Continental
The Future in Motion

KIBES® Body and Chassis Control

Multiplex system for commercial vehicles

www.continental-automotive.com/kibes


Functionality
comfort
efficiency

KIBES® – Key to Integrated onBoard Electronic System.

Increasing requirements for efficiency, comfort and functionality affect the development of modern vehicles. The KIBES® hardware and software package from Continental can meet the challenge to fulfill them.

The KIBES® system will help to optimize the OEM application: By reducing wirings, connectors, relays and fuses the vehicle will become more reliable. The costs for wiring up the vehicle, as well as the expenses for documentation service and maintenance will become remarkably less.

With our KIBES® product portfolio, we provide an efficient development tool chain that offers a scalable and flexible network system at a reasonable price level, making buses, trucks and special vehicles more powerful, efficient and reliable.

All components of the KIBES® family are automotive qualified, designed for different vehicle applications and markets and available off-the-shelf to enable a short time-to-market launch.

Thanks to the KIBES®-32 software, the integration and testing of application software is easy to handle and it supports flexible business models.

KIBES®: Advantages and base systems.

The scalable and flexible network system of KIBES® allows the easy addition or removal of several components and it also simplifies the maintenance and troubleshooting of the vehicle. Vehicles can be operated more safely and reliably due to built-in diagnostic features like short-circuit protection, open-load as well as over-temperature detection.

Thanks to the minimized amount of wirings, connectors, relays and fuses the vehicle weight and installation time can be significantly reduced and therefore also the fuel consumption and wiring, documentation service and maintenance costs.

At the same time the vehicle reliability can be improved. High quality will be guaranteed as all components are carefully tested and validated not only on a component basis but also on a system level.

The KIBES® system is available in several variants with different control units.

The system with central computer ZR32-A provides a solution to almost every possible requirement. Up to 16 nodes can be connected to ZR32-A for all types of in- and output signals. ZR32-A offers a complex CAN network with powertrain CAN, customer generic CAN, instrument CAN, body CAN and two multiplex CANs. It is also possible to connect different instrument clusters and driver's workplace solutions with ZR32-A.

Systems with a control unit of the CBCU3 family provide powerful solutions that are optimized to precisely meet any costumer requirement. Up to four nodes can be connected to CBCU3 via multiplex CAN. Beyond that control units of the CBCU3 family offer a network of powertrain CAN and instrument CAN, with the latter providing a direct connection to several possible instrument cluster solutions.

The family of MUX4 provides a system with generic multiplex node MUX4-Pn for general purposes controlled by master unit MUX4-Pcu. Up to four MUX4-Pn nodes can be connected to MUX4-Pcu via a powerful multiplex CAN. Additionally the system provides a powertrain CAN and a generic CAN as well as the installation outside of the cabin, e.g. on the frame of the vehicle, leaving more space in the already packed cabin.

Base systems	Node combinations				Cluster combinations*		DWP combinations	
 **ZR32-A** – central computer	 MUX2-B	 MUX2-M	 MUX2-BP		 MOKI3	 DMUX3	 DWP	 DWP+
 **CBCU3 family** – central computer / body controller	 MUX2-B	 MUX2-M	 MUX2-BP	 MUX4-Pn	 **Cluster stand-alone:** BusIC or CMIC			
 **MUX4-Pcu** – generic multiplex node				 MUX4-Pn				
 **MUX3-E** – multiplex expansion node								

Control units overview

	ZR32-A	CBCU3-E	CBCU3-E24L	CBCU3-EL	MUX4-Pcu	MUX3-E
Installation	cabin	cabin	cabin	cabin	outside cabin	cabin
Operation mode	master	master	master	master	master / client	master
Possible mix with nodes on M CAN	up to 16	up to 4	up to 4	up to 4	up to 4	–
Possible configuration with cluster with driver's workplace	MOKI3, stand-alone DWP, DWP+	stand-alone –	stand-alone –	stand-alone –	– –	– –
LIN interface	–	–	1 (24 V)	1 (12 V / 24 V)	–	–
CAN interface	6	3	3	3	2	3
MCU interface	–	1	1	1	–	–
CVSG interface	–	–	–	–	–	1 (optional)
Water protection	–	cover optional	cover optional	cover optional	yes	–

Nodes overview

	MUX2-B	MUX2-M	MUX2-BP	MUX4-Pn
Installation	cabin	cabin	cabin	outside cabin
Operation mode	client	client	client	client
Possible mix with nodes on M CAN	MUX2-M, MUX2-BP	MUX2-B, MUX2-BP	MUX2-M, MUX2-B	MUX4-Pn
Corresponding central computer	ZR32-A, CBCU3-E family	ZR32-A, CBCU3-E family	ZR32-A, CBCU3-E family	CBCU3-E family, MUX4-Pcu
CAN interface	M CAN	M CAN	M CAN	M CAN
Input digital analog	 24 6	 12 2	 10 6	 8 8 (also usable as digital inputs)
Output high side (PWM) low side	 24 8	 14 2	 22 3	 22 –
Water protection	–	–	yes	yes

* For detailed information see "Modular instrument cluster platforms" brochure, 2014.

ZR32-A – Central computer.

The central controller ZR32-A is an intelligent and powerful gateway controller used together with a variable number of multiplex nodes (max. 16) in high-end multiplex systems.

It is compatible to the nodes MUX2-B, MUX2-M as well as MUX2-BP that can be connected via two powerful multiplex CANs. It also provides an efficient CAN structure to connect various instrument clusters: MOKI3, FlexCluster, MultiViu®Professional12, LoaderIC and CB500 are possible choices as well as the driver's workplaces DWP or DWP+. Additionally the electronic CAN network covers powertrain CAN, generic CAN and body CAN. ZR32-A also provides a central gateway for EOL programming and diagnosis and is controlled by the model based application programming tool KIBES®-32.

ZR32-A

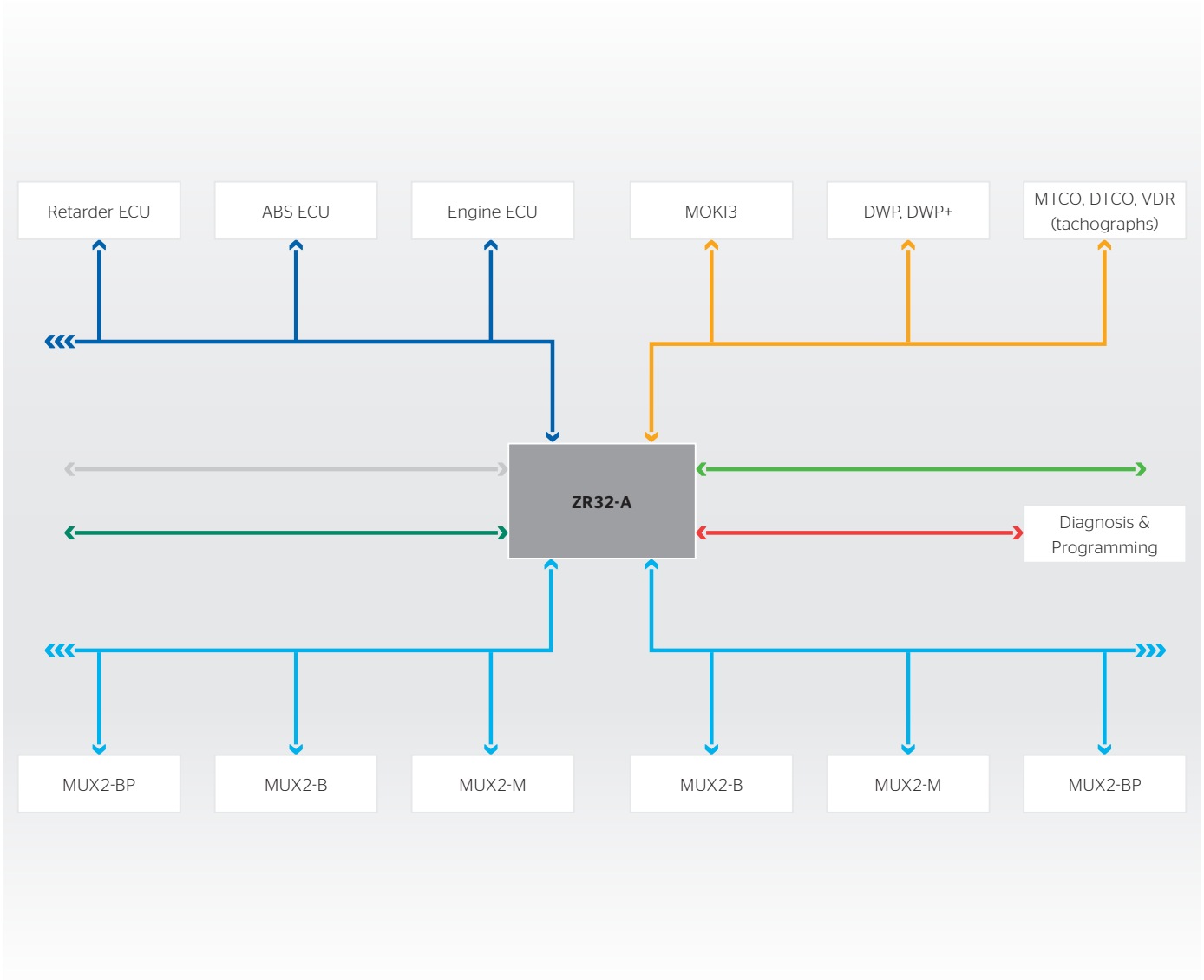
Advantages at a glance

- Generic central computer for general purpose
- Complex gateway functionality
- Up to 16 nodes

Technical specifications

Dimensions	162 x 165 x 30 mm
Nominal voltage	12 V and 24 V
Supply voltage	18 V ... 32 V
Operating temperature	- 30 °C ... + 70 °C
Protection degree	IP 40
CAN interface	6
Processor	2 x 32-bit RISC
Internal flash	2 x 512 kByte
External flash	2 Mbyte
External SRAM / external EEProm	256 kByte / 32 kByte
Input, digital (level programmable)	7 (alternative to 7 outputs)
Output low side, 0.1 A	7 + 2
Powertrain CAN	protocol SAE J 1939; generic CAN objects
Generic CAN	protocol SAE J 1939; X CAN
Instrument CAN	DMUX3, MOKI3; DWP; MTCO, DTCO, VDR – tachograph
Multiplex CAN	MUX2-BP, MUX2-B, MUX2-M
Body CAN	e. g. door control MTS, Pronova; generic CAN objects
IBIS interface (VDV 300; 1984 / 1992)	yes
Modem interface (RS232)	interface only (prepared for optional remote diagnostics)
SAE J 1587 / J 1708	Rx only
Wake up	3
EOL programming	KWP2000 on K-line
Diagnostic services	onboard: DM1, DM4 offboard: KWP2000 on K-line, ASAM

Maximum configuration.



Interface

- Instrument CAN
- Multiplex CAN (up to 16 nodes)
- Powertrain CAN (SAE J 1939)
- SAE J 1708 / J1587 (ZR32-A)
- X CAN
- K-line (ISO 15765)
- IBIS

CBCU3 family – Central Body Control Unit.

CBCU3 satisfies the growing demand for reliable and powerful onboard control units by centralizing the intelligence and input / output management of the cabin and body to one device.

CBCU3

Advantages at a glance

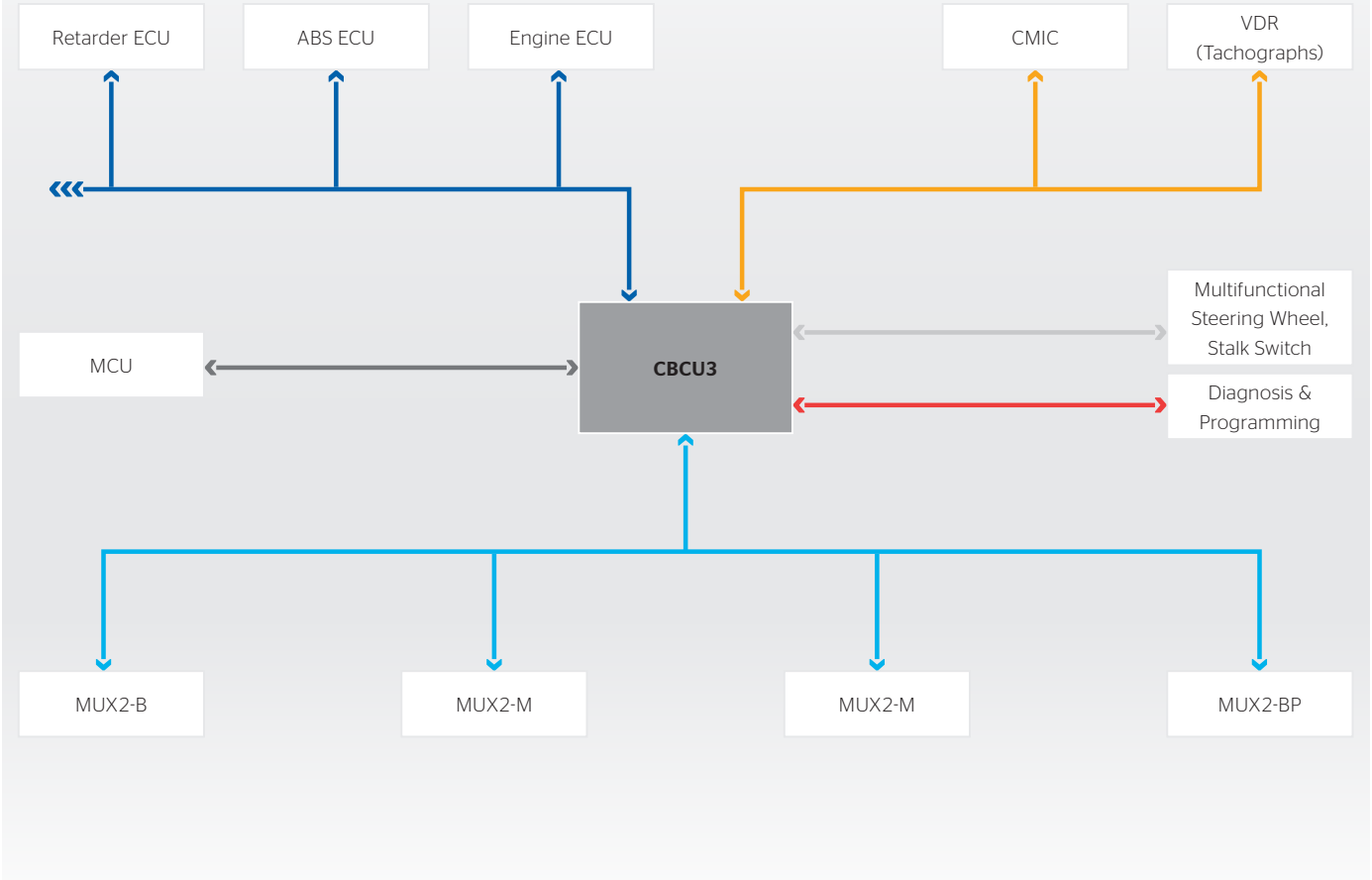
- Management of digital and analog input signals
- Electronically-controlled power outputs with full diagnostic features
- Enhanced network functionality using platform multiplexing nodes

Technical specifications

Dimensions	276 x 185 x 43 mm
Nominal voltage	24 V
Supply voltage	18 V ... 32 V
Operating temperature	- 40 °C ... + 85 °C
Protection degree	IP 30 (IP 54 with add. cover)
LIN interface	only CBCU3-EL (1 x 12 / 24 V) and CBCU3-E24L (1 x 24 V)
Processor	32-bit RISC
Internal flash	1024 kByte
External SRAM / external EEProm	256 kByte / 32 kByte
Input digital 8 mA 1 mA	 34 16
Input analog (parametric)	6
Input frequency speed RPM	 1 1
Input MSC interface	1
Output high side 7.5 A 5.6 A 3.6 A 2.7 A 1.8 A 1.0 A 0.2 A	 1 3 3 6 10 5 4 (1PWM)
Output low side 1.0 A	2 (configuration a PWM)
Output power supply 8 V / 10 mA 5 V / 20 mA	 2 1
Powertrain CAN	ISO 11898, 250 kBaud, protocol SAE J 1939, generic CAN objects
Instrument CAN	ISO 11898, 250 kBaud, generic CAN objects, compatible with CMIC, VDR
Multiplex CAN	ISO 11898, 125 kBaud; for MUX2-B (max. 4 nodes)
HMI interface	MCU
Wake up	5 digital inputs, (e. g. term 15, hazard switch), 5 free configurable inputs
EOL programming	KWP2000 on K-line, powertrain CAN
Sensor supply	1 x 5 V / 20 mA; 2 x 8 V / 10 mA
Diagnostic services	onboard: DM1 offboard: KWP2000 on K-line, ASAM, powertrain CAN

CBCU3 implies not only high reliability and robustness but also a high potential for reduction of wiring harness, connectors, relays and fuses. It can be connected to up to four nodes (compatible are MUX2-B, MUX2-M and MUX2-BP) via powerful multiplex CAN connection. CBCU3 can be connected to a number of different instrument clusters via instrument CAN. Configurations with FlexCluster, MultiViu®Professional12, LoaderIC or CB500 are possible. The CBCU3 family provides a complete system solution for bus, truck and special vehicle applications, off-the-shelf in three different variants: CBCU3-E is a large, also water protected available body controller to cover all possible functional requirements for heavy duty trucks as well as large buses and coaches; CBCU3-E24L provides a 24 V LIN interface for low-cost communication between the actuators and sensors in the vehicle; CBCU3-EL provides a standard 12 V LIN interface.

Maximum configuration



Interface

- Powertrain CAN (SAE J 1939; 250 kBaud; CAN ISO 11898)
- MCU interface
- Instrument CAN (SAE J 1939; 250 kBaud; CAN ISO 11898)
- K-line (ISO 15765)
- Multiplex CAN (250 kBaud; up to 4 nodes)
- LIN bus (only CBCU3-E24L and CBCU3-EL)

MUX4-Pcu – Generic multiplex node.

The MUX4-Pcu is the master variant of the generic multiplex node MUX4-Pn for general purposes. It is suitable for installation outside the cabin, for instance on the frame of the vehicle.

The placement outside the cabin leaves more space in the already packed cabin. The MUX4-Pcu has a fully water protected and very sturdy housing design with fastening possibilities for the cable harnesses. It provides a high output current capability, built-in diagnostic and protection capabilities including LED diagnostic (according to ISO 13207).

The master variant can be connected with up to four MUX4-Pn nodes via a powerful multiplex CAN. Additionally the electronic CAN network of the MUX4-Pcu system covers the powertrain CAN.

MUX4-Pcu

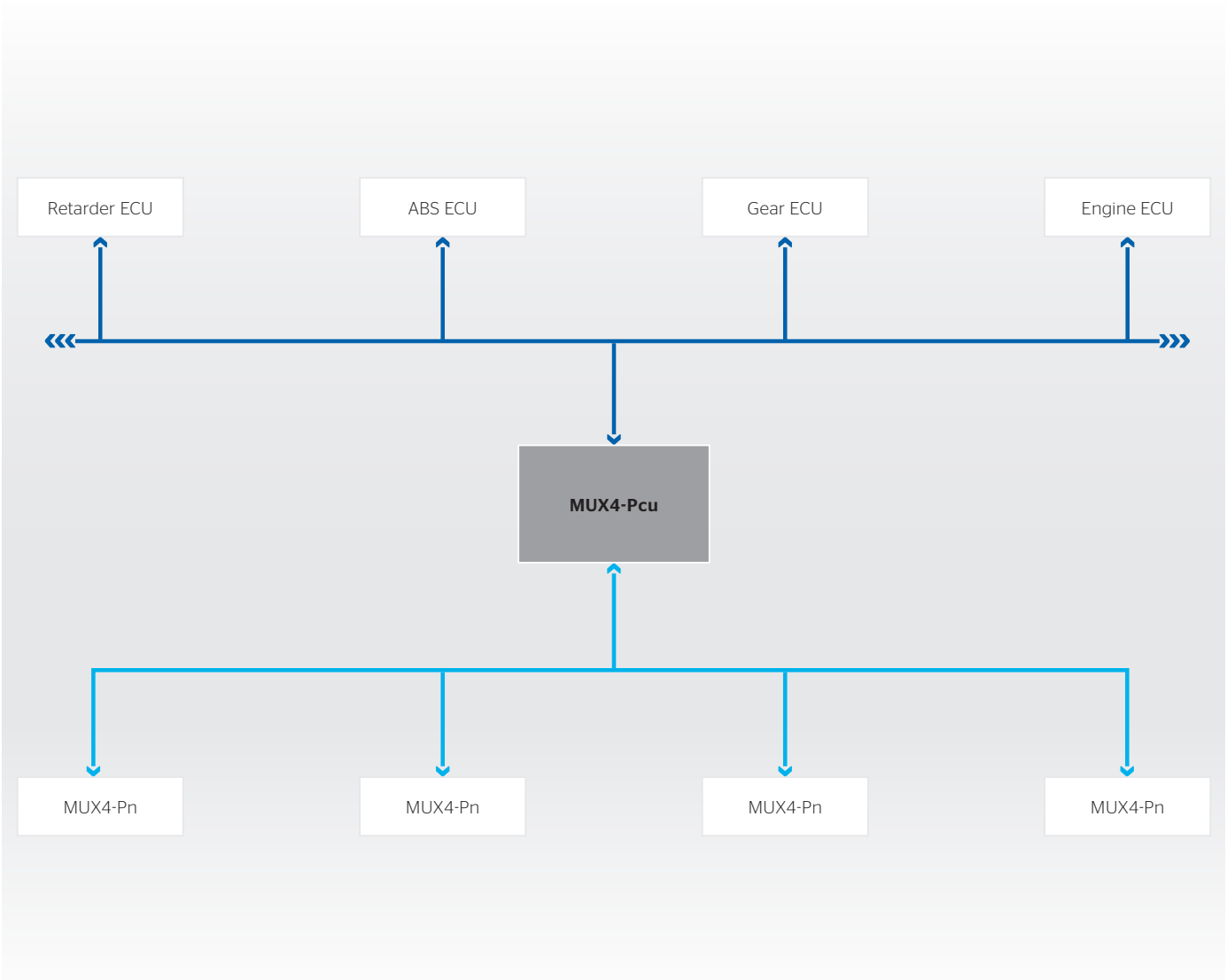
Advantages at a glance

- Built-in diagnostic & protection capabilities
- Installation outside the cabin
- Waterproof, high output current capability

Technical specifications

Nominal voltage	12 V and 24 V
Protection degree	IP 67 / IP 6K9K
CAN interface	2 (client = 1 M CAN-J)
Input digital	8
Input analog (parametric)	8 (also usable as digital inputs)
Input frequency	3 (master variant)
Output high side	22
Wake up	2 digital inputs
Sensor supply	5 V / 40 mA; 2 x 8 V / 15 mA (master variant)
Diagnostic services	built-in diagnostic & protection capabilities

Maximum configuration.



Interface

Multiplex CAN-J (up to 4 nodes)

Powertrain CAN (SAE J 1939)

MUX3-E – Multiplex expansion node.

The multiplex node MUX3-E is an intelligent gateway for cabin installation.

MUX3-E is a multiple input / output controller with built-in diagnostic and protection capabilities. Its electronic CAN network covers three CAN interfaces and one optional commercial vehicle satellite gauge interface. Used in master operation mode it can be programmed via application programming tool KIBES®-32.

MUX3-E

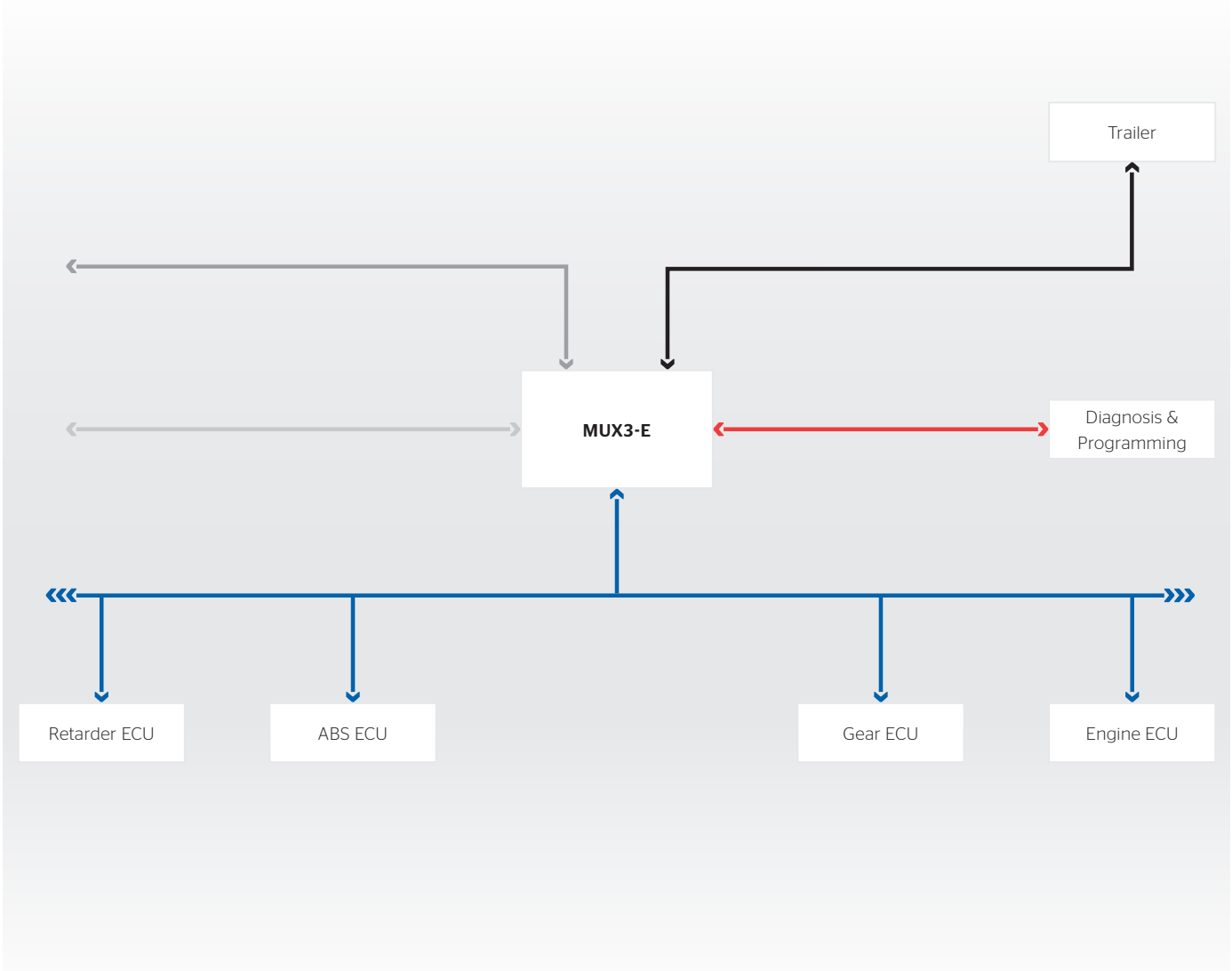
Advantages at a glance

- Intelligent gateway for cabin installation, applicable as Body Builder ECU
- Multiple I / O controller with built-in diagnostic and protection capabilities
- Master operation mode: application programming tool KIBES®-32

Technical specifications

Dimensions	155 x 111 x 40 mm
Nominal voltage	24 V
Supply voltage	18 V ... 32 V
Operating temperature	- 30 °C ... + 70 °C
Protection degree	IP 40
Processor	32-bit RISC
Internal flash	512 kByte
External SRAM / external EEProm	128 kByte / 2 kByte
Input digital	8 (optional 18 or 24)
Input analog (parametric)	2 (optional 3)
Input frequency	1 (0-2000 Hz)
Output high side 1.5 A 0.5 A	16 6 10
Output low side 0.5 A 0.1 A	 1 1(2PWM)
Powertrain CAN	ISO 11898, 250 kBaud, protocol SAE J 1939, generic CAN objects
Generic CAN	ISO 11898, 250 kBaud, protocol SAE J 1939, generic CAN objects
Wake up	1 digital input (term 15)
EOL programming	KWP2000 on K-line
Diagnostic services	onboard: DM1 offboard: KWP2000 on K-line, ASAM, powertrain CAN

Maximum configuration.



Interface

- System interface e.g. powertrain CAN (SAE J 1939, 250 kBaud, CAN ISO 11898)
- KWP2000 / K-line
- Truck gateway; body CAN; CANopen WD413 (125 kBaud; CAN ISO 11898)
- CVSG (optional), Smart Gauges
- Trailer CAN (125 kBaud; CAN ISO 11992 or optional ISO 11898)

MUX2-B – Multiplex node.

The MUX2-B is a generic multiplex node for general purposes to decentralize and optimize the system. It provides one CAN interface connected to ZR32-A central computer or CBCU3 and a large number of inputs and outputs.

It is designed for cabin installation and provides built-in diagnostic and protection capabilities as well as multiple input and output capabilities:

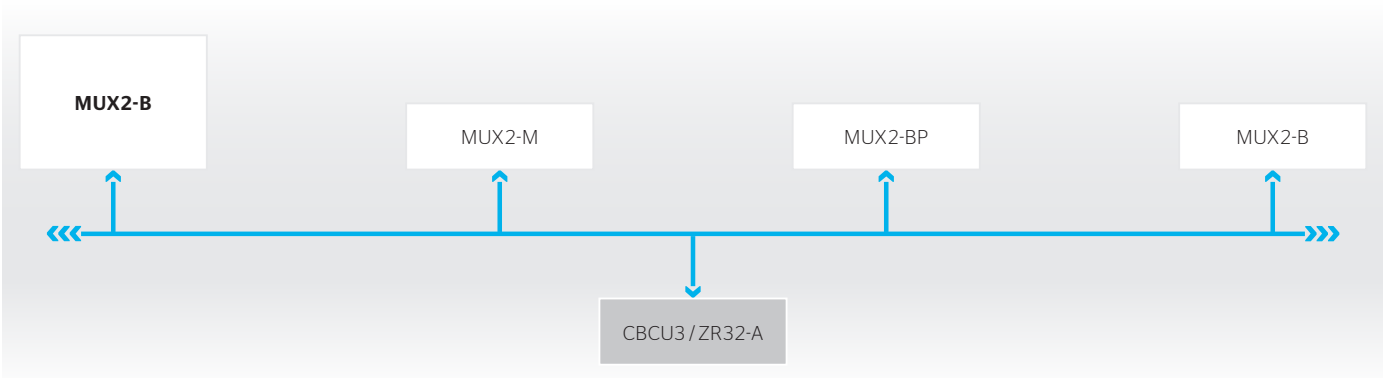
24 high side switch outputs, 8 low side switch outputs, 24 digital inputs and 6 analog inputs.

MUX2-B

Technical specifications

Dimensions	258 x 155 x 30 mm
Nominal voltage	12 V and 24 V
Supply voltage	8 V ... 32 V
Operating temperature	- 30 °C ... + 70 °C
Protection degree	IP 40
Input digital, 8 mA	24
Input analog (parametric)	6
Output high side	
10.0 A	2
5.0 A	4
3.0 A	10
1.0 A	8
Output low side, 1.0 A	8 (4PWM)
Max. current at same time	30 A
Wake up	CAN
No. of power supply groups (15 A)	5

Maximum configuration



Interface

Multiplex CAN

MUX2-M – Multiplex node.

The MUX2-M is a generic multiplex node for general purposes to decentralize and optimize the system. It provides one CAN interface connected to ZR32-A central computer or CBCU3.

It is designed for cabin installation and provides built-in diagnostic and protection capabilities as well as multiple input and output capabilities:

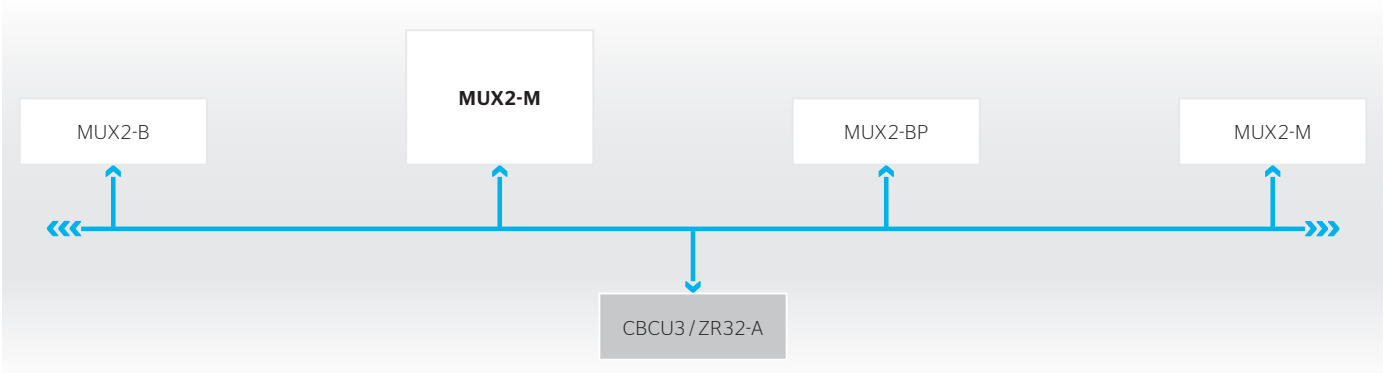
14 high side switch outputs, two low side switch outputs, 12 digital inputs and two analog inputs.

Technical specifications

Dimensions	162 x 165 x 30 mm
Nominal voltage	12 V and 24 V
Supply voltage	8 V ... 32 V
Operating temperature	- 30 °C ... + 70 °C
Protection degree	IP 40
Input digital, 8 mA	12
Input analog (parametric)	2
Output high side, 3.0 A	14
Output low side, 1.0 A	2 (HB switch, PWM)
Max. current at same time	25 A
No. of power supply groups (15 A)	2

MUX2-M

Maximum configuration



Interface

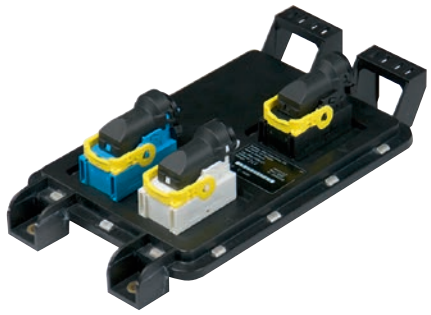
Multiplex CAN

MUX2-BP – Multiplex water protected node.

The multiplex node MUX2-BP is a generic multiple node for cabin installation. It can be connected to ZR32-A or CBCU3 via multiplex CAN.

The MUX2-BP is a water protected input / output extension to decentralize and optimize the system on a high protection level (protection degree IP 67). It provides built-in diagnostic and protection capabilities and motor control of outputs to half or full bridges. It also provides a client operation mode with configuration options.

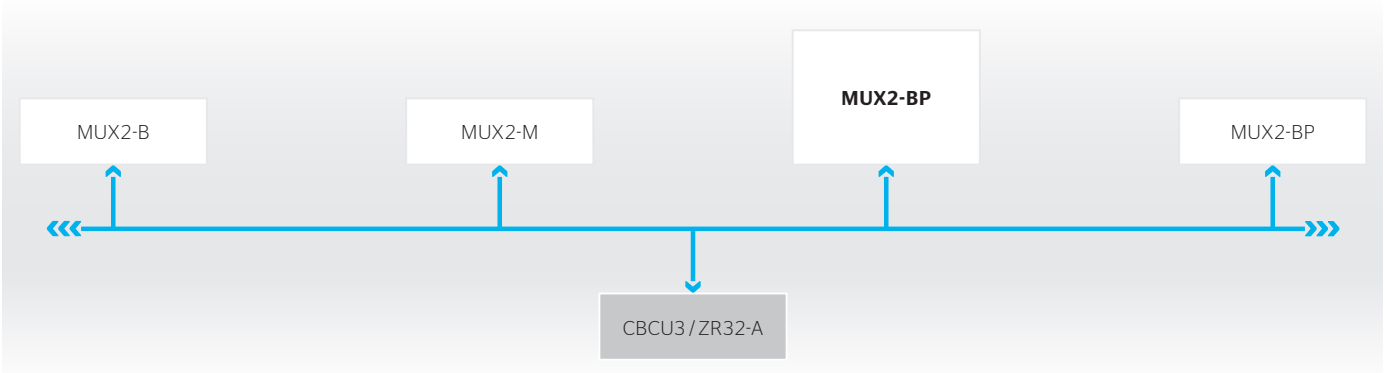
MUX2-BP



Technical specifications

Dimensions	258 x 155 x 30 mm
Nominal voltage	12 V and 24 V
Supply voltage	8 V ... 32 V
Operating temperature	- 30 °C ... + 70 °C
Protection degree	IP 67
Input digital, 8 mA	10
Input analog (parametric)	6
Output high side 10.0 A 5.0 A 3.0 A 1.0 A	 2 4 10 6
Output low side, 1.0 A	3 (HB switch, one shot, PWM)
Max. current at same time	30 A
No. of power supply groups (15 A, 20 A)	5

Maximum configuration



Interface

Multiplex CAN

MUX4-Pn – Multiplex node.

The MUX4-Pn is a generic multiplex node for general purpose. It is suitable for installation outside the cabin, for instance on the frame of the vehicle.

The MUX4-Pn provides a large number of inputs and outputs. It is water protected with a high protection level (protection degree IP 67).

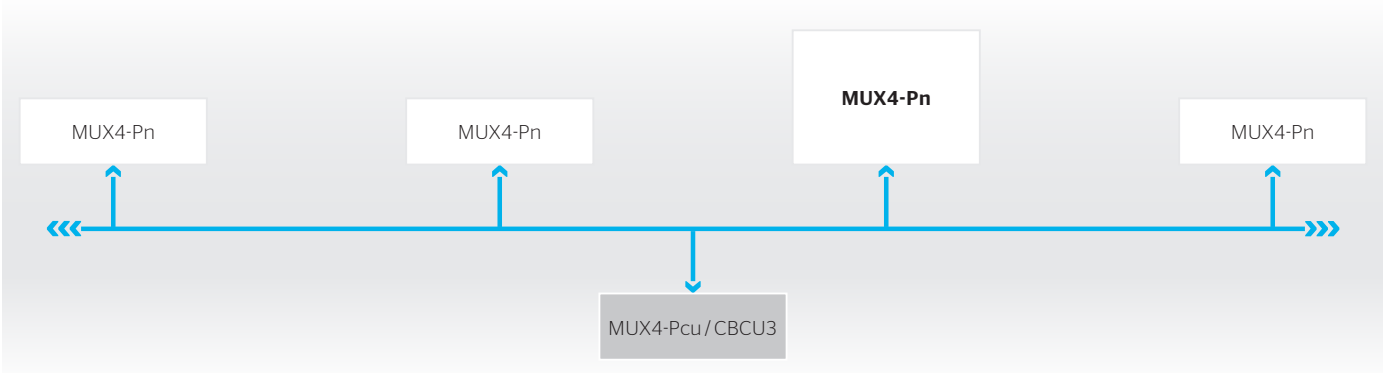
It has built-in diagnostic and protection capabilities and is suitable for the connection with MUX4-Pcu or CBCU3 via CAN.

Technical specifications

Nominal voltage	12 V and 24 V
Protection degree	IP 67 / IP 6K9K
Input digital, 8 mA	8
Input analog (parametric)	8 (also usable as digital inputs)
Input frequency	3
Output high side	
8.0 A	2
6.0 A	6
5.0 A	3
3.3 A	5
1.1 A	6
Wake up	2 digital inputs
Sensor supply	5 V / 40 mA
Diagnostic services	built-in diagnostic & protection capabilities

MUX4-Pn

Maximum configuration



Interface

Multiplex CAN

Cluster and software.

Benefit from a comprehensive systems delivery, all the way down to “one” unit, through full integration into KIBES® board electronic family, facilitating design of bus electronic architecture or, alternatively the integration with customer-specific architectures.

Cluster

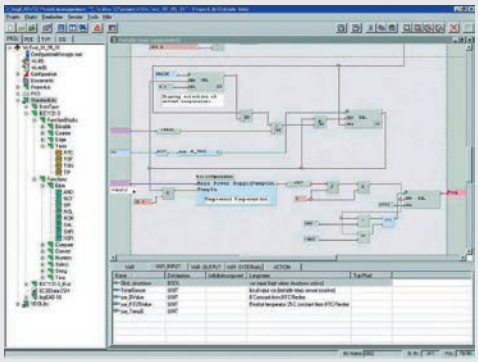
FlexCluster
With its host of customizable options, the FlexCluster provides great flexibility. The layout of the high quality central monochrome dot-matrix display is fully customizable and can be programmed to show personalized icons, corporate logos, bar graphs and different mask layers.

MOKI3
The MOKI3 is an economical and customized solution, especially suitable for small production volumes. The MOKI3 platform offers an extremely high degree of design flexibility with a large number of fully customizable components.

LoaderIC
The Loader Instrument Cluster is designed very robust and optimally protected against water and dust. Thanks to the KIBES® software, the LoaderIC can be programmed and configured to precisely meet any customer requirements.

MultiViu®Professional12
With the MultiViu®Professional12 we offer the most innovative instrument cluster. It is fully programmable to the needs and wishes of the individual user and supports the trend towards a larger and more colorful display with its 12.3” wide-view colored TFT-Display.

Software



KIBES®-32
With the application programming software KIBES®-32 we offer our customers a powerful, market-established tool for the simple programming of multiple KIBES® based electronic components. Generic CAN objects enable the programming of enhanced and open gateway functionalities.

The KIBES®-32 software tool is used to develop the PLC application program, to test it either online or offline and to download it. The KIBES®-32 software tool is model based, which improves efficiency, enhances software quality, reduces maintenance efforts and boosts development productivity. Simple to complex vehicle applications can be realized fast and easily by a drag & drop configuration and graphical programming standards. All customer applications are protected against overwriting or reverse engineering in case of unauthorized access.

Driver's workplace.

Continental offers a wide range of driver's workplace solutions for different purposes: city and intercity buses as well as special vehicle applications.

DWP

DWP Classic
The DWP Classic is a compliant driver's workplace for city buses. It is available in several variants: as driver's workplace with separate tachometer, as narrow-width driver's workplace for buses with limited space and as right-hand driver's workplace for right-hand driving markets.

DWP+
The workplace for functionality and flexibility offers an innovative design with contemporary features. The integrated instrument cluster solution MOKI3 provides possibilities of customer-specific adaption. The color pad of the DWP+ is also customizable to match with vehicle design. Moreover an accessory holder and a power outlet for miscellaneous applications (mobile phones, navigation, etc.) are available as optional features.

DWP Individual
The DWP Individual is engineered to fit individual customer requirements, saving time and development costs when choosing from a portfolio of proven electronic and mechanical components, e.g. instrumentation, switches, instrumentation panels (shells and covers) and steering columns and wheels.

Continental Automotive GmbH
Sodener Straße 9
65824 Schwalbach am Taunus
Germany
Tel. +49 6196 87-0

Heinrich-Hertz-Straße 45
78052 Villingen-Schwenningen
Germany
Tel. +49 7721 67-0

www.continental-corporation.com

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