User Manual

ACC3 Open

Release 1.00

Index

1 – Introduction

ACC3 Open (**Analog CAN Converter Open**) is an external expansion module that samples up to 4 analogic signals, converts them into digital values depending upon the chosen unit of measure and transmits them via CAN through freely configurable messages, at a maximum frequency of 1000 Hz. The analog signals that ACC3 Open manages are:

- 0-5V
- 0-12V
- Thermo-resistances
- K Type Thermocouples

2 – Top LED status

As shown here below, ACC3 Open features a LED top of it. Here follows description of its meaning according to colour and blinking frequency:

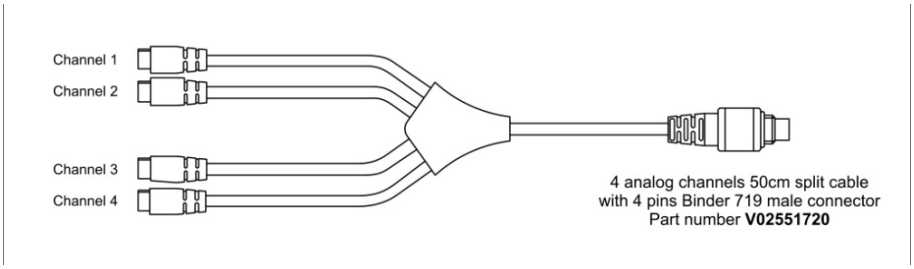
- red blinking slow: booter recovery
- red blinking fast: updating firmware
- bleu steady: calibration needed or EEPROM reading error
- green steady: normal (both in AiM CAN network or in non-AiM CAN network)
- OFF: no power/no communication for more than 3 seconds

3 – Wirings

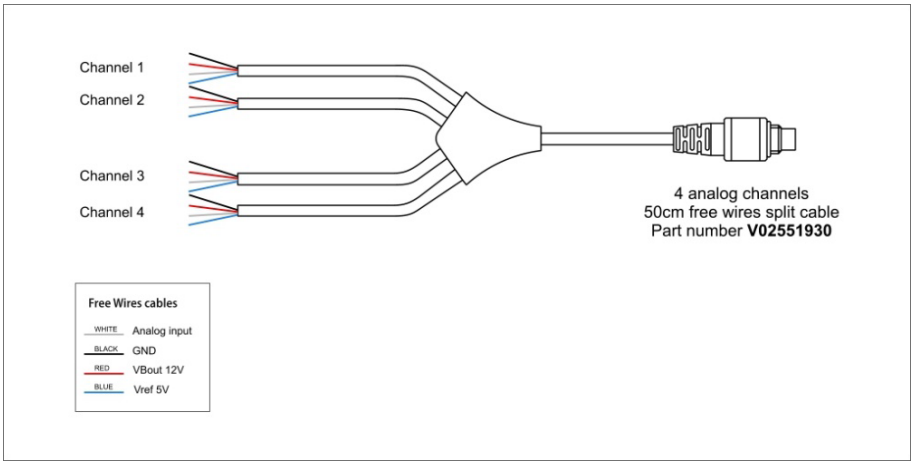
3.1 – Sensors Connections

ACC3 Open can manage many different sensors, from Thermocouples to sensors whose output is 0-12V. Please, note that the thermocouples require dedicated compensated cables, so different kits and different harnesses and cables are available. Here down some examples of the available harnesses. They have to be connected to the 8 pins Binder 712 female connector.

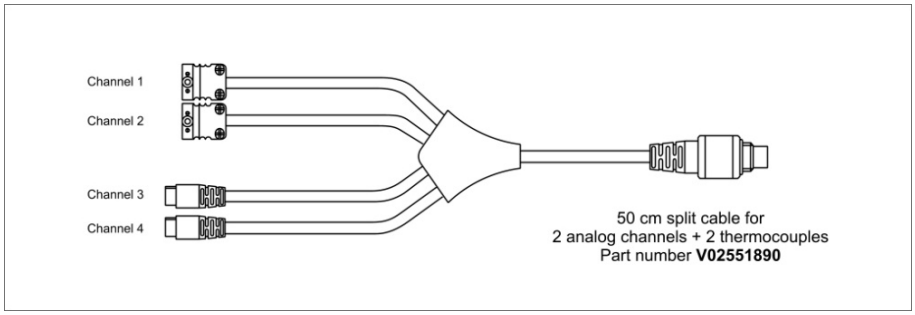
Harness intended to be used with AiM sensors (Thermo-resistances, 0-5V, 0-12V).



Harness free wires for Thermo-resistances, 0-5V, 0-12V.



Harness for 2 thermocouples and two AiM sensors.



3.2 – USB, Power and CAN Connections

8 pins Binder connector of ACC3 Open is intended for:

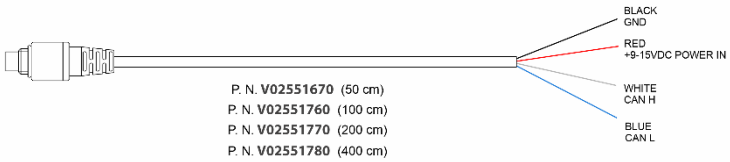
- power:
  - 9-12V for sensors which output is less than 12V
  - 12-15V for sensors which power is 12V

7pins Binder connector of ACC3 Open is intended for:

- USB connection: it is required for transmitting the configuration and for eventually look at the data online.
- CAN Connection

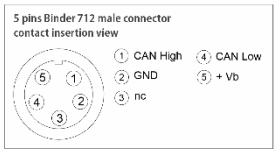
The available harnesses for the 7 pins Binder 712 female connector. are the following:

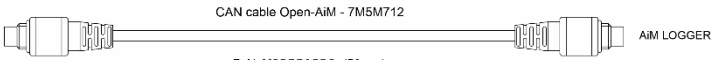
Used for connecting ACC3 Open to a device through CAN and get the power.



P. N. **V02551670** (50 cm)
P. N. **V02551760** (100 cm)
P. N. **V02551770** (200 cm)
P. N. **V02551780** (400 cm)

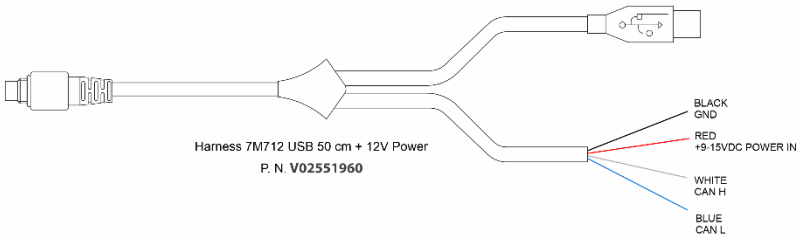
Used for connecting ACC3 Open to a device through CAN and get the power.





P. N. **V02551830** (50 cm)
P. N. **V02551840** (100 cm)
P. N. **V02551850** (200 cm)
P. N. **V02551860** (400 cm)

Used to connect ACC3 Open to the PC and power the sensors. This cable is necessary when you need to check the channels values on the PC through the OnLine feature or you need to calibrate the sensor.



Harness 7M712 USB 50 cm + 12V Power
P. N. **V02551960**

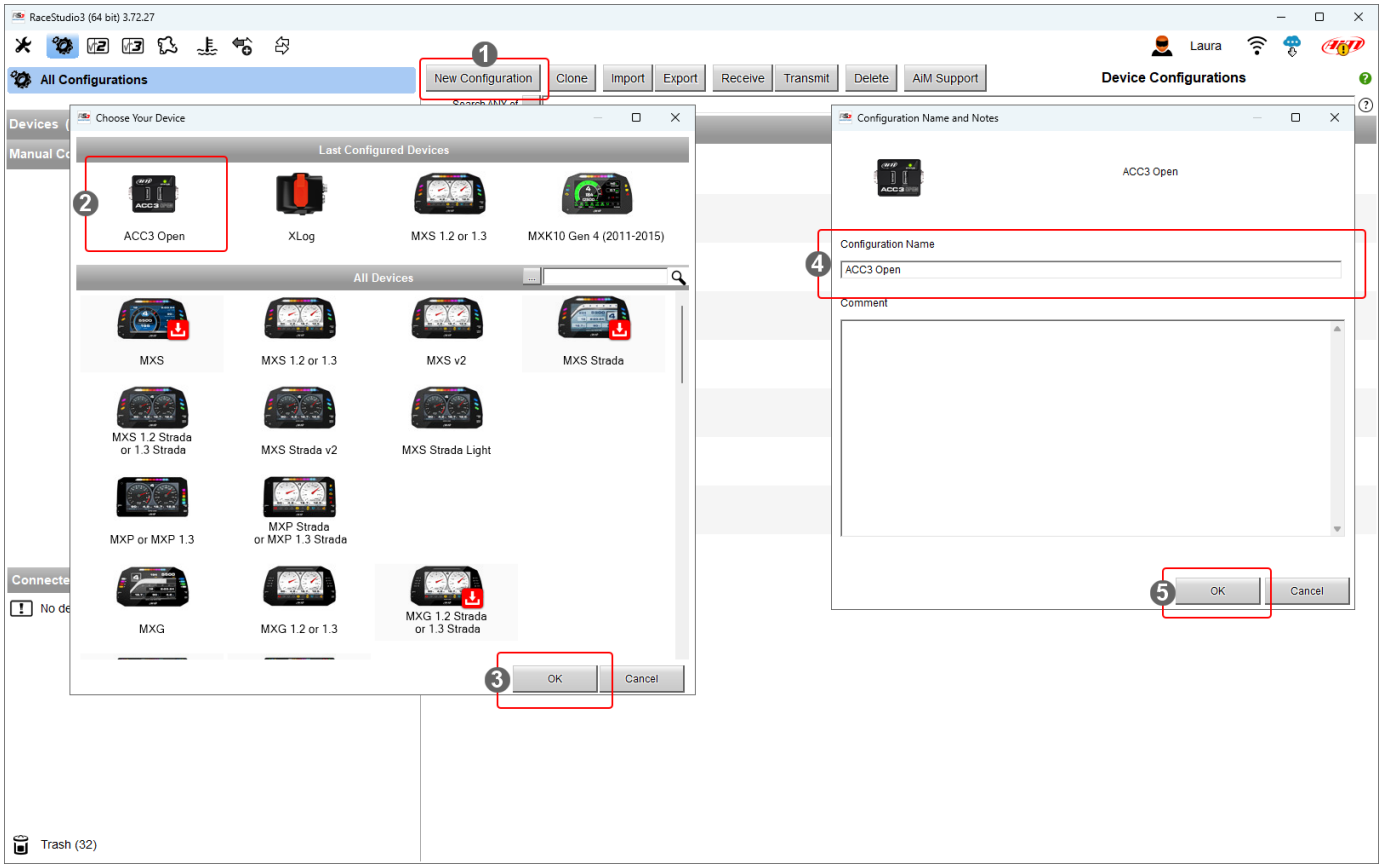
Used for connecting ACC3 Open to the PC for the configuration. This cable may be used for configuring the ACC3 Open but does not allow you to evaluate the channels OnLine or to calibrate the sensors.

Harness 7M712 USB 30 cm
P. N. **V02551690**

4 – Configuration with RaceStudio 3 software

To configure ACC3 Open, please follow these steps:

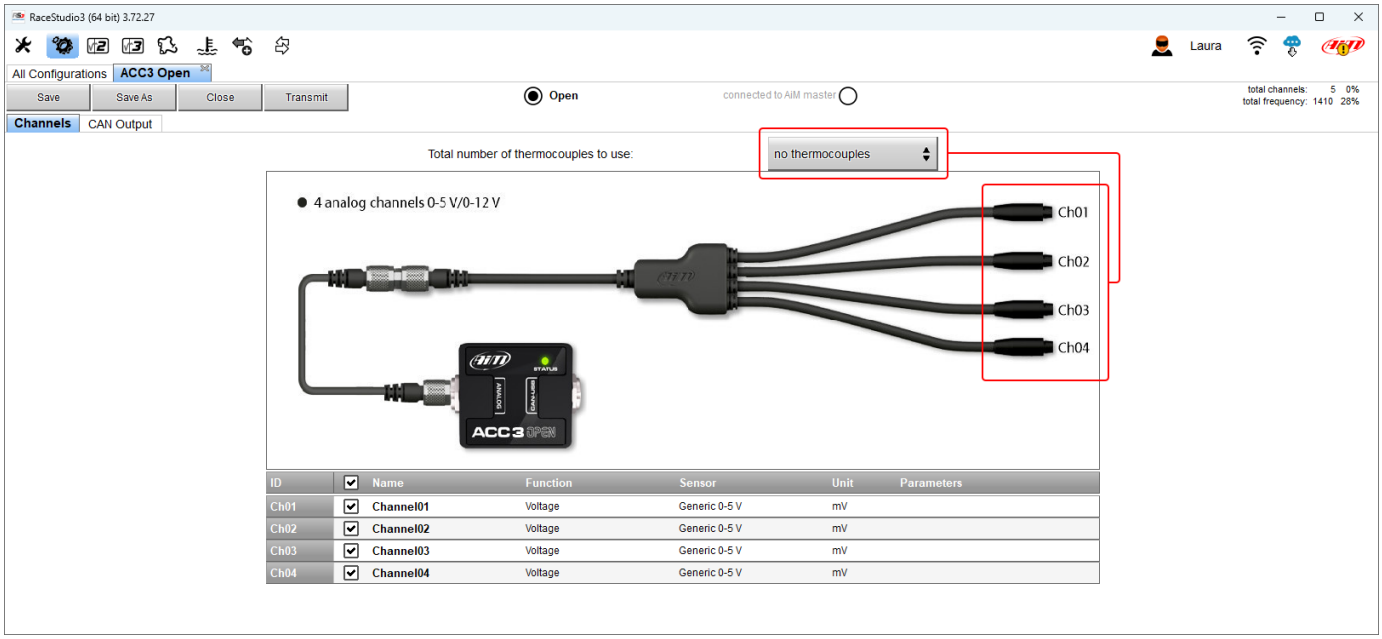
- run RaceStudio 3
- press “New Configuration” button on the top right keyboard (**1**)
- select ACC3 Open (**2**)
- press “OK” (**3**)
- name the configuration if desired (default name is ACC3 Open – **4**)
- press “OK” (**5**).



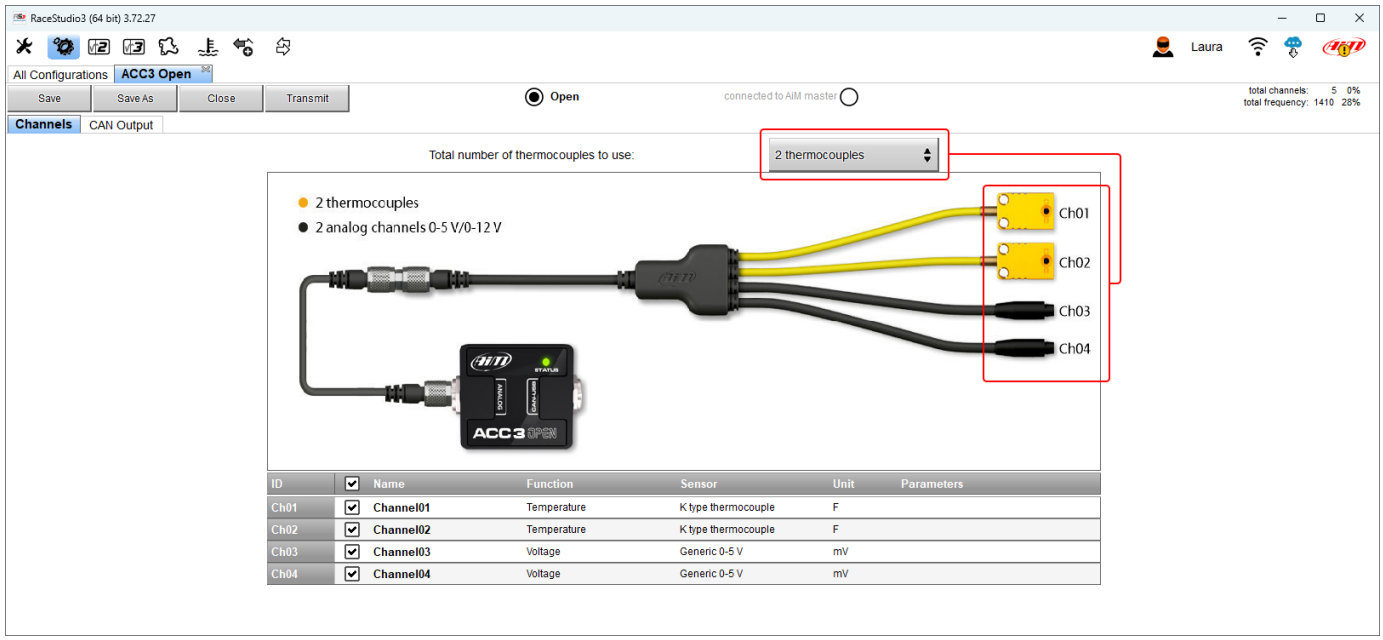
You need to configure ACC3 Open channels and the CAN messages.

4.1 – ACC3 Open channels configuration

First of all, **you need to set the number of thermocouples you will connect**; of course, you need the proper harness. Default configuration is “No thermocouples” as in the image here below.

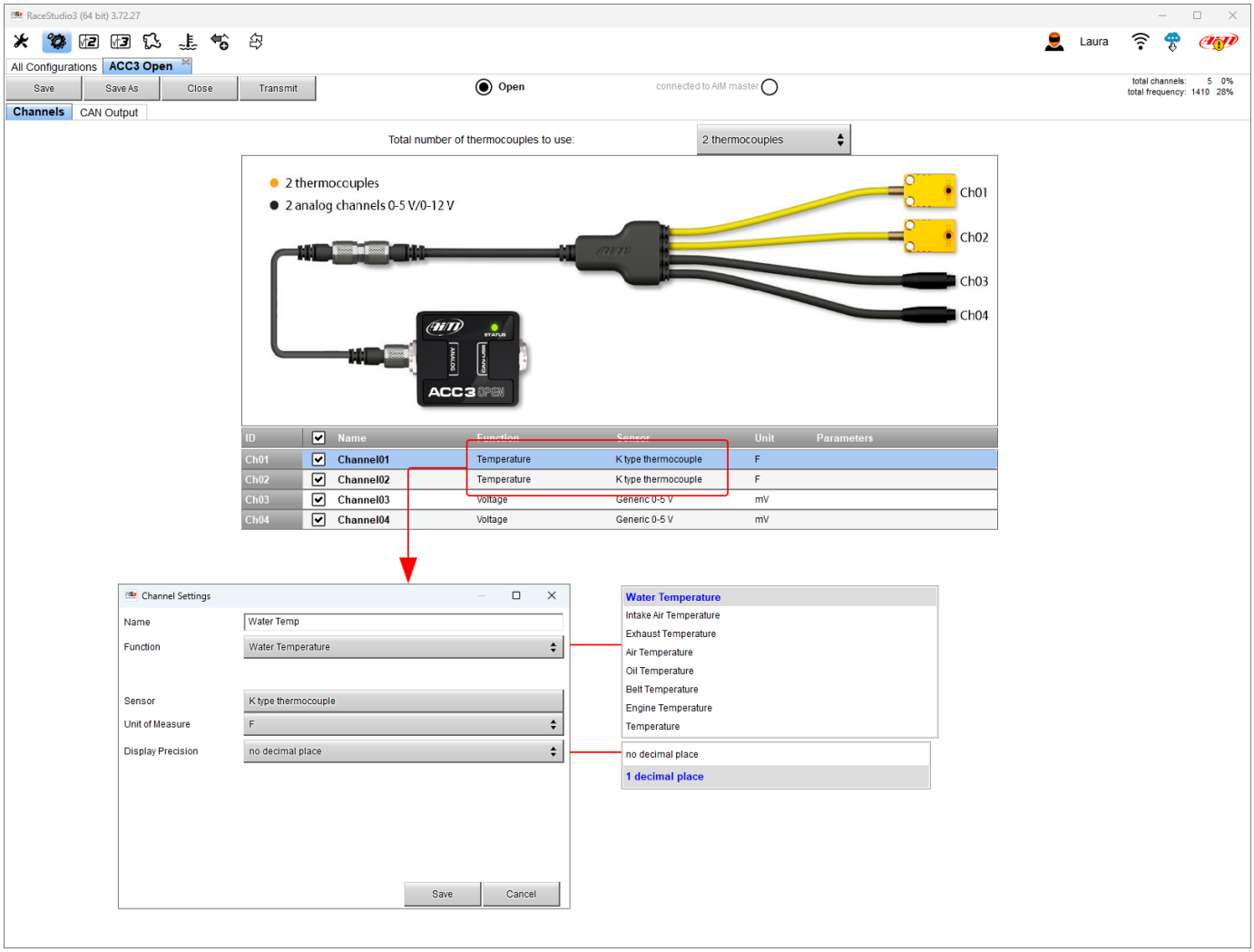


In the example below the configuration features 2 connected thermocouples.



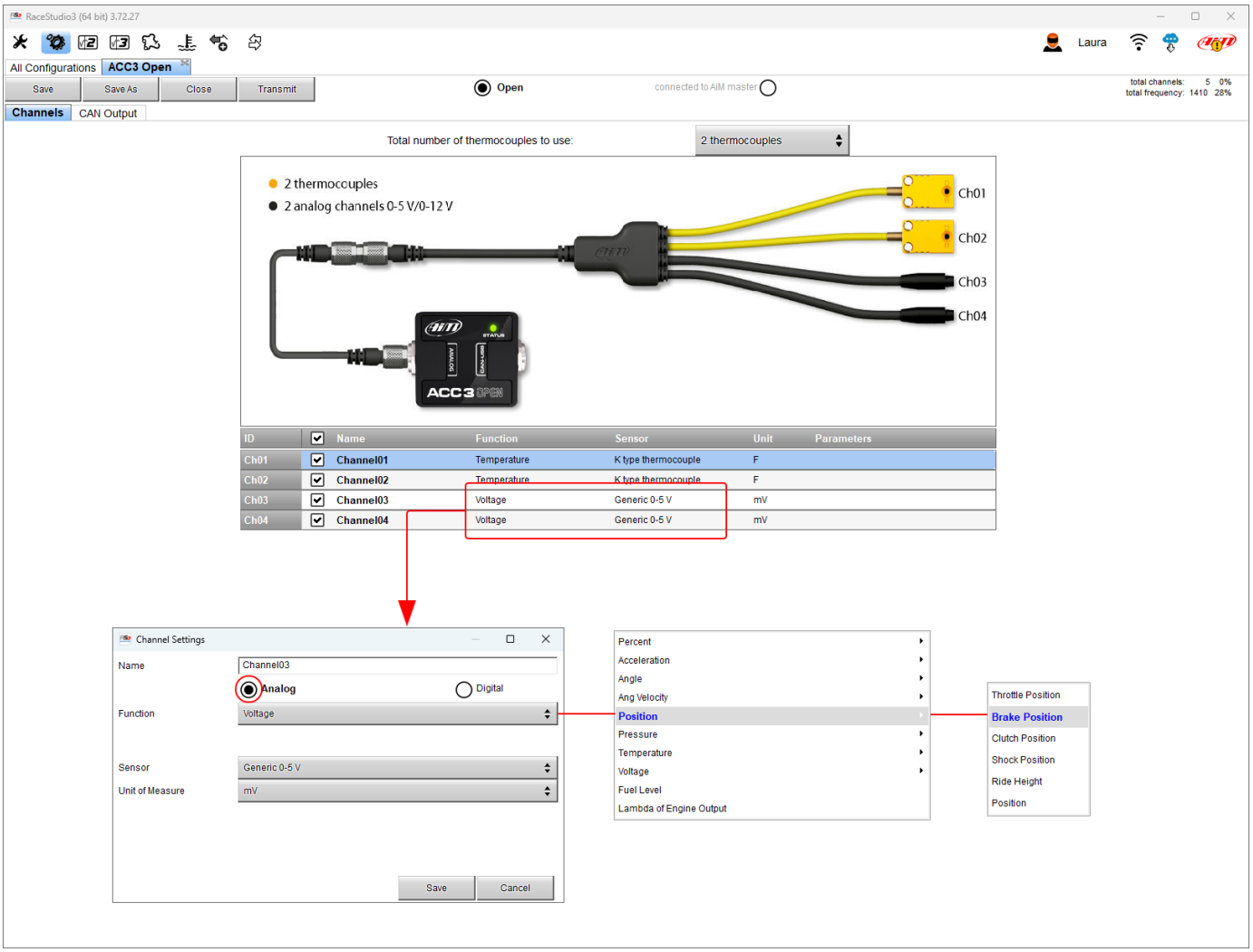
ACC3 Open supports up to four K type thermocouples. Once the number of thermocouple(s) to be connected is fixed channel(s) corresponding to the thermocouples switch(es) to “Temperature”.
To set the temperature channel:

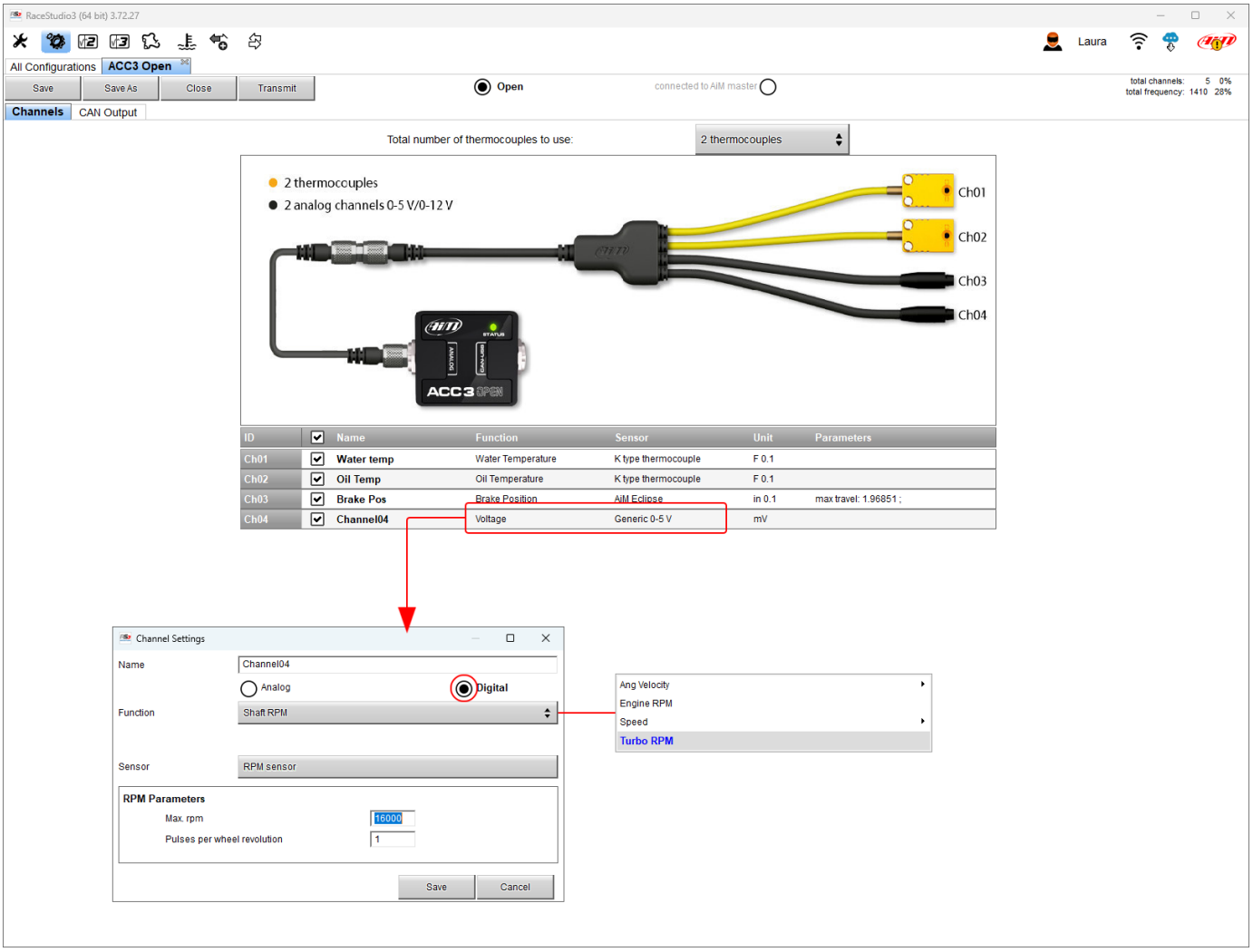
- select it
- name it (“Water Temp” in the example below)
- select the function in the menu (Water Temperature)
- set the unit of measure (°C or °F)
- set the display precision.



In the similar way you have to configure the remaining channels: click on the channel to set and a setting panel is prompted; a lot of possible functions can be set according to the kind of sensor you connect to ACC3 Open. These channel can be set both as analog or as digital. The images below show the different options (analog in the first one and digital in the second).

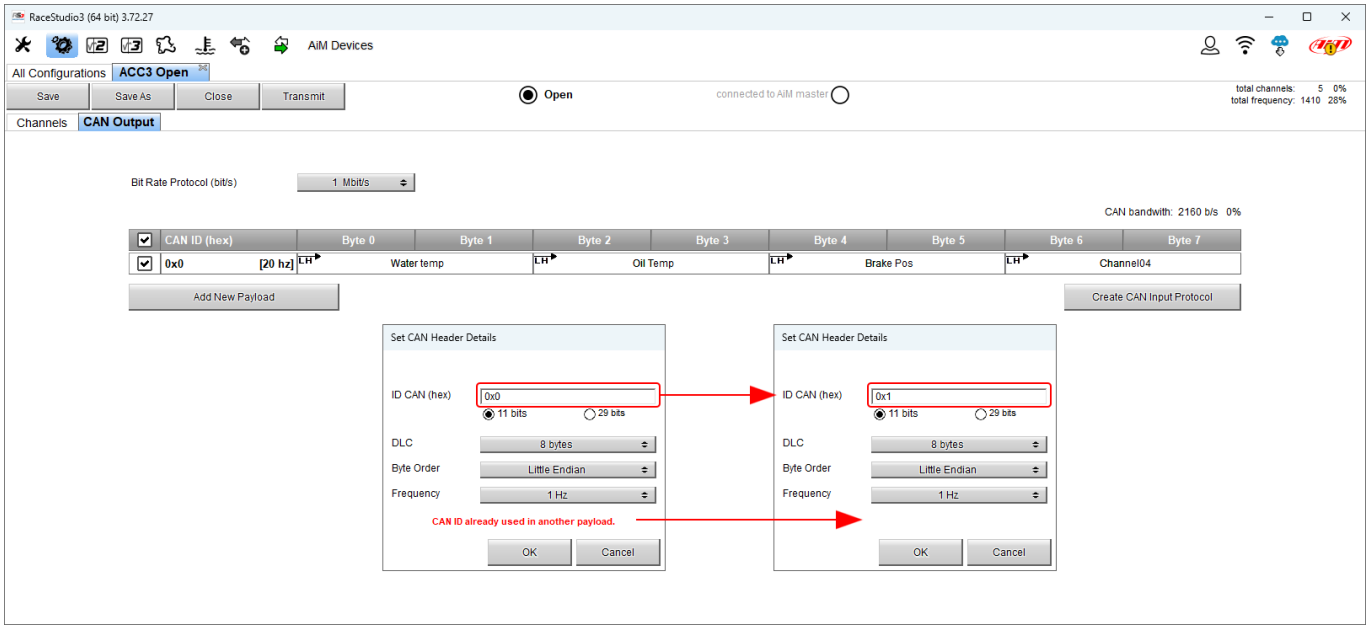
Once the function set different panels are prompted and needs to be set as for any other AiM device.




RaceStudio3 (64 bit) 3.72.27
Laura
All Configurations
ACC3 Open
Save
Save As
Close
Transmit
Open
connected to AiM master
total channels: 5 0%
total frequency: 1410 28%
Channels
CAN Output
Total number of thermocouples to use:
2 thermocouples
2 thermocouples
2 analog channels 0-5 V/0-12 V
Ch01
Ch02
Ch03
Ch04
ACC3 OPEN
ID
Name
Function
Sensor
Unit
Parameters
Ch01
Water temp
Water Temperature
K type thermocouple
F 0.1
Ch02
Oil Temp
Oil Temperature
K type thermocouple
F 0.1
Ch03
Brake Pos
Brake Position
AiM Eclipse
in 0.1
max travel: 1.96851 ;
Ch04
Channel04
Voltage
Generic 0-5 V
mV
Channel Settings
Name
Channel04
Analog
Digital
Function
Shaft RPM
Sensor
RPM sensor
RPM Parameters
Max. rpm
16000
Pulses per wheel revolution
1
Save
Cancel
Ang Velocity
Engine RPM
Speed
Turbo RPM

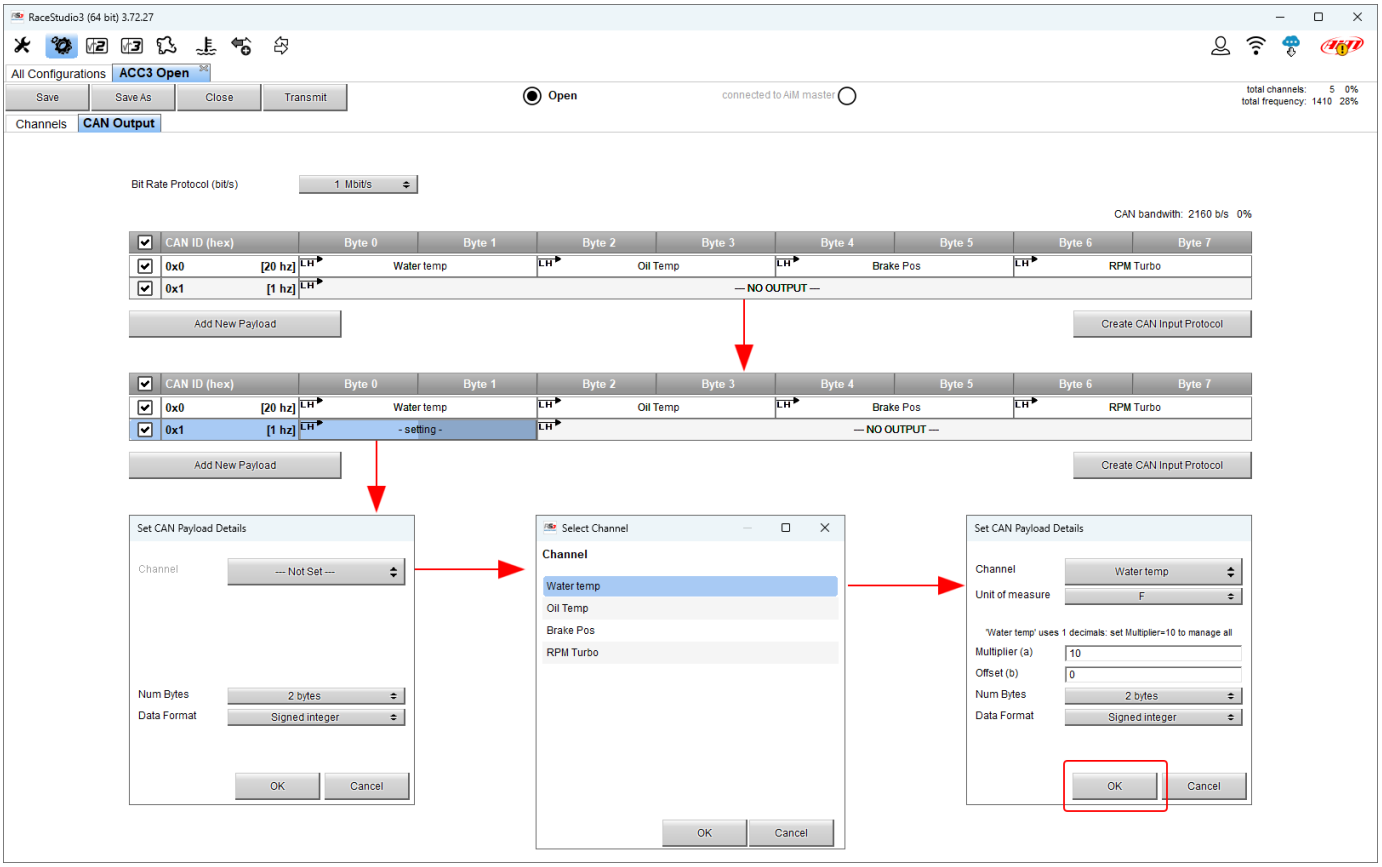
4.2 – Configuring ACC3 Open CAN Output messages

ACC3 Open allows to build a CAN Output to communicate with external devices. This can only be done if ACC3 is set as Open and CAN ID is not used in another payload; due to the fact that the software does not change the default ID CAN you need to change it as shown here below.



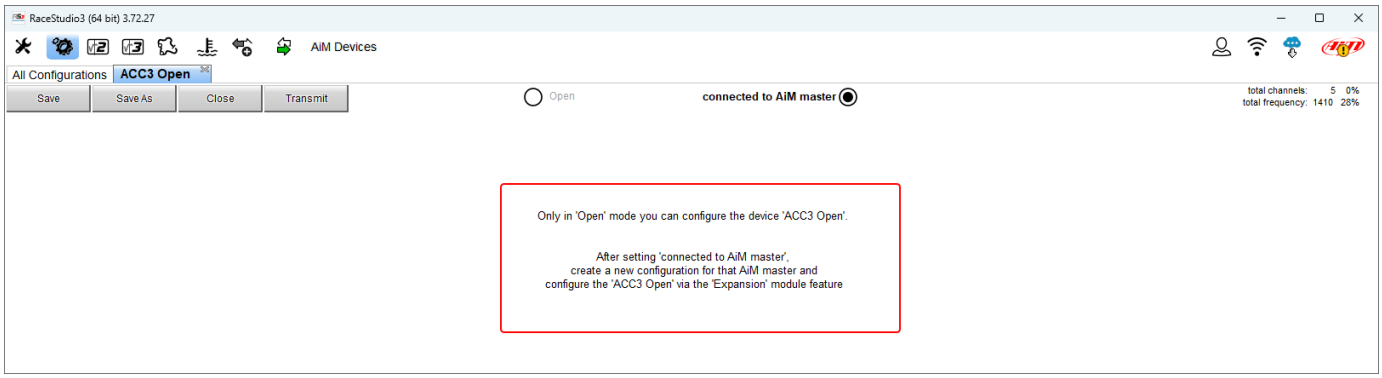
It is now possible to set the new payload. To do so:

- click on the payload row to set
- set all parameters in “Set CAN Payload Details” panel according to device ACC3 Open communicates with
- repeat the operation for all channels
- press “OK”
- the CAN protocol is modified
- save and transmit the protocol through the top left keyboard



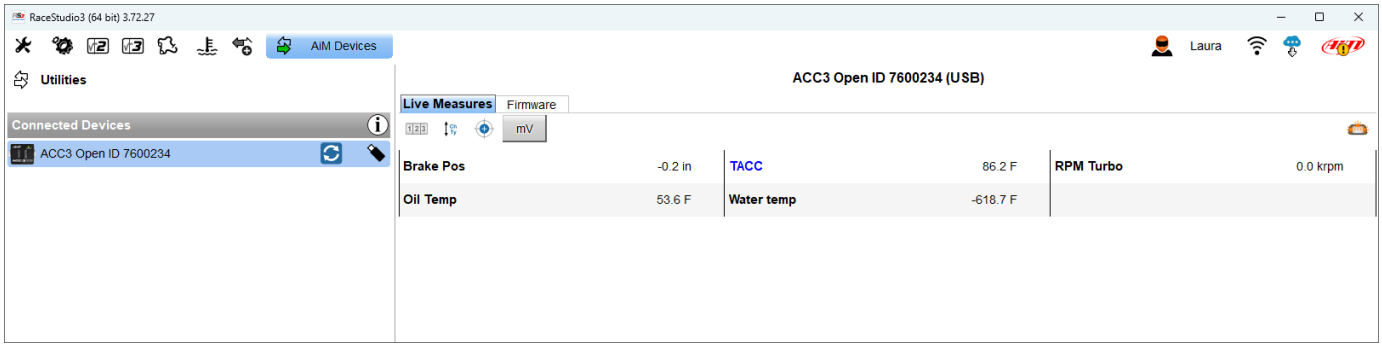
4.3 – Configuring ACC3 Open CAN Output as CAN AiM

As said ACC3 Open can also use AiM CAN Bus. In this case there is no CAN output to set and it works as ACC3.



4.4 – OnLine

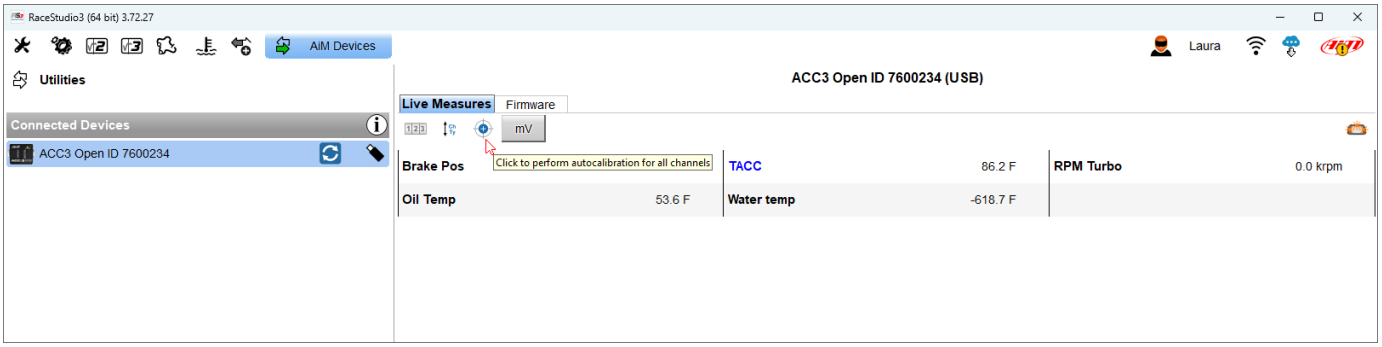
After having configured your ACC3 Open, you can verify the channels values entering OnLine feature. To do so simply click on ACC3 Open left of the software view.



4.5 – Calibration

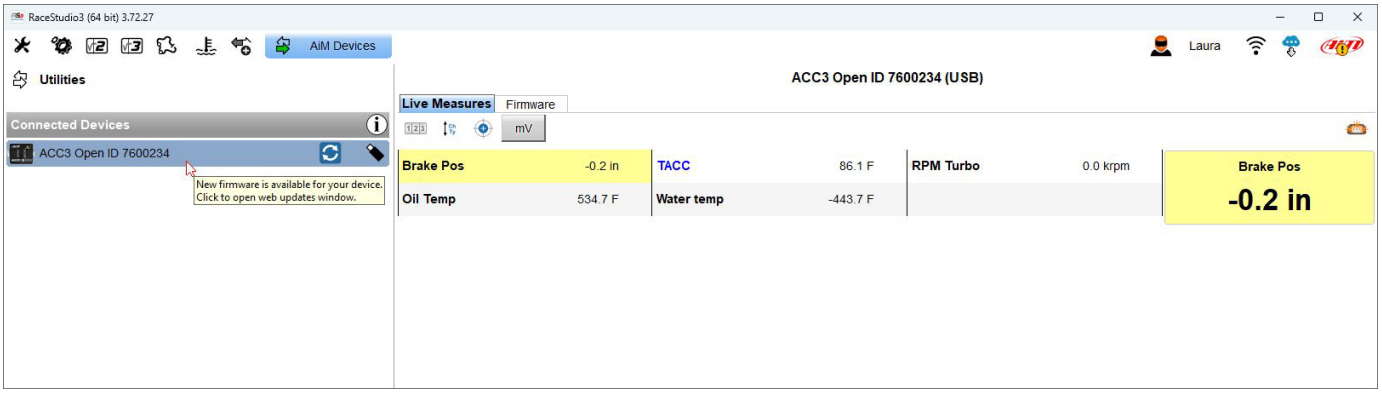
Some sensors, like the potentiometers for example, require a calibration, in order to set its “0” value. This can be performed in RaceStudio 3 online view.

Keeping the potentiometer in its “Zero” position, click “Autocalibrate” icon and the potentiometer will be auto-calibrated.

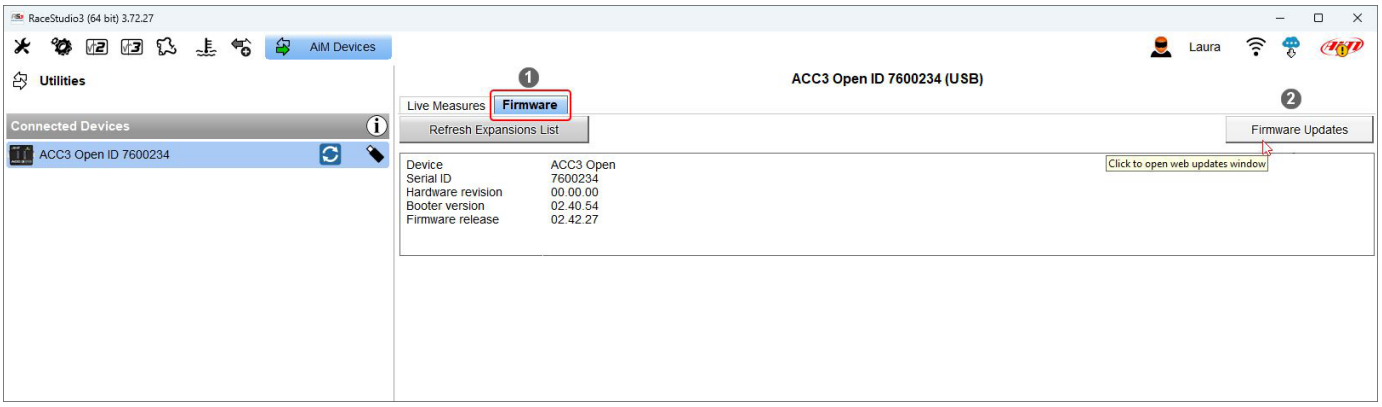


4.6 – Firmware update

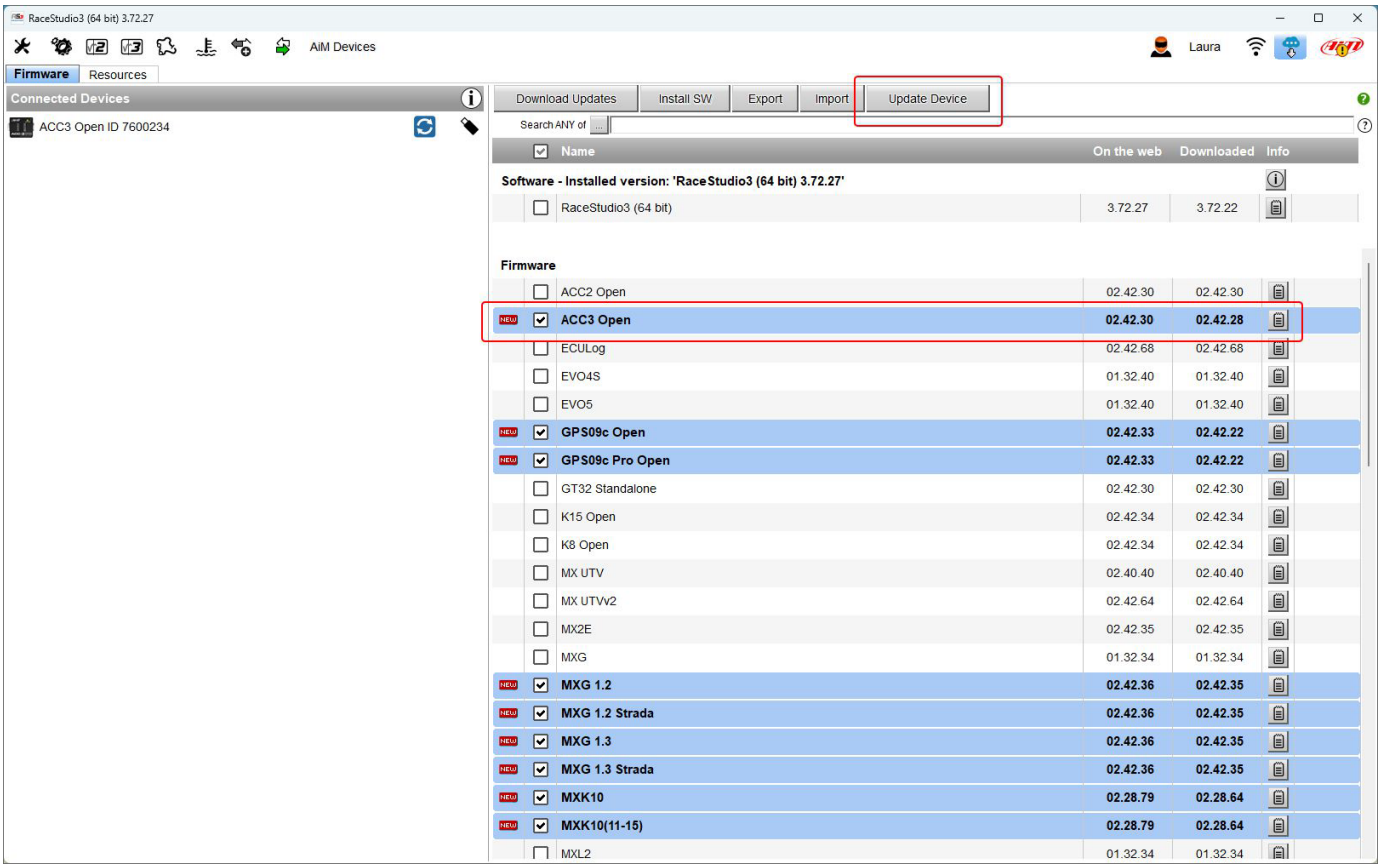
Mousing over the configuration in online view the software warns if a firmware is available.



To perform a firmware update activate the corresponding tab highlighted here below (**1**) and click "Firmware Update" button (**2**).

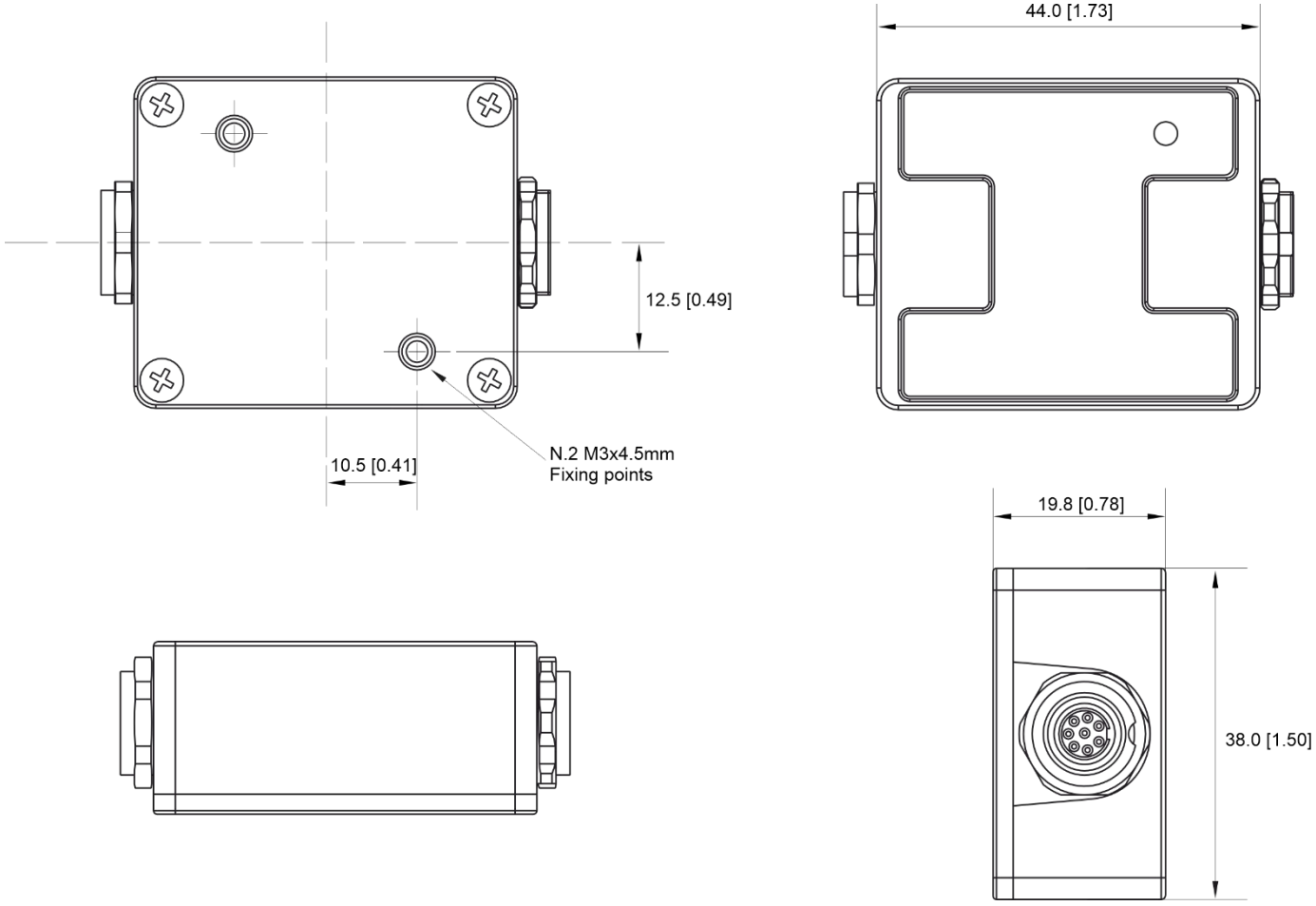


The software enters “Firmware update” view. In this view all available firmware updates are shown highlighted with “New” label. To perform the update click “Update Device” button on the top keyboard. ACC3 Open reboots and the device is updated to the last firmware.

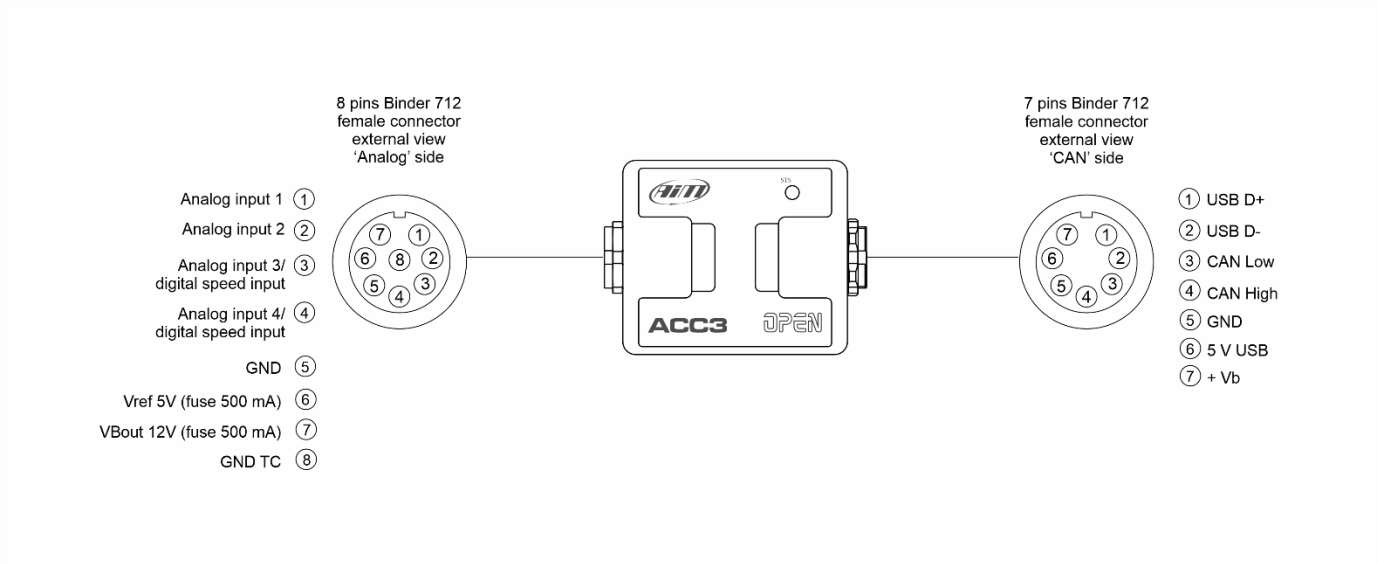


5 – Dimensions pinout and technical characteristics

The image below shows ACC3 Open dimensions in mm [inches].



The image below shows ACC3 Open pinout.



Technical characteristics:

Analog Channels:	4 fully configurable, 1kHz each: thermocouple(s) with dedicated cable(s), thermos resistors, 0-5v, 0-12v
Speed inputs	2 (AN3-AN4) 10kHz max frequency, internal pull-up for open drain/open collector input
External Power:	9-12V for thermocouples, thermo resistors, 0-5V 12-15V for sensors that need 12V power
Connection:	CAN, USB
Connectors:	2 Binder 712 female connectors
Material:	PA6 30% glass
Dimensions:	44x38x19.8mm
Weight:	50g
Waterproof:	IP65