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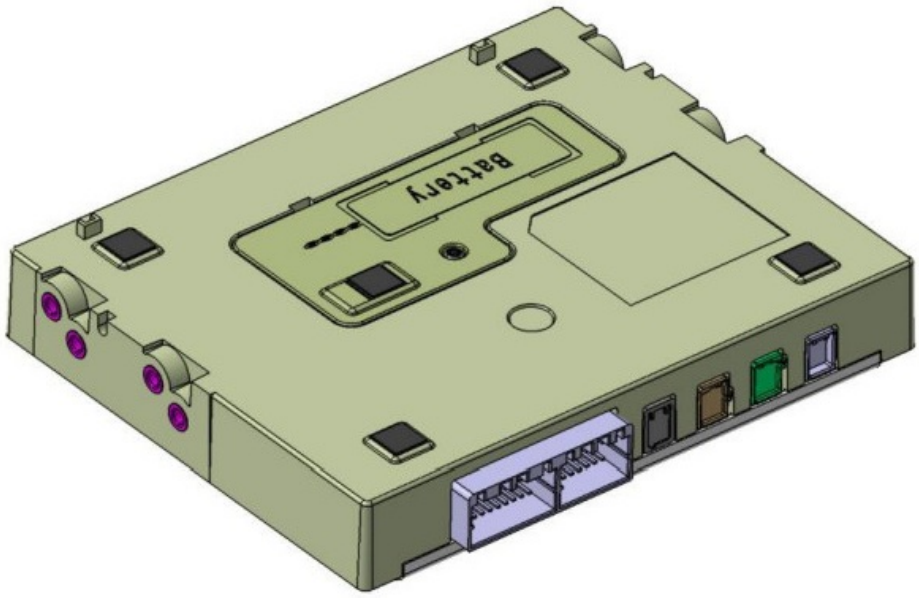
Continental Communication Module



Specifications

- **Product**: CM4 Telematics device
- **Model Names**:
  - MAN MID EU + RoW COMMUNICATION-MODULE 4 MID 0101 EU/ROW
  - MAN MID NA COMMUNICATION-MODULE 4 MID 0101 NA
  - MAN MID CN CM 4 MID 0101 CN
  - Scania MID EU + RoW C400 ECU MID EU/ROW 4.5G
  - Scania MID NA C400 ECU MID NA 4.5G
  - Scania MID CN C400 ECU MID CN 4.5G

Document History

Version ID	Document Status	Modified date	Modified by	Description
2.0	Draft	25.09.2024	Jürgen Dreyer	Released Version w/o Homologation Label

TRATON CM4

CM4 Variant	Model Name	Model number
MAN MID EU + RoW	COMMUNICATION-MODULE 4 MID 0101 EU/ROW	A3C1234050100
MAN MID NA	COMMUNICATION-MODULE 4 MID 0101 NA	A3C1234060100
MAN MID CN	CM 4 MID 0101 CN	A3C1234070100
Scania MID EU + RoW	C400 ECU MID EU/ROW 4.5G	A3C1234020100

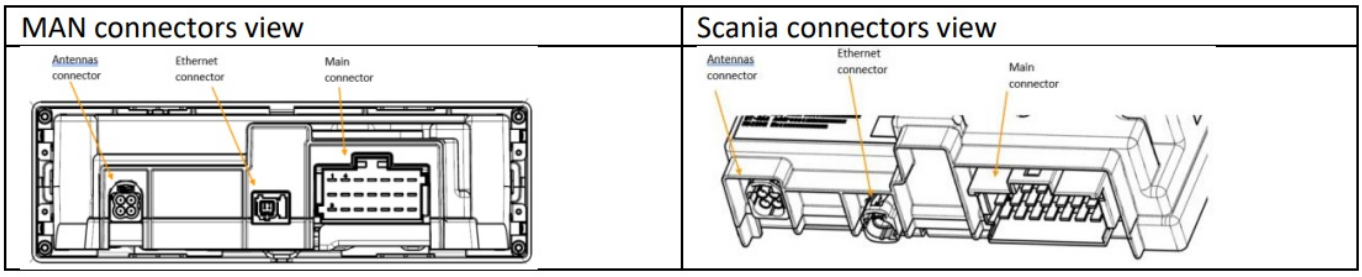
Scania MID NA	C400 ECU MID NA 4.5G	A3C1234030100
Scania MID CN	C400 ECU MID CN 4.5G	A3C1234040100

Overview

Traton CM4 is an advanced telematic and connectivity module. It is capable of performing advanced wireless communication and at the same time to interface with other ECUs or devices available on the truck. Defined customers for the Traton CM4 project are MAN and Scania. For both customers, a single HW design is developed, but the component population on the production line will be different based on the variant. The development of the HW platform and the basic platform SW is under Continental's responsibility. The development of the application SW is under Traton's responsibility.

Vehicle mountingThe

CM4 device will be mounted inside the vehicle cabin in a dedicated location. For Scania vehicles, the CM4 device will not be directly visible to the driver, while for MAN vehicles, the CM4 will be directly visible to the driver. The initial step for mounting the de device is to plug the associated harnesses according to the connectors mapping presented below,



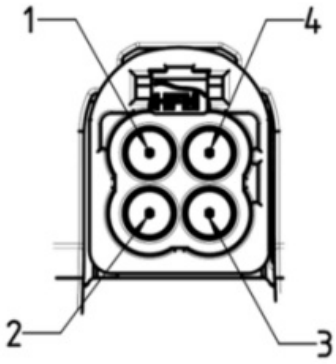
Main connector pinout

1	4	7	10	13	16	19
DIG_OUT1	DIG_OUT3	DIG_OUT4	Secondary Wake-Up	D8	Dig_In1	KL30
2	5	8	11	14	17	20
DIG_OUT2	CAN2 Shield	CAN2 Shield	Alarm Wake-Up	Activation Line	Dig_In2	KL15
3	6	9	12	15	18	21
CAN1_H	CAN1_L	CAN2_H	CAN2_L	CAN3_H	CAN3_L	KL31

After the connection of the associated harnesses, the device will have to be installed

according to the specific procedure (procedure developed by the customer for its specific version)

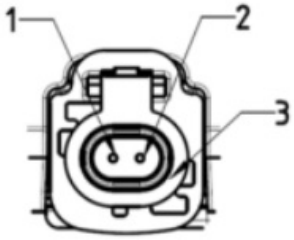
Antenna connector pinout



Antenna Connector MOL 208244-0200		Signal	Pin plating
Pin 1.01	GNSS antenna	GNSS [1, 2]	Au
Pin 1.02 GND		GNSS [1, 2]	Sn
Pin 2.01	WiFi ext. antenna	BT/WLAN	Au
Pin 2.02 GND		BT/WLAN	Sn
Pin 3.01	Primary ext. antenna	5G 1 (Rx)	Au
Pin 3.02 GND		5G 1 (Rx)	Sn
Pin 4.01	DRX0 ext. antenna	5G 2 (Rx)	Au
Pin 4.02 GND		5G 2 (Rx)	Sn

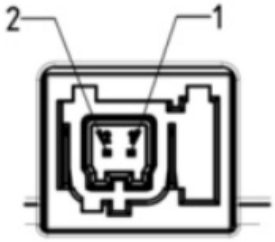
Ethernet connector pinout

Scania Ethernet connector



Dual H-MTD E6S220-40MT5-B		Signal	Pin plating
Pin 1	ENET2_M (Data Minus)	AE1 -	Au
Pin 2	ENET2_P (Data Plus)	AE1 +	Au
Pin 3	GND	Shield/GND	Sn

MAN Ethernet connector



Ethernet-Stecker/Ethernet Connector 1port MATE net l.-prof. Cod. A - 0-2320201-1/A MAN Gegenstecker/MAN Connector: 81.25475-0455	
Pin 1	ENET1_M (Data Minus)
Pin 2	ENET1_P (Data Plus)

Interfaces

Interfaces with other ECUs/devices in the vehicle

Interfaces with other ECUs/modules available in the vehicle are dependent on variants.

MAN-specific interfaces

- Power supply lines (TRM 30 and TRM31)
- Terminal 15 input indicating vehicle ignition signal;
- Ethernet communication interface – 1 channel with 100 Mbps;

- 3 CAN nodes with frequency up to 500 KHz;
- USB communication interface – Used only during device production, will be deactivated during actual operation. This interface will not be used during the operational lifetime, but only during the production test.
- 2 generic digital input signals;
- 2 generic digital output signals;
- 1 digital input for enabling DoIP(via SW);;
- 1 indicator LED

Scania specific interfaces

- Power supply lines (TRM 30 and TRM 31)
- Terminal 15 input indicating vehicle ignition signal;
- Ethernet communication interface – 1 channel with 100 Mbps;
- 2 CAN nodes with frequency up to 500 KHz;
- USB communication interface – this interface will not be used during the production lifetime, but only during the production test.
- 1-wire bus communication interface for interfacing with an external iButton
- 2 digital input signals;
- 2 digital output signals;
- 2 digital inputs/outputs signals

RF communication interfaces

RF communication interfaces supported by Traton CM4 are:

- Cellular communication
- WIFI communication
- BT communication
- GNSS signal acquisition

These RF communication protocols are supported on all variants.

Expected behaviour

After the supply voltage has been applied (KL30 set to 24V or 12V), the CM4 device

starts booting up. The bootup process takes about 90 seconds. Some functionalities, like CAN communication, ETH communication, are available before the bootup process ends, but the full functionality is reached only when the boot-up process is finished.

Main functionalities provided by the CM4 device

- GNSS positioning (starts automatically after boot-up phase)
- Communication with the back office via cellular network (triggered by customer application or test application)
- Communication over WIFI (triggered by customer application or test application)
- Communication over BT (triggered by customer application or test application)
- Communication via CAN based on the database received from the customer;
- TCP communication via Ethernet;

There is no functional difference between the 12V CM4 systems and 24V CM4 systems – a single HW design covers the full voltage functional range.

Restrictions

Assembly or disassembly of the TRATON CM4 while the operating voltage is connected is not allowed. Assembly or disassembly of connectors while the operating voltage is connected is not allowed.

Label

For label definition, see the specific document from the dedicated folder.

Block diagram

For the block diagram, see the specific document from the dedicated folder; there is a specific block diagram for the MAN variant a particular block diagram for Scania

Radio Frequency Configuration

EU/ROW variants

	2G Band: Band 3 (GSM1800): 1710-1785 / 1805-1880 MHz,

Cellular standards and frequencies	Band 8 (GSM900): 880-915 / 925-960 MHz 3G Band: Band I (B1: 2100 UMTS): 1920-1980 / 2110-2170 MHz, Band III (B3: 1800 UMTS): 1710-1785 / 1805-1880 MHz Band VIII (B8: 900 UMTS): 880-915 / 925-960 MHz 4G Band: FDD Band 1 (2100 LTE): 1920-1980 / 2110-2170 MHz, FDD Band 3 (1800 LTE): 1710-1785 / 1805-1880 MHz, FDD Band 7 (2600 LTE): 2500-2570 / 2620-2690 MHz, FDD Band 8 (900 LTE): 880-915 / 925-960 MHz, FDD Band 20 (800 LTE): 832-862/ 791-821 MHz, FDD Band 28a (700 LTE): 703-718 / 758-773 MHz, FDD Band 28b (700 LTE): 718-748 / 773-803 MHz FDD Band 38 (2600 LTE): 2570-2620 MHz, FDD Band 40 (2300 LTE): 2300-2400 MHz FDD Band 41 (2500 LTE): 2496-2690 MHz

WLAN standards and frequencies	IEEE 802.11 b/g/n/a/ac 2.4GHz … 2.462GHz 5.150GHz … 5.250 GHz
Bluetooth standards and frequencies	Bluetooth v5.0; Bluetooth LE 2.4GHz … 2.483GHz

NA variants

Cellular standards and frequencies	3G Band: Band II (B2: 1900 UMTS): 1850-1910 / 1930-1990 MHz, Band IV (B4: 1700 UMTS): 1710-1755 / 2110-2155 MHz, Band V (B5: 850 UMTS): 824-849 / 869-894 MHz, 4G Band: FDD Band 2 (1900 LTE): 1850-1910 / 1930-1990 MHz, FDD Band 4 (1700 LTE): 1710-1755 / 2110-2155 MHz, FDD Band 5 (850 LTE): 824-849 / 869-894 MHz, FDD Band 12 (700 LTE): 699-716 / 729-746 MHz, FDD Band 13 (700 LTE): 777-787 / 746-756 MHz,

	FDD Band 14 (700 LTE): 788-798 / 758-768 MHz, FDD Band 28a (700 LTE): 703-718 / 758-773 MHz, FDD Band 28b (700 LTE): 718-748 / 773-803 MHz FDD Band 29 (700 LTE): 717-728 FDD Band 30Rx (2300 LTE): 2305-2315 / 2350-2360 MHz FDD Band 66 (1700 LTE): 1710-1780 / 2110-2200 MHz,
WLAN standards and frequencies	IEEE 802.11 b/g/n/a/ac 2.4GHz … 2.462GHz 5.150GHz … 5.250 GHz
Bluetooth standards and frequencies	Bluetooth v5.0; Bluetooth LE 2.4GHz … 2.483GHz

CN variants

Cellular standards and frequencies	2G Band: Band 3 (GSM1800): 1710-1785 / 1805-1880 MHz, Band 8 (GSM900): 880-915 / 925-960 MHz 4G Band:

	FDD Band 3 (1800 LTE): 1710-1785 / 1805-1880 MHz, FDD Band 8 (900 LTE): 880-915 / 925-960 MHz, FDD Band 34 (2000 LTE): 2010-2025 MHz, FDD Band 38 (2600 LTE): 2570-2620 MHz, FDD Band 39 (1900 LTE): 1880-1920 MHz, FDD Band 40 (2300 LTE): 2300-2400 MHz, FDD Band 41 (2500 LTE): 2496-2690 MHz
WLAN standards and frequencies	IEEE 802.11 b/g/n 2.4GHz … 2.462GHz
Bluetooth standards and frequencies	Bluetooth v5.0; Bluetooth LE; 2.4GHz … 2.483GHz

Supply Voltage

Nominal voltage, U_{TRM30}:	. U_{TRM30}=12/24[V];
Functional range, U_{TRM30}:	. U_{TRM30}(min)=32[V], U_{TRM30}(max)=9[V]

Supply current, $I_{TRM30\ MAX}$:	. I_{TRM30} = 3A at min. operating voltage

Wired Interfaces configuration

Interface	**Variant**	**Characteristics**
Ethernet	MAN & Scania	– complies with IEEE P802.3bw standard; – complies with 100BASE-T1 standard; MAN Ethernet connector: – Model TE 2304372; – Impedance – 100 Ohm; Scania Ethernet connector: – Model Rosenberger AMS29B-40MZ5-Y; – Impedance – 50 Ohm;

CAN	MAN & Scania	MAN variants support 3 CAN communication nodes Scania variants support 2 CAN communication nodes – Complies with ISO 11898 physical layer; – default baud rate on all CAN channels 500 kBaud – Terminator connectors on CAN nodes
USB	MAN & Scania	– Used only during device production, will be deactivated during actual operation. This interface will not

		be used during the operational lifetime, but only during t he production test; USB connector: – Model Type-C Molex 2012670005; – Female type; – Compatible with USB 2.0; – Shielded, full shield; – Maximum voltage 30V; – No grounding to the panel;
1 Wire	Scania	– 1 wire bus interface is used for wired data transfe r between the external device (I-button) and the TCU; – On the external 1-wire bus, the CM4 module has t he role of the master; – 1 wire communication interface is mapped on the main connector according to the picture available in this document.
Generic Digital Inputs	MAN & Scania	– 2 x Dig In signals are independent of the variant – Electrical threshold for LOW level < 2V; – Electrical threshold for HIGH level > 6V;

TRM15	MAN & Scania	– 1 x Dig In signals independent of the variant – Electrical threshold for LOW level <=3.2V; Electrical threshold for HIGH level >=4.0V;
ETH_ACTIVATION	MAN	– 1 x Dig In signals are independent of the variant – Electrical threshold for LOW level < 2V (according to ISO_13400-3) ; – Electrical threshold for HIGH level >= 5V 2V (according to ISO_13400-3) ;
Digital Outputs	MAN & Scania	– 2 x Dig In signals are independent of the variant – Electrical level for inactive level <= 2V; – Electrical threshold for active level >= 6V;
Digital Inputs/Outputs	Scania	– 2 x Special lines with dual role – Dig_In and Dig_Out – Electrical level for inactive level <= 3.5V; – Electrical threshold for active level >= 5.5V;

Manufacturer

Continental Automotive Technologies GmbH

Heinrich-Hertz-Strasse 45 78052 Villingen-Schwenningen Germany

Environmental conditions

Operating temperature range	-40°C … +80°C

Storage temperature range	22 hours at -55°C (transition time 2h) 46 hours at +90°C
System of protection	IP54 for the front of the ECU IP52 for backside (side with connectors)
Relative humidity	25 % – 75 % (Accepted tolerances ± 5 %)
Altitude	**2 -3000m**

Designed By Cosmin.Trailovici@continental-corporation.com
Released By Juergen.Dreyer@continental-corporation.com

FAQs

Q: How do I update the firmware of the CM4 Telematics device?
A: Firmware updates for the CM4 Telematics device can be performed by downloading the latest firmware version from the manufacturer's website onto a USB drive and following the instructions in the firmware update guide.

Documents / Resources

	Continental Communication Module [pdf] User Manual 15891, 15893, Communication Module, Communication, Module

References

- Form a Corporation or LLC In California | MyCorporation

- User Manual

15891, 15893, Communication, Communication module, Continental, Module

Continental

—Previous Post
Continental G12N51RG1 Telematics Connectivity Platform Module User Manual
Next Post—
Continental 6600079509 Key Fob User Manual

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