



BA-CW Checkweigher

Operator's Manual

【version: V1.0】

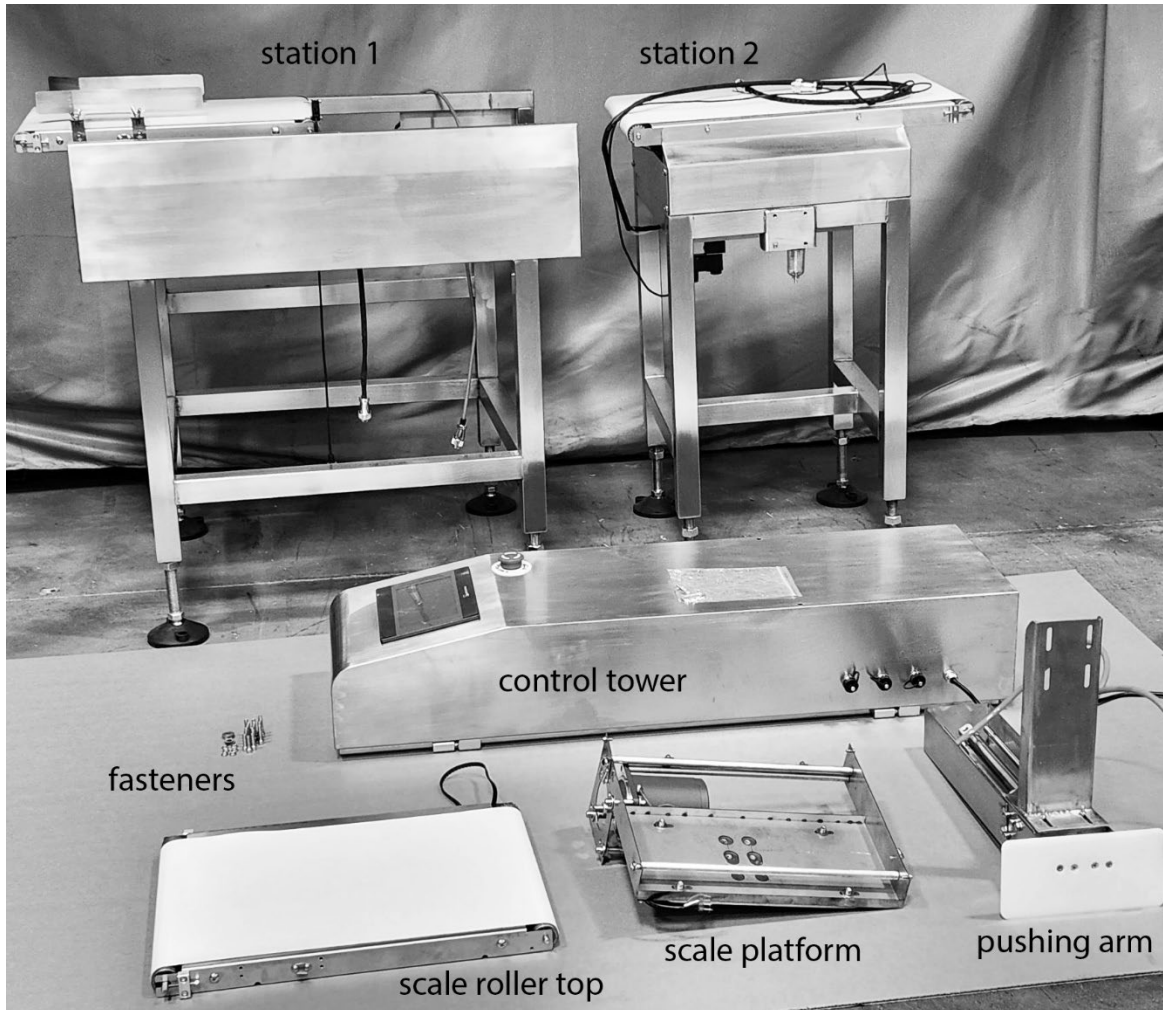


Installation

What's in the boxes?



Your shipment includes two crates. One of the crates contains Station 1 and the control tower, while the other contains Station 2. To safely extract the machine, use a hammer and a short pry bar (or equivalents) to remove the top covers. Utilize a forklift and straps to lift the machine and carefully transport it out of the box. Ensure the proper balance is maintained throughout the process.



Find the following items to complete the whole set according to the instruction manual:

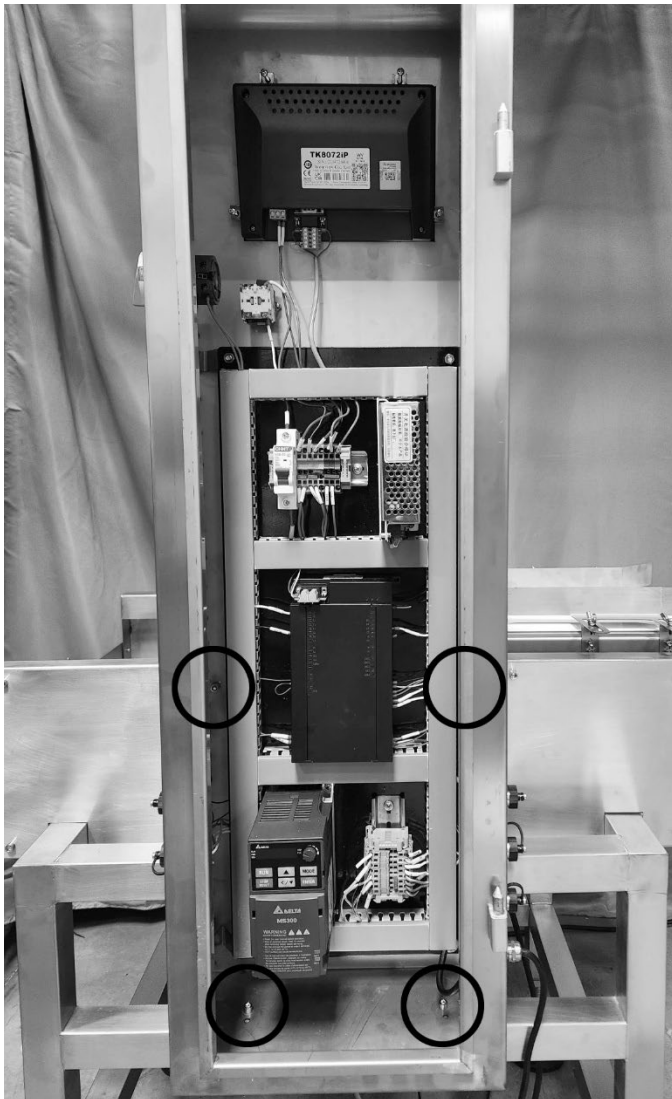
- Station 1
- Station 2
- Control Tower
- Scale Platform
- Scale Roller Top
- Pushing Arm
- Fasteners (4 long bolts, 8 short bolts, 8 lock washers and 8 flat washers, key to the door of the control tower)

Kindly take note that an air compressor is required to operate the machine. You can use your existing compressor or reach out to us at admin@bizautom.com for information on a compatible compressor.

Assemble Your Machine

Install the Control Tower

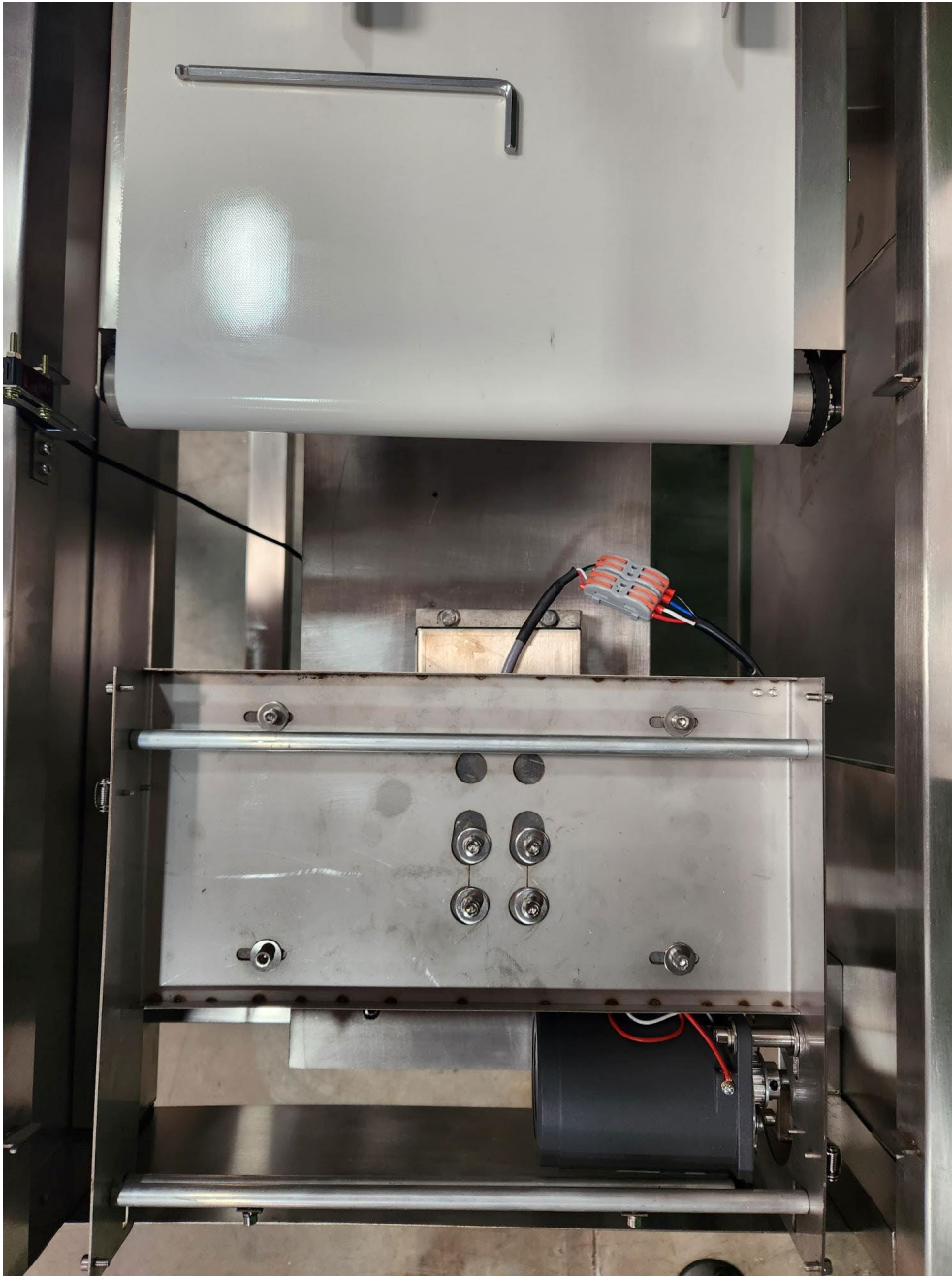
1. Detach the door of the control tower by unlocking it and sliding the door upward.
2. Mount the control tower onto the rack of Station 1.
3. Secure the control tower onto the rack of Station 1 using four short bolts. Please refer to the accompanying picture for the precise locations of the 4 bolts (indicated by circles).



4. Reinstall the door onto the control tower.

Install the Scale

1. Begin by placing the scale platform in the designated position as illustrated in the accompanying picture:

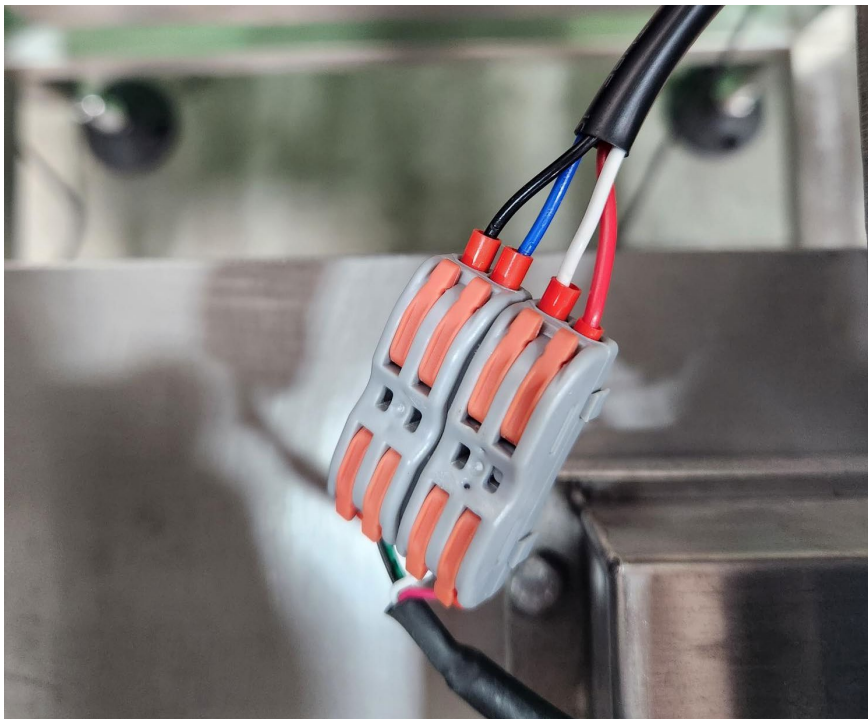


2. Utilize the four long bolts, accompanied by the lock washers and flat washers, to securely mount the scale platform onto the designated station. Take care to avoid any impacts or vibrations that may adversely affect the scale platform.

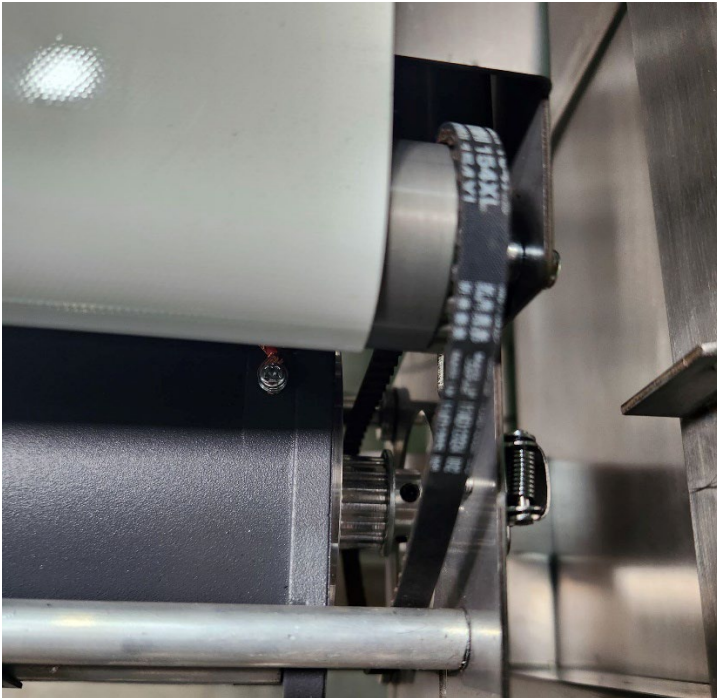
3. Align the platform with the roller located on its left side and proceed to tighten the bolts. Ensure that equal torque is applied to each bolt during the tightening process.
4. Locate the cable connector and carefully raise all the empty orange levers.



5. Insert the load cell wires into the corresponding holes, matching the color on the opposite side of the connector. Lower the orange levers to securely lock the wires in place.



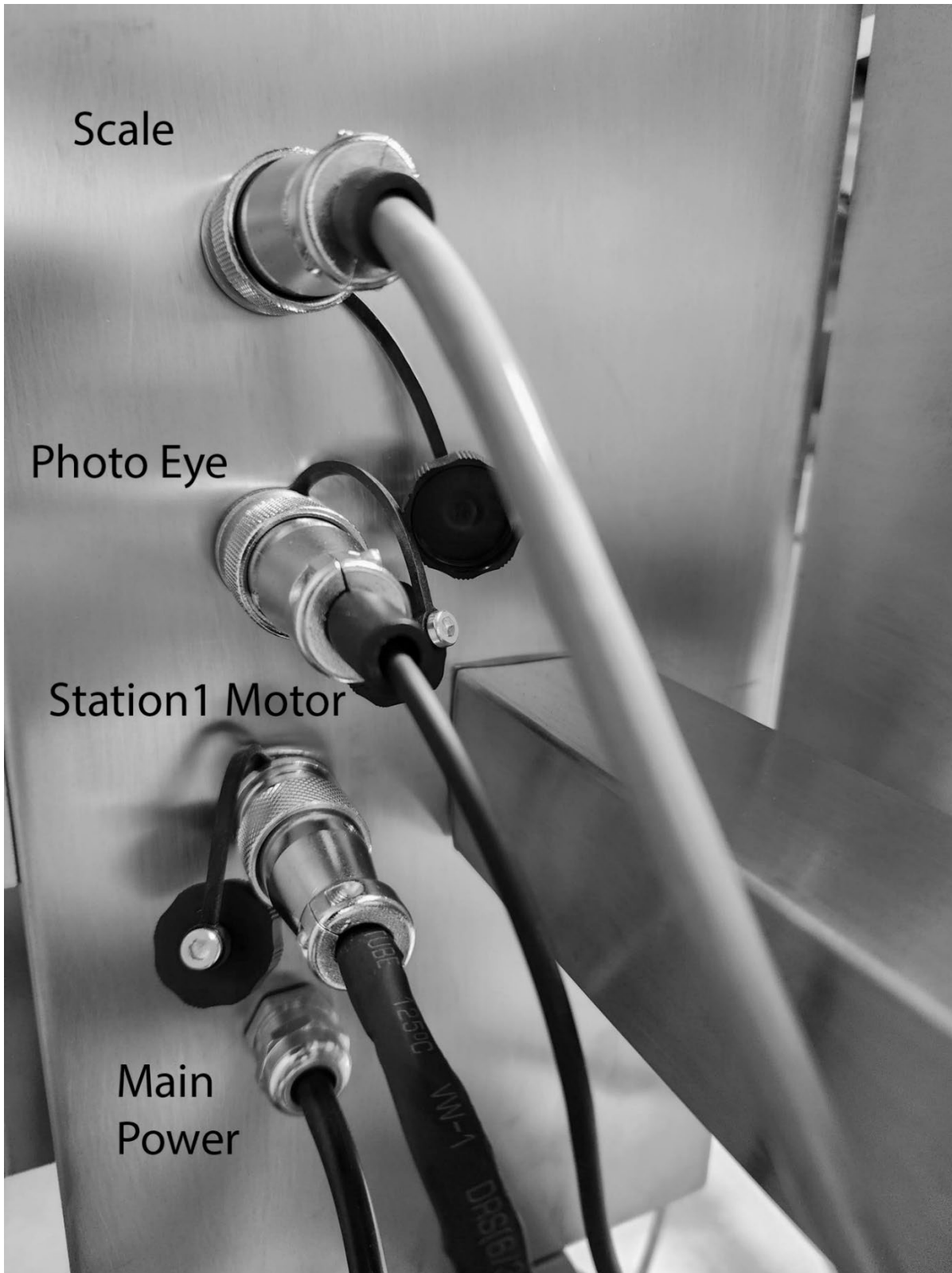
6. Pick up the scale roller and carefully mount the rubber belt onto the gear of the scale platform, as depicted in the provided picture.



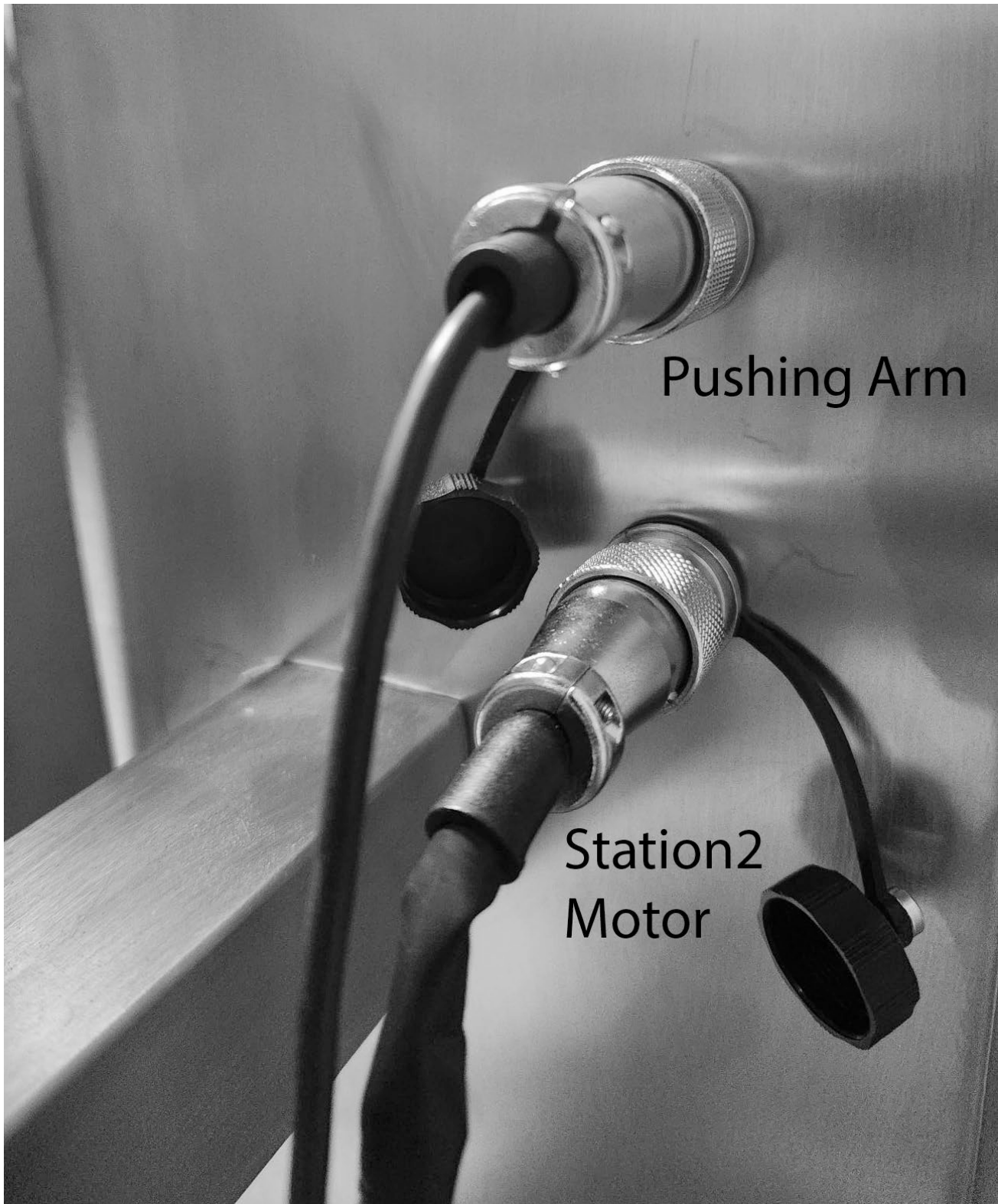
7. Please follow the steps outlined in the instruction manual to mount the top roller onto the scale platform. Once in place, secure it by locking down on all four sides.



8. Plug in the cables of Station 1:



9. Plug in the cables of Station 2:



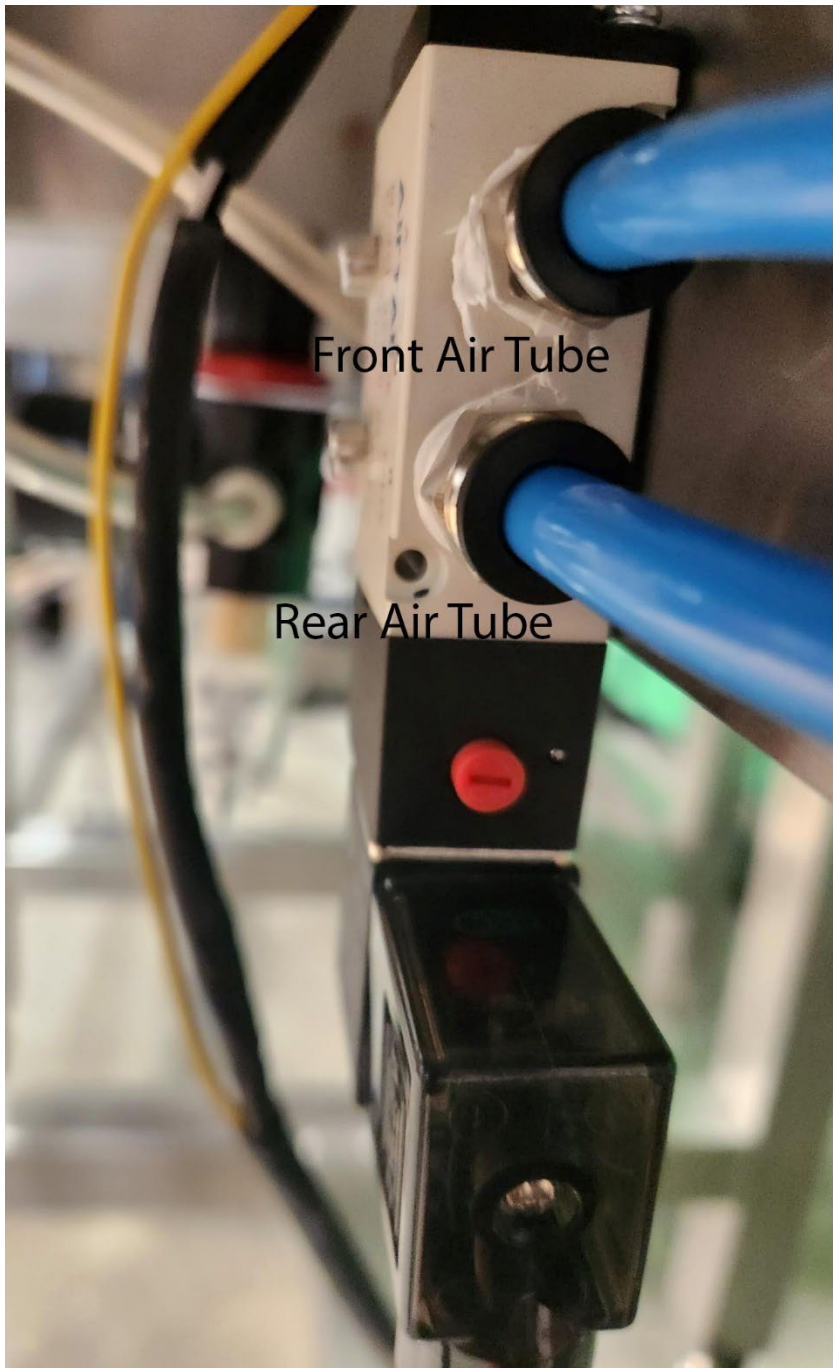
10. Use the 4 short bolts, accompanied by the lock washers and flat washers, to securely mount the pushing arm onto the rack of Station 2:



11. Locate the two air tubes.

Connect the front tube on the pushing arm to the top air socket.

Connect the rear tube on the pushing arm to the bottom air socket.



Controller Overview

The BA-CW control module, developed by BizAutom, is a robust weighing control module designed for industrial use. It enables high-speed, dynamic, and precise real-time weighing, with the option to output the results through Ethernet or serial communication.

This module is specifically designed for various applications. It incorporates a specialized digital filtering algorithm that effectively suppresses disturbances caused by motor rotation, belt rotation, and object impact.

With two Ethernet interfaces, the module supports cascading multiple modules through a daisy chain configuration. The Ethernet interface is compatible with standard protocols like MODBUS TCP/IP, MODBUS RTU Over TCP/IP, and HTTP for reading and setting parameters.

For serial communication, the module utilizes the widely adopted Modbus RTU protocol over a half-duplex RS-485 serial port transmission. It allows the configuration of interface parameters, sampling and filtering parameters, scale settings, calibration parameters for measured values, taring and zero parameters, as well as status detection parameters, among others.

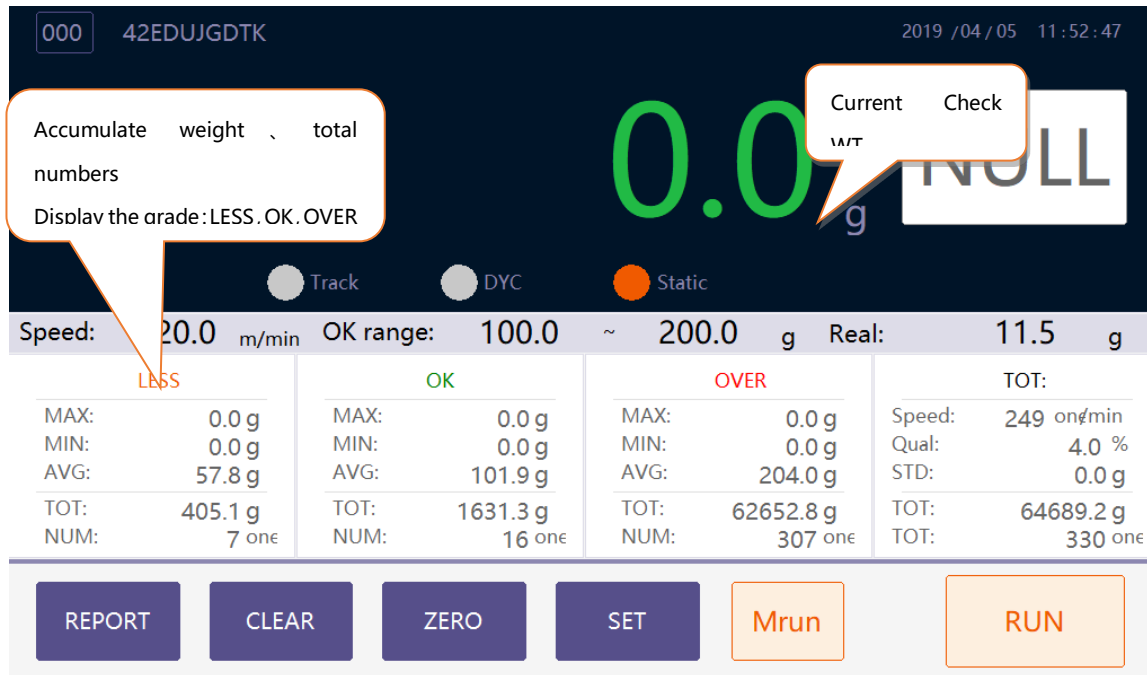
Types:

Type	I/O Output (high speed)	I/O Input	voltage output	Multi-Check Nums	Net port
BA-CW-RS01-CW10	Y0~Y9 (--)	X0~X5	V0~V3	3	×
BA-CW-EN01-CW10	Y0~Y9 (--)	X0~X5	V0~V3	3	√
BA-CW-RS01-CWT10	Y0~Y9 (Y10-Y11)	X0~X5	----	3	×
BA-CW-EN01-CWT10	Y0~Y9 (Y10-Y11)	X0~X5	----	3	√
BA-CW-RS01-SW10	Y0~Y9 (Y10-Y11)	X0~X5	V0~V3	3	×
BA-CW- EN 01-SW10	Y0~Y9 (Y10-Y11)	X0~X5	V0~V3	3	√

Specifications:

Precision / Speed	Precision	dynamic 1/5000; static 1/50000
	Speed	200 Loads/min
Display	Monitor	7 inch touchscreen
	Display resolution	800×480
A/D Convert	AD Sample:	Sigma-Delta Type
	Max of Speed	200SPS
	Input range	-30mV~30mV
	Nonlinearity	≤0.002%FS
	Temperature	≤5ppm/°C
Loadcell	Excitation voltage	5V, Provide 150mA current Max
	Nums of Loadcell	350 Ohms, max 6
	Connect type	Four-wires or Six-wires
Weight Function	Display division	0.1、0.2、0.5、1、2、5、10、20
	Auto Zero Trace	0.1d/0.1s~20.0d/5.0s
	Clear Zero	Null、+/-2%FS、+/-4%FS、+/-10%FS、+/-50%FS
	Power on Zero	Null、+/-2%FS、+/-5%FS、+/-10%FS、+/-20%FS
	Multistage weight detection	10 Level
	Digital Filter	Special Digital Filter
	Export of the Data	Support Export the Data by Thumb Drive
Case	Water Resistance	Embedded IP65
	Size	180L×108W×77H (mm)
Electrical Environment	Power Supply	24VDC 0.3A
	Temperature	-10°C~40°C
	Relative Humidity	10% ~ 90%,
Digital IO	Output Nums	12 Mosfets
	Mosfet Current	2A max
	Input Nums	6, Photoelectric isolation, Common Ground or Common Power
	Input Votage	18~36VDC
Analog Output	Output type	0~5V (4 channels)
	Output Valid bits	16 bits
	Nonlinear Error	±0.02%FS
	Max Update Freq	200KHz
MODBUS-RTU	Baud rate	1.2K,2.4K,4.8K,9.6K,19.2K,38.4K,115.2K
	Physical Interface	RS-485, RS-232

Main Interface:



System Setting:

Login permissions are necessary for accessing system settings. Depending on the granted permissions, various settings can be configured. Please find below the default login information:

User name: device owner
 Code: 0 (default password)

User name: system administrator
 Code: 111111 (default password)

System Info:

2019 / 04 / 05 11 : 56 : 16

Formula Set

2019 - 04 - 05 11 : 56 : 16

PASSWOR

Weigh Set

Restore Defaults: 654321

INS Set

Update Program: 654321

REBOOT English ▾

Motor Set

EQT Type: www.riins.com

Soft VSN: V4.5

EQT Marke: 6930663302682

Hard VSN: 4.8

Speed ADJ

Data:

Meter:

IO Set

TEL:

TEL:

WEBSITE: 6930663302682

WEBSITE:

About HMI

Return

Change password: this feature allows users to modify the password of the currently logged-in user.

Recovery module default parameters: by entering 123456, users can restore the module to its default parameters and initiate a valid restart.

Update the control module program: users can update the control module program by entering 123456.

Support language: the module provides support for both English and Chinese languages.

Formula / Sequence Settings:

2019 /04 /05 11:56:43

Formula Set Num: Name: Num Unit:

Weigh Set SPEED PRECI LESS OK OVER

INS Set OK ACT Dly: ms OK Min Val: g

Motor Set OK ACT Tim: ms OK Max Val: g

Speed ADJ Tar: g

IO Set OK Alarm Num: one

IO Set OK Alarm Val: g

About HMI Amount or weight to the maximum value is the overflow alarm, 0 is not alarm.

Return

The system has the capability to store up to 10 formulations. It can switch between formulas, update the formula name, and modify the quantity unit. Additionally, the system allows for the adjustment of speed and precision settings corresponding to different formulations.

Here is a breakdown of the various settings:

Recipe name: The maximum character limit for the recipe name is 16.

Unit of quantity: The default unit of quantity is "package," but it can be changed to accommodate various formulations. The supported units of quantity include bags, pieces, boxes, only, bars, bottles, cans, and buckets.

Weight measuring speed: This setting controls the speed of the loading table motor, weighing table motor, and dividing platform motor. The default speed is 500, which corresponds to a DC of 500mV or an AC frequency of 5Hz.

Weighing threshold: When the weight exceeds this threshold, the system performs a weight check.

Weighing data processing: By default, the system operates in maximum mode, but it can be changed to average mode. The percentage of valid data can also be adjusted.

Filter strength setting: The default filter strength is 5, with a range of 3 to 18.

Filter Factor setting: The default filter factor is 45, with a range of 30 to 100.

Dynamic compensation value: This value can be set to achieve dynamic compensation when dynamic weight deviation occurs.

Dynamic compensation coefficient: The default coefficient is 1, with a range of 1 to 100.

Minimum eligible value: This represents the lower limit of the weight range for the weighing object.

Maximum qualified value: This represents the upper limit of the weight range for the weighing object.

Tare weight: Refers to the weight of the outer packing of the weighing item, excluding the weight of the article itself.

Action delay time: The delay time associated with a detection action. Typically, when changing the speed of the counter motor, the corresponding delay time should also be adjusted.

Action execution time: The execution time for a specific sub-check action. The actual execution time depends on the mechanical part's design and structure.

Maximum number of defects: When the cumulative number of detection results exceeds the system alarm, the default value of 0 disables this functionality.

Maximum weight of defects: When the cumulative weight of the inspection results exceeds this threshold, the system will trigger an alarm. The default value of 0 disables this feature.

Weighing Scale Settings:

2019 / 04 / 05 11 : 57 : 02

Formula Set

Zero scale: 18114 SCALE Sta Real: 11.4 g

Load scale: 87600 SCALE Weight: 200.0 g

Weigh Set

INS Set

Zero range: +/-50%FUS ZERO

Motor Set

Trace range: 0.0 d

Speed ADJ

Trace rate: 2020 d/s,5420 is 5.4d/2.0s.

IO Set

Alarm Counter: 5 When the number of continuous weights is reached

Fail Alarm DLY: 0 ms

Fail Alarm TIM: 500 ms

About HMI

Alarm grade: LESS OK OVER

Return

Zero Calibration: Calibrate the balance platform (dead weight).

Load Calibration: Place the weight on the scale platform for calibration.

Weight Value: Enter the weight value of the corresponding weight.

Calibration Process Instructions:

1. Input the weight value.
2. Remove items from the platform and leave it blank for calibration.
3. Load and calibrate the weight.
4. Indicate the corresponding weight value, then remove the weight to complete the calibration.

Manual Zeroing Range:

Set the range of manual zeroing (relative percentage to the maximum/minimum quantum range).

By default, manual zeroing is disabled, and the main interface does not have a clear button.

Zero Tracking Range:

Set the range of zero-point values that can be tracked.

The default value is 0, and zero-point tracking is not performed at 0.

Zero Tracking Rate:

The input format is 5420d, where 5.4d/2.0s means the zero-point value can drift within 5.4 index values within 2 seconds.

The default value is 0.

Continuous Failure Alarm:

The system will sound an alarm when the corresponding weight check results reach the set number.

This function alerts when the check weight of N packets in a row does not meet the standard.

Continuous Failure Alarm Delay:

Set the system delay time when the corresponding weight check results are continuous to the set number.

Continuous Failure Alarm Time:

Set the duration of the alarm.

Alarm Corresponding Classification:

Set different grades corresponding to the continuous weight check alarm.

Multiple grades can be selected simultaneously.

Orange indicates selected grades, and these grades trigger the alarm.

INS Set (System Administrator permission required)

2019 / 04 / 05 11 : 57 : 20

Formula Set	Full scale: <input type="text" value="100000.0"/> <input type="text" value="g"/>	Division value: <input type="text" value="0.1"/> <input type="text" value="g"/>
Weigh Set	Optoel mode: <input type="text"/>	Decimals: <input type="text" value="1 decimals"/>
INS Set	Slave Addr: <input type="text" value="0"/> <small>从机波特率为19200, 校验位为偶校验</small>	IO Contorl: <input type="text" value="OFF"/>
Motor Set	IO Run/Stop: <input type="text" value="Level Mode"/>	IO Tare Mode: <input type="text" value="Pulse Mode"/>
Speed ADJ	IO Pause/Run: <input type="text" value="Level Mode"/>	IO Zero Mode: <input type="text" value="Pulse Mode"/>
IO Set	IO Clear Alarm: <input type="text" value="Pulse Mode"/>	
About HMI	Full Alarm DLY: <input type="text" value="0"/> ms	
	Full Alarm TIM: <input type="text" value="500"/> ms	

Maximum Range: The maximum weighing capacity of the platform can be selected in either grams (g) or kilograms (kg).

Weight Display Precision: To ensure accurate weight display, you can choose from the following options: 0.1g, 0.2g, 0.5g, 1.0g, 2.0g, 5.0g, 10g, or 20g. The default precision is set to 0.1g.

Photoelectric Mode: Depending on the photoelectric access mode of the equipment, you can configure the system with options such as no photoelectric mode, dual photoelectric mode, photoelectric entry mode, and photoelectric output mode. Following the configuration, the corresponding indicator light will be illuminated on the operation interface.

Display Decimal: Customize the number of decimal places displayed for weight. Available options include no decimal, one decimal, two decimals, or three decimals.

Slave Address: When using the touch screen 485 interface MODBUS/RTU, specify the slave address with a baud rate of 19200 and enable an even parity check.

External IO Control: This feature allows for future use or expansion.

IO Start/Stop Mode: Connect the system to an external start/stop button and select the appropriate mode (level or pulse) based on the button type.

IO Pause/Resume Mode: Connect the system to an external pause/resume button and select the corresponding mode.

IO Purge Overflow Alarm: Connect the system to an external button for purge overflow alarm status (effective when the overflow alarm is activated in the formula). Choose the appropriate stop mode based on the button type.

IO Taring Mode: Connect the system to an external button for removing the tare weight. Select the corresponding mode based on the button type.

IO Zeroing Mode: Connect the system to an external button for zeroing. Choose the appropriate mode based on the button type.

Cumulative Overflow Alarm Delay: Specify the delay time of the overflow alarm in milliseconds. This delay affects the output time of the corresponding IO when the overflow alarm is enabled in the formula.

Cumulative Overflow Alarm Time: Specify the duration of the overflow alarm in milliseconds. The corresponding IO will be activated for the specified duration when the overflow alarm is enabled in the formula.

Motor Setup (System Administrator permission required)

2019 /04 /05 11:57:35

Formula Set

Weigh Set Baud: 9600 Parity: None

INS Set

Motor Set

Speed ADJ

IO Set

About HMI

Freq reg adr: 8193 Run Reg adr: 8192 Dir reg adr: 8192

Run Val: 2 Positive: 16

Stop val: 1 Reverse: 32

Motor Stop Dly: 0 ms

Return

Communication Baud Rate: To configure the baud rate and check bit of Module A and Module B, follow these steps. If the Frequency Converter is connected to the Feed Converter, the slave address of the Feed Converter is 1. For the Scale Converter, the address is 2. If the Frequency Converter is connected to the Elimination Inverter, the baud rate should match with that of the Frequency Converter. The address for the Elimination Inverter is 3.

Motor Register Address Setting: For RS485 Modbus RTU communication, you can set the register address, start value, stop value, direction register address, forward value, and reverse value separately for the Feed Table Inverter, Weighing Table Inverter, and Check Table Inverter.

Motor Stop Delay: Use this setting to define the motor stop time in milliseconds. This setting is only valid for non-zero values. For example, if set to 1000 milliseconds, the motor will automatically stop after 1000 milliseconds when an object is detected on the platform. Users can restart the motor by pressing the Start Motor button on the touch screen.

Velocity Correction / Speed ADJ (System Administrator permission required)

2019 / 04 / 05 11 : 57 : 49

Formula Set	Feed Scale					
Weigh Set	High V/Hz:	<input type="text" value="0"/>	mV/0.01Hz	<input type="button" value="RUN"/>	Speed:	<input type="text" value="0.0"/> m/min
INS Set	Mid V/Hz:	<input type="text" value="0"/>	mV/0.01Hz	<input type="button" value="RUN"/>	Speed:	<input type="text" value="0.0"/> m/min
Motor Set	Low V/Hz:	<input type="text" value="0"/>	mV/0.01Hz	<input type="button" value="RUN"/>	Speed:	<input type="text" value="0.0"/> m/min
Speed ADJ	Weight scale					
IO Set	High V/Hz:	<input type="text" value="20000"/>	mV/0.01Hz	<input type="button" value="RUN"/>	Speed:	<input type="text" value="80.0"/> m/min
About HMI	Mid V/Hz:	<input type="text" value="10000"/>	mV/0.01Hz	<input type="button" value="RUN"/>	Speed:	<input type="text" value="40.0"/> m/min
	Low V/Hz:	<input type="text" value="5000"/>	mV/0.01Hz	<input type="button" value="RUN"/>	Speed:	<input type="text" value="20.0"/> m/min
	Sort scale					
	High V/Hz:	<input type="text" value="0"/>	mV/0.01Hz	<input type="button" value="RUN"/>	Speed:	<input type="text" value="0.0"/> m/min
	Mid V/Hz:	<input type="text" value="0"/>	mV/0.01Hz	<input type="button" value="RUN"/>	Speed:	<input type="text" value="0.0"/> m/min
	Low V/Hz:	<input type="text" value="0"/>	mV/0.01Hz	<input type="button" value="RUN"/>	Speed:	<input type="text" value="0.0"/> m/min

Loading Scale:

Input the height voltage and frequency value.

Then, set the starting point.

Use a velocimeter to measure the linear velocity of the belt and write down the measured value.

Weighing Scale:

Input the height voltage and frequency value.

Then, set the starting point.

Use a velocimeter to measure the linear velocity of the belt and write down the measured value.

Sorting Scale:

Input the height voltage and frequency value.

Then, set the starting point.

Use a velocimeter to measure the linear velocity of the belt and write down the measured value.

IO Set (System Administrator permission required)

2019 /04 /05 11 :58 :03

Formula Set IO Output: 0 1 2 3 4 5 6 7 8 9 10 11

Weigh Set Y0 Fun: NULL Y1 Fun: LESS ACT Y2 Fun:

INS Set Y3 Fun: OK ACT Y4 Fun: Y5 Fun: OVER ACT

Motor Set Y6 Fun: Y7 Fun: NULL Y8 Fun: NULL

Speed ADJ Y9 Fun: NULL Y10 Fun: NULL Y11 Fun: NULL

IO Set IO Input: 0 1 2 3 4 5

About HMI X0 Fun: Out Signal X1 Fun: In Signal X2 Fun: NULL

X3 Fun: NULL X4 Fun: NULL X5 Fun: NULL

Return

IO Settings: To debug the IO port, simply click on the corresponding port number to which the IO port is connected.

Y0~Y11 Function: The output function of each IO port can be individually configured. Output ports can be set to perform various actions, such as startup operation, stability indication, zero-bit indication, overflow indication, cumulative alarm, continuous failure, light action, qualified action, and excessive action.

X0~X5 Function: The input function of each IO port can be individually set. Input ports can be configured for different purposes, such as the start/stop button, pause/resume button, taring input, zero input, clear alarm, input from the photocell, and output from the photocell.

Report Statistics:

2019 / 04 / 05 11:58:19

Report

No.	Time	Data	Name	Num	Grade	Weight
-----	------	------	------	-----	-------	--------

Return Delete Earlier Delete All

Data Report:

View all weight check data including corresponding grades 1, 2, and 3.
Set up historical data for different time periods.

Delete Oldest Data:

Delete the oldest data in the file.

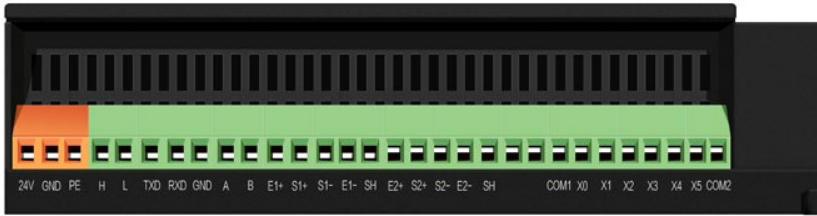
Delete All Data:

Clear all saved data.

Data Export:

Export data for the currently selected date to a thumb drive.

Interface Specification



(1) Power supply and communication terminal instructions:

Terminal Label	Functions
24V	Instrument power supply positive pole, DC 24V
GND	Instrument supply negative electrode
SH	Instrument shield end
H	CAN communication positive, H side (reserved)
L	CAN communication negative, L-side (reserved)
TxD	RS232 Communication sending end
RxD	RS232 Communication receiver
GND	RS232 Communication ground wire
A	RS485 communication positive pole A terminal
B	RS485 communication negative pole B terminal

The rated power supply voltage for this device is 24 VDC, and the rated current is 250 mA.

Connecting the shielded wire or the negative (GND) of the instrument power supply to the instrument shielded (SH) is recommended. By default, the NH end and GND end are short-connected with the 0R resistance when they leave the factory, but the external shield is not connected. If the external shield is connected, the resistance should be removed.

The RS232 communication interface is a standard MODBUS interface used for setting the internal parameters of the instrument. The default communication baud rate is 115200, and the check bit is an even check.

RS485 communication is used for driving the frequency converter to control the motor's speed. The communication baud rate is 9600, the check bit is an even check, and the transmission protocol is a standard MODBUS protocol.

(2) Loadcell terminal instructions:

Terminal label	Functions
E1+	Excitation positive of the Loadcell 1
S1+	Signal+ of the Loadcell 1
S1-	Signal- of the Loadcell 1
E1-	Excitation negative of the Loadcell 1
SH	Loadcell shield
E2+	Excitation positive of the Loadcell 2
S2+	Signal+ of the Loadcell 2
S2-	Signal- of the Loadcell 2
E2-	Excitation negative of the Loadcell 1
SH	Loadcell shield

The excitation voltage of the sensor is 5V DC. The instrument employs the sensor 1 signal terminal and the sensor 2 signal terminal.

(3) IO input terminal instructions:

Terminal label	Functions
COM1	IO input public end 1
X0-X2	IO input 0-2
X3-X5	IO input 3-5
COM2	IO input public end 2

For the switch input, set the function of each input through the IO setting interface.

Input Common End:

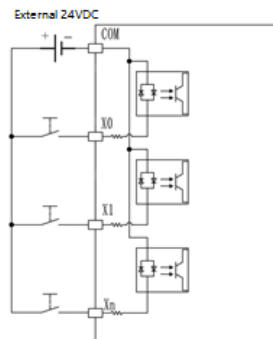
Common Power Supply (COM Connection Power)

Common Power Supply - (COM Connection Power Supply -)

X0-X2 Common Com 1 Terminal

X3-X5 Common Com 2 Terminal

Input Current Range: 5mA to 20mA



(Internal diagram)

(4) Analog output and communication terminal instructions :

Terminal label	Functions
V0	Analog output signal 0 positive
V1	Analog output signal 1 positive pole
V2	Analog output signal 2 positive
V3	Analog output signal 3 positive
VCOM	Analog output signal ground line
SH	Analog shielded end

The analog output is responsible for providing an analog voltage output with a range of 0-5VDC. This output is primarily utilized for controlling the rotation speed of the motor in the DC motor controller.

(5) Instructions for Ethernet ports and DB9 port terminals:

Ethernet port :

Quantity	Functions
2	Achieve concatenation or redundant communication in daisy chain mode

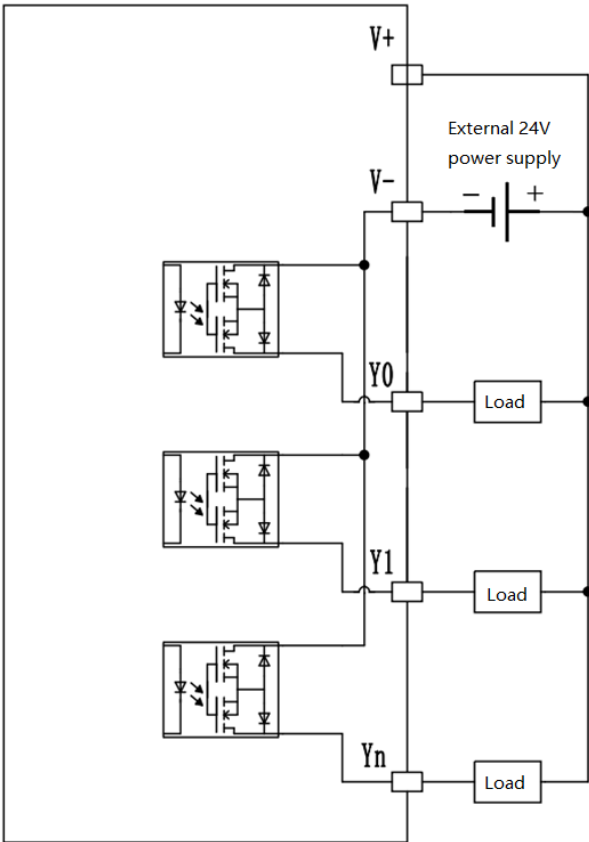
DB9 Port :

Terminal #	Terminal Label	Functions
2	RxD	RS232 Communication Receiver
3	TxD	RS232 Communication Transmitter
5	GND	RS232 Communication Ground Wire

(6) Switch output terminal description :

Terminal Label	Functions
Y0-Y9	IO Output 0-9
Y10-Y11	IO Output Y10 and Y11 - High-speed output port
V+	IO Output external power supply +, 24VDC
V-	IO Output external power supply -

The device features a total of 12 IO ports, including Y10 and Y11, which are designated as high-speed output ports capable of reaching a maximum output frequency of 100 KHz. Each input port's functionality can be configured through the IO interface. Furthermore, the output port drive capability of the device is 3A.



(Internal Diagram)