
Users Manual

DLI/VarioFlash



Use this guide to quickly familiarize yourself with your new The Imaging Source lighting modules. Should you require further help setting up your product, fast free technical support is just a phone call, email or fax away. Thank you for purchasing lighting modules from The Imaging Source.

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Important information



We cannot and do not take any responsibility for the damage caused to you or to any other equipment connected to the VarioFlash. Likewise any damage caused by not following the manual will not be repaired by The Imaging Source. Only original The Imaging Source components should be used when replacing parts of the VarioFlash. This product is provided 'as is' and you use it at your own risk.



Never look directly into the LEDs, as the extreme brightness may damage your eye sight.



Handle the VarioFlash system components with care. Do not abuse the VarioFlash system components. Avoid striking, shaking, etc. The VarioFlash system components could be damaged by improper handling or shortage.



Do not attempt to disassemble the control unit nor LED modules. To prevent electric shock, do not remove screws or covers. There are no serviceable parts inside. Ask a qualified service person for servicing.



Do not use strong or abrasive detergents when cleaning the control unit and LED modules. Use a dry cloth to clean the system components when dirty. In case the dirt is hard to remove, use a mild detergent and wipe gently.



Do not expose the control unit and LED modules to rain or moisture, or try to operate it in wet areas. The control unit and LED modules are designed for indoor use. Turn the power off immediately and ask a qualified service person for servicing. Moisture can damage the

control unit and LED modules and also create the danger of electric shock. Only modules of the same type may be connected together.



Please only use the modules and control unit with original power cables and power supply unit. Using other cables and PSU invalidates the warranty.

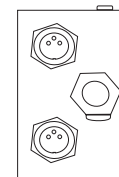
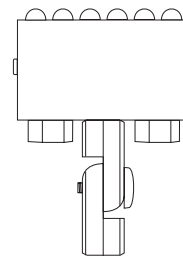


Should you, however, still wish to use your own power supply unit, please note that the modules may only be powered by +12 VDC. The control unit may only be connected to a +24 VDC power supply. Connecting the control unit or the LED modules directly to 220 / 230 / 110 VAC mains voltage is very dangerous and will result in the total destruction of both the control unit and the LED modules.



Using the modules in strobe mode without the original control unit for certain applications can be a good idea. However, please note that if the modules are strobed in an improper manner (i.e. the guidelines in the specialist handbook are not followed), the modules may be destroyed. For experienced users, the specialist handbook can be requested from The Imaging Source. Strobing the modules with your own power supply unit and controller invalidates the warranty.

The VarioFlash modules



The VarioFlash system from The Imaging Source is based on two types of LED module:

DLI/VarioFlash/IR12

with infrared (IR) LEDs (870 nm) which requires 12 VDC (200mA in always-on mode.)

DLI/VarioFlash/W12

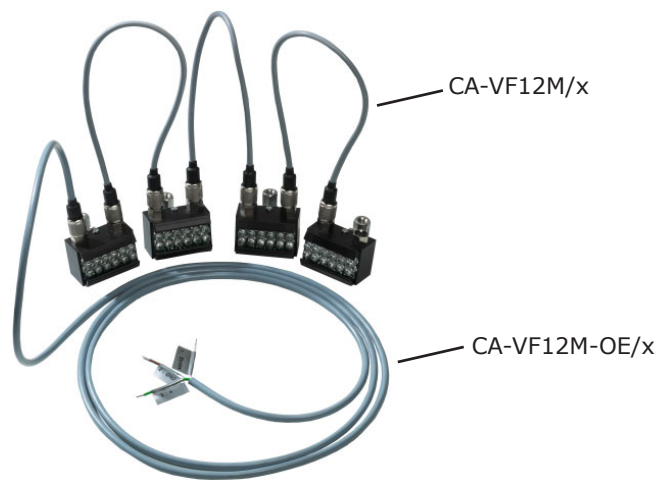
with white LEDs which requires 12 VDC (80mA in always-on mode.)

When the modules are daisy-chained in series, you may use any stabilized power supply unit (PSU) with 12 VDC. Please make sure that the total power consumption of all the modules together does not exceed the PSU's maximum power rating.

How to connect the modules

Each module has two 3 pin sub-miniature sockets which are internally wired on a one-to-one basis. It is this feature which allows the modules to be daisy-chained.

To connect the single modules The Imaging Source offers the CA-VF12M/x cable (x is the length). This cable is suitable to connect modules with IR LEDs to other modules with IR LEDs, or modules with white LEDs to other modules with white LEDs. Under no circumstances, may this cable be used to connect modules with different LEDs together - i.e. this cable must not be used, for example, to connect a module with white LEDs to a module with IR LEDs. Failure to follow this instruction will result in irreparable damage to the LEDs in both (or all) modules concerned.



Powering the modules with your own PSU

Each module has two 3 pin sub-miniature sockets which are internally wired on a one-to-one basis. It is this feature which allows the modules to be daisy-chained. For the various operating modes, the following details apply:

Always-on mode: If you want to power the LEDs in always-on mode with your own PSU, connect ground to pin 1 and then pin 2 and pin 3 to your PSU, as indicated in the above pinning tables. To assist you with the cabling, we can also supply a cable with an open end (CA-VF12M-OE/x). Any stabilized PSU with an output of 12 VDC may be used. Please pay particular attention that the amount of power drawn from the modules does not exceed the maximum power load of the PSU. The modules with infrared LEDs draw 200mA and the modules with white LEDs require 80mA.

Strobe mode: As the LEDs are driven for a short time with a current which is much higher than the normal operating current, the control of the strobe should only be undertaken by suitably trained specialists. Please see section "Strobing the modules" for details.

Pins VF module	
Pin	Signal
1	Strobe
2	GND
3	Power in
Subject to change	

Basic LED module features

LEDs are surprisingly complex electronic semiconductors. This section does not describe how LEDs function in general, rather it discusses how their features are applicable to the VarioFlash LED modules.

Forward current vs forward voltage

The graph below shows the typical current vs voltage curve of a diode. If current is applied in a forward direction and slowly increased, the current increases in a dramatic fashion (see below). If a diode is to be permanently on only the nominal voltage U_n should be used. For the VarioFlash modules, this has the following implications:

DLI/VarioFlash/IR12: This module is so built that U_n of one LED is reached when the module is powered by +12VDC. The module then draws a current of around 200mA.

DLI/VarioFlash/W12: This module is so built that U_n of one LED is reached when the module is powered by +12VDC. The module then draws a current of around 80mA.

One of the most important features is that diode current I_{Diode} may be considerably higher than the normal power consumption of I_n for a very brief moment, if three following rules are followed. This is discussed in section constraints for strobing the modules. Failure to follow them, will result in the total destruction of the LED modules:

Light intensity vs forward current

As the following diagram illustrates, the light intensity of an LED increases in a linear fashion with the forward current I_{Diode} . However, do not forget that even small changes to the diode voltage lead to large changes to the diode current (see previous section.)

Strobing the modules

Pin 1 (see section "Powering the modules with your own PSU") is used to start the strobe. It is active when the voltage U_{Pin1} is 0V and inactive when this voltage is 5VDC - see the diagram below. In this case active means that the voltage on Pin 2 and 3 (buffered in one of a capacitors in each LED modules) is switched to the diode (U_{Diode}). The current which then flows allows the LED to glow until U_{Pin1} is again at 5 VDC. Paying attention to the constraints discussed in section Constraints for strobing the module, the diode voltage U_{Puls} and thus the operating voltage which is connected to Pins 2 and 3 may be higher than the normal operating voltage U_n . This leads to a higher diode current.

The level sensitive control makes the definition of the strobe start and the definition of strobe length dangerous: If Pin 1 is always at 0V and the operating voltage is by chance permanently over U_n (due to the strobe, for example) the LED modules will be permanently damaged. The user is therefore responsible to implement safety mechanisms to prevent such a case from happening.

Constraints for strobing the modules

The increased forward current of a strobe causes the LEDs to warm up. If the following three golden rules are followed, however, this warming is so slight that the life expectancy of the LEDs only sinks from around 100,000 hours to 70,000 hours.

ton/toff < 1:4: So that the diode may cool down between strobes, the off-time should be at least a quarter of the on-time.

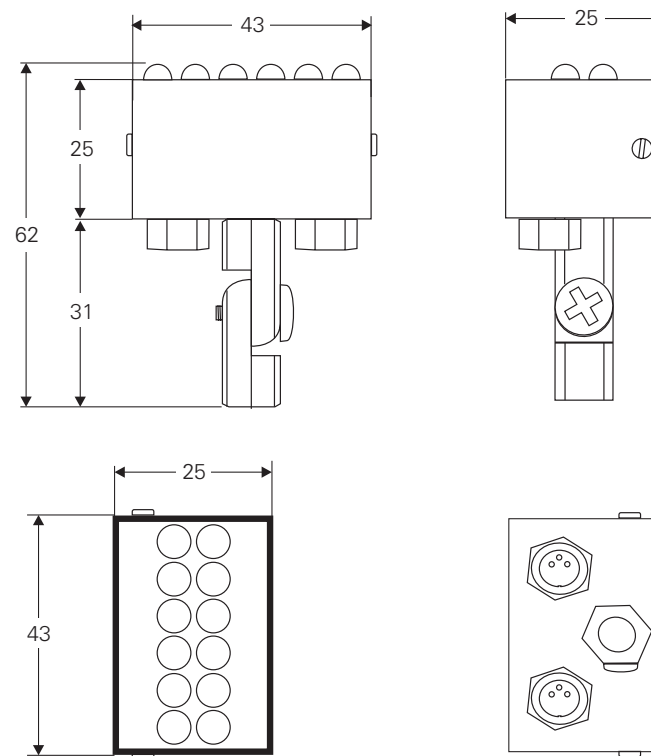
ton < 100 ms: The diode may not stay on for an unlimited time - to play it safe we recommend a maximum on-time of 100ms.

do not increase (ton+toff) * In: The diagrams to the right show that the product of the length and height of the pulse should never be greater than $(ton+toff) * In$. In practice, however, this means that +24VDC can be applied to Pin 2 and 3 of the module in strobe mode. And thus the brightness of the LEDs can be increased twenty times without problem.

If you follow the guidelines exactly as described in this hand book you can expect the VarioFlash to provide up to 100,000 hours of high performance.

But please do take these above mentioned warnings seriously - failure to do so will seriously reduce the life expectancy of the modules or will permanently damage the LEDs.

Dimensions



For your notes

Contact technical support

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