



DALI Workshop User Guide

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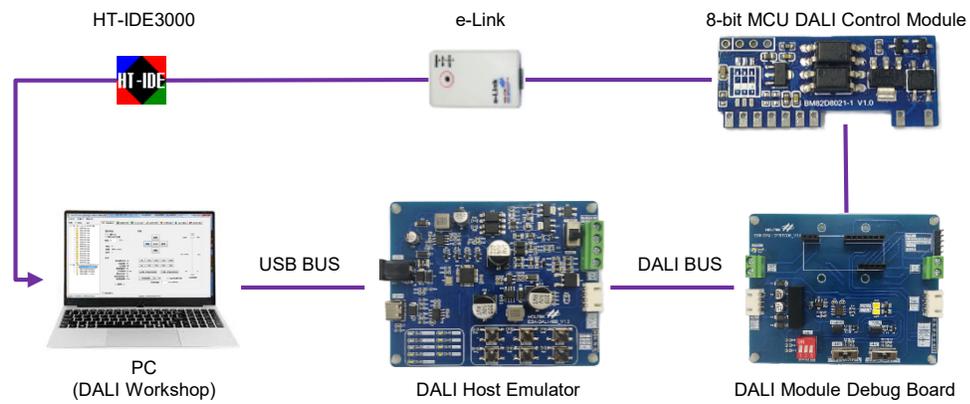
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1. Brief Introduction

Holtek’s DALI Workshop is a development platform to help users quickly design DALI-compliant products. This platform provides basic DALI slave libraries, which currently include IEC 62386 102/207/209(Tc) protocols, and can also customize relevant module variables to quickly develop modules containing the desired protocols. The platform also provides test functions for DALI protocol-related commands, including basic lighting control, protocol commands, DT6/DT8 extended control, and common variable reading and saving, which can be used to debug DALI modules through the matching DALI host emulator, verifying module functions and DALI commands.

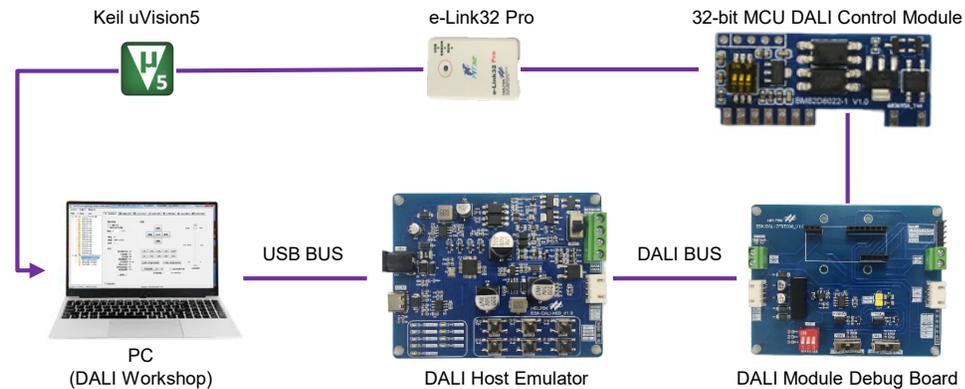
2. Development Environment

2.1 Overall Development Environment



8-bit MCU Development Environment

The development environment of the 8-bit MCU DALI control module is shown above, which includes the software DALI Workshop, 8-bit MCU development software HT-IDE3000, emulation tool e-Link, 8-bit MCU Holtek DALI control module, DALI host emulator, and DALI module debug board.

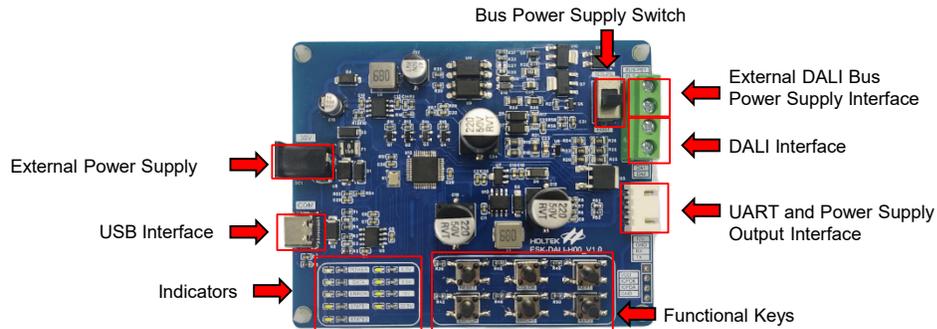


32-bit MCU Development Environment

The development environment of the 32-bit MCU DALI control module is shown above, which includes the software DALI Workshop, 32-bit MCU development software Keil uVision5, emulation tool e-Link32 Pro, 32-bit MCU Holtek DALI control module, DALI host emulator, and DALI module debug board.

The DALI Workshop communicates with the DALI host emulator through PC's USB interface and controls the DALI host emulator to send and receive DALI commands. The DALI module projects generated by the Workshop can be emulated and debugged online through the development environment HT-IDE3000 / Keil uVision5 and the emulation tool e-Link / e-Link32 Pro, and the basic module functions can be verified with the module debug board.

2.2 DALI Host Emulator



The DALI host emulator, as shown in the figure, is used with the DALI Workshop to debug DALI protocol-related functions. The external power input of the host emulator comes from the DC jack, which is powered by a 30V adapter. There are two methods to supply power to the DALI bus. One is that the bus power supply switch is dialed to the HOST sign, in which condition the DC-DC buck circuit of the host emulator is used for bus power. The other is that the bus power supply switch is dialed to the BUS-PS sign to use the external DALI bus power supply, in which condition the DALI bus power supply output should be connected to the external DALI bus power supply interface (BUS-PS1 and BUS-PS2) of the host emulator.

The functional keys on the DALI host emulator include a RESET key, a SWITCH key, a BRIGHT key and a COLOR key. When the DALI bus power is supplied by the DALI host emulator, the bus voltage amplitude can be switched between four levels, 6.5V/9.5V/16V/22.5V, using the SWITCH key on the board. The four bus voltage levels are respectively indicated by four white LED indicators on the host emulator and the illuminated LED indicates the current bus voltage level. The SWITCH key is short-pressed to switch the bus voltage level. The BRIGHT key is short-pressed to turn on/off the dimming function and is long-pressed to implement the dimming function, each time a long press will switch the dimming direction. The COLOR key is short-pressed to switch between the cool and warm color temperature, and is long-pressed to make color temperature cooler or warmer, each time a long press will switch the color temperature changing direction. The RESET key is used to reset the DALI host emulator.

There are three indicators to the left of these four bus voltage LED indicators, which are POWER indicator, DATA indicator and ERROR indicator. The blue power LED is illuminated after the host emulator is powered on. The orange data indicator flashes when the host emulator is communicating with the module. The red error indicator is illuminated when the host emulator has detected an abnormal bus output voltage/current or an abnormal bus input voltage. In this case the bus output will be protected and then automatically recovered after the abnormal situation is removed.

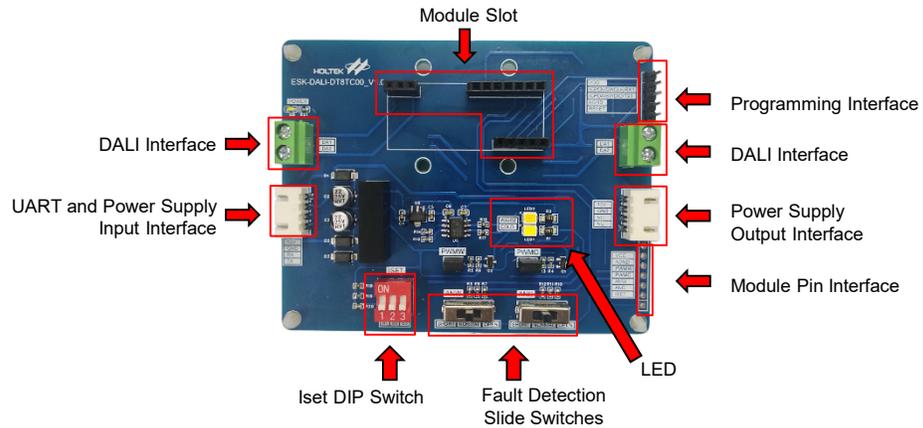
There are also two indicators STATE1 and STATE2 in the lower left part the indicator area, which are used to indicate whether the Module Parameter Setting interface is available for communication. When the Module Parameter Setting interface of the platform is opened, the STATE2 indicator is on, which means that the host emulator has entered the module parameter setting function. When the Auto Set function of the Module Parameter Setting interface is checked, the STATE1 indicator is on and the host emulator SWITCH key can be used to control the platform to set the module

parameters. When the platform controls the host emulator to set parameters, the host emulator DATA indicator flashes to indicate that the settings are in progress.

The DALI host emulator supports one DALI signal interface, DA1 and DA2. Connect DA1 and DA2 of the DALI host emulator to the DALI interface of the module through line connection to debug the communication.

The host emulator has a UART and power supply output interface, which can be connected to the UART and power supply input interface of the module debug board, and with the Module Parameter Setting interface of the platform, users can update the module parameters without the need for project programming. For details, refer to the Module Parameter Setting section.

2.3 DALI Module Debug Board



The DALI module debug board is mainly used as an adapter board for Holtek DALI control modules to implement fast debugging. The PWM dimming effect of the module is observed through the LED brightness. The fault signals of the LED driver are emulated by the resistor divider and the slide switches. The PWM output level is controlled by the external DIP switch and resistors connected to the Iset pin. The capacitor on board can be used to emulate the situation that the driver’s capacitor continues to provide power to the module when the AC power is off, which aims to test the scenario of a driver power-off. The module pins are externally bounded to facilitate connection with the driver for debugging in practical applications. The two sets of DALI interfaces can be cascaded for multi-module debugging.

The module debug board supports two power supply modes which cannot be used at the same time. One method is to obtain a 12V power through its UART and power supply input interface from the host emulator, the other method is to connect an external power supply through the module power pins on the module debug board. If the MCU supports the on-chip debug function, the module functions can be debugged online via e-Link and HT-IDE3000 or e-Link 32 Pro and Keil uVision5.

If it is required to adjust the PWM limit ratio through the DIP switch on the module debug board or the DIP switch on the module, re-power the module debug board after adjustment. For details about the relationship between the module debug board’s DIP switch level and the PWM limit ratio, the relationship between the module Iset external DIP switch level and the PWM limit ratio, and the relationship between the module DIP switch level and the PWM limit ratio, refer to the FAQ file on the code generation interface.

The fault detection emulation of the module is mainly controlled by the slide switches, and the emulated fault states are marked with silkscreen on the module debug board. For example, OPEN stands for an open-circuit signal emulation and SHORT stands for an short-circuit signal emulation.

The module PWM control signal, which is connected to the LED control circuit through the jumper cap, can be measured by removing the jumper cap if it is necessary to observe the PWM output signal.

The module debug board has a UART and power supply input interface, which can be connected to the UART and power supply output interface of the host emulator, and with the Module Parameter Setting interface of the platform, users can update the module parameters without the need for project programming. For details, refer to the Module Parameter Setting section.

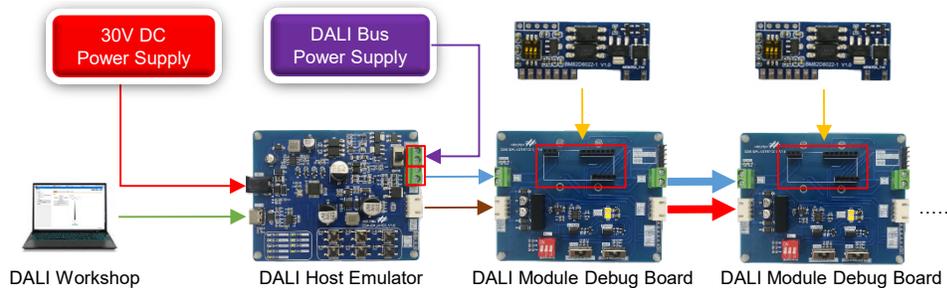
The cascading of the module debug board can be implemented by connecting the power supply output interface of the module debug board to the UART and power supply input interface of another module debug board, so as to supply power for the cascaded module debug board.

There is also a row of pads connected to the power output interface of the DALI module debug board for external debugging.

2.4 DALI Workshop

The DALI Workshop is mainly used to debug DALI commands, configure parameters, generate module code, etc. The code types currently supported by the platform includes IEC 62386 Part207 (LED-Type), Part209 (Colour Control Tc-Type), Part207 and Part209 composite protocol (Multi-Type), by which the ADC fault detection thresholds, minimum brightness level, PWM ratio limits, GTIN code and power-on delay time of the modules can be customized.

2.5 Practical Application Environment

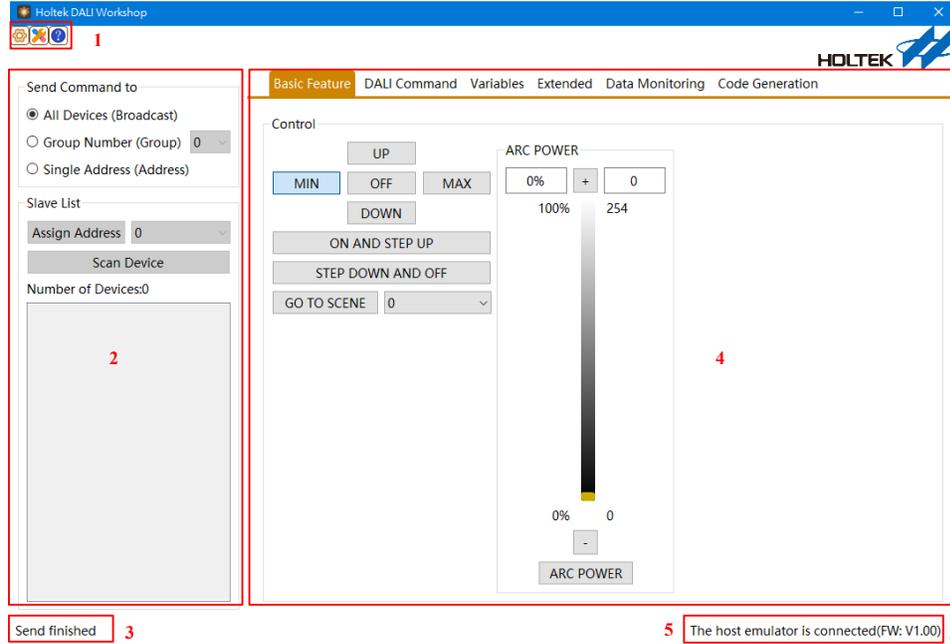


The figure above shows an application connection between the DALI Workshop, the DALI host emulator and the DALI module debug board. The DALI Workshop communicates with the DALI host emulator through the USB interface. The DC Jack interface on the host emulator is connected to a 30V DC power supply to obtain power. The UART and power supply output interface on the host emulator is connected to the UART and power supply input interface of the DALI module debug board to supply power for module and to support UART communication. If the DALI bus is selected to be powered by an external DALI bus power supply, follow the wiring illustrated in the figure. It is possible to cascade multiple DALI module debug boards. Connect the power output interface of the current module debug board to the UART and power supply input interface of the next DALI module debug board to achieve power supply, and also connect their DALI interfaces in a similar way. This can realize the emulation and debugging of the bus multi-device situation.

Note that the host emulator only has one UART interface, which means only the DALI module debug board connected to the DALI host emulator can use its UART communication function. Any subsequent cascading DALI module debug board cannot directly use the UART communication function unless it is re-connected directly to the host emulator.

3. Use of DALI Workshop

3.1 UI Introduction



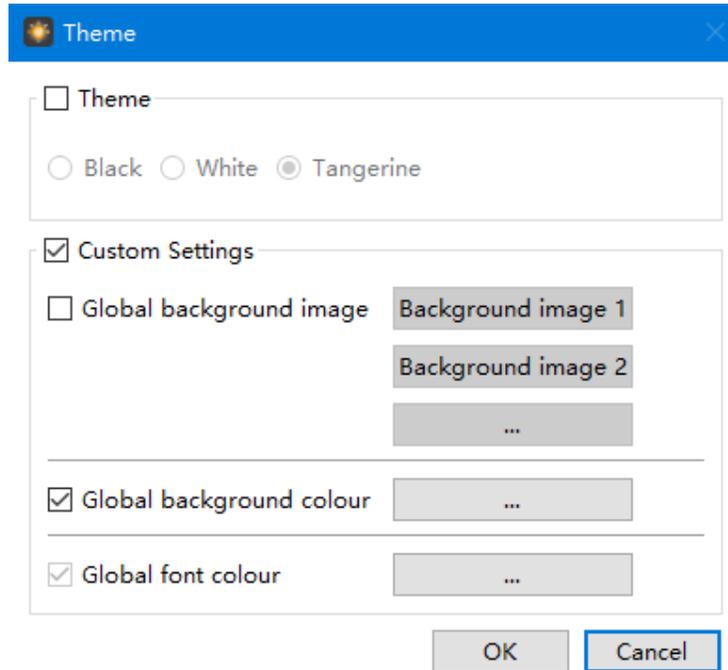
1. Menu: Setting, Host Emulator FW Update / Module Parameter Setting, Help.
2. Device List: Address Selection, Slave List.
3. The communication status bar displays the communication status between the platform and the host emulator.
4. The debugging interfaces are switched through the upper tabs.
5. Host emulator FW version and connection status.

3.1.1 Setting

A single-click on the Setting button in the top left corner will show the Language, Theme and Serial Port options.

The Language option is used to select the DALI Workshop software language, including English, Simplified Chinese and Traditional Chinese.

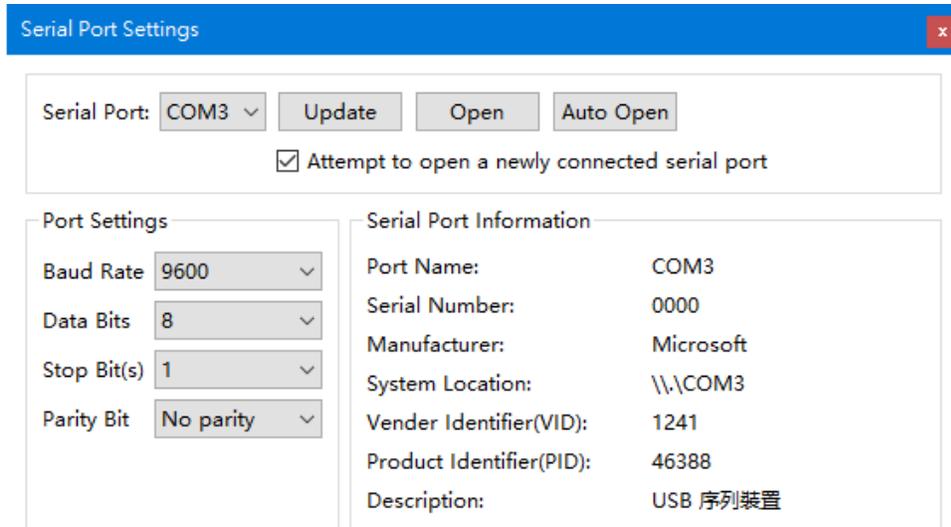
The Theme interface allows users to select the software UI colour, as shown below.



The Serial Port interface is used to open the host emulator communication serial port connected to the platform, only after this data exchange between the host emulator and the platform can be implemented. As the serial port defaults to automatically access device, it will automatically access the host emulator when the host emulator is connected. If it is required to access device manually, uncheck the “Attempt to open a newly connected serial port” option.

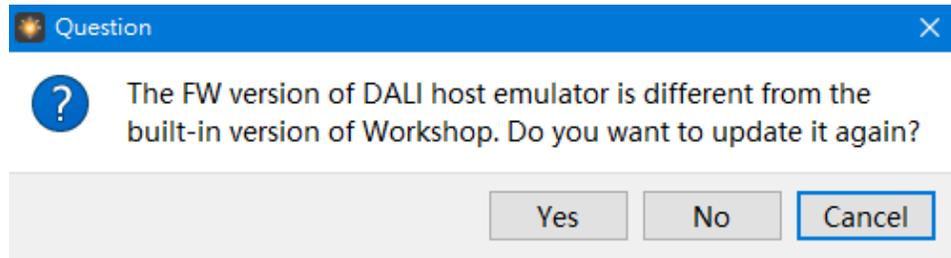
After clicking on the “Auto Open” button, the platform will search for the DALI host emulator for connection, then open the serial port. A click on the “Update” button will update the COM port connection status. A click on the “Open” button will open the COM port specified in the left drop-down list.

When the host emulator is removed, the platform will prompt that the host emulator is disconnected.



3.1.2 DALI Host Emulator FW Online Update

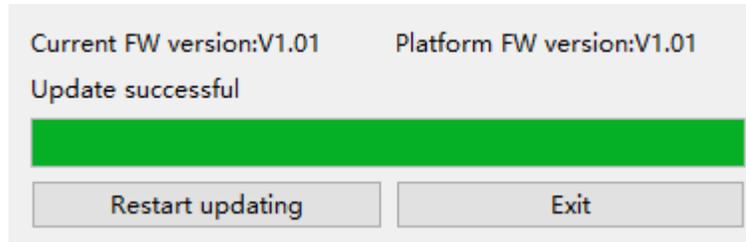
After the serial port communication between the DALI Workshop and the DALI host emulator is opened, the platform will automatically check the FW version of the host emulator. If the current FW version of the DALI host emulator is inconsistent with the FW version of the platform, a prompt window will pop up. Click “Yes” to start FW update.



To update the host emulator FW manually, click on the button in the top left corner and select “Host Emulator FW Update” to open the FW update interface and automatically start the FW update.

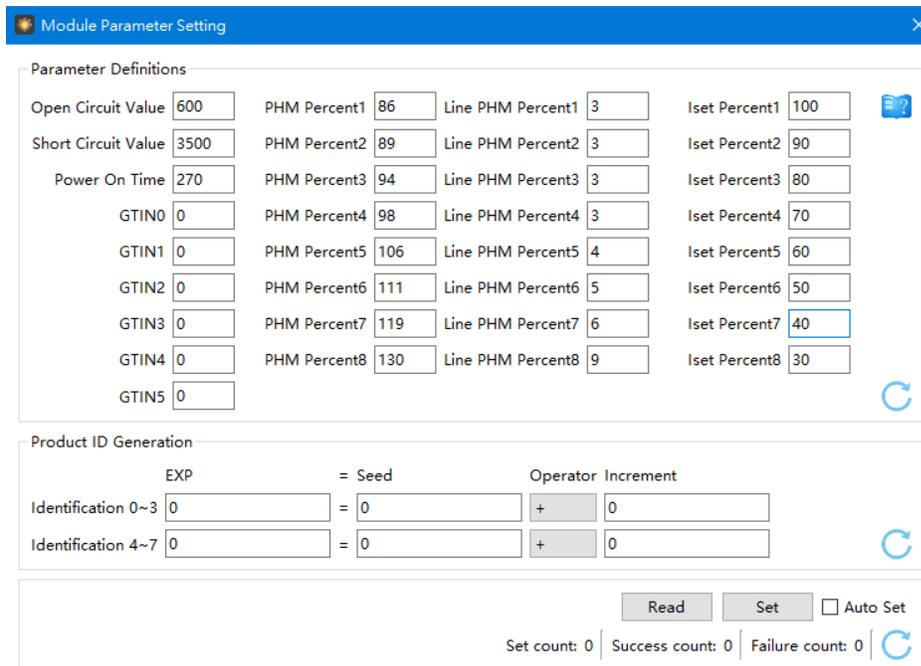


If a prompt as shown below appears, it means the update has been successfully completed.



3.1.3 Module Parameter Setting

Click on the button in the top left corner and select “Module Parameter Setting” to enter this interface. The Module Parameter Setting interface is mainly used for module parameter online update without the need for project programming. The configurable parameters of this interface include the output ratio of different Iset levels, curve dimming physical minimum brightness in different levels, linear dimming minimum brightness in different levels, GTIN code and product ID code. The following figure shows the entire interface:



For more information about the module parameters and setting values, refer to the Help function in the Parameter Definitions area, click the button to open the parameter setting FAQ file.

The module parameter setting interface also defines the product identification code of the module, which is divided into two parts: 0~3 and 4~7, calculated by seed, operator and increment. Enter a value in the Seed box as the first product identification code. Each time you click the Set button and complete the setting, the next product identification code will be calculated based on the seed value according to the operator and increment, which is convenient for batch setting in production.

The buttons are used to reset the variables of the corresponding area.

This interface also supports the Auto Set function. If this function is checked, the platform interface will be locked and cannot be operated, as shown in the following figure. At this time, the platform can be controlled by the SWITCH key on the host emulator to set the parameters. Every time the key is pressed, the platform will set the parameters once, and after completion prompt that the setting is completed, then wait for the next key press.

Module Parameter Setting
✕

Parameter Definitions

Open Circuit Value	<input type="text" value="600"/>	PHM Percent1	<input type="text" value="86"/>	ne PHM Percent1	<input type="text" value="3"/>	Iset Percent1	<input type="text" value="100"/>	
Short Circuit Value	<input type="text" value="3500"/>	PHM Percent2	<input type="text" value="89"/>	ne PHM Percent2	<input type="text" value="3"/>	Iset Percent2	<input type="text" value="90"/>	
Power On Time	<input type="text" value="270"/>	PHM Percent3	<input type="text" value="94"/>	ne PHM Percent3	<input type="text" value="3"/>	Iset Percent3	<input type="text" value="80"/>	
GTIN0	<input type="text" value="0"/>	PHM Percent4	<input type="text" value="98"/>	ne PHM Percent4	<input type="text" value="3"/>	Iset Percent4	<input type="text" value="70"/>	
GTIN1	<input type="text" value="0"/>	PHM Percent5	<input type="text" value="106"/>	ne PHM Percent5	<input type="text" value="4"/>	Iset Percent5	<input type="text" value="60"/>	
GTIN2	<input type="text" value="0"/>	PHM Percent6	<input type="text" value="111"/>	ne PHM Percent6	<input type="text" value="5"/>	Iset Percent6	<input type="text" value="50"/>	
GTIN3	<input type="text" value="0"/>	PHM Percent7	<input type="text" value="119"/>	ne PHM Percent7	<input type="text" value="6"/>	Iset Percent7	<input type="text" value="40"/>	
GTIN4	<input type="text" value="0"/>	PHM Percent8	<input type="text" value="130"/>	ne PHM Percent8	<input type="text" value="9"/>	Iset Percent8	<input type="text" value="30"/>	
GTIN5	<input type="text" value="0"/>							

Product ID Generation

	EXP	= Seed		Operator	Increment
Identification 0~3	<input type="text" value="0"/>	=	<input type="text" value="0"/>	+	<input type="text" value="0"/>
Identification 4~7	<input type="text" value="0"/>	=	<input type="text" value="0"/>	+	<input type="text" value="0"/>

Wait for the host emulator to respond...

Auto Set

Set Count: 0 | Success Count: 0 | Failure Count: 0

3.1.4 Help

A click on the “Help” button will display the About, Communication Log and User Guide options.

The About interface displays the platform version and other information.

The Communication Log interface displays the communication data between the platform and the host emulator, which are used for debugging.

3.2 Device List

The device list, on the left of the software interface and independent of the control interface on the right, cooperates with the control interface to specify the address for device control. The device list includes two parts: command address and slave list.

3.2.1 Command Address

The command address part provides three options: “All Devices” for broadcast address, “Group Number” for group address and “Single Address” for single slave address.

When the broadcast address option is selected, the command target of the debug interface is all DALI slave devices on the bus.

When the group address option is selected, the command target of the debug interface is the devices corresponding to the selected group number.

When the single address option is selected, commands will be sent to the target slave device which is selected by single-clicking on the desired slave device name in the slave list.

Send Command to

All Devices (Broadcast)

Group Number (Group) 0

Single Address (Address)

3.2.2 Slave List

The slave list part contains functions for assigning address, scanning devices and displaying devices. The slave list displays the device information in a rule of “(address) device type”.

The Assign Address function allows to modify the slave device address to a specified address, and only one slave device can be modified each time.

The Scan Device function is used to detect the number of bus devices and their information.

Note that when two or more DALI devices with the same address are connected to the bus, the bus communication will be affected. The DALI device address can be modified through the Assign Address function.

Slave List

Assign Address 3

Scan Device

Number of Devices:1

(1)Multi-Type

Slave List

Assigning address

Scan Device

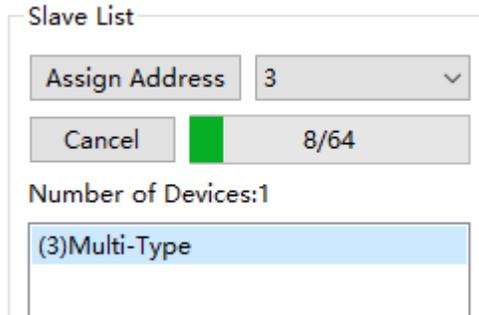
Number of Devices:1

(1)Multi-Type

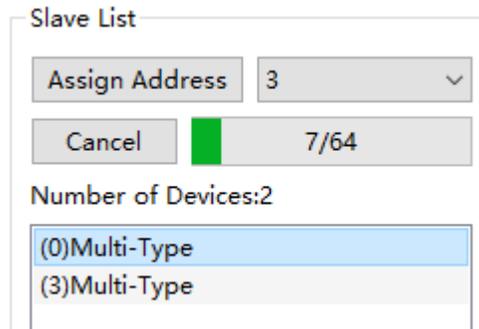
Information

Address assignment has completed, please scan the device

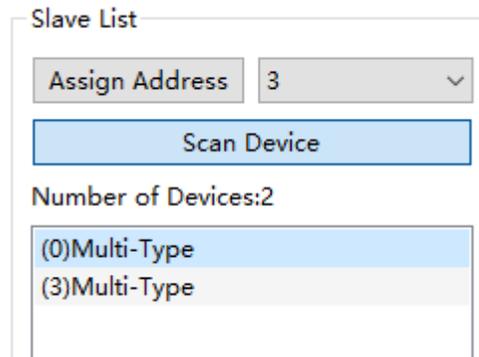
OK



The following figure shows a scanning result example for multiple devices.

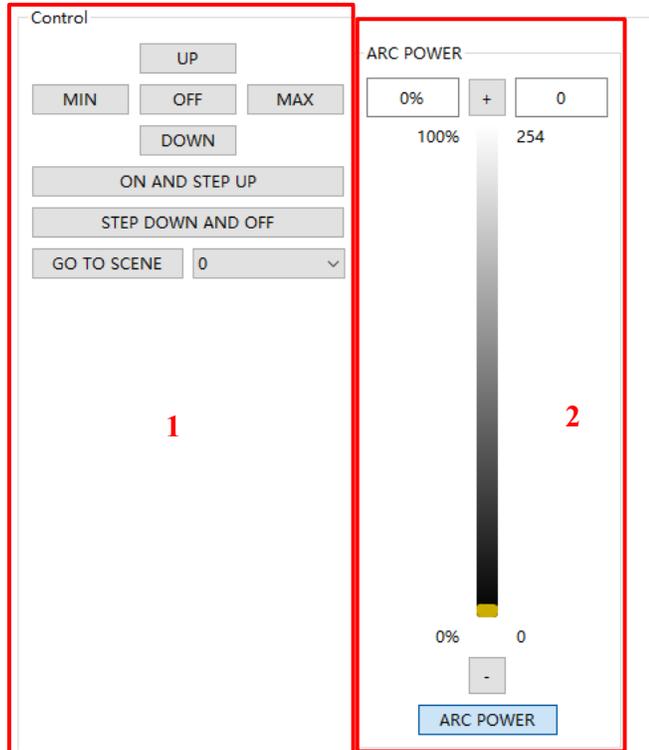


The scanning process is completed after polling for 64 addresses or by clicking the Cancel button, then users can select the device by clicking on the device name.

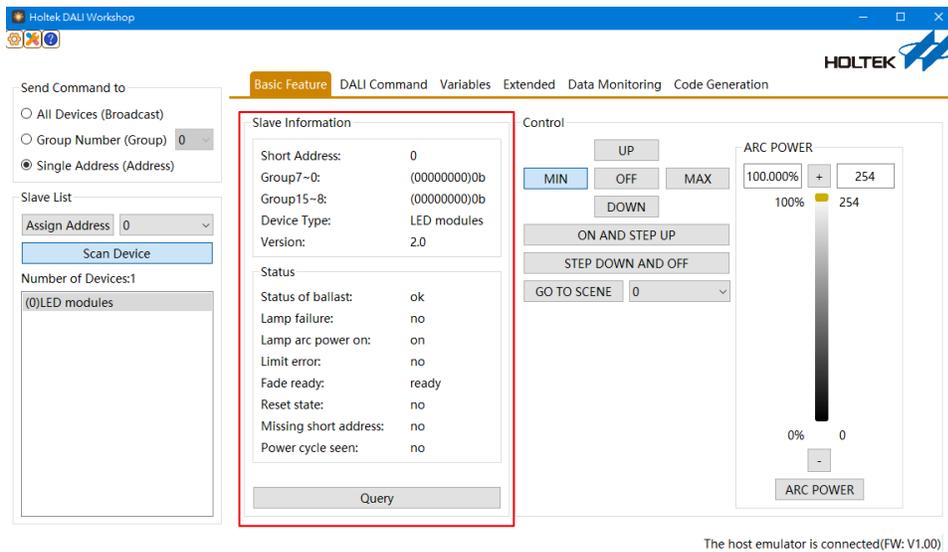


3.3 Basic Feature Interface

As shown in the following figure, the basic feature interface mainly contains the commonly used DALI direct dimming commands and the debugging of ARC dimming commands, which are sent to the DALI module at the address specified in the device list. Box 1 shows the direct dimming commands. Click the button to send the command directly. Box 2 shows an ARC slider, corresponding to 0~254 dimming levels. Drag the slider to a desired level and then click the ARC POWER button to send the ARC dimming command.



If the Single Address option has been selected in the command address field, the status and basic information of the DALI module at the current address will be displayed in this interface, including the device address, group number, device type, version and status, as shown below. Users can query the current status of the DALI module by clicking the Query button.

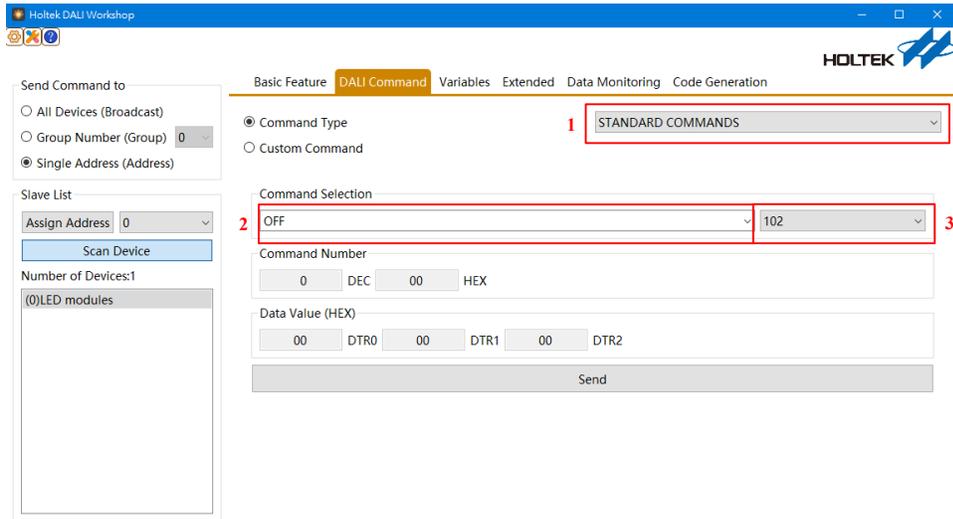


3.4 DALI Command Interface

The DALI command interface contains two parts: command type and custom command. The command type interface has integrated some DALI commands, including all IEC 62386 Part102/207/209 commands. The custom command interface allows users to edit the command data to be sent, assisting in user test.

3.4.1 Command Type

As shown in the following interface, the Command Type section includes the standard command and special command options. The Command Selection section includes the command name and command protocol. Standard command or special command can be selected in box 1. All the commands of the corresponding protocol (based on the protocol version referenced during platform development) can be selected in box 2. The 209, 207 or 102 protocol can be selected in box 3.



The host emulator is connected(FW: V1.00)

The standard commands include the direct dimming commands, indirect dimming command (i.e. ARC command), query command and other functional commands.

The special commands are mainly used for device initialisation, memory reading, address assigning and other functions.

Regarding those commands with a bracket suffix, users need to enter some additional information to complete the commands.

Basic Feature **DALI Command** Variables Extended Data Monitoring Code Generation

Command Type SPECIAL COMMANDS ▾
 Custom Command

Command Selection

TERMINATE

SEARCHADDRM (data)

SEARCHADDRL (data)

PROGRAM SHORTADDRESS (data)

VERIFY SHORT ADDRESS (data)

QUERY SHORTADDRESS

ENABLE DEVICE TYPE (data)

DTR1 (data)

DTR2 (data)

WRITE MEMORY LOCATION (DTR1,DTR0,data)

WRITEMEMORYLOCATION - NO REPLY (DTR1,DTR0,data)

After selecting the desired command, users can enter the command parameters in the boxes with a white background.

Basic Feature **DALI Command** Variables Extended Data Monitoring Code Generation

Command Type SPECIAL COMMANDS ▾
 Custom Command

Command Selection

WRITEMEMORYLOCATION - NO REPLY (DTR1,DTR0,data) ▾

Command Number

276 DEC 0114 HEX

Data Value (HEX)

C9 BYTE1 00 BYTE2 00 DTR0 00 DTR1

Send

As shown in the figure above, the command number is displayed in both decimal and hexadecimal. The data value contains BYTE1 which stands for the command code specified by the DALI protocol, and BYTE2 which stands for the required data. If the command does not need to be used with DTR, the DTR is read-only. If the command requires the use of DTR, it is indicated in the bracket after the command name and the corresponding DTR is editable. After selecting the command and completing the command configuration, click the Send button to send the command.

3.4.2 Custom Command

In the custom command interface, the command to be sent is defined by editing the hexadecimal values of Byte1 and Byte2. As shown in the red box, the “100 twice” option means that the command will be sent twice within 100ms if checked. The “EnDeviceType” option, if checked, requires to enter the hexadecimal value of the device type to be activated in the corresponding box, such as 06, 08. Before the command to be sent, an “Enable Device Type x” command will first be sent, where x stands for the entered hexadecimal value.

Regarding the DTR fields on the right, clicking the Read button will display the DTR0, DTR1 and DTR2 values. To modify the DTR values, enter the desired DTR values and click the Save button.

- Command Type
- Custom Command

Command

100ms twice
 EnDeviceType hex

Byte1: hex

Byte2: hex

Answer: hex

DTR Value

DTR0(hex) DTR1(hex) DTR2(hex)

3.5 Variable Interface

The variable interface allows to read and modify the DALI protocol variables. As shown in the figure, the grey background boxes means the variables are read-only, and the white background boxes means the variables are writable. By clicking “Read”, the variables will be read in order. Users can click the Cancel button to cancel the reading process. When the return value is unreasonable or if there is no return value, the variable will display “-1” indicating that the value is incorrect. To modify the variables, enter the desired values and then click Save to save the modification in order.

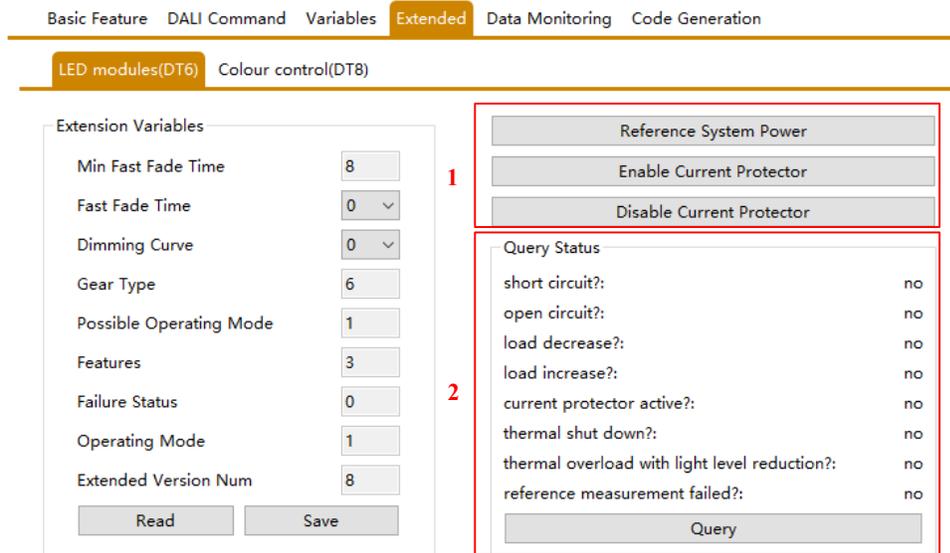
ActualDimLevel <input type="text" value="254"/>	Group0-7 <input type="text" value="0"/>	Scene9 <input type="text" value="255"/>
PowerOnLevel <input type="text" value="254"/>	Group8-15 <input type="text" value="0"/>	Scene10 <input type="text" value="255"/>
SystemFailureLevel <input type="text" value="254"/>	Scene0 <input type="text" value="255"/>	Scene11 <input type="text" value="255"/>
MinLevel <input type="text" value="128"/>	Scene1 <input type="text" value="255"/>	Scene12 <input type="text" value="255"/>
MaxLevel <input type="text" value="254"/>	Scene2 <input type="text" value="255"/>	Scene13 <input type="text" value="255"/>
FadeRate <input type="text" value="7"/>	Scene3 <input type="text" value="255"/>	Scene14 <input type="text" value="255"/>
FadeTime <input type="text" value="0"/>	Scene4 <input type="text" value="255"/>	Scene15 <input type="text" value="255"/>
DTR0 <input type="text" value="32"/>	Scene5 <input type="text" value="255"/>	StatusInformation <input type="text" value="132"/>
RandomAddress(H) <input type="text" value="0"/>	Scene6 <input type="text" value="255"/>	VersionNumber <input type="text" value="12"/>
RandomAddress(M) <input type="text" value="188"/>	Scene7 <input type="text" value="255"/>	DeviceType <input type="text" value="255"/>
RandomAddress(L) <input type="text" value="132"/>	Scene8 <input type="text" value="255"/>	PhysicalMinLevel <input type="text" value="85"/>

3.6 Extended Control Interface

The extended control interface includes two parts, LED modules (DT6) and Colour control (DT8), which are used to control the corresponding DALI device types. DT6 stands for the LED type and corresponds to the 207 protocol devices. DT8 stands for colour control type and corresponds to the 209 protocol devices.

3.6.1 LED Modules (DT6)

The LED modules (DT6) interface is designed for the DT6 type DALI modules, providing DT6 related variable reading and modification. Click the Read button to read the DT6 variables in order. Enter the desired value into the edit box or modify the value via the drop-down box, and then click the Save button to modify the variables. Box 2 displays the status information of the DT6 device. In the box 1 there are three DT6 dedicated commands, click the button to send the corresponding command.



3.6.2 Colour Control (DT8)

The Colour control (DT8) interface is designed to control the DT8 type DALI modules.

The control contents in box 1 include the on/off control of auto activation through the drop-down box, copy report to temporary, read and save operations for colour type, ARC value and colour value of the power-on colour, system failure colour and colour scene. Click the Read button to read the power-on colour, system failure colour and colour scene of the selected device, which can be changed by modifying the corresponding values and then clicking the Save button. There is a delete function for colour scene, click "Delete Scene" to restore the scene value to the default value.

Box 2 displays the variables for DT8 devices, including four colour types which are XY, Tc, Primary N and RGBWAF. The variables displayed in the table can be filtered by selecting the corresponding type. Each colour type has a corresponding colour control interface.

Auto Active: Yes

Copy Report To Temporary

Setting

Power-on Colour

System Failure Colour

Colour Scene: 0

Delete Scene

Arc Value: 0

Colour Type: **1** Tc

Colour Value: Tc(1~65535)

Read Save

xy Colour Control Tc Colour Control

primaryN Colour Control RGBWAF Colour Control

Query information about the selected variables Write information about the selected

Variable	Writable	Value	Remark
1 COLOUR TEMPERATURE TC	--	153	6535.9K
2 COLOUR TEMPERATURE TC COOL MAX	Yes	153	6535.9K
3 COLOUR TEMPERATURE TC PHYSICS COOL MAX	Yes	153	6535.9K
4 COLOUR TEMPERATURE TC WARM MAX	Yes	370	2702.7K
5 COLOUR TEMPERATURE TC PHYSICS WARM MAX	Yes	370	2702.7K
6 Tc INTERMENT 2	Yes	1	1
7 TEMPORARY COLOUR TEMPERATURE TC	Yes	65535	MASK
8 TEMPORARY COLOUR TYPE	--	255	Reserved:7; Colour type Colour type

Sort: Default sorting

3.6.2.1 DT8 Variable Reading and Modification

After checking the desired colour type, users first need to read the corresponding variables through a query operation. Single-click the Variable field to select all variables in the table, as shown in the figure below. Then click the “Query information about the selected variables” button to sequentially read the values of the variables in the table. Users can also double-click a single variable name and query its value.

xy Colour Control Tc Colour Control

primaryN Colour Control RGBWAF Colour Control

Query information about the selected variables Write information about the selected variable(s) Double-click a single variable

Variable	Writable	Value	Remark
1 COLOUR TEMPERATURE TC	--	115	8695.7K
2 COLOUR TEMPERATURE TC COOL MAX	Yes	115	8695.7K
3 COLOUR TEMPERATURE TC PHYSICS COOL MAX	Yes	115	8695.7K
4 COLOUR TEMPERATURE TC WARM MAX	Yes	370	2702.7K
5 COLOUR TEMPERATURE TC PHYSICS WARM MAX	Yes	370	2702.7K
6 Tc INTERMENT	Yes	1	1
7 TEMPORARY COLOUR TEMPERATURE TC	Yes	65535	MASK
8 TEMPORARY COLOUR TYPE	--	255	Reserved:1; Colour type xy-coordinate: Yes; Colour type colour temperature Tc: Yes; Colour type primary N: Yes; Colour type RGBWAF: Yes
9 REPORT COLOUR TEMPERATURE TC	--	65535	MASK

To modify a variable, first check whether the variable is writable or not. Refer to the “Writable” column, “Yes” means the variable can be modified. Double-click the corresponding value field to modify the value, click the variable name and then click the “Write information about selected variable(s)” button to modify the variable.

xy Colour Control Tc Colour Control
 primaryN Colour Control RGBWAF Colour Control

Query information about the selected variables Write information about the selected variable(s) Double-click a single variable cell to send a que

Variable	Writable	Value	Remark
1 COLOUR TEMPERATURE TC	--	115	8695.7K
2 COLOUR TEMPERATURE TC COOL MAX	Yes	115	8695.7K
3 COLOUR TEMPERATURE TC PHYSICS COOL MAX	Yes	115	8695.7K
4 COLOUR TEMPERATURE TC WARM MAX	Yes	370	2702.7K
5 COLOUR TEMPERATURE TC PHYSICS WARM MAX	Yes	370	2702.7K
6 Tc INTERMENT	Yes	1	1
7 TEMPORARY COLOUR TEMPERATURE TC	Yes	65535	MASK
8 TEMPORARY COLOUR TYPE	--	255	Reserved:1; Colour type xy-coordinate: Yes; Colour type colour temperature Tc: Yes; Colour type primary N: Yes; Colour type RGBWAF: Yes
9 REPORT COLOUR TEMPERATURE TC	--	65535	MASK

The variables in the table can be filtered by checking or unchecking the colour types. For example, if only the Tc type is checked, the table will only display the variables related to the Tc type.

xy Colour Control Tc Colour Control
 primaryN Colour Control RGBWAF Colour Control

Query information about the selected variables Write information about the selected variable(s) Double-click a single variable cell to send a que

Variable	Writable	Value	Remark
1 COLOUR TEMPERATURE TC	--	115	8695.7K
2 COLOUR TEMPERATURE TC COOL MAX	Yes	115	8695.7K
3 COLOUR TEMPERATURE TC PHYSICS COOL MAX	Yes	115	8695.7K
4 COLOUR TEMPERATURE TC WARM MAX	Yes	370	2702.7K
5 COLOUR TEMPERATURE TC PHYSICS WARM MAX	Yes	370	2702.7K
6 Tc INTERMENT	Yes	1	1
7 TEMPORARY COLOUR TEMPERATURE TC	Yes	65535	MASK
8 TEMPORARY COLOUR TYPE	--	255	Reserved:1; Colour type xy-coordinate: Yes; Colour type colour temperature Tc: Yes; Colour type primary N: Yes; Colour type RGBWAF: Yes
9 REPORT COLOUR TEMPERATURE TC	--	65535	MASK
10 REPORT COLOUR TYPE	--	255	Reserved:1; Colour type xy-coordinate: Yes; Colour type colour temperature Tc: Yes; Colour type primary N: Yes; Colour type RGBWAF: Yes
11 GEAR FEATURES/STATUS	--	1	Automatic Activation: Yes; Reserved: 0; Auto calibration supported: No; Auto calibration recovery supported: No

Sort Default sorting ▾

The table contents can be sorted either by name initials or by default, which can be selected in the lower left corner below the table.

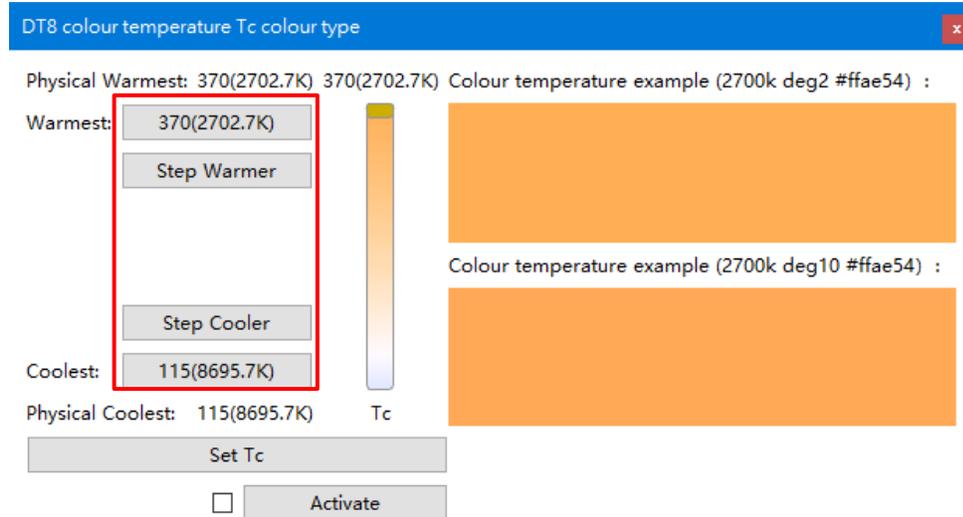


3.6.2.2 Colour Control: Tc

Next to each colour type, there is a Colour Control button to open the corresponding control interface. For example, check the Tc type then open its colour control interface by clicking the Colour Control button, as shown by the red box in the figure below. Note that all the variables of the selected colour type should first be read before opening the colour control interface.

xy Colour Control Tc **Colour Control**
 primaryN Colour Control RGBWAF Colour Control

The control interface for the Tc colour type is as follows.



The Tc colour type can be adjusted either by the buttons in the red box or by the slider. Click the Warmest/Coolest button to set the colour temperature to the warmest/coolest value. These two values of the device need to be read before entering the control interface to be valid.

Click “Step Warmer” or “Step Cooler” to increase or decrease the colour temperature by a step size of the device.

The procedure to set the colour temperature using the slider is: drag the slider to the desired colour temperature → click “Set Tc” → Click “Activate”. After this the colour temperature of the DALI device will be changed to the specified value.

The checkbox next to the Activate button represents the automatic activation function. If the function is checked, the colour temperature will be automatically activated after the Tc values are set.

The right side of the slider shows the colour effect corresponds to the current colour temperature value. However, considering the errors of lamp specifications and hardware drivers, the colour effect in the figure is for reference only.

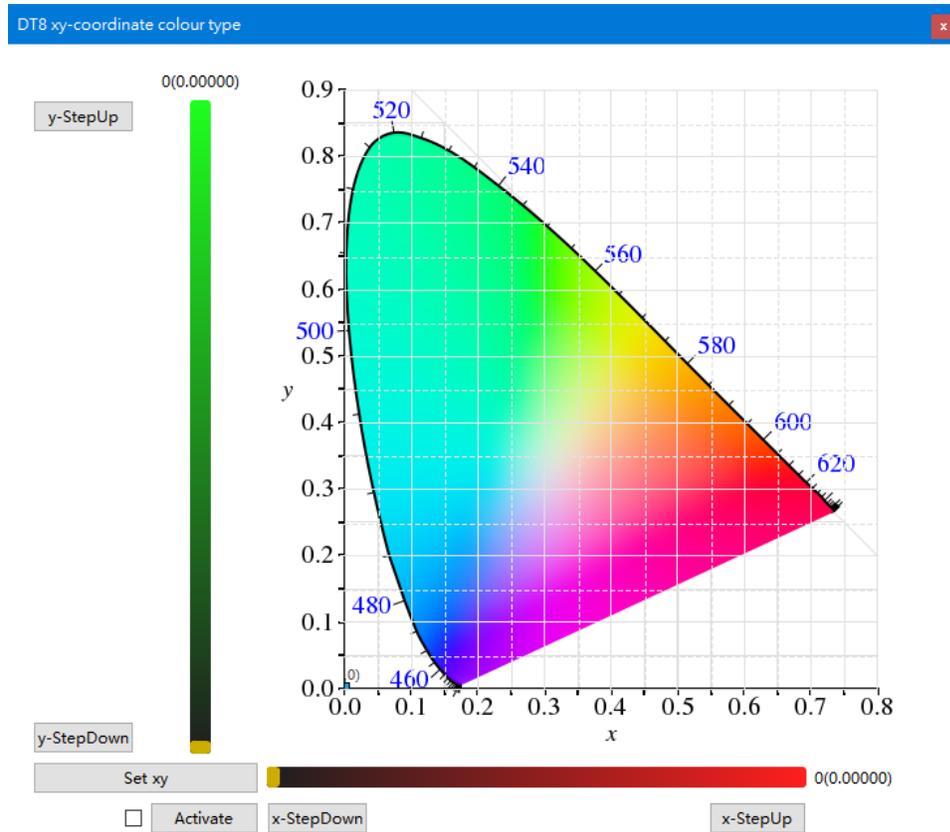
3.6.2.3 Colour Control: XY

The XY colour control interface is designed to control the DALI devices which support the XY colour type.

Refer to the figure below to open the XY colour control interface. Note that it needs to check the XY type first.

xy **Colour Control** Tc Colour Control
 primaryN Colour Control RGBWAF Colour Control

The XY colour control interface is shown below:



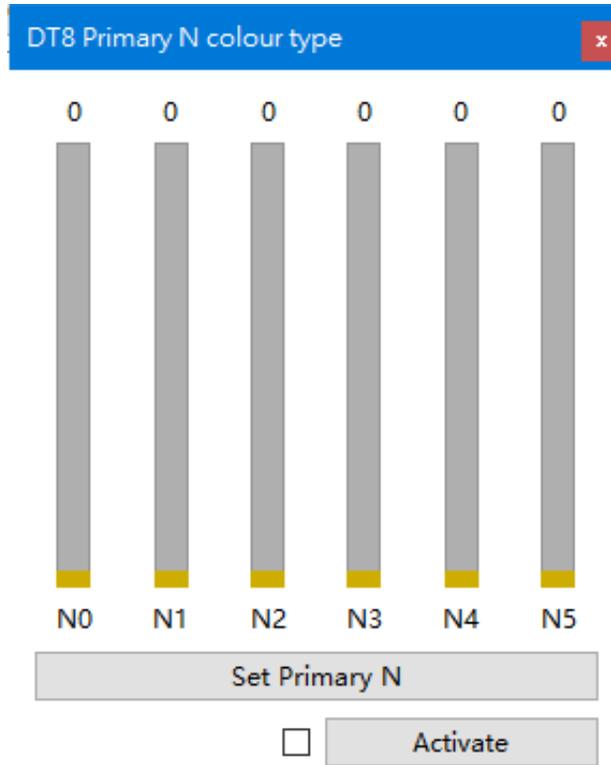
Select the desired XY value by dragging the XY coordinate slider or the reference point in the XY colour gamut map. The XY value can also be adjusted using the x/y-StepUp and x/y-StepDown buttons. After selecting the desired XY value, click “Set xy” and then “Activate” to control the DALI device XY colour value. If the checkbox to the left of the Activate button is selected, the XY colour value will be automatically activated after the XY value is set.

3.6.2.4 Colour Control: Primary N

The colour control interface of the Primary N type is opened in the same way as other types, checking the Primary N type and then clicking “Colour Control”.

xy Colour Control Tc Colour Control
 primaryN Colour Control RGBWAF Colour Control

The colour control interface of the Primary N type is as follows.



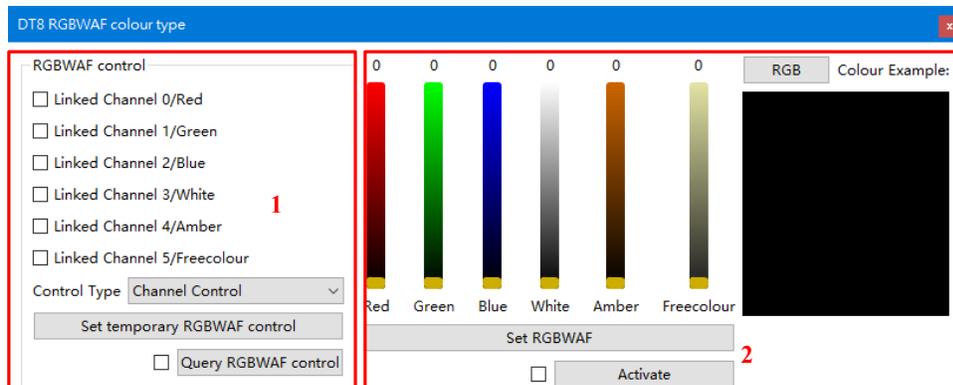
There are six sliders corresponding to Primary N0~N5 values respectively. Drag each slider to a desired value, click “Set Primary N” and then “Activate” to modify the device’s Primary N value. This colour type also supports the automatic activation function which is enabled by checking the checkbox next to the Activate button.

3.6.2.5 Colour Control: RGBWAF

Select the RGBWAF type then click “Colour Control” to open the RGBWAF colour control interface.



The figure below shows the RGBWAF colour control interface:

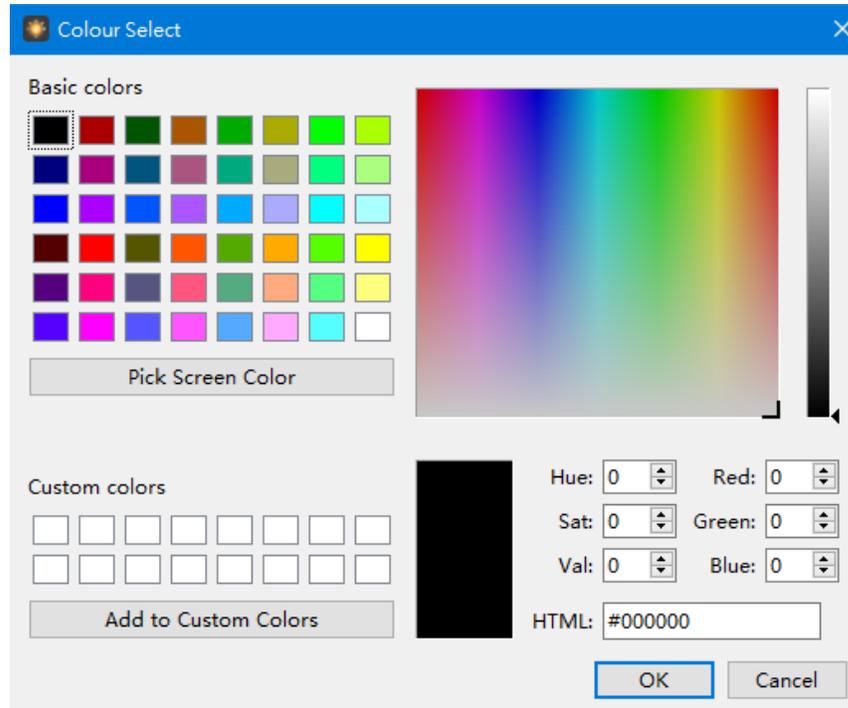


This control interface is divided into two parts. In box 1 are the RGBWAF control variables and in box 2 are the red, green, blue, white, amber and free colour settings.

Select the channels, modify the control type and click “Set temporary RGBWAF control” to modify the RGBWAF control variable values.

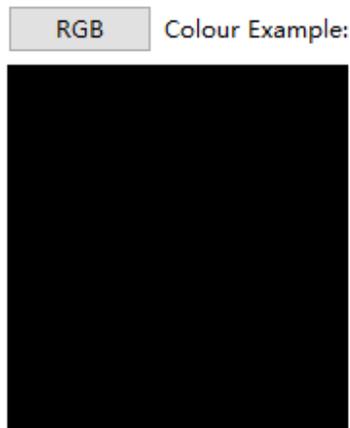
The red, green, blue, white, amber and free colour setting values are modified by dragging the corresponding slider, and clicking “Set RGBWAF” then “Activate”. The RGBWAF colour value also can be automatically activated by checking the checkbox next to the Activate button.

Another method to quickly modify the RGB values is clicking the button in the top right to enter the following RGB control interface.



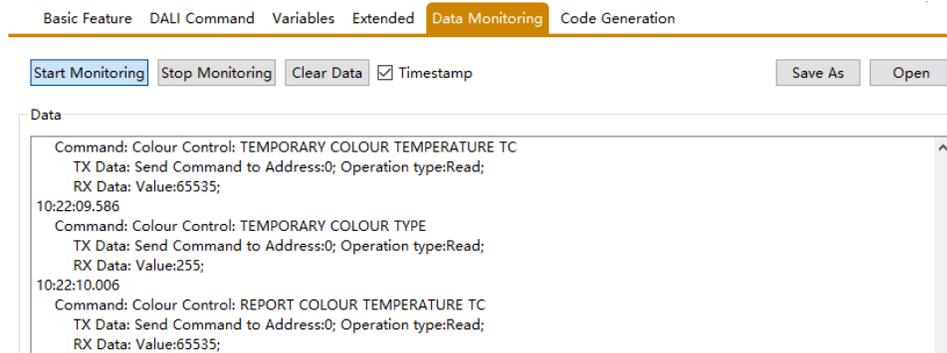
Directly select a basic colour or take a point on the chromaticity diagram to quickly set the Red, Green and Blue values, then click “OK” to synchronise the colour values to the sliders.

After returning to the colour control interface, the colour effect of the current RGB values will be displayed on the right side.



3.7 Data Monitoring Interface

The data monitoring function of the DALI Workshop is used to record the user debugging process when using the development platform.

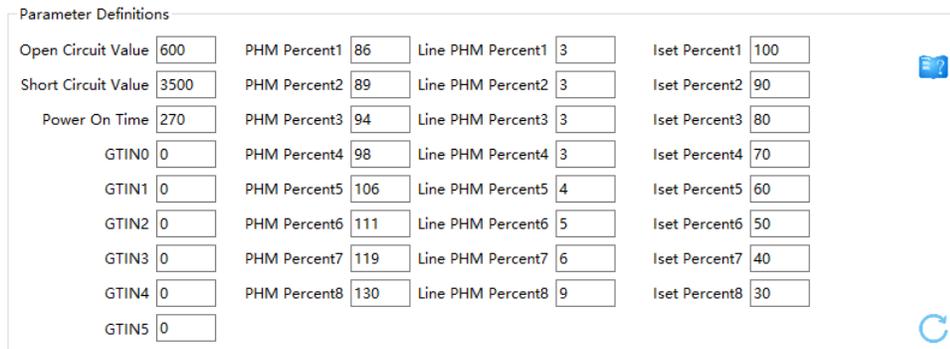


The data monitoring function is turned on by default and actions such as debugging commands or clicking buttons issued by users on the platform will be recorded and displayed in the data interface. If the monitoring function is not required, click “Stop Monitoring”. To turn on the function again, click “Start Monitoring” to re-record the debugging process. By checking the Timestamp option, the recorded commands and actions will be displayed with the occurrence time, which can remind the user of the operation time of the commands.

The user’s operation history on the data monitoring interface can be saved as a txt file through the Save As button. To view the saved data monitoring operations, click the Open button to open the txt file and then the saved operation history will be displayed on the data monitoring interface.

3.8 Code Generation

3.8.1 Parameter Definitions



This section defines the parameters that are required for DALI protocols and driver hardware adaption, such as PWM output ratio of the current limit levels, physical minimum value of brightness, ADC thresholds for fault detections, product GTIN code, power on delay time, etc.

The specific variable definitions can be referred to the Help file. Click the Help button in the top right corner of the parameter definition area to obtain a description of the variable definitions.

Variable	Description	Recommended Value
Power on Time	Power on timing	270
Short Circuit Value	Short circuit detection ADC threshold	$x/5 \times 4095$ ⁽¹⁾
Open Circuit Value	Open circuit detection ADC threshold	$x/5 \times 4095$ ⁽¹⁾
GTIN0-GTIN5	GTIN code lower bits to higher bits	Product GTIN code

Variable	Description	Recommended Value
PHM Percent 1-8	Exponential dimming minimum brightness values corresponding to DIP switch 1-8	Depends on driver specifications
Line PHM Percent 1-8	Linear dimming minimum brightness values corresponding to DIP switch 1-8	Depends on driver specifications
Iset Percent 1-8	PWM output ratio corresponding to DIP switch 1-8 ⁽²⁾	Depends on driver specifications

Note: 1. “x” stands for the fault detection threshold voltage; unit: V.

2. The PWM output ratio will affect the minimum brightness. Calculate the PHM Percent and Line PHM Percent variables according to the formulas in the Help file.

3.8.2 Module Selection and Project Generation

The Code Generation interface is mainly used to generate module programs that meet the requirements of different protocols to help users quickly develop DALI products. The code generation steps are introduced as follows.

Generate a project

Project Name

Project Path ...

MCU Type

MCU Part Number

Protocol Selection

Module Part Number

Click the filter icon to enter the selection interface.

MCU Filter
✕

Filter Items

Protocol

Part 207

Part 209(TC)

Part 209(RGBW)

MCU Type

MCU Part Number

Module Part Number

Current MCU Type:

Current MCU Part Number:

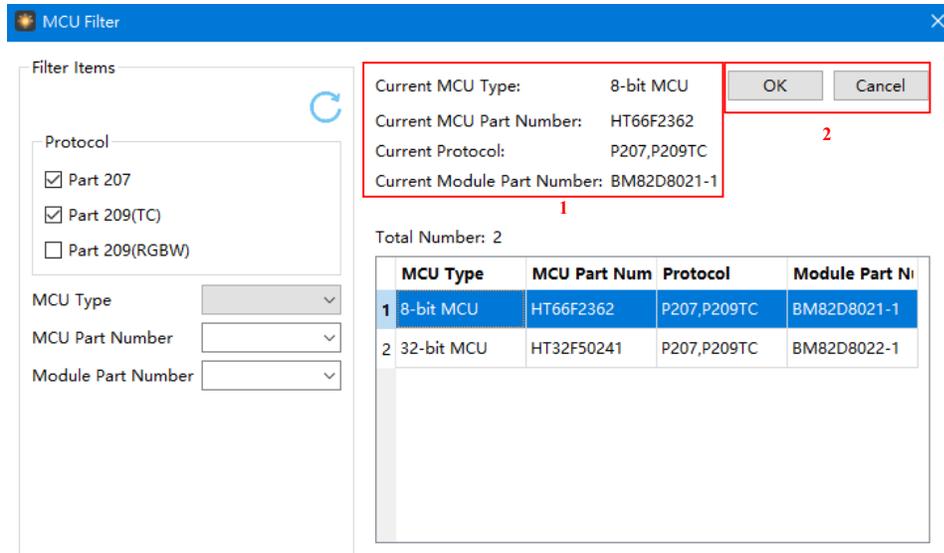
Current Protocol:

Current Module Part Number: 2

Total Number: 7

	MCU Type	MCU Part Num	Protocol	Module Pai
1	8-bit MCU	HT66F2362	P209TC	BM82D802
2	8-bit MCU	HT66F2362	P207,P209TC	BM82D802
3	8-bit MCU	HT66F31A5	P207	BM82D801
4	8-bit MCU	HT66F2362	P207	BM82D802
5	32-bit MCU	HT32F50241	P207	BM82D802
6	32-bit MCU	HT32F50241	P209TC	BM82D802

As shown above, box 1 includes the filter items for module selection. After selecting the required protocol, MCU type and MCU part number, the modules that meet the requirements and available projects will be displayed in box 2. Click any cell to select the module project to be generated.



After the desired module project is selected, as shown above, the box 1 area will display the specific information of the module, then click the OK button in box 2 after confirmation to complete the module selection.



After the parameter definitions and module selection are completed, go on to generate the project. As shown in the figure above, enter the name of the project to be created in the Project Name field. Then click the “...” button on the right side of the Project Path to select a path where the generated project files are stored. Finally, click “Generate” to generate the project files in the specified path.

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