

IuxCONTROL ready2mains™ Programmer



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1. Scope of documentation

These operating instructions are valid for the ready2mains Programmer.

TRIDONIC GmbH & Co KG is constantly striving to develop all its products. This means that there may be changes in form, equipment and technology.

Therefore, claims cannot be made on the basis of information, diagrams or descriptions in these instructions.

The latest version of these operating instructions is available on our home page at Operating instructions.

1.1. Copyright

This documentation may not be changed, expanded, copied or passed to third parties without the prior written agreement of TRIDONIC GmbH & Co KG.

We are always open to comments, corrections and requests. Please send them to info@tridonic.com.

1.2. Imprint

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2. Safety instructions

The instructions in this section have been compiled to ensure that operators and users of the ready2mains Programmer from Tridonic are able to detect potential risks in good time and take the necessary preventive measures.

The operator must ensure that all users fully understand these instructions and adhere to them. This device may only be used, installed and configured by suitably qualified personnel.

2.1. Intended use

2.1.1. Proper use

The ready2mains Programmer is a versatile tool to program various Tridonic products via ready2mains, DALI and U6Me2. It is used in luminaire productions and covers a wide range of manufacturing setups, from manual programming to fully automated production lines. In addition, the Programmer can be used in outdoor applications to configure LED Drivers via U6Me2.

2.1.2. Improper use

Extensions and modifications to the product.

WARNING!

Improper use could result in injury, malfunction or damage to property. The operator must inform all users of the potential risks associated with the use of the equipment and of protective countermeasures.

2.2. Dangers associated with the operation of the system

A DANGER!

Danger of electrocution Disconnect the power to the entire system before installing the ready2mains Programmer.

A CAUTION!

Risk of damage caused by condensation Prior to commissioning the system, wait until the control device is at room temperature and completely dry!

A CAUTION!

Risk of damage caused by humidity or water Only use the control device in dry areas and protect it against humidity and water!



A CAUTION!

Electromagnetic compatibility (EMC)

Although the Tridonic control device meets the stringent requirements of the appropriate directives and standards on electromagnetic compatibility, it could potentially interfere with other devices under certain circumstances!

3. ready2mains Programmer - Introduction

The ready2mains Programmer is a versatile tool to configure various Tridonic products via ready2mains, DALI and U6Me2. It is used in luminaire productions and covers a wide range of manufacturing setups, from manual programming to fully automated production lines. In addition, the Programmer can be used in outdoor applications to configure LED Drivers via U6Me2.

3.1. Basic information



3.1.1. Delivery contents

- ready2mains Programmer
- Protective cover
- USB cable
- System connector (Phoenix Contact)
- Installation instructions

3.1.2. Programmer overview with protective cover



- 1. USB connection
- 2. System connection (including mains)
- 3. Display
- 4. Status LEDs
- 5. Keypad
- 6. Protective cover

3.1.3. Programmer overview without protective cover



3.2. Usage of the ready2mains Programmer in production lines

The device can be used in multiple ways to program one or more LED Drivers.

3.2.1. Current programming via graphical user interface (GUI)

Programming via the GUI is the simplest way as only the Programmer itself is required.

This mode is especially useful for initial tests or small production batch sizes when only the output current needs to be set. Optionally, also the lockbit can be set in this mode.

- programming of output current and lockbit only
- programming via mains wiring by using ready2mains protocol
- adjustment of output current and execution on the device itself or via an external push button; no PC required

For more information see chapter Programmer GUI > Mode Program current, p. 20.

3.2.2. Execution of scripts via GUI

A more sophisticated way of programming an LED Driver is the use of customer-defined configuration scripts. These scripts can be compiled separately and then stored and executed on the Programmer.

Three different types of scripts can be generated, containing ready2mains, DALI or U6Me2 parameters. This enables a wide range of applications and allows for delegable working procedures.

- Excel scriptGENERATOR for easy generation of scripts
- available script types: ready2mains, DALI and U6Me2
- content of script is highly adaptable, from only a few parameter up to the entire data set valid for each protocol
- storage of the scripts on the Programmer
- use of hot keys for most used scripts
- execution on the device itself or via an external push button; no PC required

For more information see chapters:

- Programmer GUI > Mode Program script, p. 21
- Excel scriptGENERATOR, p. 31

3.2.3. Execution of scripts via application programming interface (API)

In semi or fully automated production setups, the Programmer can be controlled directly via PC software, using a dedicated Programmer API (which is the interface with which the GUI can be programmed).

This provides full control of the Programmer's overall functionality without requiring manual process steps.

- full control of Programmer via software
- access to entire data set which is valid for each protocol
- handling of all script types
- omission of manual steps

For more information see chapters:

Excel scriptGENERATOR, p. 31

For more information on how to control the Programmer via the API please contact the manufacturer.

3.3. Usage of the ready2mains Programmer in development

The ready2mains Programmer can also be used for development purposes when certain parameters need to be tested, e.g. in order to determine the correct output current required for a certain luminous flux. For doing so, a dedicated mode is implemented for testing a current setting without saving it to the LED Driver.

- set current for testing purposes without saving it to the LED Driver
- create user defined scripts and store them centrally or on the Programmer for later use at the production line

For more information see chapters:

- Programmer GUI > Mode Test current, p. 20
- Programmer GUI > Mode Program script, p. 21
- Excel scriptGENERATOR, p. 31

3.4. Usage of the ready2mains Programmer in outdoor applications

While the Programmer is mainly designed for the use in luminaire productions, it can also be used on site in outdoor applications, thanks to the implemented U6Me2 functionality. This protocol enables the Programmer to program chronoSTEP profiles in outdoor LED Drivers.

In combination with a contactor, it is possible to program the luminaires of an entire street.

For more information see chapter:

Programmer GUI > Mode Program script, p. 21

3.5. Implemented security precautions

3.5.1. Short-circuit behaviour and protection

In case of a short-circuit at the output, the Programmer will switch off immediately and restart after 10 s. If another short-circuit is detected, the Programmer will switch off and will only be reactivated after a mains reset.

3.5.2. Overload protection

If the max. permissible connected load is exceeded, the Programmer will switch off the output and automatically restart after 10 s. If the overload persists, the Programmer will switch off and will only be reactivated after a mains reset.

3.5.3. Overtemperature protection

If a temperature of 65 °C is exceeded within the Programmer, the data rate will be gradually reduced. Therefore, commands will be transferred to the LED Driver with a slight delay. If the temperature continues to rise and reaches a value of 120 °C, the Programmer will switch off and will only be reactivated after a mains reset.

4. Wiring diagrams and installation

4.1. Wiring ready2mains only



4.2. Wiring DALI only





4.3. Wiring ready2mains and DALI

4.4. Wiring U6M



4.5. External momentary-action switch

To execute scripts in production it is recommended to use an external momentary-action switch instead of the integrated keypad.

External switches can be connected via the system connector and offer the same functionality as the subsection on the Programmer.

The following criteria must be fulfilled:

- momentary-action switch has to be rated for mains voltage
- potential-free contact
- switch impulse > 200 ms

Connect the switch to pin 9 and 10 of the system connector, see chapter Pin configuration of the Programmer, p. 16.

4.6. Wiring type and cross section

The wiring can be done with stranded wires and ferrules or solid wires. The wire's cross section must be 0.25-1.5 mm².

Strip 7 mm of insulation from the cables to ensure a proper operation of the screw terminals.

Use one wire for each terminal connector only.

Additional information about the connector can be found in the chapter Connector data, p. 51.



The following points must be considered during installation.

For all devices in general:

- ▶ Connect max. 5 LED Drivers to the Programmer.
- Momentary-action switch has to be rated for mains voltage.
- Always disconnect the Programmer before conducting any high voltage tests!
- ▶ At low mains voltages the max. mains current of 3 A has to be considered (max. 330 VA at 110 V).
- To guarantee a selective shut-down in case of a hardware defect, it is recommended to use an extra circuit breaker for the Programmer.
- ► For proper programming, LED Drivers require a load to be connected during programming.
- ➤ To use the Programmer as a DALI interface, mains supply is not required. For ready2mains operation and the internal DALI power supply, mains supply is required.

For ready2mains:

- ► The ready2mains Programmer may only be used in conjunction with ready2mains compatible LED Drivers.
- ► Any other LED Driver or load shall not be connected when programming via ready2mains.

For DALI:

► DALI / DSI is not SELV. Apply the installation instructions for mains voltage.

For U6Me2:

If the load exceeds the stated maximum load, a contactor must be used in between the Programmer and the connected LED Driver.

4.7. Pin configuration of the Programmer

Connector type: Phoenix Contact MC 1,5/10-ST-3,81 - 1803659





Pin No.	Input / Output	Description
1	Input	Mains input L
2		n.c.
3	Input	Mains input N
4		n.c.
5	Output	Mains output L'
6	Output	Mains output N'
7	Output	DALI
8	Output	DALI
9	Input	Switch
10	Input	Switch

Avoid wrong wiring! Wrong wiring will destroy the programmer! (Especially for ground faults)

5. Graphical User Interface

5.1. General information

The Programmer GUI provides users with the possibility to operate the Programmer stand-alone but also to configure several internal settings.



There are several ways to configure the LED Driver:

- Set the output current and lockbit (note: via the GUI no additional parameters can be set, except when using scripts)
- Execute scripts stored on the Programmer (*.r2m, *.dali, *.u6m)

5.1.1. Main keys

Кеу	Function
ON/OFF	Short press** to switch ON/OFF the output of the Programmer Long press** to shut down the Programmer Short press** if switched off -> switch on
Save/ Select	Short press** to select a value Long press** to enter the menu / save settings and leave the menu
Send	Execute script same functionality then with the external momentary-action switch
F1F2F3F4 \checkmark \blacktriangleright \checkmark \checkmark	Arrow keys to navigate the menu Hot keys to allocate a script to a hotkey
0 1 2 3	Number keys to set a current value

** short press < 1s > long press

5.1.2. Status LEDs

LED colour	Label	Description
	Ready	Constantly on as soon as the Programmer is ready to use
•	Busy	Constantly on when the Programmer output is activated Blinking during an active communication to the connected LED Driver
	Error	Constantly on if an error has occurred See the chapter Error messages, p. 30 for more details.

5.1.3. Switch Programmer ON / OFF

Switch ON

The Programmer switches automatically on if mains supply or USB is connected.

ON/OFF

» Press ON/OFF to switch the Programmer on if it has been switched off while mains or USB is connected.

Switch OFF

	» To switch off the Programmer press ON/OFF for > 1 sec.
UN/OFF	\rightarrow Device powering off message appears.

A CAUTION!

Removing the Programmer from mains or USB without shutting it down beforehand may cause loss of data.

5.2. General operation and modes

The content of the display depends on the selected Programmer mode. The available modes are Test current, Program current (preset) and Program script as described below.

	» To execute the individual modes, ensure that the Programmer is supplied by mains.
	» Connect a LED Driver including load (max. 5 drivers) to the output of the Programmer.
	» Choose the targeted mode as described in this document.
ON/OFF	» Enable the Programmer output by pressing ON/OFF .
Send	» Press Send or use the momentary-action switch to transfer the data to the connected LED Driver.
	» Check optical feedback to ensure successful programming
ON/OFF	» Disable the output by pressing ON/OFF .
	» Connect the next LED Driver to the Programmer output to continue.

5.2.1. Mode Test current

The mode Test current is intended mainly for use in the research and development department (R&D) as it allows changing the output current of the connected LED Driver without saving it. This may be helpful when adjusting the current to determine a desired luminous flux.

In addition, this mode is essential when testing EXC LED Drivers as these allow for a maximum of 5 save operations, due to their limited storage capacity. After the fifth save operation, the current will be locked permanently and no further change is possible.



To change the target current conduct the following steps:

Save/ Select	» Press Save/Select to enter the *Test current menu.
F1 ◀	» Remove the preset value by using the F1 button and enter the required value.
Save/ Select	» Press Save/Select to confirm the new value and exit the menu.

5.2.2. Mode Program current

While the mode Test current does not store the current value in the LED Driver, the mode Program current does. It is the simplest method to program an LED Driver with a desired current value and optionally set the lockbit. The lockbit is an additional safety feature to prevent any further change of the output current via the ready2mains protocol. Note that this is not reversible.



The key symbol in front of the current value exists in two variations which indicate whether the lockbit will be set or not.

e	Lockbit set; the current value cannot be changed later on via ready2mains
ð	Lockbit not set; the current value remains accessible via ready2mains

- With fixed-output EXCITE LED Drivers it is only possible to set a current 5 times; any subsequent programming will be ignored
- Setting the optional lockbit prevents any further access to the current setting via ready2mains and is not reversible
- The mode Program current allows only the programming of the output current and optional lockbit (no programming of e.g. chronoSTEP or corridorFUNCTION as with script programming)
- See the chapter Optical Feedback, p. 23 for details on the optical feedback after successful programming

5.2.3. Mode Program script

The mode Program script allows selecting and executing pre-configured parameter scripts that are stored on the Programmer. These scripts can either be ready2mains, DALI or U6Me2 types and are generated via the Excel scriptGENERATOR.

Pro9ram script 250mA.r2m

The second line shows the selected script name. If no script has been chosen, the text **<not set>** is shown.

There are 2 possibilities to choose a script to program:

F1 F2 F3 F4 ▼	» Choose a script linked to a hot key F1, F2, F3, F4
Save/	» Choose a script directly from the integrated memory by a short press on
Select	Save/Select.

Choose a script linked to a hot key:

F1 F2 F3 F4 ▼	 » Short press on the hot key buttons F1, F2, F3, F4 to display the name of the script linked to the hot key. → The message Script info is shown in the upper line. If no script is linked to the hot key the message <not set=""> is shown.</not>
F1 F2 F3 F4 ▼	 » Long press on the hot key buttons F1, F2, F3, F4 selects the script linked to the hotkey. → The message Script selected is shortly displayed, followed by the chosen mode and the selected script.



Send

» Press **Send** or use the momentary-action switch to execute the script and send the parameters to the connected LED Driver.

I NOTICE

Note that the output of the Programmer has to be switched on either before transmitting a script or switching on and off must be included in the script.

Choose a script directly from the integrated memory:

Save/ Select	» Short press Save/Select.
F1 F2 ►	» Select the script type with F1 , F2 ; available types: r2m - DALI - U6Me
Save/ Select	» Press Save/Select to confirm the script type
F1 F2 ►	» Select the desired script with F1, F2; the message <empty> indicates that no script is available with the chosen type</empty>
Save/ Select	» Press Save/Select to confirm the script \rightarrow The mode and the selected script are shown
Send	» Press Send or use the momentary-action switch to execute the script and send the parameter to the connected LED Driver.
	O NOTICE Note that the output of the Programmer has to be switched on either before transmitting a script or switching on and off must be included in the script.

A CAUTION!

- ► All scripts need to be stored in the root folder of the storage! Subfolders are not supported.
- In order to reduce handling errors it is recommended to store only active scripts on the Programmer. Obsolete scripts should be deleted.
- Optical feedback via the luminaire is only provided when programming via ready2mains. For more information see chapter Optical Feedback, p. 23.

5.3. Optical feedback

The luminaire provides an optical feedback during/after successful programming via ready2mains. This feedback is triggered by the LED Driver itself and confirms that the received parameters have successfully been saved. Any invalid output current value (outside the operating range of the LED Driver) will result in a negative feedback.

Note that this feedback is visible only when programming via ready2mains. No optical feedback is provided when using DALI or U6Me2.

Possible feedbacks:

Feedback after successful programming: the LED Driver output is switched off twice with a period time of 1 sec and then switched on again.



> Feedback after corrupted programming: the LED Driver switches its output of and does not restart.

Save not ok

As a result, any successfully programmed luminaire will be on after programming, any error will be indicated by a turned off luminaire. Keep in mind not to switch the Programmer output off after programming as part of a script if the optical feedback shall be used to manually judge on the programming result.

Mode Test current

In the mode Test current no optical feedback will be generated because there is no store command. The values are directly set at the output and can be measured in current or light output

Mode Program script

In the mode Program script the number of optical feedbacks depends on the chosen number of "save and exit" events within the script handling. After transmitting the output current value it is automatically stored and an optical feedback is given. If no other values are transmitted afterwards, no additional feedback will be given. Otherwise, an optical feedback will be provided after each following "save and exit" command (see Save variants, p. 34 for further information).

5.4. Main menu and mode adjustments

Save/ Select	» Press and hold Save/Select to enter the menu.
F1 F2 F3 F4 ▼	» Use the arrow keys F1, F2, F3, F4 to navigate through the menu.
Save/ Select	» Press and hold Save/Select to save and exit the menu.

5.4.1. Structure

For easier recognition, every menu item is marked with an asterisk (*) in the upper left corner.



5.4.2. Submenu *Mode



Adjust mode Test current



Follow below steps to use the mode Test current:

F1 F2 Save/ ◀ ► Select	» Select the mode in the menu with F1 and F2 and confirm with Save/Select. The last set value is shown.
Save/ Select ◀	» To change the current value press Save/Select and remove the preset value by using the button F1.
Save/ Select	 » Enter the required current value and press Save/Select to confirm and to exit the menu. → The current can now be transferred to the connected LED Driver.
	Notice
	Note that it is not permanently stored when using the mode rest current.

Main screen:



Adjust mode Program current



To select and adjust the mode Program current proceed as described below:

F1 F2 Save/ ◀ ► Select	» Select the mode in the menu with F1 and F2 and confirm with Save/Select. The last set value is shown.
F1 Save/ ◀ Select	» Remove the preset value by using the button F1 and enter a new current value. Confirm change with Save/Select.
	» Set optional lockbit if any further current change via ready2mains shall be prohibited.
	A CAUTION!
	Note that this lock is not reversible in the LED Driver.



The current (and optional lockbit) can now be transferred to the connected LED Driver.

Main screen:



Adjust mode Program script



To select and adjust the mode Program script proceed as described below:



» Select the mode with F1 and F2 and confirm with Save/Select.

Configure the hot key assignments:

*Hot keys Assi9nments	
Save/ Select	ave/Select to enter Hot keys Assignment menu.
*F1 <empty></empty>	F1 F2 <=mpt⊎>
F1 F2 Save/ ◀ ► Select	» Select the hot key that shall be modified with F1 and F2 and press Save/Select to confirm.
*Script Type r2m	
F1 F2 Save/ ◀ ► Select	» Select the desired script type (r2m, DALI, U6Me2) with F1 and F2 and press Save/Select to confirm.
*Assi9n F1 250mA.r2m	
F1 F2 Save/ ◀ ► Select	» Select the desired script with F1 and F2 and confirm selection with Save/Select. The hot key is now assigned to the script. Select <empty> to clear hot key.</empty>
Save/ Select	 Continue to assign other hot keys or press and hold Save/Select to save and exit the menu. → The scripts can now be chosen by a long press on the individual hot key and then be transferred to the connected LED Driver.

Mains screen:



5.4.3. Submenu *Display Settings

*Display	
Settin9s	

Save/ Select » Press Save/Select to enter the Display Settings submenu.

Structur



*Backlight

*Backli9ht on	
F1 F2 ►	» Choose behaviour of backlight with F1 and F2 .
Save/ Select	» Press and hold Save/Select to save the mode and exit the menu.

*Display mode

This mode defines the content that will be shown on the main display.

*Display mode Standard	F1 F2 ► Pisplay mode Current [mA]
F1 F2 ►	» Select the display mode as listed below with F1 and F2 .
Save/ Select	» Press and hold Save/Select to save the mode and exit the menu.

Options for display mode:



**These modes are designed for R&D purposes mainly, to get a deeper insight on the operating conditions.

5.4.4. *Bootloader activate

This setting is required for firmware upgrades.

A CAUTION!

Do not activate the Bootloader unless a firmware upgrade shall be conducted!

See chapter Firmware upgrade, p. for more information.



Save/ Select » Press Save/Select to enter the Bootloader settings.



F1 F2 Save/	» Use the buttons F1 and F2 to select <yes> in order to activate the Bootloader,</yes>
◀ ► Select	then press Save/Select to confirm.
	The Programmer will automatically enter Bootloader mode and the display will go blank.

A CAUTION!

- Activate Bootloader mode for a firmware upgrade only!
- ► To exit the Bootloader mode disconnect Programmer from USB and mains supply!

5.4.5. *Version



This menu shows the installed Programmer firmware version.

See Firmware Upgrade, p. for information how to upgrade the Programmer.

5.5. Error messages

Error message	Description
ready2mains no mains	No mains supply connected. The Programmer can only be used for pre-configuration (e.g loading scripts into its memory) or as a DALI USB interface without DALI PS.
ready2mains DC mains	DC is connected to mains
ready2mains com failure	This error may occur if no load is connected while programming

6. Excel scriptGENERATOR

6.1. General information

The software tool scriptGENERATOR is based on MS EXCEL and is used to generate user defined parameter sets, called scripts. These scripts can then be transferred via the ready2mains Programmer into ready2mains, DALI or U6Me2 capable Tridonic LED Drivers. This provides a simple, efficient and flexible way for luminaire manufacturers to program LED luminaires.



The following script types can be generated:

- ready2mains indoor: scripts including the mainly used parameters to program indoor LED Drivers via the ready2mains protocol
- ready2mains outdoor: scripts including indoor as well as outdoor parameters (chronoSTEP2 Virtual Midnight function) to program outdoor LED Drivers via the ready2mains protocol
- DALI: scripts including an entire set of DALI parameters to program DALI LED Drivers via DALI (Memory Bank writing)
- U6Me: scripts including chronoSTEP2 sequences to program outdoor LED Drivers via U6Me2

The latest version of the scriptGENERATOR can be found on Tridonics website at ready2mains Programmer > Downloads > scriptGENERATOR. The tool requires a PC with Microsoft Excel installed.

A CAUTION!

Only compatible with Microsoft Excel (Tested with Microsoft Excel 2013)

6.2. Start worksheet

After starting the scriptGENERATOR the start window is visible. In this window it's possible to choose the display mode and the script type.

enlightening your ideas



Display mode:

- Simple Mode: Mode with reduced parameters for better overview. This mode is customer specific adjustable. The adjustment is done in the advanced mode because there are all parameters visible.
- Advanced Mode: Mode with all available parameters. Within this mode it's possible to configure parameters which are visible in the Simple Mode. All parameters which are marked with YES in the column "visible in simple mode?" are visible in the Simple mode, columns with NO not.

Script type:

Here we choose the script type. 5 Different are available:

- ready2mains Indoor: to configure indoor
- ready2mains Outdoor: to configure outdoor
- DALI: to configure DALI drivers
- U6Me2: to configure chronoSTEP 2 drivers
- basicDIM DGC: to configure the basicDIM DGC via DALI

6.3. How to generate a script

After choosing a script type a separate worksheet called "Dataset and generation" is automatically generated. The content of the worksheet depends on the selected script type as they support different kinds of parameter. While the DALI scripts support the largest set of parameter, they are already limited for ready2mains scripts. U6Me2 scripts cover chronoSTEP2 sequences only.

Nevertheless, the general worksheet structure is similar in all cases.

Line #	Add to script	Delay [ms]	DALI short address	Physical value	Parameter description M		Max value	visible in simple mode?	save to DALI file
1	2	3	4	5	Switch Programmer output off (initialization) Switch Programmer output on	7 °	8	9	10
53		100 ms			Switch on DALI supply	no	по	Yes	
101		0 ms			Start automatic addressing of all connected DALI devices on the bus	no	no	No	
102		0 ms			Set given short address in the column "value" to the connected device	0	63	No	
103		0 ms			Set output current [mA]	0 mA	2000 mA	Yes	
105		0 ms			Reset the output of the Programmer. Keep the output off for x seconds given by the column "Physical value"	0 s	255 s	Yes	
106		0 ms			OEM GTIN byte 0 (MSB)	0	255	No	
107		0 ms			OEM GTIN byte 1	0	255	No	
108		0 ms			OEM GTIN byte 2	0	255	No	
109		0 ms	2		OEM GTIN byte 3	0	255	No	
110		0 ms			OEM GTIN byte 4	0	255	No	
111		0 ms			OEM GTIN byte 5 ATTENTION: may not work with old drivers! (only ready2mains affected!)	0	255	No	
440		0			OFN Hard Bradies and hard (NOD)		000		

6.3.1. DALI scripts

- 1. Consecutive line number
- Add to script determines whether a parameter or command shall be included in the script. Enter the character "X" to include; the cell is then automatically marked green
- 3. Delay [ms] allows adding a certain delay between commands. This delay can be used for special testing purposes within the production line eg. measuring the set current after programming during Production
- 4. DALI short address cell is valid for DALI only; column is not visible for r2m, U6Me2 or basicDIM DGC scripts. It is possible to send parameters only to a specific DALI short address.
- 5. Physical value enter the physical value of each parameter; see column 6 **Parameter description** for more information
- 6. Parameter description short description with available choices, if available
- 7. Min value defines the minimum value of parameter
- 8. Max value defines the maximum value of parameter
- 9. visible in simple mode? Only visible in Advanced mode, defines if this row is visible in simple mode. YES -> visible NO -> not visible
- 10. Save to XYZ button to generate and store the script as specific type

6.3.2. ready2mains scripts

Line #	Add to script	Save	Delay [ms]	Physical value	Parameter description	Min value	Max value	visible in simple mode?	save to r2m file
1	2	3	4	5	Switch Programmer output off (initialization) Switch Programmer output on	7.	8	9	10
103			0 ms		Set output current [mA] and choose optional lockbit	0 mA	2000 mA	Yes	
105			0 ms		Reset the output of the Programmer. Keep the output off for x seconds given by the column "Physical value"	0 s	255 s	Yes	
106			0 ms		OEM GTIN byte 0 (MSB)	0	255	No	
107			0 ms		OEM GTIN byte 1	0	255	No	
108			0 ms		OEM GTIN byte 2	0	255	No	
109			0 ms		OEM GTIN byte 3	0	255	No	
110			0 ms		OEM GTIN byte 4	0	255	No	
111			0 ms		OEM GTN byte 5 ATTENTION: may not work with old drivers! (only ready2mains affected!)	0	255	No	
112			0 ms		OEM Identification number byte 0 (MSB)	0	255	No	
113			0 ms		OEM Identification number byte 1	0	255	No	

- 1. Consecutive line number
- 2. Add to script determines whether a parameter or command shall be included in the script. Enter the character "X" to include; the cell is then automatically marked green
- 3. Save set optional lockbit to prevent further access to the current programming via ready2mains and to define additional save points; see chapter "Save" below for more information
- 4. Delay [ms] allows adding a certain delay between commands
- 5. Physical value enter the physical value of each parameter; see column 6 Parameter description for more information
- 6. Parameter description short description and choices, if available
- 7. Min value determines minimum value of parameter
- 8. Max value determines maximum value of parameter
- 9. visible in simple mode? Only visible in Advanced mode, defines if this row is visible in simple mode. YES -> visible NO -> not visible
- 10. Save to XYZ button to generate and store script

Save variants

Save variants for parameter output current:



- send current value without saving (temporary): send current to LED Driver without saving it. After restart the value is lost and the previous value is restored
- save current value (permanently): send current to LED Driver and save it permanently
- save and set lockbit (permanently, not resettable): send current to LED Driver, save it permanently and set lockbit. All further current changes will be ignored by the LED Driver

- With fixed-output EXCITE LED Drivers it is only possible to set a current 5 times; any subsequent programming will be ignored
- Setting the optional lockbit prevents any further access to the current setting via ready2mains and is not reversible
- After each save command the LED Driver will confirm the successful execution with an optical feedback. See the chapter Optical Feedback, p. 23 for more details.

Save variants for all other parameter:



- > automatic (faster): preset selection, only used to reset a previous "save and continue" selection
- save and continue: for larger parameter sets it is recommended to set some save points in order to further enhance the transmission reliability

A CAUTION!

► After each save command the LED Driver will confirm the successful execution with an optical feedback. See the chapter Optical Feedback, p. 23 for more details.

6.3.3. U6Me2 scripts

Line #	Add to script	Physical value	Parameter description	Min value	Max value	visible in simple mode?	save to U6m file	
1	2	3	Switch Programmer output off (initialization)	5	6	_ 7 _	8	
لغا			Switch Programmer output on					
201			Set operating mode 128=>Automatic mode; 134=>ChronoStep2 mode	list	list	Yes		
202			Execute factory reset for chronoSTEP2. Set all values back to default settings	no	no	Yes		
203			chronoSTEP2 PowerOnLevel	1%	100%	Yes		
204			chronoSTEP2 Time2Midnight, rounded to units of 15 min	0 min	1425 min	Yes		
205			chronoSTEP2 Reduction Time 1 (Sequence 5), rounded to units of 5 min	0 min	720 min	No		
206			chronoSTEP2 Reduction Time 2 (Sequence 5)	0 min	720 min	No		
207			chronoSTEP2 Reduction Time 3 (Sequence 5)	0 min	720 min	No		
208			chronoSTEP2 Reduction Time 4 (Sequence 5)	0 min	720 min	No		
209			chronoSTEP2 Reduction Time 5 (Sequence 5)	0 min	720 min	No		
210			chronoSTEP2 Reduction Time 6 (Sequence 5)	0 min	720 min	No		

- 1. Consecutive line number
- Add to script determines whether a parameter or command shall be included in the script. Enter the character "X" to include; the cell is then automatically marked green
- 3. Physical value enter the physical value of each parameter; see column 4 Parameter description for more information

- 4. Parameter description short description and choices, if available
- 5. Min value determines minimum value of parameter
- 6. Max value determines maximum value of parameter
- visible in simple mode? Only visible in Advanced mode, defines if this row is visible in simple mode. YES -> visible NO -> not visible
- 8. Save to XYZ button to generate and store script

6.3.4. basicDIM DGC scripts

Line #	Add to script	Delay [ms]	Physical value	Parameter description	Min value	Max value	visible in simple mode?	save to basicDIM
1	2	3	4	Switch Programmer output off (initialization) Switch Programmer output on	6	7.	8	5
53		100 ms		Switch on DALI supply	no	no	Yes	
401		0 ms		Room Profiles: Select room profile 1: Profil 2 (Classroom) 2: Profil 2 (Classroom) 3: Profil 3 (Corridor) 4: Profil 4 (Toliet) 5: Profil 5 (Free-standing luminaire) NOTE: changing the room profile reset all other settings This may override other settings!	1	5	Yes	
402		0 ms		Motion Sensor: Power on behaviour 32: Standby 34: Presence value	list	list	Yes	
403		0 ms		Device-Specific configuration:	-95%	95%	Yes	

- 1. Consecutive line number
- Add to script determines whether a parameter or command shall be included in the script. Enter the character "X" to include; the cell is then automatically marked green
- 3. Delay [ms] allows adding a certain delay between commands. This delay can be used for special testing purposes within the production line eg. measuring the set current after programming during Production
- 4. Physical value enter the physical value of each parameter; see column 6 **Parameter description** for more information
- 5. Parameter description short description with available choices, if available
- 6. Min value defines the minimum value of parameter
- 7. Max value defines the maximum value of parameter
- 8. visible in simple mode? Only visible in Advanced mode, defines if this row is visible in simple mode. YES -> visible NO -> not visible
- 9. Save to XYZ button to generate and store the script as specific type



6.3.5. chronoSTEP sequence generator

In some script types chronoSTEP profiles can be integrated for outdoor applications. To simplify this procedure it is recommended to use the separate worksheet chronoSTEP sequence generator.

The chronoSTEP sequence generator is available in these script types:

- ready2mains outdoor
- DALI
- U6Me2

If one of these script types is chosen, the chronoSTEP sequence generator worksheet will automatically be displayed.



How to create chronoSTEP profiles



- 1. chronoSTEP sequence overview shows the general setup of a chronoSTEP sequence
- Parameter field define duration and light level of each sequence segment. Enter character "x" into the column "activate" to integrate each line into the sequence

- 3. Automatically calculated values based on the parameter field; no changes possible
- 4. Sequence selection select the target profile number for the chronoSTEP sequence (5, 6 or 7)
- 5. Press "Copy Data" to transfer profile parameter to the general script worksheet. The data is then automatically inserted into the target profile

After conducting the steps described above, the created profiles can be found in the data set and generation worksheet:

100								
	105	х	0 ms		69 min	chronoSTEP2 Reduction Time 1 (Sequence 6)	0	720 min
	106	х	0 ms		130 min	chronoSTEP2 Reduction Time 2 (Sequence 6)	0	720 min
1	107	х	0 ms		191 min	chronoSTEP2 Reduction Time 3 (Sequence 6)	0	720 min
	108	х	0 ms		252 min	chronoSTEP2 Reduction Time 4 (Sequence 6)	0	720 min
	109	х	0 ms		313 min	chronoSTEP2 Reduction Time 5 (Sequence 6)	0	720 min
	110	х	0 ms		374 min	chronoSTEP2 Reduction Time 6 (Sequence 6)	0	720 min
	111	х	0 ms		435 min	chronoSTEP2 Reduction Time 7 (Sequence 6)	0	720 min
	112	х	0 ms		496 min	chronoSTEP2 Reduction Time 8 (Sequence 6)	0	720 min
	113	x	0 ms		1%	chronoSTEP2 Reduction Level 1 (Sequence 6) set dim level to x %.	0	100%
	114	х	0 ms		10%	chronoSTEP2 Reduction Level 2 (Sequence 6) set dim level to x %.	0	100%
	115	x	0 ms		20%	chronoSTEP2 Reduction Level 3 (Sequence 6) set dim level to x %.	0	100%
	116	x	0 ms	2	40%	chronoSTEP2 Reduction Level 4 (Sequence 6) set dim level to x %.	0	100%
	117	х	0 ms		50%	chronoSTEP2 Reduction Level 5 (Sequence 6) set dim level to x %.	0	100%
	118	х	0 ms		21%	chronoSTEP2 Reduction Level 6 (Sequence 6) set dim level to x %.	0	100%
	119	x	0 ms		90%	chronoSTEP2 Reduction Level 7 (Sequence 6) set dim level to x %.	0	100%
	120	x	0 ms		100%	chronoSTEP2 Reduction Level 8 (Sequence 6) set dim level to x %.	0	100%
11								



6.3.6. Save ready2mains scripts

When pressing the "save to XYZ file" button the following window appears:

File Version:	1	Gui Version:	1.0	
File created by:	Max Mustermann	Freetext 1:		
File ID:	1	Freetext 2:		
File Freetext 1:	[Freetext 3:	[
File Description:	chronoSTEP	GUI Description:	Excel script generator	
			Save	Cancel

Enter any additional information into the given fields, e.g. the creator's name and a short description of the script content.

The script name is requested after pressing **Save**, whereon the script is saved to its place of destination.



6.4. Execute scripts

For more information on the execution of scripts see chapter Graphical User Interface, p. 17.

6.5. Load scripts on the Programmer

Connect the Programmer via the enclosed USB cable to a PC. All software drivers will automatically be installed on the PC, which may take several minutes. After an initial installation, the Programmer is automatically recognized as a removable disk with approx. 4 GB internal memory.

Download the scripts by drag and drop via any file manager (e.g. Windows Explorer).

A CAUTION!

- ▶ It is recommend to backup all scripts and log files stored on the Programmer.
- Scripts need to be stored in the root folder of the Programmer. Subfolders are not supported.

7. Script data file format

Programming sequences shall be received via USB (class 08) as csv files. These files are stored on the internal memory card (μ SD).

The csv files will be created with a PC tool and will have dedicated suffixes:

*.dali programming sequence (in csv format) to be sent on the DALI interface

- *.r2m programming sequence (in csv format) to be sent on the mains output as ready2mains frames
- *.u6m programming sequence (in csv format) to be sent on the mains output as U6M, U6Me or U6Me2 signals

On request the programmer loads a specific programming sequence from the memory card and sends the specified frames to the corresponding interface.

All generated csv files have the following structure:

csv file format, all fields are separated by 0x3B (semicolon), lines separated by CR + LF

File header, single line	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	
only!	SOH (0x01)	File version	Data type	File created by XXX	File_id	reserved	
Header description text	Description text for the file. Can be	multi line.	This text is	enclosed by STX	and ETX		
Data set	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	
line only!	FS (0x1C)	GUI type	Gui version	Reserved	reserved	reserved	
Data record (15 fields each)	15 fields separated by 0x3B (semicolon), lines separated by 0x0D (CR) and 0x0A (LF). Start and end of data records are marked with STX and ETX. Default values for not used fields are 0.						
	Maybe additionally Datasets including headers						
End of File	0x04 (that is the real end of the file)						

7.1. File Header

SOH (field 1)
 » Start of header for easy recognition

- File version (field 2)
 - » Version number of file for handling changes in future versions. Minor versions are incremented on changing content or small changes in file format which is backward compatible. Major version is incremented in case of incompatibility to previous file format
- Data Type (field 3):
 - » gives the data type of the data records inside the file:
 - » 0 or DALI Data ... DALI data records
 - » 1 or r2m data ... r2m data records
 - » 2 or U6m data... U6Me2 data records
 - » >2 ... reserved
- Created by XXX (field 4):
 - » No action for the programmer. This gives the ilnformation about the software which was used to create the file
- FileID (field 5):
 - » Number generated by the scriptGENERATOR to check for the user if the file has changed. Every time a file is generated that number is incremented.
- ▶ field 6
 - » reserved for future needs

The programmer verifies the data type with the file extension as described in chapter Script data file format, p. 41.

7.2. Dataset Header

- FS (field 1)
 - » File separator. Used for simple recognition of datasets coming from different GUI. Only single line is allowed behind this identifier
- GUI Type (field 2):
 - » No action for the programmer. This gives the GUI type of the data records for read operations on the PC
- GUI version (field 4)
 - » Version Number of GUI which was used to generate this data, this is needed for handling changes in future versions
- field 5, field 6
 - » reserved for future needs

7.3. Data records for DALI and ready2mains

Each data record consists of 15 fields. Each field is coded as 1 byte data and separated by semicolon. The fields are the same as defined for using over the DLL except the fact that the script contains an additionally field delay which is not transferred via USB.

File data record definition for Dali and R2M

Byte	Byte	Byte	Byte	Byte	Byte	Byte	Byte	Byte	Byte	Byte	Byte	Byte
0	1	2	3	4	5	6	7	8	9	10	11	12-14
Com- mand	Se- quence	Control	Mode	Data0	Data1	Data2	Data3	DTR Data	Prio- rity	Device Type	Delay	reserved

Delay: A delay time in 100ms step for the next command

- For DALI: 0 = delay according Priority
- For others: 0 = no delay between frames

Reserved: default 0

7.4. Data records for programmer specific commands

In general the format for all programmer specific commands is the same as for DALI and r2m. There is just the naming of the fields changed. The U6Me2 Protocol is supported on behalf of the programmer specific commands because only switching functionality is needed. All timings if not otherwise mentioned are in 100ms steps. That means a field value of 10 is equal to 1 second.

Byte	Byte	Byte	Byte	Byte	Byte	Byte	Byte	Byte	Byte	Byte	Byte	Byte
0	1	2	3	4	5	6	7	8	9	10	11	12-14
Com- mand	Se- quence	Control	Mode	Data0	Data1	Data2	Data3	Data4	Data5	Data6	Delay	reserved

7.5. Verify file format and extension

The Programmer verifies if the given file extensions is aligned with the file header. If the header is not matching the content then the file will be deleted on the Programmer.

7.5.1. Sample of file according above definitions

```
1 808Fileversion;Datatype;Created by XXX (show creation software);FileID(uniqe id for mapping to buttons);Reserve; 838

2 878Fere a multi line text is allowed 836

3 all special characters except ETX are allowed 836

4 within the text. 8788906

5 88Guitype;Guiversion;Reserve;Reserve; 836

6 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

7 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

8 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

9 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

10 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

11 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

12 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

13 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

13 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

13 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

13 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

13 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

13 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

13 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

14 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

15 87800

16 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

17 87800

18 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

19 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

19 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

19 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

19 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

10 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

10 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

10 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

10 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

10 8781;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

10 8781;2;4;5;6;7;8;9;10;11;12;13;14;15; 836

11 8781;2;4;5;6;7;8;9;10;11;12;13;14;15; 836

12 8781;2;4;5;6;7;8;9;10;11;12;13;14;15; 836

13 1;2;3;4;5;6;7;8;9;10;11;12;13;14;15; 836

14 8781;2;4;5;6;7;8;9;10;11;12;13;14;15; 836

15 8780;2;4;5;7;8;9;10;11;12;13;14;15; 836

16 8781;2;4;5;6;7;8;9;10;11;12;13;14;15; 836

17 8780;2;4;5;6;7;8;9;10;11;12;13;14;15; 836

18 8781;2;4;5;6;7;8;9;10;11;12;13;14;15; 836

19 8781;2;4;5;6;7;8;9;10;11;12;13;14;15; 836

10 8781;2;4;5;6;7;8;9;10;11;12;13;14;15; 836

10 8781;2;4;5;6;7;8;
```

8. Firmware Upgrade

Regular firmware upgrades help to further improve and extend the performance of the ready2mains Programmer.

The latest firmware version is available at www.tridonic.com.

Conduct the following steps to upgrade the ready2mains Programmer:

- Check which version is currently installed on the ready2mains Programmer. See Check installed version, p. 46 for further information.
- Uninstall old firmware upgrade tools
- Download and install the Tridonic Programmer Upgrade Tool from Tridonic at www.tridonic.com
- Download the latest ready2mains Programmer firmware (file format *dfu)
- > Activate the Bootloader mode on the Programmer and connect the Programmer via USB to the PC
- Execute the firmware upgrade

A CAUTION!

If STMicroelectronics Firmware upgrade tool and driver is installed (first version of Firmware Upgrade Tool), Uninstall this Tool and the driver completely!

8.1. Check installed version

To verify the currently installed firmware version proceed as described below:



A CAUTION!

Only install newer firmware versions. Do not downgrade to an older version!

Save/ Select » If there is no newer version available, exit the menu by press and hold Save/Select.

» If there is a firmware upgrade available, activate the Bootloader mode as described in the chapter Activate Bootloader, p. 47.

8.2. Install Tridonic Programmer Upgrade Tool

To execute the firmware upgrade a dedicated upgrade tool from Tridonic is required.

Download is available at www.tridonic.com.

After the download is finished unzip the Zip file and start the installation.

Follow the instructions of the Windows installer to install the Tridonic Programmer Upgrade Tool.

At the installation also the driver for the Programmer in Bootloader mode is installed.

Bevor the driver is installed this message will appear:

VVI	ndows can't verify the publisher of this driver software
	Don't install this driver software
	You should check your manufacturer's website for updated driver software for your device.
-	Install this driver software anyway
	Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or stea information.

Choose Install this driver software anyway!

After finishing the installation the software is ready to upgrade the ready2mains Programmer.

8.3. Activate Bootloader

Before installing the new firmware the Bootloader of the Programmer needs to be activated.

Connect the Programmer via USB to the PC. Then activate the Bootloader on the Programmer.

Save/ Select	» To activate the Bootloader press and hold Save/Select to enter the menu.
F3 F4 ▼	» Scroll down with F3 and F4 until the page Bootloader activate is shown: *Bootloader activate
Save/ Select	» Press Save/Select to enter the Bootloader settings: *Activate Yes
F1 F2 Save/ Select	 » Use the buttons F1 and F2 to select Yes in order to active the Bootloader, then press Save/Select to confirm. → The Programmer will automatically enter the Bootloader mode and the display will go blank.

A CAUTION!

- Activate Bootloader mode for a firmware upgrade only
- To exit the Bootloader mode disconnect Programmer from USB and mains supply or Exit upgrade mode in the Software
- If the ready2mains Programmer is the first time connected to PC in Bootloader mode, it may take some minutes till the driver is installed.

8.4. Execute firmware upgrade

Download the latest ready2mains Programmer firmware (file format *dfu) from www.tridonic.com

Start the Tridonic Programmer Upgrade Tool.

Firmware Upgrade

Tridonic Programmer in upgrade mode							
1	Fuit upgrade mode						
	Exit	upgrade mode					
Actions							
Target Id	Name	Available Sectors (Double Clic					
00	Internal Flash	12 sectors					
01	Option Bytes	1 sectors					
02	OTP Memory	2 sectors					
03	Device Feature	I sectors					
•							
Selected Fi Vendor ID:	ilename: tridonicPro	ogrammer_V1.0.6_Rev27_18122015.dfu Targets in file: 00 STM32F2xx					
Selected Fi Vendor ID: Procuct ID:	ilename: tridonicPrc	ogrammer_V1.0.6_Rev27_18122015.dfu Targets in file: 00 STM32F2xx					
Selected Fi Vendor ID: Procuct ID: Version:	ilename: tridonicPro	ogrammer_V1.0.6_Rev27_18122015.dfu Targets in file: 00 STM32F2xx					
Selected Fi Vendor ID: Procuct ID: Version: Version:	ilename: tridonicPro	ogrammer_V1.0.6_Rev27_18122015.dfu Targets in file: 00 STM32F2xx ptimize Upgrade duration (Remove some FFs)					
Selected Fi Vendor ID: Procuct ID: Version: Version: Choose.	ilename: tridonicPro	ogrammer_V1.0.6_Rev27_18122015.dfu Targets in file: 00 STM32F2xx ptimize Upgrade duration (Remove some FFs Upgrade Verify					
Selected Fi Vendor ID: Procuct ID: Version: Version: Choose.	ilename: tridonicPro	ogrammer_V1.0.6_Rev27_18122015.dfu Targets in file: 00 STM32F2xx ptimize Upgrade duration (Remove some FFs) Upgrade Verify Operation duration					
Selected Fi Vendor ID: Procuct ID: Version: Version: Verify a Choose. Transferr 0 KB(0 B Bytes)	ilename: tridonicPro	ogrammer_V1.0.6_Rev27_18122015.dfu Targets in file: 00 STM32F2xx ptimize Upgrade duration (Remove some FFs) Upgrade Verify 0peration duration 00:00:00					

Available devices for Upgrade:

Choose the option Tridonic Programmer in upgrade mode. All settings are automatically set.

To releas programmer from upgrade mode press Exit upgrade mode.

Upgrade or verify action:

A DANGER!

Some updates may cause a data loss of the internal storage! It's highly recommended to backup the data on the storage!

Press the button **Choose...** to select the latest Programmer firmware (*.dfu file). The message "File correctly loaded." appears at the bottom.

Press **Upgrade** to execute the firmware upgrade.

The status of the upgrade process is shown at the bottom of the upgrade tool.

A CAUTION!

Do not disconnect the Programmer during the upgrade process as this may damage the Programmer!

After a successful upgrade, the message **"Target 00: Verify successful!"** is shown. Close the upgrade tool to exit Bootloader Mode.

104 KB(107448 Bytes) of 104 KB(107448 Bytes)	00:00:09	
Target 00: '	Verify successful !	

9. Connector Data

PHOENIX CONTACT - MC 1,5/10-ST-3,81	PHOENIX CONTACT - KGG-MC 1,5/10
Art. Nr:: 1803659	Art. Nr.: 1834424
A A A A A A A A A A A A A A A A A A A	

9.1. Dimensions

Length	16.1 mm
Height	11.1 mm
Width	38.89 mm
Pitch	3.81 mm
Dimension a	34.29 mm

9.2. General

Range of articles	MC 1,5/ST
Insulating material group	1
Rated surge voltage (III/3)	2.5 kV
Rated surge voltage (III/2)	2.5 kV
Rated surge voltage (II/2)	2.5 kV
Rated voltage (III/3)	160 V
Rated voltage (III/2)	160 V
Rated voltage (II/2)	320 V
Connection in acc. standard	EN-VDE
Nominal current I _N	8 A
Nominal cross section	1.5 mm²
Maximum load current	8 A (with 1.5 mm ² Leiterquerschnitt)
Insulating material	PA
Inflammability class according to UL 94	V0
Internal cylindrical gauge	A1
Stripping length	7 mm
Number of positions	10
Screw thread	M2
Tightening torque, min	0.22 Nm
Tightening torque max	0.25 Nm



9.3. Connection Data

Conductor cross section solid min.	0.14 mm²
Conductor cross section solid max.	1.5 mm²
Conductor cross section flexible min.	0.14 mm ²
Conductor cross section flexible max.	1.5 mm²
Conductor cross section flexible, with ferrule without plastic sleeve min.	0.25 mm²
Conductor cross section flexible, with ferrule without plastic sleeve max.	1.5 mm²
Conductor cross section flexible, with ferrule with plastic sleeve min.	0.25 mm²
Conductor cross section flexible, with ferrule with plastic sleeve max.	0.5 mm²
Conductor cross section AWG min.	28
Conductor cross section AWG max.	16
2 conductors with same cross section, solid min.	0.08 mm ²
2 conductors with same cross section, solid max.	0.5 mm²
2 conductors with same cross section, stranded min.	0.08 mm ²
2 conductors with same cross section, stranded max.	0.75 mm ²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, min.	0.25 mm ²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, max.	0.34 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, min.	0.5 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, max.	0.5 mm²
Minimum AWG according to UL/CUL	30
Maximum AWG according to UL/CUL	14



Manufacturer Link

https://www.phoenixcontact.com/online/portal/gb?uri=pxc-oc-itemdetail:pid=1803659&library=gben&tab=1

10. Glossary

The following abbreviation are used in this document:

Abbreviation	Description
API	Application programming interface, the interface used to program a graphical user interface
DALI	Digital Addressable Lighting Interface
DUT	Device under test
GUI	Graphical user interface
R&D	Research and development department
U6Me2	A programming mode which makes it possible to configure drivers of outdoor luminaires. (The original meaning of the letters and numbers is not officially publicised anymore.)