LIGHTING SOLUTIONS

Operating Manual iCTI

Intelligent Control for Outdoor Lighting

Intelligent Hand-held Unit

Operating Manual

The iMCU is a multifunctional luminaire controller for street lighting and lighting in the vicinity of buildings. The device can not only be used to control luminaires operated with either magnetic or electronic ballasts fitted with a 1-10 V, DALI and PWM interface, but can also be individually programmed and updated. In addition, the unit serves as a fully functional light management system. The controller operates in standalone mode, which makes complicated commissioning unnecessary. Furthermore, device operation and parameter settings are made easy with the device's own GUI. Data transmission is effected either directly via a USB interface or via a hand-held operating unit that transfers parameters to the iMCU. This serves both to make the parameter process easy and enables software updates (controller firmware). And if modifications need to be made at a later date, the remote control function facilitates remote programming via the existing power line without having to open any luminaires.

1. SOFTWARE AND HARDWARE INSTALLATION

1.1. Software Installation

The software needed to program the iMCU is available for download at
www.vossloh-schwabe.com -> Services -> SW-Updates
and can be unpacked in a folder of your choice. The software will run without installation.

1.2. Hardware Installation

Connect the supplied cable to a free USB port and pull the programming adapter to remove it from the iCTI.

CAUTION: the programming adapter is connected and must not be rotated.
Then connect the circular plug to the coupling of the hand-held programming adapter.
The yellow LED should now light up independently of the switch position.

1.2.1. Remove the programming attachment (without turning it) from the iCTI

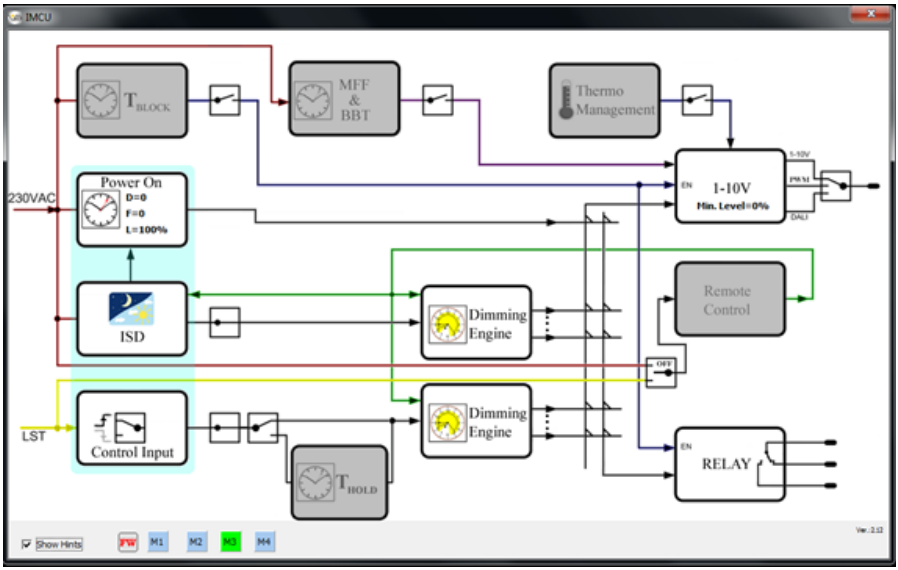
1.2.2. Turn the switch on the top of the iCTI to OFF/USB

1.2.3. Connect the USB cable (without turning it) to the iCTI; the LED will light up in yellow.

Depending on the respective version of the Microsoft® operating system, the automatic installation of the necessary USB driver can now take a few minutes. This should always be carried out automatically and will be confirmed by a message box. Should driver installation not have been carried out as described, please contact your IT department since it could be that USB ports have been disabled for security reasons.

2. RUNNING THE SOFTWARE

Double click on imcu_pgm_vxxx.exe to run the iMCU programming software.
Should the iCTI not have been properly recognised/installed, a message will appear in the upper left-hand corner that the software is running in DEMO mode. Once communication between the PC and the iCTI has been established, the data will be exported from the iCTI. The following image appears shortly afterwards:

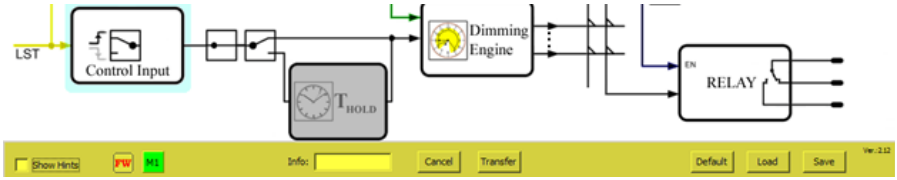


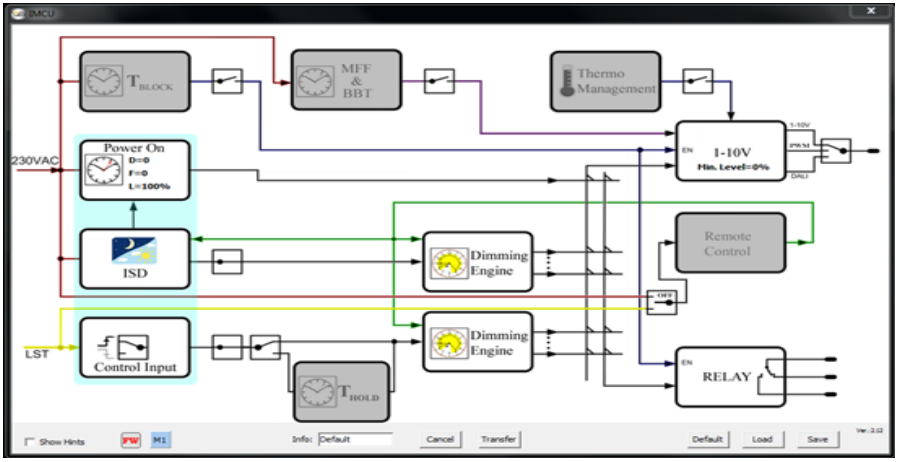
Another clear sign is if the 4 programming locations (M1 to M4) are shown at the bottom. But if the software continues to run in DEMO mode, the following could be responsible for the problem:

- the iCTI is not properly connected
- USB port is disabled (please contact your IT department)
- AtUsbHid.dll is missing in the installation directory

2.1. Select Storage Location

Setting parameters or importing a previously created set of parameters from the hard disk first depends on having chosen one of the storage locations (M1 to M4). Select the respective storage location by clicking on it. A new button bar for file operations will now appear. All parameter settings will be saved to the selected storage location of the iCTI.





3. BUTTON BAR FUNCTIONS (FILE OPERATIONS)

3.1 [Cancel]

Cancels the current action without saving data and returns to "connect new iMCU" (point 3)

3.2 [Transfer]

Transfers all program parameters to the selected storage location of the iCTI;
the program will then restart.

3.3 [Default]

Returns all program and iCTI parameters to default settings (software asks for confirmation).

3.4 [Load]

Loads a previously created parameter file into the program; all program parameters will be overwritten. A dialogue will open to select the *.vsc parameter file. As a further option, a firmware file for the iMCU can also be loaded via the right-hand pull-down menu.

3.5 [Save]

Saves the current configuration as a parameter file. A dialogue will then open to select the storage location and to name the *.vsc parameter file.

3.6 [FW]

Mousing over the info button provides information on the current firmware version for the iMCU (e.g. [Version 1.28]). If the connected iCTI is running an older version, an additional notification will be shown (Update!). In such a case, the firmware will automatically be updated to the current version during the next "Transfer". The firmware is already contained in the programming software and does not need to be loaded separately.

3.7 [Show Hints]

If the checkbox is enabled, a short explanation is shown when individual programming blocks are moused over.

3.8 [Info]

A short 8-character (max.) name can be assigned to the parameter file in this field.

4. PARAMETER PROGRAMMING

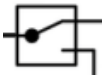
4.1. General Programming Commands

4.1.1. Switches

These switches activate or deactivate program blocks by mouse click, or alternate between different functions.

Examples:

Activates a function block. If the switch is open, the function block will be inactive and shown in grey. If the switch is closed, the function block is active and settings can be made in the block.



Switches between function blocks. For example, can switch the communication protocol to the ballast/driver from DALI to 1-10 V and vice versa.

4.1.2. Confirmation and Help Fields within the Program Blocks

Green tick: use settings
Red no entry sign: cancel
Yellow question mark: help diagram
The help diagram shows the possible settings within the current function block

4.1.3. Time Functions

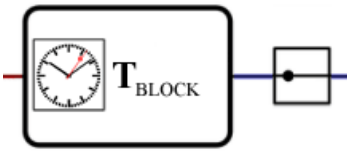
All timings are set using the slider. The total time period covered by the slider can be adjusted using the pulldown menu. This setting cannot be made in the form of a numerical value entered using the keyboard. (Sequence change.)

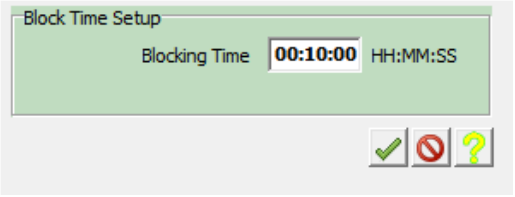
4.1.4. Fading / Fade Times

All timings are set using the slider. The total time period covered by the slider can be adjusted using the pulldown menu. Fade times are set in individual steps (%).This setting cannot be made in the form of a numerical value entered using the keyboard. Example: fade speed 1s/step means that it will take 10 seconds to fade up from 70% to 80% and 100 seconds to fade up from 0% to 100%.

4.2. Program or Function Blocks

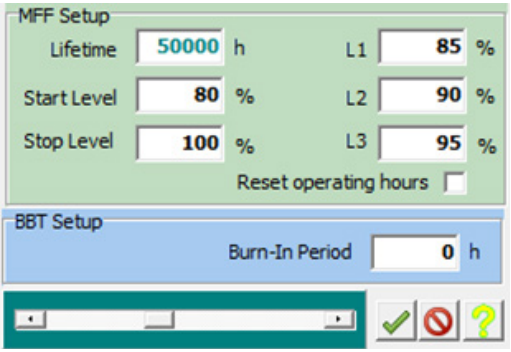
4.2.1. Blockage Times / T-Block





Blockage time is used to set a time period within which the lighting system must not be operated with reduced (dimmed) output after it has been switched on. This function is designed for use with, for example, high-pressure sodium lamps, whose output must not be reduced in the first few minutes after being switched on.

4.2.2. Maintenance Factor"MFF" und Burn-in Blockage Time"BBT"



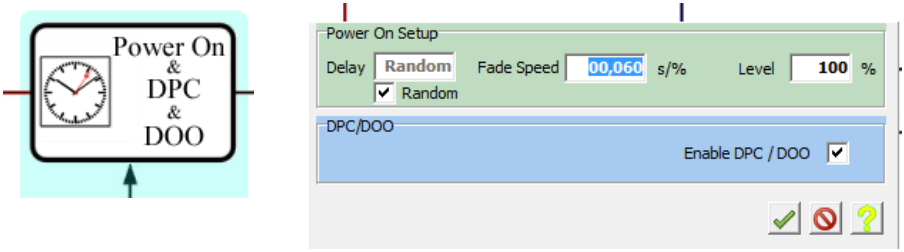
The maintenance factor to compensate for the decrease in luminous flux is set using MFF. Example: according to the manufacturer's specifications, a connected LED module is subject to a decrease in luminous flux of 20% in 50,000 hours. The maintenance factor will then be set to increase the output of the connected driver by 20% in 50,000 hours.

Three levels are available (L1, L2, L3) that permit individual adjustment of the decrease in luminous flux.

The operating-hour counter of the iMCU can be reset using the "Reset operating hours" check-box. Once the checkbox has been enabled, the counter will be reset once when the unit is next switched on.

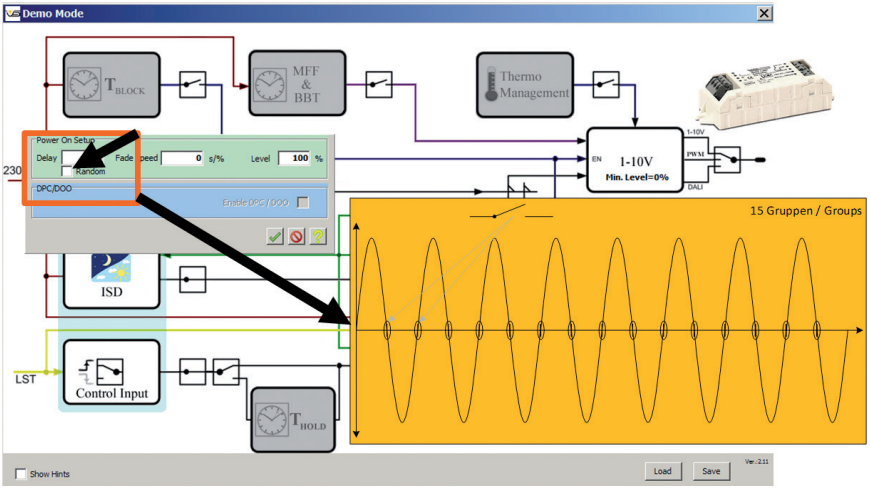
A burn-in period is defined for the lamp using "Burn-in Period". For example, the function can be used for a high-pressure sodium lamp to ensure that the lamp's output is not reduced within the first 100 hours to achieve the longest possible service life of the lamp.

4.2.3. Random/Delayed Power On "Power On & DPC & DOO"

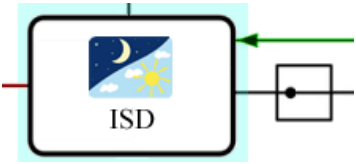


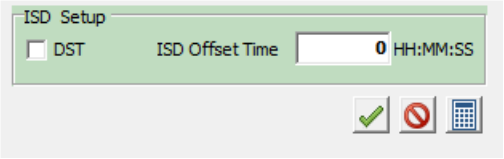
The "Random"/"Delay" function is used to set a period of time by which the moment the system is powered on is delayed. This means that the connected driver will only be switched on after the set time. The function is also used to set the fade value and the light value for the time at which the system is switched on. Fade and light values can only be set if a power-on delay of at least 1 second has been set.With DPC/DOO, the set values will also be used for switching the connected ballast/driver off at an earlier time.

If the random function is activated, current peaks can be avoided when switching-on the system.



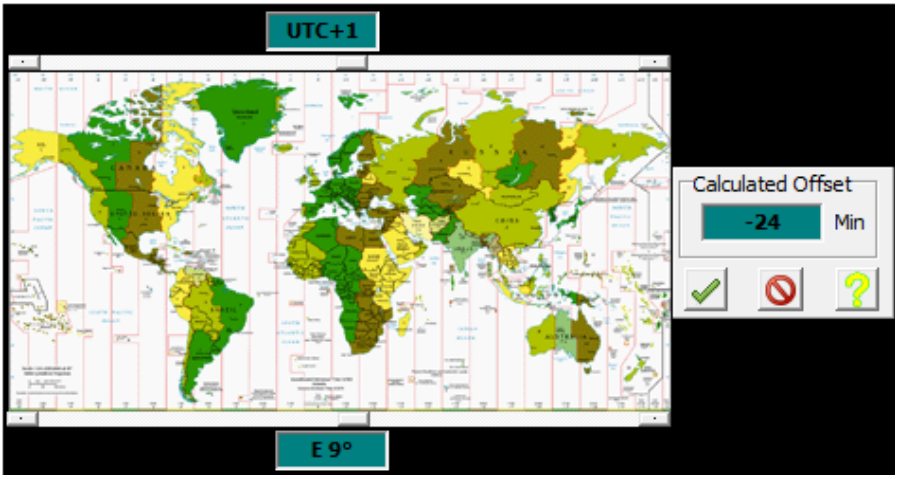
4.2.4. Astronomical Clock – ASTRO FUNCTION: ISD (Intelligent Switching Time Dimming)



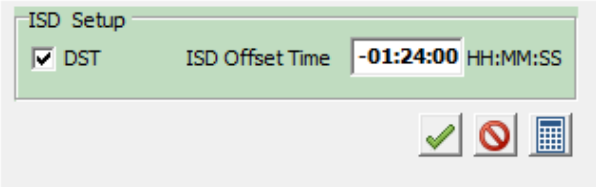


The actual duration of the night-time period is dependent on the individual location of the lighting system. The iMCU features an ASTRO/ISD function for the purpose of calculating the respective night-time hours. This function is used to set the lighting system in relation to its precise geographical installation location. This is necessary to compensate for geographical deviations within a given time zone when performing astronomical calculations of switching times.

Please proceed as follows to set the parameters:
Click on the calculator icon to enter the installation location.



The time zone is set via the upper slider, geographical longitude via the lower slider.
The calculated value is saved by clicking the confirmation button.
The settings shown here are examples for Stuttgart in Germany:
UTC + 1h and 9° (east) longitude equal a time delay of 1h and 24m in comparison to the twilight phase of UTC (Universal Time Coordinated).

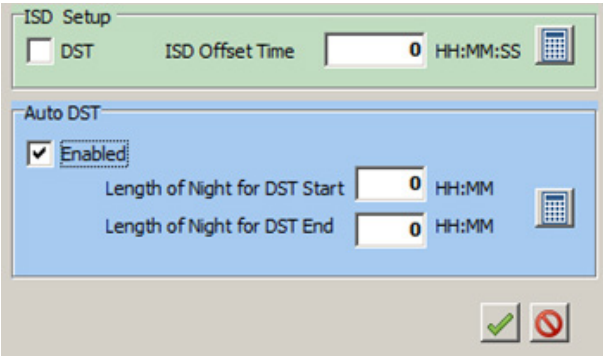


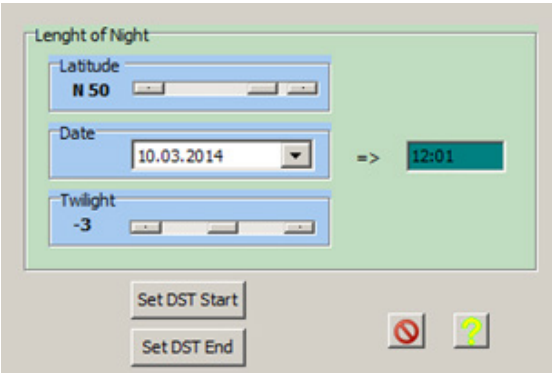
By enabling the "DST" checkbox, the astronomical calculation can be set to summer time (daylight saving time). If the checkbox is not enabled, standard time will be used instead.

Automatic Change between Regular and Daylight Saving Time

The "Auto DST" function enables the iMCU to automatically change between regular and daylight saving time. Given precise entries, automatic recognition will occur with a margin of approx. +/− 1 calendar week. The precise location is defined by its longitude and latitude. The longitude value for the offset of the UTC switching point has already been entered.

The latitude value also has a direct influence on the length of the night. Once the "Auto DST"function has been activated, a click on the calculator icon will open a help window for calculating the length of night. Now enter the actual latitude (example: Stuttgart is approximately on the 49th degree of latitude) and the dates on which the changes from regular to daylight saving time (and vice versa) take place: Example for 2015: 28.03.2015 = 10 hours 56 minutes and 24.10.2015 = 13 hours 13 minutes.

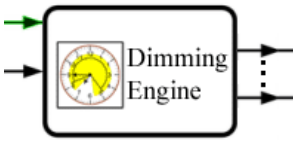


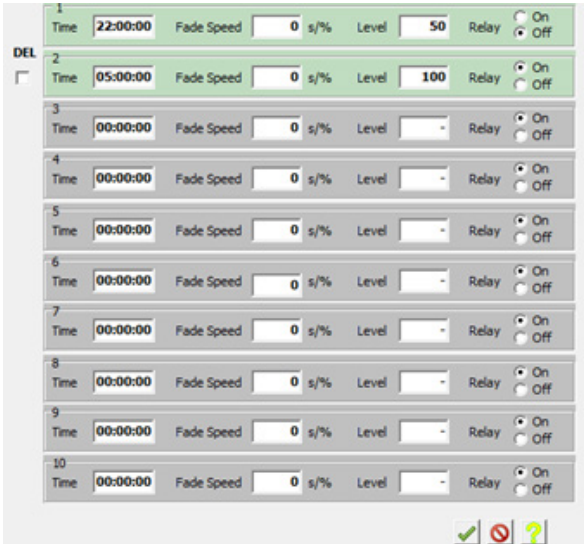


The "Dusk/Twilight" correction factor is the angle of the sun at which 20 lux has been found to be the ideal switching on value during twilight. This value applies to central Europe, the correct value has been pre-set at –3°. If necessary, you can adjust this value (at 0°, the switching point will be earlier (when there is still more natural light) and at –6° the switching point will be later (when there is less natural light).

The values can now be saved with "Set DST Start" and "Set DST End". The time change will then be calculated automatically. Please note that the iMCU will carry out the time change only a few days after the switching points have been reached, usually with 1 week (at the most).

4.2.5. Dimming Scale Normal Operation / Dimming Engine 1 (Upper Function Block)

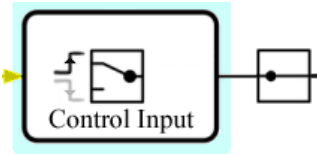




Switching times and dimming levels for normal operation are set in Dimming Engine 1. Times must be entered chronologically. A fade value, a dimming level and a switching state for the two-way relay can be entered for each switching time.

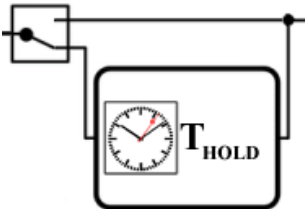
Switching times are enabled by clicking in the respective "Level" field and disabled by clicking to the right of the "Level" field.

4.2.6. External Input Function / Control Input



This function block is used to set whether the L_{st} signal input responds to a rising or a trailing edge. The respective setting is reversed with each mouse click.
The control input can, for instance, be used with systems with a switched phase, as a sensor input and for making remote parameter settings using the remote control function.

4.2.7. Holding Times / Time Hold for the External Input: T-hold Function Block



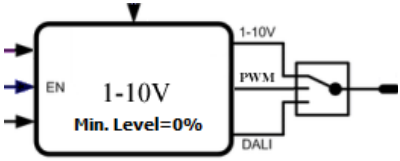
T_{Hold} is used to set the period of time for which the switching impulse to Lst is held. If T_{Hold} is not activated, switching will occur only for as long a signal is applied to Lst.
Example: motion sensor at L_{st}. If T_{Hold} is not activated, switching will occur only for as long as a signal is received from the sensor. But given a T_{Hold} value of 15 minutes, the switched state will be held for 15 minutes.

4.2.8 Dimming Scale External Input / Dimming Engine 2 (Lower Function Block)

Switching periods and dimming levels for the external L_{st} input are set in Dimming Engine 2. The set times are processed consecutively. A fade value, dimming level and switching state for the two-way relay can be set for each switching period.

Switching periods are activated by clicking in the respective "Level" field and deactivated by clicking to the right of the "Level" field.

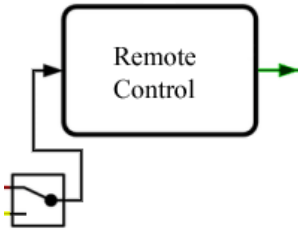
4.2.9. Changing the Communication Protocol with the Ballast/Driver

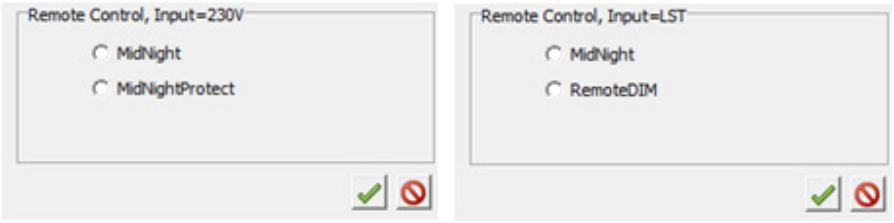


Clicking on the switch will alternate between DALI, PWM and 1–10 Volt.

Example: like the image = 1 –10 V output is active.

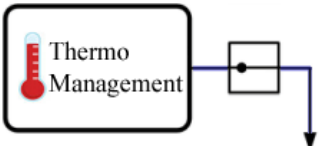
4.2.10. Remote Programming / Remote Control





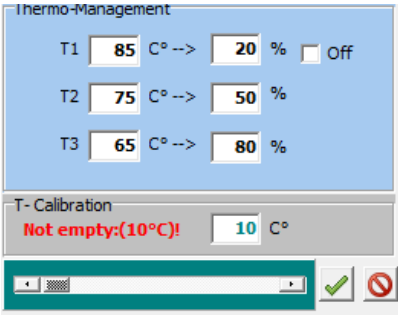
- The switch is used to alternate between remote programming using the power supply line and remote programming using the control line L_{st}.
- A programming protocol can be selected in the function block.
- Protocol details can be found in Annex A.

4.2.11. Thermal Management



With the aim of, for instance, protecting LED light sources, the Thermal Management function can be used to effect a 3-step output reduction once the iMCU controller has reached certain operating temperatures.

NOTE: this is the temperature measured inside the iMCU. Temperatures at the light source / the interface of the heat sink to the T junction can be higher and if necessary must be measured separately!



Example:
Upon reaching a temperature of 65°C, output is reduced to 80%, upwards of 75°C to 50% and at 85°C to 20% or, alternatively, switched off entirely.

5. PARAMETER TRANSFER FROM THE iCTI TO THE iMCU

5.1.

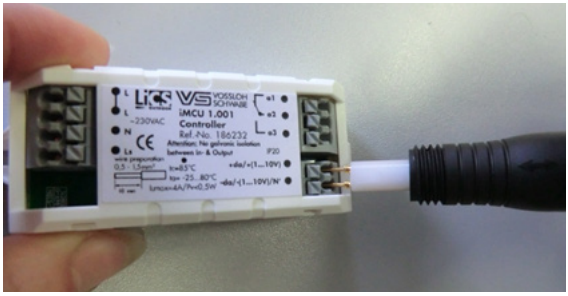
- Remove the lead (without turning it) from the iCTI.
- Insert the programming attachment without turning it; remove protective cap; turn switch to iMCU.
- The LED flashes in yellow.

5.2.

Select the storage location by pressing the respective button, after which the LED next to the storage location will light up in red.

5.3.

With the key pad facing upwards (see photos), gently press the two pins on the programming attachment into the +da and –da terminals of the iMCU. The LED will then flash in red, and an automatic check will be performed as to whether the iMCU's firmware is up to date. If this is not the case, an automatic firmware upgrade (LED will flash in yellow) will be carried out, after which the parameters will be transferred (LED will flash in red). After the programming process has been completed (a few seconds), the LED will briefly light up in yellow, all LEDs at storage locations 1 – 4 will flash and the red LED next to the storage location will go out. The parameters have now been transferred.



- If required, further iMCUs can be programmed, for which you should continue from point 5.2
- Once programming has been completed, return the switch to the OFF/USB position (LED goes out).

6. READOUT OF PARAMETERS FROM THE iMCU TO THE iCTI

6.1.

- Remove the lead (without turning it) from the iCTI.
- Insert the programming attachment without turning it and remove the protective cap. Turn the switch to iMCU.
- The LED will flash in yellow.

6.2.

- Select the storage location with a long push of the respective button; the LED next to the storage location will flash in red. The storage location will be deleted.

6.3.

With the key pad facing upwards (see photos), gently press the two pins on the programming attachment into the +da and –da terminals of the iMCU. The LED will then flash in red, and the parameters will be read out of the iMCU (LED will flash in red). After the readout process has been completed (a few seconds), the LED will briefly light up in yellow, all LEDs at program locations 1 – 4 will flash and the red LED next to the storage location will go out. The parameters have now been read out.

6.4.

Parameters that have been read out can then be transferred to the PC with the programming software and then edited and/or saved (point 5) or directly transferred to other iMCUs (point 5.2.)

ANNEX A: REMOTE PROTOCOL

1. Midnight (available for both inputs)

Remote programming protocol for modifying times set in Dimming Engine 1 and Dimming Engine 2. Programming is effected with the following Vossloh-Schwabe products: iCTT (186241) or iMICO (186250). If times are modified via Midnight, all fade values will be set to 0.

Attention, the following limitations apply when using the Midnight function:

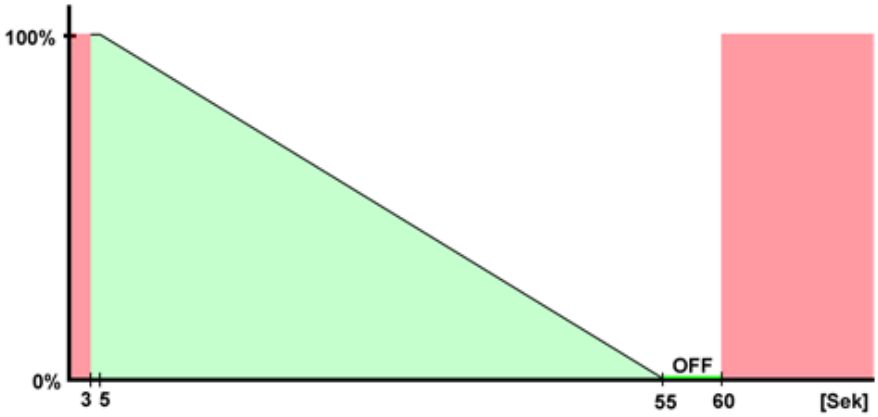
- The setting of the dimming level via the Midnight protocol can only be done in 5% steps.
- The time frame for dimming is 15 minutes.
- If new parameters are sent to the iMCU controller via Midnight protocol, fadeing is turned off in the dim engines.

2. Midnight Protect (only available for the standard phase)

Protective protocol for luminaires that are installed in a Midnight-controlled system, but that are not to be remotely programmed themselves. The Midnight Protect function checks whether data are being transferred using the Midnight protocol and, if required, will ensure luminaires are only switched on when data transfer has been completed.

3. RemoteDim (only for the external Lst input)

When using RemoteDim, a control signal is applied to L_{st}. Various switching operations are triggered depending on the duration of the signal:



Under 5 seconds: no switching operation
Longer than 5 seconds, but under 55 seconds: switches the relay on
The dimming values shown below are set in line with the duration of the impulse (between 5 and 55 seconds):
5 seconds: 100%
30 seconds: 50%
55 seconds: 5%
or respective linear values in between
55–60 seconds: the relay is switched off
60 seconds or longer: no switching operation

If no control signals are sent within a minute of the lighting system being switched on, the relay will be switched on and the dimming level set to 100%.

A member of the Panasonic group Panasonic

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LIGHTING SOLUTIONS

LiCS Outdoor iCTI 04/2015