CrossFire FX
– compact I/O-module and controller

CrossFire FX1 is a compact, rugged I/O-module and controller designed for embedded applications. The I/O set-up is mixed and the unit has a large number of I/O-channels, resulting in a very competitive price per I/O-channel. The module is used in various applications ranging from agricultural to construction equipment.

Mixed and rich I/O

The CrossFire FX has a mixed I/O set-up and several I/O channels. The I/O is intended for hydraulic control tasks typically found on vehicles and working machines.

The CrossFire FX platform offers alternative input/output configurations. This is achieved by varying the component population during manufacturing. Please contact Cross-Control for information on alternative configurations.

Compact and robust enclosure

The electronic packaging technology provides improved sealing and density by using a unique enclosure and connector design. During the CrossFire FX manufacturing process, flexible polyamide circuitry is attached to an aluminium sheet. The sheet is then formed into an enclosure, and a watertight seal is applied. This enables the unit to survive harsh environments while efficiently managing thermal loads from high current electrical switching.

Tough in the rough

The CrossFire FX is designed for operation in harsh environments:

- IP65 protection is 100% confirmed on every unit-produced.
- Goretex breather equalizes pressure through environmental changes, while keeping moisture from entering enclosure.
- Integrated ferrites on all connector pins are applied for enhanced EMC protection.
- The module has been tested extensively for shock and vibration.

Versatile functionality

The CrossFire FX can be used either as CANopen-slave in accordance with DS401 profile or as a controller.

When used as a controller the module can either execute an application of its own in a distributed system or act as a master application in a centralised system.

Depending on the application and the preference of the developer, different languages and tools can be used for developing such applications:

- IEC 61131-3 with tools like-CoDeSys.
- C/C++ with tools like Tasking or Keil Microvision.
- UML with tools like I-Logix Rhapsody

Powerful software testing

A special feature is that a complete simulation package for application development and testing can be offered together with the unit. This package makes it possible to execute the nodes simulated, on a standard PC. You can connect the simulated nodes, via commercially available CAN interface cards for the PC, to other, physical nodes in a system. Hereby, you create a powerful environment for debugging and testing of your complete system.

Humans in control

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SPECIFICATIONS

Kernel

Processor	Infineon C167CR
Flash, CPU-external	256K x 16 (Configurable to 512K x 16)
External SRAM	64K x 16 (Configurable to 256K x 16)
Data storage	2 GB flash memory, optionally up to 8 GB

Serial Interfaces

CAN	Configurable as 29-bit or 11-bit. Bit-rate configurable 10–1000 kbps
COM	RS232

Analog Inputs

Number	Total 20, different types as per below
Generic 5 V inputs	11 pcs. 1 Hz and 10 bit resolution
Diagnostic switch inputs	5 pcs. 2,7 K pull-down. Can be configured as generic 5 V inputs.
Temperature inputs	4 pcs. 499 Ω pull-up. Can be configured as generic 5 V inputs.

+5 V reference supplies

Number	2
Capacity	100 mA each

Digital switch/frequency inputs

Number	7, optional configurations available as per below
Option 1	For Hall-effect sensor or external powered switch
Option 2	1/10W (³10K) pull-up to system voltage or +5V
Digital switch	2.7K pull-down

Digital switch/universal frequency inputs

Number	2
Specification	0.2Hz–11kHz

External switch inputs

Number	6
Filtering	Min. detectable bounce 3.5 ms

Digital outputs

Number	8
Drivers	BTS621L1
Capacity	1 A each

PWM outputs

Numbers	20
Drivers	BTS621L1(High-side) and MTD3055 (Low-side)
Capacity	Configurable up to 1 A.
Feedback	All outputs except 6 have feedback for constant current.

Environment

IP class	IP65
Temperature range	-40 °C – + 75 °C (operating)

Power

Voltage	9–36 VDC

CANopen device specification 1)

Type	CANopen slave, DS 401 profile
Bit rate	Configurable, 20–1000 kbps
Node ID	Set via SDO call
Node states	Pre-operational, Operational and Stopped
SDO	All settings configurable by SDO's.
PDO	Supports all transmission types, event timer and inhibit time. Dynamic mapping supported.
NMT	Heartbeat producer and consumer. Node guarding also supported.

1) CrossFire FX can also be used with other software, for example CoDeSys.

Dimensions

Size (W x H x D) (mm)	178 x 37 x 187,3