



RS3

## "CAN Output" feature

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**Question:**

How do I have to set my AiM system to transmit data to an external CAN device?

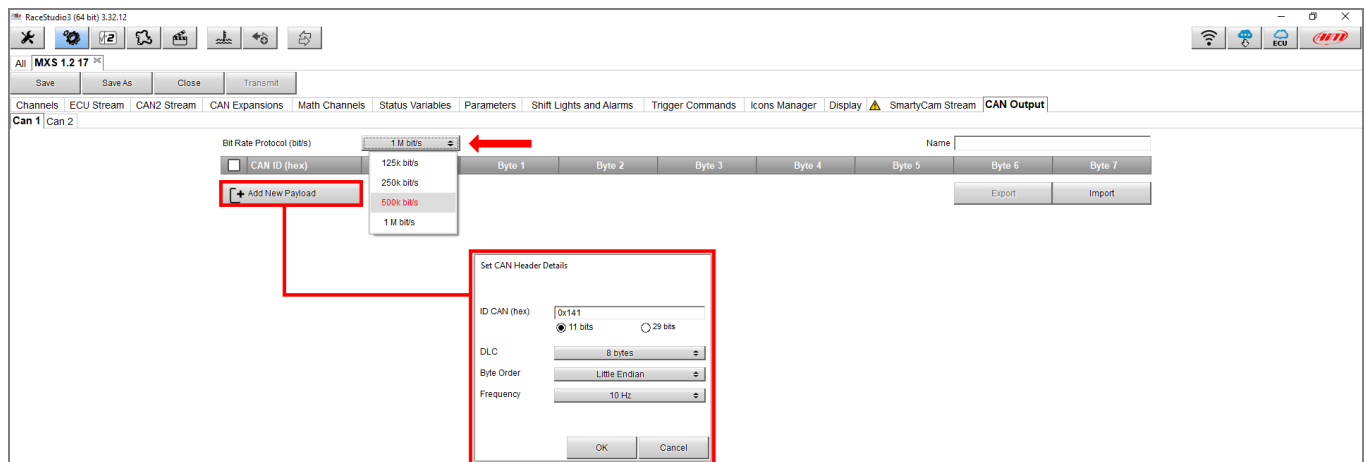
**Answer:**

AiM devices are well known for their large CAN database, but an important function linked to this technology, is the possibility to use the same data bus in a bi-directional way, this allows to perform a better integration of AiM devices within the vehicle network, sharing data collected from different sources.

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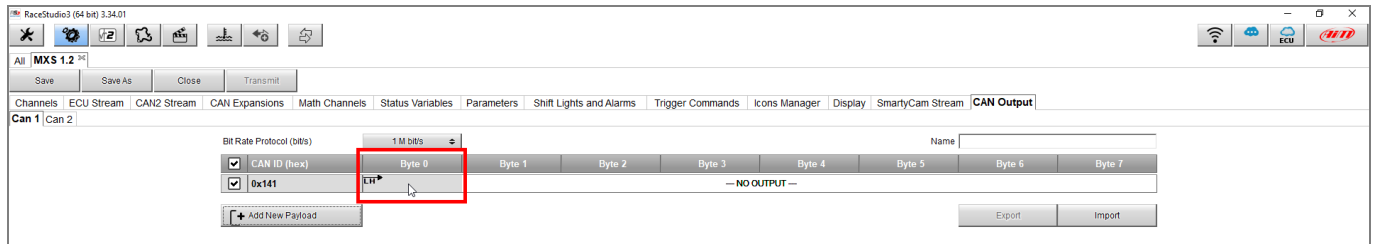
To transmit data to an external CAN module, the AiM device CAN Output function must be set in the way explained below:

- Start Race Studio 3, open your device configuration and enter the CAN Output tab.
- Depending on the device in use, there can be one or two CAN lines available, eventually used for data streams from ECUs (CAN1) or CAN modules (CAN2). In this case the Output CAN protocol must be compatible with the incoming protocol specifications; the software will prevent the user from making wrong selections for the bitrate and IDs already in use in the CANbus. If K-line, RS232 or non-standard CAN protocols have been selected in the ECU Stream / CAN2 Stream, this function shall not be available, and the software will notify it.
- The protocol bit rate must be selected from the “Bit Rate Protocol (bit/s)” drop-down menu (following image - red arrow). Then, to create a new message, press “Add New Payload” button (red box): a window shows-up, that allows to set the frame to send, specifying its ID and length, byte order (Motorola/Big Endian or Intel/Little Endian) and the transmission frequency. Once these first settings are done, press “OK”.

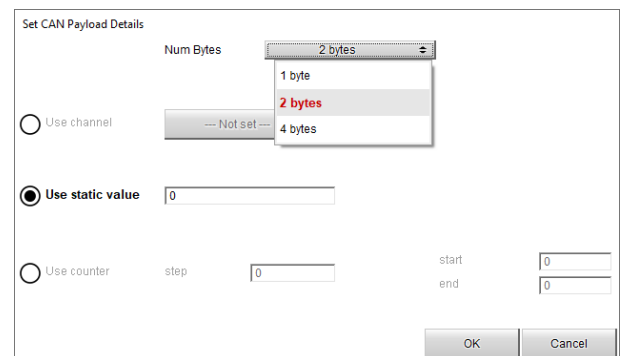


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The frame preview appears: press on the byte/word/dword to be set with the information content that will be transmitted.

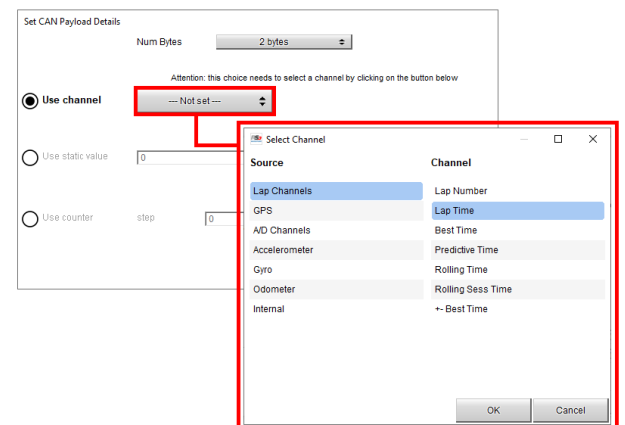


- Set the bytes length with the "Num Bytes" drop-down menu: available formats are 1, 2 or 4 bytes for a single parameter.



The three different options that can fill the payload of a CAN frame are:

- Use channel:** it is possible to select one of the channels collected by the AiM device from any of its data sources (i.e. GPS, CAN lines, analog/digital inputs, lap channels).



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### Tip1:

To transmit a parameter with decimals, multiply it so to obtain an integer value. Once this value has been transmitted over CAN, the receiving node shall divide it by the same factor.

(i.e.  $50.3 \text{ mm} \times 10 = 503 \Rightarrow \text{CAN} \Rightarrow$   
 $\Rightarrow \text{CAN} \Rightarrow 503/10 = 50.3 \text{ mm}$ )

☒ Use channel

"Shock" uses 1 decimals: set Multiplier=10 to manage all digits

Shock (mm)

Multiplier (a)

Offset (b)

### Tip2:

If a parameter with negative values must be transmitted, this can be modified with an offset, that will move the whole range in the positive area. The chosen offset is supposed to be equal or higher than the maximum negative value the parameter can get. This same offset value, must be subtracted when receiving the CAN frame, to obtain the correct value.

(i.e.  $-54 \text{ deg} + 90 = 36 \Rightarrow \text{CAN} \Rightarrow$   
 $\Rightarrow \text{CAN} \Rightarrow 36 - 90 = -54 \text{ deg}$ )

☒ Use channel

SteeringPos (deg)

Multiplier (a)

Offset (b)

- **Use static value:** it is possible to output a fixed value, typing it into the relevant field

Set CAN Payload Details

Num Bytes

Attention: this choice needs to select a channel by clicking on the button below

☐ Use channel

☒ Use static value

☐ Use counter

step

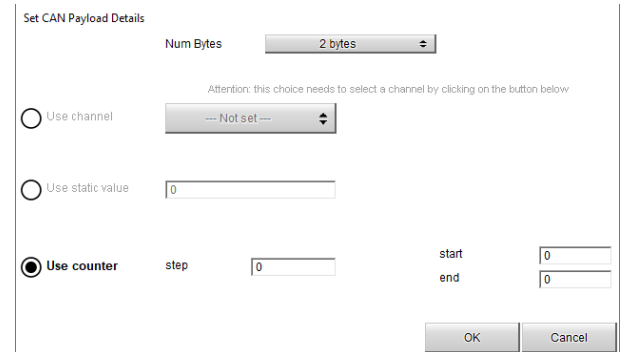
start

end

OK Cancel

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- **Use counter:** it is possible to output a counter, specifying the start value, the end one and the counter steps.



Set CAN Payload Details

Num Bytes: 2 bytes

Attention: this choice needs to select a channel by clicking on the button below

☐ Use channel: -- Not set --

☐ Use static value: 0

☒ Use counter: step: 0, start: 0, end: 0

OK Cancel

Up to 10 different frames can be transmitted with CAN output, with a transmission frequency of up to 100 Hz. CAN frames are transmitted in broadcast, so no requests/events can rule it. IDs and bitrate must be compatible, according to the selected communication protocol chosen in the ECU Stream tab: IDs must not be in conflict and bitrate must be equal to the ECU Stream. If a communication protocol based on K-Line/RS232 communication is selected from the ECU Stream tab, CAN Output function cannot be used. With non-standard CAN protocols, it is not possible to enable the CAN Output feature.