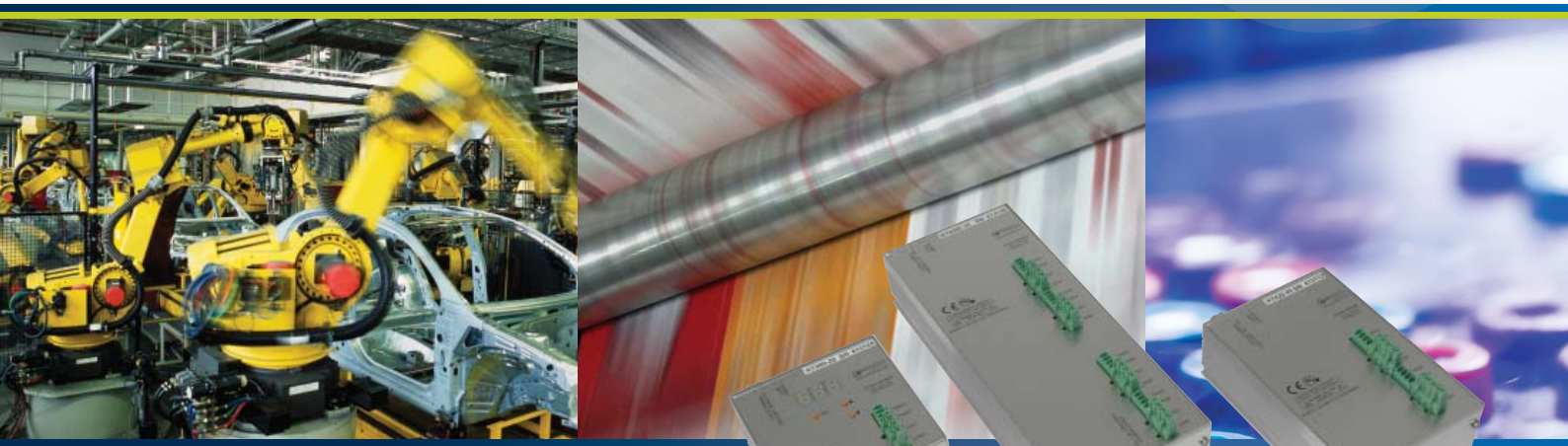
Vision Light Tech
creating optical solutions

Vision Light Tech B.V.
Protonenlaan 22, 5405 NE UDEN, P.O. Box 345, 5400 AH UDEN, The Netherlands
Phone: +31 (0)413 26 00 67, Fax +31 (0)413 26 09 38, E-mail: inquiry@vlt.nl, Website: www.vlt.nl
Trade register No. 17150044, VAT No. NL8112.30.946.B01



RT Series LED Lighting Controllers

Optimising Vision system Illumination and Control

The Gardasoft RT Series provides control of LED lighting for Machine Vision applications. It includes the power regulation, intensity control, timing and triggering functions required for vision systems.

Utilising Gardasoft's SafePower™ and SafeSense™ patented technology, the RT Series are the industry's most powerful LED Lighting Controllers.

- Up to 10 times overdriving capabilities
- 2, 4 or 8 channels of independent control
- High current pulsing up to 20A
- Resolution from 500µA to 5mA
- High power without heat-sinking

High Power, Single Housing

SafePower™ allows much greater flexibility in the DC power supply used. The advantages of SafePower™ are that no heat-sinking is required and the output voltage is not limited by the supply voltage.

No Heat-sinking

SafePower™ supply removes the need to mount the controller onto a heat-sink, simplifying the installation process. SafePower™ automatically minimises the heat generated for continuous, pulsed and switched operation.

Voltage Step-up

SafePower™ removes the restriction of the output voltage needing to be less than the input voltage, and automatically steps up or down the voltage needed to drive or Overdrive the lighting, up to a limit of 46V.

SafePower™ works automatically without needing any configuration or user input. For example, the RT range can use a 24VDC supply, regardless of the lighting connected, heat generation or Overdriving required.

Extra LED Brightness

Patented SafeSense™ technology creates a safe working environment for overdriving LED lights. Driving LEDs with a constant current source allows very precise Overdriving. SafeSense™ ensures that the pulse width and duty cycle are kept within safe working limits. The end result is that much more light is gained from the LED lighting for your machine vision application.

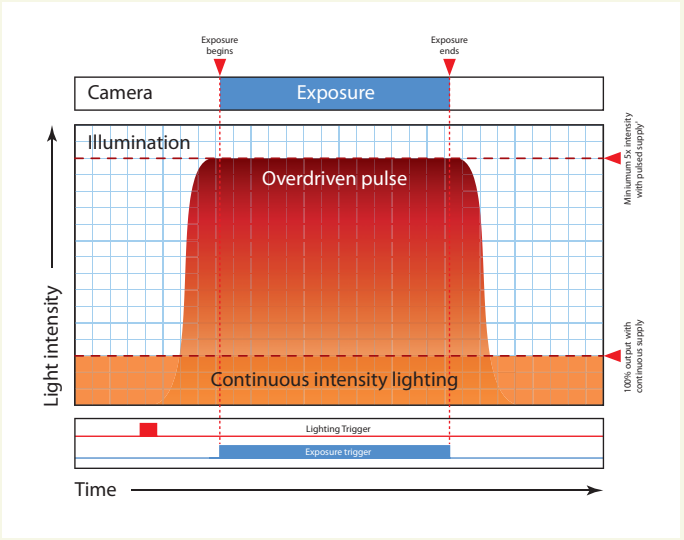
Miniature Web Server

The Ethernet option version of the RT Controllers contain a Web Server allowing the devices to be controlled by image processing software or Explorers on remote PCs. With the introduction of GigE cameras, the Machine Vision market is moving towards Ethernet - with the inherent Ethernet advantages of high speed, long distance, standardisation worldwide and inexpensive implementation.

Background to controlling LED Lighting devices

LED characteristics

LEDs are current driven devices, and their brightness is approximately proportional to the amount of current flowing through the LED. LEDs have a current rating (which is closely controlled), and a voltage rating (which can vary widely from batch to batch). Therefore for high performance, high precision, Vision applications it is essential to accurately control the current in any LED lighting device.

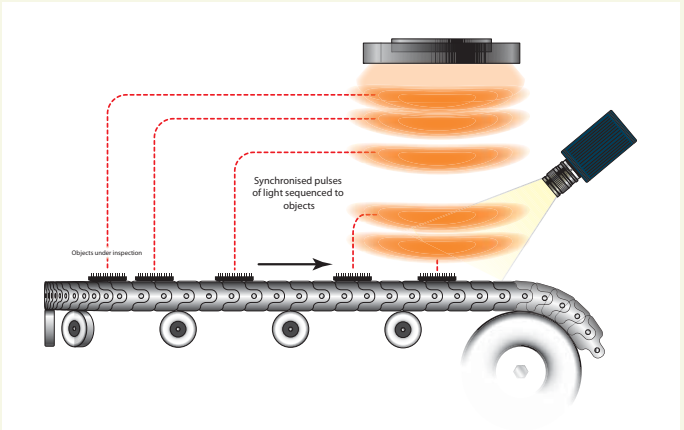


Overdriving LEDs

At their specified current rating, LEDs and LED Lights output 100% brightness. However, it is possible to obtain more than 100% brightness by driving with more current rating for short pulses. This Overdriving in conjunction with Gardasoft SafePower™ and SafeSense™ technology enables users to do this with ease and complete confidence.

Overdriving is used with pulse lighting and it brings benefit to most Vision applications. The exceptions are applications where the camera is exposed for a high percentage of the time, for example Line Scan applications (see Gardasoft VLX Line Scan illumination solutions).

Converting a constant illumination system to pulsed illumination is straightforward. The trigger for the camera is sent to a lighting controller. The controller provides precise pulse width timing, power and brightness control for the lighting pulse. This ensures that the lighting pulses during the camera exposure time and that the light energy is the same for every image.



Advantages of Pulsing

Gardasoft Vision's controllers generally have two modes of operation - Pulsed or Continuous output.

Continuous mode

Continuous output is where the lighting is on all the time. This is the easiest mode to use as the intensity of the lighting is the only parameter that needs to be set. No overdriving is permitted.

Pulsed (or Strobe) mode

In pulsed mode the lighting is switched on only when required. The controller receives a trigger signal when a pulse is required. The delay from the trigger to the output pulse, the length of the pulse and the intensity of the pulse are all configurable.

Using pulsing, it is possible to freeze the image of moving objects. Gardasoft's controllers have fine adjustment of the pulse timing, which is often more flexible than the camera's timing. The camera can be set for a longer exposure time and the light pulsed on for a short time to freeze the motion.

Flexible operation

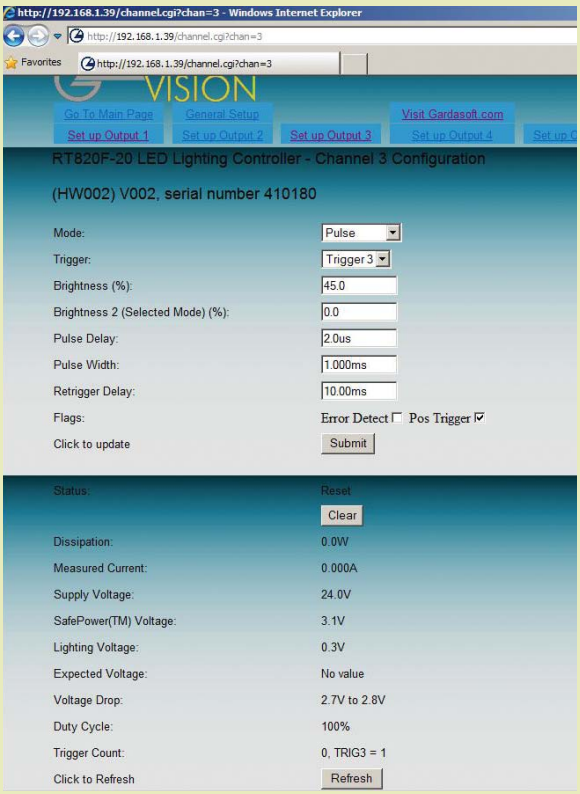
Four modes of operation are provided separately for each channel:

Continuous:	Output is a continuous level
Pulsed:	Output is pulsed once per trigger
Switched:	Output is switched by a digital input
Selected:	Output intensity selected by a digital input

Three ways to configure

All RT Series products have options to be configured via RS232 or Ethernet, and the RT200 Series has the additional option for front panel push-button operation. With the Ethernet options, a Web browser can be used to access the RT Series internal Web pages allowing status to be viewed and parameters to be changed.

The RT Series can also be configured using simple string commands sent from an application program using RS232, TCP/IP or UDP. The Gardasoft Vision Website 'www.gardasoft.com' has a free download of a demonstration program (with fully commented source) showing how the RT Series Controllers can be controlled from a PC using C++. The configuration is stored in non-volatile memory providing turn-key operation.



Common characteristics

Parameter	RT200	RT400	RT800
Output channels	Constant current outputs with SafeSense™		
Trigger inputs	Opto-isolated digital inputs. 3V to 24V operation		
Output power	Max 30W per channel		
Timing repeatability	Delay + Pulse up to 10ms: 0.1µs for pulse width and 2µs for delay. Otherwise 100µs		
Output voltage	0V to 46V		
Supply voltage	Regulated 24V to 48V		
Dimensions (mm)	112(L) x 97(W) x 62(H)	159(L) x 97(W) x 62(H)	267(L) x 97(W) x 62(H)
Weight	300g	400g	700g
Mounting	Panel mounting. DIN rail mount option (part reference PP704)		

RT Series selection

Simply follow this 3 step guide to select your RT Series Controller:

Step 1 Select the number of Channel outputs you require, and your preferred Configuration option:

	Configuration		
Channels	**Front panel keypad**	**Ethernet**	**Serial (RS232)**
2 outputs 2 trigger inputs	RT200	RT220	RT260
4 outputs 4 trigger inputs	n/a	RT420	RT460
8 outputs 8 trigger inputs	n/a	RT820	RT860

RT ☐ ☐ **0**

- **0** — Always '0'
- ☐ — Configuration: 0 = Front panel, 2 = Ethernet, 6 = RS232
- ☐ — Number of channels: 2 = 2 channels, 4 = 4 channels, 8 = 8 channels

Step 2 Select whether you require Standard or Fast pulse timing:

	Standard	Fast
Timing	From 20µs to 999ms in steps of 20µs/100µs	From 1µs to 999ms in steps of 1µs/100µs
Delay from trigger to pulse		From 3µs to 999ms in steps of 1µs/100µs

RT ■ ■ ■ ☐

- ☐ — F = Fast Pulse

Step 3 Select your required output current rating:

	2 Amp	20 Amp
Output current	Up to 2A per channel continuous or 2A pulsed in steps of 0.5mA	Up to 3A per channel continuous or 20A pulsed in steps of 5mA

RT ■ ■ ■ ■ **–** ☐

- ☐ — Output current: -2 = 2A, -20 = 20A

Examples

RT420F-20 4 channel controller, Ethernet configuration, Fast pulse and 20A output
RT200-2 2 channel controller, Front panel configuration and 2A output

ORDERING INFORMATION

RT(cd)0 (F) - XX

- **c = Number of channels 2, 4, 8**
  d = Configuration option.
  0 (Front panel)
  2 (Ethernet)
  6 (RS232)
- **(F) = Fast Pulsing**
- **(XX) Maximum current rating (A)**
  2
  20

Vision Light Tech B.V.
Protonenlaan 22, 5405 NE UDEN, P.O. Box 345, 5400 AH UDEN, The Netherlands
Phone: +31 (0)413 26 00 67, Fax +31 (0)413 26 09 38, E-mail: inquiry@vlt.nl, Website: www.vlt.nl
Trade register No. 17150044, VAT No. NL8112.30.946.B01