JVL Profinet Library Manual

Siemens S7-1200 & S7-1500 PLC Function Block Library for the Control of JVL Motors

V1.0 10/2019

Contents

1. Note 4

2. Configuration 5

2.1 Requirements 5

2.2 Import Library 5

2.3 Device Configuration 6

2.4 MacTalk Configuration 11

3. Common Function Blocks (for MIS & MAC) 17

3.1 JVL_ReadWriteReg 17

4. MIS Function Blocks 19

4.1 JVL_MIS_Disable 19

4.2 JVL_MIS_Halt 20

4.3 JVL_MIS_Home 22

4.4 JVL_MIS_Jog 24

4.5 JVL_MIS_Position 26

4.6 JVL_MIS_Reset 29

4.7 JVL_MIS_Velocity 30

5. MAC Function Blocks 34

5.1 JVL_MAC_Disable 34

5.2 JVL_MAC_Halt 35

5.3 JVL_MAC_Home 37

5.4 JVL_MAC_Jog 39

5.5 JVL_MAC_Position 41

Contents

5.6 JVL_MAC_Reset 43
5.7 JVL_MAC_Velocity 44

1. Note

Please note that this library has been tested with MacTalk V1.90.0 and JVL Profinet firmware V3.30.

2. Configuration

2.1 Requirements

- TIA Portal V14 or higher.
- TIA Portal project containing an S7-1200 or S7-1500 PLC.
- MacTalk project for the JVL motor configuration.

2.2 Import Library

In order to import the JVL Profinet Function Block library into TIA Portal, you should right-click in the Global Libraries section of the Library sidebar in TIA Portal, and select 'Retrieve Library...'. Select the library archive (.zal14 file) then choose the destination to save the extracted library files.

2.2.1 Add Library Components

2.2.1.1 User data Types (UDTs)

The UDTs are required in order for the function blocks to be compiled. In the Master Copies folder within the library, drag the 'JVL UDT' group into the PLC's 'PLC data types' folder.

2.2.1.2 Common Function Blocks

The 'JVL Common' function blocks group are blocks that can be used, or are required for, both MIS and MAC devices. This group includes:

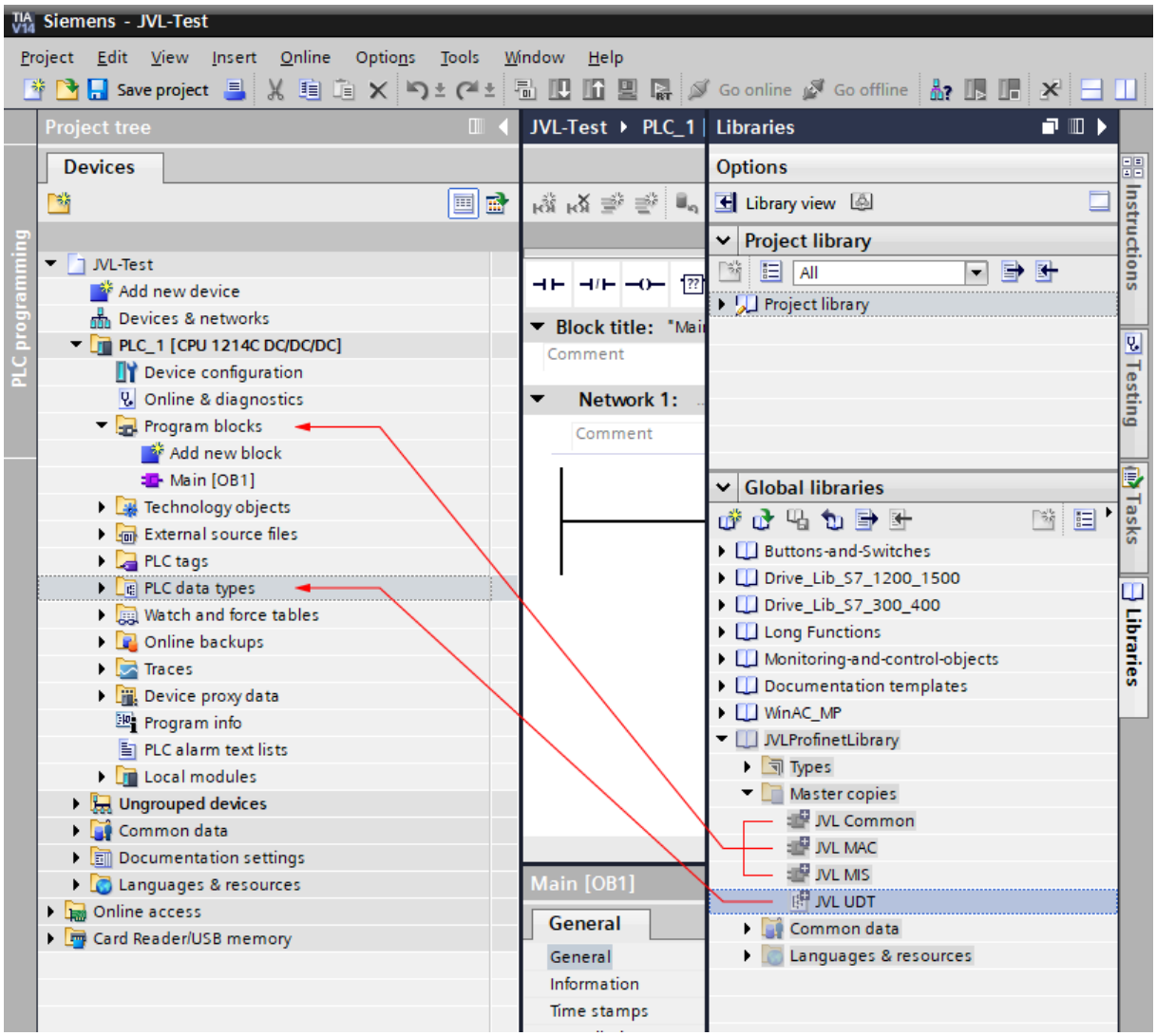
- JVL_ReadWriteReg - Function block for reading or writing motor registers.

The 'JVL Common' group should be dragged into the PLC's 'Program blocks' folder.

2.2.1.3 Device Specific Function Blocks

If using a MIS device, drag the 'JVL MIS' group into the PLC's 'Program blocks' folder.

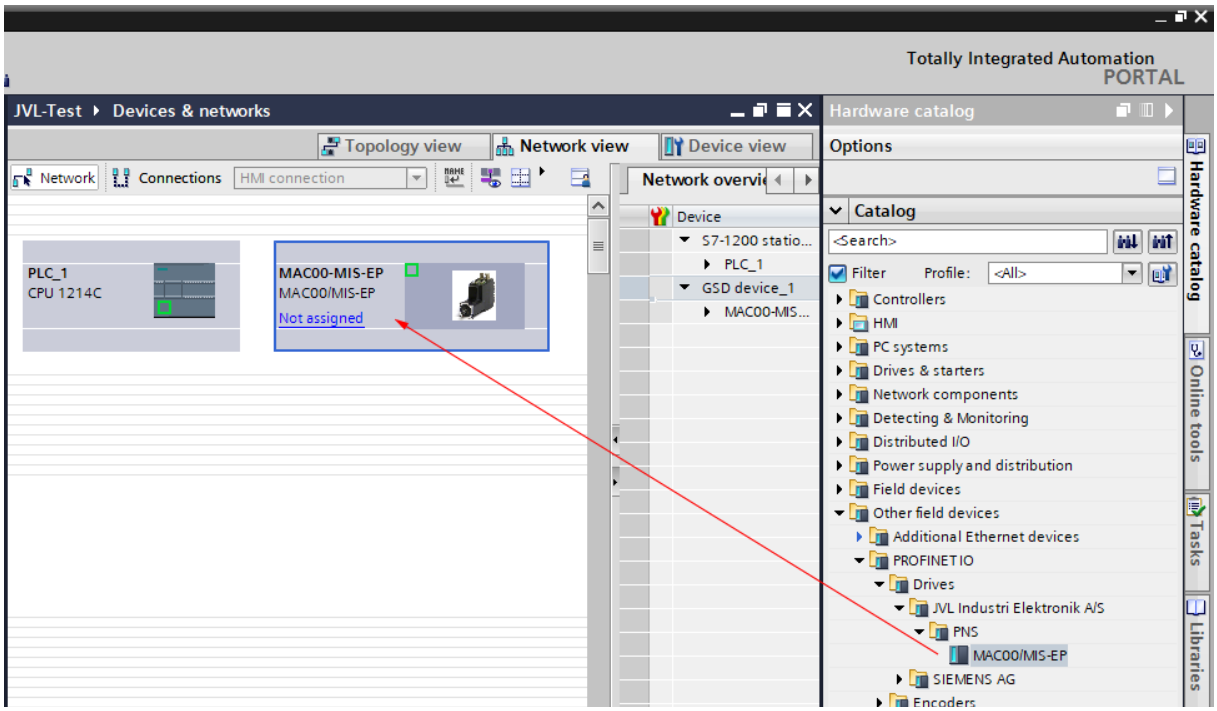
If using a MAC device, drag the 'JVL MAC' group into the PLC's 'Program blocks' folder.



2.3 Device Configuration

2.3.1 Import GSD (General Station Description) File

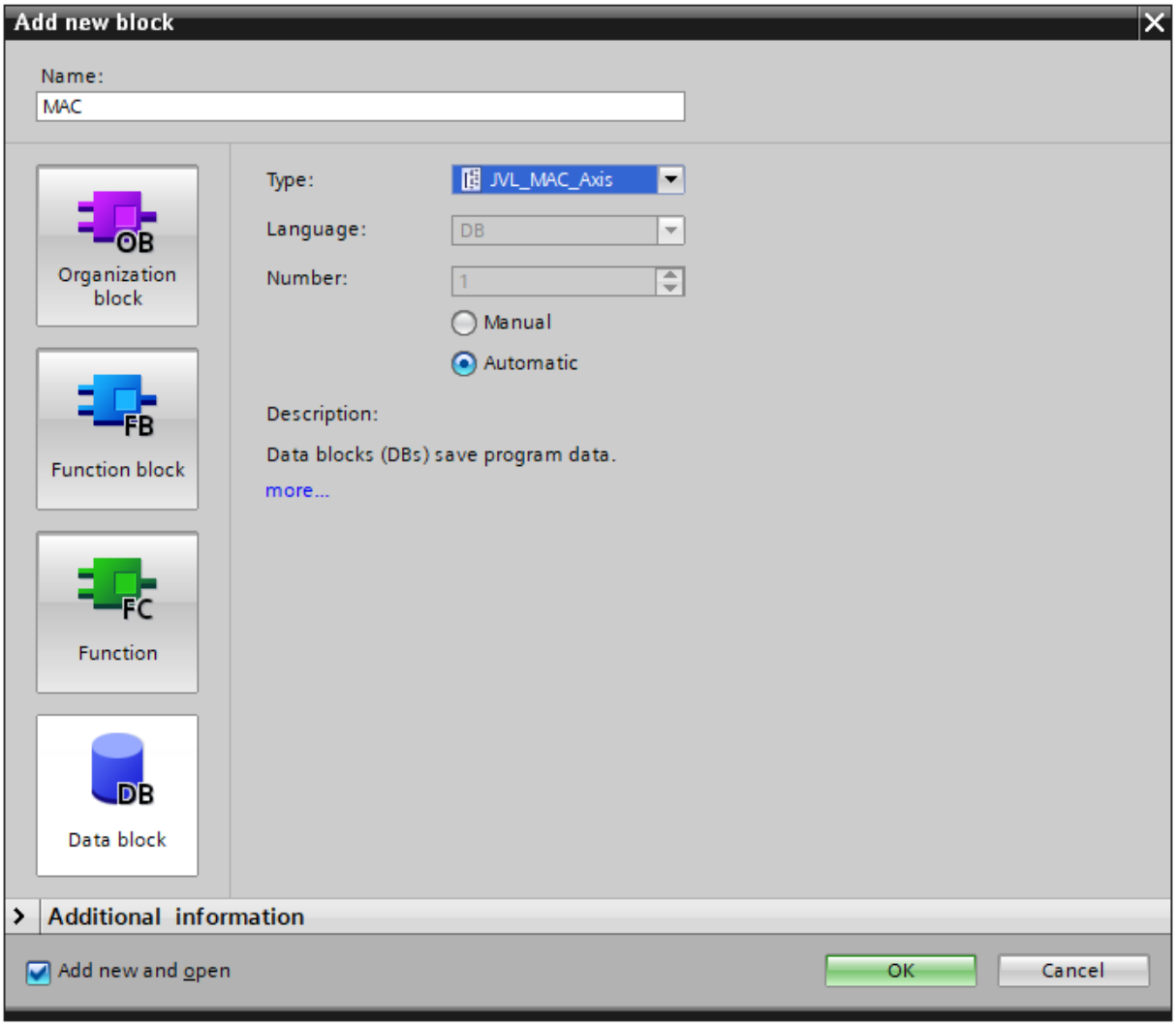
Foreach JVL device to be configured, a GSD file must be included in the TIA Portal project. The GSD file can be downloaded from the JVL website GSD section. When downloading from the JVL website, please select the 8 register Profinet GSD file. Firstly, the GSD must be installed. Using the Options > Manage general station description files (GSD) menu option. Select the GSD file for installation into TIA Portal. Once the GSD is installed, it can be added to the project from the Hardware Catalog sidebar. It can be found under Other field devices > PROFINET IO > Drives > JVL Industri Elektronik A/S > PNS folder. Foreach jvl drive/axis, drag a MAC00/MIS-EP GSD into the Devices & Networks window in the TIA Portal project.



> Remember to set the IP and Profinet name of each of the GSD files and connect them to the PLC's subnet.

2.3.2 Datablocks

Foreach JVL device/axis, a datablock must be created of the correct type. A datablock can be created using the 'Add new block' command, located under the 'Program blocks' PLC folder. For MAC devices, create a datablock of type JVL_MAC_Axis. For MIS devices, create a datablock of type JVL_MIS_Axis.

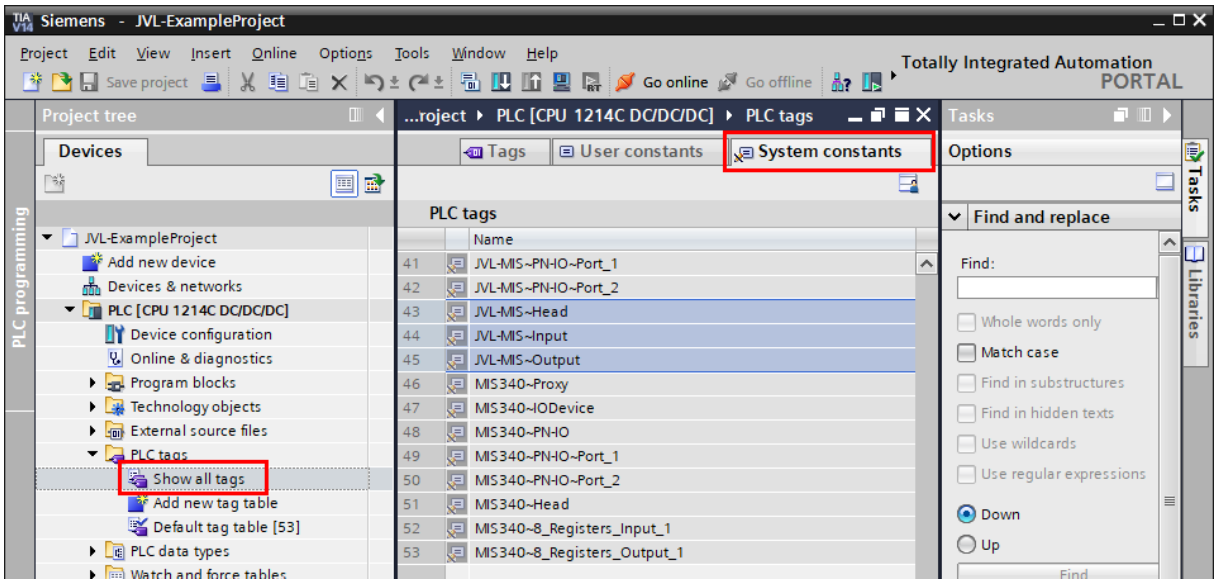


2.3.2.1 Datablock Configuration

Each of the axis datablocks must be configured, in order to link the datablock to its corresponding GSD file. The Device > Config section within the datablock contains parameters which must be set.

Name	Description
DeviceId	Used to define the main address of the unit, used to perform register reads and writes.
TelegramInputAddress	Used to define the address of the JVL input telegram.
TelegramOutputAddress	Used to define the address of the JVL output telegram.
A_SOLL_CountsPerSample2	Acceleration scaling value. (For MAC motors only)
V_SOLL_CountsPerSample	Velocity scaling value. (For MAC motors only)

The device ID and telegram input and output address values can be found in the PLC Tags > Show All Tags > System Constants section.



For each JVL/GSD in the project, you will find a HEAD, INPUT and OUTPUT tags, for example:



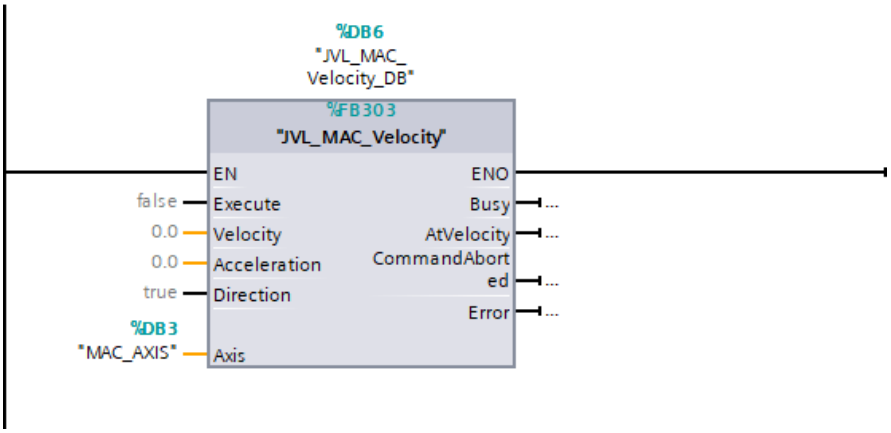
Add these 3 tags to the datablock Device > Config section.

	Name	Data type	Start value
1	Static		
2	Device	"JVL_Device"	
3	Config	Struct	
4	DeviceId	HW_IO	"JVL-MAC~Head"
5	TelegramInputAddress	HW_IO	"JVL-MAC~Input"
6	TelegramOutputAddress	HW_IO	"JVL-MAC~Output"
7	A_SOLL_CountsPerSample2	LReal	0.0037
8	V_SOLL_CountsPerSample	LReal	2.84
9	CommsOK	Bool	false
10	CommandId	DWord	16#0
11	Telegram	"JVL_MAC_Telegram"	
12	Output	Struct	
13	Input	Struct	

The acceleration and velocity scaling values depend on the type of JVL being used. Please refer to the following table for the appropriate values. These values are only applicable to MAC JVL motors and are not used when running a MIS motor.

	A_SOLL_CountsPerSample2	V_SOLL_CountsPerSample
MiniMac	0.0040	2.097
MAC400+	0.0037	2.840
MAC800+	0.0036	2.771

These datablocks will be used as the Axis input on all the motion function blocks in this library. For example:



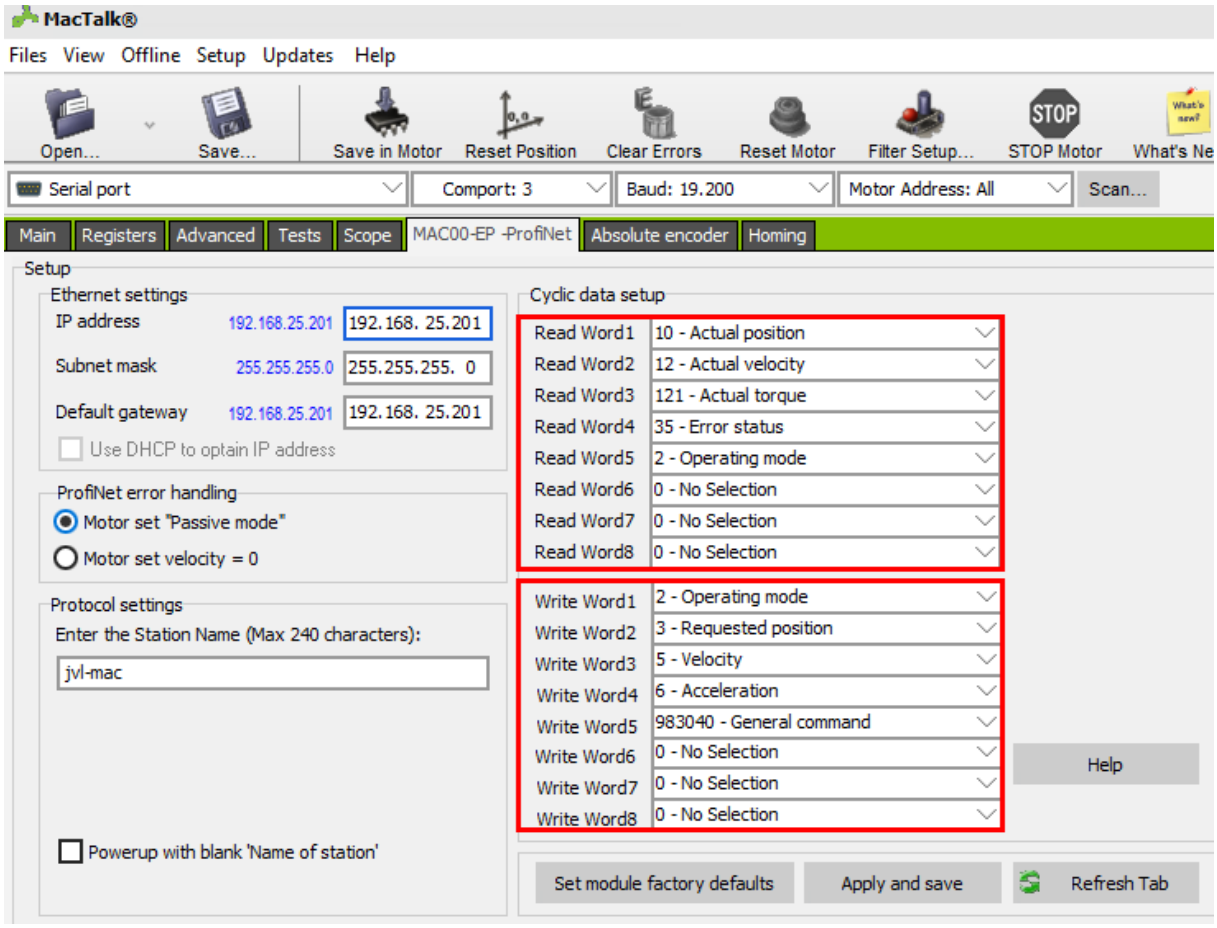
2.4 MacTalk Configuration

In the MacTalk project for your JVL device, a specific telegram must be set in order to communicate with the Profinet library function blocks. The contents of this telegram depend on the type of JVL drive to be used. Use the cyclic data setup section of the MAC00-EP Profinet tab in MacTalk to configure the telegram.

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

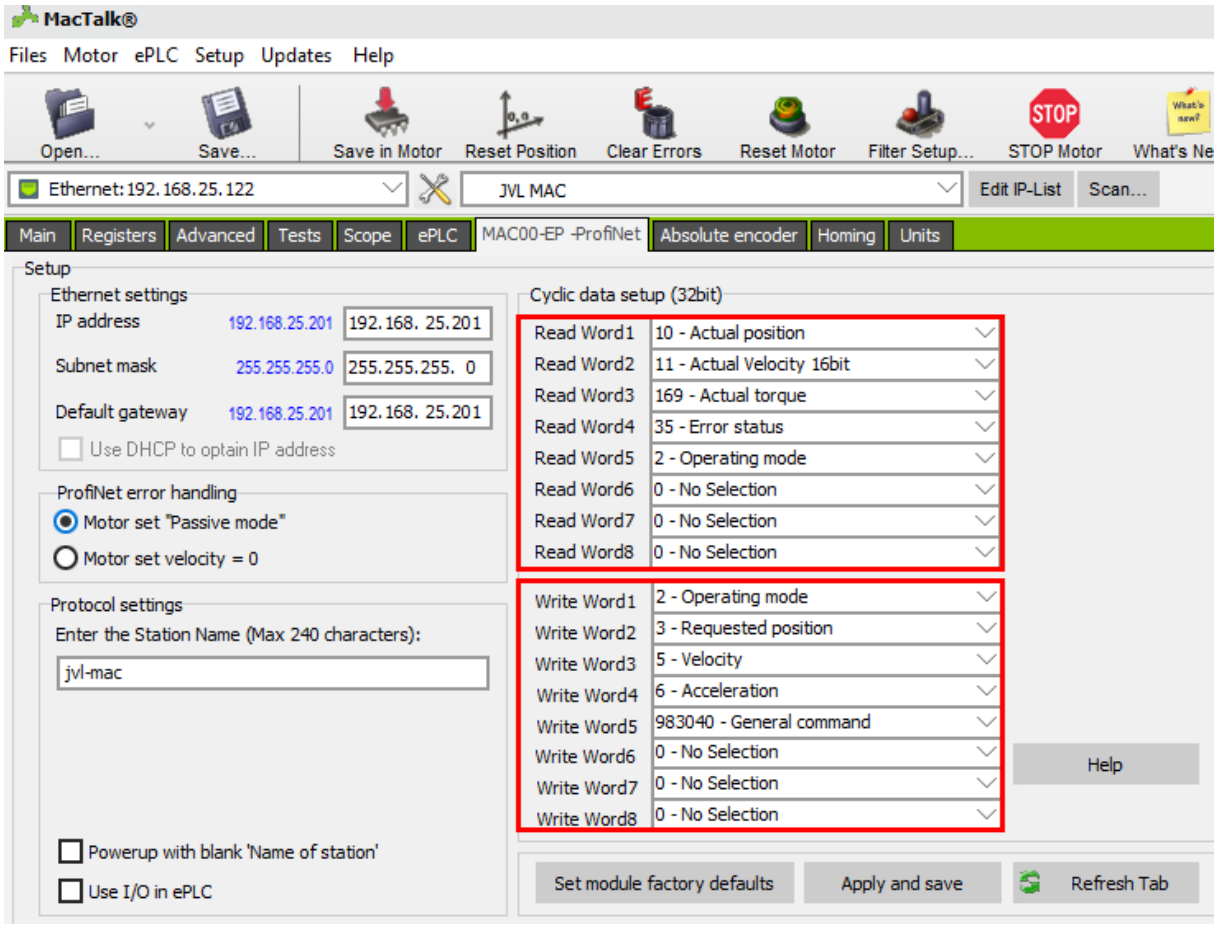
2.4.1 For MAC1xx Devices

Word	Register Number	Description
Read Word 1	10	Actual Position
Read Word 2	12	Actual Velocity
Read Word 3	121	Actual Torque
Read Word 4	35	Error Status
Read Word 5	2	Actual Operating Mode
Read Word 6	-	Not used - freely configurable
Read Word 7	-	Not used - freely configurable
Read Word 8	-	Not used - freely configurable
Write Word 1	2	Operating Mode
Write Word 2	3	Requested Position
Write Word 3	5	Velocity
Write Word 4	6	Acceleration
Write Word 5	983040	General Command
Write Word 6	-	Not used - freely configurable
Write Word 7	-	Not used - freely configurable
Write Word 8	-	Not used - freely configurable


MacTalk®
Files View Offline Setup Updates Help
Open... Save... Save in Motor Reset Position Clear Errors Reset Motor Filter Setup... STOP Motor What's Ne
Serial port
Comport: 3
Baud: 19.200
Motor Address: All
Scan...
Main Registers Advanced Tests Scope MAC00-EP -ProfiNet Absolute encoder Homing
Setup
Ethernet settings
IP address 192.168.25.201 192.168. 25.201
Subnet mask 255.255.255.0 255.255.255. 0
Default gateway 192.168.25.201 192.168. 25.201
Use DHCP to optain IP address
ProfiNet error handling
Motor set "Passive mode"
Motor set velocity = 0
Protocol settings
Enter the Station Name (Max 240 characters):
jvl-mac
Powerup with blank 'Name of station'
Cyclic data setup
Read Word1 10 - Actual position
Read Word2 12 - Actual velocity
Read Word3 121 - Actual torque
Read Word4 35 - Error status
Read Word5 2 - Operating mode
Read Word6 0 - No Selection
Read Word7 0 - No Selection
Read Word8 0 - No Selection
Write Word1 2 - Operating mode
Write Word2 3 - Requested position
Write Word3 5 - Velocity
Write Word4 6 - Acceleration
Write Word5 983040 - General command
Write Word6 0 - No Selection
Write Word7 0 - No Selection
Write Word8 0 - No Selection
Help
Set module factory defaults
Apply and save
Refresh Tab

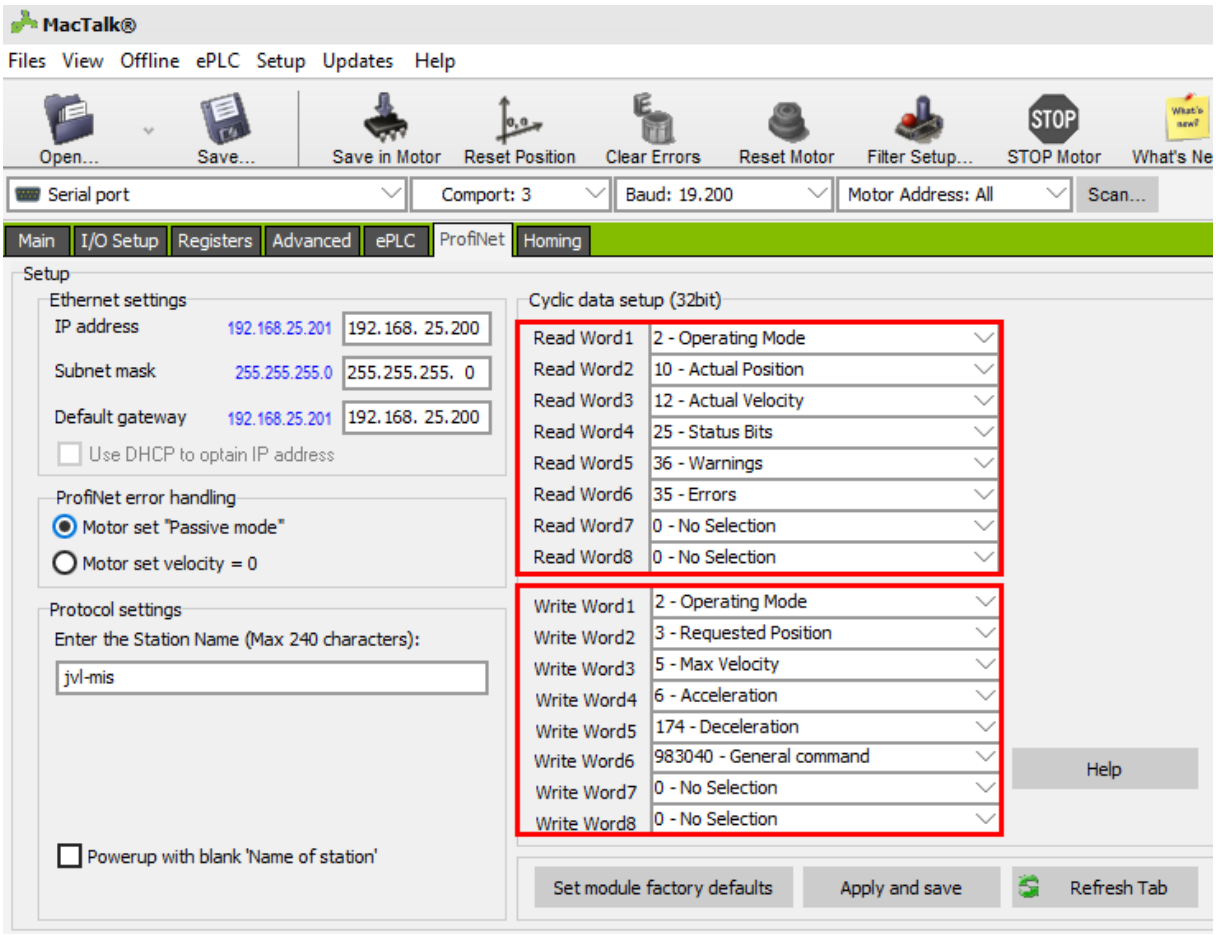
2.4.2 For MAC4xx Devices

Word	Register Number	Description
Read Word 1	10	Actual Position
Read Word 2	11	Actual Velocity 16bit
Read Word 3	169	Actual Torque
Read Word 4	35	Error Status
Read Word 5	2	Actual Operating Mode
Read Word 6	-	Not used - freely configurable
Read Word 7	-	Not used - freely configurable
Read Word 8	-	Not used - freely configurable
Write Word 1	2	Operating Mode
Write Word 2	3	Requested Position
Write Word 3	5	Velocity
Write Word 4	6	Acceleration
Write Word 5	983040	General Command
Write Word 6	-	Not used - freely configurable
Write Word 7	-	Not used - freely configurable
Write Word 8	-	Not used - freely configurable


MacTalk®
Files Motor ePLC Setup Updates Help
Open... Save... Save in Motor Reset Position Clear Errors Reset Motor Filter Setup... STOP Motor What's Ne
Ethernet: 192.168.25.122
JVL MAC
Edit IP-List Scan...
Main Registers Advanced Tests Scope ePLC MAC00-EP -ProfiNet Absolute encoder Homing Units
Setup
Ethernet settings
IP address 192.168.25.201 192.168. 25.201
Subnet mask 255.255.255.0 255.255.255. 0
Default gateway 192.168.25.201 192.168. 25.201
Use DHCP to optain IP address
ProfiNet error handling
Motor set "Passive mode"
Motor set velocity = 0
Protocol settings
Enter the Station Name (Max 240 characters):
jvl-mac
Powerup with blank 'Name of station'
Use I/O in ePLC
Cyclic data setup (32bit)
Read Word1 10 - Actual position
Read Word2 11 - Actual Velocity 16bit
Read Word3 169 - Actual torque
Read Word4 35 - Error status
Read Word5 2 - Operating mode
Read Word6 0 - No Selection
Read Word7 0 - No Selection
Read Word8 0 - No Selection
Write Word1 2 - Operating mode
Write Word2 3 - Requested position
Write Word3 5 - Velocity
Write Word4 6 - Acceleration
Write Word5 983040 - General command
Write Word6 0 - No Selection
Write Word7 0 - No Selection
Write Word8 0 - No Selection
Help
Set module factory defaults
Apply and save
Refresh Tab

2.4.3 For MIS Devices

Word	Register Number	Description
Read Word 1	2	Actual Operating Mode
Read Word 2	10	Actual Position
Read Word 3	12	Actual Velocity
Read Word 4	25	Status Bits
Read Word 5	36	Warning Bits
Read Word 6	35	Error Bits
Read Word 7	-	Not used - freely configurable
Read Word 8	-	Not used - freely configurable
Write Word 1	2	Operating Mode
Write Word 2	3	Requested Position
Write Word 3	5	Velocity
Write Word 4	6	Acceleration
Write Word 5	174	Deceleration
Write Word 6	983040	General Command
Write Word 7	-	Not used - freely configurable
Write Word 8	-	Not used - freely configurable


MacTalk®
Files View Offline ePLC Setup Updates Help
Open... Save... Save in Motor Reset Position Clear Errors Reset Motor Filter Setup... STOP Motor What's Ne
Serial port
Comport: 3
Baud: 19.200
Motor Address: All
Scan...
Main I/O Setup Registers Advanced ePLC ProfiNet Homing
Setup
Ethernet settings
IP address 192.168.25.201 192.168. 25.200
Subnet mask 255.255.255.0 255.255.255. 0
Default gateway 192.168.25.201 192.168. 25.200
Use DHCP to optain IP address
ProfiNet error handling
Motor set "Passive mode"
Motor set velocity = 0
Protocol settings
Enter the Station Name (Max 240 characters):
jvl-mis
Powerup with blank 'Name of station'
Cyclic data setup (32bit)
Read Word1 2 - Operating Mode
Read Word2 10 - Actual Position
Read Word3 12 - Actual Velocity
Read Word4 25 - Status Bits
Read Word5 36 - Warnings
Read Word6 35 - Errors
Read Word7 0 - No Selection
Read Word8 0 - No Selection
Write Word1 2 - Operating Mode
Write Word2 3 - Requested Position
Write Word3 5 - Max Velocity
Write Word4 6 - Acceleration
Write Word5 174 - Deceleration
Write Word6 983040 - General command
Write Word7 0 - No Selection
Write Word8 0 - No Selection
Help
Set module factory defaults
Apply and save
Refresh Tab

3. Common Function Blocks (for MIS & MAC)

3.1 JVL_ReadWriteReg

3.1.1 Description

Read or write a motor register.

3.1.2 Inputs

Input	Data Type
Execute	Bool
Register	Int
WriteValue	DWord
WriteRegister	Bool
Device	JVL_Device

3.1.2.1 Execute

A rising edge is required to start the read/write command. If the input is given a rising edge whilst a command is currently running, then the current command is overriden/ aborted. The input is not required to remain TRUE for the duration of the command. Setting the value of Execute to FALSE during the command will not stop the command.

3.1.2.2 Register

The register number to be read or written to. A full list of register numbers is available in the Ethernet Industrial modules manual appendix 12.2/12.3.

3.1.2.3 WriteValue

The new value of the register to be written.

3.1.2.4 WriteRegister

Choose between reading or writing a register.

Value	Description
TRUE	Write Register
FALSE	Read Register

3.1.2.5 Device

The Device input should be linked to a datablock of type JVL_Device. This datablock provides axis references to the unit.

> Please use the axis datablock device section for this input. For example: MIS_AXIS.Device

3.1.3 Outputs

Output	Data Type
Busy	Bool
Done	Bool
Error	Bool
ReadValue	DWord

3.1.3.1 Error

Error is TRUE when an error occurs during the reading or writing of a register value.

3.1.3.2 Busy

Busy is TRUE whenever the command is in the process of reading or writing to a register and the Error output is FALSE.

3.1.3.3 Done

Done is TRUE when the read/write command has completed successfully.

3.1.3.4 ReadValue

The value of the register after reading.

4. MIS Function Blocks

4.1 JVL_MIS_Disable

4.1.1 Description

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

4.1.2 Inputs

Input	Data Type
Execute	Bool
Axis	JVL_MIS_AXIS

4.1.2.1 Execute

A rising edge is required to start the motion command. If the input is given a rising edge whilst a motion command is currently running, then the current motion command is over-riden/aborted. The input is not required to remain TRUE for the duration of the motion command.

4.1.2.2 Axis

The axis input should be linked to a datablock of type JVL_MIS_Axis. This datablock provides axis references to the unit and to its telegram slots.

4.1.3 Outputs

Output	Data Type
Busy	Bool
Done	Bool
Error	Bool

4.1.3.1 Error

Error is TRUE whenever there is an error in the drive, given by the ANY_ERR signal in the drive status word (DRIVE_DB.Telegram.Input.StatusWord, bit 24 of drive register 35 ERR_STAT). For more information on the error that occured, see the value of DRIVE_DB.Telegram.Input.StatusWord (drive register 35 ERR_STAT)

4.1.3.2 Busy

Busy is TRUE whenever the motion command is running (both when the motor is disabling and is disabled) and the Error output is FALSE.

4.1.3.3 Done

Done is TRUE when the motor has been successfully disabled.

4.1.3.4 CommandAborted

The motion command was aborted by another motion command, or the drive operating mode (DRIVE_DB.Telegram.Output.OperatingMode) was changed whilst the motion command was running. CommandAborted is TRUE for atleast one PLC cycle. CommandAborted is always FALSE if the Error output is TRUE.

4.2 JVL_MIS_Halt

4.2.1 Description

Brings the motor to a standstill.

4.2.2 Inputs

Input	Data Type	Units
Execute	Bool	
Deceleration	LReal	RPM/s
Axis	JVL_MIS_AXIS	

4.2.2.1 Execute

A rising edge is required to start the motion command.
If the input is given a rising edge whilst a motion command is currently running, then the current motion command is overriden/aborted.
The input is not required to remain TRUE for the duration of the motion command. Setting the value of Execute to FALSE during the motion command will not stop the motion command.

4.2.2.2 Velocity

The target velocity in RPM.
Giving a negative value will NOT reverse the motor direction.

4.2.2.3 Deceleration

The target deceleration in RPM/s.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 6 A_SOLL), a value of **at least** 150 RPM/s should be given, or the motion command will not execute.

4.2.2.4 Axis

The axis input should be linked to a datablock of type JVL_MIS_Axis. This datablock provides axis references to the unit and to its telegram slots.

4.2.3 Outputs

Output	Data Type
Busy	Bool
Done	Bool
CommandAborted	Bool
Error	Bool

4.2.3.1 Error

Error is TRUE whenever there is an error in the drive, given by the ANY_ERR signal in the drive status word (DRIVE_DB.Telegram.Input.StatusWord, bit 24 of drive register 35 ERR_STAT). For more information on the error that occured, see the value of DRIVE_DB.Telegram.Input.StatusWord (drive register 35 ERR_STAT)

4.2.3.2 Busy

Busy is TRUE whenever the motion command is running (both when the motor is accelerating and when 'At Velocty') and the Error output is FALSE.

4.2.3.3 Done

Done is TRUE when the motor has come to a standstill.

4.2.3.4 CommandAborted

The motion command was aborted by another motion command, or the drive operating mode (DRIVE_DB.Telegram.Output.OperatingMode) was changed whilst the motion command was running. CommandAborted is TRUE for atleast one PLC cycle. CommandAborted is always FALSE if

the Error output is TRUE.

4.3 JVL_MIS_Home

4.3.1 Description

Homes or references the motor position.

4.3.2 Inputs

Input	Data Type	Units
Execute	Bool	
Mode	Int	
Position	LReal	Counts
Velocity	LReal	RPM
Acceleration	LReal	RPM/s
Deceleration	LReal	RPM/s
Axis	JVL_MIS_AXIS	

4.3.2.1 Execute

A rising edge is required to start the motion command.
If the input is given a rising edge whilst a motion command is currently running, then the current motion command is overriden/aborted.
The input is not required to remain TRUE for the duration of the motion command.
Setting the value of Execute to FALSE during the motion command will not stop the motion command.

4.3.2.2 Mode

Set the homing method.

Value	Name
0	Set Home Position
1	Home to Sensor
2	Home to Endstop

4.3.2.2 Set Home Position

The current axis actual position is set to the value of the Position input. The axis does not move.

4.3.2.2 Home to Sensor

> Note: Please make sure to use Input 4 on the MIS device as the homing sensor.

4.3.2.2 Home to Endstop

4.3.2.3 Position

The new axis position, after referencing, in encoder counts.

4.3.2.4 Velocity

The target velocity in RPM.

4.3.2.5 Acceleration

The target acceleration in RPM/s.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 6 A_SOLL), a value of **at least** 150 RPM/s should be given, or the motion command will not execute.

4.3.2.6 Deceleration

The target deceleration in RPM/s. If set to 0, the value in Acceleration is used instead.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 174 D_SOLL), a value of **at least** 150 RPM/s should be given.

4.3.2.7 Axis

The axis input should be linked to a datablock of type JVL_MIS_Axis. This datablock provides axis references to the unit and to its telegram slots.

4.3.3 Outputs

Output	Data Type
Busy	Bool
Done	Bool
CommandAborted	Bool
Error	Bool

4.3.3.1 Error

Error is TRUE whenever there is an error in the drive, given by the ANY_ERR signal in the drive status word (DRIVE_DB.Telegram.Input.StatusWord, bit 24 of drive register 35 ERR_STAT). For more information on the error that occured, see the value of DRIVE_DB.Telegram.Input. StatusWord (drive register 35 ERR_STAT)

4.3.3.2 Busy

Busy is TRUE whenever the motion command is running and the Error output is FALSE.

4.3.3.3 Done

Done is TRUE when the homing sequence has completed and the axis has been successfully referenced.

4.3.3.4 CommandAborted

The motion command was aborted by another motion command, or the drive operating mode (DRIVE_DB.Telegram.Output.OperatingMode) was changed whilst the motion command was running. CommandAborted is TRUE for atleast one PLC cycle. CommandAborted is always FALSE if the Error output is TRUE.

4.4 JVL_MIS_Jog

4.4.1 Description

Run the motor at the specified velocity. The axis is stopped when the control inputs JogForwards and JogBackwards are reset.

4.4.2 Inputs

Input	Data Type	Units
JogForwards	Bool	
JogBackwards	Bool	
Velocity	LReal	RPM
Acceleration	LReal	RPM/s
Deceleration	LReal	RPM/s
Axis	JVL_MIS_AXIS	

4.4.2.1 JogForwards

When TRUE, the axis runs in the positive direction at the speed set in the Velocity input.

4.4.2.2 JogBackwards

When TRUE, the axis runs in the negative direction at the speed set in the Velocity input.

> Note: If JogForwards and JogBackwards are both set TRUE, the axis will come to a standstill.

4.4.2.3 Velocity

The target velocity in RPM. Giving a negative value will NOT reverse the motor direction.

4.4.2.4 Acceleration

The target acceleration in RPM/s.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 6 A_SOLL), a value of **at least** 150 RPM/s should be given, or the motion command will not execute.

4.4.2.5 Deceleration

The target deceleration in RPM/s. If set to 0, the value in Acceleration is used instead.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 174 D_SOLL), a value of **at least** 150 RPM/s should be given.

4.4.2.6 Axis

The axis input should be linked to a datablock of type JVL_MIS_Axis. This datablock provides axis references to the unit and to its telegram slots.

4.4.3 Outputs

Output	Data Type
Busy	Bool
AtVelocity	Bool
CommandAborted	Bool
Error	Bool

4.4.3.1 Error

Error is TRUE whenever there is an error in the drive, given by the ANY_ERR signal in the drive status word (DRIVE_DB.Telegram.Input.StatusWord, bit 24 of drive register 35 ERR_STAT). For more information on the error that occured, see the value of DRIVE_DB.Telegram.Input.StatusWord (drive register 35 ERR_STAT)

4.4.3.2 Busy

Busy is TRUE whenever the motion command is running (both when the motor is accelerating/decelerating and when 'At Velocty') and the Error output is FALSE.

4.4.3.3 AtVelocity

At Velocity is TRUE when the drive has reached the motion command target velocity and the Error output is FALSE.

4.4.3.4 CommandAborted

The motion command was aborted by another motion command, or the drive operating mode (DRIVE_DB.Telegram.Output.OperatingMode) was changed whilst the motion command was running. CommandAborted is TRUE for atleast one PLC cycle. CommandAborted is always FALSE if the Error output is TRUE.

4.5 JVL_MIS_Position

4.5.1 Description

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

4.5.2 Inputs

Input	Data Type	Units
Execute	Bool	
Position	LReal	Counts
Velocity	LReal	RPM
Acceleration	LReal	RPM/s
Deceleration	LReal	RPM/s
AbsolutePositioning	Bool	
Axis	JVL_MIS_AXIS	

4.5.2.1 Execute

A rising edge is required to start the motion command.
If the input is given a rising edge whilst a motion command is currently running, then the current motion command is overriden/aborted.
The input is not required to remain TRUE for the duration of the motion command. Setting the value of Execute to FALSE during the motion command will not stop the motion command.

4.5.2.2 Position

The axis target position, or distance to move, in encoder counts.
See AbsolutePositioning input.

4.5.2.3 Velocity

The target velocity in RPM.

4.5.2.4 Acceleration

The target acceleration in RPM/s.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 6 A_SOLL), a value of **at least** 150 RPM/s should be given, or the motion command will not execute.

4.5.2.5 Deceleration

The target deceleration in RPM/s. If set to 0, the value in Acceleration is used instead.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 174 D_SOLL), a value of **at least** 150 RPM/s should be given.

4.5.2.6 AbsolutePositioning

Choose between absolute or relative positioning.

Value	Description
TRUE	Absolute Positioning Selected
FALSE	Relative Positioning Selected

4.5.2.7 Axis

The axis input should be linked to a datablock of type JVL_MIS_Axis. This datablock provides axis references to the unit and to its telegram slots.

4.5.3 Outputs

Output	Data Type
Busy	Bool
Done	Bool
CommandAborted	Bool
Error	Bool

4.5.3.1 Error

Error is TRUE whenever there is an error in the drive, given by the ANY_ERR signal in the drive status word (DRIVE_DB.Telegram.Input.StatusWord, bit 24 of drive register 35 ERR_STAT). For more information on the error that occured, see the value of DRIVE_DB.Telegram.Input. StatusWord (drive register 35 ERR_STAT)

4.5.3.2 Busy

Busy is TRUE whenever the motion command is running (both when the motor is accelerating and when 'At Velocty') and the Error output is FALSE.

4.5.3.3 Done

Done is TRUE when the positioning command has completed successfully.

4.5.3.4 CommandAborted

The motion command was aborted by another motion command, or the drive operating mode (DRIVE_DB.Telegram.Output.OperatingMode) was changed whilst the motion command was running. CommandAborted is TRUE for atleast one PLC cycle. CommandAborted is always FALSE if the Error output is TRUE.

4.6 JVL_MIS_Reset

4.6.1 Description

Resets any errors or faults in the drive.

4.6.2 Inputs

Input	Data Type
Execute	Bool
Axis	JVL_MIS_AXIS

4.6.2.1 Execute

A rising edge is required to start the command.
If the input is given a rising edge whilst a command is currently running, then the current command is overriden/aborted.
The input is not required to remain TRUE for the duration of the command.
Setting the value of Execute to FALSE during the command will not stop the command.

4.6.2.2 Axis

The axis input should be linked to a datablock of type JVL_MIS_Axis. This datablock provides axis references to the unit and to its telegram slots.

4.6.3 Outputs

Output	Data Type
Busy	Bool
Done	Bool

4.6.3.1 Busy

Busy is TRUE whenever the command is in progress.

4.6.3.2 Done

Done is TRUE when the reset command has completed successfully.

4.7 JVL_MIS_Velocity

4.7.1 Description

Run the motor at the specified velocity.

4.7.2 Inputs

Input	Data Type	Units
Execute	Bool	
Velocity	LReal	RPM
Acceleration	LReal	RPM/s
Deceleration	LReal	RPM/s
Direction	Bool	
Axis	JVL_MIS_AXIS	

4.7.2.1 Execute

A rising edge is required to start the motion command.
If the input is given a rising edge whilst a motion command is currently running, then the current motion command is overriden/aborted.
The input is not required to remain TRUE for the duration of the motion command.
Setting the value of Execute to FALSE during the motion command will not stop the motion command.

4.7.2.2 Velocity

The target velocity in RPM.
Giving a negative value will NOT reverse the motor direction.

4.7.2.3 Acceleration

The target acceleration in RPM/s.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the tele-

> gram (register 6 A_SOLL), a value of **at least** 150 RPM/s should be given, or the motion command will not execute.

4.7.2.4 Deceleration

The target deceleration in RPM/s. If set to 0, the value in Acceleration is used instead.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 174 D_SOLL), a value of **at least** 150 RPM/s should be given.

4.7.2.5 Direction

Set the direction of travel.

Value	Description
TRUE	Positive motor direction (clockwise)
FALSE	Negative motor direction (counter-clockwise)

4.7.2.6 Axis

The axis input should be linked to a datablock of type JVL_MIS_Axis. This datablock provides axis references to the unit and to its telegram slots.

4.7.3 Outputs

Output	Data Type
Busy	Bool
AtVelocity	Bool
CommandAborted	Bool
Error	Bool

4.7.3.1 Error

Error is TRUE whenever there is an error in the drive, given by the ANY_ERR signal in the drive status word (DRIVE_DB.Telegram.Input.StatusWord, bit 24 of drive register 35 ERR_STAT). For more information on the error that occured, see the value of DRIVE_DB.Telegram.Input.StatusWord (drive register 35 ERR_STAT)

4.7.3.2 Busy

Busy is TRUE whenever the motion command is running (both when the motor is accelerating and when 'At Velocty') and the Error output is FALSE.

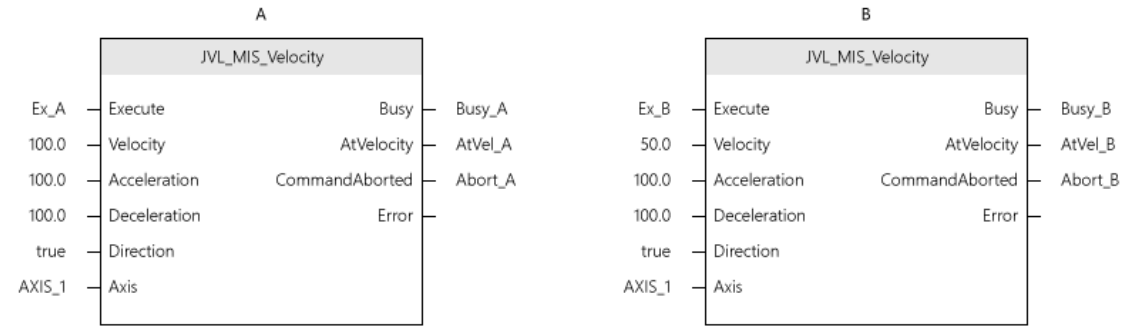
4.7.3.3 AtVelocity

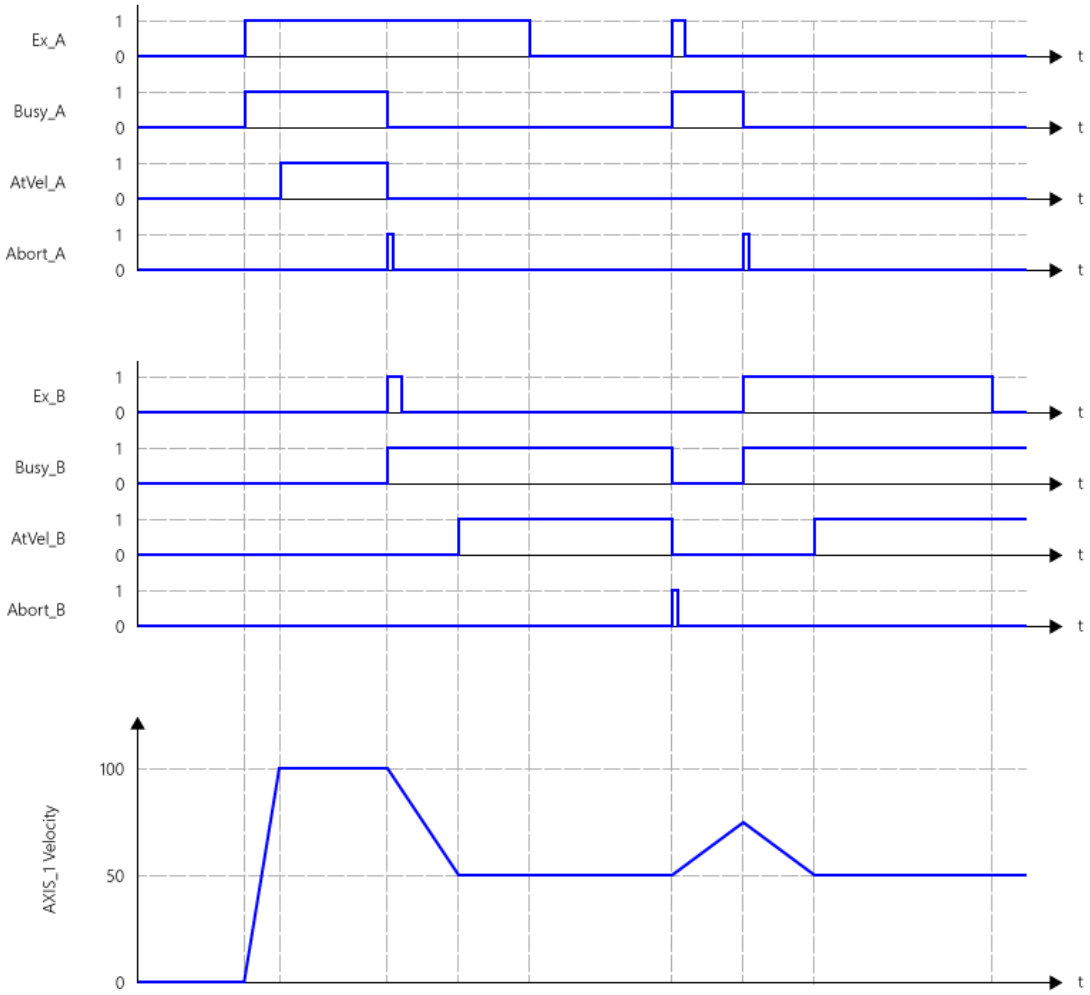
At Velocity is TRUE when the drive has reached the motion command target velocity and the Error output is FALSE.

4.7.3.4 CommandAborted

The motion command was aborted by another motion command, or the drive operating mode (DRIVE_DB.Telegram.Output.OperatingMode) was changed whilst the motion command was running. CommandAborted is TRUE for atleast one PLC cycle. CommandAborted is always FALSE if the Error output is TRUE.

4.7.4 Example Function Diagram





5. MAC Function Blocks

5.1 JVL_MAC_Disable

5.1.1 Description

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

5.1.2 Inputs

Input	Data Type
Execute	Bool
Axis	JVL_MAC_AXIS

5.1.2.1 Execute

A rising edge is required to start the motion command.
If the input is given a rising edge whilst a motion command is currently running, then the current motion command is overriden/aborted.
The input is not required to remain TRUE for the duration of the motion command.

5.1.2.2 Axis

The axis input should be linked to a datablock of type JVL_MAC_Axis. This datablock provides axis references to the unit and to its telegram slots.

5.1.3 Outputs

Output	Data Type
Busy	Bool
Done	Bool
Error	Bool

5.1.3.1 Error

Error is TRUE whenever there is an error in the drive, given by the ANY_ERR signal in the drive status word (DRIVE_DB.Telegram.Input.StatusWord, bit 24 of drive register 35 ERR_STAT). For more information on the error that occured, see the value of DRIVE_DB.Telegram.Input.StatusWord (drive register 35 ERR_STAT)

5.1.3.2 Busy

Busy is TRUE whenever the motion command is running (both when the motor is disabling and is disabled) and the Error output is FALSE.

5.1.3.3 Done

Done is TRUE when the motor has been successfully disabled.

5.1.3.4 CommandAborted

The motion command was aborted by another motion command, or the drive operating mode (DRIVE_DB.Telegram.Output.OperatingMode) was changed whilst the motion command was running. CommandAborted is TRUE for atleast one PLC cycle. CommandAborted is always FALSE if the Error output is TRUE.

5.2 JVL_MAC_Halt

5.2.1 Description

Brings the motor to a standstill.

5.2.2 Inputs

Input	Data Type	Units
Execute	Bool	
Deceleration	LReal	RPM/s
Axis	JVL_MAC_AXIS	

5.2.2.1 Execute

A rising edge is required to start the motion command.
If the input is given a rising edge whilst a motion command is currently running, then the current motion command is overriden/aborted.
The input is not required to remain TRUE for the duration of the motion command. Setting the value of Execute to FALSE during the motion command will not stop the motion command.

5.2.2.2 Velocity

The target velocity in RPM.
Giving a negative value will NOT reverse the motor direction.

5.2.2.3 Deceleration

The target deceleration in RPM/s.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 6 A_SOLL), a value of **at least** 150 RPM/s should be given, or the motion command will not execute.

5.2.2.4 Axis

The axis input should be linked to a datablock of type JVL_MAC_Axis. This datablock provides axis references to the unit and to its telegram slots.

5.2.3 Outputs

Output	Data Type
Busy	Bool
Done	Bool
CommandAborted	Bool
Error	Bool

5.2.3.1 Error

Error is TRUE whenever there is an error in the drive, given by the ANY_ERR signal in the drive status word (DRIVE_DB.Telegram.Input.StatusWord, bit 24 of drive register 35 ERR_STAT). For more information on the error that occured, see the value of DRIVE_DB.Telegram.Input. StatusWord (drive register 35 ERR_STAT)

5.2.3.2 Busy

Busy is TRUE whenever the motion command is running (both when the motor is accelerating and when 'At Velocty') and the Error output is FALSE.

5.2.3.3 Done

Done is TRUE when the motor has come to a standstill.

5.2.3.4 CommandAborted

The motion command was aborted by another motion command, or the drive operating mode (DRIVE_DB.Telegram.Output.OperatingMode) was changed whilst the motion command was running. CommandAborted is TRUE for atleast one PLC cycle. CommandAborted is always FALSE if

the Error output is TRUE.

5.3 JVL_MAC_Home

5.3.1 Description

Homes or references the motor position.

5.3.2 Inputs

Input	Data Type	Units
Execute	Bool	
Mode	Int	
Position	LReal	Counts
Velocity	LReal	RPM
Acceleration	LReal	RPM/s
Axis	JVL_MAC_AXIS	

5.3.2.1 Execute

A rising edge is required to start the motion command.
If the input is given a rising edge whilst a motion command is currently running, then the current motion command is overriden/aborted.
The input is not required to remain TRUE for the duration of the motion command.
Setting the value of Execute to FALSE during the motion command will not stop the motion command.

5.3.2.2 Mode

Set the homing method.

Value	Name
0	Set Home Position
1	Home to Sensor
2	Home to Endstop

5.3.2.2 Set Home Position

The current axis actual position is set to the value of the Position input. The axis does not move.

5.3.2.2 Home to Sensor

5.3.2.2 Home to Endstop

5.3.2.3 Position

The new axis position, after referencing, in encoder counts.

5.3.2.4 Velocity

The target velocity in RPM.

5.3.2.5 Acceleration

The target acceleration in RPM/s.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 6 A_SOLL), a value of **at least** 150 RPM/s should be given, or the motion command will not execute.

5.3.2.6 Axis

The axis input should be linked to a datablock of type JVL_MAC_Axis. This datablock provides axis references to the unit and to its telegram slots.

5.3.3 Outputs

Output	Data Type
Busy	Bool
Done	Bool
CommandAborted	Bool
Error	Bool

5.3.3.1 Error

Error is TRUE whenever there is an error in the drive, given by the ANY_ERR signal in the drive status word (DRIVE_DB.Telegram.Input.StatusWord, bit 24 of drive register 35 ERR_STAT). For more information on the error that occured, see the value of DRIVE_DB.Telegram.Input.

StatusWord (drive register 35 ERR_STAT)

5.3.3.2 Busy

Busy is TRUE whenever the motion command is running and the Error output is FALSE.

5.3.3.3 Done

Done is TRUE when the homing sequence has completed and the axis has been successfully referenced.

5.3.3.4 CommandAborted

The motion command was aborted by another motion command, or the drive operating mode (DRIVE_DB.Telegram.Output.OperatingMode) was changed whilst the motion command was running. CommandAborted is TRUE for atleast one PLC cycle. CommandAborted is always FALSE if the Error output is TRUE.

5.4 JVL_MAC_Jog

5.4.1 Description

Run the motor at the specified velocity. The axis is stopped when the control inputs JogForwards and JogBackwards are reset.

5.4.2 Inputs

Input	Data Type	Units
JogForwards	Bool	
JogBackwards	Bool	
Velocity	LReal	RPM
Acceleration	LReal	RPM/s
Axis	JVL_MAC_AXIS	

5.4.2.1 JogForwards

When TRUE, the axis runs in the positive direction at the speed set in the Velocity input.

5.4.2.2 JogBackwards

When TRUE, the axis runs in the negative direction at the speed set in the Velocity input.

> Note: If JogForwards and JogBackwards are both set TRUE, the axis will come to a standstill.

5.4.2.3 Velocity

The target velocity in RPM.
Giving a negative value will NOT reverse the motor direction.

5.4.2.4 Acceleration

The target acceleration in RPM/s.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 6 A_SOLL), a value of **at least** 150 RPM/s should be given, or the motion command will not execute.

5.4.2.5 Axis

The axis input should be linked to a datablock of type JVL_MAC_Axis. This datablock provides axis references to the unit and to its telegram slots.

5.4.3 Outputs

Output	Data Type
Busy	Bool
AtVelocity	Bool
CommandAborted	Bool
Error	Bool

5.4.3.1 Error

Error is TRUE whenever there is an error in the drive, given by the ANY_ERR signal in the drive status word (DRIVE_DB.Telegram.Input.StatusWord, bit 24 of drive register 35 ERR_STAT). For more information on the error that occured, see the value of DRIVE_DB.Telegram.Input. StatusWord (drive register 35 ERR_STAT)

5.4.3.2 Busy

Busy is TRUE whenever the motion command is running (both when the motor is accelerating/decelerating and when 'At Velocty') and the Error output is FALSE.

5.4.3.3 AtVelocity

At Velocity is TRUE when the drive has reached the motion command target velocity and the Error output is FALSE.

5.4.3.4 CommandAborted

The motion command was aborted by another motion command, or the drive operating mode (DRIVE_DB.Telegram.Output.OperatingMode) was changed whilst the motion command was running. CommandAborted is TRUE for atleast one PLC cycle. CommandAborted is always FALSE if the Error output is TRUE.

5.5 JVL_MAC_Position

5.5.1 Description

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

5.5.2 Inputs

Input	Data Type	Units
Execute	Bool	
Position	LReal	Counts
Velocity	LReal	RPM
Acceleration	LReal	RPM/s
AbsolutePositioning	Bool	
Axis	JVL_MAC_AXIS	

5.5.2.1 Execute

A rising edge is required to start the motion command.
If the input is given a rising edge whilst a motion command is currently running, then the current motion command is overriden/aborted.
The input is not required to remain TRUE for the duration of the motion command. Setting the value of Execute to FALSE during the motion command will not stop the motion command.

5.5.2.2 Position

The axis target position, or distance to move, in encoder counts.
See AbsolutePositioning input.

5.5.2.3 Velocity

The target velocity in RPM.

5.5.2.4 Acceleration

The target acceleration in RPM/s.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 6 A_SOLL), a value of **at least** 150 RPM/s should be given, or the motion command will not execute.

5.5.2.5 AbsolutePositioning

Choose between absolute or relative positioning.

Value	Description
TRUE	Absolute Positioning Selected
FALSE	Relative Positioning Selected

5.5.2.6 Axis

The axis input should be linked to a datablock of type JVL_MAC_Axis. This datablock provides axis references to the unit and to its telegram slots.

5.5.3 Outputs

Output	Data Type
Busy	Bool
Done	Bool
CommandAborted	Bool
Error	Bool

5.5.3.1 Error

Error is TRUE whenever there is an error in the drive, given by the ANY_ERR signal in the drive status word (DRIVE_DB.Telegram.Input.StatusWord, bit 24 of drive register 35 ERR_STAT). For more information on the error that occured, see the value of DRIVE_DB.Telegram.Input.StatusWord (drive register 35 ERR_STAT)

5.5.3.2 Busy

Busy is TRUE whenever the motion command is running (both when the motor is accelerating and when 'At Velocty') and the Error output is FALSE.

5.5.3.3 Done

Done is TRUE when the positioning command has completed successfully.

5.5.3.4 CommandAborted

The motion command was aborted by another motion command, or the drive operating mode (DRIVE_DB.Telegram.Output.OperatingMode) was changed whilst the motion command was running. CommandAborted is TRUE for atleast one PLC cycle. CommandAborted is always FALSE if the Error output is TRUE.

5.6 JVL_MAC_Reset

5.6.1 Description

Resets any errors or faults in the drive.

5.6.2 Inputs

Input	Data Type
Execute	Bool
Axis	JVL_MAC_AXIS

5.6.2.1 Execute

A rising edge is required to start the command.
If the input is given a rising edge whilst a command is currently running, then the current command is overriden/aborted.
The input is not required to remain TRUE for the duration of the command.
Setting the value of Execute to FALSE during the command will not stop the command.

5.6.2.2 Axis

The axis input should be linked to a datablock of type JVL_MAC_Axis. This datablock provides axis references to the unit and to its telegram slots.

5.6.3 Outputs

Output	Data Type
Busy	Bool
Done	Bool

5.6.3.1 Busy

Busy is TRUE whenever the command is in progress.

5.6.3.2 Done

Done is TRUE when the reset command has completed successfully.

5.7 JVL_MAC_Velocity

5.7.1 Description

Run the motor at the specified velocity.

5.7.2 Inputs

Input	Data Type	Units
Execute	Bool	
Velocity	LReal	RPM
Acceleration	LReal	RPM/s
Direction	Bool	
Axis	JVL_MAC_AXIS	

5.7.2.1 Execute

A rising edge is required to start the motion command.
If the input is given a rising edge whilst a motion command is currently running, then the current motion command is overriden/aborted.
The input is not required to remain TRUE for the duration of the motion command.
Setting the value of Execute to FALSE during the motion command will not stop the motion command.

5.7.2.2 Velocity

The target velocity in RPM.

Giving a negative value will NOT reverse the motor direction.

5.7.2.3 Acceleration

The target acceleration in RPM/s.

> Note: Due to the resolution of the acceleration/deceleration setpoint in the telegram (register 6 A_SOLL), a value of **at least** 150 RPM/s should be given, or the motion command will not execute.

5.7.2.4 Direction

Set the direction of travel.

Value	Description
TRUE	Positive motor direction (clockwise)
FALSE	Negative motor direction (counter-clockwise)

5.7.2.5 Axis

The axis input should be linked to a datablock of type JVL_MAC_Axis. This datablock provides axis references to the unit and to its telegram slots.

5.7.3 Outputs

Output	Data Type
Busy	Bool
AtVelocity	Bool
CommandAborted	Bool
Error	Bool

5.7.3.1 Error

Error is TRUE whenever there is an error in the drive, given by the ANY_ERR signal in the drive status word (DRIVE_DB.Telegram.Input.StatusWord, bit 24 of drive register 35 ERR_STAT). For more information on the error that occured, see the value of DRIVE_DB.Telegram.Input. StatusWord (drive register 35 ERR_STAT)

5.7.3.2 Busy

Busy is TRUE whenever the motion command is running (both when the motor is accelerating and when 'At Velocty') and the Error output is FALSE.

5.7.3.3 AtVelocity

At Velocity is TRUE when the drive has reached the motion command target velocity and the Error output is FALSE.

5.7.3.4 CommandAborted

The motion command was aborted by another motion command, or the drive operating mode (DRIVE_DB.Telegram.Output.OperatingMode) was changed whilst the motion command was running. CommandAborted is TRUE for atleast one PLC cycle. CommandAborted is always FALSE if the Error output is TRUE.

5.7.4 Example Function Diagram

