



CANON CONTROLLER

Control unit for
Canon EF/EF-S lenses

Datasheet



DOCUMENT INFORMATION

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3	Navrátil J.	13/02/2019	Adding new lenses to compatibility list, adding connectors description and drawing correction

Appendixes

Notes

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TABLE OF CONTENTS

1 KEY FEATURES..... 4

2 PRODUCT DESCRIPTION 4

3 COMPATIBLE LENSES 5

4 MOUNTING THE LENS 6

5 CONNECTORS AND INDICATORS..... 7

6 INPUT CONNECTOR..... 7

7 ADDRESS DIP SWITCH 8

8 LED INDICATION..... 8

9 MOUNTING..... 9

10 PRODUCT VARIANTS..... 10

1 KEY FEATURES

- Utilization of excellent optical properties of photographic lenses with Basler industrial cameras
- Motorized control of focus and aperture
- Designed for the Basler ace Classic and ace U series with USB 3.0, GigE, and Camera Link
- Designed to control Canon EF and EF-S lenses
- RS485 communication interface with galvanic isolation
- Wide range of supply voltage from 10 to 30 VDC with galvanic isolation
- Aluminium holder with mounting holes
- Designed primarily for transport systems (ITS)
- LabVIEW driver available for download

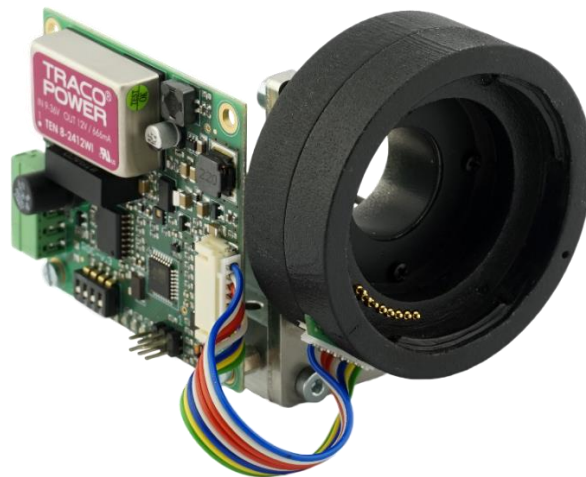


Fig. 1 – System without lens

2 PRODUCT DESCRIPTION

The Canon lens controller is an interface designed for the functional connection of industrial cameras and photographic lenses. This controller allows electronic control of focus and aperture of the lens, therefore allowing to use any type of Canon EF and EF-S lenses with Basler ace industrial cameras. Canon lenses can be controlled from a PC or other device using a set of commands via the RS485 interface.

The undeniable advantage of this solution is the use of great optical properties of comparatively low-cost camera lenses with industrial cameras, that have high quality sensors suitable for ITS and industrial applications with up to 12-megapixel resolution.

The ability to electronically control the aperture and focus also opens up the possibility of installation in difficult-to-reach areas and use in any light conditions, even with infrared auxiliary light at night. This illumination can be very precisely synchronized with the camera via its digital output.

The hardware of the controller consists of three basic parts:

- **Adapter** between the C-mount thread and the Canon EF/EF-S bayonet mount, which also includes contacts for lens communication and power supply.
- **Electronics** - evaluates commands received via the RS485 interface (such as request for focus or aperture adjustment) and communicates with the lens. It is connected to the adapter with a flat cable.
- **Mounting Aluminium Profile** – used to mechanically connect the adapter, electronics, and to mount and cool the camera. It also includes four mounting holes for installation of the whole set into a device or a housing.

Parameter	Value
Supply voltage	10 – 30 VDC, galvanically isolated
Current consumption	When 12 V: 240 mA When 24 V: 140 mA (Depending on the attached lens, these values are for EF-S 55-250mm f/4-5.6 IS STM)
Temperature range	-20°C up to +70°C, limited by the lens and camera used!
Weight	455 g
Dimensions	95 x 80 x 80 mm
Mounting	4 x mounting hole 4.2 mm

Tab. 1 – System parameters

3 COMPATIBLE LENSES

The control unit is designed for Canon EF and EF-S lenses. Tab. 2 contains a list of tested lenses. The absence of other lenses does not necessarily mean their incompatibility, but only the fact that they have not been tested yet. **Using lenses by other manufacturers such as Tamron or Sigma is not possible, although they are designed for Canon cameras.**

Lens	Control		Reading operational range			Reading current position		
	Focus	Aperture	Focus	Aperture	Zoom	Focus	Aperture	Zoom
EF-S 10-18mm f/4.5 – 5.6 IS STM	YES	YES	YES	YES	YES	YES	NO	YES
EF-S 18-55mm f/3.5 – 5.6	YES	YES	YES	YES	YES	YES	NO	YES
EF-S 18-55mm f/3.5 – 5.6 IS	YES	YES	YES	YES	YES	YES	NO	YES
EF-S 18-55mm f/3.5 – 5.6 IS II	YES	YES	YES	YES	YES	YES	NO	YES
EF-S 18-55mm f/3.5 – 5.6 IS STM	YES	YES	YES	YES	YES	YES	NO	YES
EF-S 24mm f/2.8 STM	YES	YES	YES	YES	NO*	YES	NO	NO*
EF 50mm f/1.8 STM	YES	YES	YES	YES	NO*	YES	NO	NO*
EF-S 55-250mm f/4-5.6 IS STM	YES	YES	YES	YES	YES	YES	NO	YES
EF 75-300mm f/4-5.6 III USM	not compatible							

Tab. 2 – Compatible lenses

* The lens cannot zoom; it has a fixed focal length.



Fig. 2 – System with EF-S 18-55 mm lens mounted

4 MOUNTING THE LENS

Before mounting the lens, make sure that the contact pins in the adapter and the contact surfaces on the lens are clean and freely accessible. If the contact surface is dirty or scratched, the lens may not work properly. Attaching the lens is done by turning the lens in the adapter ring clockwise in the same way as with a DSLR camera body. At this step, it is advisable to move smoothly and carefully so that no harm is done to the contact pins.

If the lens has a manual and auto focus switch, it must be set to automatic "AF". For further reference on lens manipulation and maintenance see the manufacturer's manual.



Fig. 3 – Auto and manual focus switch

5 CONNECTORS AND INDICATORS

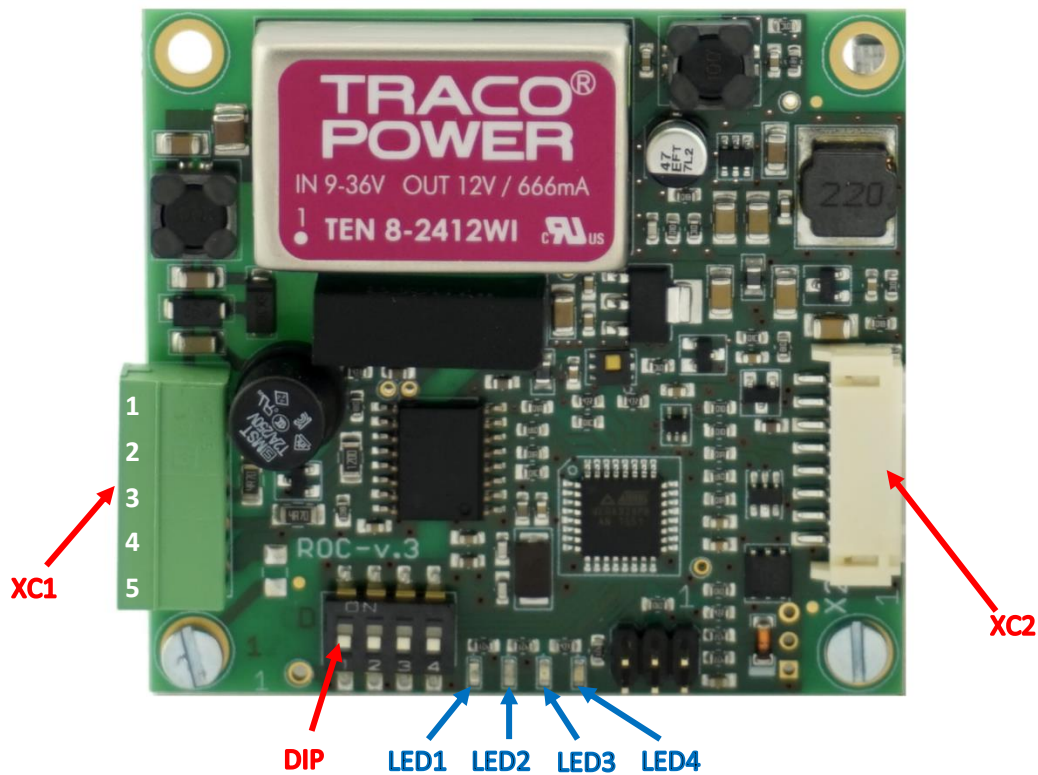


Fig. 4 – PCB top view

Label	Meaning
XC1	Input connector
XC2	Connector for adapter
DIP	Address DIP switch
LED1– 4	LED indication

Tab. 3 – Description of Fig. 4

6 INPUT CONNECTOR

The input connector is used to connect the supply voltage and the RS485 communication interface.

Pin	Meaning
1	GND
2	Supply voltage 10 – 30 V DC
3	RS485 R+
4	RS485 R-
5	RS485 GND

Tab. 4 – Meaning of pins on the connector

7 ADDRESS DIP SWITCH

A four-pole DIP switch is used to set up the unit's address. If only one unit is connected, it is advisable to keep the address of the unit at value "1".

Switch	Meaning
1	Zero address bit
2	First address bit
3	Not specified, for future use; recommended to be left in the OFF position
4	Not specified, for future use; recommended to be left in the OFF position

Tab. 5 – Meaning of the DIP switch

DIP 1	DIP 2	Address
OFF	OFF	1
ON	OFF	2
OFF	ON	3
ON	ON	4

Tab. 6 – Address settings

8 LED INDICATION

Colour	Meaning
Orange	A blink indicates the reception of valid data on the RS485 bus
Yellow	A blink indicates sending data via RS485
Green	Blinking with 1s period, unit operation indication
Red	Error indication

Tab. 7 – Description of LED indication

9 MOUNTING



Caution:

The product contains a freely accessible printed circuit board with electronic components. It is designed exclusively for installation in other equipment or housing to prevent external influences such as humidity/water or dirt. It is also necessary to observe the electrostatic discharge (ESD) precautions when handling the product. Damage caused by non-observance of the above instructions is not covered by the warranty.

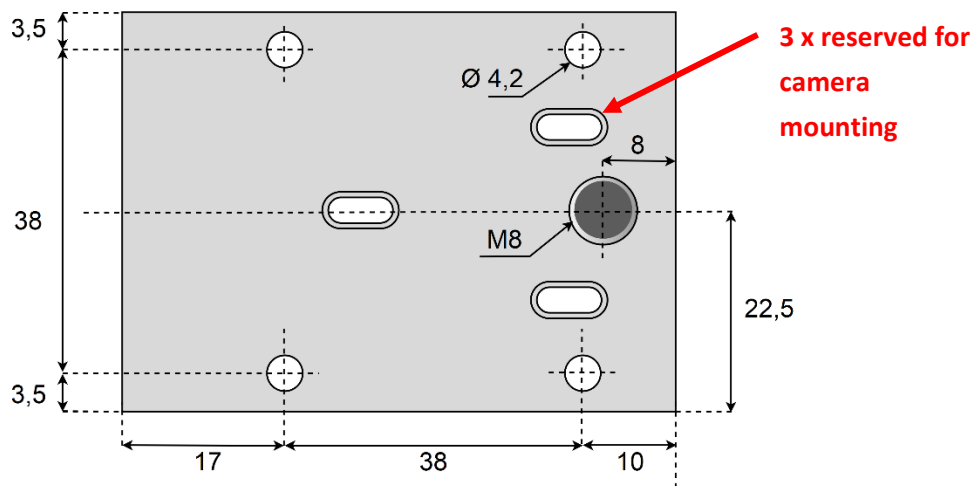


Fig. 5 – Drawing of the mounting profile (bottom view)

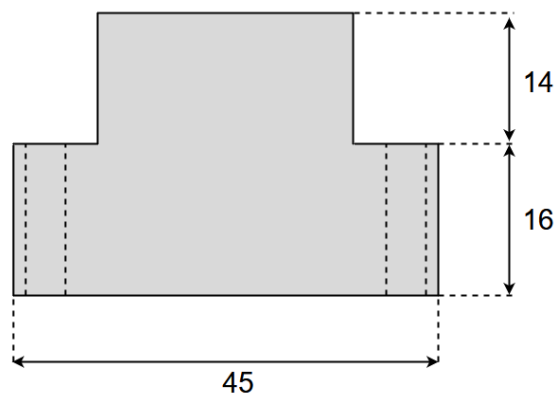


Fig. 6 – Drawing of the mounting profile (front view)

10 PRODUCT VARIANTS

Order number	Name
60262000	Canon controller - control unit for Canon EF/EFS lenses Camera and lens are not included!

The camera and lens are always selected to fit the particular application; for consultation and help with component selection contact please ATEsystem s.r.o.



Fig. 7 Control unit with lens attached