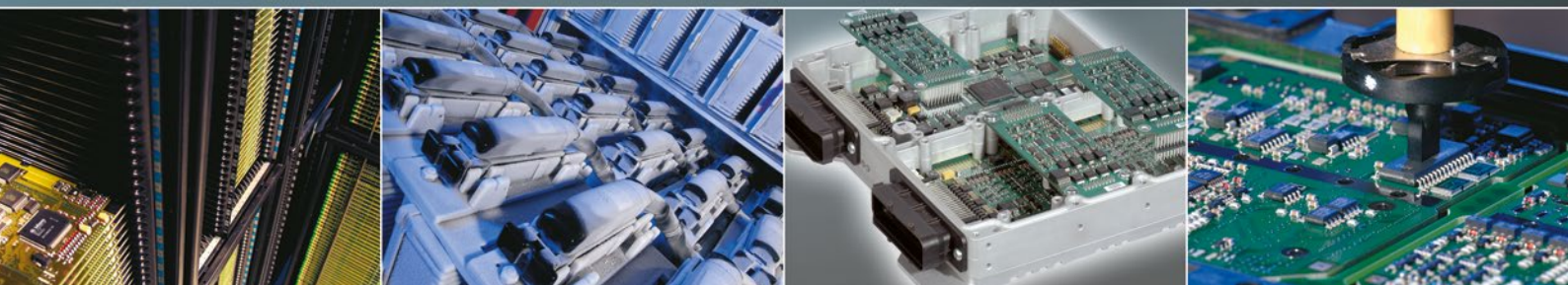
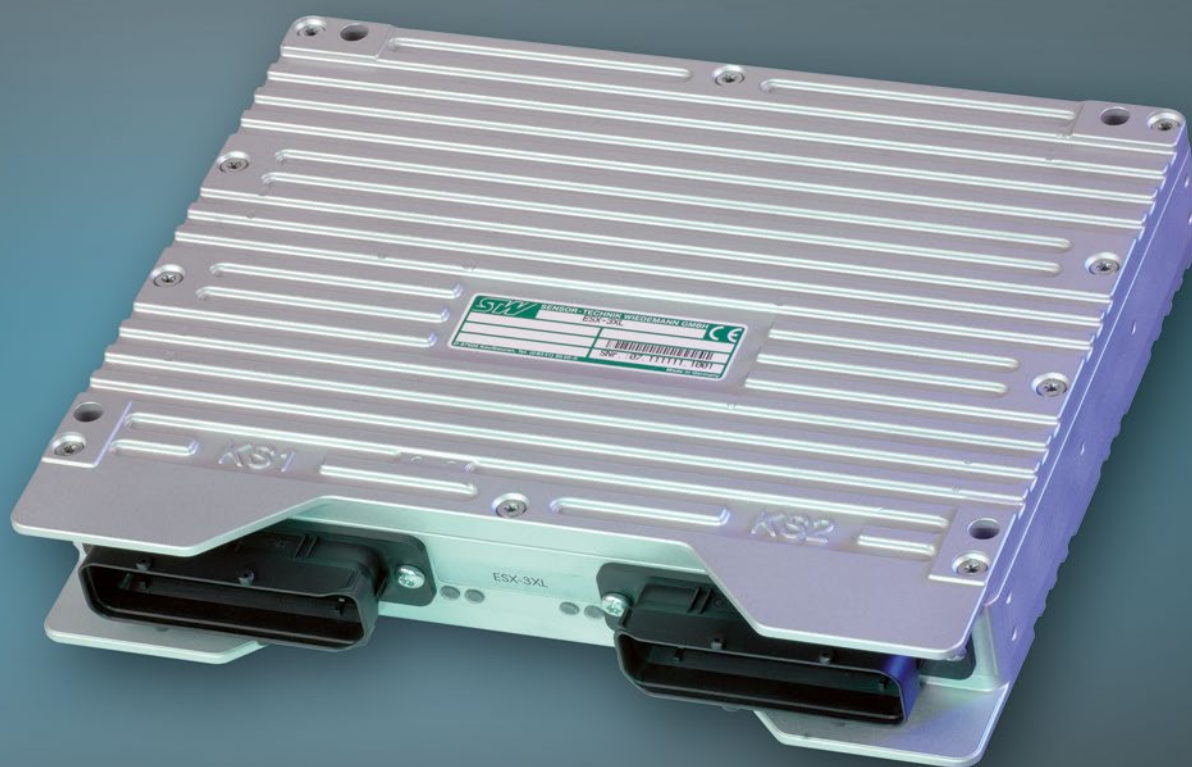


Pioneering new technologies
Pioneering new technologies



Sensor-Technik Wiedemann GmbH
Mobile Controllers and Measurement Technologies

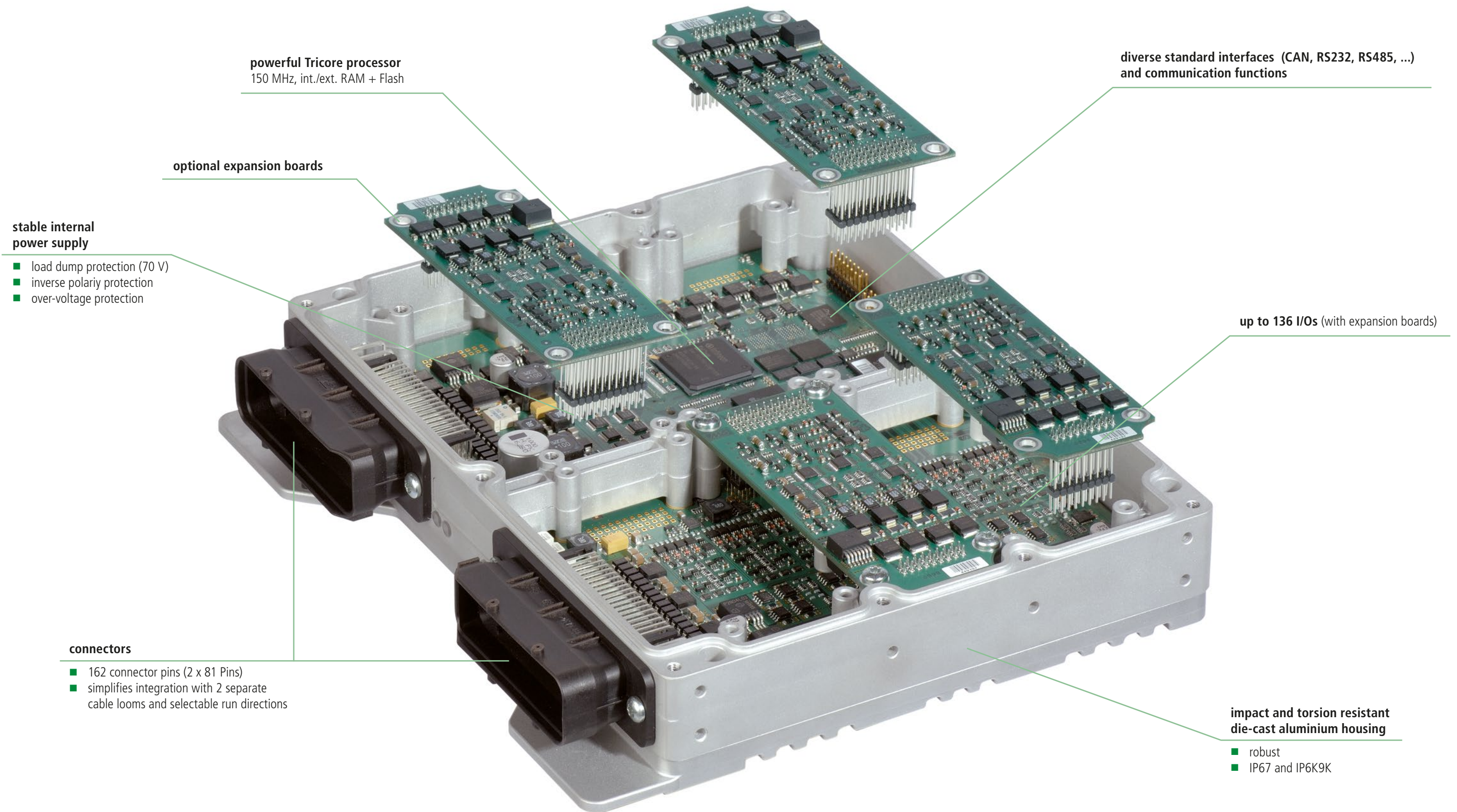
ESX[®]-3XL



Freely programmable electronic control units
for vehicles and machines with CAN bus



ESX[®]-3XL



powerful Tricore processor
150 MHz, int./ext. RAM + Flash

**diverse standard interfaces (CAN, RS232, RS485, ...)
and communication functions**

optional expansion boards

**stable internal
power supply**

- load dump protection (70 V)
- inverse polarity protection
- over-voltage protection

up to 136 I/Os (with expansion boards)

connectors

- 162 connector pins (2 x 81 Pins)
- simplifies integration with 2 separate cable looms and selectable run directions

**impact and torsion resistant
die-cast aluminium housing**

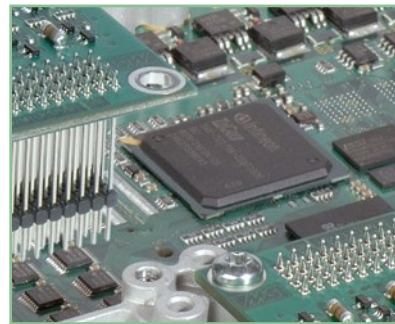
- robust
- IP67 and IP6K9K

Take control of your application

Powerful TriCore processor

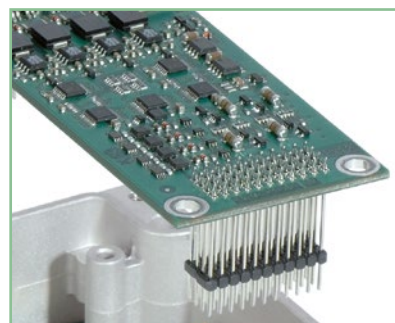
150 MHz, int./ext. RAM + Flash

- 150 MHz clock frequency
- Combination of RISC / DSP / μ C-Architecture
- 32-bit Floating Point Unit
- Parallel processing (through Superscalar Architecture)
- Memory protection mechanism
- 2 MB + 4 MB Flash ROM (int./ext.)
- up to 4 MB static RAM (ext.), 32-bit data bus, 10 ns access time
- Debug-interface



modular expansion concept

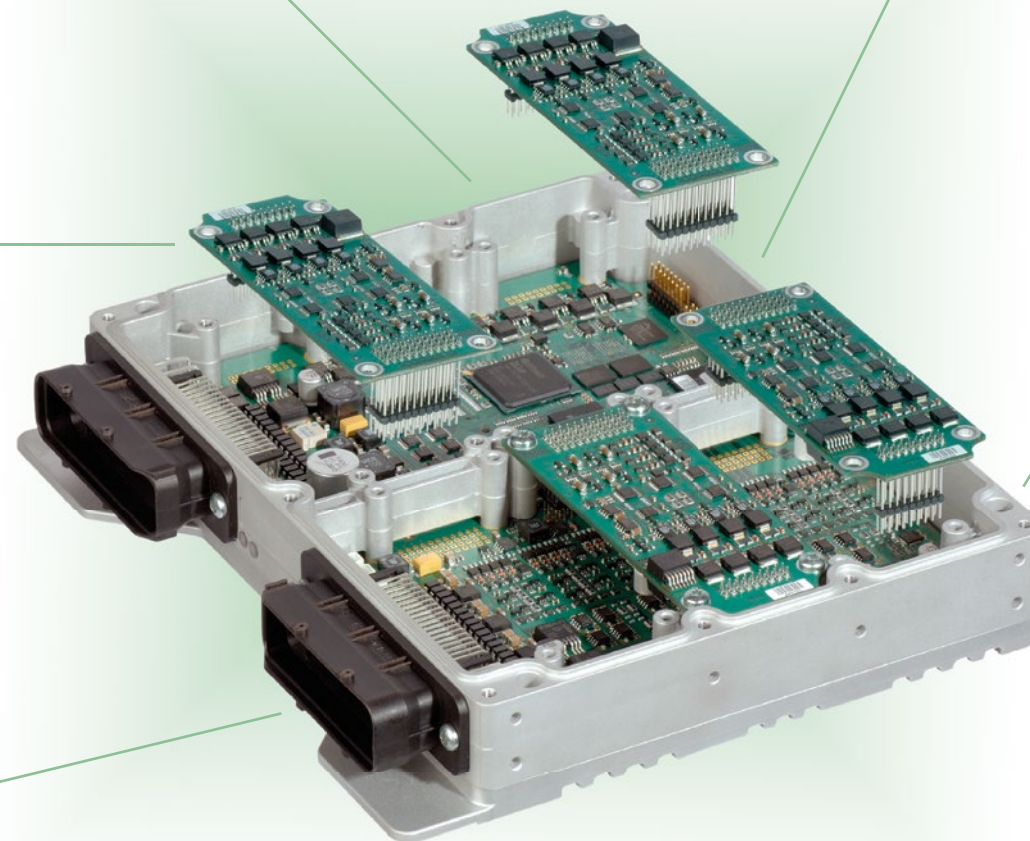
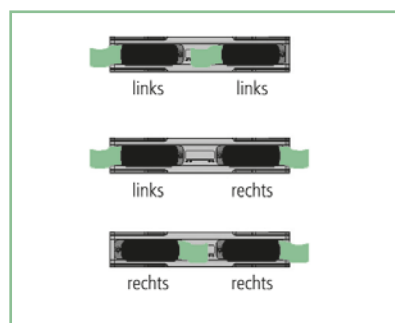
- 6 expansion board positions, each expansion board services 14 pins of the 2 x 81 pin connectors
- **Robust Hardware**
 - Protection against short circuits and negative voltages
 - satisfies high EMC and safety requirements
- Device configuration to customer specification through a selection of standard and custom expansion boards



Connectors

- 2 x 81 pin automotive connectors
- additional secondary interlock to prevent wrong orientation
- IP67 and IP6K9K
- standard Tyco mating connector (Tyco-DocID 411-78008)
- 10 JPT contacts, max. 15 A, \varnothing 2.5 mm²
- 152 MQS contacts, max. 4 A, \varnothing 0.5 mm²
- STW Connector-Kit (2 x 81 pin)

Possible cable loom directions:



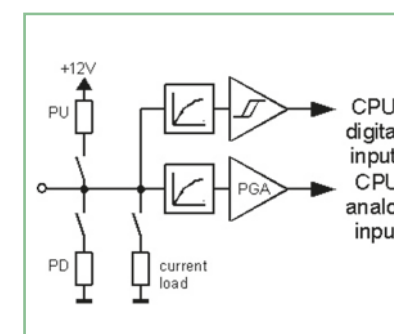
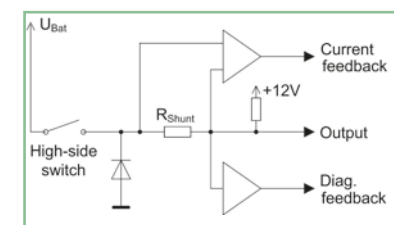
Standard Interfaces and Communication Functions

- 4 independent CAN interfaces, gateway function (without intervention of the CPU)
- RS232 interface
- non-volatile memory: 32 kB EEPROM
- 3 x programmable sensor supplies 5 V ... 10 V (max. 250 mA at 10 V)
- freely programmable indicators: 2 LEDs and a buzzer



Configurable I/O

- 28 Multi-Function Inputs: digital or analogue
 - Digital inputs high- or low-active (programmable Pull-Up / Pull-Down-resistors)
 - RPM inputs 0.6 Hz ... 20 kHz
 - Analogue inputs configurable as current or voltage inputs 0 V ... 5 V, 0 V ... 10 V or 0 V ... 40 V (in groups of 4)
 - Incremental encoder inputs (2 channels each) cut off frequency 20 kHz, short circuit protected
- 24 high side outputs, digital or PWM, all outputs with current measurement



ESX®-3XL – an advanced control unit for the next generation

Off-highway vehicles and mobile machinery need powerful control. The freely programmable electronic control unit ESX®-3XL is conceived for exactly these applications.

This new, powerful generation of control system (32-Bit, 150 MHz) meets your requirements for computing power, for flexibility and for scalability: The ESX®-3XL scales to any application.

A complete solution...

The base configuration offers 28 software configurable inputs and 24 outputs. The functionality of an input is open: whether current, voltage, RPM, or frequency are to be measured, or a simple digital input is required, the Multi-Function Inputs (MFI) serve every possibility. Switching, controlling and precise regulation of lamps, valves and other actuators can be done with 24 high side outputs, that are organised in three groups and can be turned off via a second path. In most cases an external power supply is required for external sensors, here a comprehensive and flexible sensor supply is included, with three programmable voltage supplies. Communication capabilities continue to take on an even greater role in control electronics. An increasing number of sensors and actuators rely on CAN-Bus, as does intercommunication between control units. To meet this need, there are four CAN interfaces that operate independently from one another, and can be programmed to operate with different protocols. A serial RS-232 interface is also included. For optical and audible feedback there are four two color LEDs and a programmable buzzer. The capabilities of the ESX®-3XL are rounded out with short circuit and overload protection for all inputs and outputs, as well as detection of cable breaks and overload on the supply.

... with endless possibilities

Mobile machines have a development cycle, and the number of functions increases with each cycle. The ESX®-3XL has six positions for expansion boards, with each expansion board serving 14 connector pins. The functionality of these boards is customer specific, and customisable, with a fast and straight forward development service. Expansion boards with additional inputs (digital, incremental), outputs (PVG, digital, current) and special functions (RS232/RS485, Real Time Clock, data memory) are already available as standard options.

Surviving in a tough world ...

Use in agricultural and construction machinery in diverse climate zones exposes the ESX®-3XL to extreme environmental conditions. The electronics are effectively protected in a compact, robust, and sealed die-cast aluminium housing. The proven connector system with secondary interlock forms the interface to the vehicle.

... but simple to use

The ESX®-3XL hardware is encapsulated in a user friendly software layer, which supports efficient and reliable application development in C, based on the ESX®-3XL-BIOS (API), or using PLC style programming according to IEC 61131-3 (CoDeSys V3). Diverse additional libraries, for example for CANopen or error handling simplify application development and system integration of the ESX®-3XL. A complete and intuitive electronic reference manual and a low cost tool chain with service tools (KEFEX) complete the development package.

See the difference

What control tasks do you have ...

Environmental conditions

Robust construction (IP67 and IP6K9K), especially designed for mobile applications

Safety

Secondary supervising processor for monitoring program execution, particularly for safety related applications (SIL2). Secondary safety shutdown path for all outputs (in three groups).

Diagnosis and error containment

Inputs and Outputs with built-in diagnosis for failure recognition

High processing power

high processing power with the latest 32-bit Tricore processors with 150MHz and 32-bit Floating Point Unit

High switching capacity

Switching, control and regulation of up to 90 A at 85 °C ambient temperature

High I/O count

28 Inputs and 24 Outputs in the base configuration, maximum 136 with expansion boards

Communication capabilities

4 x CAN Bus and 1 RS232 in the base configuration

Diverse load types

Driving all types of loads (resistive and inductive)

Sensor connection

3 independent, programmable sensor supplies

Scalable

6 expansion boards possible (a control unit that grows with the project)

Include custom hardware

Customer specific expansion: fast and reliable development

Simplified, non-proprietary programming

Software package with IDE, compiler, and programmer interface (API) library in C or programming according to IEC 61131-3 (CoDeSys V3)

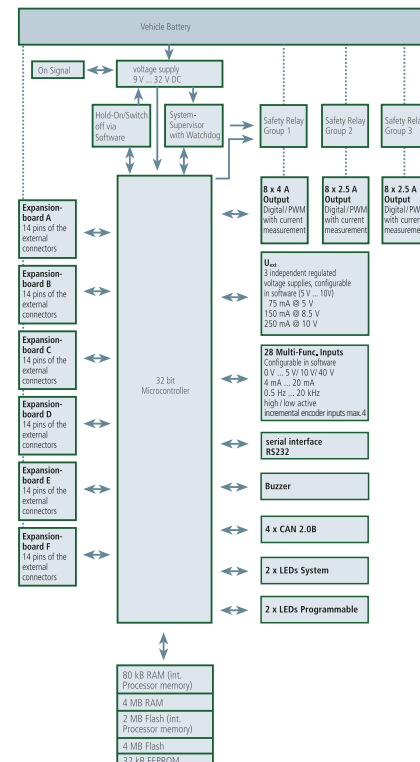


ESX[®]-3XL - Technical Data

Processor System	
Processor	32 Bit controller, 150 MHz, separate system supervisor with programmable watchdog
SRAM	4 MByte external memory, 80 kByte internal memory
Flash	4 MByte external memory, 2 Mbyte internal flash memory
EEPROM	32 kByte
Interfaces	
CAN	4 separate CAN, 2.0 B interfaces Full CAN, Low-/High-Speed up to 1 MBit/s
RS232	programmable Baud rate up to 115 kBit/s
Expansion Possibilities	6 modules for additional inputs and outputs or other functionalities
Inputs/Outputs (Base configuration 52, max. 136)	
Base Configuration	
Multi-Function Inputs	max. 28 analogue , 4 mA ... 20 mA or 0 V ... 5 V / 10 V / 40 V, 12 Bit, cut off frequency 100 Hz, short circuit protected, inbuilt diagnosis max. 28 digital inputs , high / low active configurable, short circuit protected, inbuilt diagnosis max. 28 RPM/frequency inputs , high / low active configurable, cut off frequency 20 kHz, short circuit protected, inbuilt diagnosis max. 4 incremental encoder inputs , (2 channels each) cut off frequency 20 kHz, short circuit protected
Digital- /PWM-outputs with current measurement	8 x 4 A , high-side, 0 % ... 100 %, short circuit protected, built-in diagnosis 16 x 2.5 A , high-side, 0 % ... 100 %, short circuit protected, built-in diagnosis
Voltage Output	3 independant, regulated voltage supplies programmable 5 V ... 10 V
Expansion possibilities	max. 6 modules , each serving up to 14 Inputs/Outputs, e.g. for digital or analogue I/Os PVG-outputs for Danfoss-Valves, inputs for encoders, motor bridges, communication interfaces or customer specific design
System Data	
Voltage supply	8 V ... 32 V DC
Indicators	Buzzer, 4 Status LEDs (two color)
Current consumption	200 mA (24 V) ... 350 mA (12 V), Stand-by < 1 mA
Mechanical Data	
Connectors	2 x 81 pol. automotive connectors (Tyco / AMP)
Housing	IP67 and IP69K, die-cast aluminium, GORE-TEX [®] -Membrane for pressure equalisation
Weight	approx. 2.5 kg (5.5 lbs)
Dimensions	approx. 248 mm x 217 mm x 51 mm (ca. 9.76" x 8.54" x 2.01")

Environmental	
Standards	Qualified to the applicable for the automotive, agricultural and construction industries, CE approved.
Operating Temperature	-40°C ... +85°C (-40°F ... +185°F) housing temperature
Software	
Programming	Freely programmable in "C" (high level API-library included) or with CoDeSys V3 (IEC61131)
	Application Libraries and Tool Chain

Block Diagram



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