

Datasheet Dali Controller
INT-202-D-01

External Dali power supply required

The DALI Controller module acts as a master device, in accordance with the DALI standard, it enables the operation of 64 ballasts - Control Gears, connected to the DALI bus.



1. Parameters - DALI\_MASTER

<b>Features:</b>	
State	0 - no ballast configuration, 1 - DALI Discovery, 2 - No power to the DALI bus, 3 - ballast configuration is on the device, 4 - saving information about groups
NumberOfGear	Number of ballasts in the device configuration. The feature value is refreshed after a system restart or when the UpdateMissingGears method is called
GearAddresses	Ballast addresses given during DALI_Discovery. The feature value is refreshed after Dali Discovery
ActiveGears	Addresses of active ballasts. The feature value is refreshed after system restart or calling the UpdateMissingGears method
MissingGears	Addresses of inactive ballasts. The feature value is refreshed after system restart or calling the UpdateMissingGears method
<b>Methods:</b>	
GetDAPCValue	Queries the gear for the DAPC value
Identify	Turns on the luminaire for 2 seconds
ResetGear	Restart the ballast
ResetLocalAddress	Removes the LocalAddress of the selected ballast. RemoveFromController parameter: True - removes the ballast address from the controller memory, False - retains the address in the controller's memory
ChangeLocalAddress	Changes the current LocalAddress of the ballast to the selected one, address is not deleted from Dali Controller memory
RemoveGear	Removes the ballast from the controller memory
ResolveAddressDuplicate	Resolves address conflicts on the Dali bus
UpdateMissingGears	Checks the activity of the ballasts that are in the configuration
DALI_Discovery	Search for ballasts connected to the DALI bus and assign them local addresses: GetConfiguration - retrieve the addresses of ballasts on the bus, NewWithoutLocalAddress - assign addresses to new ballasts without an assigned address, ResetAllLocalAddress - assign addresses to all ballasts on the bus. When an address is assigned, the ballast is turned on for 300ms. No operations should be performed on the device during DALI_Discovery.
SetPowerOnLevel	For the selected address, it saves in the ballast memory the DAPCValue value that is to be set after a restart/bus failure
SetDAPCValue	Sets the value of the power with which the luminaire shines. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
SetLastActiveLevel	If the ballast is off, turns on the ballast with the DAPCValue value set before it was turned off
SetGroupDAPCValue	Sets the value of the power with which the luminaire shines for a given group. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
GroupSwitch	Changes the output state for a ballast group to the opposite. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
GroupSwitchOn	Turns on the luminaire for a given group. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
GroupSwitchOff	Turns off the luminaire for a given group. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
<b>Events:</b>	
OnDALI_DiscoveryCompleted	Event occurring after the ballasts have been found and given local addresses
OnDALI_BusPowerFailure	Event generated: when there is no power supply to the DALI bus for more than 1s, when there is a short circuit on the DALI bus

2. Parameters - PowerSupplyVoltage

<b>Features:</b>	
Value	Current output value taking into account the scalar
Value%	Current percentage input value of the maximum value (MaxValue characteristic)
Sensitivity	Minimum change of input state when the OnValueChanged, OnValueLower or OnValueRise event is generated
MinValue	Minimum value of the Value characteristic after exceeding which the OnOutOfRange event is generated
MaxValue	Maximum value of the Value characteristic after exceeding which the OnOutOfRange event is generated
<b>Methods:</b>	
SetSensitivity	Sets input sensitivity value
SetMinValue	Sets MinValue
SetMaxValue	Sets MaxValue
<b>Events:</b>	
OnValueChanged	Event resulting from changing input state
OnValueLower	Event occurs when a value lower than the value from the last reading appears at input
OnValueRise	Event occurs when a value higher than the value from the last reading appears at input
OnOutOfRange	Event resulting from exceeding the permissible range (MinValue : MaxValue)
OnInRange	Event occurs when value returns to MinValue/MaxValue range

3. Parameters - DALI\_GEAR

<b>Features:</b>	
Address	Ballast address
Group	Ballast group numbers, subsequent groups from the 1-16 range are given after the decimal point. 0 - no belonging to any group
DAPCValue	The value of the power with which the luminaire shines
<b>Methods:</b>	
GetDAPCValue	Queries the gear for the DAPC value
Identify	Turns on the luminaire for 2 seconds
SetDAPCValue	Sets the value of the power with which the luminaire shines. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
Switch	Changes the luminaire state to the opposite (0 / 254). RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
SwitchOn	Turns on the luminaire. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
SwitchOff	Turns off the luminaire. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
Hold	Executes the function of illuminating / dimming the luminaire
HoldUp	Executes the function of illuminating the luminaire
HoldDown	Executes the function of dimming the luminaire
<b>Events:</b>	
OnDAPCValueChanged	Event occurring when changing the DAPCValue
OnSwitchOn	Event occurring when the DAPCValue value is changed from 0 to the greater value
OnSwitchOff	Event occurring when the DAPCValue value is changed to 0

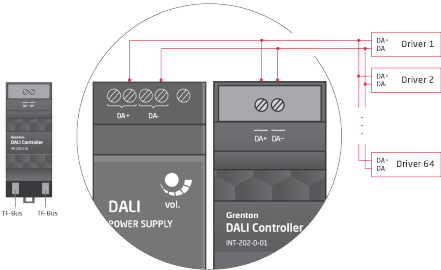
4. Parameters - DALI\_GEAR\_DT8

<b>Features:</b>	
Address	Ballast address
Group	Ballast group numbers, subsequent groups from the 1-16 range are given after the decimal point. 0 - no belonging to any group
DAPCValue	The value of the power with which the luminaire shines
HSVValue	Brightness value as per the HSV model (range: 0.00-1.00)
HSVSaturation	Colour saturation value as per the HSV model (0.00-1.00)
HSVHue	Colour hue value as per the HSV model (0-360)
ColourTemperature	Colour temperature set based on the invoked SetColourTemperature method. The feature does not retrieve the actual colour temperature of the fixture
<b>Methods:</b>	
GetDAPCValue	Queries the gear for the DAPC value
Identify	Turns on the luminaire for 2 seconds
SetDAPCValue	Sets the value of the power with which the luminaire shines. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
Switch	Changes the luminaire state to the opposite (0 / 254). RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
SwitchOn	Turns on the luminaire. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
SwitchOff	Turns off the luminaire. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
Hold	Executes the function of illuminating / dimming the luminaire
HoldUp	Executes the function of illuminating the luminaire
HoldDown	Executes the function of dimming the luminaire
SetHSVValue	Sets brightness value (0.00-1.00). RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
SetHSVSaturation	Sets saturation value (0.00-1.00). RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
SetHSVHue	Sets hue value (0-360). RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
SetRGBValue	Sets the value of the R (Red), G (Green), B (Blue) channels. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
SetWAFValue	Sets the value of the W (White) channel, and the A (Amber) and F (Freecolor) parameters. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
SetColourTemperature	Sets the color temperature value, where 0 - physical minimum, 100 - physical maximum. RampTime parameter set on a logarithmic scale 0.8 - 90 [s]
<b>Events:</b>	
OnDAPCValueChanged	Event occurring when changing the DAPCValue
OnSwitchOn	Event occurring when the DAPCValue value is changed from 0 to the greater value
OnSwitchOff	Event occurring when the DAPCValue value is changed to 0

5. Technical Data

Device power supply	24V <sub>dc</sub>
Maximum power consumption	2.2W
Maximum device current	91mA (for 24V <sub>dc</sub> )
Maximum number of addresses	64
Maximum number of group	16
Maximal DALI current	250mA
Maximum wire cross section	2.5mm <sup>2</sup>
Weight	55g
Size [DIN]	2
Fixing	electrical box, rail DIN-3 / TH 35 / TS 35
Dimensions (H/W/D)	90/36/58mm
Operating temperature range	0 to +45°C
Standard	IEC 62386-1:02

6. Wiring Diagram



DA+	DA+ Dali signal
DA-	DA- Dali signal

7. Module Configuration

LED signaling

- The blue diode indicates the voltage on the DALI bus.
- The green diode indicates the current state of the module:
  - ON - no ballast configuration on module, DALI Discovery must be performed,
  - Flashes at 200ms interval - DALI Discovery, the ballasts connected to the DALI bus are searched and local addresses assigned to them,
  - Flashes at 1 second interval - ballast configuration is on the module.

Adding a module to the project

After the CLU Discovery process has been executed, two objects appear in the project:

- DALI\_MASTER - main object used to manage the module configuration,
- PowerSupplyVoltage - object for monitoring the voltage on the system bus.

Ballast addressing

The module configuration should start with addressing the DALI ballasts connected to the bus. The DALI Controller enables two types of addressing: fully automatic or manual.

Automatic addressing allows you to address the entire installation with one click, using the DALI Discovery process.

- In the DALI\_MASTER object in the Control tab, call the ResetGear (Broadcast) method and then the DALI\_Discovery with chosen parameter:
  - GetConfiguration,
  - NewWithoutLocalAddress,
  - ResetAllLocalAddress.
- Calling the method with the GetConfiguration parameter initiates automatic retrieval of local ballast addresses located on the bus from the range 0 to 63.  
**NOTE! During this process all addresses are retrieved, if there are duplicates on the bus they will remain unchanged, in which case the conflicts should be resolved using the ResolveAddressDuplicate method! The controller memory is not deleted, the previous configuration will remain!**

- Calling the method with the `NewWithoutLocalAddress` parameter initiates automatic addressing of new ballasts without an assigned address on the bus, which will receive local addresses from the range 0 to 63. The address assignment will be confirmed by lighting up the given luminaire for 300ms. During DALI Discovery with the `NewWithoutLocalAddress` parameter, the addresses of ballasts that were already on the bus will remain unchanged.
- Calling the method with the `ResetAllLocalAddress` parameter initiates automatic addressing of all ballasts on the bus, which will receive local addresses from 0 to 63. The assignment of the address will be confirmed by lighting up the given luminaire for 300ms. It should be noted that after starting the addressing, all previous addresses will be deleted. During DALI Discovery with the `ResetAllLocalAddress` parameter, addresses are assigned to ballasts randomly.
- During DALI Discovery:
  - The green LED on the DALI Controller flashes at 200ms interval,
  - The embedded feature `State` of the `DALI_MASTER` object takes the value 1.

The duration of the DALI Discovery depends on the number of ballasts (it can take up to several minutes for the maximum number of devices).

**NOTE!** Do not perform any operations on the DALI Controller during DALI Discovery!

**Manual addressing** allows you to address individual ballasts using the `ChangeLocalAddress` method. It is helpful in the event that the ballast is not found after DALI Discovery, the address is doubled or we want a specific sequence of addresses in accordance with the assembly order.

In the `DALI_MASTER` object, after going to the Control tab, call the `ChangeLocalAddress` method with the parameters:

- `ActualAddress` - current ballast address,
- `AddressToSet` - new unoccupied address that will be assigned to the device,

In the `DALI_MASTER` object, after going to the Control tab, call the `ResolveAddressDuplicate` method with the `Address` parameter:

- Calling the method resolves address conflicts on the Dali bus, in the case when the address is duplicated for one of the ballasts, the first free address that is not in the module configuration is assigned,
- During `ResolveAddressDuplicate`:
  - The green diode on the DALI Controller module flashes at an interval of 200ms,
  - The built-in feature `State` of the `DALI_MASTER` object takes the value 1.

**NOTE!** Do not perform any operations on the DALI Controller during `ResolveAddressDuplicate`!

**After the DALI Discovery**

- The green LED on the DALI Controller flashes every 1s (ballasts found) or is on continuously (no ballasts found),
- The embedded feature `State` of the `DALI_MASTER` object takes the value:
  - 3 - ballasts found,
  - 0 - no ballasts found,
- The embedded feature `NumberOfGear` of the `DALI_MASTER` returns the number of correctly found and addressed devices,
- The event `OnDALI_DiscoveryCompleted` is generated.

**Operations possible on devices after DALI Discovery has ended**

Using the methods of the `DALI_MASTER` object we can:

- Verify the device reporting to the given address - the `Identify` method,
- Restart the device at the given address - the `ResetGear` method,
- Set the value of the luminaire for the device at the given address - the `SetDAPCValue` method.

**Adding ballasts to the project**

After the ballast addressing process is completed with the `DALI_Discovery` and `SetLocalAddress` methods, CLU Discovery should be performed:

- New `GEAR` objects are added to the project to represent each DALI device (address) correctly found and added during the addressing process,
- The embedded `GearAddresses` feature of the `DALI_MASTER` object returns address numbers in the range 0 - 63, occupied by DALI devices,
- `GEAR` objects are in the `DALI_GEAR` and `DALI_GEAR_DT8` - Device Type 8 versions:
  - `DALI_GEAR` - all ballasts with basic control methods,
  - `DALI_GEAR_DT8` - ballasts for color control (RGBWA control mode) or color temperature (Tc control mode).

**NOTE!** For correct operation of `GEAR` configuration and objects, CLU Discovery should be performed after each change in ballast addressing!

**Ballast control**

The control of a single ballast is carried out using a given `DALI_GEAR` / `DALI_GEAR_DT8` object using available methods or using the methods of the `DALI_MASTER` object (detailed functionalities can be found in the description of individual objects).

The ballast groups are controlled by the `DALI_MASTER` object using the `SetGroupDAPCValue`, `GroupSwitch`, `GroupSwitchOn`, `GroupSwitchOff` methods. In order to be able to control a given group of devices, it is necessary to:

- For the desired `GEAR` objects, set the value of the embedded feature `Group`. Each object can be assigned to 16 groups in the range 1 - 16, the next groups are given after a decimal point,
- After assigning objects to groups, send the configuration to CLUZ,
- After sending the configuration, the groups are sent by the DALI Controller. Embedded feature `State` of the `DALI_MASTER` object takes the value 4. The duration of the process depends on the number of devices for which the value of the `Group` feature has been changed, it can last up to 60 seconds,
- After correct grouping, the embedded feature of the `DALI_MASTER` object takes the value 3.

**NOTE!** When assigning groups (after CLUZ restart / configuration sending) it is not possible to control the objects!

**RampTime**

The DALI Controller supports the smooth change of the `DAPCValue` value using the `RampTime` parameter, in a logarithmic manner:

RampTime	Minimum fade time [s]	Nominal fade time [s]	Maximum fade time [s]
1	0,6	0,7	0,8
2	0,9	1,0	1,1
3	1,3	1,4	1,6
4	1,8	2,0	2,2
5	2,5	2,8	3,1
6	3,6	4,0	4,4
7	5,1	5,7	6,2
8	7,2	8,0	8,8
9	10,2	11,3	12,4
10	14,4	16,0	17,6
11	20,4	22,6	24,9
12	28,8	32,0	35,2
13	40,7	45,3	49,8
14	57,6	64,0	70,4
15	81,5	90,5	99,6

## 8. Warnings and Cautionary Statements



ATTENTION!

- Before proceeding with the assembly, read the installation schematics and full instructions available at [www.grenton.com](http://www.grenton.com).
- Failure to follow the guidelines contained in the instructions and other requirements of due care valid as a result of the nature of the equipment (device) may be dangerous to life / health, damage the device or installation to which it is connected, damage



DANGER!

- Danger to life caused by electric current!
- The components of the installation (individual devices) are designed to work in a home electrical installation or directly in its

other property or violate other applicable regulations. The manufacturer of the device, Grenton Sp. z o. o. does not bear any responsibility for the damage (property and non-property related) resulting from the assembly and / or use of the equipment not in accordance with the instructions and / or due diligence in handling the equipment (device).

- Device power supply, permissible load or other characteristic parameters have to be in accordance with the device specification, described in particular in the "Technical data" section.
- The product is not intended for children and animals.
- If you have technical questions or comments about the device operation, contact Grenton Technical Support.
- Answers to frequently asked questions can be found at: [www.support.grenton.com](http://www.support.grenton.com).

vicinity. Incorrect connection or use may cause a fire or electric shock.

- All work related to the installation of the device, in particular works involving interference in the electrical installation, may be performed only by a person with appropriate qualifications or licences.
- When installing the device, make sure that the power supply voltage is disconnected from the circuit in which the device is connected or near which the assembly takes place.

## 9. CE Marking

The manufacturer declares that the device is in full compliance with the requirements of EU legislation that includes the directives of a new approach appropriate for this equipment. In particular, Grenton Sp. z o. o. declares that the device fulfills the requirements on safety, specified by law, and that it conforms

to the national regulations that implement the appropriate directives: The Directive on the electromagnetic compatibility (EMC - 2014/30/UE) and the Directive on the limitation of the use of specific substances in electrical and electronic equipment (RoHS II - 2011/65/UE).



## 10. Warranty

Warranty available at [www.grenton.com/warranty](http://www.grenton.com/warranty).

## 11. Manufacturer Contact Details

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