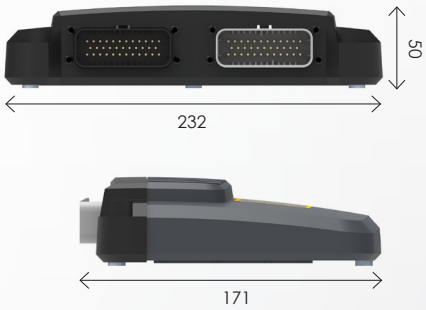

(mm)




# CrossFire SX VERSATILE AND SAFE I/O CONTROLLER

**CrossFire SX** is a freely programmable 32-bit I/O controller, designed for use in both On- and Off- Highway industrial vehicles and equipment. It has 38 I/O channels which are completely versatile and fully configurable within software applications to provide all necessary functions, including hydraulic controls, electrical lights and brushless DC motor.

The device is exceptionally reliable and built to cope with the toughest environmental conditions to ensure critical safety controls. The components in the CrossFire SX have been individually qualified to ensure a high MTBF.

The base technical platform for CrossFire SX has inherent support for functional safety. The dual core CPU has a state of the art safety architecture, good for safety functions up to SIL3 per IEC61508 And the base design is prepared for running CODESYS Safety, enabling implementation of SIL2 safety functions. Safety-enabled versions of the CrossFire SX are offered on request.

**Turn for technical specifications »**

## Standard models

| PART NUMBER | PRODUCT VARIANT | COMMENT |
|---|---|---|
| C000 137-20 | CrossFire SX, CODESYS | Freely programmable through CODESYS with full support for CANopen Master, CANopen Slave and J1939 |
| C000 137-40 | CrossFire SX, CANopen Slave | CANopen slave according to CiA 401 |

*All current versions of the CrossFire SX feature identical hardware. All functions except the Encoder Inputs and H-bridges are certified for safety critical applications.

crosscontrol
making machines smarter, safer and more productive

# CrossFire SX PRODUCT SPECIFICATIONS

| KERNEL | |
|---|---|
| PROCESSOR | 32-bit safety CPU, Texas Instruments TMS570 ARM Cortex R4, 180 MHz |
| MEMORY | Internal: 3 MB Flash, 256 kB RAM, 64 kB Emulated EEPROM<br>External: Up to 2 MB (optional), 8 kB FRAM, 4 kb EEPROM |

| HMI | |
|---|---|
| STATUS LED | Freely programmable Red/Green LED |

| COMMUNICATION INTERFACES | |
|---|---|
| CAN | 3 x ISO 11898 2.0B, Bit-rate configurable 20-1000kbps |
| COM | 1 x RS232, for debugging |
| PROTOCOLS | SAE J1939, CANopen |
| EASY CAN | Built in T-connection (CAN 1), to simplify cabling and termination. |
| SOFTWARE UPGRADE | CAN bootloader |

| CANOPEN SLAVE SPECIFICS | |
|---|---|
| TYPE | CANopen slave, CiA 401 profile |
| NODE ID | ID keying in 127 positions through SW. Position 1-16 can also be set by 4 pins in the connector. (If these pins are not used for Node ID, they can be used as 4 additional digital in.) |
| NODE STATES | Pre-operational, Operational and Stopped |
| SDO | All settings configurable by SDO's |
| PDO | Supports all transmission types, event timer and inhibit time. |
| NMT | Heartbeat producer and consumer |

| CONTROLLER SPECIFICS | |
|---|---|
| TYPE | IEC 61131-3 soft PLC |
| RUNTIME SOFTWARE | CODESYS 3.5.X |

| 16 X INPUTS | |
|---|---|
| CURRENT INPUT | 4..20 mA |
| VOLTAGE INPUT | 0..5 V |
| VOLTAGE INPUT | 0..10 V |
| VOLTAGE INPUT | 0..32 V |
| FREQUENCY INPUT | 20 kHz, trigger level 2.5-3.0 V |
| DIGITAL INPUT | Trigger level 2.5-3.0 V. Integrated pull up or down resistor. |
| ENCODER INPUT | Available by pairing two frequency inputs. |
| MISCELLANEOUS | All inputs have 12-bit resolution. Current and voltage inputs -3 db, 150 Hz. Protection from short circuit and overload (0..$U_b$). Individually configurable in software. |

| 16 X OUTPUTS | |
|---|---|
| OPERATING VOLTAGE RANGE | 8...30 VDC |
| PWM OUTPUT, FREQUENCY | 50…400 Hz |
| PWM OUTPUT, DUTY CYCLE | 0…100%, resolution 0.1% |
| PWMI OUTPUT, FREQUENCY | Fixed high frequency |
| CURRENT CONTROLLED OUTPUT (PWMI), DITHER FREQUENCY RANGE | 25…400 Hz, adjustable in fixed steps |
| DITHER CURRENT | Adjustable up to 400 mA. |
| CAPACITIVE LOADS | The 4 A outputs are designed to drive capacitive loads such as LED lamps. The 2 A outputs can be used to drive lighter capacitive loads. |
| MISCELLANEOUS | All outputs have 12-bit resolution. Protection from short circuit and overload (0..$U_b$). |

| | 4 X OUTPUT A | 12 X OUTPUT B |
|---|---|---|
| CURRENT PER OUTPUT | 0...4000 mA | 0...2000 mA |
| CURRENT CONTROLLED OUTPUT (PWMI), ACCURACY | ± (ca 2% + 25 mA) | ± (ca 2% + 10 mA) |

| 2 X H-BRIDGE | |
|---|---|
| MAX LOAD | 15A continous |
| OVERCURRENT LIMITATION | Configurable in the range 0-20A |
| CONTROL | Forward, Reverse, Brake, Coast |
| STATUS FEEDBACK | Protection from short circuit and overload (0..$U_b$). |

| POWER | |
|---|---|
| VOLTAGE | 8...30 VDC |
| PROTECTION | Load dump and reverse polarity protected. |
| POWER CONSUMPTION | ≤ 5 mA when not operational |
| SENSOR SUPPLY | 5 V, 300mA |

| ENVIRONMENT & CERTIFICATIONS | |
|---|---|
| IP CLASS | Up to IP67 |
| TEMPERATURE RANGE (°C) | -40 to +85 |
| EMC EMISSIONS | ISO 13766: 2006, EN 55011: 2010, CISPR 25 |
| EMC IMMUNITY | ISO 13766: 2006, ISO 11452-2: 2004, ISO 11452-4: 2011, EN 61000-4-3:2006, EN 61000-4-6:2014 |
| EMC TRANSIENT | ISO 13766:2006, ISO 7637-2: 2011 (Pulse5: +123V 2Ohm), EN 61000-4-4: 2012, EN 61000-4-5: 2014 |
| VIBRATION | IEC 60068-2-64: 2008, IEC 60068-2-6: 2007 |
| SHOCK | IEC 60068-2-27: 2008 |
| CERTIFICATIONS | E-marking, CE Marking, FCC compliance |

| ENCLOSURE | |
|---|---|
| HOUSING | Glass fibre reinforced nylon. Silicone filled. |
| CONNECTORS | 2 x AMP 35-pin |

| SIZE AND WEIGHT | |
|---|---|
| W x H x D (mm) | 232 x 50 x 171 |
| WEIGHT (g) | 1.0 |

crosscontrol

**Sales contact**: sales@crosscontrol.com | **General**: info@crosscontrol.com | www.crosscontrol.com