



JVL
intelligent motors

MAB electronic brake setup

For ServoStep™ Integrated Stepper (MIS) Motors



1 Important User Information



Warning

The MAC series of products are used to control electrical and mechanical components of motion control systems. You should test your motion system for safety under all potential conditions. Failure to do so can result in damage to equipment and/or serious injury to personnel.

Please contact your nearest JVL representative in case of technical assistance. Your nearest contact can be found on our web site www.jvl.dk

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4 Introduction

This guide is intended to supplement the section 5.11 - *Electro Mechanical Brake* in the user manual for the MIS line of motors, [lb0058.bk](#). It is assumed that the user has already read the manual section.

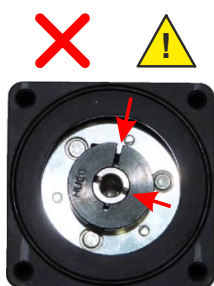
This guide covers the mechanical installation and connection of an MAB brake to an MIS motor. It also covers the setup required to ensure that the brake is properly engaged and disengaged by either the MIS motor, or an external control.

5 Mechanical installation of a brake

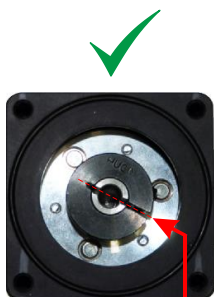
To ensure that the brake is properly mounted to the motor, please follow the instructions below:

- ① Step 1:** Ensure the shaft collar is correctly oriented to allow proper tension on the motor shaft.

Tip: Lightly tighten it to hold it in place, then rotate it such that it is possible to reach the bolt from the outside.



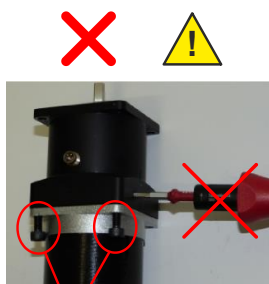
The inner and outer slits must be aligned. Make sure they are aligned as in the illustration on the right.



Correctly aligned inner and outer slits.

- ② Step 2:** Mount the gear or brake onto the motor, but first fasten the 4 shaft bolts before securing the shaft collar.

Tip: Apply Loctite 278 to the threads to ensure the bolts stay firmly in place.



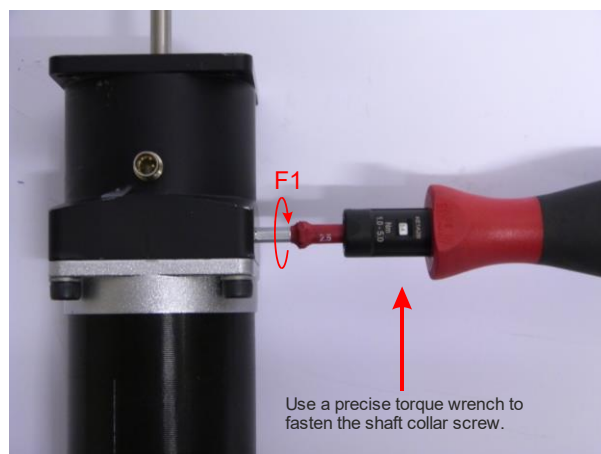
Do not tighten the shaft collar before the flange bolts.



Properly mounted and tightened flange bolts.

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- ③ Step 3:** Tighten the shaft collar to the torque from the chart below.
Note: Incorrect torque may cause slippage leading to position errors



Use a precise torque wrench to fasten the shaft collar screw.

Gears (Product type to be mounted)

Series	Used with motor type	Tool	Torque (F1)
HTRG05	MAC083 to MAC320 (Ø6.35 shaft)	Hex size 3	5Nm
HTRG05	MIS230-233 (Ø6.35 shaft)	Hex size 3	5Nm
HTRG06	MAC083 to MAC320 (Ø6.35 shaft)	Hex size 3	5Nm
HTRG06	MAC400-402 (Ø14 shaft)	Hex size 3	11Nm
HTRG08	MIS340-341 (Ø9.53 shaft)	Hex size 4	5Nm
HTRG08	MIS342 (Ø14 shaft)	Hex size 5	8Nm
HTRG08	MAC800 (Ø19 shaft)	Hex size 5	11Nm
HTRG10	MAC800 (Ø19 shaft)	Hex size 5	11Nm

Brakes (Product type to be mounted)

Series	Used with motor type	Tool	Torque (F1)
MAB23x	MAC050 to MAC320 (Ø6.35 shaft)	Hex size 2.5	2Nm
MAB23x	MIS230-233 (Ø6.35 shaft)	Hex size 2.5	2Nm
MAB34x	MIS340-341 (Ø9.53 shaft)	Hex size 3	5Nm

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6 Connecting the brake to a MIS motor

This section will cover how to connect the brake to the MIS motor. We strongly recommend using official JVL cables to ensure proper operation. This also makes the installation process significantly faster and easier.

If the brake is wired directly to the MIS motor, the motor can supply the brake with power and control it. A MIS motor will automatically engage or disengage the brake depending on the motor's current mode. For example, going to *passive mode* will engage the brake and going to *velocity* or *position* mode will disengage the brake to allow free movement. If an error occurs, the motor will always go to *passive mode*, engaging the brake.

The timing can be configured using MacTalk or the motor registers. For more information on this, please refer to 5.11.2 – *Brake timing* in the MIS manual, [lb0058.bk](#).

6.1 Using JVL cables WI1013-x

The **WI1013-M12M17TF4T.4N** and **WI1013-M12M17TF4TXAA** cables simplifies the wiring significantly. These cables connect to the 17-pin connector present on all MIS motors.



WI1013-M12M17TF4T.4N

This cable features a 17-pin male M12 connector for the motor and a 4-pin female M8 compatible with all MAB brakes.



WI1013-M12M17TF4TXAA

This cable has the same features as the *WI1013-M12M17TF4T.4N* to the left but features an additional open-ended cable for IO1-3 and CVO.

Both cables use I/O 5+6 as the brake output. This is due to the current draw of the brake exceeding the maximum a single I/O is capable of handling.

WI1013-M12M17TF4T.4N		
4 pin cable (brake) pin	17 pin cable (motor) pin	Signal name (MIS)
1	16 + 2	Ground
2	11 + 12	IO 5 + IO 6

WI1013-M12M17TF4TXAA			
4 pin cable (brake) pin	17 pin cable (motor) pin	Open ended cable color	Signal name (MIS)
1	16 + 2	Brown	Ground
2	11 + 12	-	IO 5 + IO 6
-	1	White	IO1
-	3	Blue	IO2
-	4	Black	IO3
-	9	Gray	CVO



4-pin M8 connector



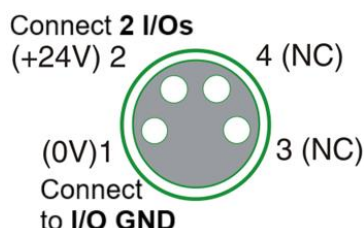
6.2 Using WI1000-M8F4AxxN or custom cabling

The MAB brakes require connection to **two** I/Os to function properly. This is due to their current consumption exceeding the rating of one I/O.

Depending on the chosen motor option, there can be multiple connectors with I/Os. For example, a MISxxxxx**Q5**xxxx has two and a MISxxxxx**E**xxxx has one. For more information, please check the datasheet of your motor. In the table to the right, the universal 17-pin I/O connector is shown, with the **possible choices marked in bold**.

Connect **two I/Os** to **pin 2 of the M8 brake connector** seen on the right.

Connect **0V/GND** (pin 2 on the 17-pin connector) to **pin 1 of the M8 brake connector**.



MIS 17-pin connector	
Pin 1	IO1
Pin 2	GND
Pin 3	IO2
Pin 4	IO3
Pin 5	B1- (RS422)
Pin 6	IO4
Pin 7	A1- (RS422)
Pin 8	B1+ (RS422)
Pin 9	CVO (out)
Pin 10	A1+ (RS422)
Pin 11	IO5
Pin 12	IO6
Pin 13	IO7
Pin 14	IO8

6.3 Other recommended accessories

If any of the WI1013 cable variants are used, it is not possible to connect to the motor via RS485. Moreover, depending on the motor option, the user only has access to IO1-3 and CVO if WI1013-M12M17TF4TXAA is used.

If the application requires more than three IOs, JVL offers the **PA0190** junction box and IO gateway. The user connects to the 17-pin cable and has access to all I/Os as well as RS485. By using the *bypass* port on the module, the WI1013 cable can be connected, retaining the easy brake connection.

Alternatively, JVL offers the **WI1302** junction box for connection to several I/Os. The brake should be connected to two ports on this device using the 3-pin M8 connector.



PA0190

This junction box allows simultaneous usage of all I/Os, RS485 and brake (through the bypass port).



WI1302

This junction box allows simultaneous usage of all I/Os. Brake and sensors can be connected using a 3-pin M8 connector.

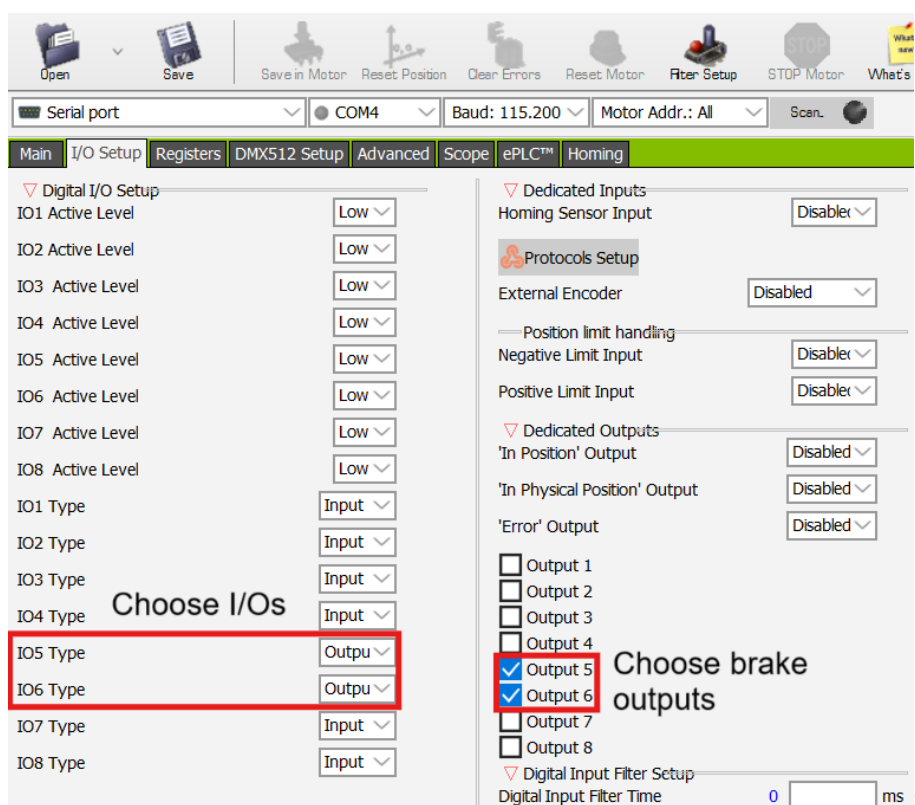


7 Motor setup

For the brake to be controlled by the motor, there is some setup in MacTalk that must be followed first.

In the *I/O setup* tab, the I/Os connected to the brake must be marked as *outputs*. Then, they must be chosen from the brake selection menu on the right side of the window. Remember to press *Save in motor* to save the I/O setup.

See the picture below for an example setup. This setup is appropriate for JVL supplied brake cables or custom cabling where the brake is wired to I/Os 5+6.



7.1 Registers for setting up without MacTalk

To see relevant registers for brake setup which can be used to set this up without MacTalk, please refer to 5.11.6 – *Access without MacTalk* in the MIS manual, [lb0058.bk](#).

8 Other ways of controlling the brake

The brake disengages whenever +24 V is applied between pin 2 (+) and pin 1 (0/GND) of the connector.

Therefore, it is also possible to control the brake using an external relay or PLC, should you choose to. In that case, do not follow the above motor setup and instead use the connector diagram.

