

# Control a JVL motor from a Universal Robots robot via Modbus TCP

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This document is aimed at robot technicians that need an external motor for a robot application. This document describes the setup process for communicating with the motor. The data is accessible through variables in the robot scripts.

The communication used is Modbus TCP. The JVL device is a Modbus slave, so this guide configures a Modbus slave in the Universal Robots robot.

# 1. Network Configuration

Make sure that robot and motor are connected to the same network and network mask.

In this scenario both robot and motor are connected to network 192.168.0.0 / 24

Before setting the Ethernet settings in the JVL device, read the robot network setup to know the assigned network. Find a vacant IP address for the JVL device on the same network.

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#### **Robot network**

Program Installation Move	a VO Log		New Opert Save		
		Settings			
> Preferences	Network				
> Password	Select your network method				
✔ System	O DHCP				
System	O Static Address				
Robot Registration	O Disabled network				
URCaps	Not connected to network!				
Remote	IP address:		19	2.168.0.100	
Constrained	Subnet mask	:	25	5.255.255.0	
Freedrive	Default gate	vay:		192.168.0.1	
Network	Proformed DN	IS convor		192 168 0 1	
Update		NS server		0.0.0.0	
> Security	A RECENTALIVE D			0.0.00	
				Apply	
Exit					

#### JVL motor network

Make sure that the JVL device includes Modbus TCP firmware, and the Modbus tab is shown in MacTalk®.

٨M	1acTalk®	) – Nona	ame											
Files	Motor	ePLC	Setup	Updates	Window	Help								
1		~			-	1	0,0	Ę	1	4	الله →		STOP	
	)pen		Save	S(	ave in Motor	Reset	Position	Clear	Errors	Reset Moto	r Filter Setup.		STOP Motor	What
	Serial port	:			$\sim$ $\bullet$	Comport	::6	∼ Ba	ud: 19.200	0 ~	Motor Address	s: All	∼ Sca	an
Maii —Set	n Regist	ters A	dvanced	Event Lo	g Tests	Scope	ePLC	MACOO-E	M -Modbu	ISTCP Units	(Disabled) Ho	ming		
	Ethernet :	settings					Cyclic	data seti	up (32bit)-					
	IP addres	55	192	.168.200.1	192.168. 0.	.150	Read	Word1	0 - No Se	election		$\sim$	Entry '35 - En is mandatory	rors'
	Subnet m	nask	255	.255.255.0	255.255.25	5.0	Read	Word2	0 - No Se	election		$\sim$	is mandacory.	
ШГ	Defaultio	atoway	100	469 200 4	192 168 -0	1	Read	Word3	0 - No Se	election		$\sim$		
		acemay	102		192,100, 0,	-	Read	Word4	0 - No Se	election		$\sim$		
	Use	DHCP t	o optain l	P address			Read	Word5	0 - No Se	ection		$\sim$		

# 2. Create Modbus TCP Master

Navigate to the fieldbus configuration on the Universal Robots Polyscope software.

This guide is made with version 5.8 of Polyscope.

- # Press the Installation menu
- # Go to the Fieldbus setting

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#### # Select the Modbus configuration

# Add a Modbus master by selecting "Add MODBUS Unit"



#### A new master can be configured

# Enter the address of the slave. This should be the address of the motor slave. In this case IP address 192.168.0.150.

# The register type should be "Register Output" for holding registers, which is the type used in JVL Modbus slaves.

"Register Output" reads the register cyclic, and if there is a change, the robot sends a write "single register" until the slave has confirmed the message.

"Register Input" writes to the slave cyclic.

# The address is set to the Modbus address you should read or write

# The name is the variable identifier used in your robot script.

IODBUS client IO Setup				
		Add MODBUS Unit		
IP address 192.	168.0.150			Delete Unit
Type Register Output	Address	Name MODBUS_1	Value 65535	Delete
		Add New Signal	]	

#### Reading more Modbus registers

#### Add New Signal

Press the "Add New Signal" button. Enter the address of the Modbus register, and give it a name to use in the Robot script.



### 3. Calculating the Modbus Addresses

All registers in JVL motors are 32 bit. This means that all registers occupy two Modbus addresses: a low word part, and a high word part.

E.g. to read the position in the motor from the Actual Position register 10 you need to read these addresses:

Low word address = register \* 2 =  $10 \times 2$  = 20 High word address = register \* 2 + 1 =  $(10 \times 2) + 1$  = 21

# 4. Setup Example

This is an example where the following are accessed in a JVL device.

Actual Position (P_IST):	address 20 and 21
Mode (MODE_REG):	address 4 (high word is not used)
Requested Position (P_SOLL):	address 6 and 7
Requested Velocity (V_SOLL):	address 10 and 11

IP address 192.168.0.15	0	
Туре	Address	Name
Register Output	20	ACTPOS_LOWORD
Register Output 🔻	21	ACTPOS_HIWORD
Register Output 🔻	4	SETMODE
Register Output 🔻	6	REQPOS_LOWORD
Register Output 🔻	7	REQPOS_HIWORD
Register Output 🔻	10	REQVEL_LOWORD
Register Output	11	REQVEL_HIWORD

**NB**. You can find a list of motor registers in the relevant user manuals for the ServoStep<sup>™</sup> and the MAC motor<sup>®</sup> series. Go to www.jvl.dk and click Downloads:

JVL Literature



JVL A/S publishes a wide selction of literature to help our customers to get full and precise information about our products before a purchase and to get full information about their use after a purchase. Here you have the possibility to download what you need of information.

Getting Started - Help for MAC and MIS and other JVL products
User Manuals

Datasheets, Brochures, JVL News, Technical News, Application Notes
Special documents: UL, CE, RoHS, ISO-9001 and others