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EXCEED YOUR VISION

VT6L All-in-One 6-Axis Robot

The ultra affordable all-in-one solution that's compact and easy to use.

Full featured; ultra low cost — the same powerful features found in Epson's high-end robots at an incredibly affordable price; with a reach up to 900 mm and payload up to 6 kg

Easy to use — intuitive and feature-packed Epson RC+® development software makes it easy to create powerful solutions

All-in-One solution — space-saving design with built-in controller

SlimLine design — compact wrist pitch enables access to hard-to-reach areas in confined spaces

Comes standard with 110 V and 220 V power — low wattage and power consumption

Fast, easy integration — installs in minutes; requires less time and money for system integration

Integrated vision guidance option — designed specifically for robot guidance; makes it easy to automate simple applications when vision is required

Simplified cabling — hollow end-of-arm design makes end-of-arm tooling easier than ever

No battery required for encoder — minimizes downtime and reduces overall cost of ownership

Application versatility — ideal for machine-tool and injection-molding load/unload, pick and place, dispensing and simple assembly projects

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Specifications

Mounting Type[1] Tabletop/Ceiling/Wall Mount
Arm Length 920 mm
Repeatability Joints #1 - 6 ±0.1 mm
Payload
Rated 3 kg
Max. 6 kg
Standard Cycle Time[2] 0.60 sec
Max. Motion Range
Joint #1 ±170 deg
Joint #2 -160 deg ~ +65 deg (225 deg)
Joint #3 -51 deg ~ +190 deg (241 deg)
Joint #4 ±200 deg
Joint #5 ±125 deg
Joint #6 ±360 deg
Max. Reach
P Point: Joints #1-5 Center 920 mm
P Point: Joints #1-6 Flange Surface 1,000 mm
Allowable Moment of Inertia[3]
Joint #4 0.3 kg·m²
Joint #5 0.3 kg·m²
Joint #6 0.1 kg·m²
Standard I/O In 24/Out 16
Remote I/O In 8/Out 8
(Remote function assigned to standard I/O)
Brake All axes

Other

Power AC 100-240 V Single Phase
Power Consumption 1.2 kVA
Power Cable Length 5 m
Weight (cables not included) 40 kg; 88.2 lb
Applicable Controller Built-in
Installation Environment Standard
Safety Standard
CE Mark; EMC directive, machinery directive, RoHS directive
ANSI/RIA R15.06-2012
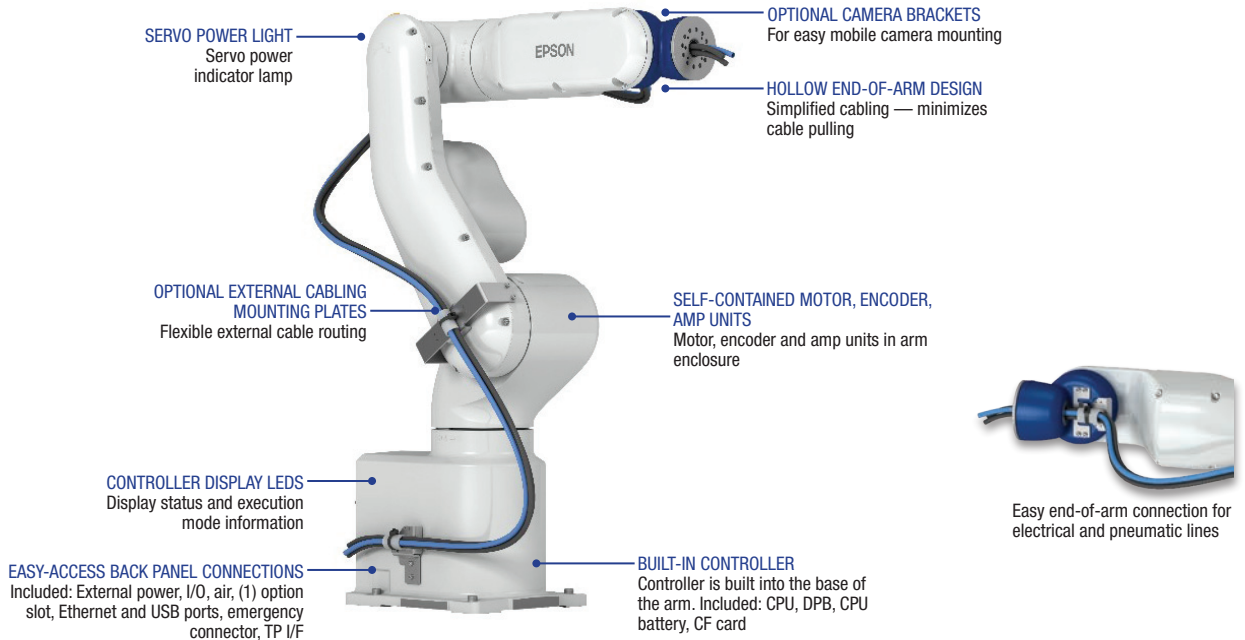NFPA 79 (2007 Edition)

What's in the Box

VT6L All-in-One 6-Axis Robot
Robot power cable
Epson® RC+ software
USB cable
E-Stop unit with cable
VT6L Robot System Safety & Installation Manual
Connector set (I/O, hand I/O and safety circuit connectors)

Support

Customer Service (562) 290-5920
service@robots.epson.com
Applications Support (562) 290-5930
applications@robots.epson.com
Sales Inquiries (562) 290-5997
info@robots.epson.com

Ordering Information

Product Name	Product Code
VT6L	VT6L-A901SS
Options	
Vision Guide CV2	Available
Vision Guide PV1	Available
VT6L External Cable Mounting Plates	R12NZ900ZW
VT6L Camera Mounting Bracket	R12NZ900ZZ
OCR (for use with Vision Guide)	R12NZ920H3
Epson RC+ 7.0 API	R12NZ920AE
GUI Builder 7.0	R12NZ900AH
External Control Point (ECP) Option	R12NZ900AF
TP3 – Teach Pendant	R12NZ900N3
TP2 – Teach Pendant	R12NZ900L9
Ethernet/IP Fieldbus I/O (Slave)	R12NZ900TH
Ethernet/IP Fieldbus I/O (Master)	R12NZ900NZ
DeviceNet Fieldbus I/O (Slave)	R12NZ900TE
DeviceNet Fieldbus I/O (Master)	R12NZ900NX
PROFINET Fieldbus I/O (Slave)	R12NZ900TG
PROFIBUS Fieldbus I/O (Slave)	R12NZ900TF
PROFIBUS Fieldbus I/O (Master)	R12NZ900NY
EtherCAT Fieldbus I/O (Slave)	R12NZ900TX
CC-Link Fieldbus I/O (Slave)	R12NZ900TD

SERVO POWER LIGHT
Servo power indicator lamp

OPTIONAL CAMERA BRACKETS
For easy mobile camera mounting

HOLLOW END-OF-ARM DESIGN
Simplified cabling — minimizes cable pulling

OPTIONAL EXTERNAL CABLING MOUNTING PLATES
Flexible external cable routing

SELF-CONTAINED MOTOR, ENCODER, AMP UNITS
Motor, encoder and amp units in arm enclosure

CONTROLLER DISPLAY LEDS
Display status and execution mode information

EASY-ACCESS BACK PANEL CONNECTIONS
Included: External power, I/O, air, (1) option slot, Ethernet and USB ports, emergency connector, TP I/F

BUILT-IN CONTROLLER
Controller is built into the base of the arm. Included: CPU, DPB, CPU battery, CF card

Easy end-of-arm connection for electrical and pneumatic lines

1 Default software setting is "tabletop." To use the VT6L in a wall or ceiling mount configuration requires changing the model setting in Epson RC+. | 2 Cycle time based on round-trip arch motion (300 mm horizontal, 25 mm vertical) with 2 kg payload (path coordinates optimized for maximum speed). | 3 If the center of gravity is at the center of each arm. If the center of gravity is not at the center of each arm, set the eccentric quantity using inertia command.

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RG2 Gripper Datasheet

The RG2 gripper is a flexible electric gripper specially designed for robots from Universal Robots. The long stroke allows the gripper to handle a variety of object sizes. Adjusting the gripping force allows the gripper to handle both delicate and heavy object. The standard fingers can be used with many different object. It is also possible to fit custom fingers. The installation complexity is minimal as the cable attaches directly onto any robot from Universal Robots. All configurations of the gripper is controlled from the Universal Robots software.

Features

- **Simple installation**
  Runs directly from the robot.

- **Integrated control board**
  No need for wiring or external programming.

- **Flexible**
  handles many different object.
  Easily reconfigured.

- **Supports two grippers**
  Two grippers can be operated without any extra wiring.

- **Adjustable force**
  Is set in the Universal Robots software.

- **Wide work range**
  Allows handling of multiple sized objects.

- **Quick finger change**

- **Plug n' play**
  Mount, connect, run script - Automate

- **Simple programming**
  As simple as setting variables.

- **Failsafe operation**
  In case of powesr loss the gripping force is maintained.

- **Force and Width detection**
  Uses I/O's to give feedback on reached force or Width.

- **Analog width feedback**
  One of the analog input on the robot is always corresponding to the present finger position.

- **Tool output extension**
  The robot tool connecter is extended to the gripper connector

Technical data	Min	Typical	Max	Units
Total stroke (adjustable)	0	-	110	[mm]
Finger position resolution	-	0,1	-	[mm]
Repetition accuracy	-	0,1	0,2	[mm]
Reversing backlash	0,2	0,4	0,6	[mm]
Gripping force (adjustable)	3	-	40	[N]
Gripping force accuracy	±0,05	±1	±2	[N]
Gripping speed*	55	110	184	[mm/s]
Gripping time**	0,04	0,07	0,11	[s]
Operating voltage***	10	24	26	[V DC]
Power consumption	1,9	-	14,4	[W]
Maximum Current	25	-	600	[mA]
Ambient operating temperature	5	-	50	[°C]
Storage temperature	0	-	60	[°C]
Product weight	-	0,65	-	[kg]

* see speed table
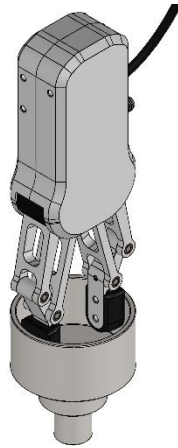** based on 8mm total movement between fingers, see speed table
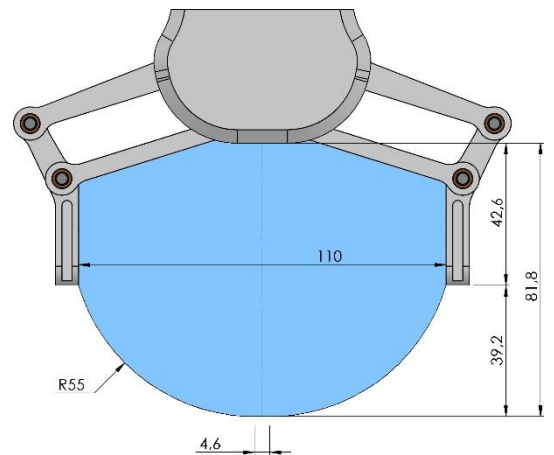***At 12V the gripper runs at approximately half the normal speed
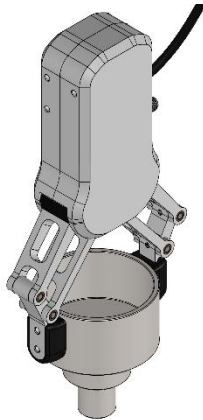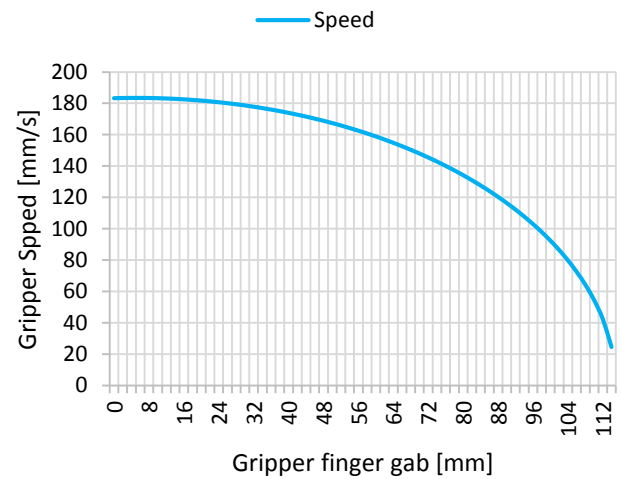
### External Grip

Internal Grip

Fingers are rotated.

110

42,6

81,8

39,2

R55

4,6

Gripping speed

The Speed table are illustrating the difference in speed relative to the gripper finger position.

── Speed

Gripper Spped [mm/s]

200
180
160
140
120
100
80
60
40
20
0

0 8 16 24 32 40 48 56 64 72 80 88 96 104 112

Gripper finger gab [mm]

Load capacity

Parameter	Static	Unit
Fy	362	[N]
Mx	7,55	[Nm]
My	4,1	[Nm]
Mz	6,92	[Nm]
Mx_1	22	[Nm]
My_1	11	[Nm]
Mz_1	22	[Nm]

The parameters in the finger tips are calculated at the shown closed position and will change in relation to the finger positions.
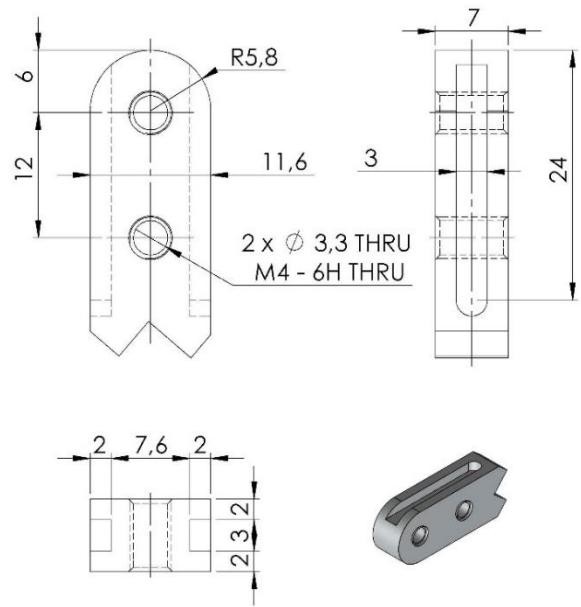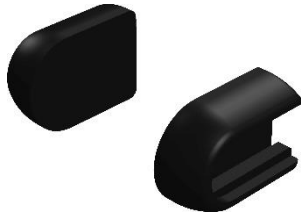
My_1

Fy

Mx_1

Mz_1

Mz

Mx

My
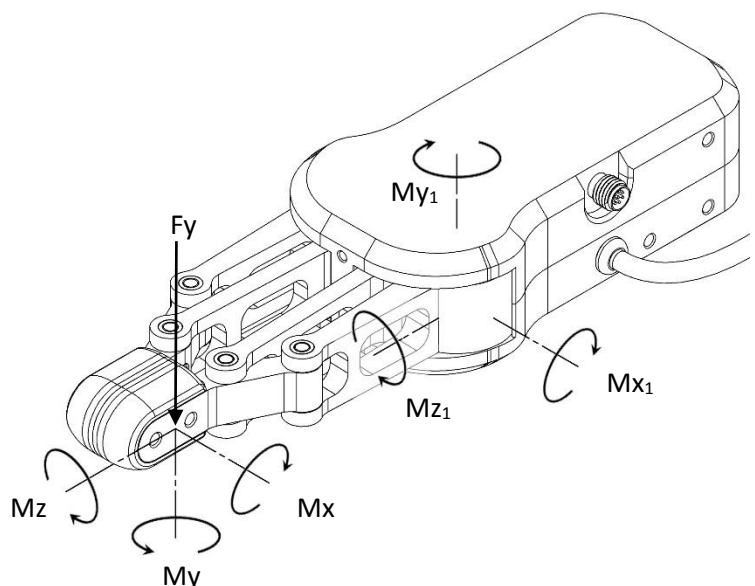
Fingers

The Standard fingers can be used for many different workpieces. If custom fingers are required, they can be made to fit the gripper finger tips.
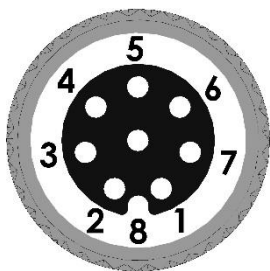
Standard fingers
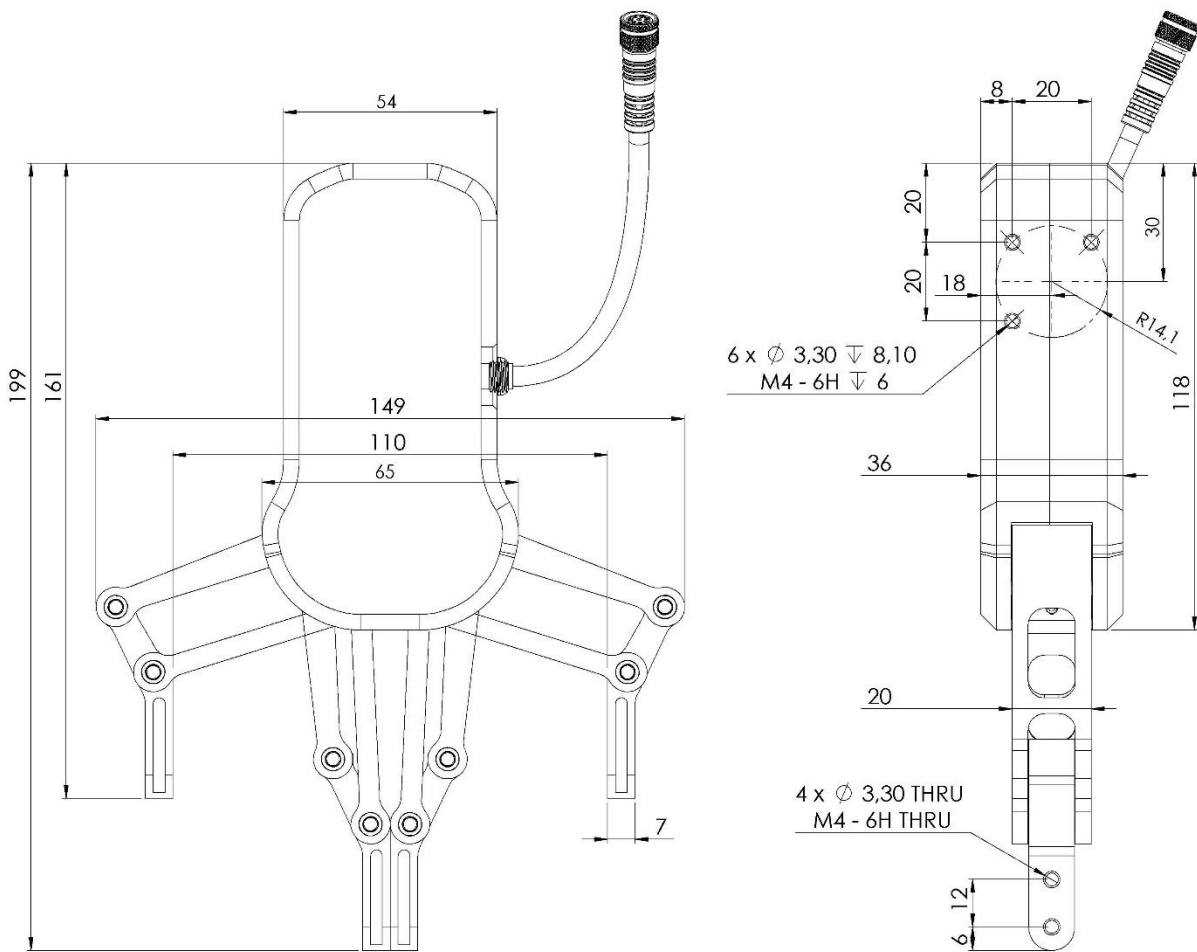
For a variety of workpieces

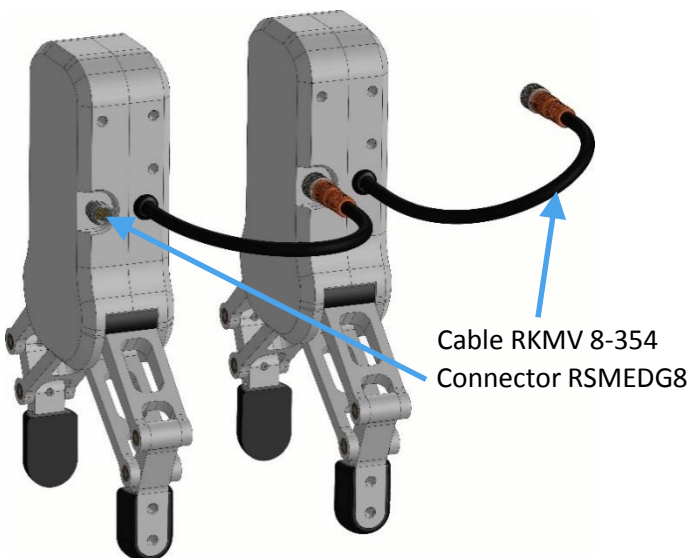Dimensions of the gripper aluminum finger tips

Tool connector pinout

pin	wire	UR I/O	UR I/O V3
1	White	AI2	Tool analog input 2
2	Brown	AI3	Tool analog input 3
3	Green	DI9	Tool input 1
4	Yellow	DI8	Tool input 0
5	Gray	Power	24V DC
6	Pink	DO9	Tool output 1
7	Blue	DO8	Tool output 0
8	Red	GND	0V DC

Mechanical dimensions

Gripper output connector

When one gripper is connected to another via the gripper output connector. The first gripper in the chain (from the robot) becomes master and the second slave. This makes it possible to use both grippers individually using only to digital outputs from the robot.

Cable RKMV 8-354
Connector RSMEDG8

Teach Mode

When the robot is turned on, you can use the gripper without programming it first. Use the tool output I/O's. The table to the right is shows the preset configuration.

1) Go to the I/O screen on the teach pendant
2) Turn on 24V in the tool section
3) Use DO8(0) to move the gripper

4) And DO9(1) to select High or Low Force

Teach Mode	Tool Outputs	
UR Version 3	**0**	**1**
UR Version 1 & 2	**DO8**	**DO9**
Open Gripper (110mm)	Off	-
Close Gripper (0mm)	On	-
High Force (40N)	-	Off
Low Force (5N)	-	On

Controlling the gripper

In the **SubProg_2Pos_2Force.urp** program you have two options for setting Width and two for Force. Set the variables to the desired forces and widths.

The table shows how to use it.

Control Gripper	Tool Outputs	
UR Version 3	**0**	**1**
UR Version 1 & 2	**DO8**	**DO9**
Width_DO8_Off	Off	-
Width_DO8_On	On	-
Force_DO9_Off	-	Off
Force_DO9_On	-	On

I/O Feedback

The gripper uses DI8, DI9 and AI3 to give feedback on its status and finger position.

Use DI8 to detect if the gripper grabbed a workpiece or stopped at a given position.

DI9 will go LO (Busy) when the gripper is programmed, moving or changing force.

Digital status Feedback	Tool Inputs	
UR Version 3	**0**	**1**
UR Version 1 & 2	**DI8**	**DI9**
Position Reached	LO	-
Force Reached	HI	-
Gripper Busy	-	LO
Gripper Ready	-	HI

Analog feedback

AI2 outputs a voltage correspondingto the gripper width.

Analog Feedback			
	UR Input	Voltage	Width
Actual Width @ 0V:5V	AI2	0…3.7V*	0…110mm
Actual Width @ 0V:10V	AI2	0…3.0V*	0…110mm

* Due to the gripper analog output resistance (10kΩ), the analog feedback voltage will be affected by the robot input resistance. For the robots from Universal Robots, the input resistance is 29kΩ @ 0V:5V and 15kΩ @ 0V:10V, that result in a maximum input voltage of $5V \cdot \frac{29k\Omega}{10k\Omega+29k\Omega} = 3.7V @ 0V: 5V$ and

$5V \cdot \frac{15k\Omega}{10k\Omega+15k\Omega} = 3.0V @ 0V: 10V$ which correspond to the maximum width of 110mm.

The actual width can be calculated by $\frac{voltage}{maximum\ input\ voltage} \cdot 110mm$.

Controlling two grippers

In the **SubProg_Duo_2Pos_1Force.urp** program, each gripper have two positions they can shift between.
They share one Force. Set the variables to the desired force and widths in the program tree.

Control Grippers	Tool Outputs	
UR Version 3	0	1
UR Version 1 & 2	DO8	DO9
Master_DO8_Off	Off	-
Master_DO8_On	On	-
Slave_DO9_Off	-	Off
Slave_DO9_On	-	On