

**mc<sup>2</sup>m : MACHINE CONTROL DUAL MANAGER**  
**INPUT/OUTPUT MODULE**  
**WITH MULTIPLE CAN BUS INTERFACE AND PWM OUTPUTS**



Controller with double processor expressly designed for centralized control of new generation mobile machines.

**mc<sup>2</sup>m** is a main CAN BUS controller provided of high number of inputs (analogue, digital, RPM) and outputs (ON/OFF and PWM) software configurable.

It is based on FREESCALE microprocessors, freely programmable in "C" language.

Suitable for "safety critical" applications and to EN-280 for aerial platforms.

All I/O connections are through a single automotive TYCO 120 pin connector, separate from a DEUTSCH 4 pin dedicated to power supply.

**mc<sup>2</sup>m** is produced according to the ISO9001 quality standards.



**TECHNICAL DATA SHEET**

**CONTROL SYSTEM:**

- 2 Freescale Microprocessors, 16bit, clock 40 MHz
- Flash memory 512KB for control program (expandable up to 2 MB)
- RAM 32 KB for control program (expandable a 256 KB)
- EEPROM 8KB for parameters
- RTC (real time clock) with 256KB Flash for Black Box

**INTERFACES:**

- 3 CAN-BUS interface, standard 2.0B (11 or 29 bit identifier), according to ISO-11898, baud rate up to 1Mbit/s
- 2 LIN BUS master
- 1 RS232

**CONNECTORS:**

- 1 automotive connector TYCO 120 pin for I/O
- 1 connector DEUTSCH 4 pin for power supply

**POWER SUPPLY:**

- Main power supply: from +9 to +30 V DC full operational (suitable for battery direct connection)
- Logic power supply (COLD CRANKING): from +4 to +30 V DC
- Separate power supply for each 8 outputs bank
- Internal safety relays controlled by watchdog, used to disconnect outputs in case of hardware or software malfunctions.

**CERTIFICATIONS:**

The controller is certified for following automotive standards required by 89/336 CE:

1) EMC standards for emission, immunity for industry (high density industrial environment):

- Reference standard: EN 61000-6-4
- Base standard: EN 55011 (RF Emission)

2) Electromagnetic immunity, low density environment:

- Reference standard : EN 61000-6-2
- Base standard : EN 61000-4-3 (Radio Frequency)
- EN 61000-4-4 (Burst)
- EN 61000-4-6 (Conducted disturbance)

**MECHANICAL AND RATINGS:**

- Die cast aluminum case
- Operative temperature range: from -40°C to +85°C (from -40°F to +185°F)
- Storage temperature range: from -40°C to +95°C (from -40°F to +203°F)
- Protection IP65

### I/O CONFIGURATION:

- **8 Input** double channel for safety applications:
  - **On/Off Input (high side)**
  - **Analog Input 0÷30 V**, resolution 10-bit
- **20 Input** software configurable as:
  - **On/Off Input (high or low side)**
  - **Analog Input** range 0÷5V, 10-bit resolution
  - **Analog Input** for resistances reading in range 0÷300Ω, 10-bit resolution
- **12 Input** software configurable as :
  - **On/Off Input (high or low side)**
  - **Analog Input** range 0÷5 V, 10-bit resolution
  - **Analog Input** range 0÷20mA, 10-bit resolution
  - **Analog Input** resistances reading in range 0÷300Ω, 10-bit resolution
- **8 Input** software configurable as :
  - **On/Off Input (high side)**
  - **Analog Input 0÷30 V**, 10-bit resolution
- **8 Digital Input** software configurable as :
  - **On/Off Input (high side)**
  - **Encoder or RPM Input**
- **16 Output (4A max)** with status feed-back, software configurable as:
  - **On/Off Output**
  - **PWM Output**
- **16 Output (4A max)** with status and current feed-back, software configurable as:
  - **On/Off Output**
  - **PWM Output**
  - **PWM Output** with current feedback
- **8 Output** with status feed-back, software configurable as:
  - **Analog Output** 0-5V, 0-10V o Danfoss
- **1 Stabilized external power supply for sensors: +5V (100mA max)**
- **1 Stabilized external power supply for sensors: +15V (100mA max)**

### MECHANICAL DIMENSIONS :

