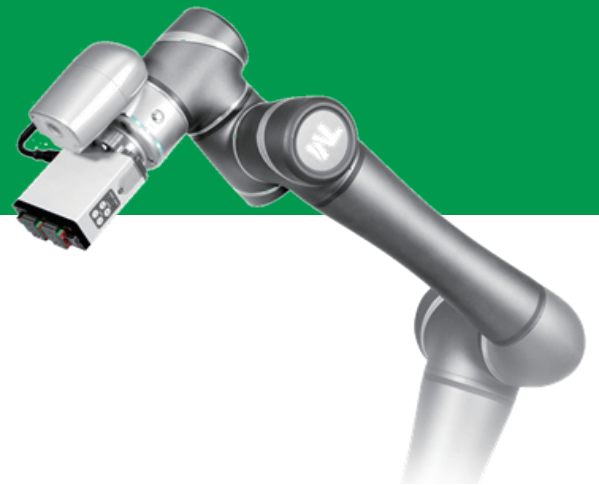




S-Series and X-Series Electric Grippers

TM Technical Manual Guide



Original Instruction





Multi-Axis Robot

- Pick-and-Place / Assembly / Array and Packaging / Semiconductor / Electro-Optical Industry / Automotive Industry / Food Industry
- Articulated Robot
 - Delta Robot
 - SCARA Robot
 - Wafer Robot
 - Electric Gripper
 - Integrated Electric Gripper
 - Rotary Joint



Single-Axis Robot

- Precision / Semiconductor / Medical / FPD
- KK, SK
 - KS, KA
 - KU, KE, KC



Torque Motor

Rotary Table

- Medical / Automotive Industry / Machine Tools / Machinery Industry
- RAB Series
 - RAS Series
 - RCV Series
 - RCH Series



Ballscrew

- Precision Ground / Rolled
- Super S Series
 - Super T Series
 - Mini Roller
 - Ecological & Economical Lubrication Module E2
 - Rotating Nut (R1)
 - Energy-Saving & Thermal-Controlling (Cool Type)
 - Heavy Load Series (RD)
 - Ball Spline



Linear Guideway

- Automation / Semiconductor / Medical
- Ball Type--HG, EG, WE, MG, CG
 - Quiet Type--QH, QE, QW, QR
 - Other--RG, E2, PG, SE, RC



Bearing

- Machine Tools / Robot
- Crossed Roller Bearing
 - Ballscrew Bearing
 - Linear Bearing
 - Support Unit



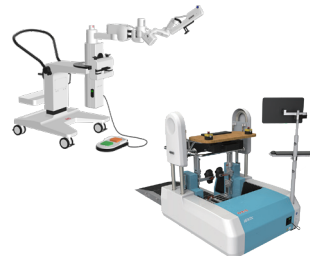
DATORKER® Robot Reducer

- Robot / Automation Equipment / Semiconductor Equipment / Machine Tools
- WUT-PO Type
 - WUI-CO Type
 - WTI-PH Type
 - WTI-AH Type



AC Servo Motor & Drive

- Semiconductor / Packaging Machine / SMT / Food Industry / LCD
- Drives--D1, D2T/D2T-LM, E1
 - Motors--50W-2000W



Medical Equipment

- Hospital / Rehabilitation Centers / Nursing Homes
- Robotic Gait Training System
 - Robotic Endoscope Holder



Linear Motor Stage

- Automated Transport / AOI Application / Precision / Semiconductor
- Iron-core Linear Motor
 - Coreless Linear Motor
 - Linear Turbo Motor LMT
 - Planar Servo Motor
 - Air Bearing Platform
 - X-Y Stage • Gantry Systems
 - Single-Axis Linear Motor Stage



Torque Motor & Direct Drive Motor

- Machine Tools
- Torque Motor--TM-2/IM-2, TMRW Series
- Inspection / Testing Equipment / Robot
- Direct Drive Motor--DMS, DMY, DMN, DMT Series

Contents

<u>1.</u>	<u>General Product Introduction</u>	<u>2</u>
<u>2.</u>	<u>Warranty</u>	<u>3</u>
<u>3.</u>	<u>Technical Information</u>	<u>4</u>
3.1.	Integrated parallel electric gripper S-series	4
3.2.	Parallel electric gripper X-series.....	5
<u>4.</u>	<u>S-Series Getting Started</u>	<u>6</u>
4.1.	What's in the box?	6
4.2.	Mechanical mounting.....	7
4.3.	Electrical mounting	9
4.4.	Installing TM Plug&Play software package	10
4.5.	TM Plug&Play components.....	12
4.6.	Function button descriptions.....	15
<u>5.</u>	<u>X-Series Getting Started</u>	<u>18</u>
5.1.	What's in the box?	18
5.2.	Mechanical mounting.....	22
5.3.	Electric mounting	27
5.4.	Installing TM Plug&Play software package	31
5.5.	TM Plug&Play component	34
	<u>Appendix.1 : Example program</u>	<u>42</u>
	<u>Appendix.2 : Certification.....</u>	<u>44</u>

1. General Product Introduction

HIWIN is a world leader in reliable and precise linear motion. We offer several plug-and-play solutions for collaborative robots in automation. This manual describes the operation procedures of HIWIN's parallel electric gripper, the S-series and the X-series. HIWIN's electric grippers are made with ball-screws and linear guideways from HIWIN itself which allows us to offer our customers a reliable and high-quality gripping solution at a reasonable price range.

The **S-series Electric Grippers**, S for Simple, includes two different models: SEG-24, with two fingers, and STG-16 with three. This series is characterized by the simplicity of operation, possible thanks to the controller integrated on the body of the gripper itself. Users can simply control this gripper with digital Input/Output discrete signals, to open and close the gripper. For the SEG-24, it is also possible to set in advance the opening and closing position of the gripper, with the intuitive buttons on the side of the gripper. For more information, please refer to the following:

[https://www.hiwin.tw/download/tech_doc/ee/Integrated_Electric_Gripper-\(E\).pdf](https://www.hiwin.tw/download/tech_doc/ee/Integrated_Electric_Gripper-(E).pdf)

The **X-series Electric Grippers**, X for expert, includes five different models depending on the gripping stroke and force required. This series is characterized by the flexibility of the control system possible thanks to the second-generation gripper controller XEG-C2. Users can choose to run the gripper in position control with the move function, for fast positioning, or to use force control with the grip function, to grasp object with a pre-defined certain force, depending on the object. For more information, please refer to the following:

[https://www.hiwin.tw/download/tech_doc/ee/Electric_Gripper-\(E\).pdf](https://www.hiwin.tw/download/tech_doc/ee/Electric_Gripper-(E).pdf)

2. Warranty

The warranty period for the product is 12 months or 5 million operations (whichever comes first), but it does not include any of the following causes of failure:

- ⊙ Beyond the operation method, operating environment and storage specifications defined in the product manual.
- ⊙ The damage caused by installation place movement, change of working environment, or improper transfer after being installed by a professional installer.
- ⊙ Product damaged due to collision or accident caused by improper operation or installation.

The following conditions are not covered by the warranty:

- ⊙ Product serial number or date of production(month and year) cannot be verified.
- ⊙ Gripper body and control components using non-HIWIN original products.
- ⊙ Adding or removing any element into/out the gripper or the controller.
- ⊙ Modifying the wire or the cables between the gripper body and the controller.
- ⊙ Any modification of the appearance of the gripper or controller; Removal of the components inside the gripper or the controller. e.g., demolition of the outer covering, product drilling or cutting.
- ⊙ Damage caused by any natural disaster. i.e., fire, earthquake, tsunami, lightning, windstorms, floods etc.

HIWIN does not provide any warranty or compensation to all the damage caused by above-mentioned circumstances unless the user can prove that the product is defective.

For more information towards warranty terms and conditions, please contact the technician or the dealer who you purchased with.

3. Technical Information

3.1. Integrated parallel electric gripper S-series

Model			SEG-24	STG-16
Category	Item	Unit	Value	
Motion specifications	Stroke per side	mm	12	8
	Gripping force	N	35 [Note2]	40 [Note1]
	Gripping speed	mm/s	15(45) [Note3]	30
	Repeatability	mm	±0.1	±0.1
Power specifications	Operation voltage	V	24±10%	24±10%
	Operation current	A	0.5	0.5
Load	Load torque Mr	N-m	11.76	7
	Load torque Mp	N-m	7.35	4.5
	Load torque My	N-m	7.35	4.5
	Load strength F	N	254.8	196
Hardware specifications	Weight	kg	0.7	0.7
	IP class	-	IP20	IP40
	Cleanroom class	-	-	-
	Operation temperature	°C	5-45	5-45
	Operation humidity	%RH	< 85	< 85
	Storage temperature	°C	0-60	0-60
	Total length	mm	105.5	72.3
	Total height	mm	88	100
Total thickness	mm	38	100	

[Note 1] This gripping force is measured at a gripping point (L) of 20mm with a gripping force accuracy of ±25%.

[Note 2] This gripping force is measured at a gripping point (L) of 20mm with a gripping force accuracy of ±30%.

[Note 3] Moving velocity is 45mm/s.

[Description 1] Gripping force is recommended to be 10 to 20 times the weight of gripped object.

[Description 2] High-speed movement or rotation after gripping requires the weight of object to be reduced.

[Description 3] Material, shape, grip area, etc. of gripping part will affect the maximum weight of gripped object, and the gripping part required to be installed before gripping.

3.2. Parallel electric gripper X-series

Model		XEG-16	XEG-32	XEG-48	XEG-64	XEG-32-PR	
Electric Gripper	Stroke [both sides] (mm)	16 ±0.5	32 ±0.5	48 ±0.5	64 ±0.5	32 ±0.5	
	Gripping Force (N)	25~50	60~150	135~270	180~450	75~150	
	Speed (mm/s)	Motion	1~60	1~80	1~80	1~100	1~60
		Gripping [Note 2]	1~10	1~20	1~20	1~20	1~10
	Repeatability (mm)	±0.01	±0.01	±0.02	±0.02	±0.01	
	Weight (kg)	0.4	0.7	1.5	1.9	1.1	
	IP Class	IP20				IP65	
	Cleanroom Class	ISO Class 5 (Class 100)				ISO Class 3 (Class 1)	
	Drive Device	Single-Axis Robot					
	Grease Supply of Drive Device [Note 3]	500,000 cycles or 6 months					
	Impact/Vibration Resistance (m/s ²)	150 / 30					
	Operating Temperature Range (°C)	5 ~ 45					
	Operating Humidity Range (%)	RH 35~85 (No condensing)					

[Note 1] The weight of workpiece(kg) * acceleration of gravity 9.81(m/s²) should be 1/10~1/20 of the gripping force(N).If the gripper holding a workpiece moves or turns with high-acceleration/ deceleration, choose the model with higher force allowance.

[Note 2] Set the parameters and operation mode to avoid application of excessive impact force to the attachments (fingers) during operation.

[Note 3] Apply proper amount of grease to the grease hole of single axis robot by a grease supply device or on the surface of ball screws with brushes.

[Note 4] Mass of a workpiece that the attachments (fingers) can grip greatly differs depending on the material quality, shape, and gripping surface condition of the attachments (fingers). Design the attachments (fingers) to be lightweight and minimum length.

[Note 5] The gripping force of the specification sheet is measured at a speed of 2mm/s and a gripping point (L) of 20mm. The accuracy of the maximum gripping force is XEG-16 : ±30%, XEG-32 : ±16.6%, XEG-48 : ±15%, XEG-64 : ±13.3%, XEG-32-PR : ±20%,.

4. S-Series Getting Started

4.1. What's in the box?

- Model: SEG-24-TM
 1. Integrated electric gripper SEG-24-TM
 2. TM Robot adapter set (ISO-9409-1-50-4-M6)
 3. TM actuator cable
 4. Accessory kit
 - Pin
 - Centering sleeve
 5. Software
 - TM Plug&Play Software Package ([Download](#))

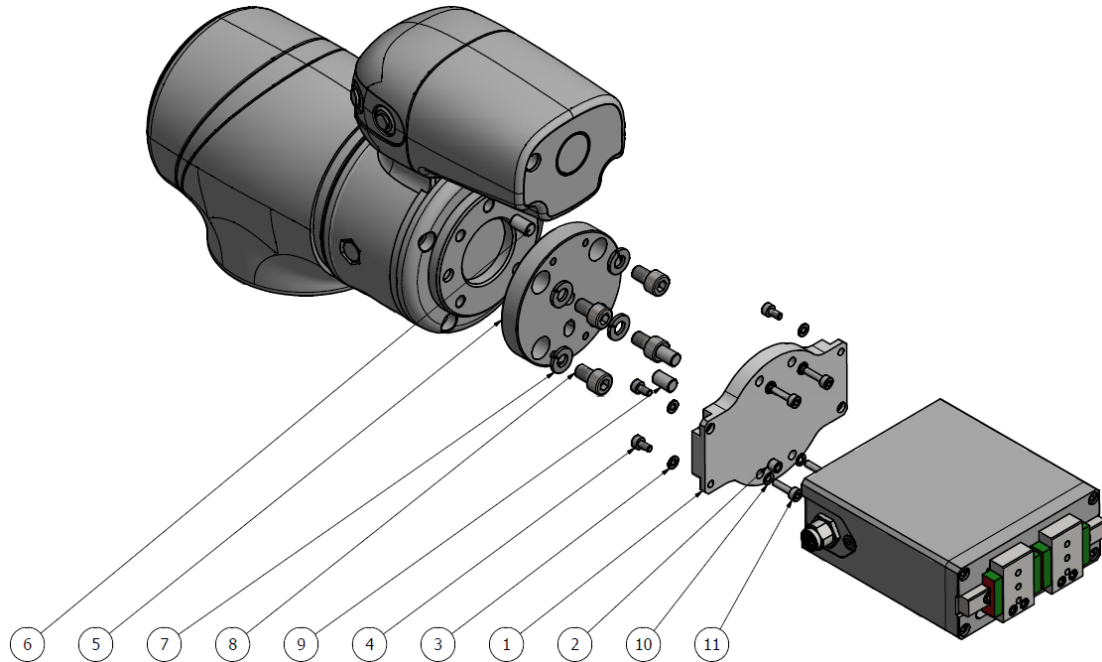
- Model: STG-16-TM
 1. Integrated electric gripper STG-16-TM
 2. TM Robot adapter set (ISO-9409-1-50-4-M6)
 3. TM actuator cable
 4. Accessory kit
 - Pin
 - Centering sleeve
 5. Software
 - TM Plug&Play Software Package ([Download](#))

- Example:



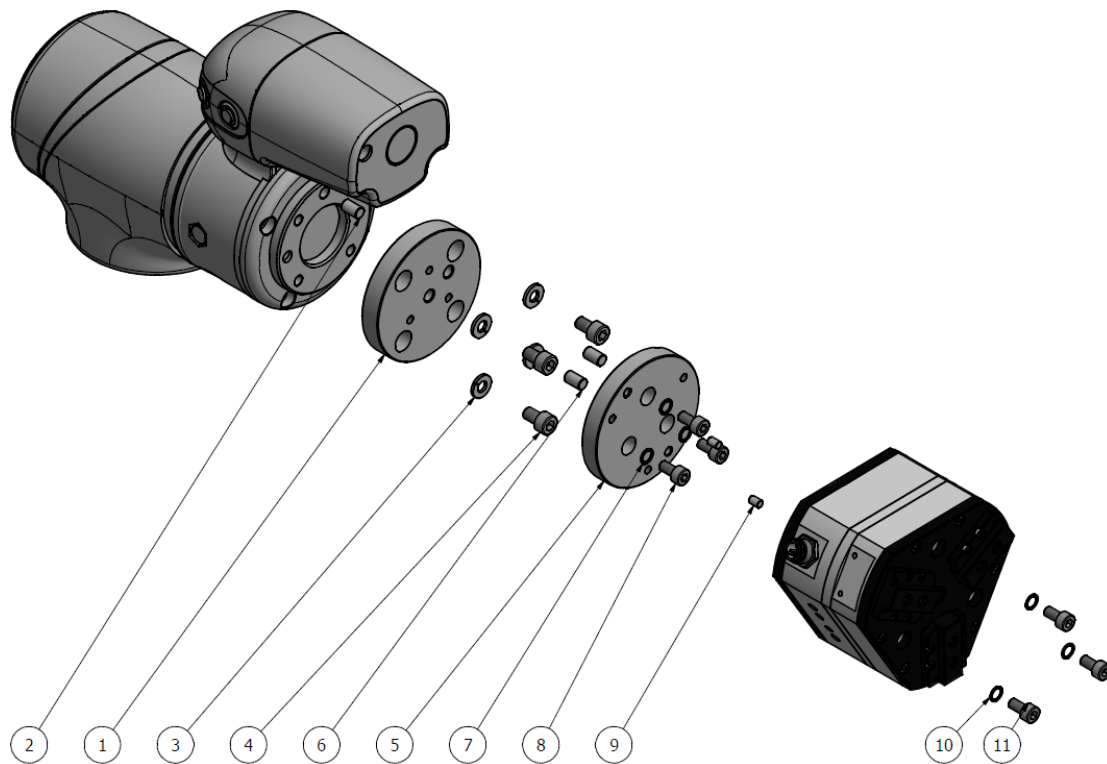
4.2. Mechanical mounting

- Model: SEG-24-TM



11	Bolt	M4X0.7PX16L SUS304	4
10	Spring washer	M4 SUS304	4
9	Pin	ø6X10L	2
8	Bolt	M6X1PX8L SUS304	4
7	Spring washer	M6 SUS304	4
6	Pin	ø6X10L	1
5	TM adapter	–	1
4	Bolt	M3X0.5PX8L US304	4
3	Spring washer	M3 SUS304	4
2	Centering sleeve	ø5Xø3X4L	2
1	SEG-24 adapter	–	1
No.	Parts	Description	Amount
SEG-24 & TM5/12/14			

● Model: STG-16-TM



11	Bolt	M5X0.8PX12L SUS304	3
10	Spring washer	M5 SUS304	3
9	Pin	ø4X6L	2
8	Bolt	M5X0.8PX12L SUS304	3
7	Spring washer	M5 SUS304	3
6	Pin	ø6X10L	2
5	STG-16 adapter	—	1
4	Bolt	M6X1PX8L SUS304	4
3	Spring washer	M6 SUS304	4
2	Pin	ø6X10L	1
1	TM adapter	—	1
No.	Parts	Description	Amount
STG-16 & TM5/12/14			

4.3. Electrical mounting

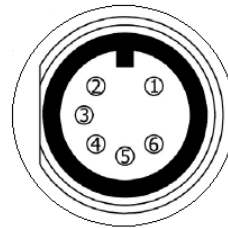
- ① The connector of cable
(Robot side: 8 pins)



Pin	Pin Define	
1	+24v	24 OUTPUT
2	DI_0	Digital Input0
3	DI_1	Digital Input1
4	DI_2	Digital Input2
5	DO_0	Digital Output0
6	DO_1	Digital Output1
7	DO_2	Digital Output2
8	+0v	+0v



- ② The connector of cable
(Gripper side: 6 pins)



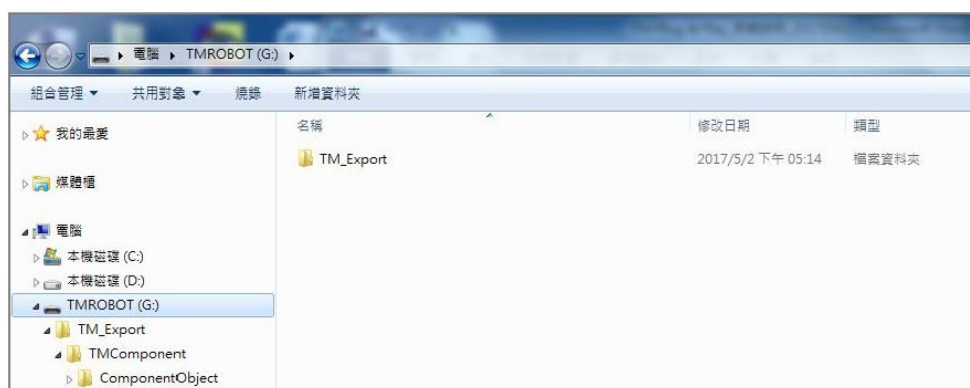
Pin definition		
Pin	I/O	Function
1	IN1	Ready
2	IN2	DIR (O/C)
3	OUT1	Busy
4	VCC	24V/0.5A
5	GND	0V
6	OUT2	Alarm [Note 1]
7	---	Shielding

[Note 1] SEG-24 only

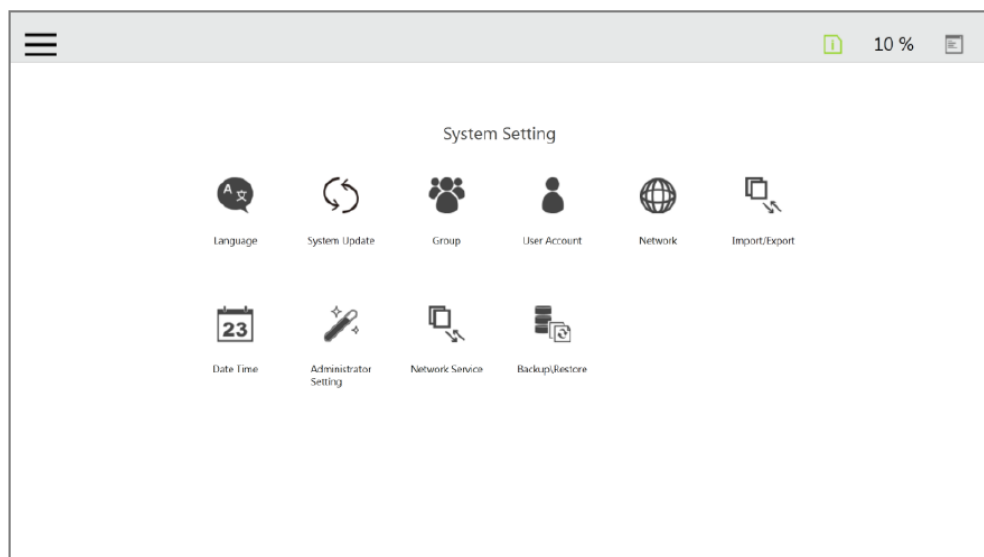
4.4. Installing TM Plug&Play software package

TM Plug&Play is an independent software package provided for the robot. For Plug&Play supported items, the user does not need to write additional programs, and does not need to read the manuals of both parties before integrating, only need to import the software package and can use in TMflow directly.

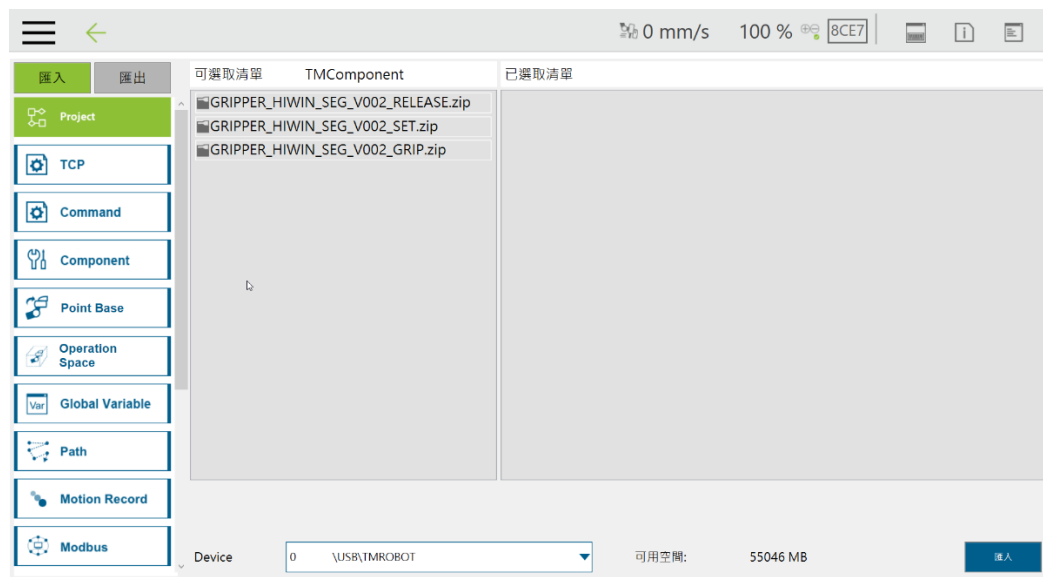
1. Click [here](#) (SEG) or [here](#) (STG) for free downloading of TM Plug&Play software package. After downloaded the software package, place the folder with filename of TM_Export in the root directory of the USB flash drive. The name of the USB flash drive must be TMROBOT. After inserted the USB into the robot's control box, the software package can be exported/imported into the robot on the robot system page.



TMROBOT flash drive schematic diagram

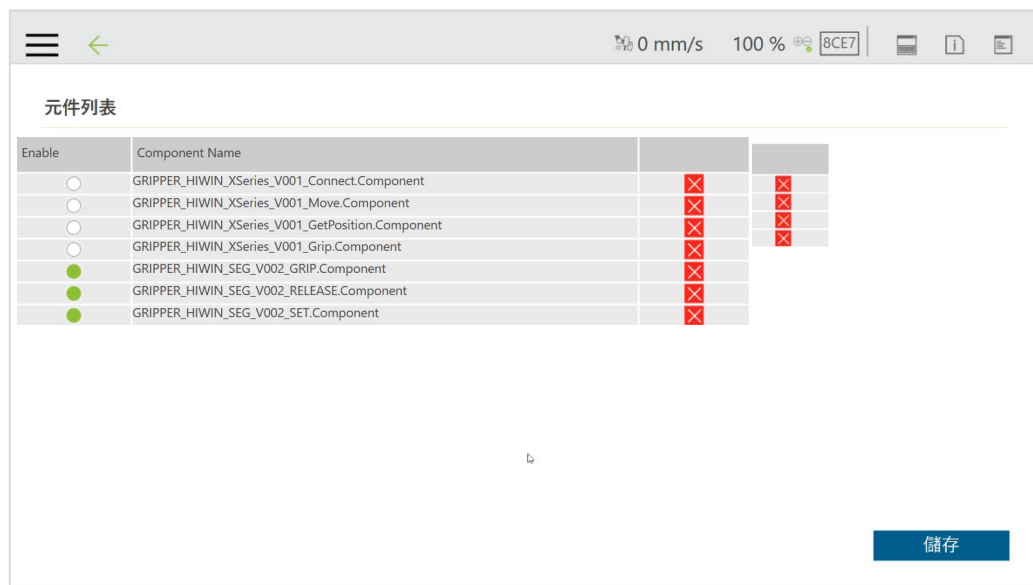


Import / Export page access window




Import component

2. After imported the software package, the imported software package needs to be enabled in the Robot Setting page. After enabled, the software package imported in each project will be added to the left side of TMflow. The user can use it directly after dragged from the left side.

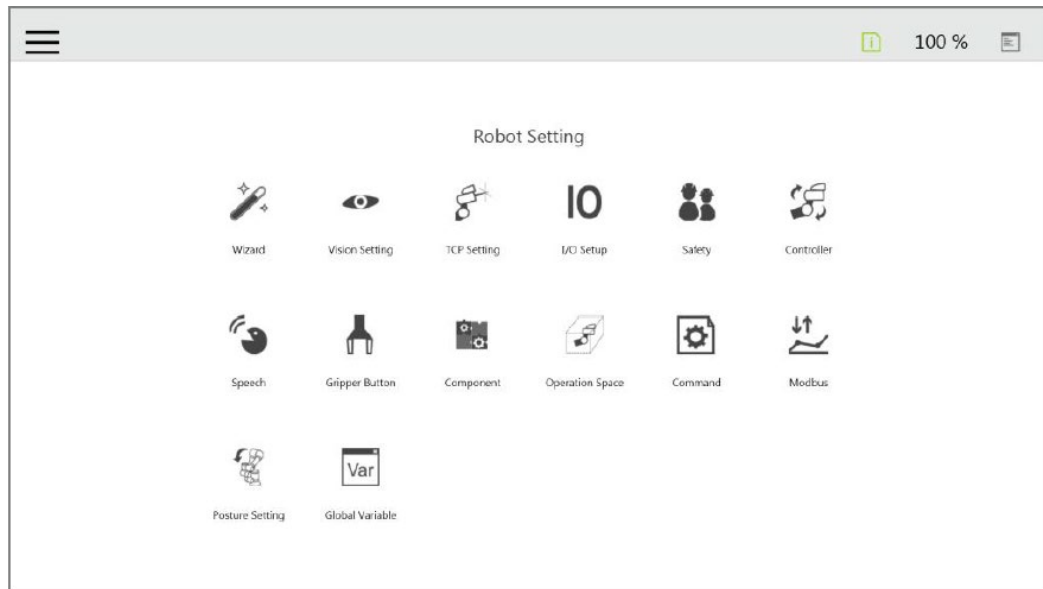


Robot setting page component

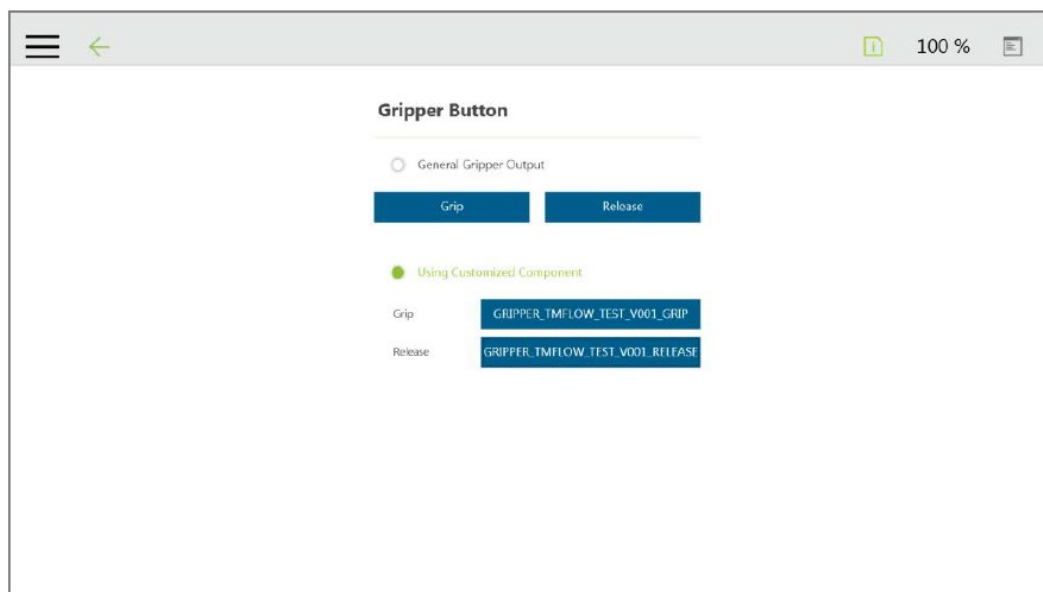
	<p>CAUTION: HIWIN S-Series Gripper SET Component need use Command to communicate with robot. Please confirm whether the corresponding instruction set is enable and the corresponding Command will be added in the Command list.</p>
---	---

3. The robot provides a simpler process programming method for the gripper-type software package. On the robot setting page, click the Gripper Button to set the job triggered by the Gripper Button at the robot end. The concept is when clicking the Gripper Button, a set of Component is added in the

flow and execute once, and two Components are used in sequence (remember that HIWIN S-series grippers need to be executed with SET Component before can be used). In practical applications, the robot uses the FreeBot button, working with the buttons of end record gripper and point, to complete flow programming without TMflow control.



Gripper setting page to enter the window



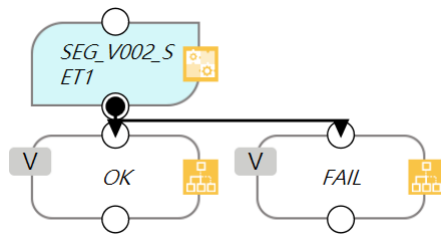
Gripper button setting page

4.5. TM Plug&Play components

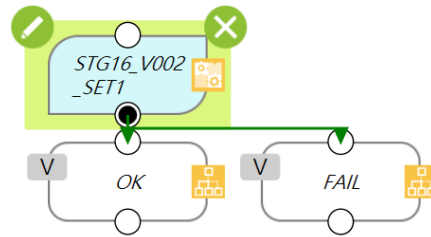
HIWIN SEG gripper and STG gripper have three components: SET, RELEASE, GRIP components. The following are the components introduction and setting.

- SET component:

1. SET component needs use command to communicate with robot before using the gripper
2. For the SEG gripper, when the SET component is activated, the gripper will execute the RESET program. The gripper will move inward to confirm the origin position, and then open to the maximum stroke position.
3. If RESRT has been manually executed after power-on, it will not be executed RESET again after activating the SET component.
4. The STG gripper will not execute RESET when the SET component is activated.



SET component of the *SEG* gripper

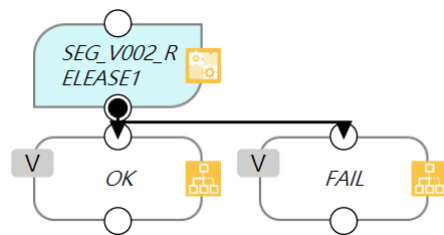


SET component of the *STG* gripper

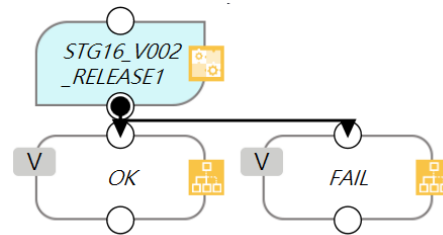
● **RELEASE components:**

1. The gripper will open outward to the maximum stroke.
2. If using the SEG gripper and finish function button setting, the gripper will move mode [Note1] to the FREE point. For the advanced FREE point setting of the SEG gripper, please refer to chapter 4.6

[Note1] Motion speed of the move mode will faster than normal mode.



RELEASE component of
the *SEG* gripper

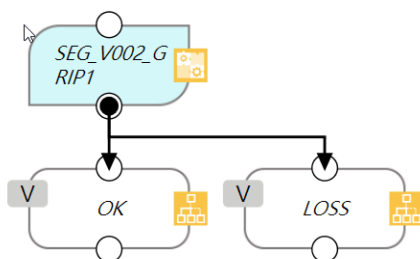


RELEASE component of
the *STG* gripper

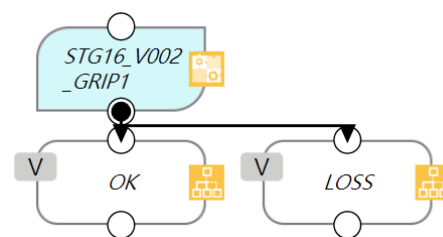
● **GRIP components:**

1. The gripper will close inward to the minimum stroke.
2. If using the SEG gripper and finish function button setting, the gripper will grip mode [Note1] to the GRIP point. For the advanced GRIP point setting of the SEG gripper, please refer to chapter 4.6

[Note1] Gripping workpiece with fast close and slow grasp.



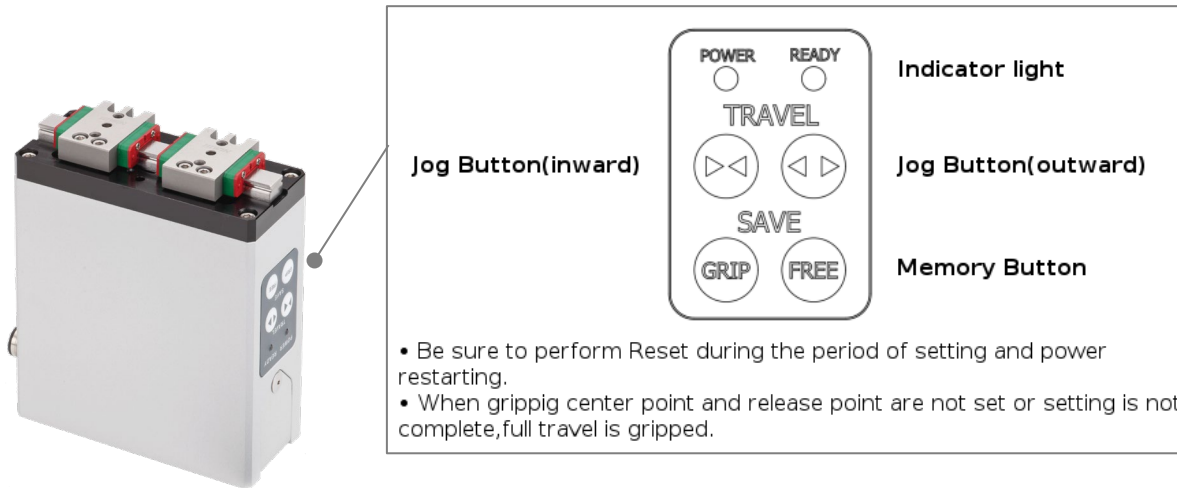
GRIP component of the *SEG* gripper



GRIP component of the *STG* gripper

4.6. Function button descriptions

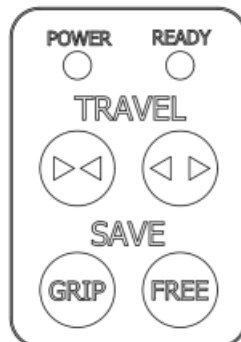
For more information about the function button descriptions and setup process of the electric gripper SEG-24, please refer to the following:



Setup process

Step 3

Use jog buttons to move gripper to gripping center point and press "GRIP" to save button. Ready indicator blinks 1 times when saved successfully.



Step 2

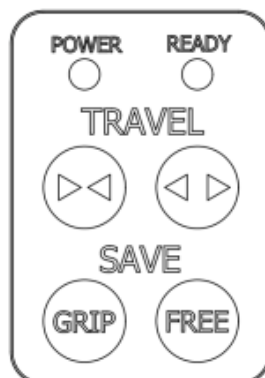
Press "FREE" for 3 second to clear all stored points.(it depends on user's requirement to setup.)

Step 1

Press "GRIP" and "FREE" at the same time to execute Reset.

Step 5

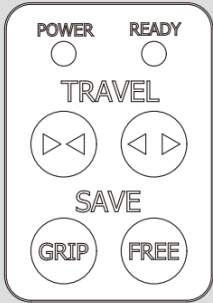




Use jog buttons to move gripper to release point and press "FREE" to save. Ready indicator blinks 1 times when saved successfully.



Step 4

Use jog buttons to adjust gripping travel range, press "GRIP" 3 second to save tolerance point. Ready indicator blinks 3 times when saved successfully.(it depends on user's requirement to setup.)

● Function button descriptions:

Panel	Press button	Mode	Short press	Long press
		Jog button (inward)	Move inward 1 mm	Move inward continuously
		Jog button (outward)	Move outward 1 mm	Move outward continuously
		Memory button	Gripping center point (G)	Tolerance (G+n or G-n)
		Memory button	Release point (F)	Clear all storage points

[Description 1] This function button can be used only when gripper Ready = OFF.

[Description 2] After re-connected to power, reset must be executed first (press GRIP and FREE at the same time). Then, the function button can be used to move the gripper. Or the Ready light would sparkle 5 times rapidly to warn the user.

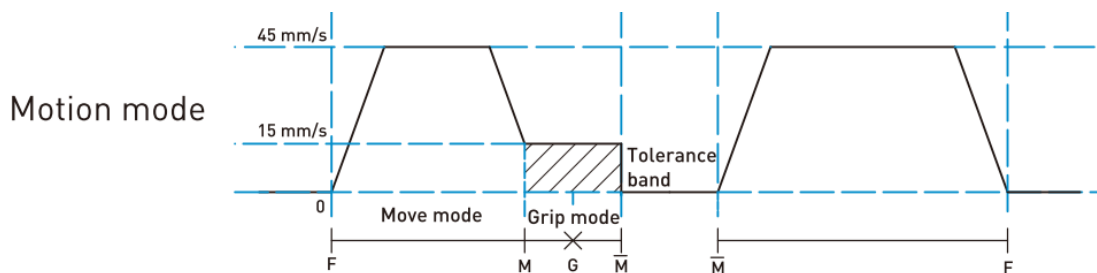
[Description 3] The distance between gripping center point and release point shall not be less than 1mm.

\bar{M}

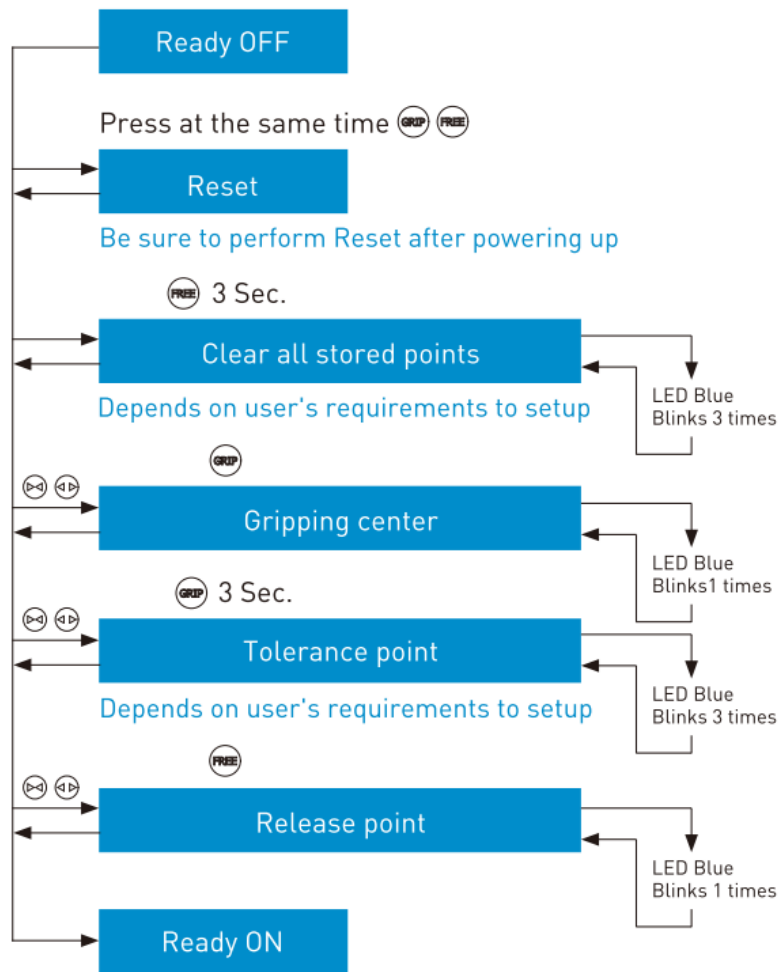
[Description 5] The distance between tolerance point and second tolerance point is called "tolerance band (n)".

[Description 6] If user does not set tolerance point, the system default tolerance point is $G \pm 0.5\text{mm}$.

[Description 7] Taking grip gripper inward, fast outward movement as an example, the timing chart is as follows:



● Setup process:



5. X-Series Getting Started

5.1. What's in the box?

- Model: XEG-16-C25L1-TM
 1. Electric gripper XEG-16
 2. Electric gripper controller XEG-C2
 3. TM Robot adapter set (ISO-9409-1-50-4-M6)
 4. Cable
 - Actuator cable 5M-L
 - RS485 cable 1.5M (RS232 to RJ45)
 - I/O cable 1.5M
 - USB cable 1.5M
 5. Accessory kit
 - Power plug
 - Pin
 - Greasing nozzle/tubing
 6. Software
 - TM Plug&Play Software Package ([download](#))

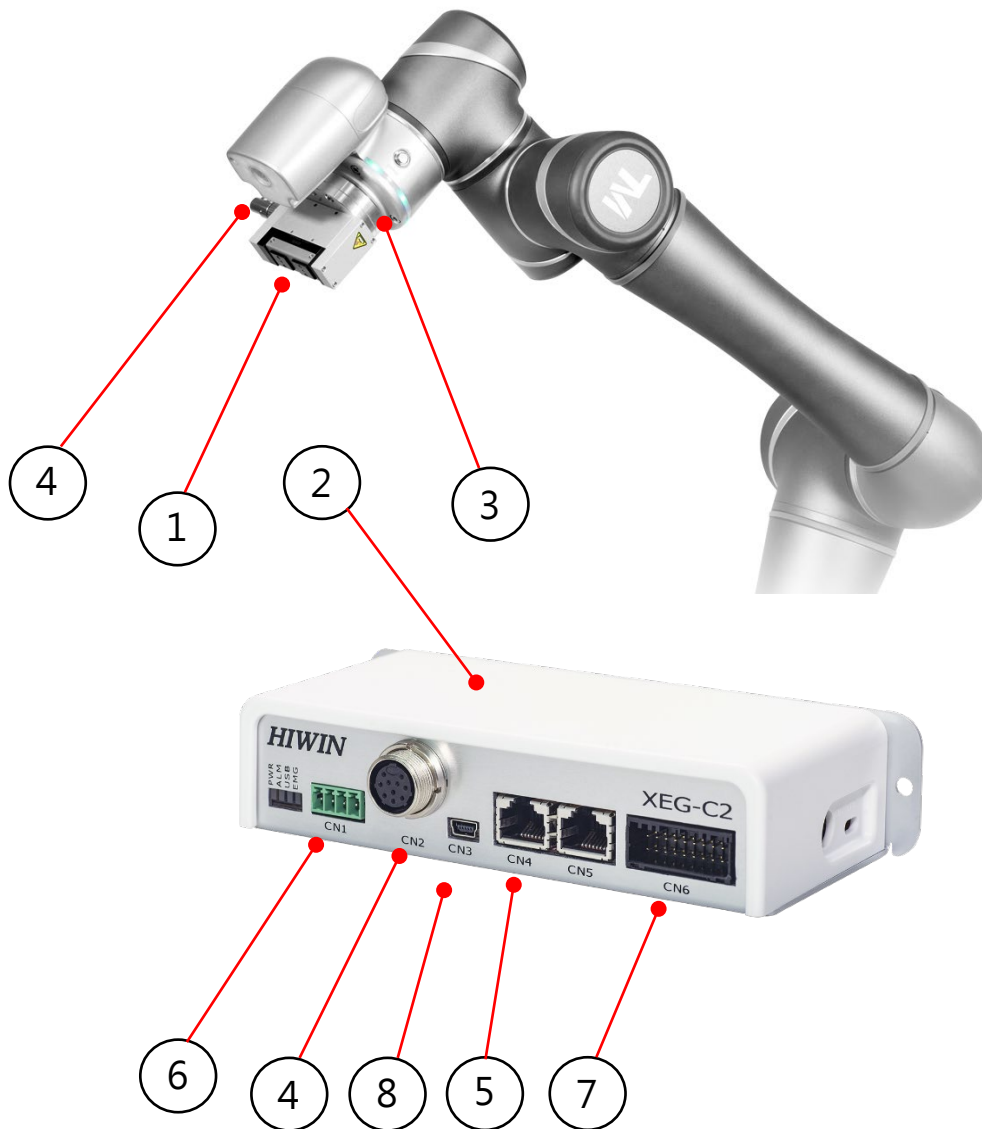
- Model: XEG-32-C25L1-TM
 1. Electric gripper XEG-32
 2. Electric gripper controller XEG-C2
 3. TM Robot adapter set (ISO-9409-1-50-4-M6)
 4. Cable
 - Actuator cable 5M-L
 - RS485 cable 1.5M (RS232 to RJ45)
 - I/O cable 1.5M
 - USB cable 1.5M
 5. Accessory kit
 - Power plug
 - Pin
 - Greasing nozzle/tubing
 6. Software
 - TM Plug&Play Software Package ([download](#))

- **Model: XEG-48-C25L1-TM**
 1. Electric gripper XEG-48
 2. Electric gripper controller XEG-C2
 3. TM Robot adapter set (ISO-9409-1-50-4-M6)
 4. Cable
 - Actuator cable 5M-L
 - RS485 cable 1.5M (RS232 to RJ45)
 - I/O cable 1.5M
 - USB cable 1.5M
 5. Accessory kit
 - Power plug
 - Pin
 - Greasing nozzle/tubing
 6. Software
 - TM Plug&Play Software Package ([download](#))

- **Model: XEG-64-C25L1-TM**
 1. Electric gripper XEG-64
 2. Electric gripper controller XEG-C2
 3. TM Robot adapter set (ISO-9409-1-50-4-M6)
 4. Cable
 - Actuator cable 5M-L
 - RS485 cable 1.5M (RS232 to RJ45)
 - I/O cable 1.5M
 - USB cable 1.5M
 5. Accessory kit
 - Power plug
 - Pin
 - Greasing nozzle/tubing
 6. Software
 - TM Plug&Play Software Package ([download](#))

- **Model: XEG-32PR-C25L1-TM**
 1. Electric gripper XEG-32-PR
 2. Electric gripper controller XEG-C2
 3. TM Robot adapter set (ISO-9409-1-50-4-M6)
 4. Cable
 - Actuator cable 5M-L
 - RS485 cable 1.5M (RS232 to RJ45)
 - I/O cable 1.5M
 - USB cable 1.5M
 5. Accessory kit
 - Power plug
 - Pin
 6. Software
 - TM Plug&Play Software Package ([download](#))

Example:

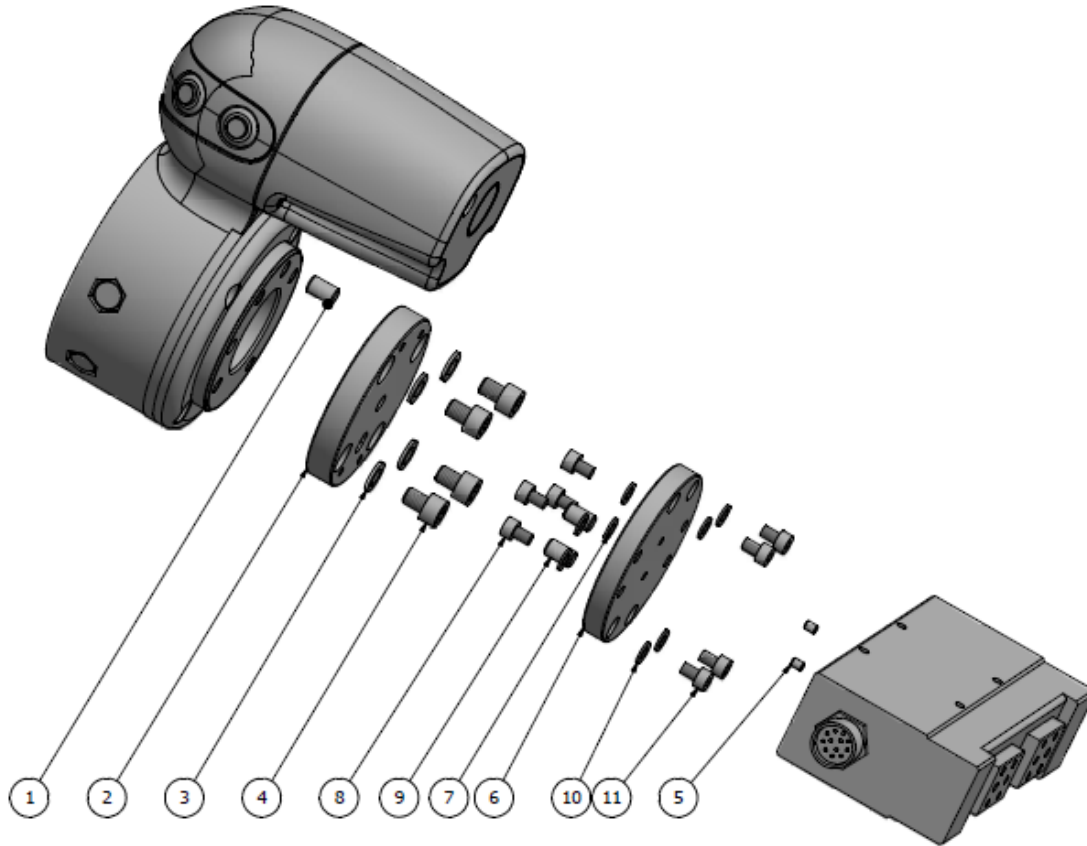


● Standard shipping items:

1. Electric gripper x 1 pcs
2. Electric gripper controller x 1 pcs
3. TM Robot adapter x 1 set
4. Actuator cable (5m-L) x 1 pcs
5. RS485 cable (1.5m) x 1 pcs
6. Power plug x 1 pcs
7. I/O signal cable (1.5m) x 1 pcs
8. USB cable (1.5m) x 1 pcs

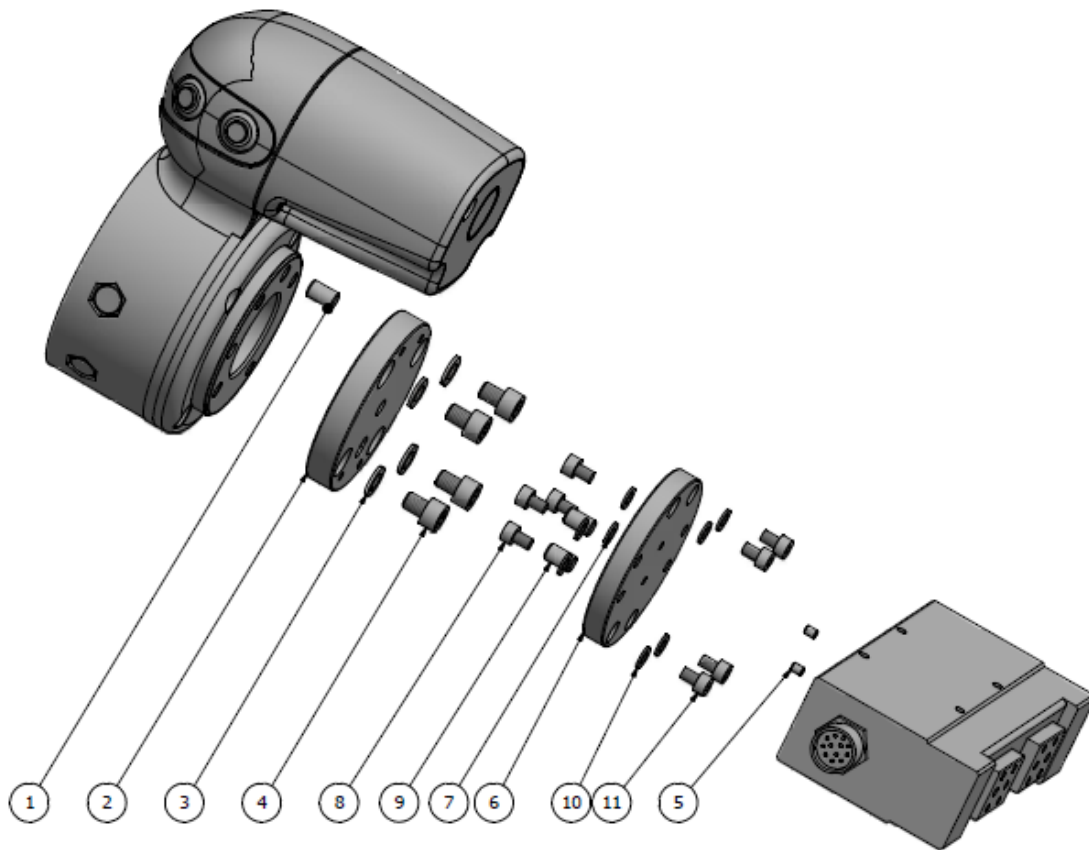
5.2. Mechanical mounting

- Model: XEG-16-TM



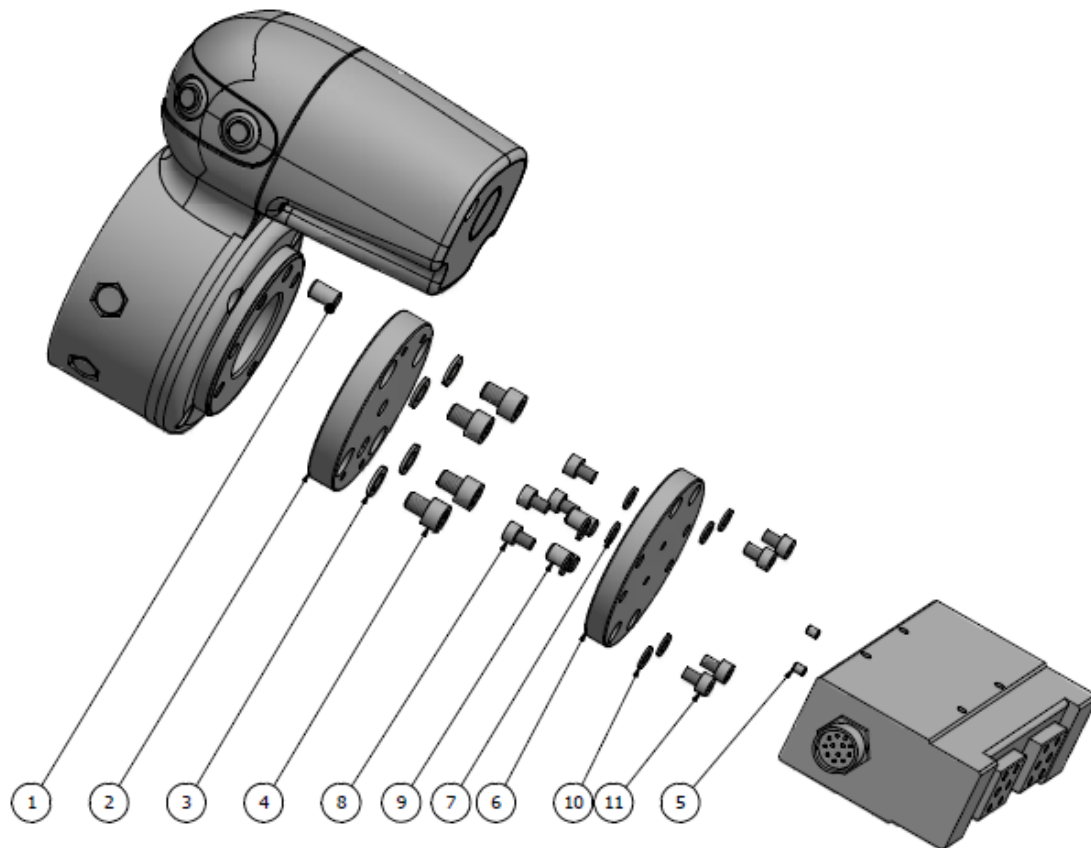
11	Bolt	M4X0.7PX6L SUS304	4
10	Spring washer	M4 SUS304	4
9	Pin	φ6X10L	2
8	Bolt	M3X0.5PX5L SUS304	4
7	Spring washer	M3 SUS304	4
6	XEG-16 adapter	—	1
5	Pin	φ2X4.4L	2
4	Bolt	M6X1PX8L SUS304	4
3	Spring washer	M6 SUS304	4
2	UR adapter	—	1
1	Pin	φ6X10L	1
Items	Parts	Description	Amount

- Model: XEG-32-TM



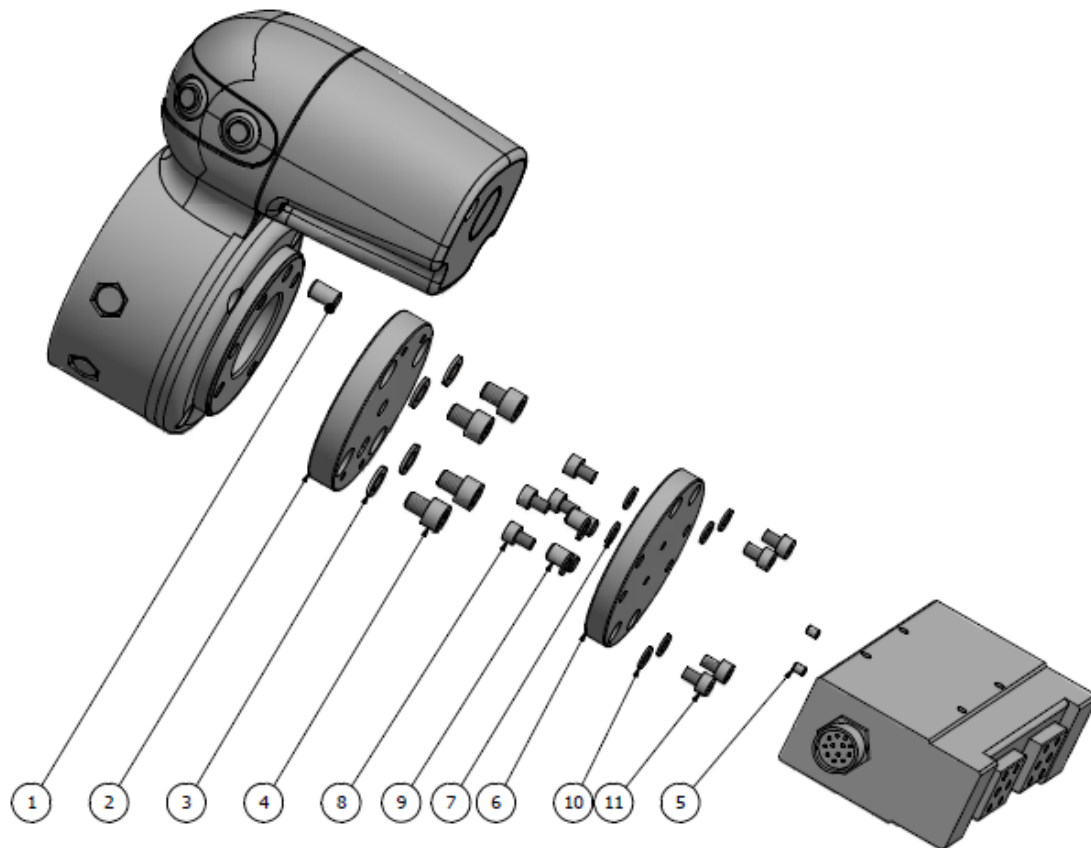
11	Bolt	M4X0.7PX6L SUS304	4
10	Spring washer	M4 SUS304	4
9	Pin	φ6X10L	2
8	Bolt	M4X0.7PX6L SUS304	4
7	Spring washer	M4 SUS304	4
6	XEG-32 adapter	—	1
5	Pin	φ3X4L	2
4	Bolt	M6X1PX8L SUS304	4
3	Spring washer	M6 SUS304	4
2	UR adapter	—	1
1	Pin	φ6X10L	1
Items	Parts	Description	Amount

- Model: XEG-48-TM



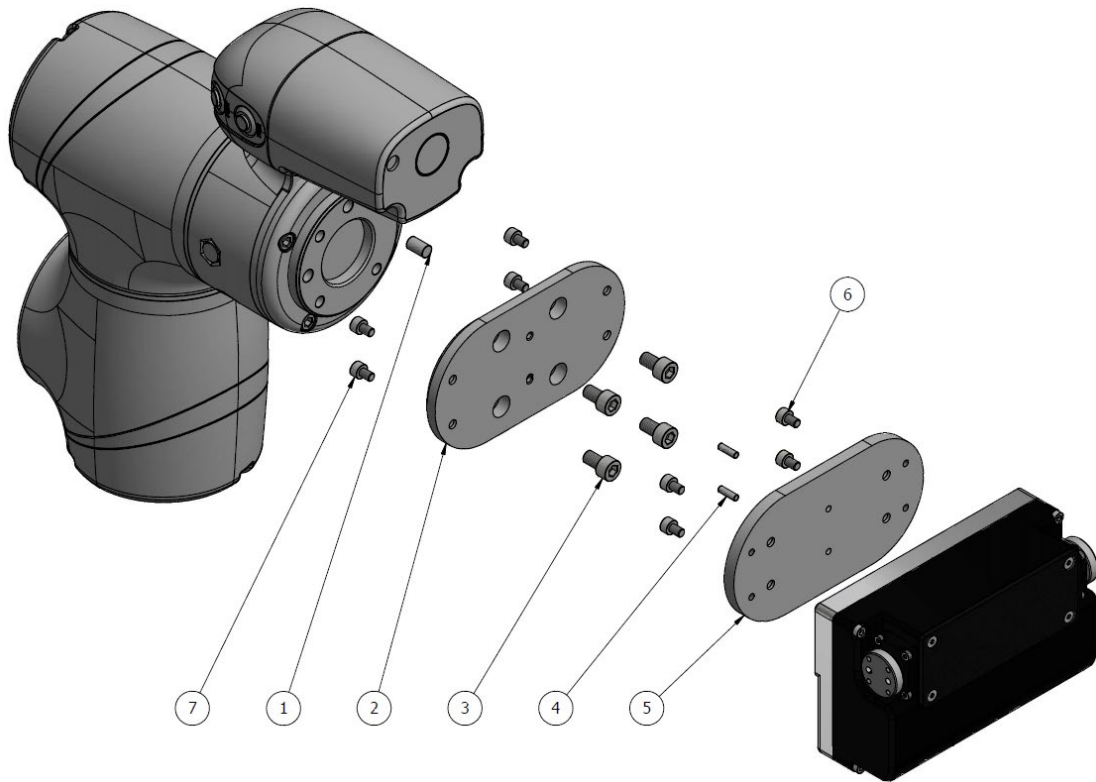
11	Bolt	M6X1PX8L SUS304	4
10	Spring washer	M6 SUS304	4
9	Pin	∅5X6L	2
8	Bolt	M6X1PX8L SUS304	4
7	Spring washer	M6 SUS304	4
6	XEG-64 adapter	—	1
5	Pin	∅5X6L	2
4	Bolt	M6X1PX8L SUS304	4
3	Spring washer	M6 SUS304	4
2	UR adapter	—	1
1	Pin	∅6X10L	1
Items	Parts	Description	Amount

- Model: XEG-64-TM



11	Bolt	M6X1PX8L SUS304	4
10	Spring washer	M6 SUS304	4
9	Pin	∅5X6L	2
8	Bolt	M6X1PX8L SUS304	4
7	Spring washer	M6 SUS304	4
6	XEG-64 adapter	—	1
5	Pin	∅5X6L	2
4	Bolt	M6X1PX8L SUS304	4
3	Spring washer	M6 SUS304	4
2	UR adapter	—	1
1	Pin	∅6X10L	1
Items	Parts	Description	Amount

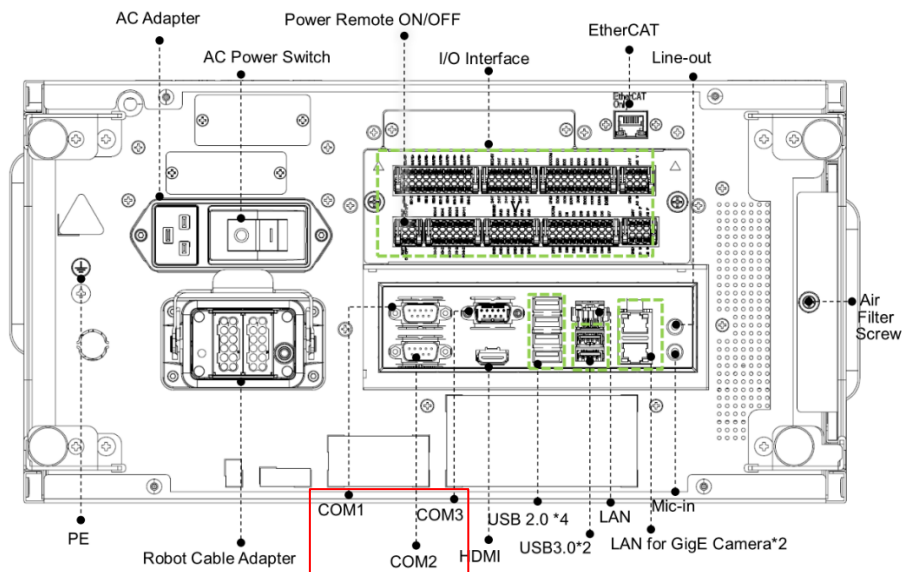
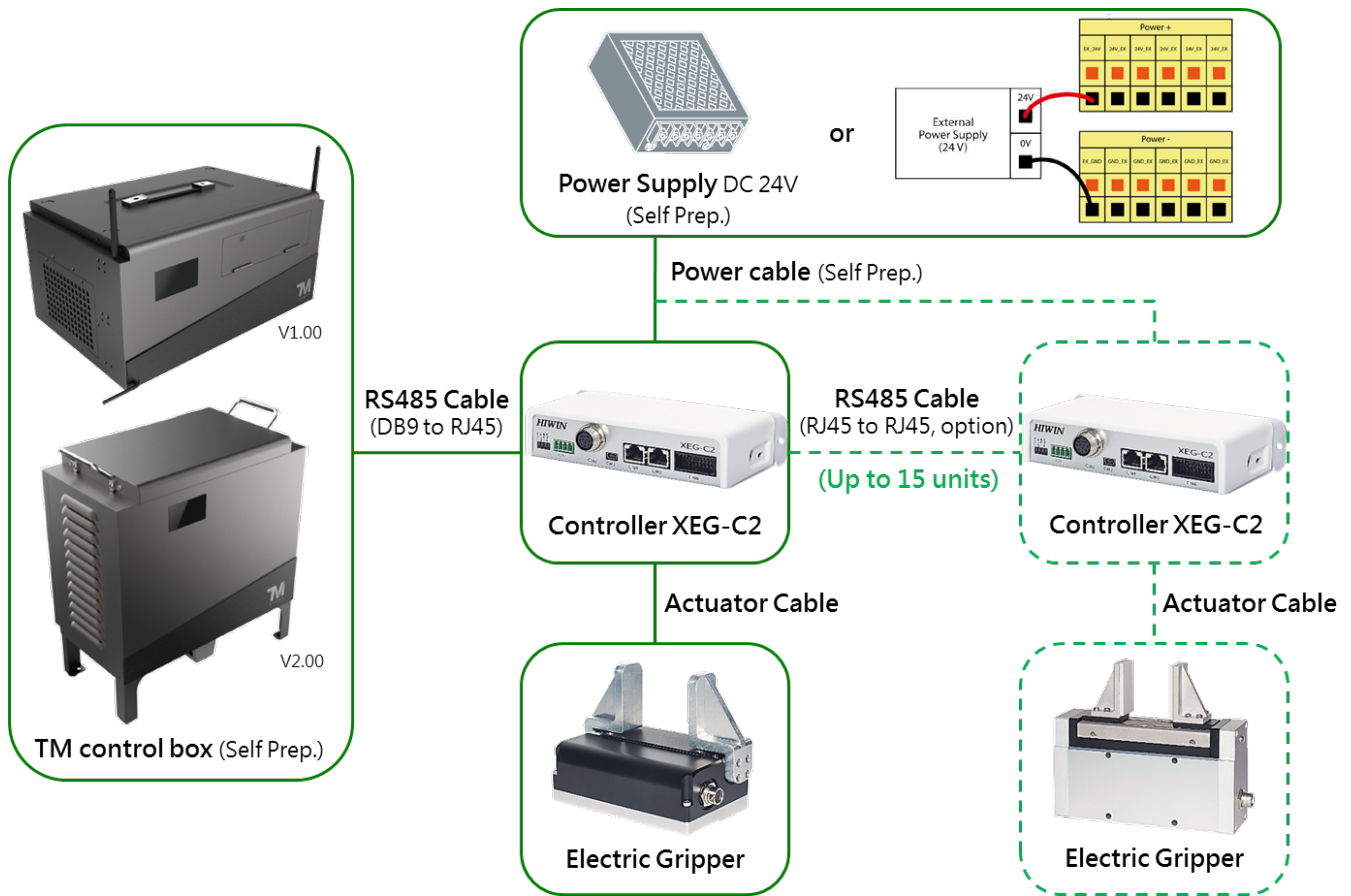
- Model: XEG-32-PR-TM



7	Bolt	M4X0.7PX6L SUS304	4
6	Bolt	M4X0.7PX6L SUS304	4
5	XEG-32-PR adapter	---	1
4	Pin	Φ3X10L	2
3	Bolt	M6X1PX10L SUS304	4
2	UR adapter	---	1
1	Pin	Φ6X10L	1
Items	Parts	Description	Amount

5.3. Electric mounting

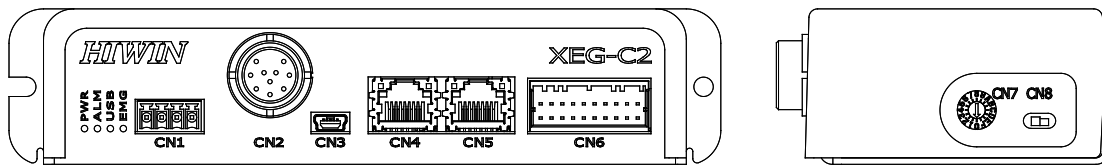
- System construction:



TM5 controller box interface

[Note] The DB9F connector of the RS485 cable of the electric gripper controller is connected to the COM1~COM3 of the TM controller box.

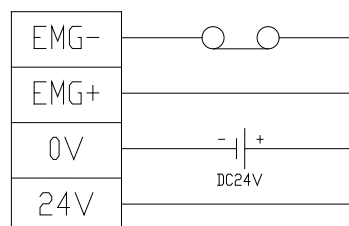
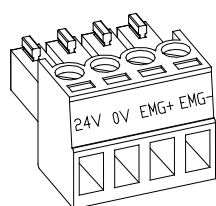
● Names and function of XEG-C2



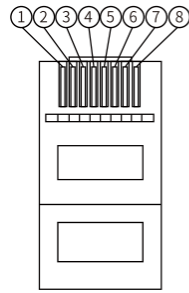
Code	Part Name	Illustration
PWR	24V Power supply lamp (Green)	Lights after 24V / 0V power input
ALM	Error status lamp (Red)	Lights after error status occurs [Note 1]
USB	5V Power supply lamp (Green)	Lights after USB cable is connected
EMG	Emergency stop lamp (Red)	Lights after emergency stop trigger
CN1	Power terminal and Emergency stop terminal	Connect power supply and emergency stop [Note 2]
CN2	Actuator terminal	Connect actuator cable
CN3	Communication terminal	Connect USB cable
CN4	Communication terminal	Connect RS485 cable [Note 3]
CN5	Communication terminal	Connect RS485 cable [Note 3]
CN6	I/O signal terminal	Connect I/O cable
CN7	Station channel	Set controller station number [Note 4]
CN8	Terminal resistor	Two-stage switch, left direction is off, right direction is on [Note 5]

[Note 1] The display mode of the ALM indicator in each abnormal state is as follows:

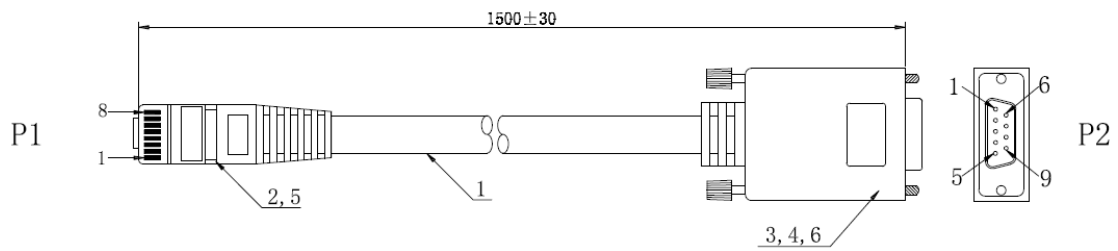
Error Status	ALM Indicator
1. Position fault	After every 1 second, ALM indicator blinks 1 time
2. Over travel	After every 1 second, ALM indicator blinks 2 times
3. Original point fault	After every 1 second, ALM indicator blinks 3 times
4. Trigger emergency stop	After every 1 second, ALM indicator blinks 4 times
5. Firmware version update	Continuous flashing



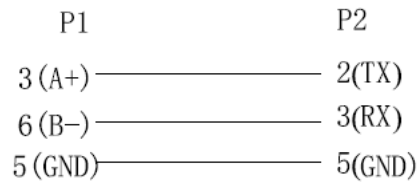
[Note 3] The pin definition of the RS485 cable is as follows. Please use EIA-485 as the reference, use twisted pair cables and recommend TIA/EIA CAT5e or more. A maximum of 15 controllers can be connected in series, and the longest serial cable length is 50 meters in total.



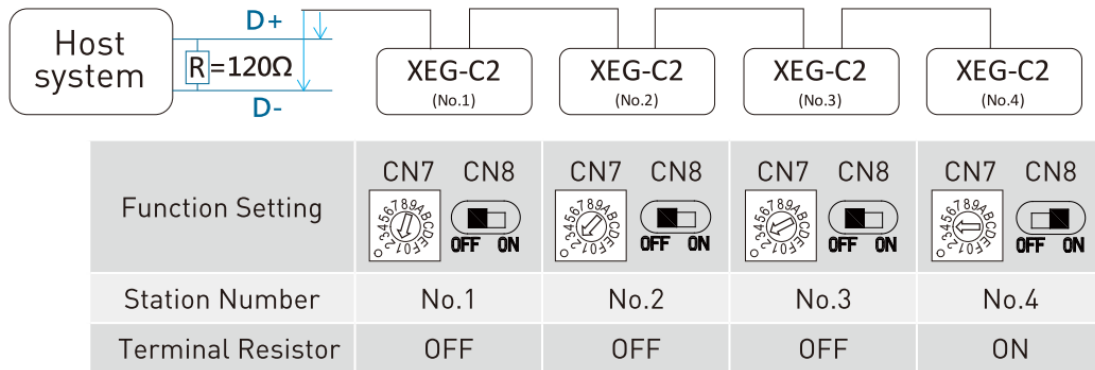
PIN	Define	Color
1	N/A	White/Orange
2	GND	Orange
3	D+	White/Green
4	N/A	Blue
5	GND	White/Blue
6	D-	Green
7	N/A	White/Brown
8	N/A	Brown



PIN WIRING



[Note 5] When two or more controllers are connected in series and the total cable length is more than 10 meters, the last controller must have the terminating resistor function enabled. The host system needs to be connected with a terminating resistor (120Ω) between the two signal wires. The system wiring is as follows:

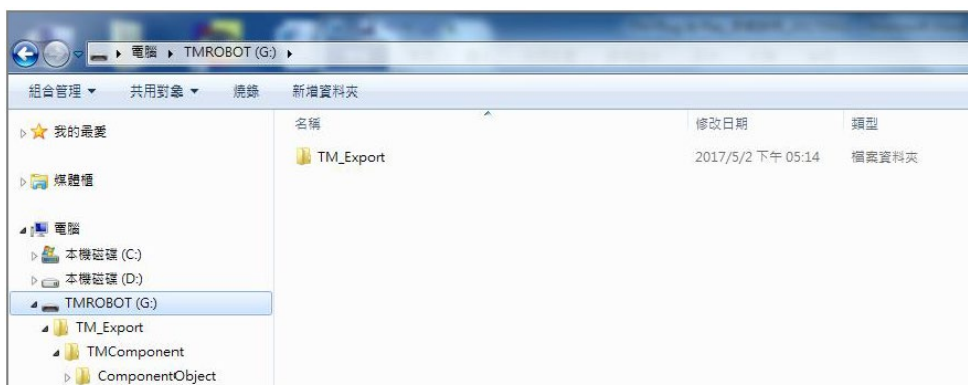


[Note 7] XEG-C2 controller firmware update information, please refer to the following:
[https://www.hiwin.tw/download/tech_doc/ee/XEG-C2_firmware_update_user_manual-\(E\).pdf](https://www.hiwin.tw/download/tech_doc/ee/XEG-C2_firmware_update_user_manual-(E).pdf)

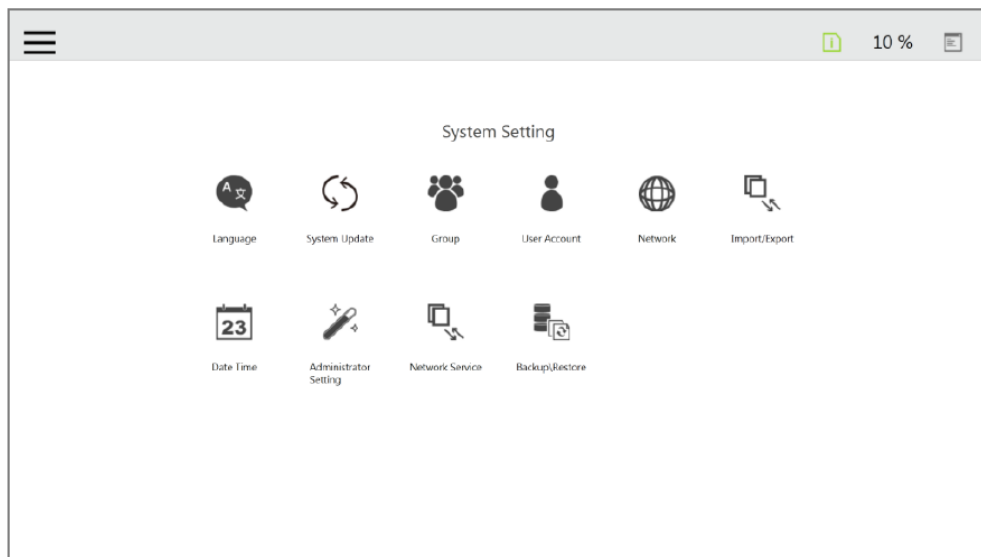
5.4. Installing TM Plug&Play software package

TM Plug&Play is an independent software package provided for the robot. For Plug&Play supported items, the user does not need to write additional programs, and does not need to read the manuals of both parties before integrating, only need to import the software package and can use in TMflow directly.

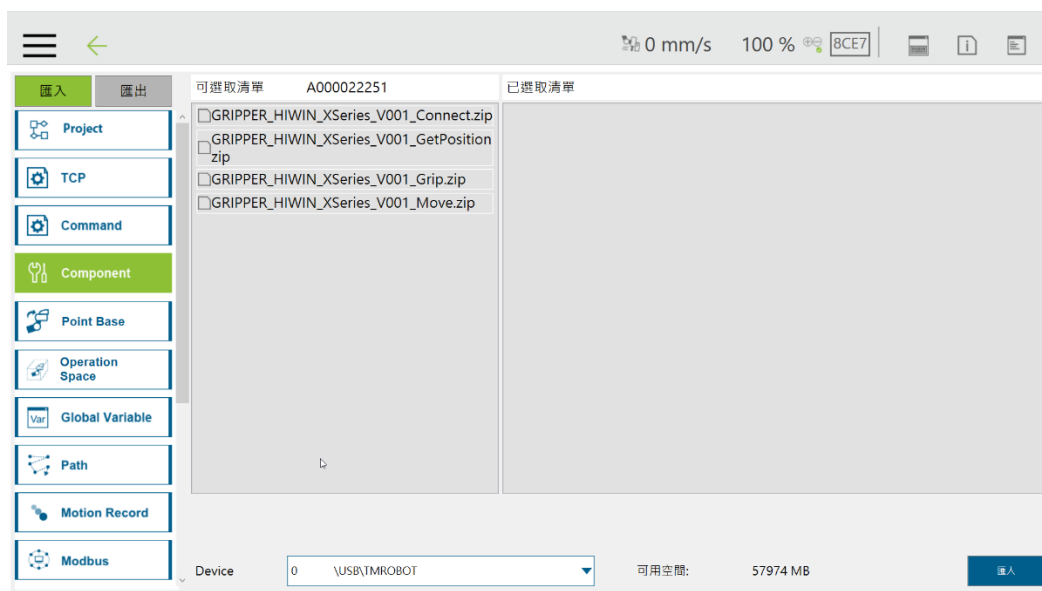
1. Click [here](#) for free downloading of TM Plug&Play software package. After downloaded the software package, place the folder with filename of TM_Export in the root directory of the USB flash drive. The name of the USB flash drive must be TMROBOT. After inserted the USB into the robot's control box, the software package can be exported/imported into the robot on the robot system page.



TMROBOT flash drive schematic diagram

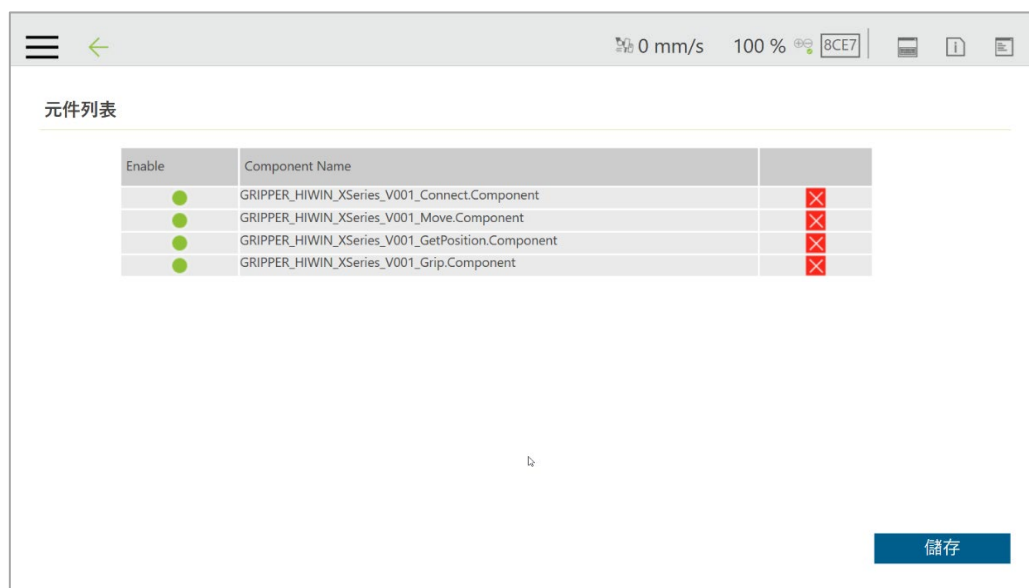


Import / Export page access window




Import component

2. After imported the software package, the imported software package needs to be enabled in the Robot Setting page. After enabled, the software package imported in each project will be added to the left side of TMflow. The user can use it directly after dragged from the left side.

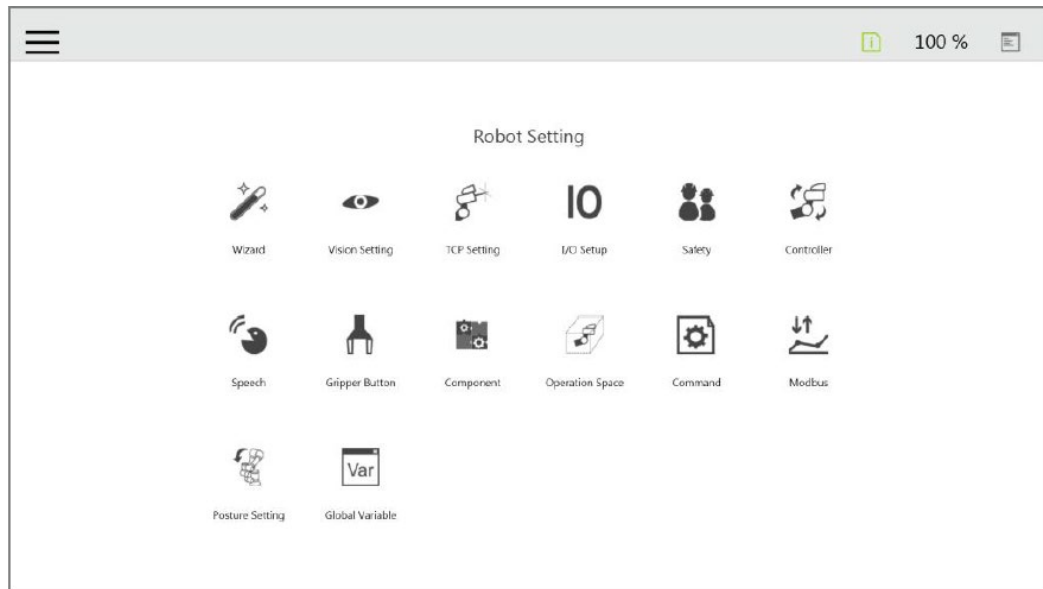


Robot setting page component

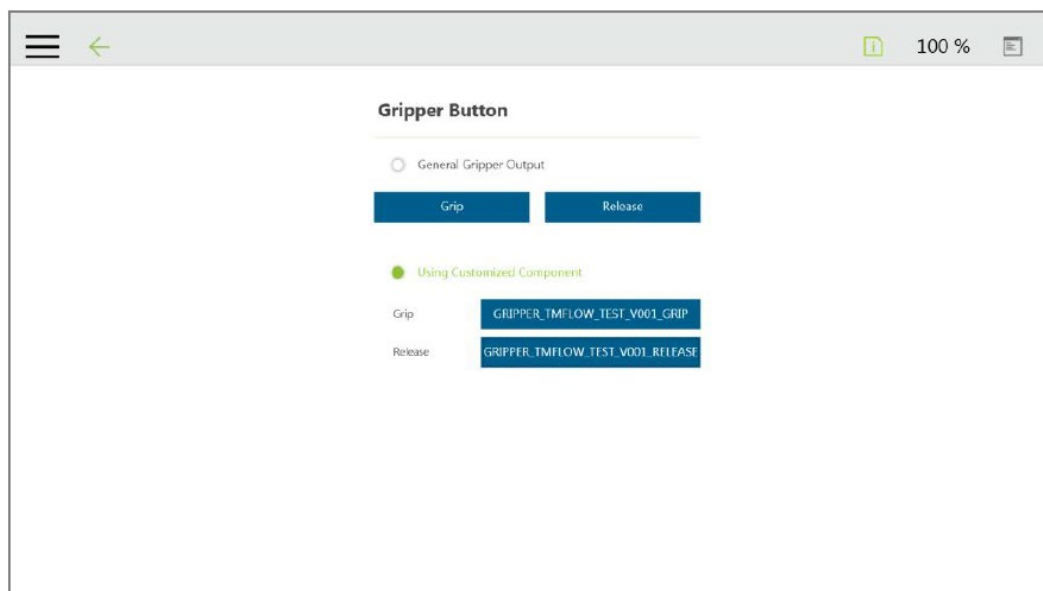
	<p>CAUTION: HIWIN X-Series Gripper Connect Component need use Command to communicate with robot. Please confirm whether the corresponding instruction set is enable and the corresponding Command will be added in the Command list.</p>
---	---

3. The robot provides a simpler process programming method for the gripper-type software package. On the robot setting page, click the Gripper Button to set the job triggered by the Gripper Button at

the robot end. The concept is when clicking the Gripper Button, a set of Component is added in the flow and execute once, and two Components are used in sequence (remember that HIWIN X-series grippers need to be executed with Connect Component before can be used). In practical applications, the robot uses the FreeBot button, working with the buttons of end record gripper and point, to complete flow programming without TMflow control.



Gripper setting page to enter the window

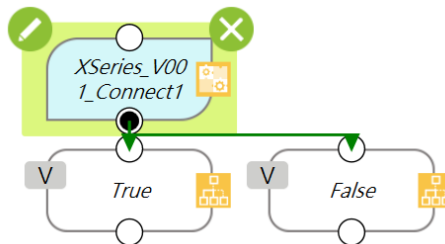


Gripper button setting page

5.5. TM Plug&Play component

HIWIN X-Series gripper have four components: CONNECT, MOVE, GRIP and GetPosition components. The following are the components introduction and setting.

- CONNECT component:
 1. CONNECT component needs use command to communicate with robot before using the gripper
 2. When the CONNECT component is activated, the gripper will execute the RESET program. The gripper will move inward to confirm the origin position, and then open to the maximum stroke position.
 3. If the RESET has executed the gripping force model establishment after power-on, it will not be executed gripping force tuning again after activating the CONNECT component.



CONNECT component of the X-series gripper

4. Set up:

- Gripper station: The station number can be set up to 15 (1~F) at most, and station number 0 is Broadcast Mode, which is only used in specific situations.
- Gripper model: The gripper model including XEG-16, XEG-32, XEG-32-PR, XEG-48 and XEG-64.

運算式編輯器設定

新增

byte GRIPPER_HIWIN_XSeries_V001_Connect1_var_station = 1

int GRIPPER_HIWIN_XSeries_V001_Connect1_var_type = g_GRIPPER_HIWIN_TYPE_XEG_16

確認

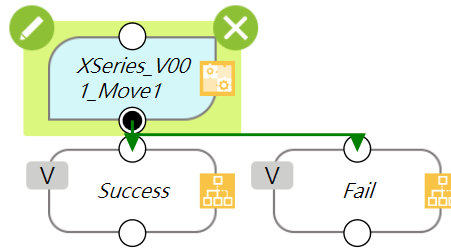
Gripper station: 0~15 (0: forecast mode)

Gripper model:

變數	int/g_GRIPPER_HIWIN_TYf	插入
函數	int/g_GRIPPER_HIWIN_TYPE_XEG_16	
數學	int/g_GRIPPER_HIWIN_TYPE_XEG_32	
	int/g_GRIPPER_HIWIN_TYPE_XEG_32_PR	
	int/g_GRIPPER_HIWIN_TYPE_XEG_48	
	int/g_GRIPPER_HIWIN_TYPE_XEG_64	

● MOVE component:

1. The gripper will move with specified motion speed to the target position.



MOVE component of the X-series gripper

2. Set up:

- Gripper station: The station number can be set up to 15 (1~F) at most, and station number 0 is Broadcast Mode, which is only used in specific situations.
- Move speed: Different models have different setting values, the move speed range is 1~100 mm/s, please refer to Table 1 for details.

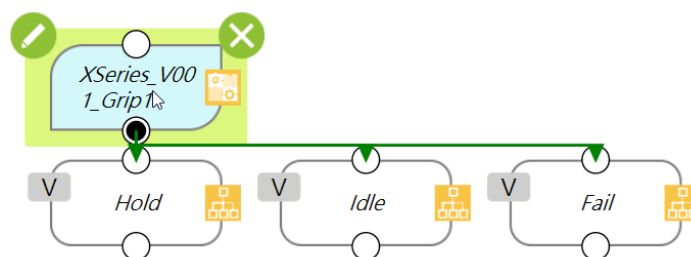
Variable Name	Type	Value	Range / Reference
GRIPPER_HI WIN_XSeries s_V001_Move1_var_station	byte	1	Gripper station: 0~15 (0: forecast mode)
GRIPPER_HI WIN_XSeries s_V001_Move1_var_position	int	8	Move position: 0~64 mm (see Table1)
GRIPPER_HI WIN_XSeries s_V001_Move1_var_speed	int	30	Move speed: 1~100 mm/s (see Table1)

Table 1 The parameter setting range of X-series grippers

Gripper Model	Moving position	Moving speed	Gripping stroke	Gripping speed	Gripping force
XEG-16	0~16 (mm)	1~60 (mm/s)	1~16 (mm)	1~10 (mm/s)	50~100%
XEG-32	0~32 (mm)	1~80 (mm/s)	1~32 (mm)	1~20 (mm/s)	40~100%
XEG-32-PR	0~32 (mm)	1~60 (mm/s)	1~32 (mm)	1~10 (mm/s)	50~100%
XEG-48	0~48 (mm)	1~80 (mm/s)	1~48 (mm)	1~20 (mm/s)	50~100%
XEG-64	0~64 (mm)	1~100 (mm/s)	1~64 (mm)	1~20 (mm/s)	40~100%

● GRIP component:

1. The gripper will grip with the set gripping force until the object is clamped or the gripping stroke ends.
2. In the general grip mode, the gripper will perform the grip action with default gripping force and gripping speed. In the advanced gripping mode, the gripper will grip workpiece with the set gripping force and gripping speed.
3. When the gripper grips an object, it will return HOLD. When the gripper reaches the end of the gripping stroke and does not grip the object, it will return IDLE. When the gripper moves abnormally, it will return FAIL.



GRIP component of the X-series gripper

4. Set up:

- In normal grip mode:

- Gripper station: The station number can be set up to 15 (1~F) at most.
- Gripper station:
 - **CLOSE** : The gripper will clamp inwards to the end side.
 - **OPEN** : The gripper will clamp outwards to the end side.

GRIPPER_HIWIN_XSeries_V001_Grip

提供者: General User

節點名稱: XSeries_V001_Grip1

Set Parameter

進階

確認 刪除此節點

運算式編輯器設定

新增

GRIPPER_HIWIN_XSeries_V001_Grip1_var_station = 1

GRIPPER_HIWIN_XSeries_V001_Grip1_var_Direction = OPEN

確認

Gripper station: 1~15

Grip direction: OPEN / CLOSE
[Note] The gripper will clamp outwards (OPEN) or inwards (CLOSE) to the end side.

- In advance grip mode (Note: Tick the advanced box and finish normal grip mode setting):
 - Gripping speed: Different models have different setting values, the gripping speed range is 1~20 mm/s, please refer to Table 1 for details.
 - Gripping force: Different models have different setting values, the gripping force range is 40~100%, please refer to Table 1 for details.

GRIPPER_HIWIN_XSeries_V001_Grip ? X

提供者 : General User

節點名稱

Set_Parameter >

Set_Parameter_Advanced >

進階 **Advanced**

確認

刪除此節點

← 運算式編輯器設定

▼

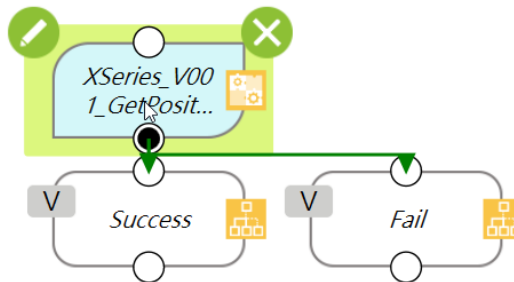
新增

int	GRIPPER_HIWIN_XSeries_V001_Grip1_var_Speed = 5	●	Grip speed: 1~20 mm/s (see Table1)
int	GRIPPER_HIWIN_XSeries_V001_Grip1_var_Force = 75	●	Grip force: 40~100 % (see Table1)

確認

- GetPosition component:

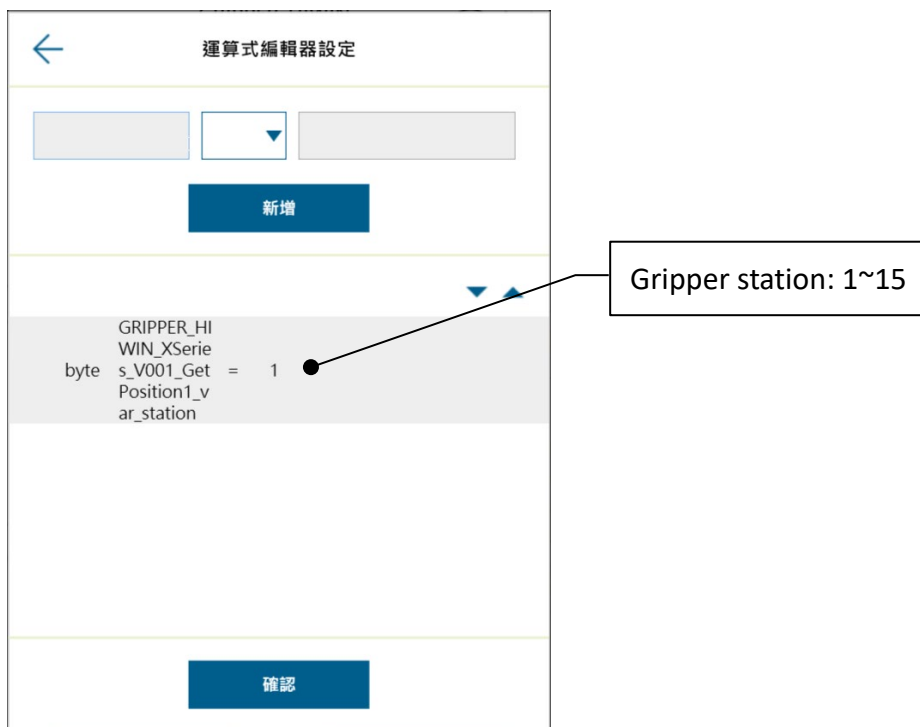
1. Get the current position of the gripper, which can be used for object size identification or detection.




GetPosition component of the X-series gripper

2. Set up:

- Gripper station: The station number can be set up to 15 (1~F) at most.



	<p>CAUTION: All imported X-Series components need to set Modbus parameters and Com port.</p>
---	---

set Modbus parameters:

Modbus裝置 ✕

新增TCP
新增RTU

✎ TCP localhost ✕
RTU mrtu_X_Series_Gripper
GRIPPER_HIWIN_XSeries_V00 1_Connect1_mrtu_X_Series_Gripper
RTU 1_MoveSingle1_mrtu_X_Series_Gripper
GRIPPER_HIWIN_XSeries_V00 1_MoveAll1_mrtu_X_Series_Gripper
RTU 1_GripSingle1_mrtu_X_Series_Gripper

確認

← **Modbus裝置編輯**

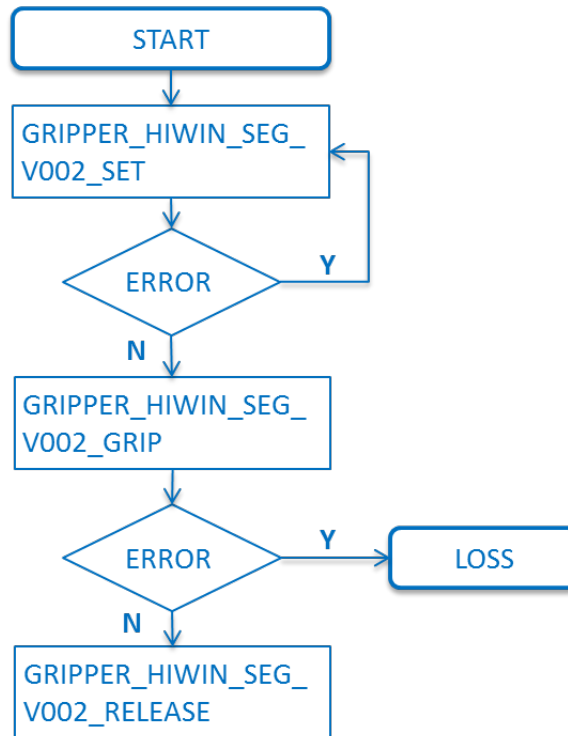
裝置名稱	mrtu_X_Series_Gripper
Com埠	▼
鮑率	115200 ▼
資料位元	8 ▼
停止位元	1 ▼
檢查碼	none ▼
逾時(ms)	50

確認

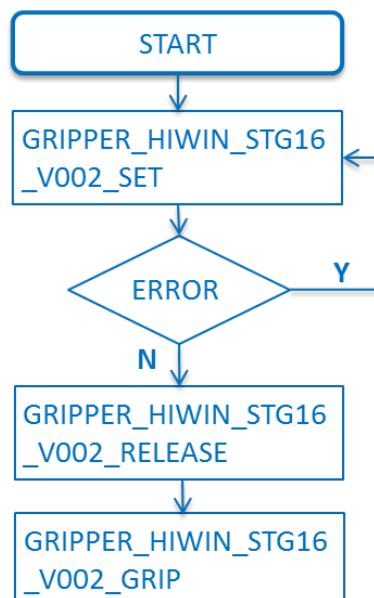
Appendix.1 : Example program

To set up the HIWIN Electric gripper with TM robot, a quick example is provided as below.

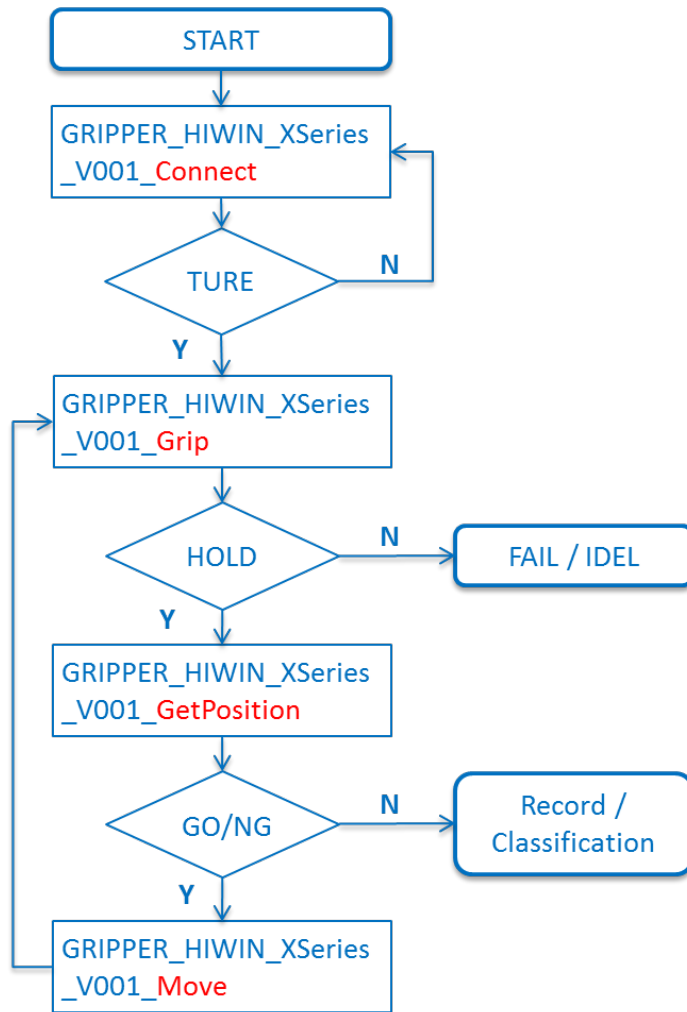
- SEG gripper:



- STG gripper:



- X-series gripper:



Appendix.2 : Certification

Declarations of conformity with the following directives and standards are available on request.

CE Compliance	
Machinery Directives	2006/42/EC
Low Voltage Directives (LVD)	2014/35/EU
Safety of Machinery	EN ISO 12100:2010
	EN 60204-1:2006+AC:2010
Electromagnetic Compatibility Directives (EMC)	EN 61000-6-2:2005
	EN 61000-6-4:2007+A1:2011
Hazardous Substances Restriction Directives (RoHS 2)	2011/65/EU (2015/863)

S-Series and X-Series Electric Grippers (Original Instruction) TM Plug&Play Manual Guide

Publication Date : November 2021

-
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HIWIN GmbH

OFFENBURG, GERMANY
www.hiwin.de
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info@hiwin.kr

HIWIN CHINA

SUZHOU, CHINA
www.hiwin.cn
info@hiwin.cn

Mega-Fabs Motion Systems, Ltd.

HAIFA, ISRAEL
www.mega-fabs.com
info@mega-fabs.com

HIWIN TECHNOLOGIES CORP.

No. 7, Jingke Road,
Taichung Precision Machinery Park,
Taichung 40852, Taiwan
Tel: +886-4-23594510
Fax: +886-4-23594420
www.hiwin.tw
business@hiwin.tw (Sales)
robotservice@hiwin.tw (Customer Service)