
401001	401002	DALI command 1	w	0-0xFFFF		0
...	...	...	...	...	...	...
401127	401128	DALI command 127	w	0-0xFFFF		0
401128-401999	401129-402000	free				
402000	402001	DALI response 0	ro	0-0xFFFF		0
402001	402002	DALI response 1	ro	0-0xFFFF		0
...	...	...	...	...	...	...
402127	402128	DALI response 127	ro	0-0xFFFF		0

Functional description / Transparent writing of DALI commands

There are a total of 128 DALI command registers in the range from 401000/401001 (0-based/1-based) to 401127/401128 for transparent output of commands on the DALI bus.

New from firmware 1.2:

The range of DALI command registers is logically organized into 8 ranges of 16 registers each. Each area can be written to first. The default value is 0xFC00.

	Bit 7 = Block 7	Bit 6 = Block 6	Bit 5 = Block 5	Bit 4 = Block 4	Bit 3 = Block 3	Bit 2 = Block 2	Bit 1 = Block 1	Bit 0 = Block 0
HOLDING-Reg., Generic Modbus (0-based)	401112- 401127	401096- 401111	401080- 401095	401064- 401079	401048- 401063	401032- 401047	401016- 401031	401000- 401015
HOLDING-Reg., Modicon Modbus (1-based)	401113- 401128	401097- 401112	401081- 401096	401065- 401080	401049- 401064	401033- 401048	401017- 401032	401001- 401016

In order to output the data in the correct sequence or with an ascending address on the DALI, the data is only sent after setting the corresponding Execute flag in the DALI Execute register at 400999 or 401000.

Examples:

- Send block 0 -> Write **0x0001** to register 400999 or 401000.
- Send block 1,2 and 3 -> Write **0x000E** to register 400999 or 401000.
- Send all blocks -> Write **0x00FF** to register 400999 or 401000.

This applies to all commands described in the DALI standard (DIN EN 62386-102 (VDE 0712-0-102):2010-04).

For DALI commands that request or expect a response from one of the DALI devices, e.g. command 144 / "QUERY STATUS", the response is already available in the corresponding DALI response register.
The address of the corresponding response register is always that of the DALI command register +128 (decimal).

Example:

After writing command 144 "QUERY STATUS" in register "DALI command 1" (401000/401001) and setting the flag DALI Execute (400999/401000) = 0x0001, the response is in register "DALI response 1" (402000/402001).

The DALI response is composed as follows:

Highbyte:

0: ANSWER_NOT_AVAILABLE
1: ANSWER_NOTHING_RECEIVED
2: ANSWER_GOT_DATA
3: ANSWER_INVALID_DATA
4: ANSWER_TOO_EARLY

Lowbyte:

Data on the DALI bus

New from version 1.2: Customizable write cycles on the DALI bus:

In cases where there may be timing problems on the ballast side due to rapid transmission of the AL-511-00 IP-DALI-BRIDGE, it is possible to configure a delay in the range of 0 to 1000ms between the individual telegrams.

This is done via the "Additional DALI Tx Pause" register (400036/400037). The factory setting is 0 ms.

Important: After a firmware update, reset the AL-511-00 IP-DALI-BRIDGE to the factory settings or set the register manually to the value 0!

Functional description / control of the relay

Writing a "1" to the "Digital output current" register (400028/400029) (0-based/1-based) sets the digital output or closes the relay contact. A "0" resets the output accordingly or opens the contact.

If the relay is to assume the old switching state again after voltage recovery, write access is made to the "Digital output remanent" register (400029/400030) (0-based/1-based).

Functional description / evaluation of the analog/digital input

The measured analog value is available in register 400024/400025 in [mV] and in register 400024/400025 as a value in [%] of the measuring range end value = 30,000 mV.

In addition, pre-processing takes place in the device, which provides a simple binary evaluation as a digital input. The current status is shown in register 400027/400028.

The switching thresholds are preset in register 400026/400027 for "0" with 5,000mV and in register 400027/400028 for "1" with 15,000mV on delivery.

These can be adjusted by the user by writing to the registers.

Functional description / evaluation of push-button coupler # 12002 DALI input module 4CH

The AL-511-00 IP-DALI-BRIDGE V2 supports the push-button coupler #12002 DALI input module 4CH in the simplest way.

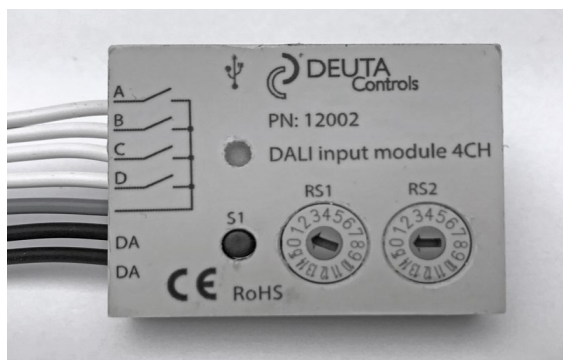
The states of the total of 4 input channels are automatically mapped in MODBUS holding registers.

The switch position of the RS1 rotary switch selects the address of the register.

A total of 37 digital input registers are available.

Note:

All other switch positions are not mapped (RS1 > 10 or / and RS2 not equal to 0). In this case, the push-button coupler sends direct DALI commands (DAPC) as DALI BROADCAST. For further details, see data sheet.



The mapping is carried out according to the following table:

HOLDING-Reg., Generic Modbus (0- based)	HOLDING-Reg., Modicon Modbus (1-based)	Selector switch	Entrance	r/w	Value range
400100	400101	1	A	r	0/1
400101	400102	1	B	r	0/1
400102	400103	1	C	r	0/1
400103	400104	1	D	r	0/1
400104	400105	2	A	r	0/1
400105	400106	2	B	r	0/1
400106	400107	2	C	r	0/1
400107	400108	2	D	r	0/1
400108	400109	3	A	r	0/1
400109	400110	3	B	r	0/1
400110	400111	3	C	r	0/1
400111	400112	3	D	r	0/1

HOLDING-Reg., Generic Modbus (0- based)	HOLDING-Reg., Modicon Modbus (1-based)	Selector switch	Entrance	r/w	Value range
400112	400113	4	A	r	0/1
400113	400114	4	B	r	0/1
400114	400115	4	C	r	0/1
400115	400116	4	D	r	0/1
400116	400117	5	A	r	0/1
400117	400118	5	B	r	0/1
400118	400119	5	C	r	0/1
400119	400120	5	D	r	0/1
400120	400121	6	A	r	0/1
400121	400122	6	B	r	0/1
400122	400123	6	C	r	0/1
400123	400124	6	D	r	0/1
400124	400125	7	A	r	0/1
400125	400126	7	B	r	0/1
400126	400127	7	C	r	0/1
400127	400128	7	D	r	0/1
400128	400129	8	A	r	0/1
400129	400130	8	B	r	0/1
400130	400131	8	C	r	0/1
400131	400132	8	D	r	0/1
400132	400133	9	A	r	0/1
400133	400134	9	B	r	0/1
400134	400135	9	C	r	0/1
400135	400136	9	D	r	0/1
400136	400137	10	A	r	0/1

Function description / Reset to factory settings

The AL-511-00 IP-DALI-BRIDGE V2 can be reset to factory settings as follows:

Write 0xAA55 to register 400000/4000001.

Order information

Article text	Order number	Description
AL-511-00 IP-DALI-BRIDGE V2	11991	Interface converter from Ethernet to DALI, MODBUS TCP 1x Ethernet 10/100 MBit / RJ45 1x DALI, 1x power supply, 1x USB 2.0, 1x relay 250 V AC / 30 V DC / 5 A 1x Analog In 0..30 V DC Supply voltage: 24 V DC; for top-hat rail mounting, Dimensions: 2TE (94x36x60 mm); Ambient temperature: 0°..+40°C, storage temperature: -40°..+70°C;

EU Declaration of Conformity

DEUTA Controls GmbH hereby declares that the **AL-511-00 IP-DALI-BRIDGE V2** device complies with the standards and limit values to be observed in accordance with the applicable EU directives. The full text of the EU Declaration of Conformity is available at the following Internet address: www.deuta-controls.de in the Service/Downloads section (Doc. EUDC2024_104).

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