TVG
The Vehicle Group

OEMTech

Excellence Through Innovation

CoreCAN4

Product Guide

Document ID: G0043 CoreCAN4 - PG v1.0

Read guide fully before commencing installation.
This guide must be present during time of install.
This guide is to be used in conjunction with training.

www.thevehiclegroup.com +44 (0) 345 0 60 50 40 info@tvg.uk

MADE IN BRITAIN

Document Change Control

Date	Version	Author	Approval	Changes
11/11/2024	V1.0	A. Barker	M. Blackbourn	Initial Release
18/11/2024	V1.1	A. Barker	M. Blackbourn	Added Type Approval Number

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General Notices

- Before starting installation, please read the documentation fully as the performance of the device is dependent on correct installation.
- This device is designed for automotive use only. It must not be used in situations where human life is dependent on its performance.
- Installation of this device may conflict with some countries regulations, or the vehicle manufacturers instructions. Compliance with these regulations shall solely be the customers responsibility. Improper installation may invalidate the vehicle warranty.
- Prior to the commencement of any work, the correct PPE should be worn and a risk assessment should be conducted in accordance with your company policies.
- Ensure manufacturers guidance is followed during the installation.
- The device must be installed by a suitably qualified and experienced professional skilled in automotive electronics.
- Misuse, physical damage and incorrect installation will invalidate the warranty of this device or systems using this device.
- Vehicle batteries should be isolated before working on any electrical systems.
- If using the OEM body builders module to gain CANbus information, ensure the module is correctly configured by the manufacturer.
- Do not secure the device in a way where it will interfere with the vehicles control systems. E.g. steering column, brake pedals etc.
- Other people may install equipment after you, so your work must be firmly secured in place, this includes devices and cabling.
- Connecting the power supply and ground should be done as per OEM specifications. Once any jointing or crimping has been completed, testing should be conducted to ensure the joint is compliant with the crimp specifications and all other relevant standards.
- We do not recommend drilling through vinyl (vehicle decals etc) as this will lead to blistering from the heat generated. Hole should be fitted with a grommet and sealed with appropriate sealant.
- Any alteration to metal must be de-burred and all sharp edges removed. Exposed bare metal must be treated with appropriate anti-corrosion solution in accordance with manufacturers recommendations. Any swarf produced must be collected by placing a magnet or catchment device under the area of modification. No swarf is to be left on or in a vehicle.
- We recommend using flexible polyurethane sealants. Any sealed areas must be sealed to a minimum of IP65 and must comply with the vehicle manufacturers recommendations.
- Any serial / key numbers from the equipment being installed must be logged against the vehicle identity for future reference.

Introduction

The TVG CoreCAN4 is designed to interface with up to two CANbus networks simultaneously and allow reception or transmission of data, to or from those networks. The data received from those networks, could be used to trigger up to four CoreCAN4 outputs or be received on one network and then retransmitted on the other in a different format. The device also provides two digital inputs that can also be used to provide non CANBUS based input into CoreCAN4 to allow for more logic options.

CoreCan4 can be set in 3 main configurations, described on pages 7-9. Each configuration allows the ECU to be utilised in different ways.

CAN bus

The CoreCAN4 has two independent CANbus circuit interfaces. These interfaces are capable of both Classic and CANFD operation. They also have removable jumper-controlled termination resistors to allow them to be the end point of a CAN circuit if required. TVG recommend using our EasyReader capacitive CAN reader to connect to a vehicle CAN in a galvanically isolated way.

Inputs

The CoreCAN4 has 2 High impedance digital inputs that can be used to allow non-CAN based circuits to interact with the CoreCAN4. These inputs accept the full vehicle voltage and operate as positive inputs.

Outputs

The CoreCAN4 offers four positive output circuits, these circuits can drive up to 2A of current at full vehicle voltage into any attached load. All four outputs are protected against short circuits and will self-limit in the event of any attempt to draw too much current from them.

Processor

The CoreCAN4 contains an ARM based Cortex Microcontroller to allow for a vast range of custom capabilities to be provided by the CoreCAN4 system.

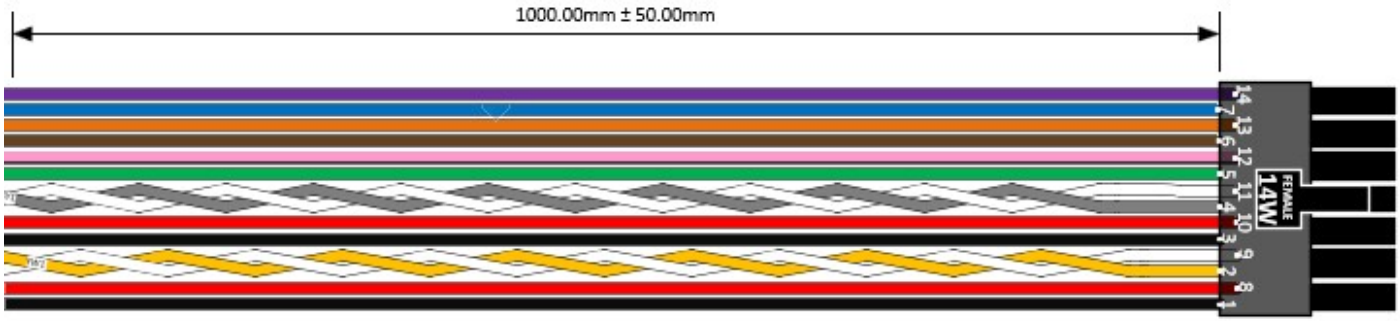
Type Approval

E11*10R06/00*13043*00

Technical Data

Electrical	
Operational Voltage	12v / 24v
Sleep Current 12V	0.4mA
Active Current 12V	24mA
Sleep Current 24V	0.8mA
Active Current 24V	24mA
CANbus	
Number Of Channels	2
Type(s) of CAN bus	CAN Classic / CAN FD
Physical Dimensions	
Length	72 m
Width	61 mm
Height	19 mm
Weight	40 g

Loom 305203

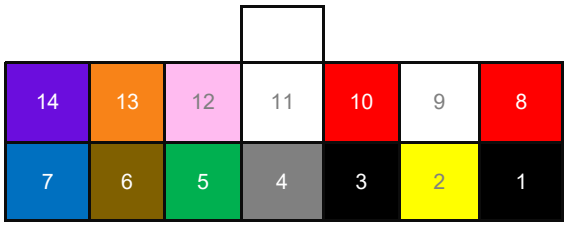


Configuration A - CAN to Outputs

In this config, CoreCAN4 can read up to 2 Classic CAN input channels and up to 2 digital inputs. It then uses logic to create 4 digital outputs that can be used to control external devices.

When CoreCAN4 reads a preprogrammed message, it will activate the relevant output.

An example of this configuration is CoreCAN4 reading the vehicles CAN network looking for certain conditions such as left indicator, vehicle speed etc, when these conditions are met it will activate the correct outputs to control a left turn lighting system.



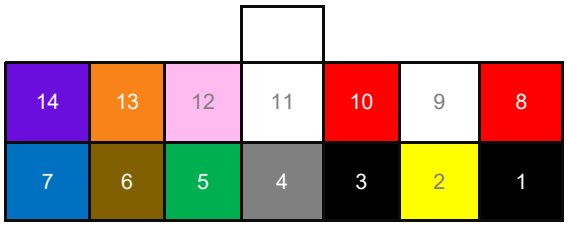
Pin	Wire Colour	Description
1	Black	Ground
2	Yellow (twisted)	CAN 1 Low
3	Black	Ground
4	Grey (twisted)	CAN 2 Low
5	Green	Input 2
6	Brown	Output 1
7	Blue	Output 3
8	Red	V+ (12v / 24v) Input
9	White (twisted)	CAN 1 High
10	Red	V+ (12v / 24v) (internally connected to pin 8)
11	White (twisted)	CAN 2 High
12	Pink	Input 1
13	Orange	Output 2
14	Purple	Output 4

Configuration B - CANFD to Classic CAN

In this configuration, CoreCAN4 will read data from a CANFD network looking for specific data. When it reads the correct data it will convert that CANFD data into Classic CAN, so it can used by external devices or systems. CoreCAN4 can also be used in the opposite way to convert Classic CAN data into CANFD.

In this configuration CoreCAN4 still has its 2 digital inputs and 4 digital outputs that can be used to trigger external devices.

An example use for this configuration would be using CoreCAN4 to read CANFD from a modern vehicle, and convert specific data to Classic CAN so it can be used by a current external device that only accepts Classic CAN.

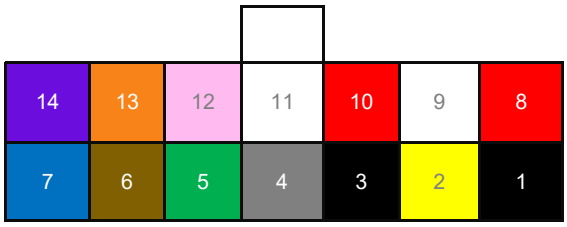


Pin	Wire Colour	Description
1	Black	Ground
2	Yellow (twisted)	CAN FD Low
3	Black	Ground
4	Grey (twisted)	Classic CAN Low
5	Green	Input 2
6	Brown	Output 1
7	Blue	Output 3
8	Red	V+ (12v / 24v) Input
9	White (twisted)	CAN FD High
10	Red	V+ (12v / 24v) (internally connected to pin 8)
11	White (twisted)	Classic CAN High
12	Pink	Input 1
13	Orange	Output 2
14	Purple	Output 4

Configuration C - CAN Filter

In this configuration, CoreCAN4 can be used to read Classic CAN and filter (notch) out certain CAN data to stop it from transmitting onwards. Like a one way valve it will allow all CAN through from the vehicle to external devices, but will block predetermined data from going back to the vehicle network.

For example CoreCAN4 can be used to send can data through to a telematics hub for analysis/ datalogging. It will then function as firewall to stop any control messages from reaching the vehicle CAN network. This control data can be used to control a range of external devices, either directly from CAN or from the 4 CoreCAN4 digital outputs. The CAN control message could also be used to control another CAN device like our CVAS CAN speaker.



Pin	Wire Colour	Description
1	Black	Ground
2	Yellow (twisted)	CAN Low Through
3	Black	Ground
4	Grey (twisted)	CAN Low Filtered
5	Green	Input 2
6	Brown	Output 1
7	Blue	Output 3
8	Red	V+ (12v / 24v) Input
9	White (twisted)	CAN High Through
10	Red	V+ (12v / 24v) (internally connected to pin 8)
11	White (twisted)	CAN High Filtered
12	Pink	Input 1
13	Orange	Output 2
14	Purple	Output 4

Installation

Before starting the installation please ensure that all relevant safety precautions have been taken and the equipment is safe to work on.

- Locate a suitable mounting position for the CoreCAN4 where fused power (12 or 24V), and the vehicle CAN network are available.
- Connect the supplied TVG loom to the CoreCAN4 so that it clicks securely in place.
- Connect the loom CAN wires to the relevant vehicle CAN networks.
- Connect the power wires, red to V+ supply (with a 3 A fuse) and black to ground.
- Connect the CoreCAN4 input / output wires to the devices providing or requiring signals.
- Carry out all relevant safety checks before switching on the ignition and commencing functions tests.

About Us

The Vehicle Group Limited (TVG) is a leading manufacturer of high quality safety and security systems for commercial vehicles. Our facility in North Yorkshire, where we have circa 100 employees, is home to our design, manufacturing, engineering, and service centre. We are especially proud of our market leading, British engineered and manufactured CCTV solution Oculux®, which is used Worldwide.

Our technology's include:

- Oculux® Cameras.
- Automotive CCTV.
- CANbus Readers.
- Commercial Vehicle Announcement System (CVAS).
- Vehicle Solar Systems.
- Cable Harness Design & Manufacture.
- Electronic Design & Manufacture.
- Systems Development.

Useful Contacts

Sales and Account Management Team
Telephone: 03450 60 50 40
Email: sales@tvg.uk

Technical Support
Telephone: 03450 60 50 40
Web: https://support.tvg.uk/
Email: support@tvg.uk

Service and Installation Centre
Telephone: 03450 60 50 40
Email: service@tvg.uk

1 Target
Chartermark Way
Colburn
North Yorkshire
DL9 4QJ
Tel: +44 (0) 3450 60 50 40
Email: info@tvg.uk
Web: www.thevehiclegroup.com