



# Digital Analogue Converter User Guide





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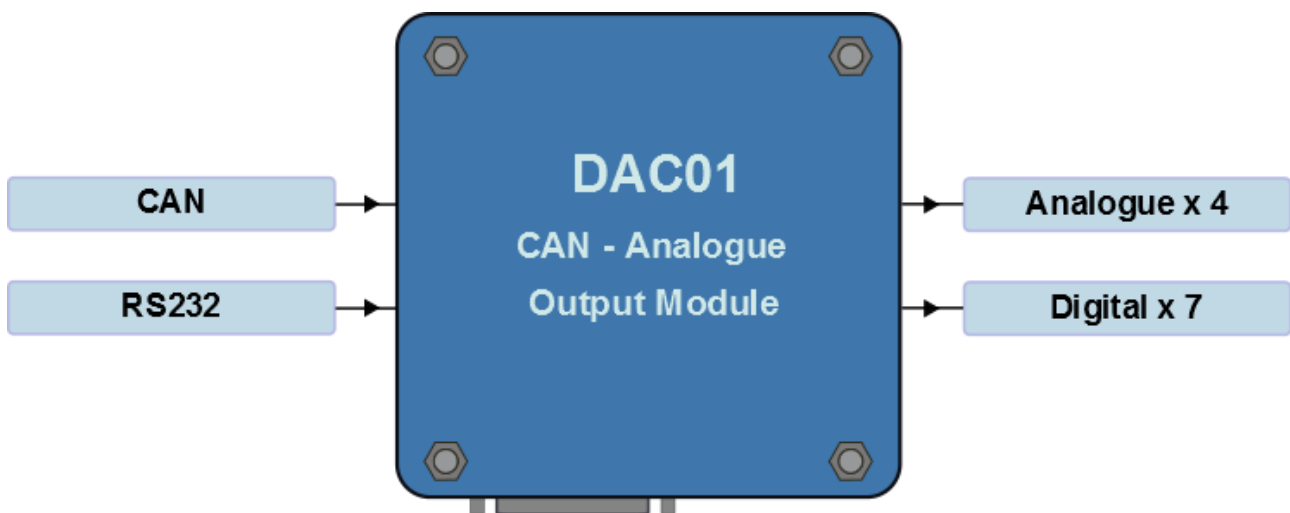
## Introduction

The CAN to analogue output module is designed to convert CAN bus data into a voltage, frequency or level output. In this way it is possible to log data from a CAN bus with data logging equipment not incorporating a CAN interface.

Four analogue voltage outputs are available and these can be mapped using the configuration software to output virtually any CAN bus parameter. An example might be throttle position data read from CAN and converted into a 0 to 10v signal.

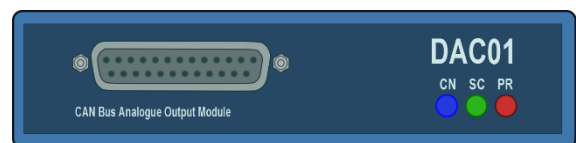
The module is also equipped with seven digital outputs, of which four can be set as frequency generators.

## Inputs / Outputs



## LED behaviour

CN (CAN) → Flashes Blue as the DAC01 receives CAN data.  
 SC (Serial) → Flashes Green as the DAC01 receives RS232 data.  
 PR (Power) → Solid Red as long as the DAC01 is powered up.



## Standard inventory

Description	Product Code
VBOX CAN to analogue output module	VBDAC01
VBOX serial PC cable	RLCAB001
5 way Lemo to 6 wire un-terminated	RLCAB015-L
25 Way D connector for VB products	ADC25IPCON
CD containing standalone module	CDRLMOD

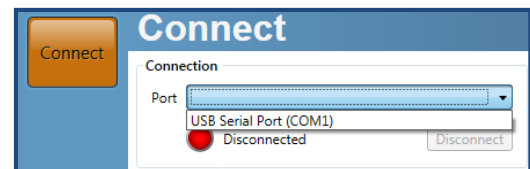
## Configuring the DAC01

### Hardware connection

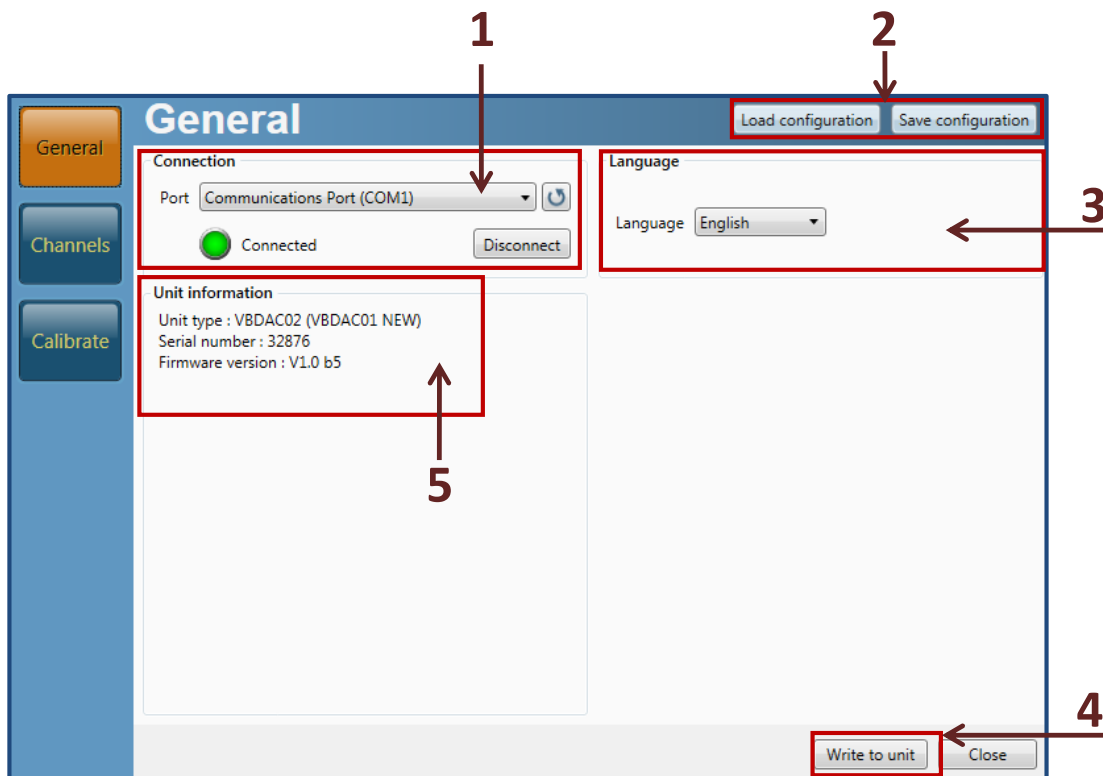
Configuration of the DAC01 is performed using Racelogic Config software. Using the supplied RLCAB001 cable, connect the serial port on the DAC01 to the computers 9 way D serial port – this can be done via a serial > USB converter if required.

### Software connection

Use the drop down list to select the correct COM port that the speed sensor is connected to. Click the connect button to enter the DAC01 setup screen.



## General

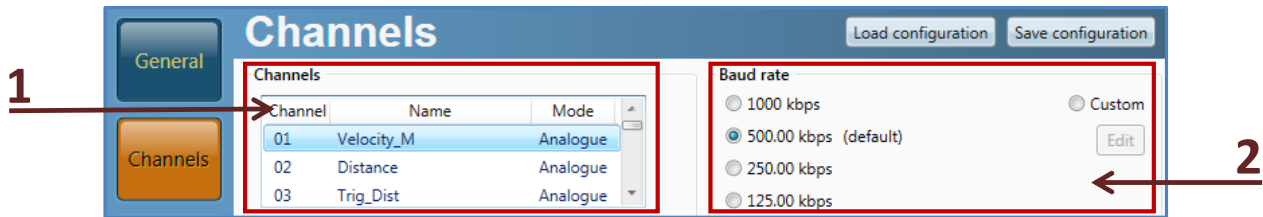


1. **Connection** - Selected com port, refresh and disconnect buttons.
2. **Load/Save** - Load/Save settings from/into a Racelogic settings file (.RSF). This allows setups to be kept for future use.
3. **Language** - Select an operating language.
4. **Write to unit** - After making changes to setup, the write to unit button must be selected to upload settings.
5. **Unit Information** – Serial number and installed firmware version of connected unit.

## Channels

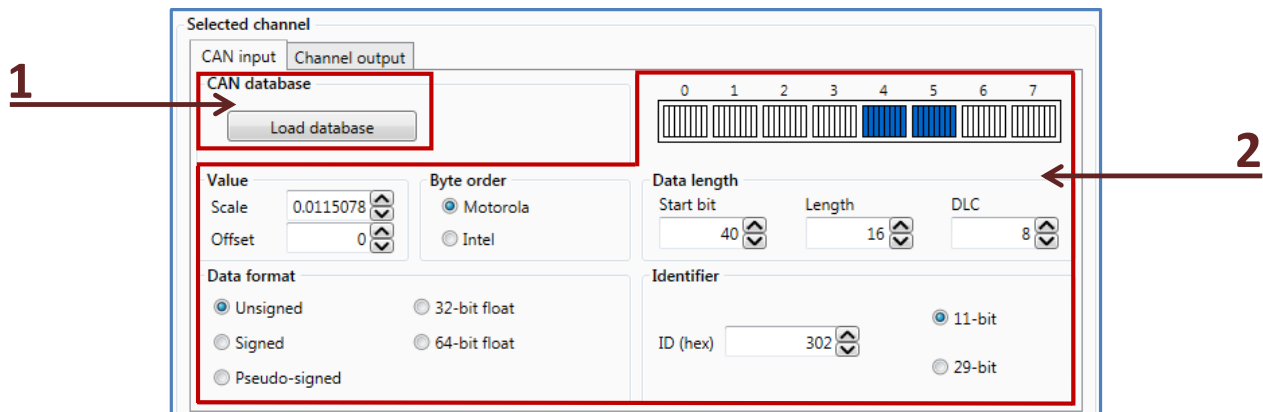
In this section, the eleven configurable channels can be set up to convert CAN data to either analogue, level or frequency. Note some of the channels have a fixed output mode, as listed below.

1	Analogue only	5	Level / Frequency	9	Level only
2	Analogue only	6	Level / Frequency	10	Level only
3	Analogue only	7	Level / Frequency	11	Level only
4	Analogue only	8	Level / Frequency		

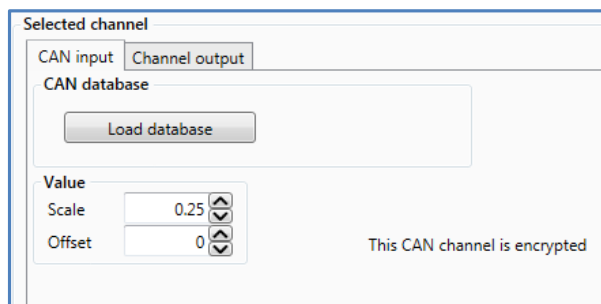
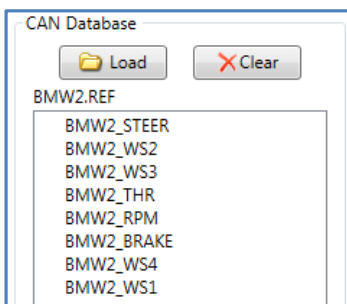


1. Channel list – Shows the channel name and states if the output is configured to analogue, level or frequency. Select a channel here to configure or view its input and output settings.
2. Baud rate – Set the baud rate which the DAC01 will read CAN data from.

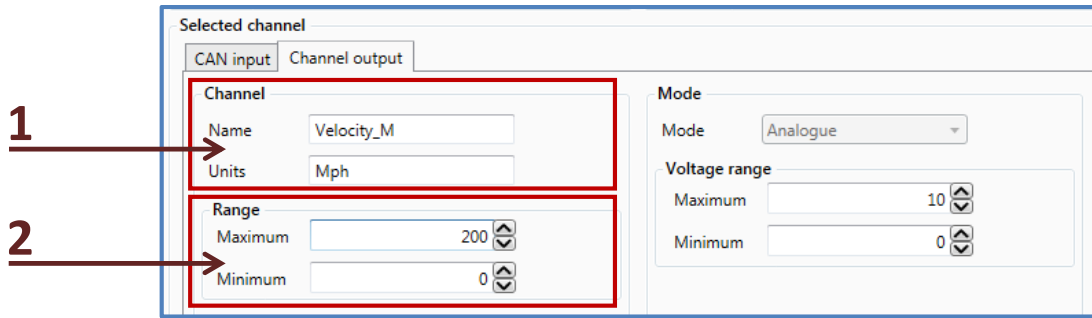
## CAN input tab



1. Load CAN database – here a CAN database file (.DBC .REF or .VCI) can be selected to load a CAN input parameter into the currently selected channel.
2. Channel info - This section will show the CAN input details of the selected channel, or allow new details to be manually entered.  
Note that if a REF file is loaded, this section will be mostly blank as REF CAN data is encrypted. The only accessible settings in this case would be scale and offset, see images below.

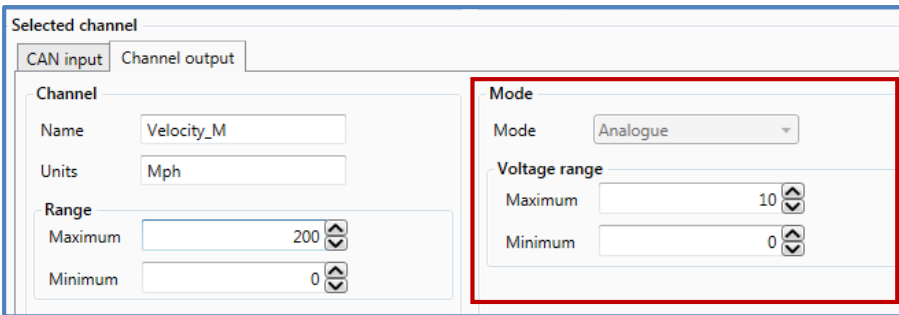


### Channel output tab



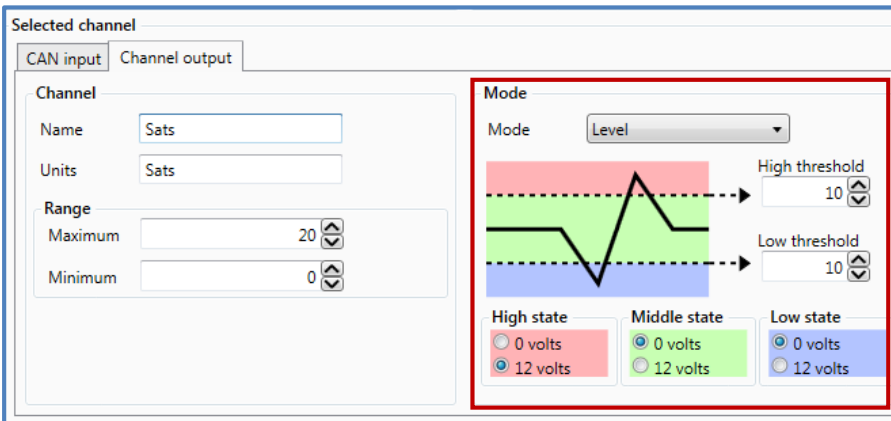
1. Channel details – Enter or change selected channel name and units.
2. Range – Expected input value minimum and maximum for selected channel.

### Analogue mode settings



Set the minimum and maximum voltage range to be outputted by the DAC01 module. This corresponds directly with the expected input range as set on the left hand side of this screen.

### Level mode settings

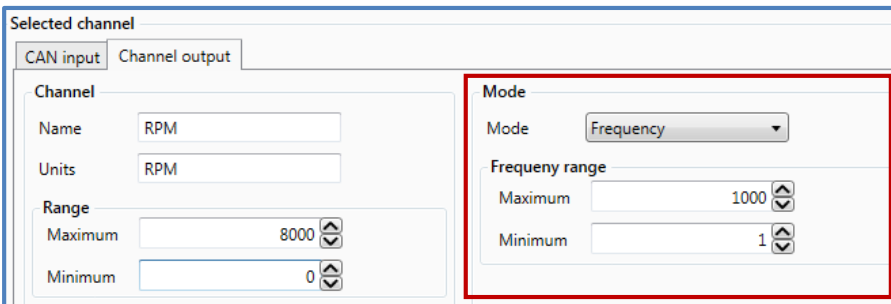


Here, high and low threshold values can be set, providing three different output states.

Each state can have a 0v or 12v signal associated with it.

For example, this setup is such that once the satellite count is over 10, 12v will be outputted. As soon as the count drops under 10, the output will drop to 0v.

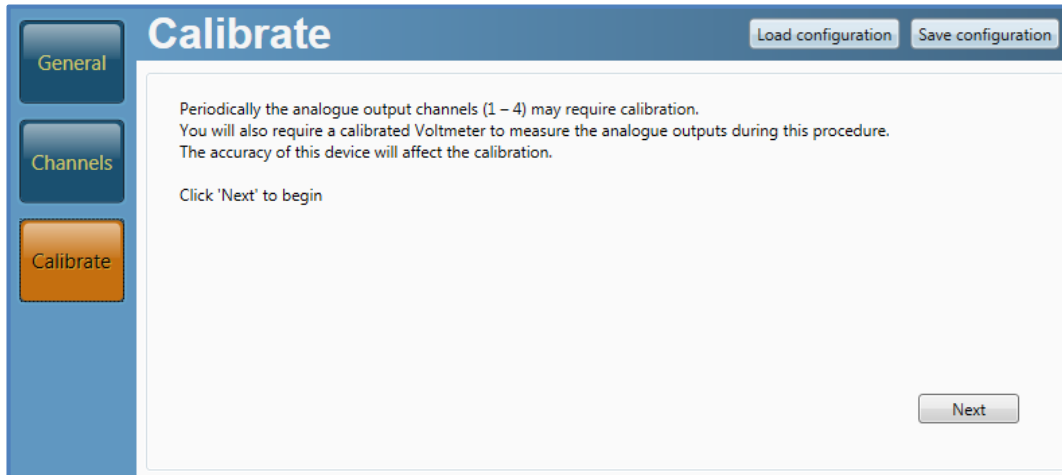
### Frequency mode settings



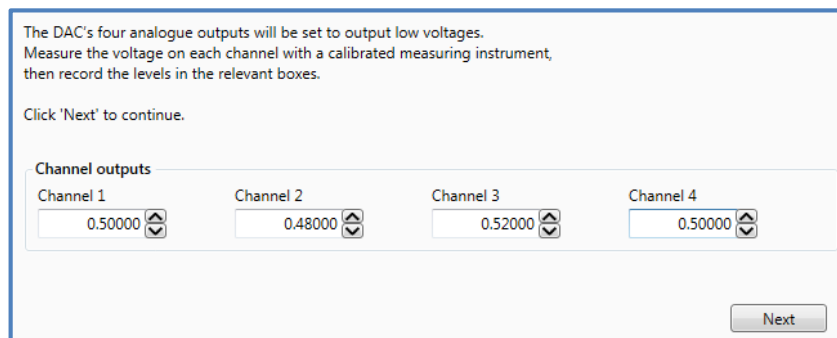
Set the minimum and maximum frequency range to be outputted by the DAC01 module. This corresponds directly with the expected input range as set on the left hand side of this screen.

## Calibrate

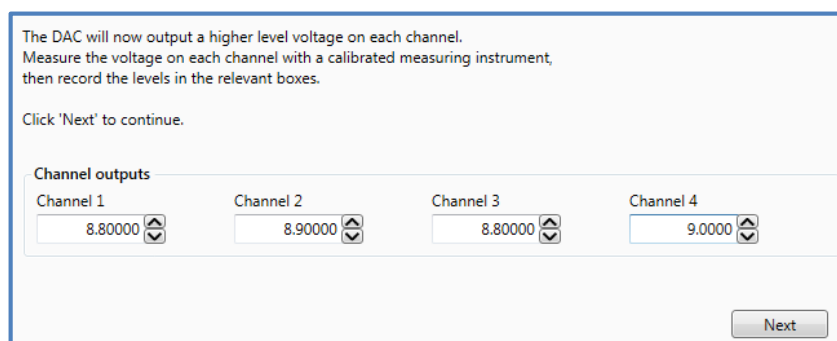
To re-calibrate the four analogue outputs, select this option. Please note a voltmeter will be needed to complete this procedure.



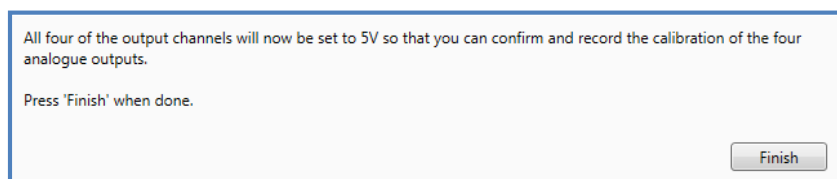
The DAC01 will first output a low voltage on each channel, measure the voltage and enter the individual values.



In the next step, the DAC01 will output higher voltages. Again, these needs to be measured and the values entered.



The DAC01 will then output 5V on each channel. This is the end of the calibration procedure.

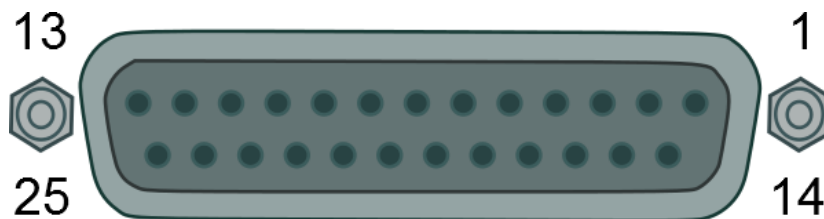


If an official certificate of conformity is required, please contact [support@racelogic.co.uk](mailto:support@racelogic.co.uk) or your local dealer.

## Specifications

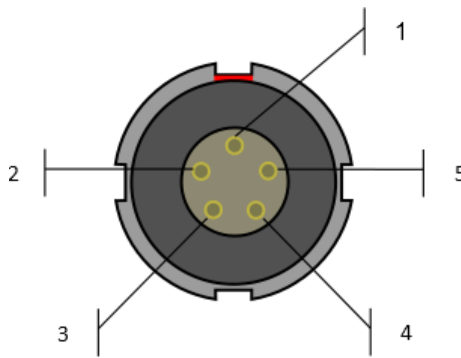
Specification	
<b>Output Channels</b>	4 Analogue Channels 7 Digital Channels
<b>Output Signal Range</b>	
Analogue Voltage	0 to +10VDC
Digital	0V/+12 VDC
<b>Resolution</b>	
Analogue Voltage	12 bit, 2.44 mV per bit
Timer Compare	16 bit
<b>Voltage Accuracy</b>	±0.1%
<b>Power Supply Voltage</b>	+12VDC (± 10%)
<b>CAN</b>	
Type	CAN 2.0A or CAN2.0B Compatible
Baud Rates	250Kbit/s, 500Kbit/s, 1Mbit/s

## Connection data



Pin	Function	Pin	Function
1	Digital Output 1	14	Ground
2	Digital Output 2	15	Ground
3	Digital Output 3	16	Ground
4	Digital Output 4	17	Ground
5	Digital Output 5	18	Ground
6	Digital Output 6	19	Ground
7	Digital Output 7	20	Ground
8	Ground	21	Analogue Ground
9	Analogue Ground	22	Analogue Output 4
10	Analogue Output 3	23	Analogue Ground
11	Analogue Ground	24	Analogue Ground
12	Analogue Ground	25	Analogue Output 2
13	Analogue Output 1		

## Connection data (continued)



Pin numbering on LEMO socket connector

### Connector 1 – CAN/POWER IN

Pin	I/O	Function
1	I/O	Direct connection to Connector 2 pin 1
2	I/O	Direct connection to Connector 2 pin 2
3	I/O	CAN High
4	I/O	CAN Low
5	O	+12 V Power
Chassis		Ground

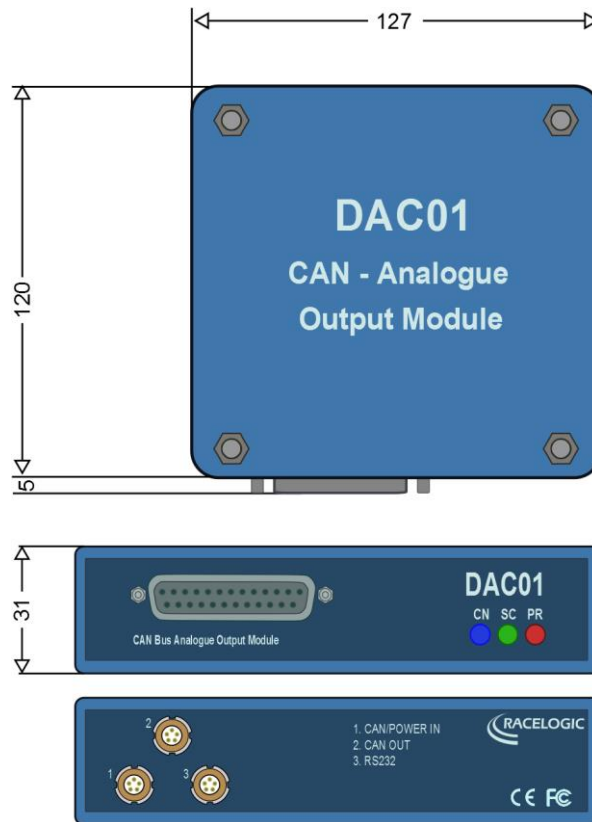
### Connector 2 – CAN OUT

Pin	I/O	Function
1	I/O	Direct connection to Connector 1 pin 1
2	I/O	Direct connection to Connector 1 pin 2
3	I/O	CAN High
4	I/O	CAN Low
5	O	+12 V Power
Chassis		Ground

### Connector 3 – RS232

Pin	I/O	Function
1	O	TxD, Serial Data Transmit
2	I	RxD, Serial Data Receive
3	-	N/A
4	-	N/A
5	O	+12V Power
Chassis		Ground

## Unit dimensions



## Upgrading the DAC01 firmware

It is recommended to check the web site periodically for updates. To upgrade the DAC01 firmware, download the following from the RL website.

1. [The DAC01 latest firmware file](#) (.RUF extension file)
2. [Racelogic Upgrader software](#)

Connect the DAC01 to the PC via the supplied RLCAB001 serial cable, and apply power to the DAC01.

Double click on the .RUF upgrade file, which auto runs the Upgrader software. Ensure the correct COM port is selected in Racelogic Update software, then hit 'upgrade' to start the procedure.

When this is complete, powering the DAC01 off and back on will complete the process.

**Note:** To confirm which COM port is assigned to the DAC01, check device manager.

Ensure that other software which may try and use the COM port communications, such as VBOX Tools, is closed.

## Contact information

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