



IQAN-MC4 Master Controller Family

Electronic Control Systems



ENGINEERING YOUR SUCCESS.

IQAN-MC4

Efficiency in focus – throughout the entire machine life cycle

The IQAN-MC4x is a family of master controllers in the IQANdesign platform. There are 3 versions that can be used in different ways to meet the requirements of any system.

- MC41 for cost efficient task oriented control
- MC42 mid-size applications and I/O distribution
- MC43 large centralized control saves valuable space

The MC4 family of controllers share the same pinout, making it possible for easy up-/down-scaling of the application. They are designed to be either a *performance optimized* standard controller, or an IEC 61508 SIL2 *Functional Safety* (FS) variant. When applying EN ISO 13849-1 for safety functions, the FS variant can be used as a PLd subsystem.

The MC4 family utilizes a high performance 3 core CPU for fast closed-loop control and large applications.

There is up to 1.5 MB application memory and 2 MB log memory in the IQAN-MC4 for complete machine control and a future proof solution.

The MC4 architecture has lockstep CPU and hardware redundancy for very high real-time performance in safety critical applications.

The Tri core processor offers fast application cycle time down to 1ms.

The MC4 family supports CAM - a Parker Hannifin proprietary solution for precision control of proportional mobile valves.

- No tuning or tweaking CAM regulator circuit guarantees consistent performance on mobile valves
- Precision control with a resolution down to 1 mA, a must when there is need for controlling precise crane movements
- Zero drift control provides the lowest possible output offset current and drift

Parker Hannifin's zero drift CAM offers initial offset current of less than 5 mA and almost immeasurable offset current drift over time, temperature and load change.

I/O

The MC4 family can support up to 50 inputs and 36 outputs (see table):

- 32 analog inputs for reading 0-5V, 0-32V and 4-20mA sensor signals
- 6 timer inputs for speed and position sensors up to 50KHz - PWM is also supported
- 18 digital inputs for switch signals
- 10 CAM outputs for precision control of up to 10 directional proportional valves
- 8 PWM outputs capable of driving 6 A loads (when in parallel)
- 8 low-side digital outputs for LED lamp control
- 5 CAN and Ethernet for in-vehicle network and diagnostics

Capabilities	MC41	MC42	MC43
vmAC core			
MCU triple core 300 MHz	✓	✓	✓
Program memory (Flash/SRAM)	0.5 MB / 0.5 MB	1 MB / 1 MB	1.5 MB / 1.5 MB
Data log memory (Dflash)	2 MB	2 MB	2 MB
Settings and counter memory (FRAM)	32 KB	32 KB	32 KB
Inputs total	18	18	50
Voltage inputs: 12-bit, 0 – 5 V	8	8	26
Voltage inputs: 12-bit, 0 – 32 V	2	2	2
Current-loop inputs: 13-bit, 0 – 20 mA	2	2	4
Timer inputs (Freq., PWM, Pulse): 0 – 50 KHz	6	6	6
Digital inputs	6	6	18
Outputs total	8	16	36
COU (HS)* outputs: 100 – 2500 mA high-side	2 x 2	6 x 2	10 x 2
PWM/Digital outputs: 4 A high-side	4	4	8
COU/PWM (LS)* outputs: 2.5 A low-side	4	12	20
Digital outputs: 300 mA low-side	-	-	8
Network			
CAN	2	3	5
Ethernet	-	✓	✓

The inputs and outputs can have different functionality depending on software configuration.

* - denotes pins that are always used in combination with another pin.

Installation

The IQAN-MC4 family's 155 mm [6.1"] x 166 mm [6.5"] footprint is small enough for any installation.

To meet the environment found in mobile machines the MC4 uses the Molex MX123 high reliability connector system, made for

harsh environment, high vibration applications.

The enclosure is rated IP66 + IP69K and is a rugged mechanical design, sealed for outdoor use.

The MC4 family has CE and E-mark certifications.

Ordering PN	Description
20085111	IQAN-MC41
20085121	IQAN-MC41FS
20085112	IQAN-MC42
20085122	IQAN-MC42FS
20085113	IQAN-MC43
20085123	IQAN-MC43FS

Environmental protection

EMI

- ISO 13766/ISO 14982 (radiated emission)
- EN 55025:2003 (conducted emission)
- ISO 11452-2:2004 (immunity vs EM field)
- ISO 11452-4:2005 (immunity vs injected RF)
- ISO 7637-2:2004 (immunity vs supply transients)
- ISO 7637-3:2007 (immunity vs supply transients)

Mechanical environment

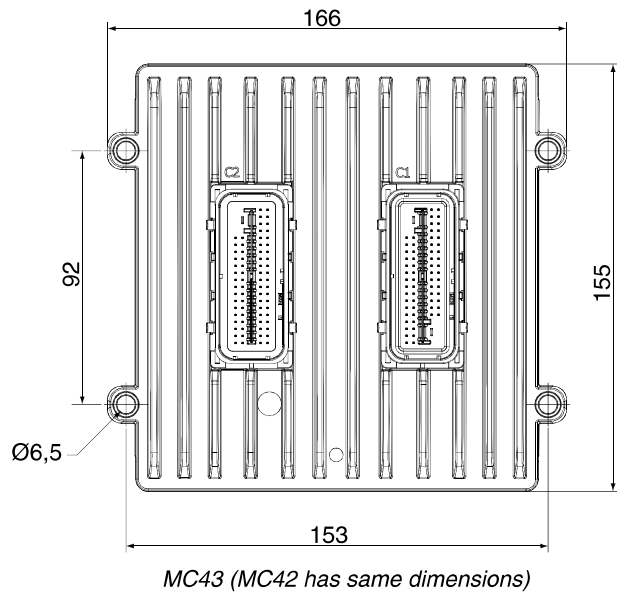
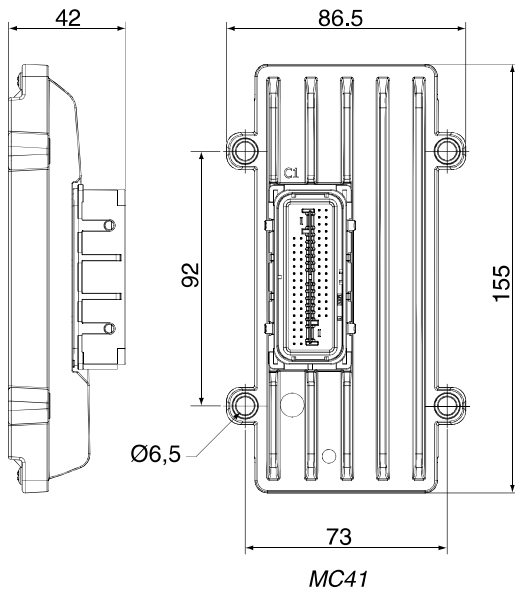
- IEC 60068-2-64:2008 Fh (random)
- IEC 60068-2-27:2008 Ea (bump)

ESD

ISO 10605:2008 (external)

Climate environment

- IEC 60529:2001 IP66 (dust, water)
- DIN 40050 Part 9:1993 IP6K9K (steam jet cleaning)
- IEC 60068-2-30:2005 Db (damp heat, cyclic)
- IEC 60068-2-78:2001 Cab (damp heat, steady state)
- IEC 60068-2-2:2007 Bb (heat)
- IEC 60068-2-1:1993 Ab (cold)
- IEC 60068-2-14:1984 Nb (change of temperature)
- IEC 60068-2-52:1996 Kb (salt mist, cyclic)



WARNING - USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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