

JVL AOI MAC G3 Manual

Rockwell PLC AOI for the control of JVL MAC G3 over
Ethernet/IP

V1.0 05/2026

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1 Note

Please note that this AOIs have been tested with MacTalk V1.93.00.85.

The JVL AOI's will simplify the integration into the Rockwell Logix5000 environment.

For the Rockwell motion programmer the JVL AOI's will help the integration of the JVL motors into a Rockwell application.

This document along with the example project should give a good understanding on how to setup and control a JVL motor.

2 Configuration

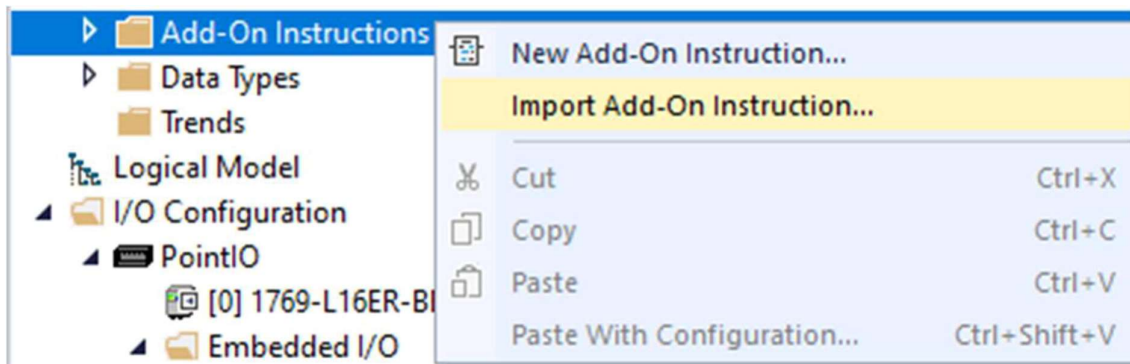
2.1 Requirements

Studio5000 V37 or higher.

MacTalk project for the JVL motor configuration.

2.2 Import AOIs and Data Types

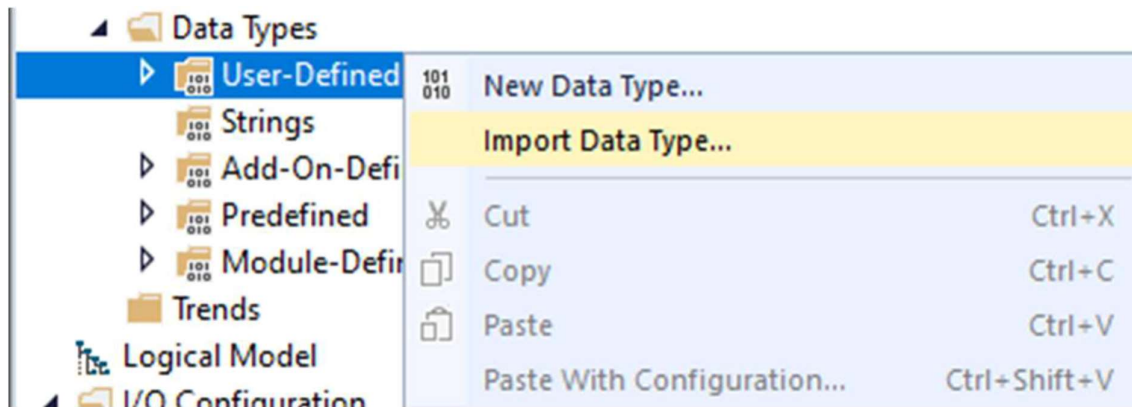
To import the Add-On Instruction and select Import Add-On Instruction and choose/open MAC_G3_AOI.L5X.



With these AOIs the Datatypes should be installed, too.

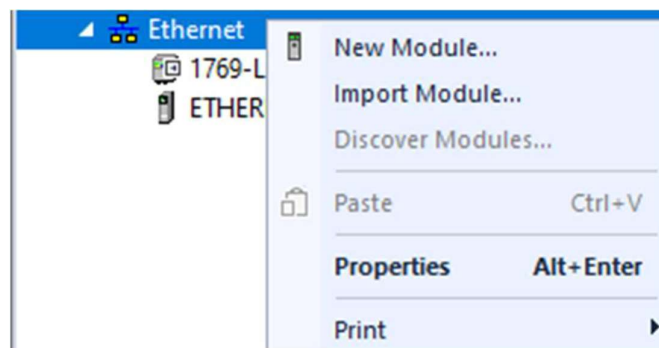
Otherwise do:

To import the Data Type and select Import User-Defined Data Types and choose/open MAC_G3_Datatypes.L5X.



2.3 Add new MAC_G3 - Motor

To add a new MAC-Motor click right and choose New Module.



Then select the MAC G3 Servo motor. Enter the Name and IP address and set the Connection

Parameters as shown below.

The screenshot shows a software window titled "Module Properties: Local (MAC G3 Servo motor 1.004)". On the left is a tree view with the following items: General (selected), Connection, Module Info, Parameters, Internet Protocol, Port Configuration, and Network. The main area is titled "General" and contains the following fields:

- Type: MAC G3 Servo motor MAC G3 Integrated Servomotor
- Vendor: JVL A/S
- Parent: Local
- Name: M1 (text input field)
- Description: (empty text area)
- Ethernet Address:
 - ☒ Private Network: 192.168.1. 115 (dropdown)
 - ☐ IP Address: (empty text field)
 - ☐ Host Name: (empty text field)
- Module Definition:
 - Revision: 1.004
 - Electronic Keying: Compatible Module
 - Connections: Exclusive Owner

At the bottom right of the Module Definition section is a "Change ..." button. At the bottom left, it says "Status: Offline". At the bottom right are four buttons: OK, Cancel, Apply, and Help.

2.4 MacTalk Configuration

In the MacTalk project for your JVL motor, a cyclic data setup must be set in order to communicate with the Ethernet/IP AOIs. The contents of this setup depend on the type of JVL drive to be used. Use the cyclic data setup section of the MAC00-EI EtherNet/IP tab in MacTalk to configure the telegram.

Once configured, please remember to click the Apply and Save button in order to save the setup configuration in the drive.

2.4.1 MAC G3

This is the default setup configuration. Change the IP-address. You can choose additional registers (Read Word 6-8, Write Word 7-8). You will find these registers as IO of MAC G3 Servo motor (Position 1-5) in the Controller tags. After a change press “Apply and save”.

The screenshot shows the 'EtherNet/IP' configuration window for a MAC G3 servo motor. The 'IP address' field is highlighted with a yellow box and contains the value '192.168.1.115'. The 'Subnet mask' is '255.255.255.0' and the 'Default gateway' is '0.0.0.0'. The 'EtherNet/IP error handling' section has 'Motor set "Passive mode"' selected. The 'Protocol settings' section has 'Sercos Address' set to '0'. The 'Cyclic data setup (32bit)' section shows a list of Read Words and Write Words. Read Word 1 is '2 - Operating mode', Read Word 2 is '10 - Actual position', Read Word 3 is '11 - Actual Velocity 16bit', Read Word 4 is '169 - Actual torque', Read Word 5 is '35 - Error status', Read Word 6 is '0 - No Selection', Read Word 7 is '0 - No Selection', and Read Word 8 is '0 - No Selection'. Write Word 1 is '2 - Operating mode', Write Word 2 is '3 - Requested position', Write Word 3 is '5 - Velocity', Write Word 4 is '6 - Acceleration', Write Word 5 is '7 - Torque', Write Word 6 is '983040 - Unknown Register', Write Word 7 is '0 - No Selection', and Write Word 8 is '0 - No Selection'. A note on the right says 'Read Entry '35 - Errors' is mandatory.' and 'Reset Error: Reg. 983040 CMD:0x010000E1 (16777441). Click '?' to learn more.' At the bottom, there are buttons: 'Set module factory defaults', 'Apply and save', and 'Refresh Tab'. A checkbox 'Enable 8 cyclic R/W words' is checked.

3 Addon Instructions for MAC G3

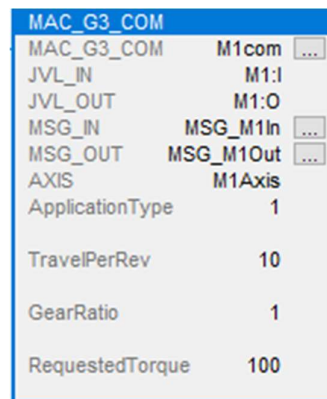
3.1 MAC_G3_COM

3.1.1 Description

MAC_G3_COM performs cyclic communication. The cyclic data setup is transferred between PLC input/output area and the axis data.

This AOI also calculates the position and velocity depending on the application type

This AOI is required for all other motion control AOIs to operate. The Message commands MSG_IN and MSG_OUT are necessary for homing registers (additional acyclic register)



3.1.2 Parameter

Name	Data Type	Usage	Description
EnableIn	BOOL	Input	Enable Input - System Defined Parameter
EnableOut	BOOL	Output	Enable Output - System Defined Parameter
▶ JVL_IN	_03A8:MACG3Servomotor_939149E5:I:0	InOut	
▶ JVL_OUT	_03A8:MACG3Servomotor_D07D4DE6:O:0	InOut	
▶ MSG_IN	MESSAGE	InOut	
▶ MSG_OUT	MESSAGE	InOut	
▶ AXIS	JVL_AXIS_MAC_G3	InOut	Drive Data
▶ ApplicationType	DINT	Input	Application_Type - 0=none (counts) 1=linear 2=degree
TravelPerRev	REAL	Input	Travel per Revolution. Exc. actuator w. 60mm/rev, then value=60
GearRatio	REAL	Input	Gear ratio if a gearbox is mounted. select 1 for none
▶ RequestedTorque	DINT	Input	Torque in %, 0-300%

3.2 MAC_G3_MSO

3.2.1 Description

There is no MAC_G3_MSO because the controller of a JVL Motor is always enabled.

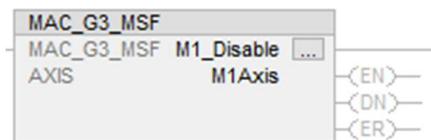
3.3 MAC_G3_MSF

3.3.1 Description

Place the drive in passive mode, removing all torque from the motor.

If the motor is running then it stops with the configured deceleration of the command that is in progress.

Caution, this can result in a long stopping distance if the configured acceleration is low. It is recommended that MAC_G3_MAS is used with suitable deceleration before then executing MAC_G3_MSF.



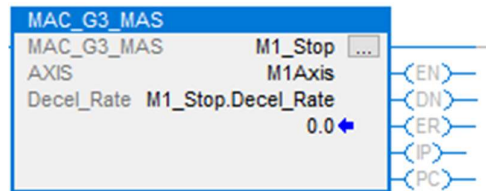
3.3.2 Parameter

Name	Data Type	Usage	Description
EnableIn	BOOL	Input	Enable Input - System Defined Parameter
EnableOut	BOOL	Output	Enable Output - System Defined Parameter
▶ AXIS	JVL_AXIS_MAC_G3	InOut	Drive Data
EN	BOOL	Output	
CommandAborted	BOOL	Output	
DN	BOOL	Output	
ER	BOOL	Output	

3.4 MAC_G3_MAS

3.4.1 Description

Stops the motor to a standstill with defined deceleration.



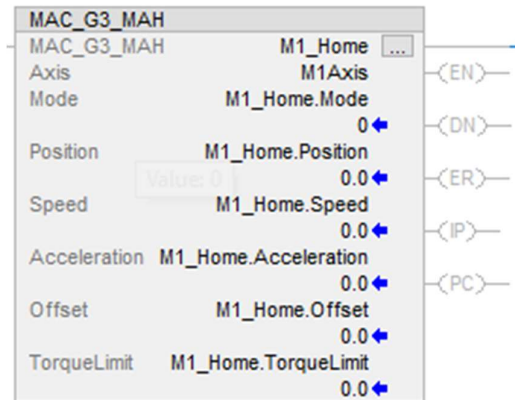
3.4.2 Parameter

Name	Data Type	Usage	Description
EnableIn	BOOL	Input	Enable Input - System Defined Parameter
EnableOut	BOOL	Output	Enable Output - System Defined Parameter
▶ AXIS	JVL_AXIS_MAC_G3	InOut	Drive Data
Decel_Rate	REAL	Input	in RPM/s
CommandAborted	BOOL	Output	
EN	BOOL	Output	
DN	BOOL	Output	
ER	BOOL	Output	
IP	BOOL	Output	
PC	BOOL	Output	

3.5 MAC_G3_MAH

3.5.1 Description

MAC_G3_MAH homes or references the motor position. Homing parameters like speed, torque are set acyclic by message command



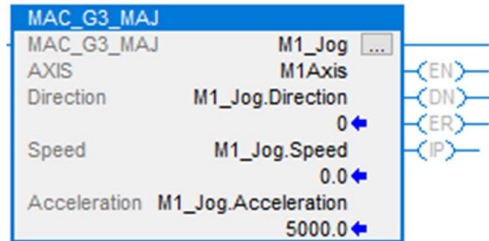
3.5.2 Parameter

Name	Data Type	Usage	Description	Default
EnableIn	BOOL	Input	Enable Input - System Defined Parameter	1
EnableOut	BOOL	Output	Enable Output - System Defined Parameter	0
▶ Axis	JVL_AXIS_MAC_G3	InOut	Drive Data	
CommandAborted	BOOL	Output		0
EN	BOOL	Output	Enable Bit - The EN bit stays Set until the Process is Complete a...	0
DN	BOOL	Output	Done Bit - The Done bit is Set if the Instruction Executed without...	0
ER	BOOL	Output	Error Bit - An Error Happened	0
IP	BOOL	Output	In Progress Bit - The In Progress bit is Set While the Axis is Moving	0
PC	BOOL	Output	Process Complete, Motion has stopped	0
▶ Mode	INT	Input	0 = set Encoder, 1 = Homing on Sensor, 2 = Homing on Block	0
Position	REAL	Input	Scaled Position after setting Encoder, with Mode = 0	0.0
Speed	REAL	Input	Scaled velocity	0.0
Acceleration	REAL	Input	in RPM/s	0.0
Offset	REAL	Input	scaled Position after Homing, with Mode = 1 or 2	0.0
TorqueLimit	REAL	Input	Homing Torque in %	0.0

3.6 MAC_G3_MAJ

3.6.1 Description

Run the motor at the specified speed. The axis is stopped when the EnableIn is reset.



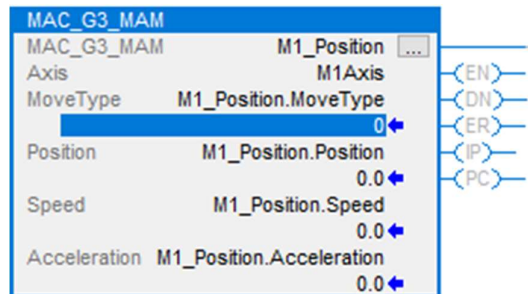
3.6.2 Parameter

Name	Data Type	Usage	Description	Default
EnableIn	BOOL	Input	Enable Input - System Defined Parameter	1
EnableOut	BOOL	Output	Enable Output - System Defined Parameter	0
▶ AXIS	JVL_AXIS_MAC_G3	InOut	Drive Data	
▶ Direction	DINT	Input	0 = CW rotation, 1 = CCW rotation	0
Speed	REAL	Input	scaled velocity	0.0
Acceleration	REAL	Input	in rpm/s	5000.0
EN	BOOL	Output	Enable Bit - The EN bit stays Set until the Process is Complete a...	0
DN	BOOL	Output	Done Bit - The Done bit is Set if the Instruction Executed without...	0
ER	BOOL	Output	Error Bit - An Error Happened	0
IP	BOOL	Output	In Progress Bit - The In Progress bit is Set While the Axis is Moving	0

3.7 MAC_G3_MAM

3.7.1 Description

Move the axis to the specified position, or by the specified distance.



3.7.2 Parameter

Name	Data Type	Usage	Description	Default
EnableIn	BOOL	Input	Enable Input - System Defined Parameter	1
EnableOut	BOOL	Output	Enable Output - System Defined Parameter	0
▸ Axis	JVL_AXIS_MAC_G3	InOut	Drive Data	
▸ MoveType	DINT	Input	0=absolute, 1= relative	0
Position	REAL	Input	scaled Position	0.0
Speed	REAL	Input	scaled velocity	0.0
Acceleration	REAL	Input	in rpm/s	0.0
CommandAborted	BOOL	Output		0
EN	BOOL	Output	Enable Bit - The EN bit stays Set until the Process is Complete a...	0
DN	BOOL	Output	Done Bit - The Done bit is Set if the Instruction Executed without...	0
ER	BOOL	Output	Error Bit - An Error Happened	0
IP	BOOL	Output	In Progress Bit - The In Progress bit is Set While the Axis is Moving	0
PC	BOOL	Output	Process Complete, Motion has stopped	0

The Position and Speed depends on the Application Type in MAC_G3_COM.

Application Type = 0, Position in counts, Speed in rpm

Application Type = 1, Position in mm or inch..., Speed in mm/s or inch/s.....

Application Type =2, Position in degree, Speed in °/s

Acceleration is always rpm/s

3.8 MAC_G3_MAFR

3.8.1 Description

MAC_G3_MAFR resets any errors or faults in the drive.

