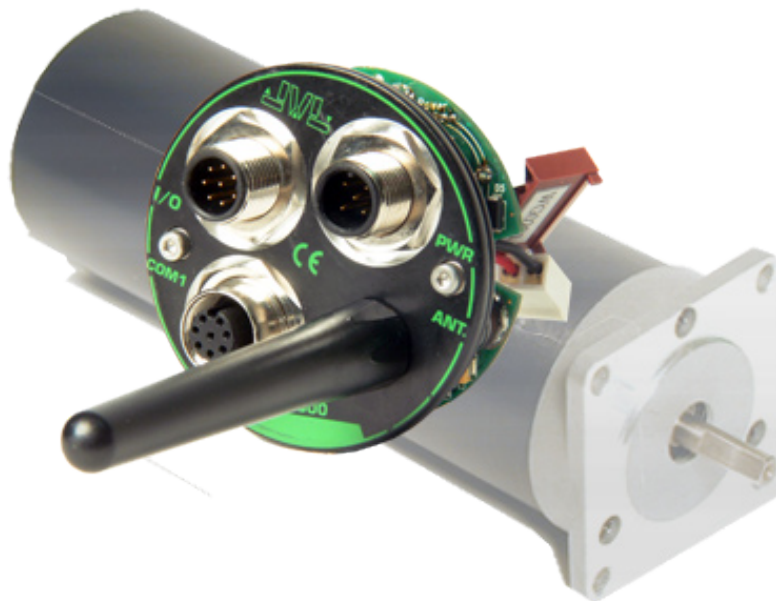




## Wireless Expansion Modules for MAC motors. Type **MAC00-FZ4** (IEEE 802.15.4) and **MAC00-FZ4-ZB** (ZigBee)



A range of integrated AC servo motors makes JVL a world leader within motion control. The numerous features of these motors include a modular concept that makes it extremely easy to adapt the motors to a very wide range of applications.

The new wireless MAC00-FZ4 module is based on the established IEEE 802.15.4 standard with a special high-speed serial communications and the option to implement other protocols, like ZigBee, on top to realize true mesh networking at low transmission power.

The module makes it possible to have a fast direct point-to-point connection to the motor and to switch between a large number of motors. Used in this way, the module effectively replaces a serial cable.

Another way to use the same module is as a node in a larger network, which will require some software work, but can be used to build very large and robust mesh networks, with automatic route discovery and self-healing characteristics.

The master PC or other device must use a small interface module running the same proprietary protocol. This can be supplied with a ready-to-use USB adapter or a serial adapter. Very low power consumption is possible for battery operated master equipment like a remote control.

The module is otherwise nearly identical to the MAC00-Rx modules with a built-in nanoPLC and a set of digital input and output signals to control local logic.

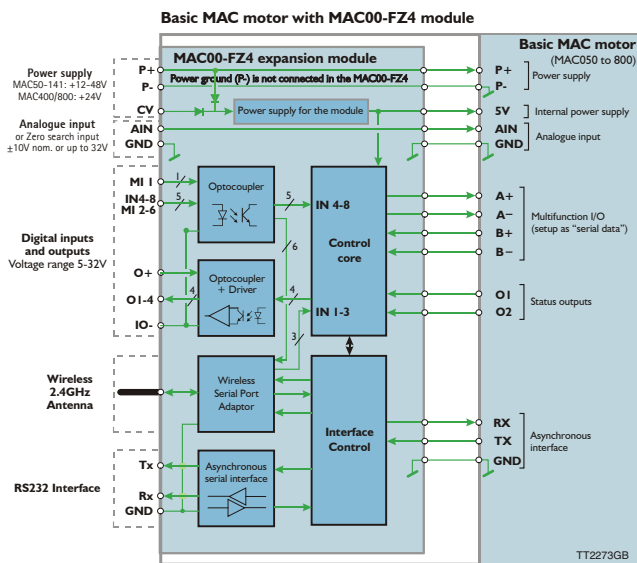
### Applications:

- Positioning of axes
- Supervision of motor
- Parameter setup

### Function:

- The solution gives full access to all functions and registers in the MAC motor
- Baud rates of 9600, 19200, 38400 or 57600 with the MAC400 and MAC800. Fixed baudrate of 19200 with the MAC050 to MAC141
- Wireless control of the motor.
- Local intelligence for multipurpose control
- 4 inputs and 4 outputs
- Programmable via wireless control with MacTalk
- Uses the worldwide 2.4GHz frequency band.

## Block Diagram



## Pin Connections

### "PWR" Power input. M12 – 5 pin male connector

Signal name	Description	Pin no.
P+	Main supply+12-48VDC.	1
P+	Main supply+12-48VDC	2
P-	Main supply ground	3
CV	Control voltage	4
P-	Main supply ground	5




### "IO1" Basic I/O's. M12-8pin male connector

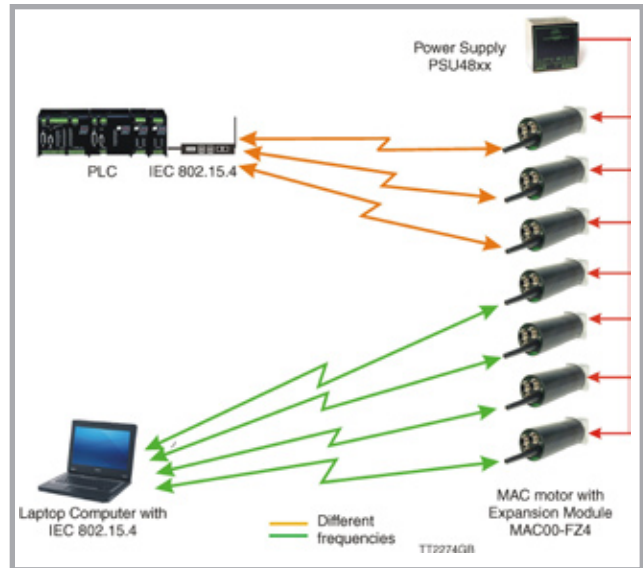
Signal name	Description	Pin no.
MI1	Mirror input I1	1
IN4/MI2	Digital input 4 and Mirror I2	2
IN5/MI3	Digital input 5 and Mirror I3	3
IN6/MI4	Digital input 4 and Mirror I4	4
O1	Digital output 1 - PNP output	5
O2	Digital output 2 - PNP output	6
O+	Output supply +5-32VDC. used for O1-4.	7
IO-	I/O ground. Used for IN4-8, MI1-MI4 and O1-4	8

### "IO2" - Extended I/O's. M12 – 8pin female connector

Signal name	Description	Pin no.
IN7/MI5	Mirrored input A	1
RS232: Tx	RS232 Transmit	2
RS232: Rx	RS232 Receive	3
GND	Ground for AIN. This ground is shared with the main ground	4
O3	Digital output 3 - PNP output	5
O4	Digital output 4 - PNP output	6
AIN	Analog input +/-10V (also used for zero search sensor)	7
IN8/MI6	Digital input 8 and Mirror I6	8

## Accessories

-  MA0006: Antenna stand for relocation with 1m cable.
-  MA0002: 70mm antenna on 3m cable.
-  MA0004: Antenna, rugged stub. 1pcs. delivered together with the module



Example of simultaneous communications to two groups of MAC00-FZ4 enabled motors from a PLC and a PC using two different radio channels. With the standard software, one motor in each group is connected to its master controller at any time. With expanded software, all motors in a group can be addressed simultaneously.

## Specifications

Uses the IEEE 802.15.4 low-rate standard with a proprietary protocol to obtain fast and reliable communications. Uses one of 16 selectable radio channels in the 2450 MHz band.

### Infrastructure modes:

Point-to-point, switchable with AT-commands.  
Mesh networking with additional software work.

### Wireless range:

Up to 400 meters with good antennas and line-of-sight.

### Security:

Data can be encrypted using AES-128 as described in the 802.15.2 specification.

### Baud rates:

9600, 19200, 38400, 57600 baud when used with MAC400 or MAC800.  
19200 baud when used with the MAC050 to MAC141 range of motors

### Antenna connection:

SMA.

### Additional features:

Can be configured over-the-air.



JVL Industri Elektronik A/S  
Blokken 42  
DK-3460 Birkerød, Denmark  
Tel: +45 4582 4440  
Fax: +45 4582 5550  
E-mail: [jvl@jvl.dk](mailto:jvl@jvl.dk) [www.jvl.dk](http://www.jvl.dk)

Sold & Serviced by  
**ELECTROMATE**

Toll Free Phone (877) SERV098  
Toll Free Fax (877) SERV099  
[www.electromate.com](http://www.electromate.com)  
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