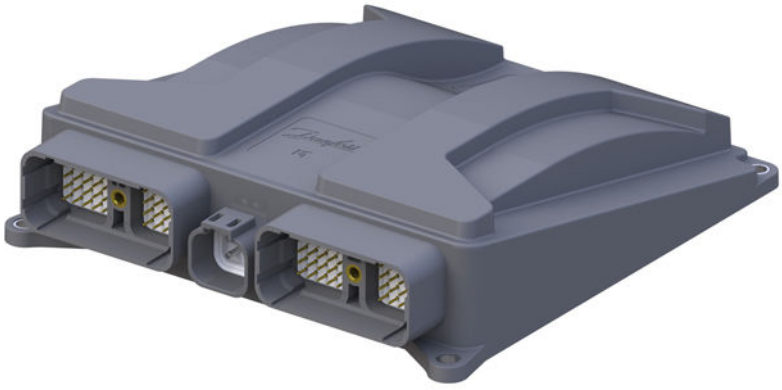
ENGINEERING TOMORROW

Data Sheet

# PLUS+1® Controller
## XL104-0000

### Flexible Machine Management

The XL controller platform provides a solid and powerful background to meet requirements for managing mobile machinery. The modular concept of the XL controller gives you the flexibility meeting a big range of different needs with the same product. The high pin count makes it possible to let this solution fit to control even your most complex machines.



### Product Highlights

The XL controller is a power house employing a 32bit Processor, providing the controller with very fast single cycle processing speed and 2.5 MB of internal flash. The architecture of the XL controller platform furthermore gives you the opportunity to comply with current functional safety standards.

### Application Development

Users develop XL Controller applications with PLUS +1® GUIDE. This Microsoft Windows based development environment features a user-friendly, field proven, icon-based graphical programming tool, application downloader, and service/diagnostic tool.

### Features

- User-programmed with PLUS+1® GUIDE and C Open
- 4 pin DEUTSCH DTP connector for power and ground
- 2 x 50 pin DEUTSCH DRC connectors
- Processor: AURIX 32 bit running at 200 MHz 2.5 MB flash, 240kB RAM, Lock Step Core
- External memory:
  - 32 kB EEPROM non-volatile memory
  - 64 MB Flash vault memory
- 12 bit analog-to-digital converter
- 7 to 36 Vdc power supply, monitored internally
- Sensor power output for external sensors each are rated at 5 Vdc to 500mA:
  - 1x 5V Fixed
  - 1x 3V to 12V variable
- 3 CAN 2.0B ports
- SIL2 compliant

Comprehensive technical literature is online at *www.danfoss.com*

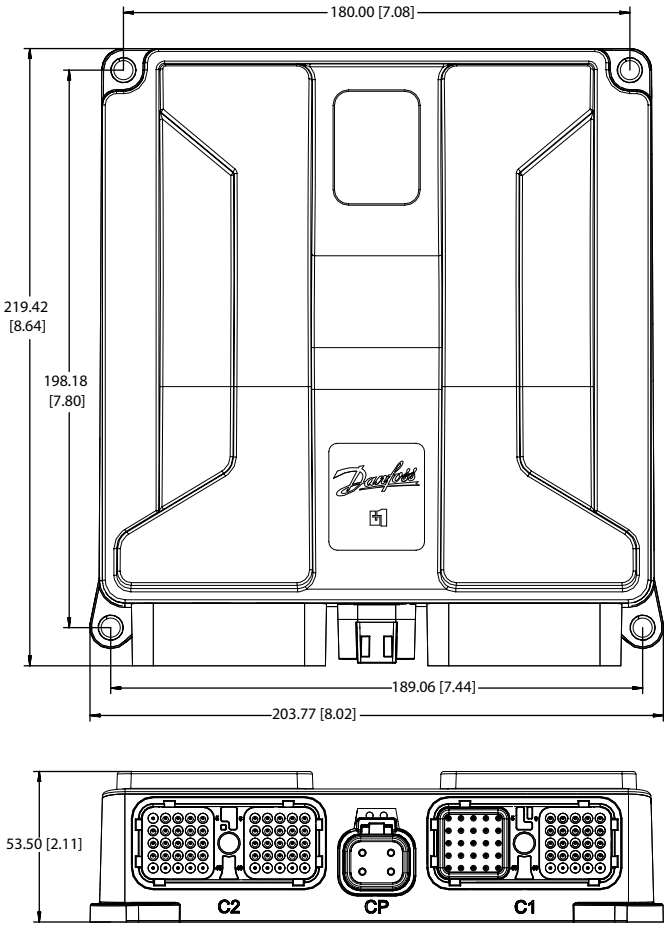
### 48 Inputs

- 20 digital (DIN) configurable with pull up (5 V) or pull down (0 V)
- 4 universal (DIN/AIN/FreqIn) that are user-defined as either:
  - Analog: with configurable ranges of 0 to 5.25 V, 0 to 36 V, or 0 to 365 mV;
  - Digital: pull up (5 V), pull down (0 V), or pull to center (2.5 V);
  - Frequency: (timing) 1 Hz to 10 kHz
- 4 universal (DIN/AIN/FreqIn/Rheo/ 4-20mA) that are user-defined as either:
  - Analog: with configurable ranges 0 to 5.25 V, 0 to 36 V, or 0 to 365 mV;
  - Digital: pull up (5 V), pull down (0 V), or pull to center (2.5 V);
  - Frequency: (timing) 1 Hz to 10 kHz
  - Rheostat: (Resistance) 6 ohms to 10K ohms
  - Current: 0.1 mA to 28 mA
- 17 digital/analog (DIN/AIN) that are user-defined as either:
  - Digital: pull up (5 V), pull down (0 V), or pull to center (2.5 V);
  - Analog: 0 to 5.25 V or 0 to 36 V
- 3 digital/analog/CAN shield (DIN/AIN/CAN shield) that are user-defined as either:
  - Digital: pull up (5 V), pull down (0 V), or pull to center (2.5 V);
  - Analog: 0 to 5.25 V or 0 to 36 V

### 40 Outputs

- 14 digital (DOUT) 3 A (source only)
- 6 digital (DOUT) 4 A (source only)
- 12 universal (PWMOUT/DOUT/PVGOUT) that are user-defined as either:
  - Digital: (3 A), configurable as source or sink;
  - PWM: (33 to 4000 Hz) configurable as open or closed loop with current control
- 8* universal (PWMOUT/DOUT/PVGOUT) that are user-defined as either:
  - Digital: (3 A), configurable as source or sink;
  - PWM: (33 to 4000 Hz or 20 kHz configurable as open or closed loop with current control
  - Safety FET Support

*Dimensions in mm [in]*




**Caution**

Warranty will be voided if device is opened. Device is not field serviceable. Do not open the device.

Use care when wiring mating connector. Pinouts are for device pins.

**Caution**

PCB damage may occur.
To prevent damage to the module all module power supply + pins must be connected to the vehicle power supply to support advertised module maximum output current capacity. DO NOT use module power supply + pins to supply power to other modules on a machine.

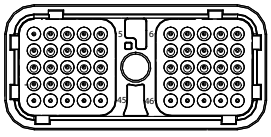
### 1 DEUTSCH DTP 4 pin connector

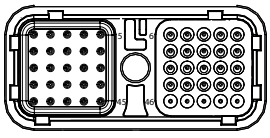
CP

*Connector pins (CP)*

| Pin | Function |
|---|---|
| C-P1 | Power ground - |
| C-P2 | Power supply + |
| C-P3 | Power supply + |
| C-P4 | Power supply + |

### C2 and C1 - DEUTSCH DRC 50 pin connector


C2


C1

*Connector pins (C2)*

| Pin | Function | Pin | Function |
|---|---|---|---|
| C2-P1 | DIN/AIN | C2-P26 | DIN |
| C2-P2 | DIN/AIN | C2-P27 | DIN |
| C2-P3 | DIN/AIN | C2-P28 | DIN |
| C2-P4 | DIN/AIN | C2-P29 | DIN |
| C2-P5 | DIN/AIN | C2-P30 | DIN |
| C2-P6 | DIN/AIN | C2-P31 | PWM/DOUT/PVGOUT* |
| C2-P7 | DIN/AIN | C2-P32 | PWM/DOUT/PVGOUT* |
| C2-P8 | DIN/AIN | C2-P33 | DOUT |
| C2-P9 | Sensor power (3-12V) | C2-P34 | DOUT |
| C2-P10 | Sensor ground | C2-P35 | DOUT (4A) |
| C2-P11 | DIN | C2-P36 | DOUT (4A) |
| C2-P12 | DIN | C2-P37 | DOUT |
| C2-P13 | DIN | C2-P38 | DOUT |
| C2-P14 | DIN | C2-P39 | PWM/DOUT/PVGOUT |
| C2-P15 | DIN | C2-P40 | PWM/DOUT/PVGOUT |
| C2-P16 | DIN | C2-P41 | PWM/DOUT/PVGOUT* |
| C2-P17 | DIN | C2-P42 | PWM/DOUT/PVGOUT* |
| C2-P18 | DIN | C2-P43 | DOUT |
| C2-P19 | DIN | C2-P44 | DOUT |
| C2-P20 | DIN | C2-P45 | DOUT (4A) |
| C2-P21 | DIN | C2-P46 | DOUT (4A) |
| C2-P22 | DIN | C2-P47 | DOUT |
| C2-P23 | DIN | C2-P48 | DOUT |
| C2-P24 | DIN | C2-P49 | PWM/DOUT/PVGOUT |
| C2-P25 | DIN | C2-P50 | PWM/DOUT/PVGOUT |

*Connector pins (C1)*

| Pin | Controller function | Pin | Controller function |
|---|---|---|---|
| C1-P1 | CPU ground - | C1-P26 | DIN/AIN |
| C1-P2 | CPU supply + | C1-P27 | DIN/AIN |
| C1-P3 | CAN 0+ | C1-P28 | DIN/AIN |
| C1-P4 | CAN 0- | C1-P29 | DIN/AIN |
| C1-P5 | CAN 0 shield/AIN | C1-P30 | DIN/AIN |
| C1-P6 | DIN/AIN | C1-P31 | PWM/DOUT/PVGOUT |
| C1-P7 | DIN/AIN | C1-P32 | PWM/DOUT/PVGOUT |
| C1-P8 | Sensor power (5V) | C1-P33 | DOUT |
| C1-P9 | Sensor ground | C1-P34 | DOUT |
| C1-P10 | DIN/AIN/Freq | C1-P35 | DOUT |
| C1-P11 | DIN/AIN | C1-P36 | DOUT (4A) |
| C1-P12 | DIN/AIN | C1-P37 | PWM/DOUT/PVGOUT* |
| C1-P13 | CAN 1+ | C1-P38 | PWM/DOUT/PVGOUT* |
| C1-P14 | CAN 1- | C1-P39 | PWM/DOUT/PVGOUT |
| C1-P15 | CAN 1 shield/AIN | C1-P40 | PWM/DOUT/PVGOUT |
| C1-P16 | DIN/AIN/Freqln/Rheo/4-20mA | C1-P41 | PWM/DOUT/PVGOUT |
| C1-P17 | DIN/AIN/Freqln/Rheo/4-20mA | C1-P42 | PWM/DOUT/PVGOUT |
| C1-P18 | DIN/AIN/Freqln/Rheo/4-20mA | C1-P43 | DOUT |
| C1-P19 | DIN/AIN/Freqln/Rheo/4-20mA | C1-P44 | DOUT |
| C1-P20 | DIN/AIN/Freqln | C1-P45 | DOUT |
| C1-P21 | DIN/AIN/Freqln | C1-P46 | DOUT (4A) |
| C1-P22 | DIN/AIN/Freqln | C1-P47 | PWM/DOUT/PVGOUT* |
| C1-P23 | CAN 2+ | C1-P48 | PWM/DOUT/PVGOUT* |
| C1-P24 | CAN 2- | C1-P49 | PWM/DOUT/PVGOUT |
| C1-P25 | CAN 2 shield/AIN | C1-P50 | PWM/DOUT/PVGOUT |

*Product parameters*

| | |
|---|---|
| **Supply voltage** | 7 to 36 V |
| **Operating temperature (ambient)** | – 40°C to 85°C [– 40°F to 185°F] |
| **Storage temperature** | – 55°C to 85°C [– 67°F to 185°F] |
| **IP rating (with mating connector attached)** | IP 67 |
| **EMI/RFI rating** | 150 V/m |
| **Weight** | 0.675 kg [1.48 lb] |
| **Vibration** | IEC 60068-2-64 |
| **Shock** | IEC 60068-2-27 |
| **Maximum current, sourcing** | 40/20A at 70/85°C [158/185°F] |
| **Maximum current, sinking** | 20/12A at 70/85°C [158/185°F] |

*Product part number*

| Order code | Part number | Description |
|---|---|---|
| XL104-0000 | 11244762 | 104-pin full populated 48/40 IN/OUT |

| Part number | Description |
|---|---|
| 11188220 | 4 pin DEUTSCH® DTP06-4S mating connector bag assembly (10 to 14 AWG) |
| 10102024 | 50 pin DEUTSCH® DRC26-50S01 (C1) mating connector bag assembly (16 to 20 AWG) |
| 11249153 | 50 pin DEUTSCH® DRC26-50S02 (C2) mating connector bag assembly (16 to 20 AWG) |
| 11179523 | PLUS+1® GUIDE Professional |