

# ECUMASTER TireTempCamera

**Manual**  
Revision 0.2

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## 1. Copyright and trademarks

All trademarks, service marks, trade names, trade dress, product names and logos appearing on this document are the property of their respective owners.

## 2. Introduction

This document provides information about the ECUMASTER TireTempCamera module. In this document you will find the device description, specifications, available features and example use cases.

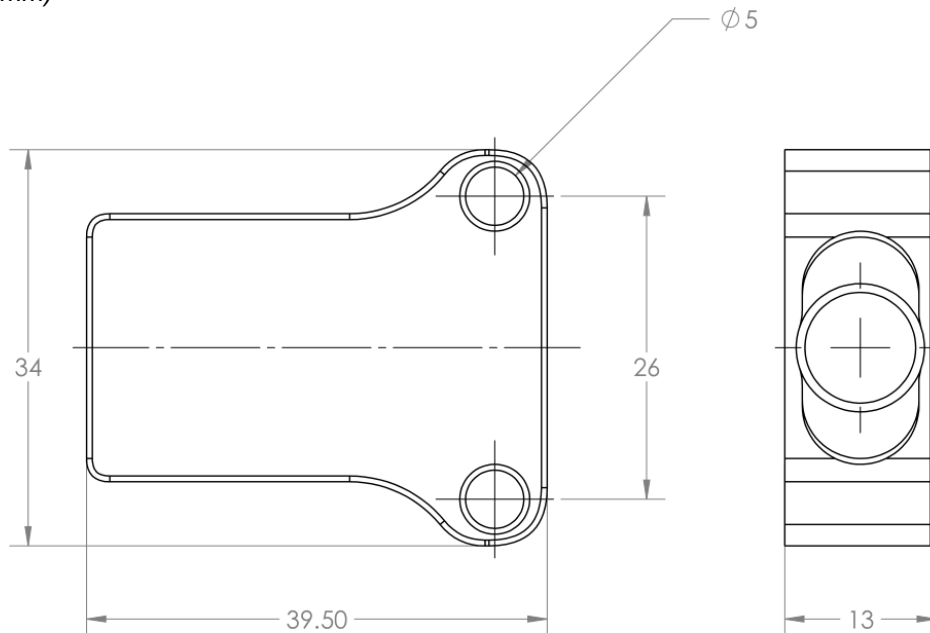
## 3. Description

The TireTempCamera device is designed to measure object temperature in multiple points using infrared waves and send that data over CAN-bus. Main use case for the device is measurement of a tire temperature across its width in 16 different points. Temperature of almost any object can be measured using the device, but emissivity has to be taken into account.

## 4. Specification

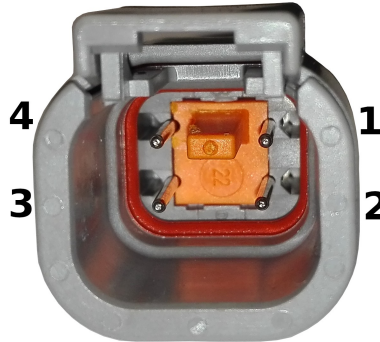
### 4.1. Mechanical drawings

(Dimensions in mm)

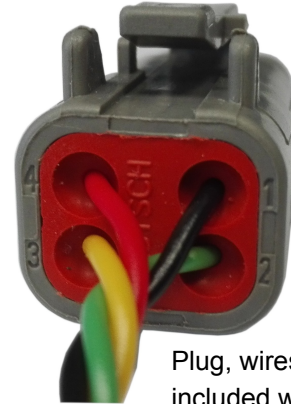


#### 4.2. Connector description

Pin	Description
1	Ground
2	CAN High
3	CAN Low
4	+12V



Socket, terminals side,  
at sensor harness



Plug, wires side,  
included with sensor

#### 4.3. Specification table

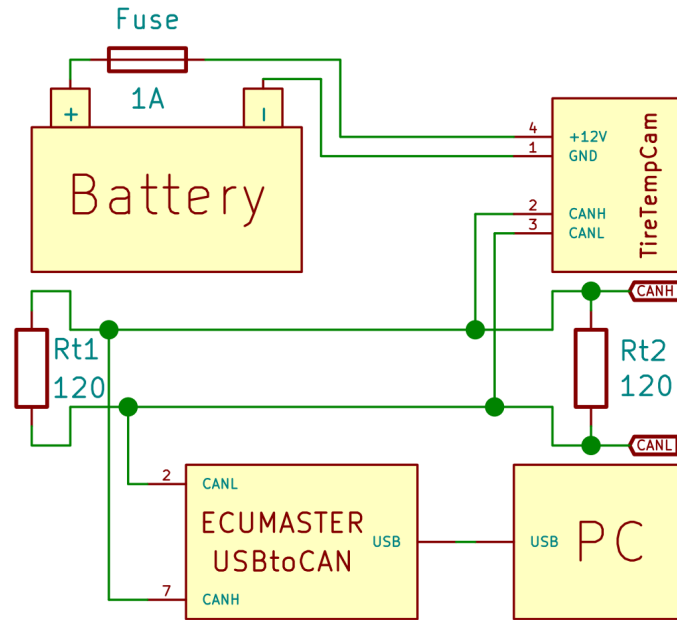
GENERAL	
Operating supply voltage	6-22V, immunity to transients according to ISO 7637
Reverse polarity protection	Yes, internal up to 16V
Temperature range	-40 to +85°C
Enclosure	IP67, bespoke CNC machined aluminium
Size and weight	40x34x13mm (case), 46g (with harness)
Connector	Deutsch DTM04-4P
CAN-bus bitrate	1Mbps, 500kbps, 250kbps, 125kbps
PC communication	Using USB to CAN interface (ECUMASTER USBtoCAN, PEAK, Kvaser)
TEMPERATURE	
Measurement points	16
Temperature range	0 – 255 °C
Field of view	125° x 25° (horizontal, vertical)

### 5. PC connection

Communication with PC software is done using CAN-bus. This requires a special interface which converts CAN-bus communication to USB 2.0. Interface is an independent device and must be purchased separately. Supported interfaces:

- ECUMASTER USBtoCAN (driver and manual: <http://www.ecumaster.com/download/>)
- PEAK-System
- Kvaser

Wiring diagram:



## 6. Light Client description

ECUMASTER Light Client is a configuration software for many ECUMASTER products as well as tool for CAN-bus monitoring. Light Client can be used to check available devices on the CAN-bus, display channel values, change CAN-bus bitrate and device specific properties. Monitoring of CAN-bus is possible thanks to list of frames grouped by ID, saving traffic trace file and sending custom messages on the CAN-bus.

Software can be downloaded from: <http://www.ecumaster.com/lcbeta.html>

Light Client with TireTempCamera connected:

Type	Rev	Serial number	Firmware	Comment	Info
tireTempCam	A	1853-0001	FW 11.2		Out: 420-421

Base ID	Value	Standard
Base ID	0x420	Standard
Wheel	Front Left (ID+0)	

Channel	Value
T1	26 °C
T2	25 °C
T3	25 °C
T4	25 °C
T5	25 °C
T6	25 °C
T7	25 °C
T8	25 °C
T9	25 °C
T10	26 °C
T11	26 °C
T12	27 °C
T13	27 °C
T14	27 °C
T15	27 °C
T16	27 °C

ID	DLC	Bytes	Freq	Count	Tx
420h	8	1A 19 19 19 19 19 19 19	10,0 Hz	1426	
421h	8	19 1A 1A 1B 1B 1B 1B 1B	10,0 Hz	1426	

Bit rate: 1 Mbps        Status: OK

User interface description:

- 1) List of the devices available on the CAN-bus. General information about the device. Double click a row to select the device and display its channels and properties.
- 2) Device control buttons:
  - Refresh – refresh the list of the devices
  - Set comment – set comment for the device
  - User manual – go to online user manual
  - Restore – restore default settings
  - Upgrade – device firmware upgrade, online or local file
- 3) List of properties for the device
- 4) List of channels sent over the CAN-bus
- 5) Button for changing bit rate of all devices compatible with Light Client
- 6) CAN-bus status information
- 7) List of received frames on the CAN-bus, grouped by ID
- 8) Clear trace button removes all received frames from history and Save trace button saves that history to a text file
- 9) Transmit window allows you to set custom frames which will be sent over CAN-bus

## 7. Software features

### 7.1. Channels

Channels are the data values sent over CAN-bus. Channels are sent as raw values, which means that obtaining values with correct units requires some calculations.

$$Value[unit] = \frac{Value[raw] * Multiplier}{Divider} + Offset$$

The table below describes how each channel is positioned inside CAN frame and how to obtain the correct value.

Byte	Channel	Data type	Range	Multiplier	Divider	Offset	Unit
<b>Base ID + Wheel Offset (default: 0x420 + [0, 2, 4, 6])</b>							
0	T1	8bit unsigned	0-255	1	1	0	°C
1	T2	8bit unsigned	0-255	1	1	0	°C
2	T3	8bit unsigned	0-255	1	1	0	°C
3	T4	8bit unsigned	0-255	1	1	0	°C
4	T5	8bit unsigned	0-255	1	1	0	°C
5	T6	8bit unsigned	0-255	1	1	0	°C
6	T7	8bit unsigned	0-255	1	1	0	°C
7	T8	8bit unsigned	0-255	1	1	0	°C

Base ID+1 + Wheel Offset (default: 0x421 + [0, 2, 4, 6])							
0	T9	8bit unsigned	0-255	1	1	0	°C
1	T10	8bit unsigned	0-255	1	1	0	°C
2	T11	8bit unsigned	0-255	1	1	0	°C
3	T12	8bit unsigned	0-255	1	1	0	°C
4	T13	8bit unsigned	0-255	1	1	0	°C
5	T14	8bit unsigned	0-255	1	1	0	°C
6	T15	8bit unsigned	0-255	1	1	0	°C
7	T16	8bit unsigned	0-255	1	1	0	°C

Channels description:

(X is temperature point from 1 to 16)

**TX** – temperature of point X in degrees Celsius

## 7.2. Properties

Device properties can be changed using the ECUMASTER Light Client software and connection interface.

Each setting is described below:

Output:

**Base ID** – base CAN ID for output data

**Wheel** – wheel selection offsets Base ID

- Front Left (Base ID + 0)
- Front Right (Base ID + 2)
- Rear Left (Base ID + 4)
- Rear Right (Base ID + 6)

## 8. Device placement

When the device is used to measure tire temperature it is recommended to place it in front of the wheel to minimize the possibility of debris hitting the sensor.

## 9. Document revision history

Revision	Date	Changes
0.2	12-04-2019	- added Light Client description
0.1	22-03-2019	- initial release

