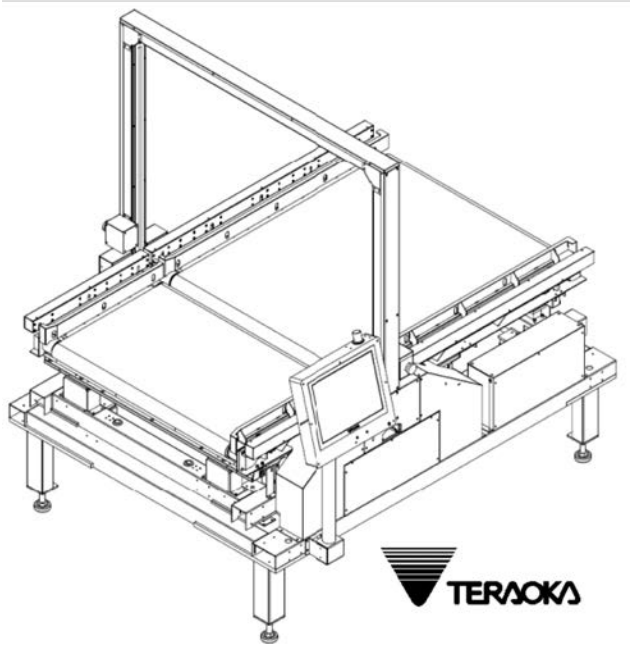
CUBISCAN™ 200 SQ

Operation and service manual



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This document was created with the purpose of providing the most accurate and complete information. If you have comments or suggestions for improving this manual, contact Quantronix at manual@cubiscan.com.

Manual updated September 19, 2022.

Important safety information

Important safety information includes important matters necessary for safe use of products and ensuring safety. Most accidents involving machine operation and maintenance are caused by failure to observe basic safety rules or precautions. An accident can often be prevented by recognizing potential hazards.

Follow all the safety precautions when checking, starting, operating, stopping, or performing any maintenance on the 200 SQ. The basic safety precautions given in this manual and the warning labels placed on the machine are:

DANGER Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

The items that you need to know before using the product are explained on the next page. Be sure to read them before operation.

Danger

DANGER AREA Do not put hands and /or any part of your body on the conveyor.

CONVEYOR START UP Make sure of the following conditions are met before starting the conveyor:

- No object is on the conveyor.
- Nobody is working near the conveyor.

POWER SOURCE Use the machine with the prescribed power source and voltage indicated on the nameplate. Non-compliance could result in fire, accidental electrocution, and/or machine damage.

REPAIR DO NOT repair, convert, and/or dismantle the machine and parts except in the manner described in this manual. Non-compliance could result in fire, accidental electrocution, and/or machine damage.

Warning

PLUGGING AND UNPLUGGING

Do not handle the 200 SQ plug when connected to a live power supply with wet hands. Hold the plug, NOT the power cable, when unplugging. Failure to observe this may cause accidental electrocution and damage to plug.

POWER SUPPLY CABLE

Handle the power supply cable with care. DO NOT step or put any heavy objects on it. DO NOT place the cable near heated objects. DO NOT modify, bend, or pull the cable. In case of cable damage or tear, immediately turn off the 200 SQ and unplug from power source if doing so does not pose a risk to you.

INSTALLATION

The 200 SQ should not be installed in any environment where excessive heat, humidity, or dust is present.

FUSE REPLACEMENT

Replace the fuse only when specified in this manual, and be sure to disconnect the power plug from the outlet before replacing to avoid electric shock. When replacing, be sure to use the rated fuse attached to the product.

EARTH WIRES

Check if earth wires are properly set up. Failure to do so could result in fire, accidental electrocution, and/or machine damage. If the earth wires are not properly set, or you are unsure, contact your DIGI dealer.

ABNORMAL OPERATION

Turn off power to the 200 SQ and unplug it immediately if the machine experiences shock, emits foul smell, makes odd sound, overheats, or emits smoke. Call your DIGI service engineer to inspect machine before returning to operation. Failure to do so could result in fire, accidental electrocution, and/or machine damage.

Caution 1

1. Inspections are required twice a year to maintain product performance and prevent breakdowns.

2. Do not use the 200 SQ near electronic devices that handle high-precision control or weak signals as it may affect electronic devices leading to malfunction.

3. Do not install the 200 SQ in a location that is unstable or inclined as this may cause it fall, leading to injury or malfunction. Install it in a flat and stable location, where it can easily be leveled.

4. Do not install or store in a place with high temperature or humidity, or in a place with a lot of dust. Doing so may cause a malfunction, electric shock, or fire.

5. Do not allow foreign matter or liquids to get inside the 200 SQ. Doing so may cause short circuit or smoke, resulting in fire, electric shock, or malfunction. If foreign matter or liquid gets inside the 200 SQ, immediately turn off the machine and unplug it from the outlet.

6. If the 200 SQ is dropped or suffers a strong impact, immediately turn it off and unplug it from the outlet. Continued use may cause fire, electric shock, injury, or malfunction.

7. If you do not use the product for a long time, disconnect the power plug from the outlet to ensure safety. Allowing it to remain plugged in over a long period of time without use, may cause fire or electric shock.

8. Do not operate the touch panel with sharp objects. Pressing the touch panel strongly with a sharp object may cause damage, leading to malfunction.

9. Do not install the 200 SQ in direct sunlight.

10. Do not climb onto or lean on the 200 SQ. Doing so may cause injury.

Caution 2

1. The Cubiscan 200 SQ is made for use in Japan only. Do not use it outside of Japan.

2. The 200 SQ may have unique specifications designed for particular users. Please note that the handling of specially designed products may differ from what is described in this manual.

3. Use the optional equipment, connection parts, consumables, etc. specified by Teraoka Seiko for connecting to the 200 SQ. If the customer uses optional equipment, connection parts, or consumables that are not specified, Teraoka Seiko Co., Ltd., the seller will not be held responsible for any resulting failures and the warranty will be considered void even if it is within the warranty period of the product. All non-designated consumables, parts, etc. will be outside the scope of the maintenance contract.

4. The dimensions and specifications of this product are subject to change without notice. Please note that due to changes in the 200 SQ, optional equipment and parts may differ from the dimensions, specifications, and operations, etc.

5. Reproduction of all or part of the contents of this manual without permission is strictly prohibited.

6. The contents of this manual are subject to changes without notice.

7. The contents of this manual have been prepared with the utmost care attention to the needs of the customer. If questions arise that fall outside the scope of this manual or if mistakes, omissions, etc., are found, please contact the sales office in charge.

8. Please note that we are not responsible for the impact of the operation results regardless of items 3, 4, and 6.

9. For assured accuracy, the internal clock should be set once a month.

10. For products that can manage product data, sales data, customer information, etc., this data may be recorded in the FD, CD-R, USB memory, memory card, etc. connected to the 200 SQ. Please be careful when handling these memory devices to prevent loss of data.

Precautions for use and maintenance

This device weights and dimensions objects along a conveyor. Regular cleaning and calibration tests are required to maintain accurate measurements. Run calibration test after any maintenance work.

Pre-start inspection items by the customer:

As a pre-start inspection, clean the passage sensor and gate sensor while conveyor is stopped. Before operating the 200 SQ, conduct calibration tests in test mode to ensure accuracy of measurements.

Required confirmation issues after maintenance work:

- After turning on the power, check that each sensor responds normally in maintenance mode.
- Check the date / time.
- Check the weight and three-sided measurement value in the test mode.

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CHAPTER 1
DESCRIPTON

The Cubiscan 200 SQ is an automated weighing and dimensioning system designed to seamlessly measure length, width, height and weight of packages along a conveyor system. The efficient package management of the 200 SQ prevents measurement mistakes, reducing overall costs.

Basic performance

The 200 SQ is designed for the following functions:

1. Transport of goods by belt conveyor (variable speed).
2. Automatic dimensioning of packages (length, width, height).
3. Automatic weighing of package.
4. Instant display of measured values for quick reference.
5. Display of measurement errors to be addressed.
6. Output of the measurement data to a USB memory file.
7. Transfer of measurement data via FTP server (PC).
8. Export of measurement data to an external device through Serial Socket communication.
9. Start/Stop of conveyor remotely by external control device (requires optional DIO).
10. Recording of measurement and operation logs.
11. Facilitating remote operation from client PC on LAN.

Precautions for use

1. Do not install the 200SQ in direct sunlight.

2. Install system on a flat, horizontal surface with little vibration.
3. For 3D measurement, an installation area larger than the machine size is required.
4. Since the 200 SQ is a scale, any touching of the conveyor system during operation will cause error in measurement.

Specifications

Basic Specifications

Transport Section	Motor	G3L22N5N-IPM040NT : 400w x 2 units
	Inverter	VF-NC3M-2004PY-A30 : 2 units
	Transport Belt	Belt width: 880mm, Guide width: 910mm
	Roller diameter	Φ70mm
Measurement (weight)	Capacity	50kg
	Scale	50g(0~5kg)/100g(5kg~50kg)
	Detection method	Loadcell
	Tolerance	150g(0~5kg)/300g(5kg~50kg)
	Weighing range	200g~50kg
Measurement (size)	Scale	5mm
	Detection	Infrared transmission sensor
	Tolerance	±5mm
Maximum package size	L: 1530 mm, W: 900 mm, H: 900mm	
Minimum package size	L: 150 mm, W: 100 mm, H: 5 mm	
Transport speed	30~120 m/min	

Inching operation	If the cargo is stopped or started while it is passing through the conveyor, the cargo may vibrate, fall, or slide. This can cause the following symptoms: 1. Dimensions and weight are not measured correctly. 2. The output timing of measured values fluctuates in data communication. 3. Abnormal transport due to operation with a motor or inverter that is not rated.
Minimum transport interval	700mm
Transport surface height	500mm
Body dimensions	L: 1735mm, W: 1350mm, H: 1560mm
Body weight	About 460kg
Interface (standard)	RS-232C: D-Subs pin (RS-422 is optional)
Interface (option)	RS-422: DIO terminal (RS-232C cannot be used at the same time). For control device connection DIO input: • Transport, high speed, medium speed, low speed, reverse transport, emergency stop, inverter reset. For control device connection DIO output: • Power on, transporting, measurable, scale abnormality, sensor abnormality, inverter abnormality, emergency stop, conveyor inlet sensor, conveyor outlet sensor, Gate sensor, BCR trigger
Usage environment	Operating temperature: 0~40°C (No condensation) Operating humidity: 15~85%RH (No condensation)
Power-supply voltage	AC200~240V Three-phase (50/60Hz)
Consumption	1.1 kVA

Display specifications

Display	15-inch color LCD, touch panel
Interface	USB, Ether-net(100BASE-TX)
External dimensions	L : 136mm, W : 360mm, H : 344mm
Display mass	About 8kg
Installation	Directly attached to main body mount
Installation orientation range	From the front side to 90° left and right

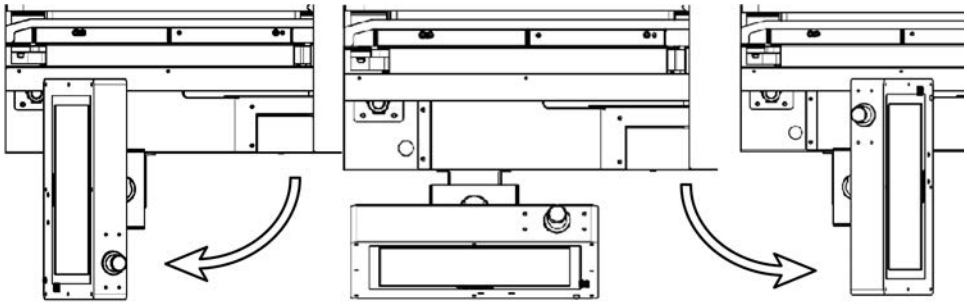


Figure 1
Display specification: Range of motion

NOTE *Although the display can be rotated at an angle larger than 90°, the display should be installed within the range of 90° in order to prevent wire breakage.*

Power supply specifications

Power plug shape: Three-phase 200V grounded 3P (Three-phase + earth)

Used plug model number: MH2584

Cable length: 5m from the main body

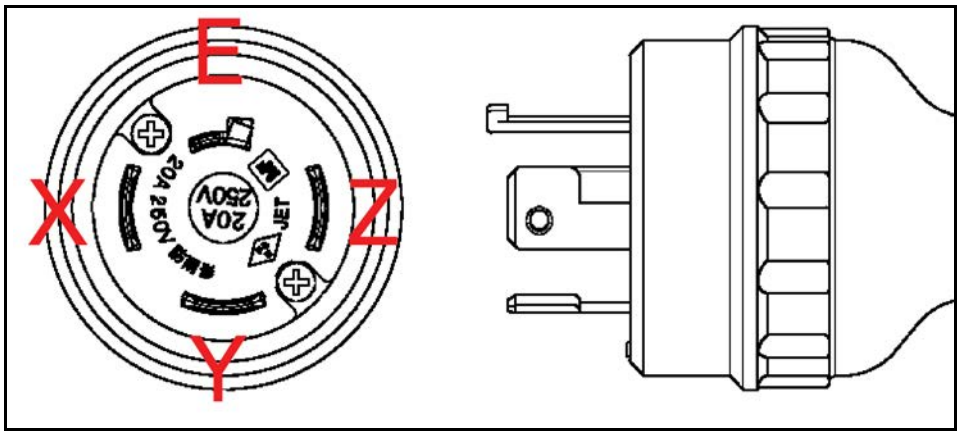


Figure 2
Power supply specification: Plug shape

Dimensions

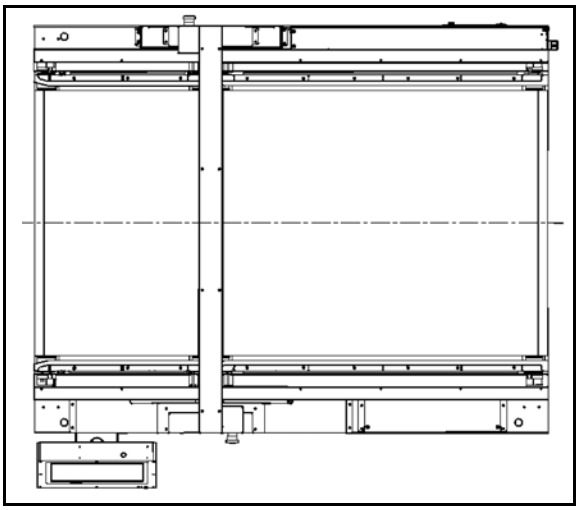


Figure 3
Dimensions: Top view of the main body

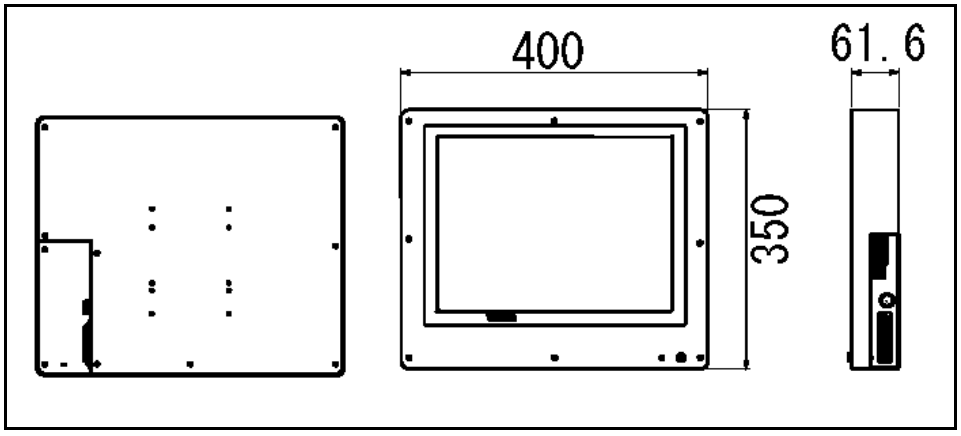


Figure 4
Dimensions: View of display

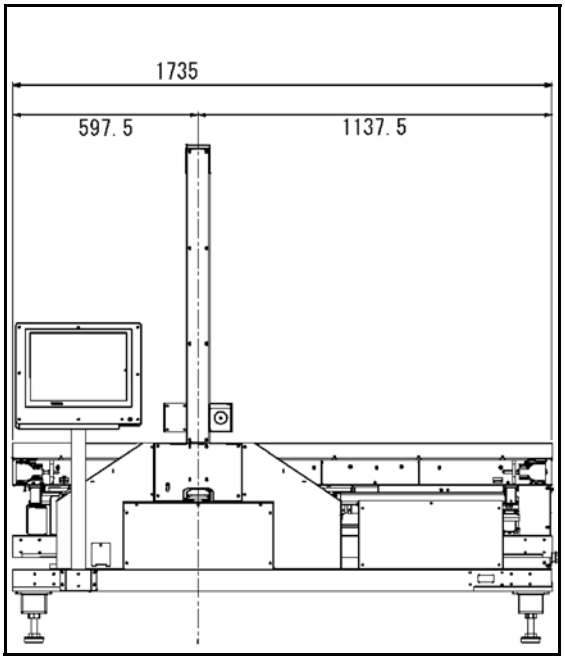


Figure 5
Dimensions: Front view of the main body

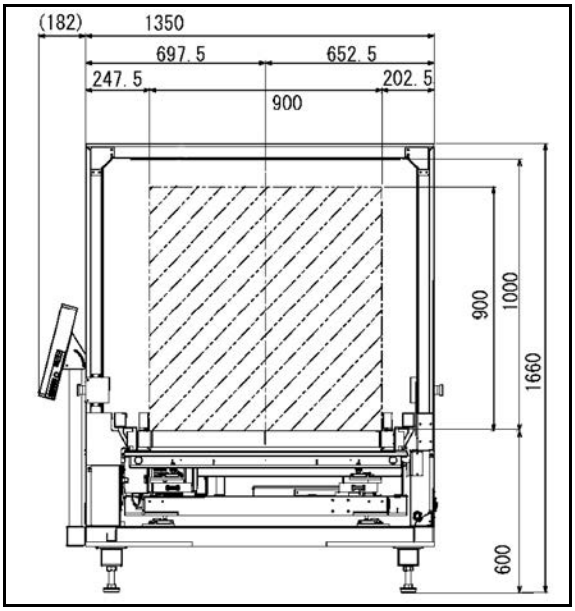


Figure 6
Dimensions: Side view of the main body

Part description

Conveyor main unit

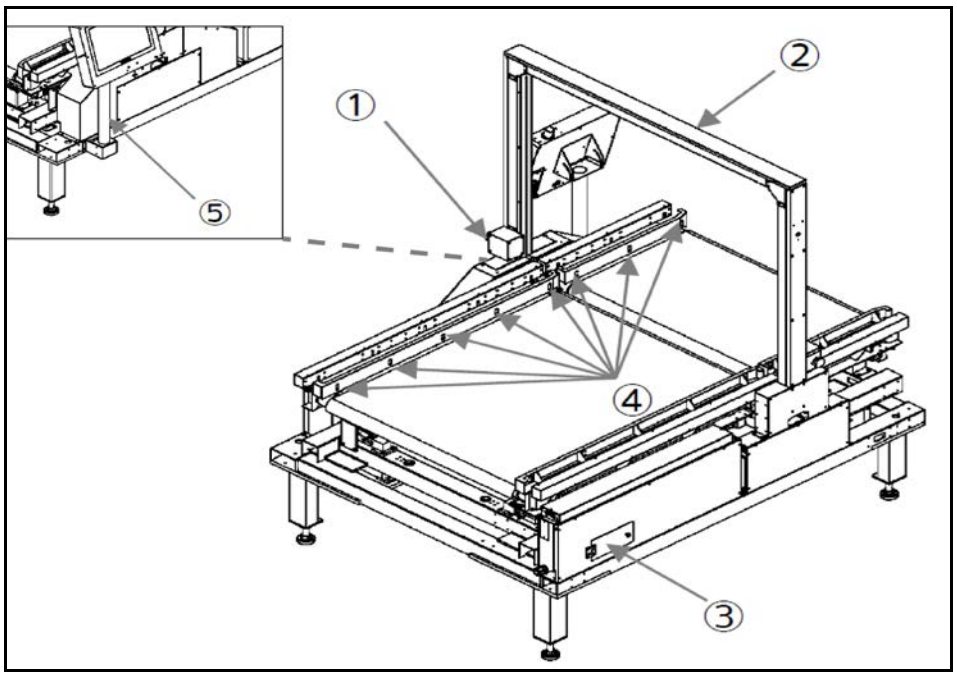


Figure 7
Part description: Conveyor main unit

1. Emergency stop button	Press this button to stop the machine in case of emergency.
2. Gate sensor	Sensors used for dimensioning packages (length, height, and width).
3. Main power switch	Switch for toggling the conveyors main power off and on.
4. Passage sensor	Sensor for detecting the movement of packages on the conveyor.
5. Manual switch	Switch to manually move conveyor forward or reverse.

Display

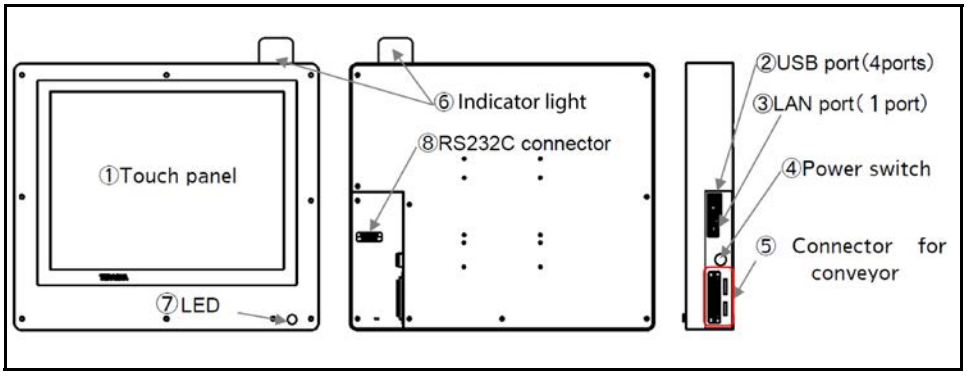


Figure 8
Part description: Display unit

1. Touch panel	You can press the button displayed on the screen.
2. USB port	Port for USB memory or handy scanner connection.
3. LAN port	Port for PC network connection.
4. Power switch	Press switch for SQ start up.
5. Connector for conveyor	Port of conveyor connection.
6. Indicator light	Indicates the proper functioning of the system.
7. Status LED	Indicates the functioning of the display.
8. RS232C connector	Port for PC connection.

Safety sticker position

A		B	
C		D	
E		F	

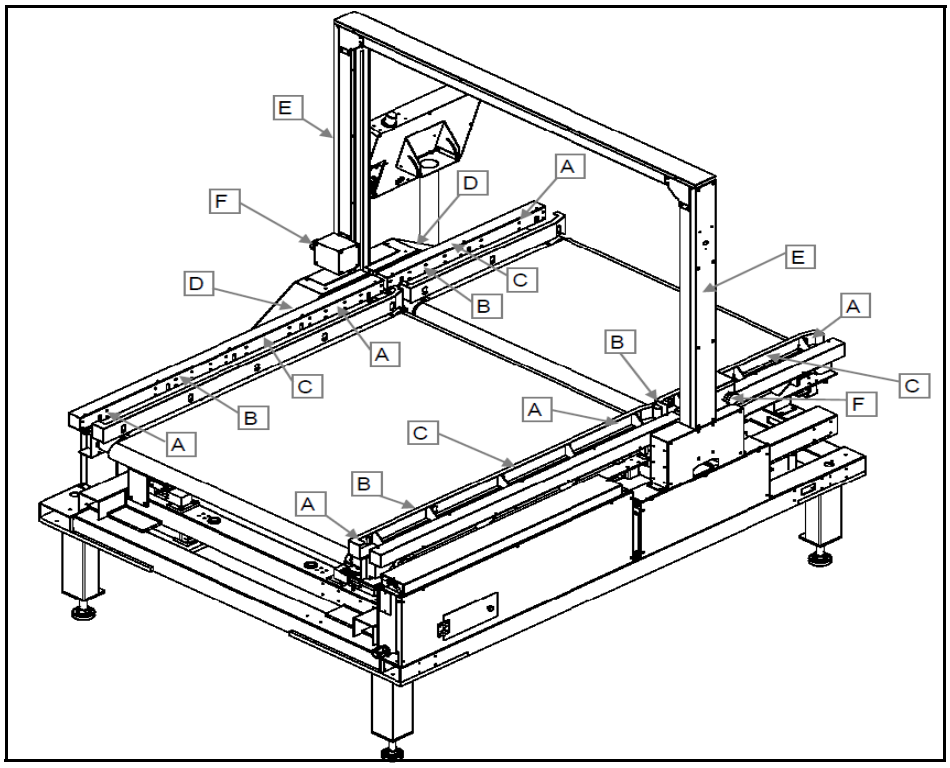


Figure 9
Safety sticker position: Safety stickers

Switches description

Main switch (main breaker)

Open the cover on the side of the conveyor to find the main power supply as illustrated below. The cover closes when you release the knob.

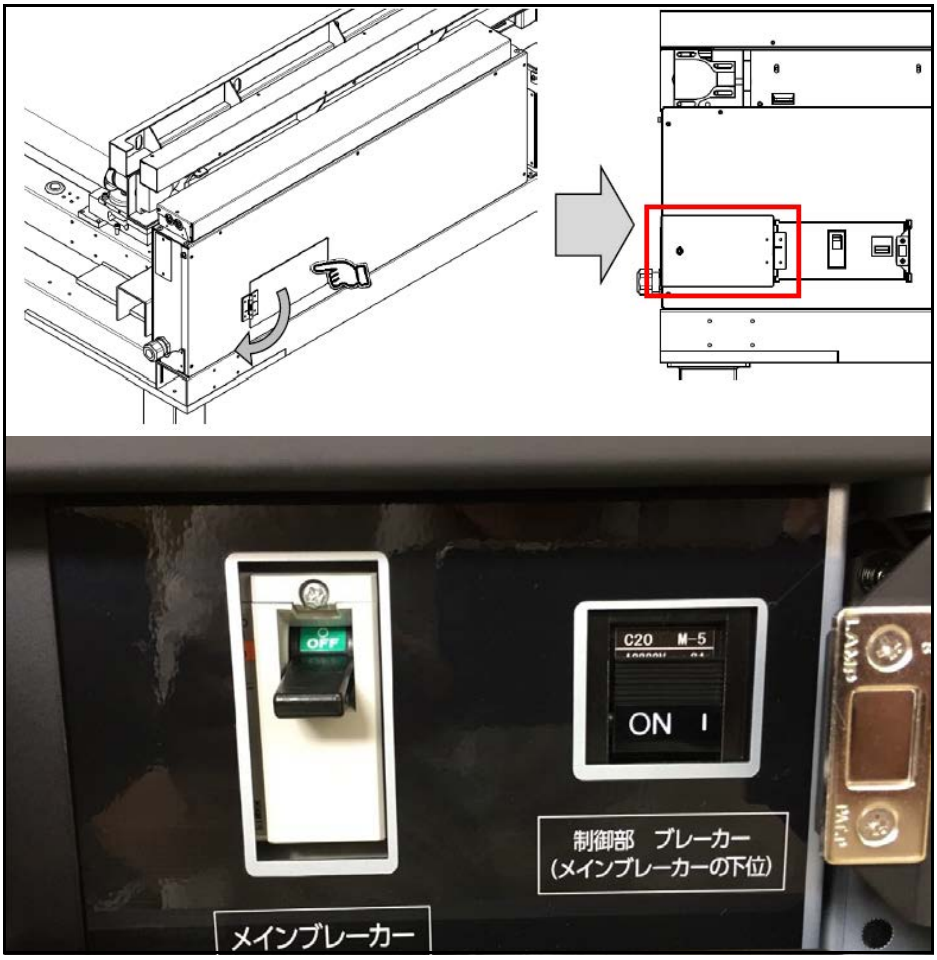


Figure 10
Switches description: Main switch cover

Main breaker	When off (lever lowered), all 200 SQ systems power is turned off.
Control breaker	When off, all 200 SQ systems power is turned off except for the optional scanner.

Emergency stop switch

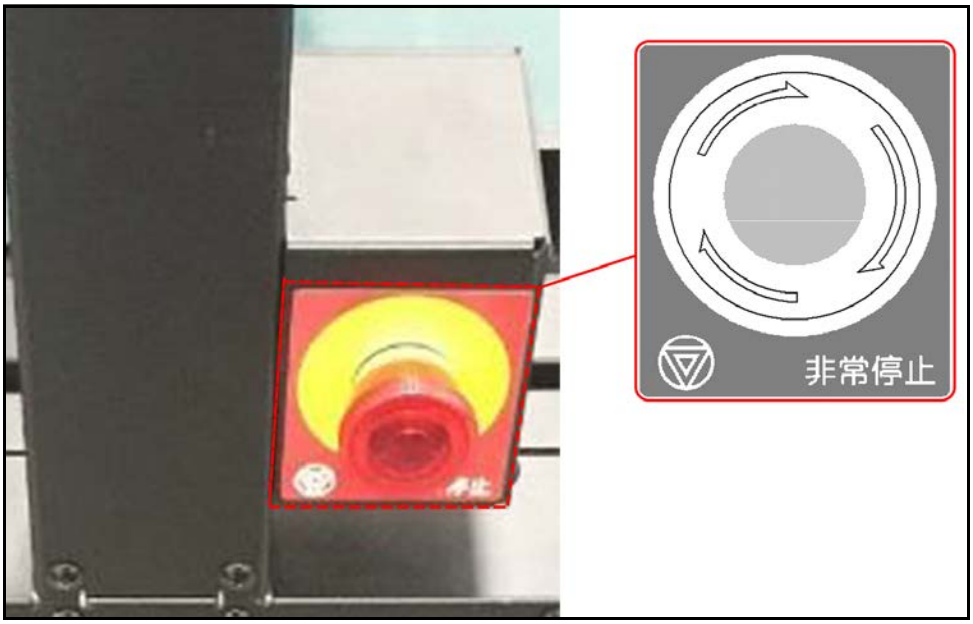


Figure 11
Switches description: Emergency stop switch

In case of emergency or possible injury, use the emergency stop switch to immediately shutdown conveyor function. Press the emergency stop switch button to stop the conveyor. In order to restart the conveyor, turn the button clockwise.

Manual switch

Use the manual switch to maneuver the conveyor in case of emergency where conveyor does not move do to malfunction. If the conveyor power unit (motor/inverter) malfunctions, the conveyor will not operate even if switch is used.

To access the switch, loosen the screw and remove cover.

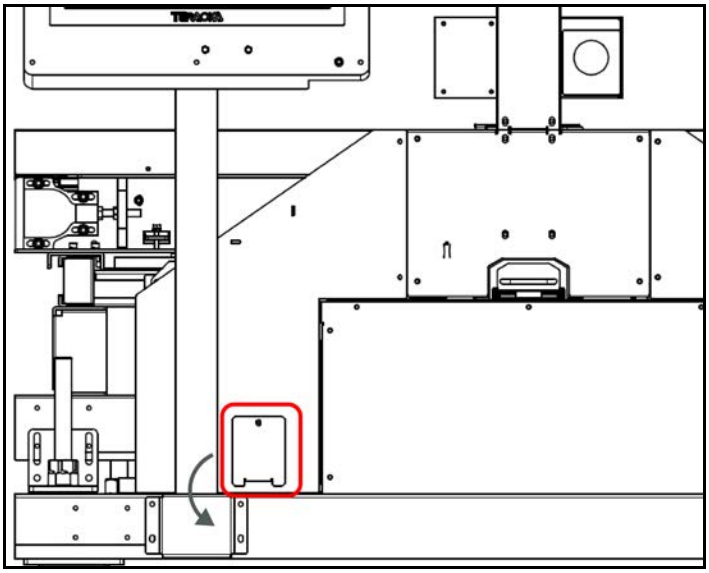


Figure 12
Switches description: Manual switch cover

The switch may be turned to the FORWARD or REVERSE position. If the switch is in the FORWARD position, the conveyor moves in the forward direction. In the REVERSE position, the conveyor moves in the reverse direction.

Figure 13
Switches description: Manual switch

Indicator specifications

Indicator overview

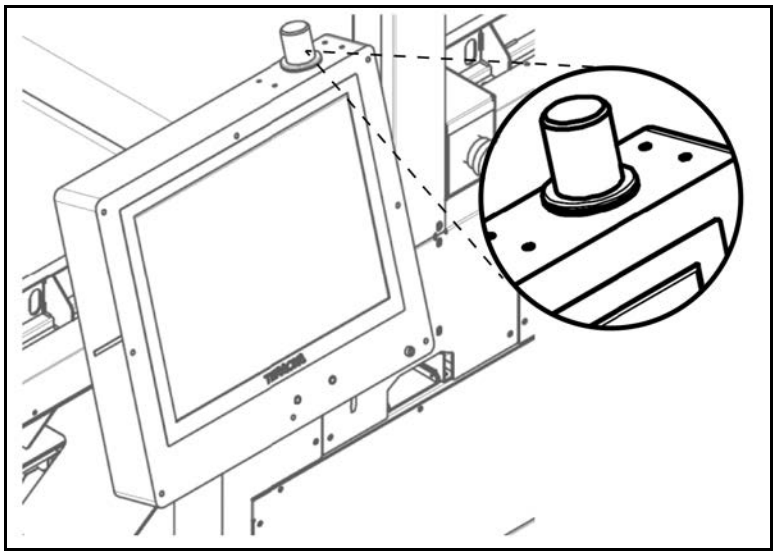


Figure 14
Indicator specifications: Indicator overview

Operation table

Green indicator	Red indicator	Alarm	Status
Blinking	Blinking	Silent	Warm up
Off	Off	Silent	Conveyor is stopped
Off	Blinking	Ringing	Warning for conveyor starting
On	Off	Silent	Measurement in process
Off	On	Ringing	Measurement error
Off	Blinking	Silent	System error

Communication Specifications

FTP communication

Operation

1. The 200 SQ operates as an FTP client with a PC operating as the FTP server.
2. File transfers (PUT) from the 200 SQ occur at intervals of 1 to 1440 minutes (24 hours).
3. If there is no measurement record, the data file will not be transferred.
4. The format of the file to be sent is CSV format, separated by commas.
5. The file name is “xxxx_YYYYMMDDhhmmss.csv”.
6. In the file name, xxxx is an arbitrary string assigned by the system, YYMMDD is the date (Year, Month, Day), hhmmss is the time (hour, minute, second).
7. The 200 SQ supports two modes of communication: passive mode and SSL mode.

File format

	Item	Format	ASCII	Notes
1.	Date	variable length	2017/5/12	
2.	Time	variable length	8:23:05	
3.	Header	“MA”	4Dh, 41h	
4.	Machine number	00-99		
5.	Measurement number	000.0-9999		
6.	Length header	“L”	4Ch	
7.	Length	0000-999.9		
8.	Length status	00-99		More details
9.	Width header	“W”	57h	

	Item	Format	ASCII	Notes
10.	Width	000.0-999.9		
11.	Width status	00-99		More details
12.	Height header	"H"	48h	
13.	Height	000.0-999.9		
14.	Height status	00-99		More details
15.	Measurement unit	"mm", "cm", "m", or "in"		
16.	Weight header	"M"	4Dh	
17.	Weight	0.00-99.99		
18.	Weight status	00-99		More details
19.	Weight unit	"kg" or "lb"		
20.	Error number	00-99		More details
21.	Barcode header	"B"	42h	
22.	Barcode value			
23.	Barcode status	00-99		More details

NOTE *When reading two or more barcodes per measurement, the number of columns in the file will increase by the number of barcode values with each barcode value separated by a comma.*

Socket communication

Operation

1. The 200 SQ operates as a server with a PC operating as a client.
2. Measurement result packets are sent to the PC when the server port is open.
3. A dummy packet is sent to the client once every 30 seconds.

Outgoing packet format

	Item	Format	ASCII	Notes
1.	Start text	STX	02h	
2.	Header	"MA"	4Dh, 41h	

	Item	Format	ASCII	Notes
3.	Machine number	00-99		
4.	Measurement number	0000-9999		
5.	Length header	"L"	4Ch	
6.	Length	000.0-999.9		
7.	Length status	00-99		More details
8.	Width header	"W"	57h	
9.	Width	000.0-999.9		
10.	Width status	00-99		More details
11.	Height header	"H"	48h	
12.	Height	000.0-999.9		
13.	Height status	00-99		More details
14.	Measurement unit	"mm", "cm", "m", or "in"		
15.	Weight header	"M"	4Dh	
16.	Weight	0.00-99.99		
17.	Weight status	00-99		More details
18.	Weight unit	"kg" or "lb"		
19.	Error number	00-99		More details
20.	Barcode header	"B"	42h	
21.	Barcode value			
22.	Barcode status	00-99		More details
23.	End text	ETX	03h	

NOTE *When reading two or more barcodes per measurement, the number of columns in the file will increase by the number of barcode values with each barcode value separated by a comma.*

Dummy packet format

	Item	Format	ASCII	Remarks
1.	STX	02h	1 digit	
2.	Identification code	"DA"	2 digit	Dummy packet
3.	ETX	03h	1 digit	

Serial communication (RS-232C/RS-422)

RS-232C Interface

When connecting to a PC, use the optional cable (PLU: 23299).

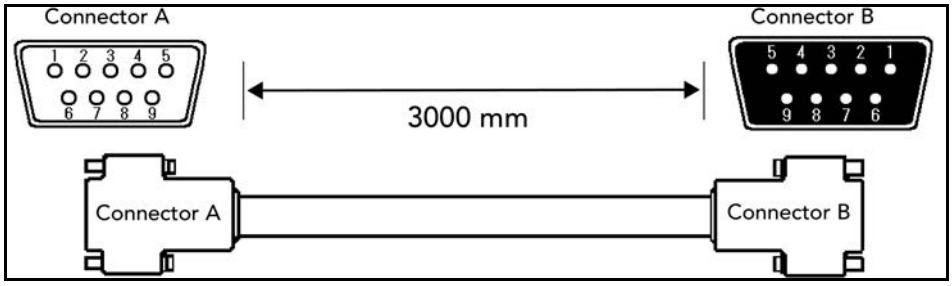


Figure 15
Serial Communication: Connector details

Connector A to 200 SQ		
No.	Signal	Color
2	RXD	red
3	TXD	purple
5	GND	green
7	RTS	purple
8	CTS	gray

Connector B to PC		
No.	Signal	Color
2	RXD	purple
3	TXD	red
5	GND	green
7	RTS	gray
8	CTS	purple

RS-422 Interface (optional)

The optional RS-422 interface connects to the DIO external connection terminal block using the ports: TX+, TX-, and GNDS (numbered respectively as 14, 15, and 16).

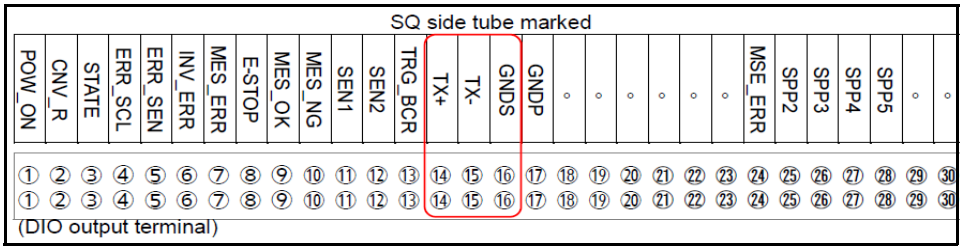


Figure 16
Serial Communication: Connecting RS-422 interface

Communication Specifications

Transmission method	Synchronous pace
Transmission speed (bps)	4800, 9600 (default), 19200, 38400, 115200
Data bit	7bit, 8bit (default)
Parity bit	None, Even (default), odd
Stop bit	1bit (default), 2bit
Flow control	None (default), hardware, Xon/Xoff

Communication format

	Item	Format	ASCII	Notes
1.	Start text	STX	02h	
2.	Header	"MA"	4Dh, 41h	
3.	Machine number	00-99		
4.	Measurement number	0000-9999		
5.	Length header	"L"	4Ch	
6.	Length	000.0-999.9		
7.	Length status	00-99		More details

	Item	Format	ASCII	Notes
8.	Width header	"W"	57h	
9.	Width	000.0-999.9		
10.	Width status	00-99		More details
11.	Height header	"H"	48h	
12.	Height	000.0-999.9		
13.	Height status	00-99		More details
14.	Measurement unit	"mm", "cm", "m", or "in"		
15.	Weight header	"M"	4Dh	
16.	Weight	0.00-99.99		
17.	Weight status	00-99		More details
18.	Weight unit	"kg" or "lb"		
19.	Error number	00-99		More details
20.	Barcode header	"B"	42h	
21.	Barcode value			
22.	Barcode status	00-99		More details
23.	Checksum	00-FF		ASCII code the last 2 digits of the hexadecimal addition of data from 2 to 22
24.	End text	ETX	03h	

NOTE *When reading two or more barcodes per measurement, the number of columns in the file will increase by the number of barcode values with each barcode value separated by a comma.*

Status in communication format

Measuring status (L/W/H)

Code	Status	Error number
00	Normal measurement	
01	Size error	E17, E93, E95, E97
11	Size error	E16, E92, E94, E96
21, 22	Luggage spacing is too short.	E18, E19

Code	Status	Error number
31	Reduced or increased transport speed.	E10, E11
51	One of the passage sensors 1 to 8 could not detect the article normally.	E20~E34
71	• The article could not be detected. • Tracking by the passage sensor could not be performed correctly. • The value of the article length changed during tracking. • Error during measurement and weighing calculation. • When the detection status of the passage sensor and the gate sensor do not match.	E01~E08, E40~E49
72	Article passed outside the measurable area.	E09
73	The article is judged to be atypical.	E12~E15

Weighing status (M)

Code	Status	Error number
00	Normal weighing	
01	Weight error (Items exceed weight limit)	E99
11	Size error (Items below minimum weight)	E98
21, 22	Luggage spacing is too short.	E18, E19
31	Reduced or increased transport speed.	E10, E11
51	One of the passage sensors 1 through 8 could not detect the article normally.	E20~E34

Code	Status	Error number
71	• The article could not be detected. • Tracking by the passage sensor could not be performed correctly. • The value of the article length changed during tracking. • Error during measurement and weighing calculation. • The detection status of the passage sensor and the gate sensor do not match.	E01~E08, E40~E49
72	Article judged to be atypical.	E09

Barcode status

Code	Status	Error number
00	Normal read	
89	Communication error with barcode scanner	E89
90	No read	E90
91	Multi read	E91

Error barcode status

Code	Error details
00	Normal measurement completed
01-05	E01-05: Could not recognize the cargo properly. Please measure again.
06	E06: Gate sensor error
07	E07: Invalid error
08	E08: Could not recognize the cargo properly. Please measure again.
09	E09: Cargo passed through areas outside the measurement range. Please measure again at the center of conveyor.
10	E10: During the measurement, a decrease in the transport speed was detected. Please measure again.

Code	Error details
11	E11: During measurement, an increase in the transport speed was detected. Please measure again.
12-15	E12-15: It was judged to be non-cubic.
16	E16: The length of the cargo is too short.
17	E17: The length of the cargo is too long.
18-19	E18-19: The gap between the cargo is too short. Please remeasure it.
20-21	E20-21: The photosensor (1) could not detect the cargo. Please measure again.
22-23	E22-23: The photosensor (2) could not detect the cargo. Please measure again.
24-25	E24-25: The photosensor (3) could not detect the cargo. Please measure again.
26-27	E26-27: The photosensor (4) could not detect the cargo. Please measure again.
28-29	E28-29: The photosensor (5) could not detect the cargo. Please measure again.
30-31	E30-31: The photosensor (6) could not detect the cargo. Please measure again.
32-33	E32-33: The photosensor (7) could not detect the cargo. Please measure again.
34-35	E34-35: The photosensor (8) could not detect the cargo. Please measure again.
40	E40: Cargo is too small.
41	E41: It is possible that the length of the cargo could not be measured correctly. Please measure again.
42	E42: Invalid error.
43	E43: Weight calculation timeout error. Please measure again.
44	E44: Weight calculation timeout error. Please measure again.
45-46	E45-46: Could not recognize the cargo properly. Please measure again.
47	E47: Size measurement calculation error. Please measure again.
48	E48: Cargo detection error.
49	E49: The gate sensors have been intercepted.
89	E50: Injection error (not ready)
90	E90: Scanner: no read
91	E91: Scanner: multi read
92	E92:Cargo length too short
93	E93: Cargo length too long

Code	Error details
94	E94: Cargo width too short
95	E95: Cargo width too long
96	E96: Cargo height is too low
97	E97: Cargo height is too high
98	E98: Cargo is too light
99	E99: Cargo is too heavy

Communication timing (socket/serial)

Data output for rear of package

Depending on system settings, specifications may vary. Typical data output follows:

Maintenance ⇨ Device setting ⇨Weighing ⇨ Output timing

- Set timing output result will be“0: normal output” or “1: time delay output” is set.

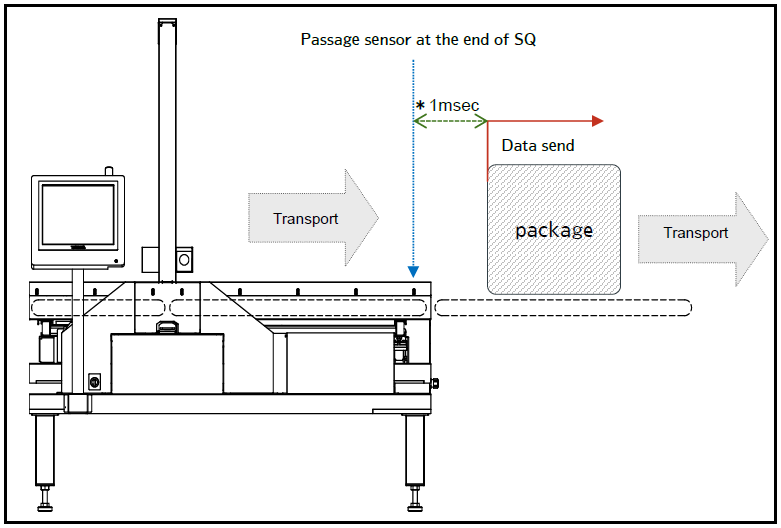


Figure 17
Rear package data output

- After the article passes through the passage sensor at the end of the main unit, data transmission will start in *1msec. The error at the time of output is *2msec plus/minus.

*1	Maintenance⇨Device setting⇨Weighing⇨Output timing of result: Delay time setting.
*2	Maintenance⇨Device setting⇨Weighing⇨Output timing of result: Tolerance setting value.

NOTE *If the conveyor is stopped or started during or after the baggage has passed, or if the transport speed is not synchronized with the main body due to the start/stop of the post-stage conveyor, the article may tip over or slide, causing the specified transmission timing to shift.*

Data output for front of package

Depending on system settings, specifications may vary. Typical data output follows:

Maintenance ⇨ Device setting ⇨ Weighing ⇨ Output timing

- Set timing output result will be “2: Reference position output”.

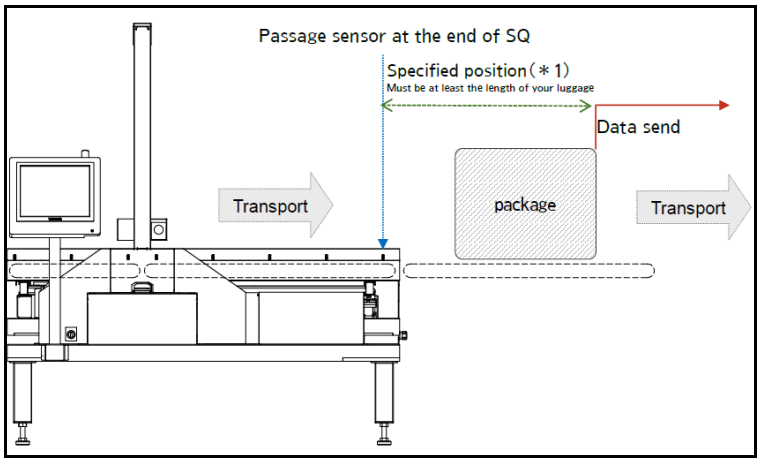


Figure 18
Communication specifications: Front package data output

- Data transmission begins when the head of the item reaches the specified position (*1). This position can be set to any location that is at least the length of the item. The error at the time of output is *2msec.

*1	Maintenance⇨Device setting⇨Weighing⇨Output timing of result: Delay time setting.
*2	Maintenance⇨Device setting⇨Weighing⇨Output timing of result: Tolerance setting value.

NOTE *If the conveyor is stopped or started during or after the baggage has passed, or if the transport speed is not synchronized with the main body due to the start/stop of the post-stage conveyor, the article may tip over or slide, causing the specified transmission timing to shift.*

DIO External input/output signal (optional)

Terminal block mounting position

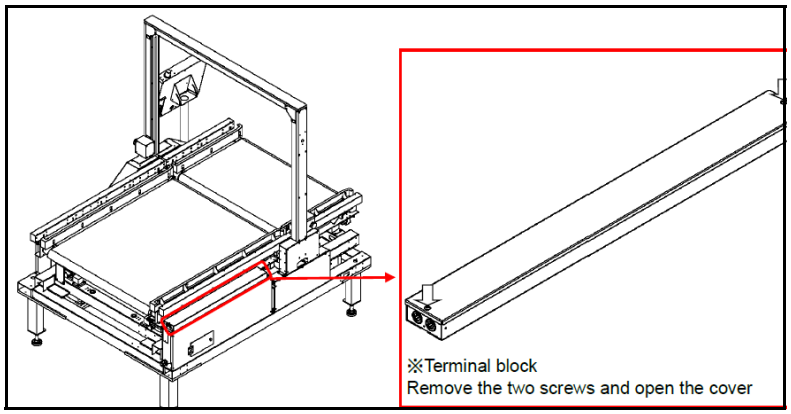


Figure 19
Communication specifications: PLC box cover closed

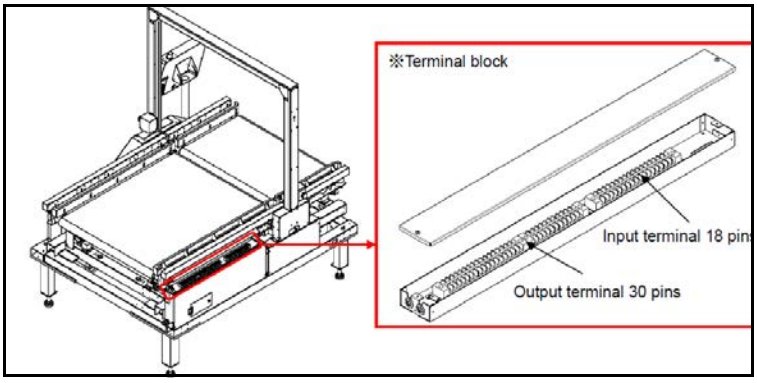


Figure 20
Communication specifications: Opening PLC box cover

Input connection diagram

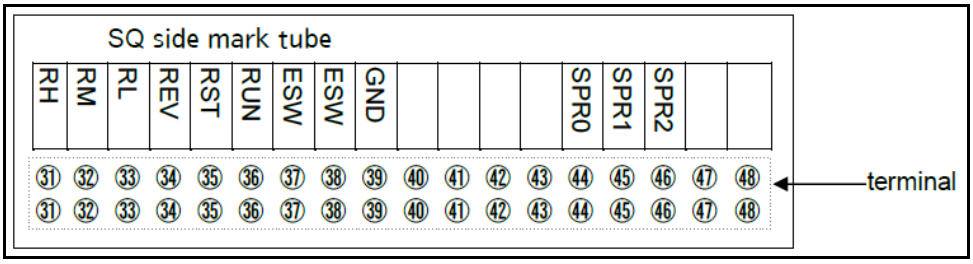


Figure 21
Communication specifications: Terminal block connection diagram (input)

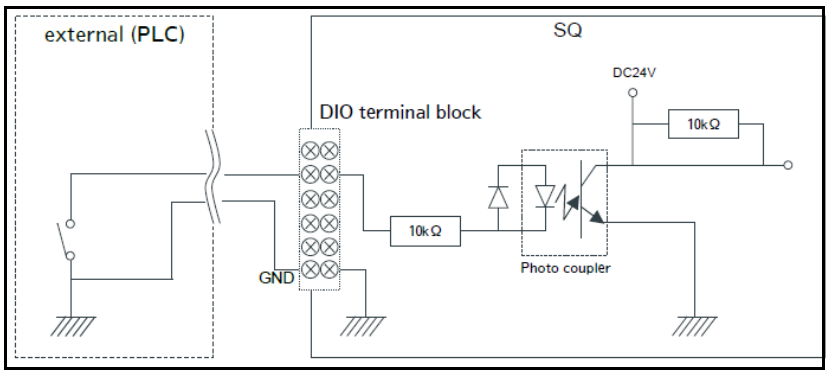


Figure 22
Communication specifications: Circuit diagram (input)

No.	Mark tube	Signal	Short	Open	Notes
31	RH	High speed transport	High speed transport	...	
32	RM	Medium speed transport	Medium speed transport	...	
33	RL	Low speed transport	Low speed transport	...	
34	REV	Transport direction	Reversal	Forward rotation	
35	RST	Inverter reset	Reset	...	Reset to inverter
36	RUN	Transport command	Transport	Stop	
37	ESW	Emergency stop	Emergency stop	...	

No.	Mark tube	Signal	Short	Open	Notes
38	ESW	Emergency stop (spare)	Emergency stop	...	
39	GND	For common GND			

Output connection diagram

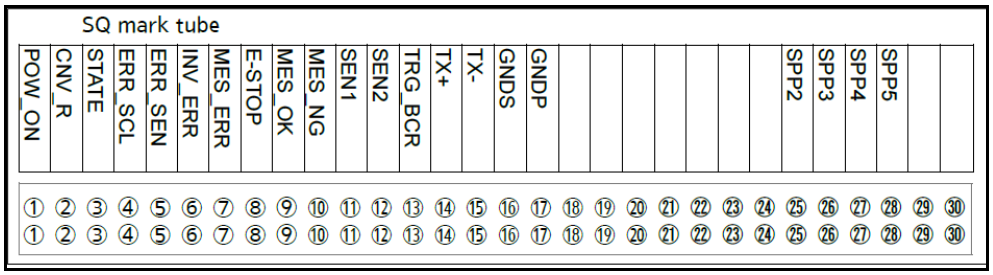


Figure 23
Communication specifications: Terminal block connection diagram (output)

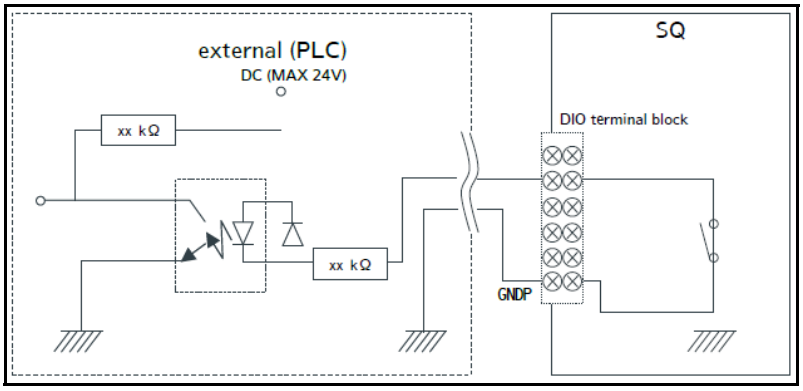


Figure 24
Communication specifications: Circuit diagram (output)

No.	Mark tube	Signal	Short	Open	Notes
1	POW_ON	Power on	Power on	Power off	
2	CNV_R	In transit	In transit	Stop	
3	STATE	Measurable	Possible	Impossible	
4	ERR_SCL	Abnormal scale	Normal	Abnormal	Error No. 5002-5009

No.	Mark tube	Signal	Short	Open	Notes
5	ERR_SEN	Abnormal sensor	Normal	Abnormal	Error No. 5013-5022
6	INV_ERR	Abnormal inverter	Normal	Abnormal	Error No. 6101-6284
7	MES_ERR	Other abnormalities	Normal	Abnormal	Error No. 9001-9804
8	E_STOP	Emergency stop	In operation	Emergency stop	
9	MES_OK	Usage prohibited			
10	MES_NG	Usage prohibited			
11	SEN1	Conveyor entrance sensor	Detection	Not detected	
12	SEN2	Conveyor exit sensor	Detection	Not detected	
13	TRG_BCR	BCR trigger	Detection	Not detected	
14	TX+	RS-422 output +			
15	TX-	RS-422 input -			
16	GNDS	RS-422 GND			
17	GNDP	Common GND			

CHAPTER 2
SETUP

Getting started

Tools for setup

Before setting up the 200 SQ, please prepare the following tools:

- Phillips screwdriver
- Hex wrench (5mm-6mm)
- Wrench (8mm)
- Level
- USB memory device

Checklist for setup

SQ installation checklist

Please record the following information before setup:

User Name	
Model Name	
N10 Ver.	
FPGA (Main) Ver.	
FPGA (Relay) Ver.	
Installation date	
Serial No.	
SH Ver.	
FPGA (Conveyor) Ver.	
SQ Disp. APP Ver.	

Use the following checklist to help with the setup process. Put a check mark next to each completed item:

Setup Procedure			
1.	The 200 SQ installation	To prevent injury, please move the 200 SQ by forklift.	☐
2.	Taking the shipping stopper off	Take the 10 shipping stoppers and remove the zip tie and remove the air package for the UPS.	☐
3.	Installation of the sensor cover	Set the conveyor covers for each conveyor (A and B).	☐
4.	Installation of console and hand scanner (optional)	If using a optional hand scanner, mount bracket to frame.	☐
5.	Installation of fixed scanner	If installing fixed scanner, affix the scanner to the top bracket of the frame.	☐
6.	Check the power cable and 200 SQ start up	Plug the 200 SQ outlet in, then check the application booting.	☐
7.	Date and time setting	Check the date and time setting in maintenance mode.	☐
8.	Device setting	Check the device setting in the maintenance mode.	☐
9.	Weight setting	Check the weight setting in the maintenance mode.	☐
10.	Weight adjustment	Use 50kg weight placed on select point in middle and each corner of the scale platform to assure weighing accuracy.	☐
11.	Backup maintenance setting data	Back up the setting file to USB memory in maintenance mode.	☐
12.	Operation confirmation in test mode	Check that all data is correct by moving the item on the conveyor.	☐

200 SQ installation

Unloading and installation of the main unit

Since the 200 SQ is a large machine, a forklift is required for unloading. Any attempt to move the main unit without a forklift may result in injury or damage to unit. When moving on a flat surface, casters are provided to make movement of the unit easier.

When maneuvering with a forklift, position the forks in the designated holes indicated in the following figure:

Figure 25
Unloading and installation: Designated fork holes

After unloading, unlock each of the four casters while positioning on a flat surface. Please make sure there are no stairs or inclines nearby when moving the unit.

With the four caster unlocked position the unit in the desired location. When the unit is properly positioned in the installation location, lock each of four casters again. This will prevent unwanted movement of unit.

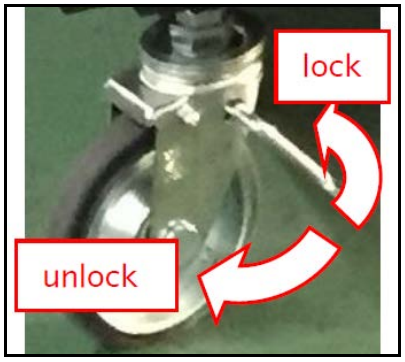


Figure 26
Unloading and installation: How to lock casters

Removal of shipping stopper

Location of shipping stoppers

Remove all shipping stoppers as depicted in the figure below:

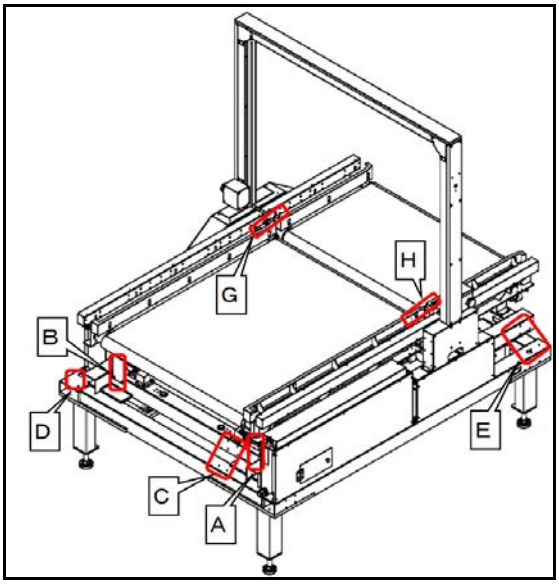


Figure 27
Removal of shipping stoppers: Shipping stoppers diagram (front)

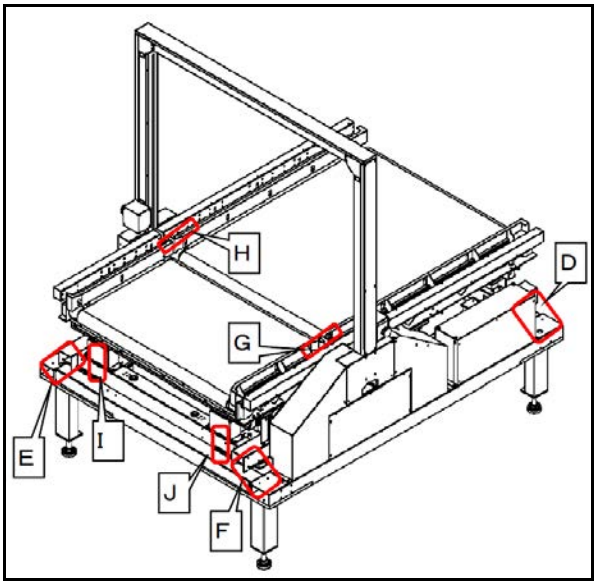


Figure 28
Removal of shipping stoppers: Shipping stopper (back)

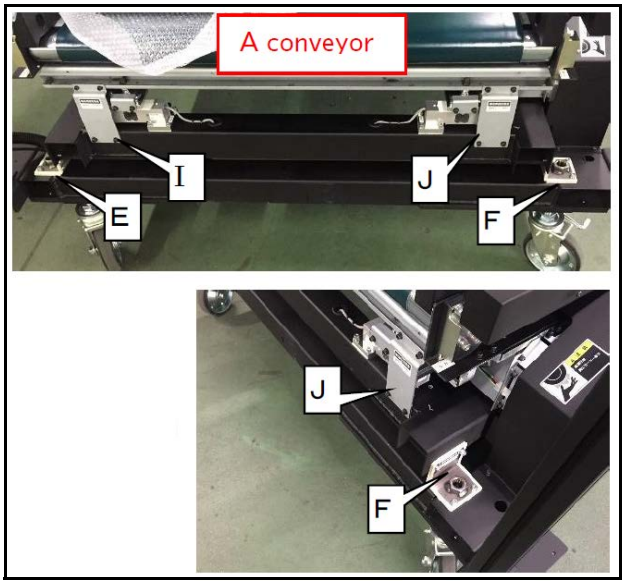


Figure 29
Removal of shipping stoppers: Shipping stopper (Conveyor A)

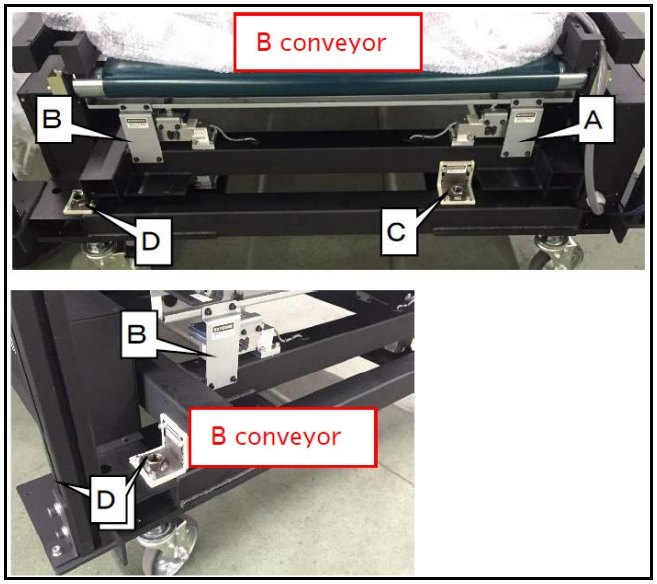


Figure 30
Removal of shipping stoppers: Shipping stopper (Conveyor B)

Removal procedure of shipping stopper

1. Take off plates G and H by removing the two screws with hex wrench.

Figure 31
Removal of shipping stoppers: Removing plates G and H

2. Take off plates A, B, I, and J by removing the four screws with hex wrench.

Figure 32
Removal of shipping stoppers: Remove plates A, B, I, J

3. Take off plates C, D, E, and F by removing the four screws with hex wrench.

Figure 33
Removal of shipping stoppers: Remove plates C, D, E, and F

UPS shipping stopper removal (optional)

1. Cut the zip tie securing the UPS
2. Remove the air pack wrapping.

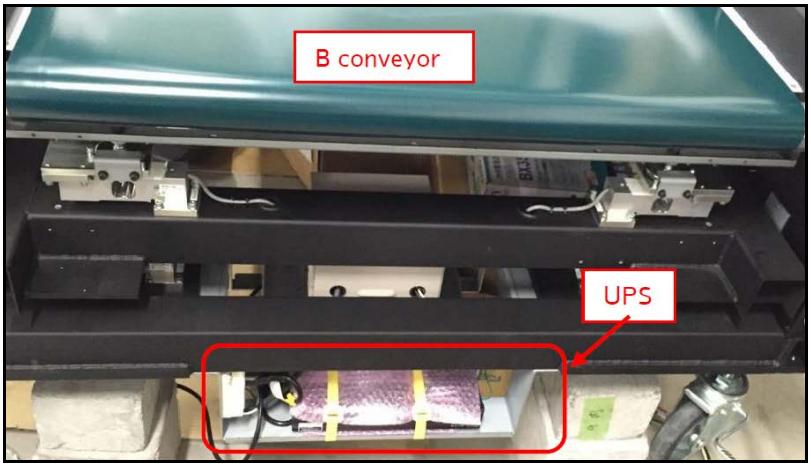


Figure 34
Removal of shipping stoppers: UPS shipping stopper removal

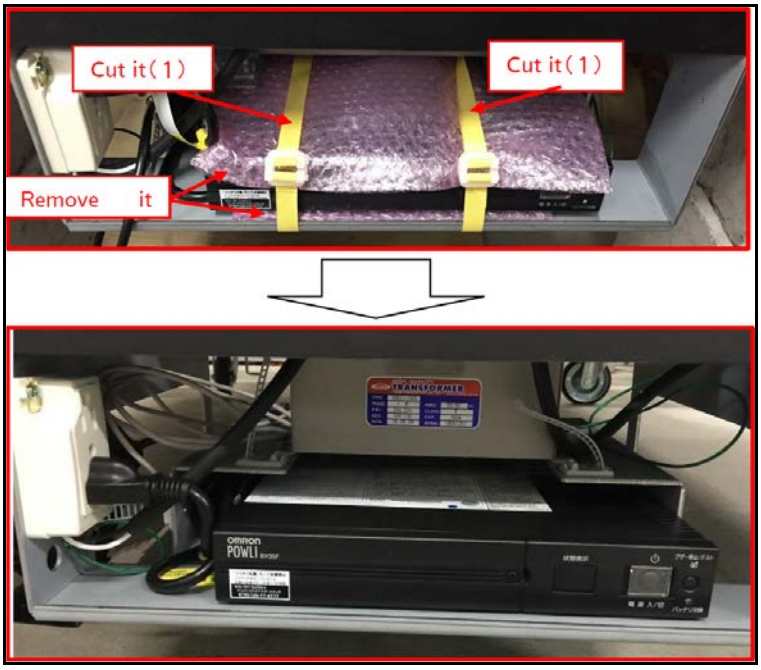


Figure 35
Removal of shipping stoppers: Removing zip ties and airpack

Console and scanner installation

1. Remove the 4 cup screws to fix stand pole to console.

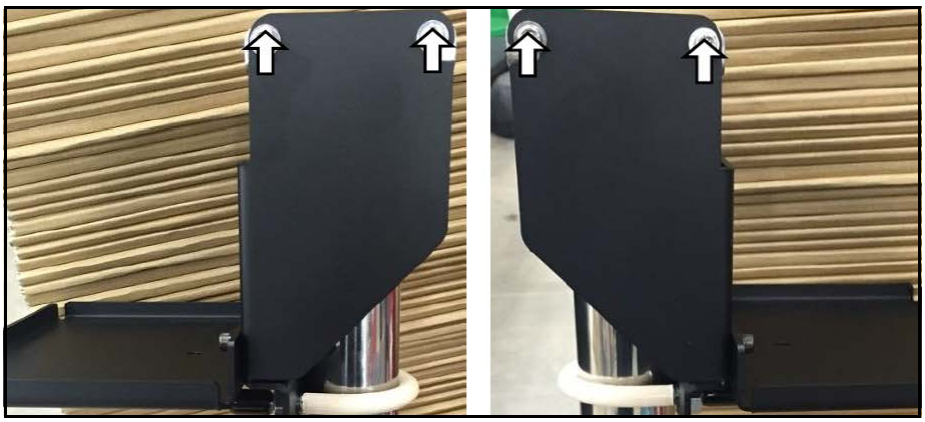


Figure 36
Console and scanner installation: Stand pole

2. Affix the console to the pole stand. Attach the display bracket and set the stand pole on inside of scanner stand. Once positioned properly, tighten the 4 cup screws to secure the console in place. Refer to the figures below.

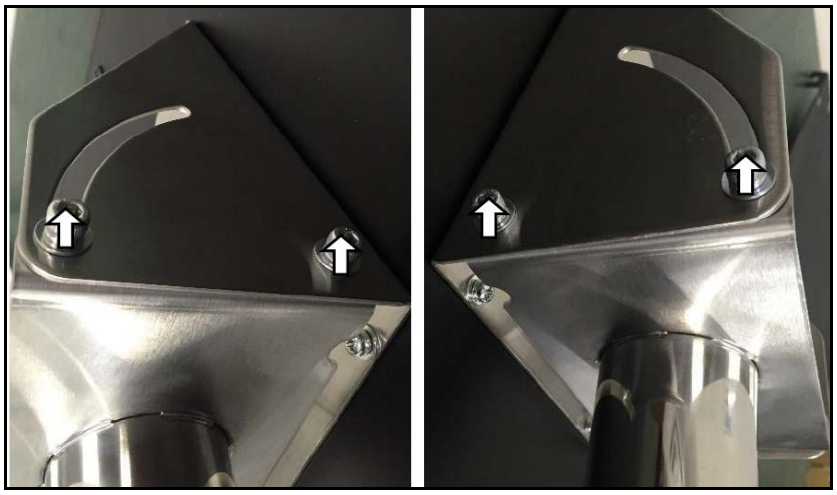


Figure 37
Console and scanner installation: Securing display bracket

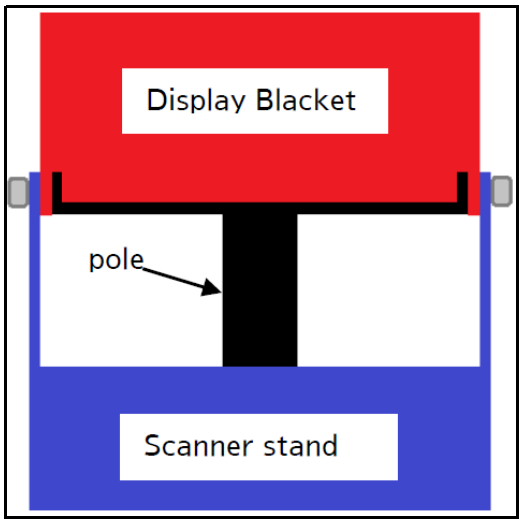


Figure 38
Console and scanner installation: Display bracket diagram (rear view)

NOTE *The console angle may be adjusted at anytime by loosening the side screws and repositioning. Make sure to tighten screws once properly positioned.*

3. Connect the USB cable under the cradle for the hand scanner before mounting to console bracket.

Figure 39
Console and scanner installation: Connecting USB cable

4. Loosen bolts on side of scanner stand bracket. Insert the pole of the console into the bracket.

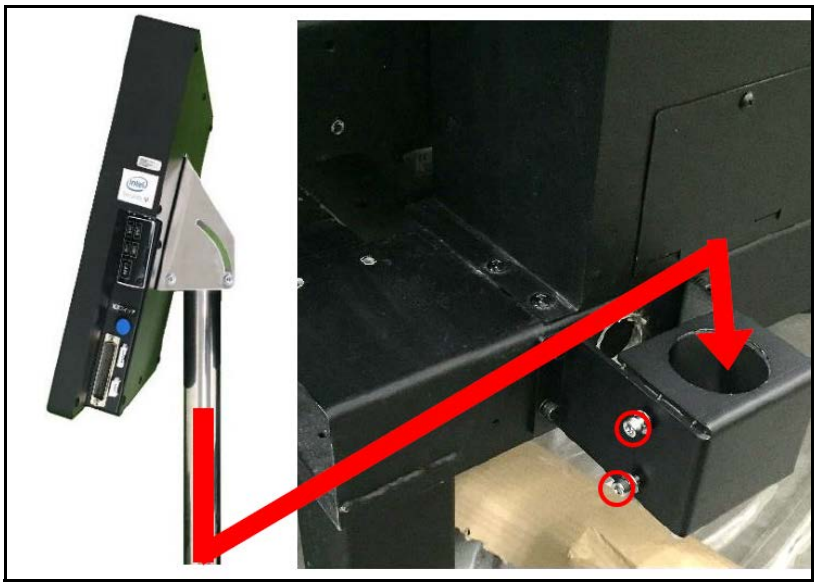


Figure 40
Console and scanner installation: Installing console pole

5. Tighten the hex bolts to secure console pole in place.

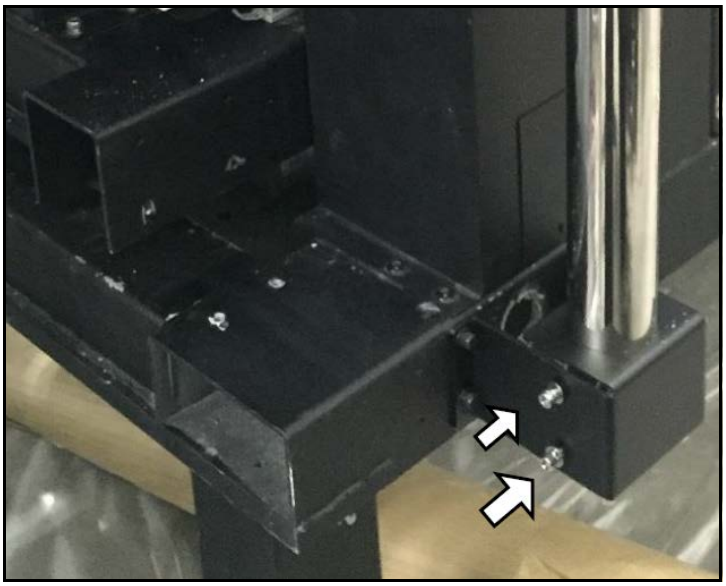


Figure 41
Console and scanner installation: Secure console pole

6. Attach the cradle for the optional hand scanner by securing the cradle to the console via screws on underside.

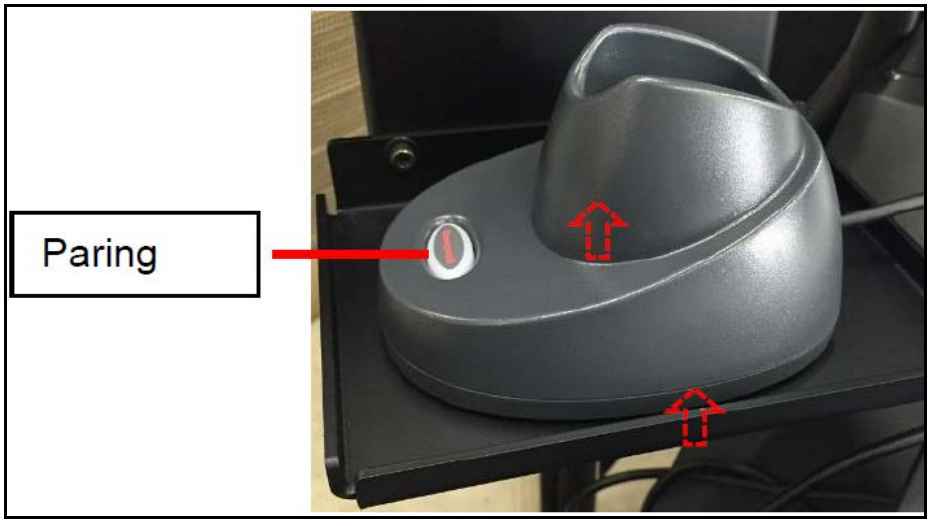


Figure 42
Console and scanner installation: Hand scanner cradle

7. Ensure console is installed parallel to 200 SQ as shown in the figure:

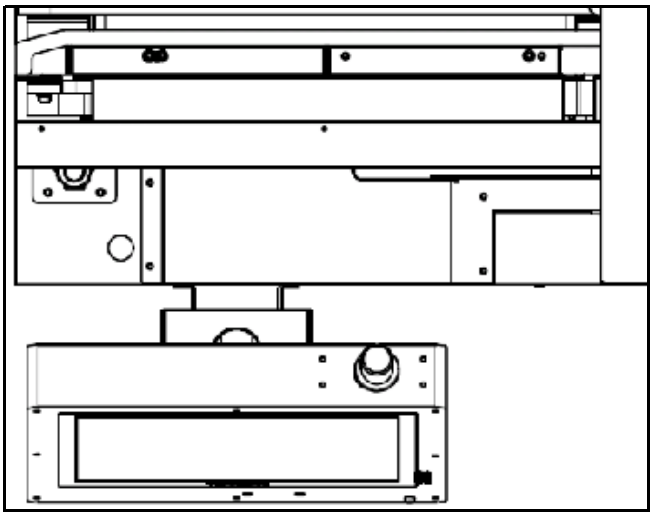


Figure 43
Console and scanner installation: Final console installation

8. Connect the USB cable form the cradle and LAN cable for PC to the USB ports in the right side of the console.

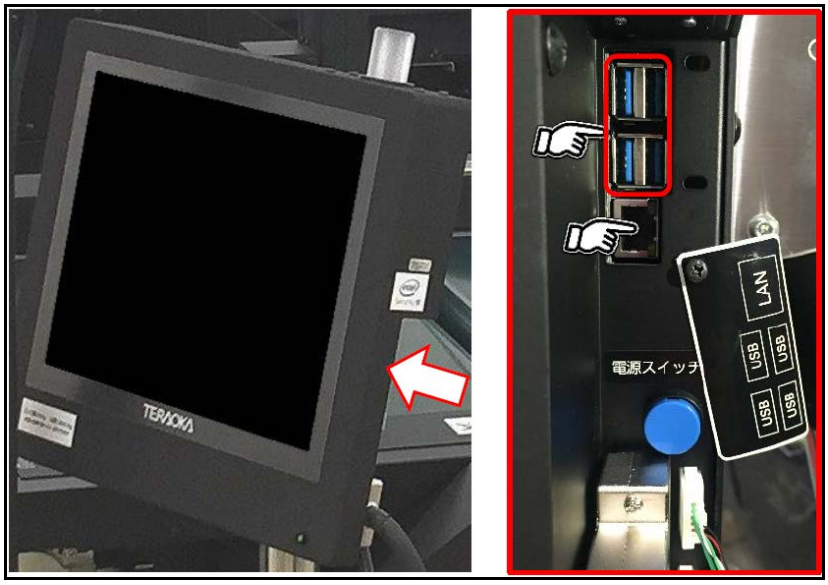


Figure 44
Console and scanner installation: Console cables

Fixed scanner installation (optional)

1. Remove the 3 cap screws from the fixed scanner.

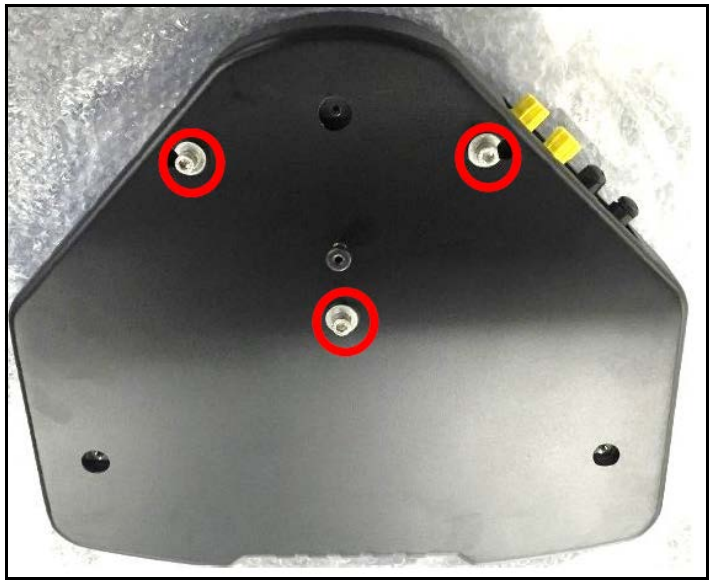


Figure 45
Fixed scanner installation: 3 cap screws

2. Position the scanner under the bracket and secure in place by raising the docking fixture through the corresponding hole and sliding into place.

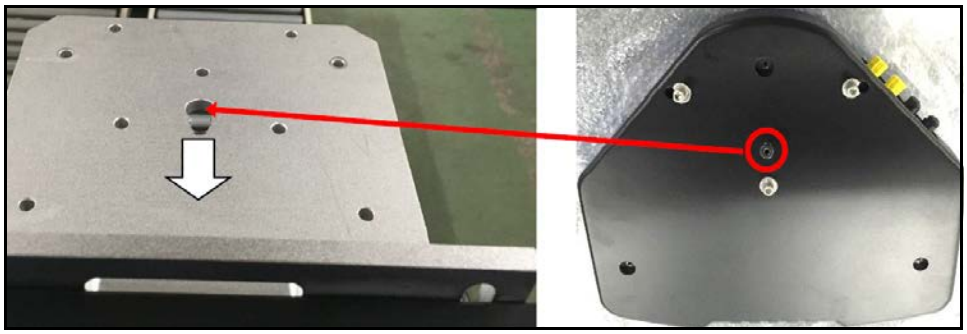


Figure 46
Fixed scanner installation: Docking fixture

3. Replace the 3 cap screws by threading through the corresponding hole in the bracket.

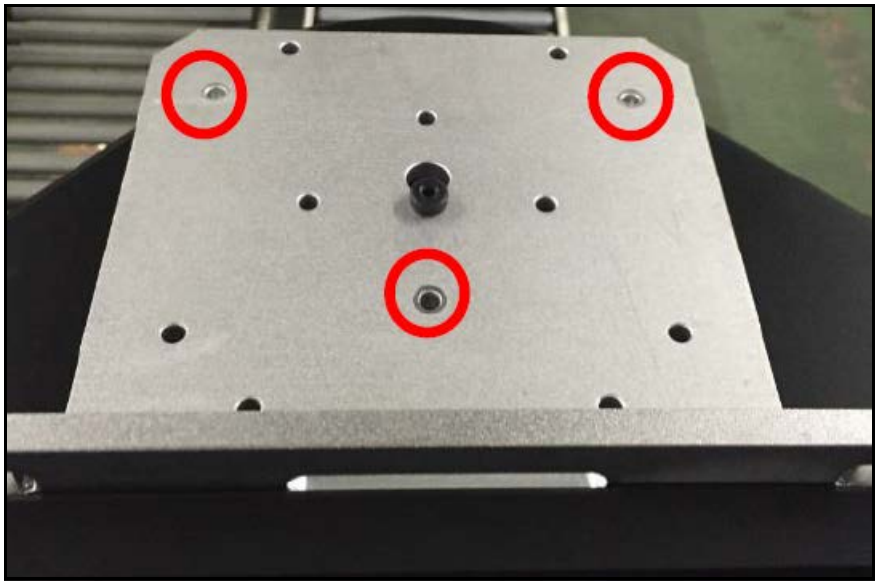


Figure 47
Fixed scanner installation: Cap screw holes

Figure 48
Fixed scanner installation: Securing fixed scanner

4. Remove caps from [POWER] and [I/O] connectors by turning clockwise.

Figure 49
Fixed scanner installation: Removing connector caps

5. Connect the blue cable from main unit to **[I/O]** connector and the black cable to **[POWER]** connector.

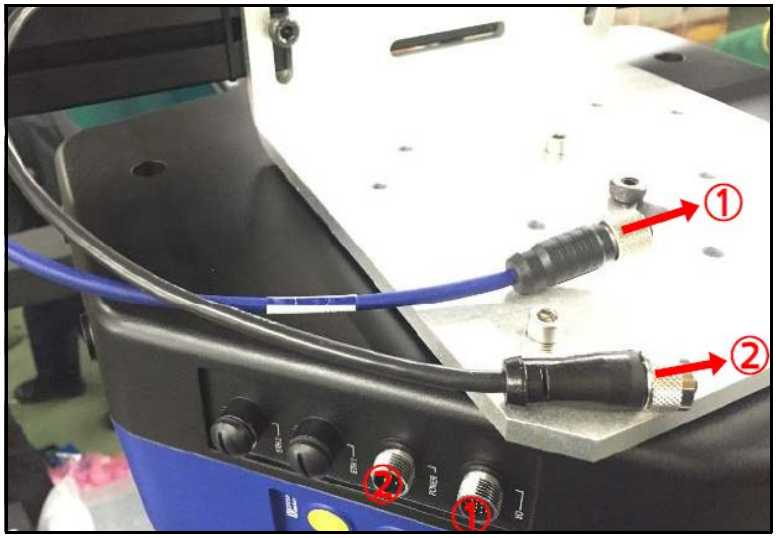


Figure 50
Fixed scanner installation: Connecting [POWER] and [IO] cables

6. Power on scanner and look for the laser emission to ensure the scanner is functioning properly.

7. Once the 200 SQ is fully set up, position adjustments may be made to ensure reliability.

Powering on

1. Turn the power on after inserting the power plug. Ensure the power source is designed to handle 20A and 250V. After the plug is inserted into the outlet, turn clockwise to secure in place. This prevents the plug from being unintentionally pulled from the wall.

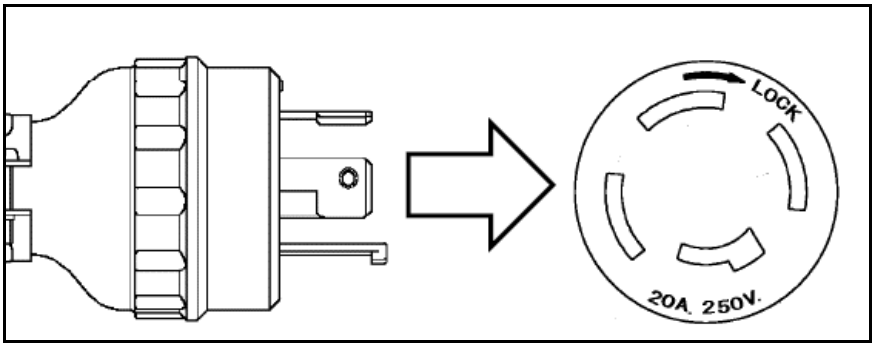


Figure 51
Powering on: Plugging in

2. Open the cover to the main switch located at the side of the unit. Toggle the switch to the ON position. The unit should power on.

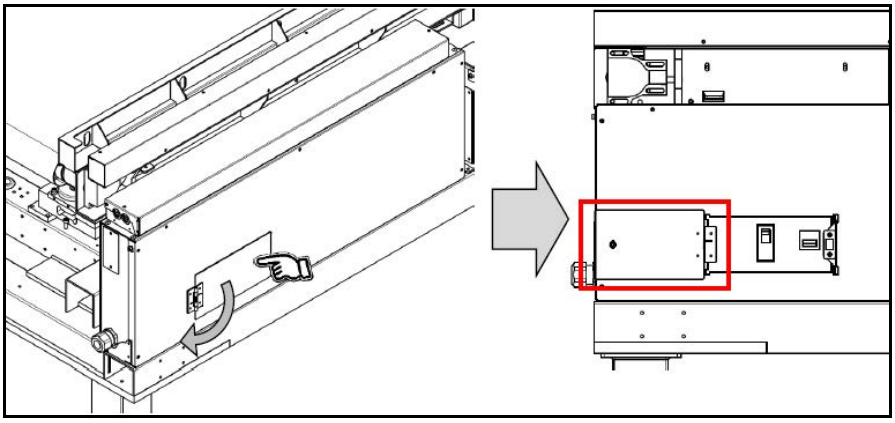


Figure 52
Powering on: Main switch cover

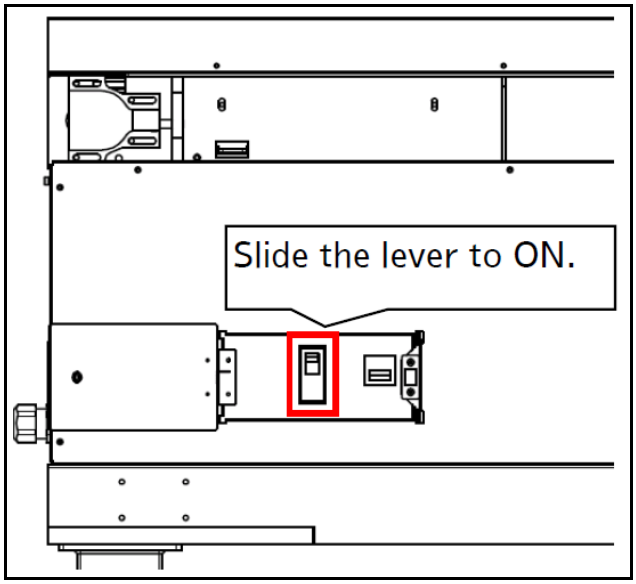


Figure 53
Powering on: Main switch

3. It may take about 8 minutes (480 seconds) for the 200 SQ operation system to boot up and the scale to finish its warming up procedure. A countdown clock will appear on the screen. Once the notification disappears, the unit is ready for product.

Sensor cover assembly

1. Place 4 covers over sensors in the areas designated in the figure:

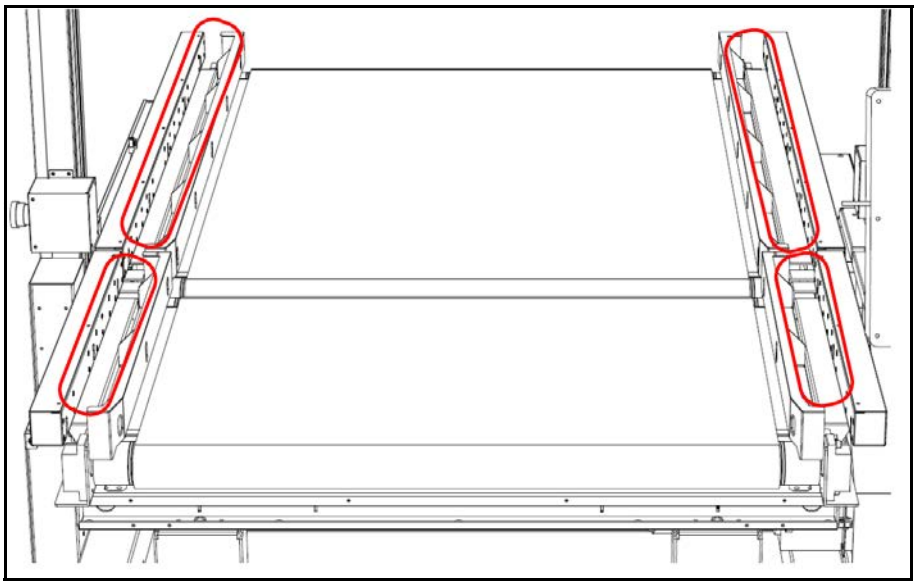


Figure 54
Sensor cover assembly: Locations for sensor covers

2. Secure covers with screws in the 14 locations shown in the figure:

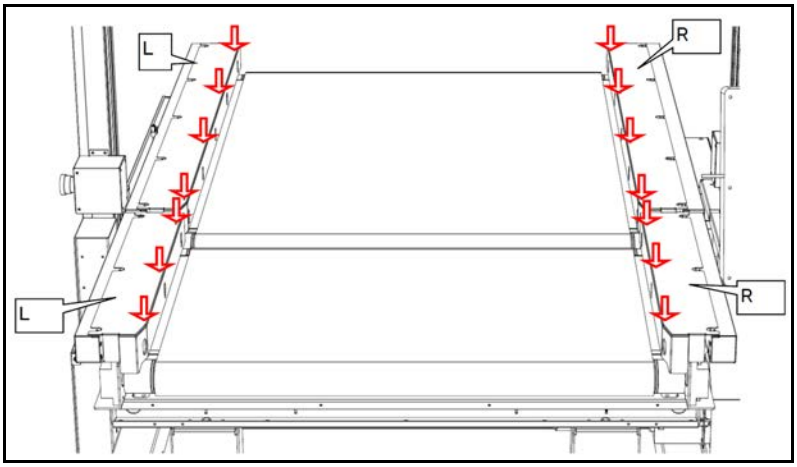


Figure 55
Sensor cover assembly: Securing sensor covers

Date and Time setting

1. In order to modify the date and time, go to **[Setting]** from main control screen.

Figure 56
Date and Time setting: Settings

2. Select **[Maintenance]** in the right panel.

Figure 57
Date and Time setting: Maintenance

3. At the Login screen, check the box next to **Maintenance**, then tap in the **Password** text field to enter passcode.

Figure 58
Date and Time setting: Login screen

4. A passcode window will appear. Enter the passcode **8715** followed by **[Enter].**

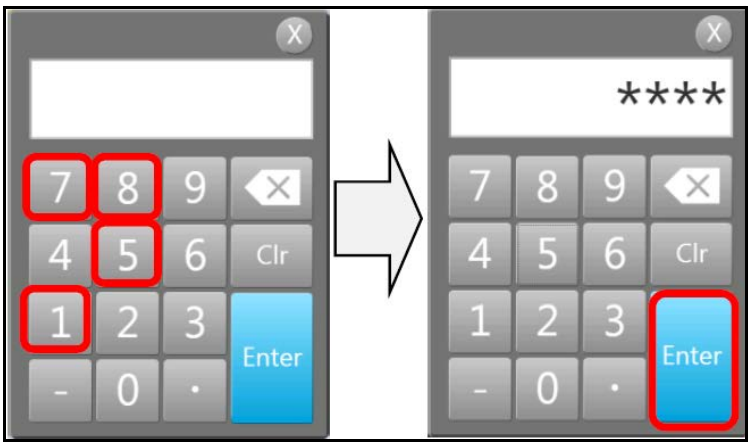


Figure 59
Date and Time setting: Entering passcode

5. The Login dialog box will return. Ensure that the box next to **Maintenance** is checked and tap **[Login].**

Figure 60
Date and Time setting: Returning to login

6. In the **Setting** menu, select **Device setting** by tapping the **[+]**.

Figure 61
Date and Time setting: Device setting

Select **Clock,** from the **Device setting** options.

Figure 62
Date and Time setting: Clock settings

7. Use the calendar to set the date as shown in the figure:

Figure 63
Date and Time setting: Setting date

8. Use the **[+]** and **[-]** buttons to set the **Hour**, **Minute**, and **Second.**

Figure 64
Date and Time setting: Setting clock time

9. Tap **[Set]** after date and time settings are entered.

Conveyor setting

1. From the **Device setting** menu found within the **Setting** panel, select **Conveyor**.

Figure 65
Conveyor setting: Conveyor screen

2. Ensure that the Conveyor setting matches those shown in the following figure:

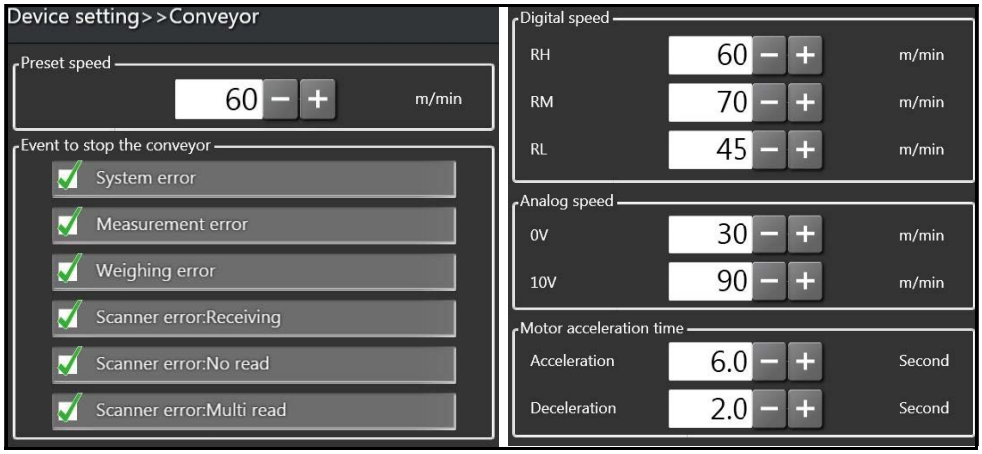


Figure 66
Conveyor setting: Settings

Scanner setting (optional)

1. Select **Scanner** from the **Device setting** menu.

Figure 67
Scanner setting: Scanner option

2. If using the fixed scanner, select the **Fixed** tab.

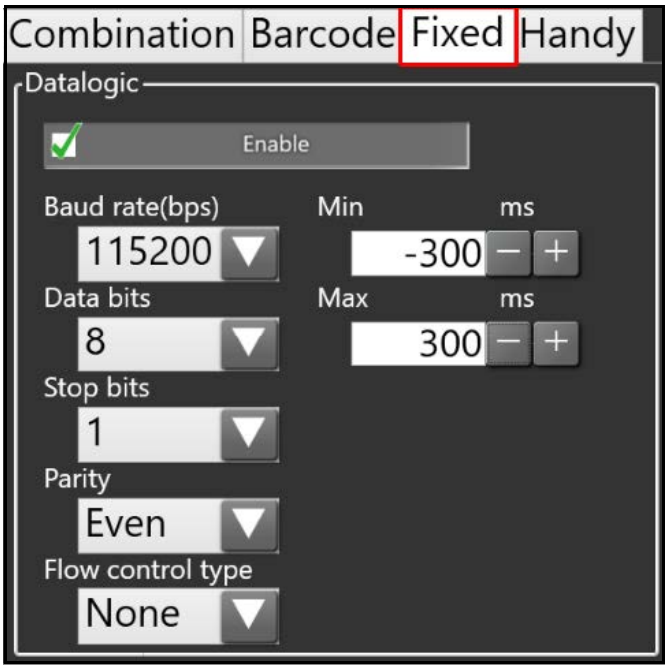


Figure 68
Scanner setting: Fixed menu

3. If using the hand scanner, select the **Handy** tab. Once the scanner connects tap **[Enable]**. The box next to **Enable** should be checked.

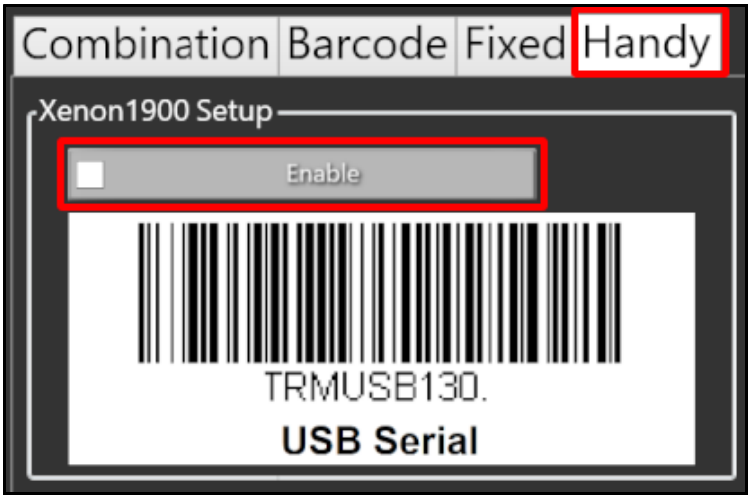


Figure 69
Scanner setting: Enable hand scanner

NOTE *Be sure to enable the scanner after it is properly connected. If scanner can not be found, ensure the device is properly connected. If problem persist please* ***contact Cubiscan Technical Assistance at 801.451.7000*** *for assistance.*

4. Once the scanner connects, select the **Barcode** tab and choose the barcode type from the drop down menu under **Symbol1**.

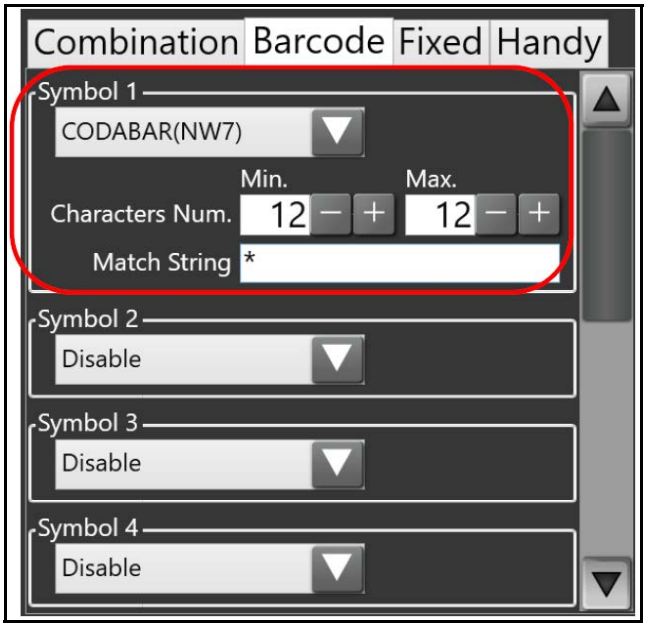


Figure 70
Scanner setting: Barcode menu

5. Select the **Combination** tab and uncheck the box under **Essential**.

Figure 71
Scanner setting: Combination menu

TCP/IP setting (optional)

1. Select **TCP/IP** under **Device setting** in the side menu.

Figure 72
TCP/IP setting: TCP/IP menu

2. Ensure that the settings for **IP address**, **Mask**, and **Gateway** match those in the figure below:

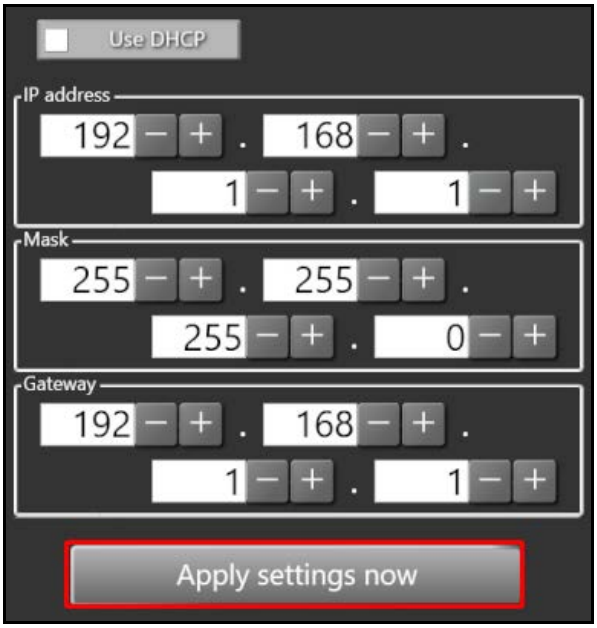


Figure 73
TCP/IP setting: Settings

3. Once the settings are entered correctly, save the setting by tapping **[Apply settings now]**.

4. Next, select **FTP** under **Device setting** from the side menu.

Figure 74
TCP/IP setting: FTP menu

5. Ensure the **FTP** settings match those from your network. The Password will be blanked out in the text box. The default password is "**matehan**".

Figure 75
TCP/IP setting: FTP settings

Weight setting

1. Expand the **Adjustment** menu by tapping the **[+]** and select **Weight** from the expanded options.

Figure 76
Weight setting: Weight menu

2. Ensure all settings in the **Weight** menu match those in the following figure:

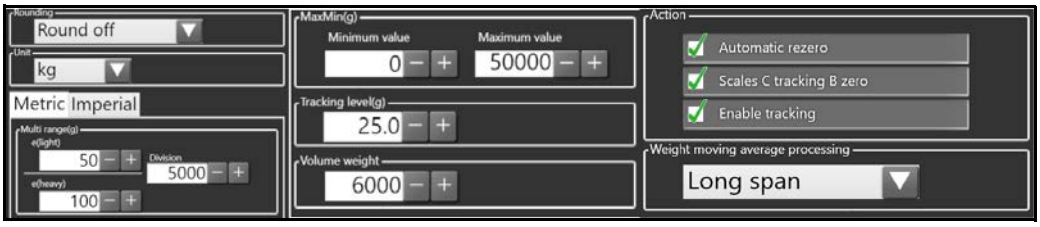


Figure 77
Weight setting: Settings

3. Select **Length** under **Adjustment** in the left side menu.

Figure 78
Weight setting: Length menu

4. Ensure all setting match those in the following figure.

Figure 79
Weight setting: Length settings

Scales setting

1. Expand the **Device setting** menu by tapping **[+]**, and select **Scales** from the expanded menu.

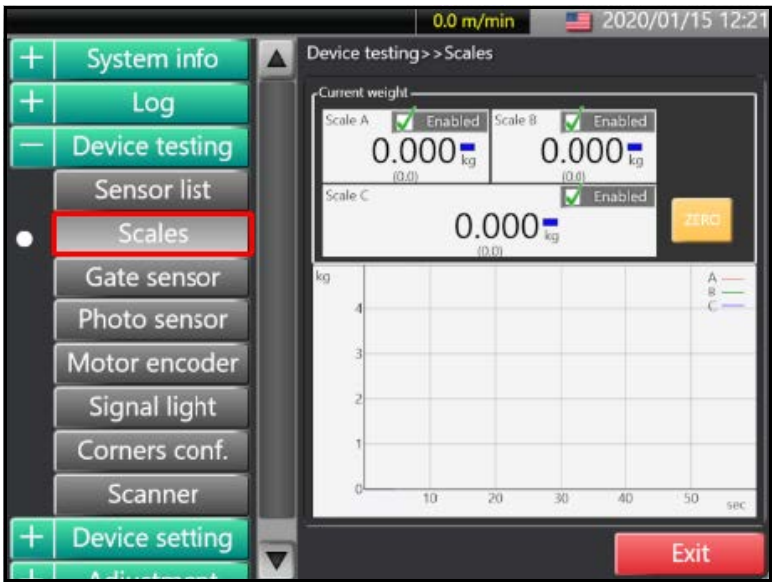


Figure 80
Scale settings: Scales menu

2. Tap **[Zero]** to set scale to 0.

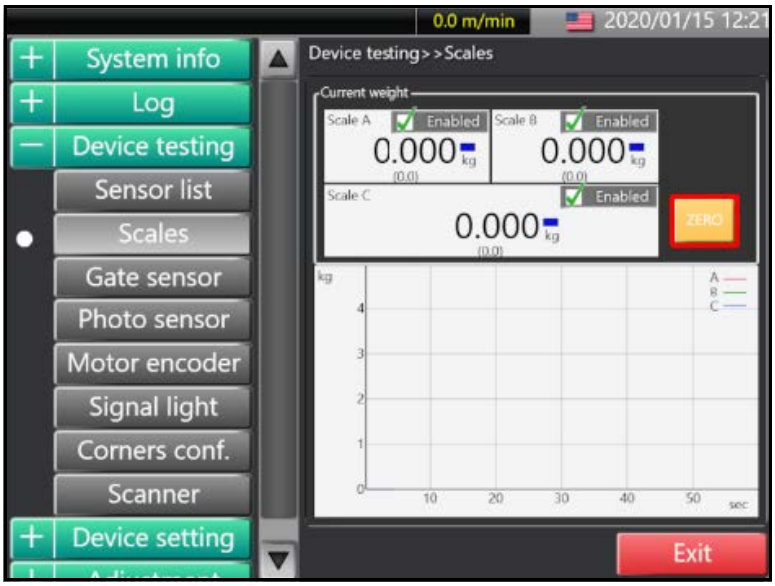


Figure 81
Scale settings: Zeroing scale

3. Use the calibration weight of 50kg to calibrate the scale in the 10 key points along the conveyor as depicted in the following figure.:

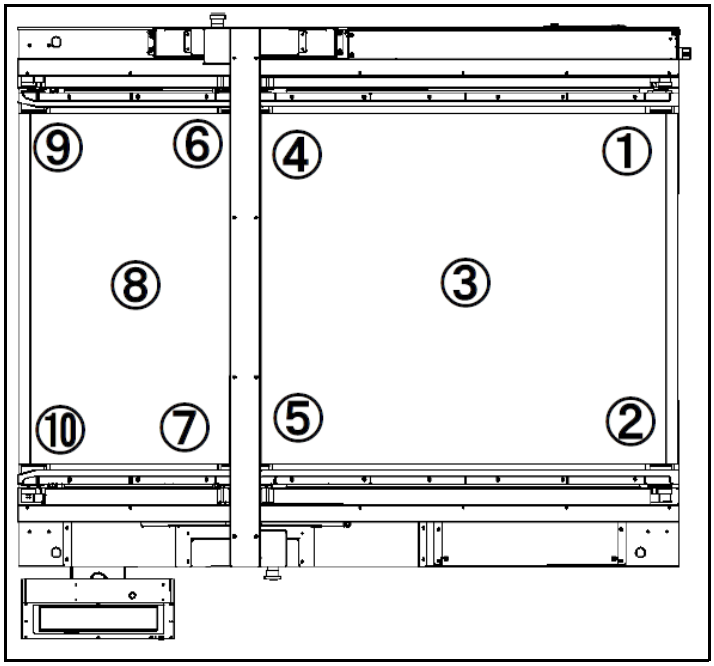


Figure 82
Scale settings: Conveyor calibration points

4. To calibrate, zero the scale, then place the weight on one of the 10 positions along the conveyor. Record the weight, and then remove. Record the measured weight after removing the calibration weight. Use a table like the following to record the values:

Weight calibration results				
	0 kg	50 kg	0 kg	Scale
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

NOTE *Acceptable weight tolerance is within ±100g. If weight exceeds the tolerance limit, check the conveyor and its cable to ensure that nothing is touching the main unit as this may interfere with correct measurement.*

5. To leave the scale screen, tap **[Exit]**. A pop-up message will appear with an option to logout. Check the box next to **Logout** and tap **[OK]**.

Figure 83
Scale settings - logout screen

6. If you have adjusted any settings, another pop-up message will appear to update settings. Enter your name or username in the text box next to **Signature**. This will allow the system to track who made changes to the scale settings. Next, tap **[Update]** to save changes to the settings.

Figure 84
Scale settings - update screen

Setting data backup

Maintenance recovery

1. To backup data to a USB memory drive, plug the drive into one of the USB ports on the side of the console unit.

Figure 85
Setting data backup - USB ports

If the system security is active, a software keyboard and password authentication screen will appear shortly after the USB memory drive is plugged in. Enter the password to be able to save on the drive.

2. Once the USB drive is properly connected to the console, open the **Maintenance** menu by tapping **[Setting]**.

Figure 86
Setting data backup - Setting

3. When the **Setting** screen appears, tap **[Maintenance]**.

Figure 87
Setting data backup - Maintenance

4. Next, tap in the **Password** text box. A touchpad will appear. Enter the passcode **8715**, then tap **[Enter]**.

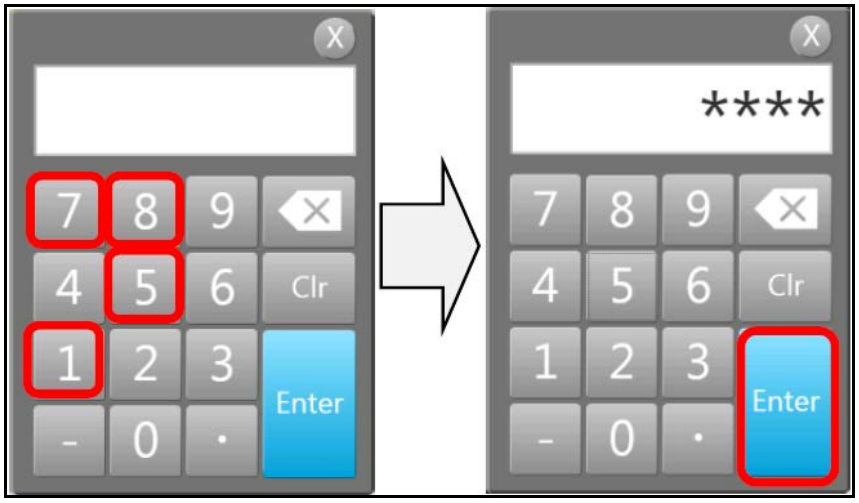


Figure 88
Setting data backup - Entering passcode

Tap **[+]** next to **Device setting** in the side panel and select **Recovery** from the drop down list.

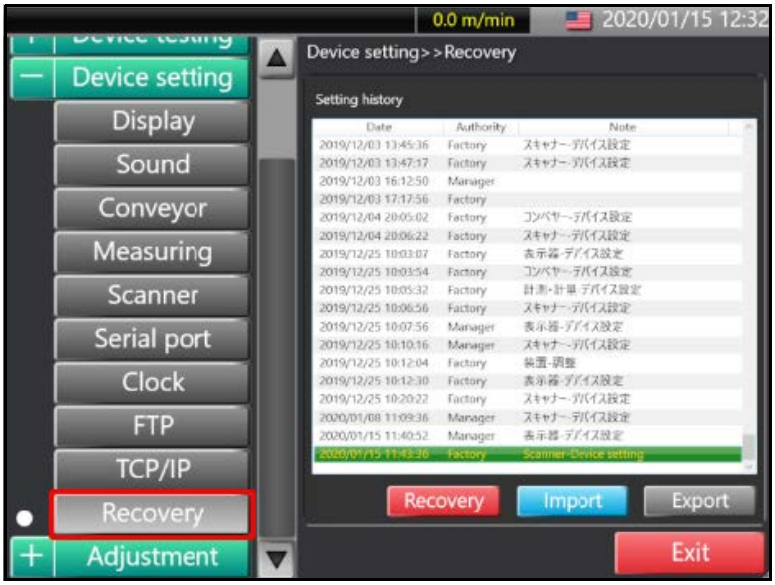


Figure 89
Setting data backup - Recovery menu

5. A list of the most recent data will appear in **Setting history** with the date of the recording. Select the data of the latest date and tap **[Export]**.

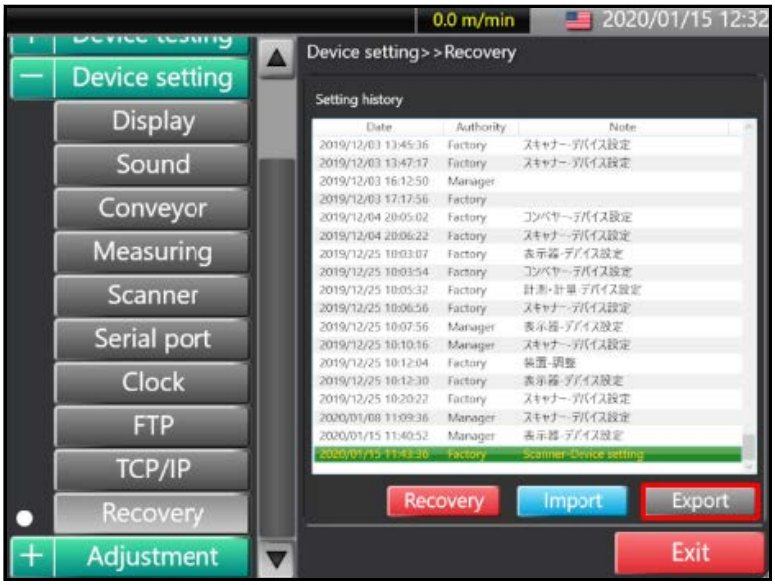


Figure 90
Setting data backup - Recovery setting history

6. A pop of menu will appear requesting the drive to which the data will be backed up. Select the drive for the USB memory drive and tap **[OK]**.

Figure 91
Setting data backup - Select drive

7. Another popup will appear requesting confirmation. Tap **[Yes, I understood]** to complete the recovery process.

Figure 92
Setting data backup - Confirmation popup

8. The file will be found on the memory drive in a folder designated with the machine number. The file name will follow the format **YYMMDDhhmmss.ini**, where Y=year, M=month, D=data, h=hour, m=minute, or s=second.

Adjustment data backup

1. Adjustment data can be backed up similar to maintenance data. To back up adjustment data, open the **Adjustment** drop down menu by tapping **[+]**. Then, tap **[Recovery]**.

Figure 93
Setting data backup - Adjustment recovery

2. A list of the most recent adjustment data will appear in **Setting history** with the date of the recording. Select the data of the latest date and tap **[Export]**.

Figure 94
Setting data backup - Adjustment setting history

3. A pop of menu will appear requesting the drive to which the data will be backed up. Select the drive for the USB memory drive and tap **[OK]**.

Figure 95
Setting data backup - Select drive

4. Another popup will appear requesting confirmation. Tap **[Yes, I understood]** to complete the recovery process.

Figure 96
Setting data backup - Confirmation popup

5. The file will be found on the memory drive in a folder designated with the machine number. The file name will follow the format **YYMMDDhhmmss.ini**, where Y=year, M=month, D=data, h=hour, m=minute, or s=second.

Measurement confirmation

1. To confirm the accuracy of measurements, use a calibration cube or a box with known measurements. Tap **[Start]** on the console.

Figure 97
Measurement confirmation - Start

2. The **Conveyor warning** message will appear to warn that the conveyor is moving with an option to stop the conveyor. The message will soon disappear as the conveyor starts.

Figure 98
Measurement confirmation - Conveyor warning message

3. When **[Zero]** and **[Ready]** indicators both turn green, the sensor is ready for measurement. Place the object for calibration on the edge of conveyor A. The measurement results will display.

Figure 99
Measurement confirmation - Ready for measurement

4. Run the same calibration object on the conveyor about ten times. Record the measurements in a table like the following:

Test sampling					
Measurement	Width	Length	Height	Weight	Barcode
Actual					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

NOTE *Acceptable weight tolerance is within ±5mm. If the box does not have a barcode, a "No Read" error may trigger. If the box has multiple barcodes, a "Multi Read" error will display. In both cases the conveyor will stop.*

CHAPTER 3
MAINTENANCE MODE

Measurement screen

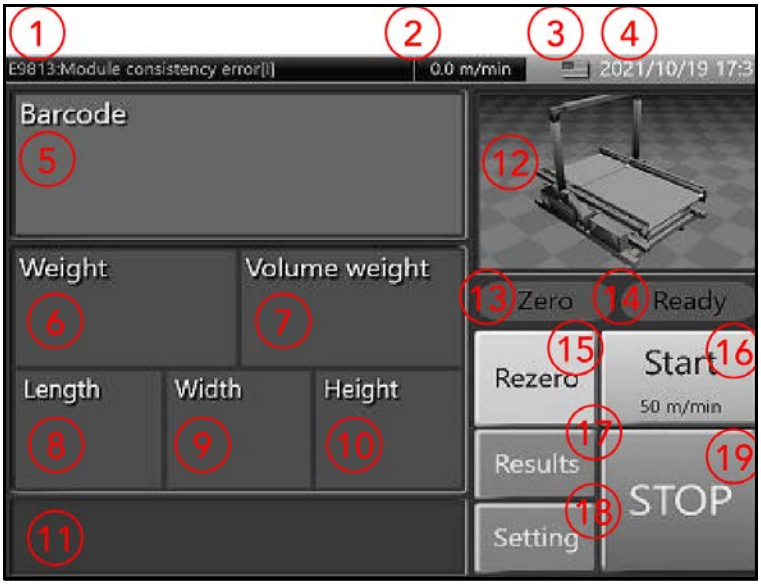
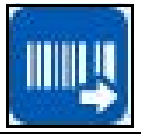
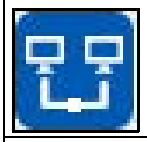


Figure 100
Measurement screen - Details

1.	System information	System error or any information is displayed.
2.	Conveyor speed	Displays the speed of either conveyor A or B
3.	Status	There are 3 icons that explain the status: • Scanner (No icon when not in use) • Serial communication (No icon when not in use) • LAN communication (No icon when not in use)
4.	Language	Displays current language.
5.	Barcode	Displays the measured barcode data.

6.	Weight	Displays weight of measured object.
7.	Volume weight	Displays volume of measured object. Note: Volume weight = Volume/coefficient (default coefficient is 6000).
8.	Length	Displays length of measured object.
9.	Width	Displays width of measured object.
10.	Height	Displays height of measured object.
11.	Error	Displays any errors that occurred during measurement. If no errors occurred, box will be left blank.
12.	Shape	Displays a 3-dimensional representation of the measured object.
13.	Zero point	Indicator light is on when all scales are in zero tracking state (zero point).
14.	READY	Indicator light is on when the conveyor is unobstructed and ready to receive. The following conditions must be met: • Conveyor runs at 30-70mm/min • The scale is in zero state • No objects within 700mm along the conveyor. • No current system errors.
15.	Zero reset	Tap to reset the scale to zero. This function is not available while conveyor is in operation.
16.	Start	Tap to activate the conveyor.
17.	Results	Tap to access the data history screen.
18.	Maintenance	Tap to access the maintenance mode.
19.	Stop	Tap to stop conveyor.

Status display icon details (status)

Scanner		Error occurrence status
		Read standby state
		Receiving barcode data
Serial		Error occurrence status
		Read standby state
		Sending measurement data
LAN		Error occurrence status
		Read standby state
		Sending measurement data

Select language details

Tap the desired language from the list of country options:

Figure 101
Measurement screen - Language selection

Result details

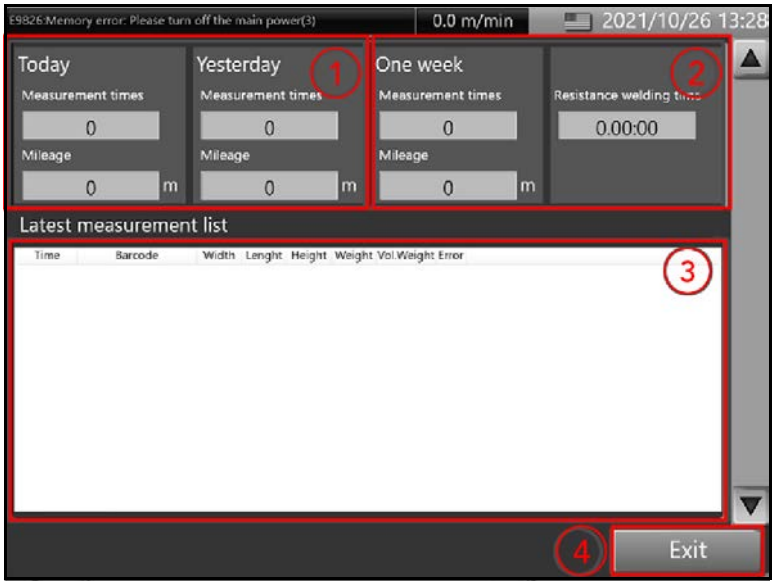


Figure 102
Measurement screen - Results page details

1.	Measurements and mileage	Displays the cumulative number of measurements and total conveyor mileage for the past week.
2.	Run time	Displays the total run time since the power was last turned on.
3.	List of conveyance results	Displays list of measurement results for the day.
4.	Exit	Tap to return to the measurement screen.

Maintenance settings

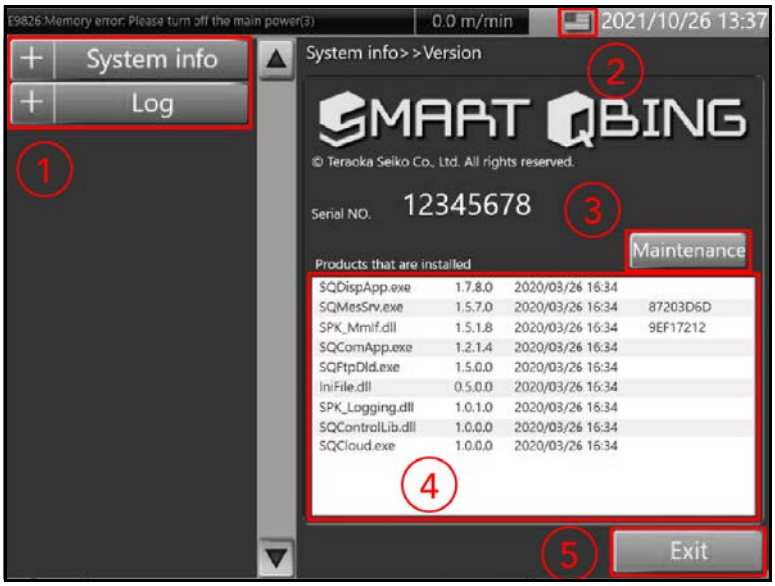


Figure 103
Measurement screen - Measurement screen details

1.	Maintenance settings	Tap to display maintenance items in the right side panel.
2.	Language	Tap to select desired language.
3.	Maintenance	Tap to access the maintenance mode.
4.	System info	Displays all firmware version and details.
5.	Exit	Tap to return to the measurement screen.

Maintenance mode

Maintenance mode details

User login

The following steps are for user login access:

1. From the **Measurement** screen, tap **[Settings]**.

Figure 104
Maintenance mode details - measurement screen

2. This will display the **Settings** screen. From here, other login options can be accessed through the **Maintenance** option.

Administrator (manager) login

The following steps are for administrator or manager login access:

1. With the **Settings** screen displayed, tap **[Maintenance]**.

Figure 105
Maintenance mode details - Settings screen

2. A pop-up Login window will appear. Check the box next to **Manager** by tapping it, then tap **[Login]**.

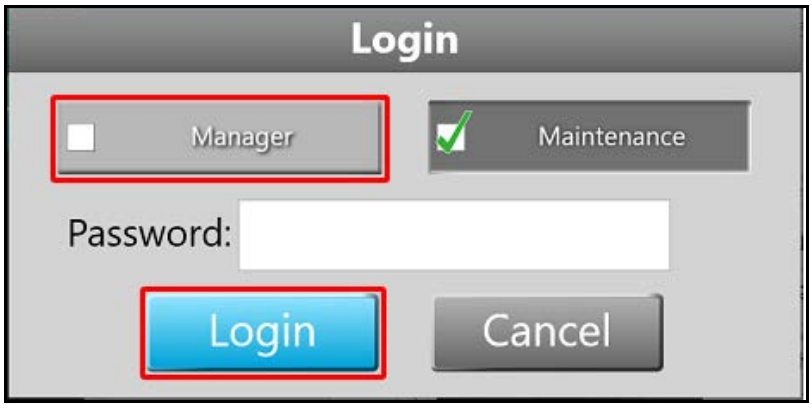


Figure 106
Maintenance mode details - Administrator login

3. The **Maintenance** screen for manger will now be displayed.

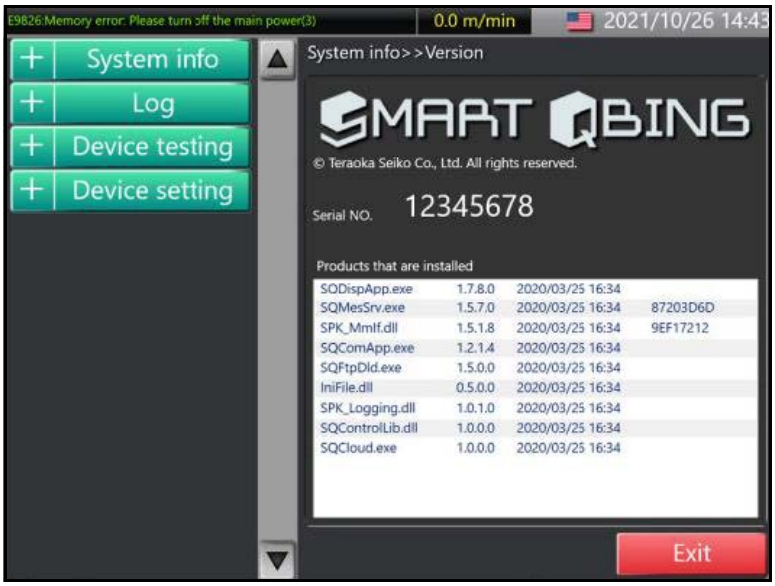


Figure 107
Maintenance mode details - Maintenance screen

Service engineer login

The following steps are for service engineer login access:

1. Access the **Login** window by tapping **[Maintenance]** at the **Settings** screen. Check the box next to **Maintenance** by tapping it. Then tap in the text field next to **Password**.

Figure 108
Maintenance mode details - Service engineer login

2. The password key window will display. Enter the passcode **8715** by tapping the associated numbers in the key window. Then, tap **[Enter]**.

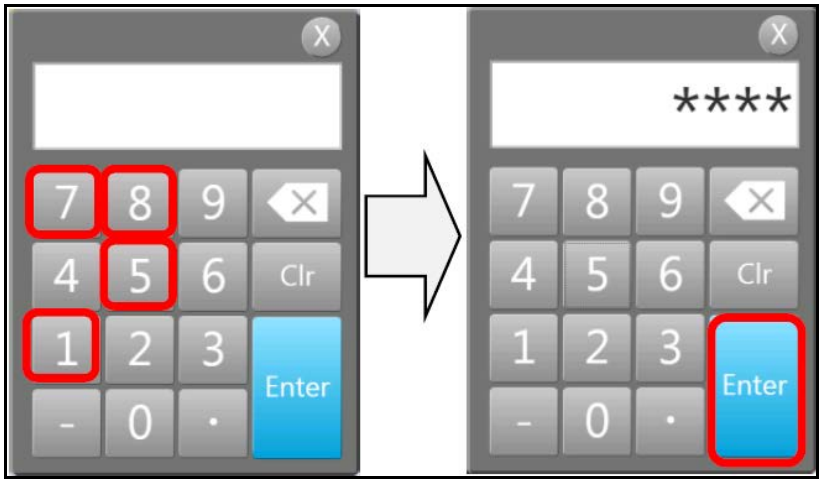


Figure 109
Maintenance mode details - Password key window

3. This will return you to the **Login** window. From here, tap **[Login]** to finalize the login for service engineer.

Figure 110
Maintenance mode details - Passcode entered

4. The **Maintenance** screen for service engineer will now be displayed.

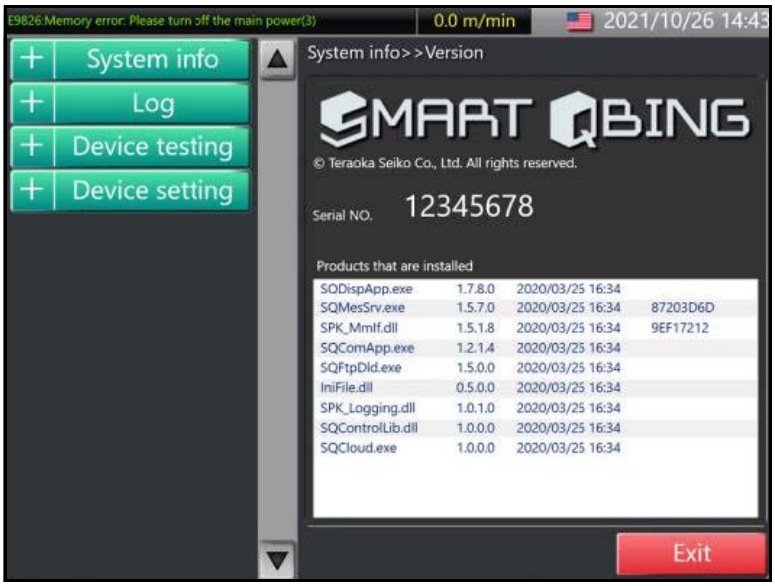


Figure 111
Maintenance mode details - Service engineer maintenance

Exiting maintenance mode

With User login

The following steps are for exiting the maintenance mode with **User** login:

1. From the **Settings** screen, tap **[Exit]**.

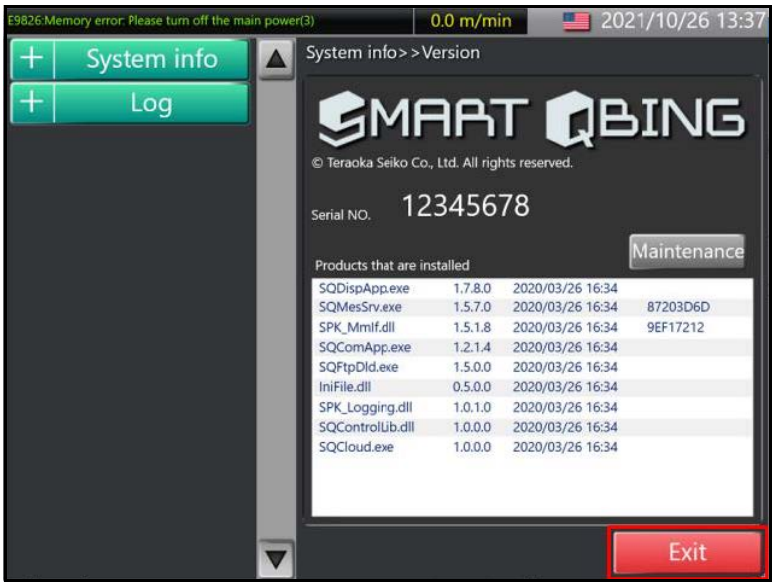


Figure 112
Exiting maintenance mode - User login

2. This will return you to the **Measurement** screen.

Figure 113
Exiting maintenance mode - Measurement screen

With Administrator (manager) login

The following steps are for exiting the **Maintenance mode** with **Administrator** (manager) login:

1. From the **Settings** screen, tap **[Exit]**.

Figure 114
Exiting maintenance mode - Administrator login

2. A popup message will appear, prompting to **"Finish setting"**. Tap **[OK]** to continue.

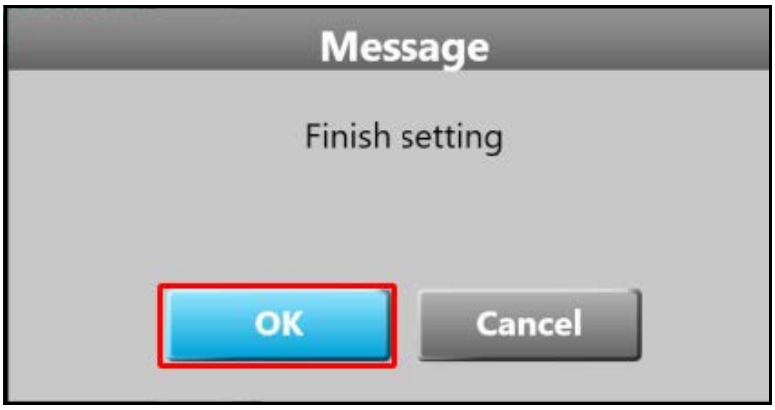


Figure 115
Exiting maintenance mode - Finish setting

3. From the **Settings** screen, tap **[Exit]**. This will return you to the **Measurement** screen.

With Service engineer login

The following steps are for exiting the maintenance mode with **Service** engineer login:

1. From the **Settings** screen, tap **[Exit]**.

Figure 116
Exiting maintenance mode - Service engineer login

A popup message will appear, prompting **"Finish setting"**. A checkbox is available for logout. If **[OK]** is tapped without checking the box next to **Logout**, the **Maintenance** screen may be accessed again without a password during a 10 minute window. If more than 10 minutes transpire, you will be forced to log out.

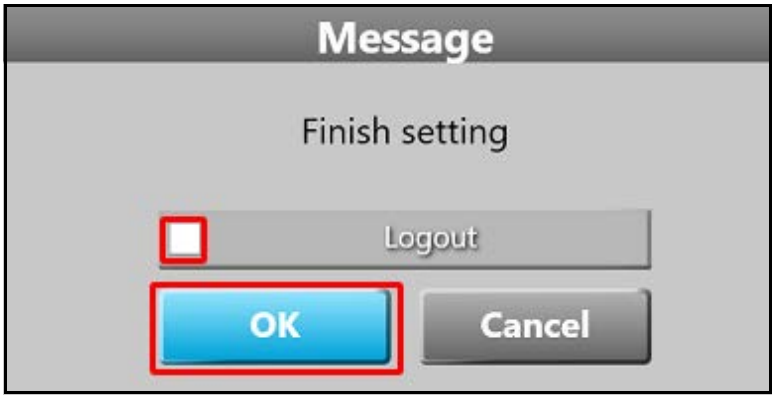


Figure 117
Exiting maintenance mode - Logout

2. To logout immediately, check the box next to **Logout** and tap **[OK]**.

Figure 118
Exiting maintenance mode - Logout checked

3. If changes have been made to the settings, the **Update** settings window will appear. If your settings require the user to register, input ***teraoka*** in the text box next to **Signature**. Then, tap **[Update]**.

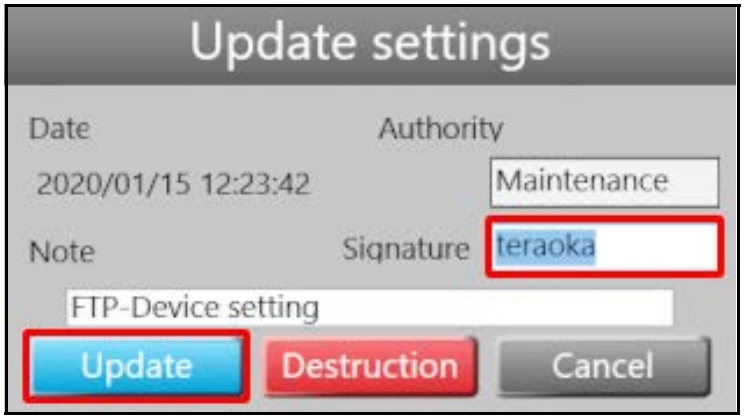


Figure 119
Exiting maintenance mode - Update register

4. If setting do not require user to register, no signature is need. Simply, tap **[Destruction]**. The register will be destroyed.

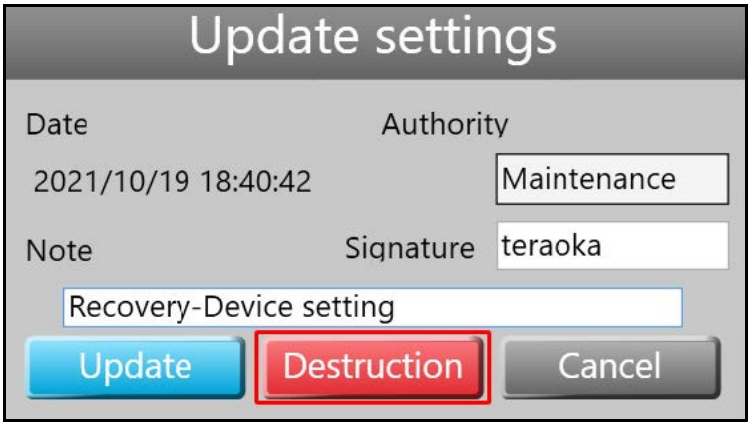


Figure 120
Exiting maintenance mode - Destroy register

5. After successfully logging out, the **Measurement** screen will appear.

Maintenance mode item details

Available selections for System info

The following options are available under **System Info**:

Version

Figure 121
System info selections- Version

The **Version** screen displays the most recently updated version of each program and library file currently running on the system. The following is a short description of each file:

N10: Communication control firmware

SH: Weighing measurement control firmware

FPGA (Main): N10-SH Communication control firmware

FPGA (Conveyor): Conveyor transfer control firmware

FPGA (Relay): PLC-7Seg-Emergency stop control firmware

FPGA (Display): Display control firmware

SH (DSP): A/D control firmware

SQDispAPP.exe: Conveyor control execution application

SQMesSrv.exe: Conveyor control execution application

IniFile.dll: Files for reading .ini files

SPK_Logging.dll: Files for log output

SPK_Mmlf.dll: Files to access shared memory

SQControlLib.dll: Screen design files.

SQComApp.exe: APP that outputs COM results

SQFtpDld.exe: APP that outputs FTP results

Digital DIO

Figure 122
System info selections - Digital DIO

The **Digital DIO** screen displays the status of each PLC terminal. When there is an input/output signal, the terminal displays red.

Condition

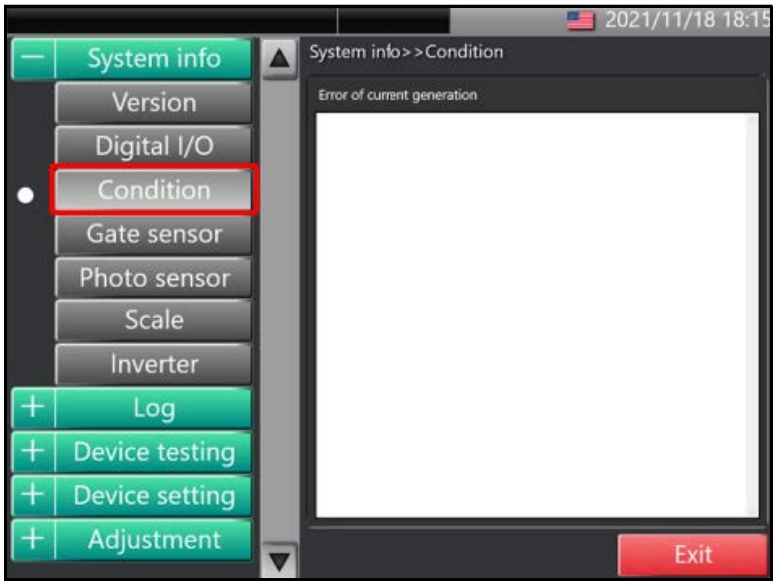


Figure 123
System info selections - Condition

The **Condition** screen displays a list of currently occurring errors.

Gate sensor

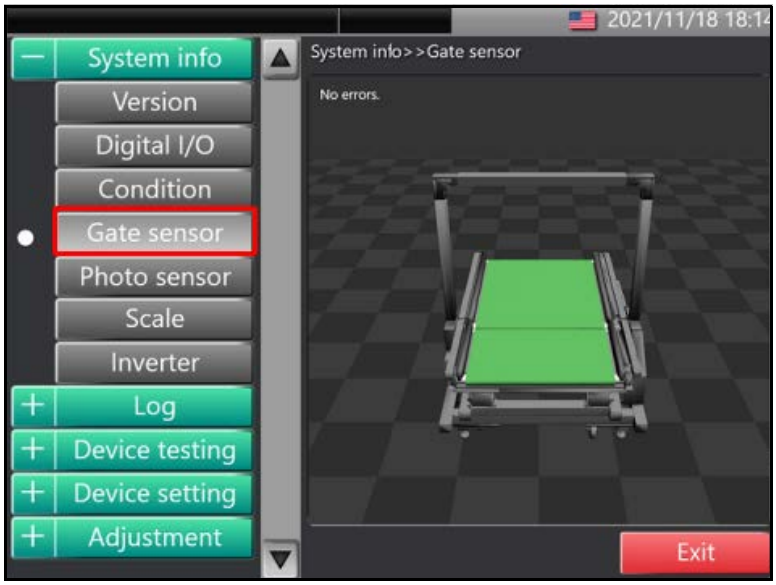


Figure 124
System info selections- Gate Sensor

The **Gate** sensor screen displays any errors due to defective parts associated with the gate sensor. The defective part of the gate sensor is displayed with a red line. If there are no defective parts, the red line will not be displayed.

Photo sensor

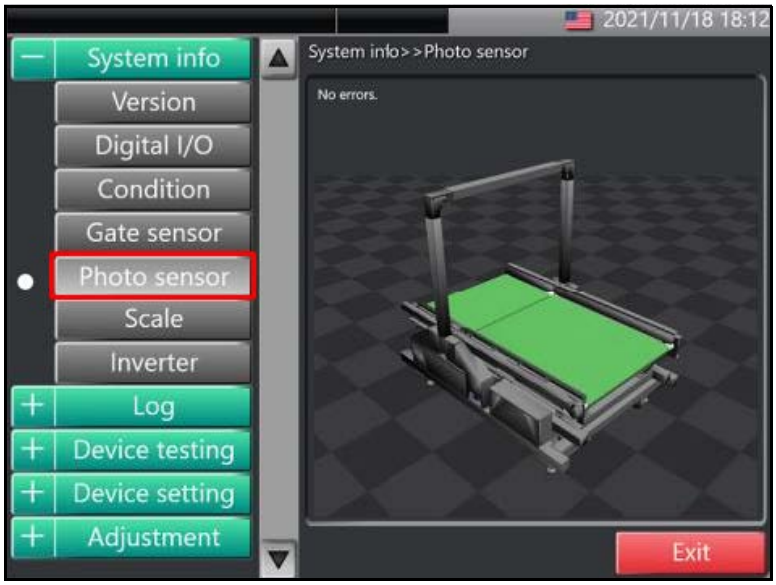


Figure 125
System info selections - Photo sensor

The **Photo** sensor screen displays any errors due to defective parts associated with the photo sensor. The defective part of the photo sensor is displayed with a red line. If there are no defective parts, the red line will not be displayed.

Scale

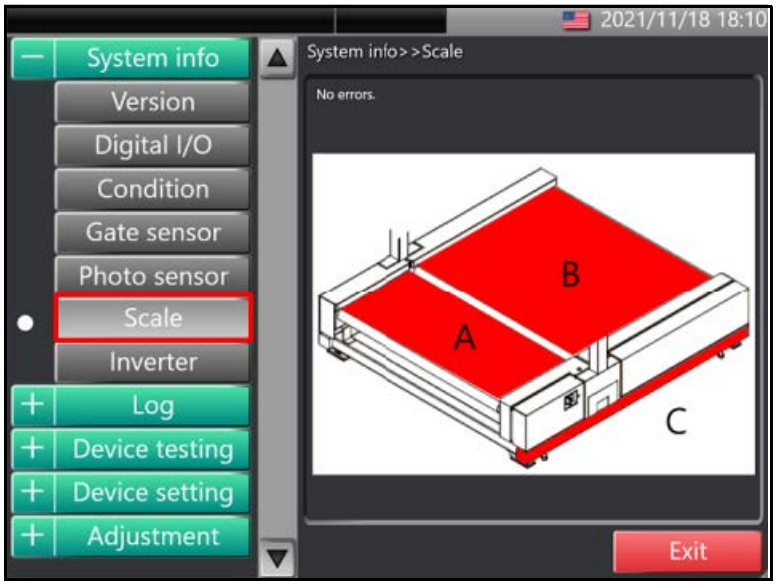


Figure 126
System info selections - Scale

The **Scale** screen displays the location where a scale error has occurred. Any scales with errors are highlighted in red.

Inverter

Figure 127
System info selections - Inverter

The **Inverter** screen displays the inverter status and error (alarm) occurrence status. Check the box next to the inverter **A** or **B** to check the

status of that inverter. When there is an input/output signal, the terminal displays red.

Available selections for Log

The following options are available under **Log**:

Measurement

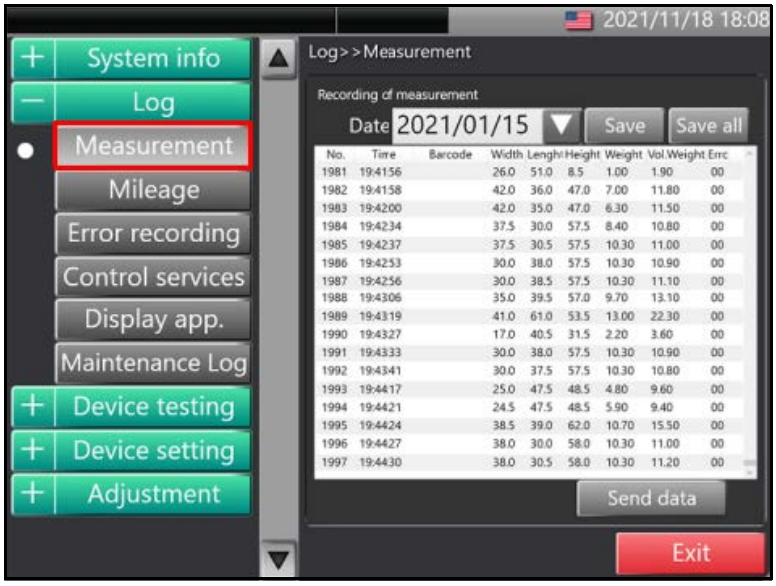


Figure 128
Log selections - Measurement

The **Measurement** screen displays all measurement logs for a selected period. Use the down arrow next to the **Date** text field to select a date range. The data can be transfered to a prepared USB memory by tapping **[Send data]**.

Mileage

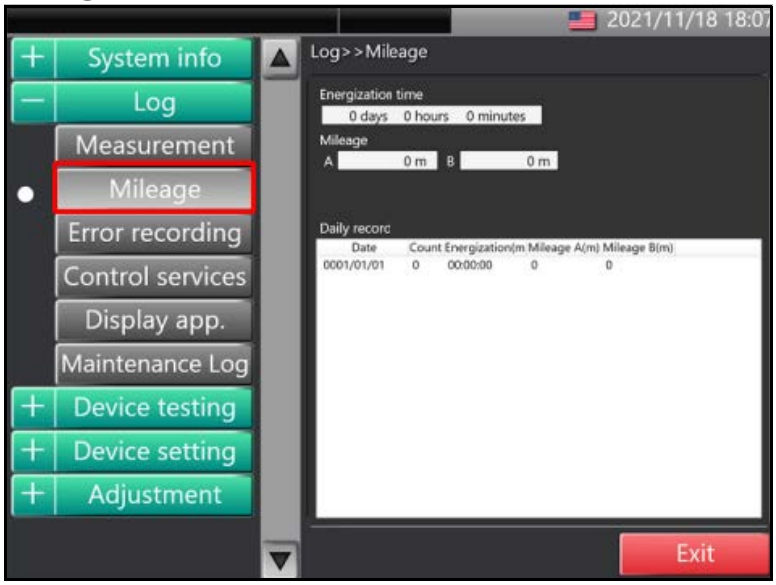


Figure 129
Log selections - Mileage

The **Mileage** screen displays maintenance information to aid in the upkeep of the system. The following information is displayed:

Energizing time: Displays the cumulative time that the system has been active.

Transport distance: Displays the cumulative transfer distance of each conveyor (A and B).

Expected belt replacement date: Displays the estimated belt replacement dates for conveyor A and B.

Daily record: Displays the number of packages measured, run time, and A/B conveyor transport distance for each date.

Error recordings

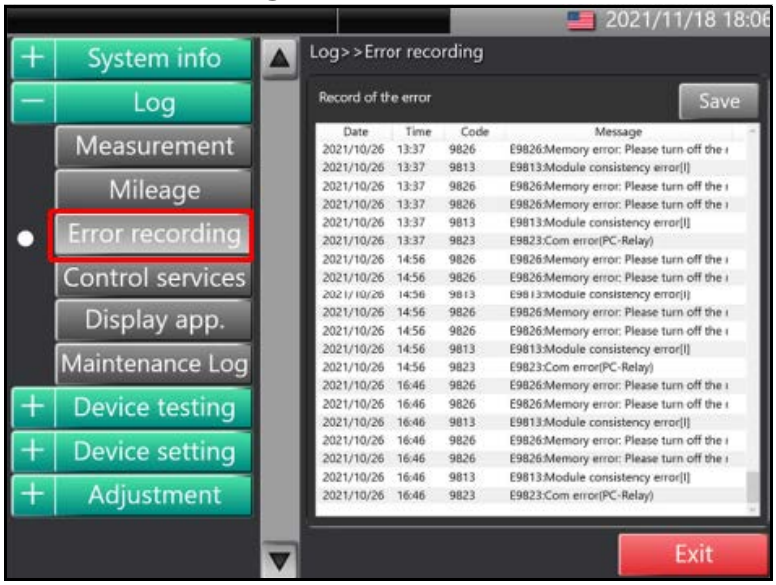


Figure 130
Log selections - Error recordings

The **Error recordings** screen displays a list showing the history of errors that have occurred while the system was active. This data can be saved onto a prepared USB memory drive by tapping **[Save]**.

Control services

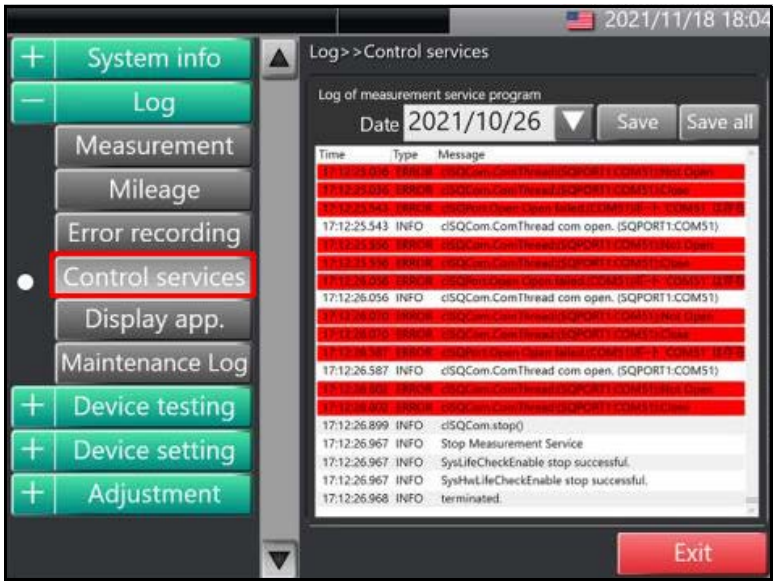


Figure 131
Log selections - Control services

The **Control services** screen displays a list of control service logs of measurements for a selected period. Use the down arrow next to the **Date**

text field to select a date range. The data for the chosen date can be transfered to a prepared USB memory drive by tapping **[Save]**. Alternatively, all data can be transfered to a prepare USB memory drive by tapping **[Save all]**.

Display app.

Figure 132
Log selections - Display app.

The **Display app.** screen displays a list of measurements of the display app. program for a selected period. Like the **Control services**, the down arrow next to the **Date** text field allows for the selection of a date range. The data for the chosen date can also be transfered to a prepared USB memory drive by tapping **[Save]** or all data can be transfered by tapping **[Save all]**.

Maintenance log (service engineer only)

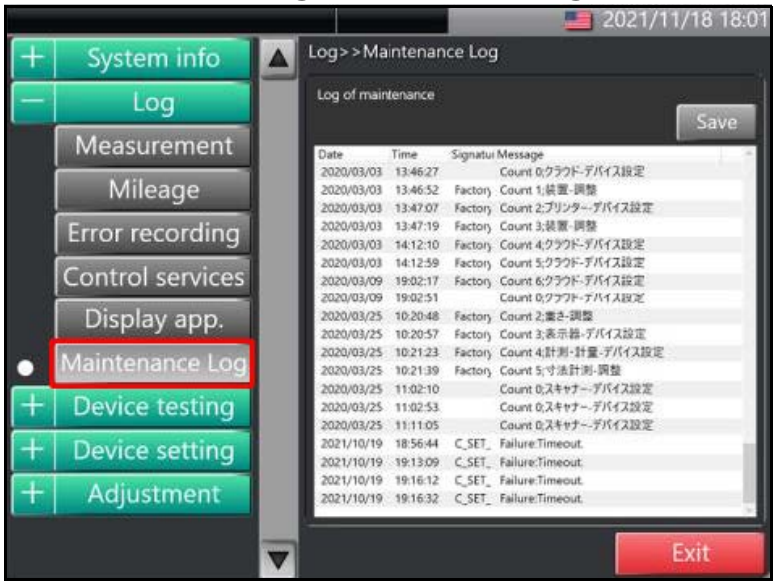


Figure 133
Log selections - Maintenance log

The **Maintenance** log is a listed history of all changes made during maintenance. The data may be transfered to a prepared USB memory drive by tapping **[Save]**.

Equipment test (available to admin/engineer)

The following options are available to administrator and service engineer logins under **Device testing**:

Sensor list

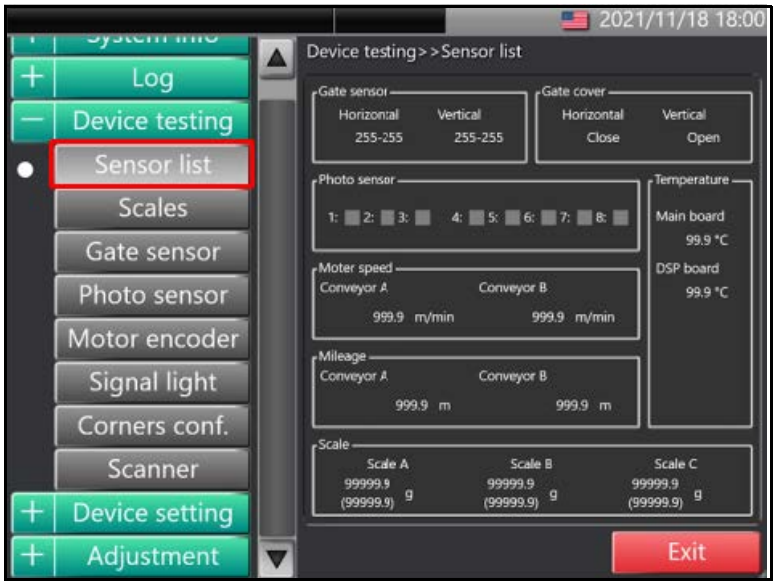


Figure 134
Device testing selections - Sensor list

The **Sensor list** selection displays the status of each sensor for the CS 200 SQ. The following describes each section of the **Sensor list** screen:

Gate sensor: Displays the horizontal and vertical status of the gate. If all gate sensors are ready to receive, **255-255** will display. If a gate sensor is blocked, the numbered range of the blocked sensor will display instead.

Gate cover: Displays the cover-on status for the gate both horizontally and vertically. If the cover is removed, the indicator will display open. If the cover is attached, the indicator will display closed.

Passenger sensor: The status of each passage sensor is displayed. If any of the passaged sensors are blocked, the respective indicator for that sensor will display red.

Motor speed: Displays the current transport speed of both conveyor A and conveyor B in units of **meters per minute**.

Mileage: Displays the cumulative transport distance of conveyor A and conveyor B in units of meters.

Temperature: Displays the average temperature of the **Main board** and **DSP board** in units of **°C**.

Scale: Displays the weight value of each of the scales in units of **grams**.

Scales

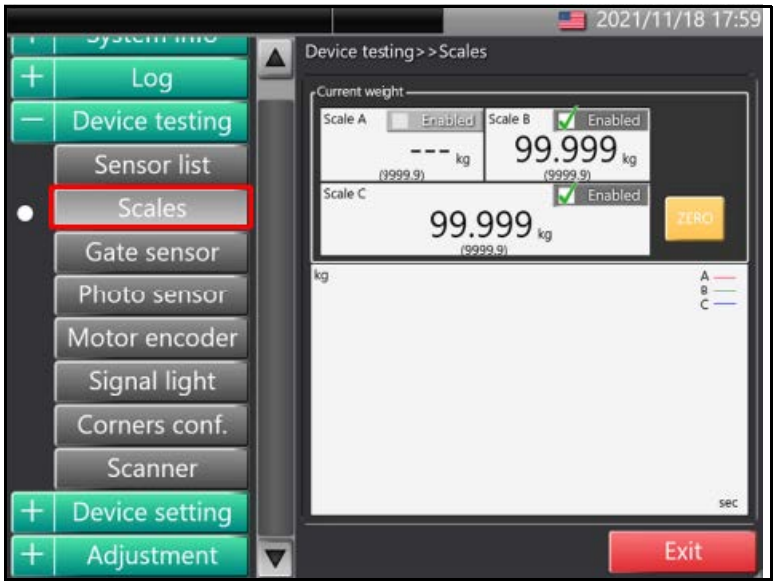


Figure 135
Device testing selections - Scales

The **Scales screen** displays the status of each scale for the CS 200 SQ. The current weight of each scale is displayed in units of ***kilograms***. An **Enabled** option exists for each weight.

When the check box next to **Enabled** is unchecked, the scale value will not be reflected on the graph. Those scale weights that are enabled will be included in the graph.

Tap **[Zero]** to reset the scales to their zero value.

Gate sensor

Figure 136
Device testing selections - Gate sensor

The **Gate sensor** screen displays detailed information about the status of the gate sensor. The gate sensor indicators are detailed as follows:

When the red line is displayed, the gate sensor is blocked. The position of the red line indicates the position of the blocked sensor.

A displayed red square indicates the sensor board for the sensor that is blocked.

The numbers at the bottom of the screen correspond with the sensors along the gate. When a sensor is blocked, the corresponding sensor number will not appear in the list.

NOTE *If the sensor number continues to appear in the list even when the corresponding sensor is blocked, the sensor can be determined to be defective.*

The indicators may be placed in two different modes:

Normal mode: The red line indicator will be displayed in real time. It will only stay on as long as the sensor is blocked.

Latch mode: Unlike the indicator in Normal mode which is only on when the sensor is blocked, Latch mode allows the indicator to remain even after the sensor is no longer blocked. Once the sensor is blocked the red line indicator will turn on and will not toggle off until cleared.

By checking the box next to **Beep**, the system will emit an indicator sound when a sensor is blocked.

Photo sensor

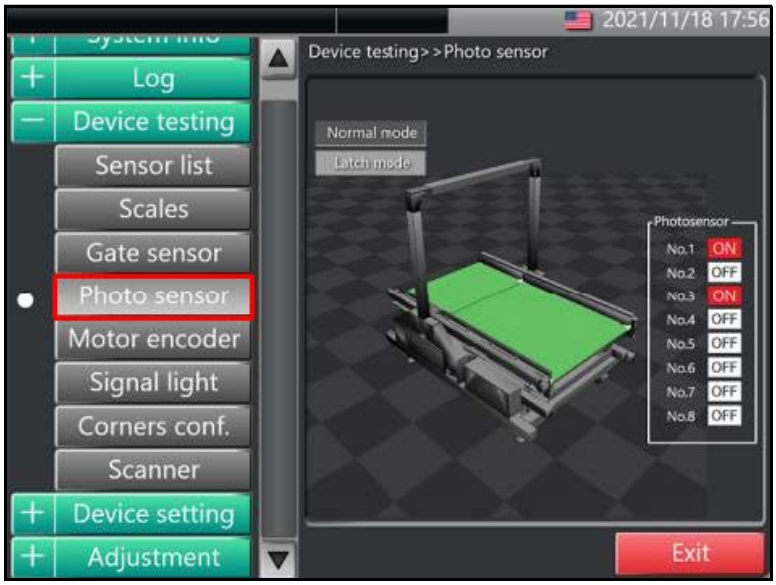


Figure 137
Device testing selections - Photo sensor

The **Photo sensor** screen displays status of the passage sensors. Along the right panel under **Photosensor** are indicators for each of the passage sensors. When a sensor is unobstructed, the indicator displays **OFF**. When a sensor is blocked, the indicator displays **ON**.

Like the gate sensor the photo sensor indicators have two different modes:

Normal mode: The indicator will be displayed in real time. It will display **ON** as long as the sensor is blocked. When it is unobstructed it will return to displaying **OFF**.

Latch mode: When Latch mode is selected, the sensor will display **ON** when blocked and will remain in that state even when the sensor is no longer blocked. The sensor will not toggle off until cleared.

Motor encoder

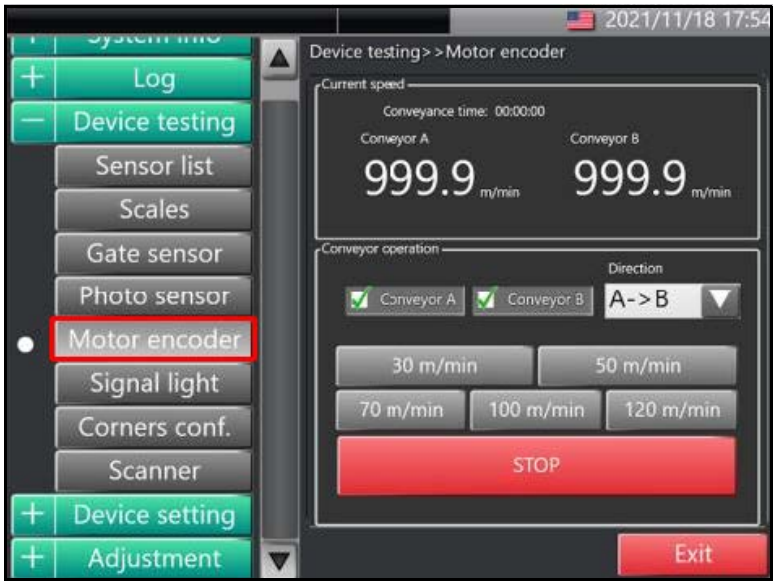


Figure 138
Device testing selections - Motor encoder

The **Motor encoder** screen displays the test operation of the main motor for the conveyor. The following information is displayed:

Current speed: Displays the real time speed each conveyor (A and B) is displayed in units of meters per minute.

Conveyor operation: Displays conveyor operation controls used to adjust the speed and operation of each conveyor. The following controls are available:

- Check the box next to the conveyor to display the operation.
- Use the down arrow to select either forward motion of the conveyor (**A → B**) or reverse motion (**B → A**).
- Select the speed of the conveyor by tapping the corresponding button. Speeds range from **10 m/min** to **120 m/min**.
- Tap **[Stop]** to halt the conveyors and stop transfer.

Signal light

Figure 139
Device testing selections - Signal light

The **Signal light** screen displays the test operations of the indicator light. The following toggles are available to test the indicator light:

Red	Tap **[Off]** to turn off the red lamp.
	Tap **[On]** to turn on the red lamp in continuous mode.
	Tap **[Blink]** to turn on the red lamp in blinking mode.
Green	Tap **[Off]** to turn off the green lamp.
	Tap **[On]** to turn on the green lamp in continuous mode.
	Tap **[Blink]** to turn on the green lamp in blinking mode.
Buzzer	Tap **[Off]** to stop buzzer.
	Tap **[On]** to emit a continuous buzzer sound.

Corners conf.

Figure 140
Device testing selections - Corners conf.

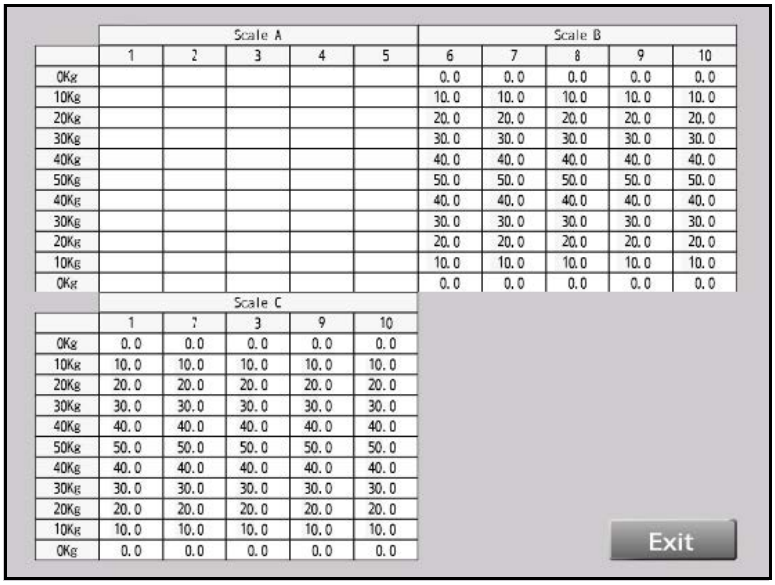
The **Corners conf.** screen displays indicators and controls for testing the four corners and weight value of each scale. Perform the following steps when testing the scales:

1. Ensure the scales (A,B, and C) are free of objects. Tap **[Zero reset and next]**.

2. A message will appear prompting the placement location for the calibration weight. Place the weight where indicated, then tap **[Record]**.

NOTE *Tap [Skip] at any time to skip measuring a location on the scale. A prompt will appear for the next location.*

3. After checking all items, tap **[Report]** to display a detailed list of all measurements from each of the scales.



	Scale A					Scale B				
	1	2	3	4	5	6	7	8	9	10
0Kg						0.0	0.0	0.0	0.0	0.0
10Kg						10.0	10.0	10.0	10.0	10.0
20Kg						20.0	20.0	20.0	20.0	20.0
30Kg						30.0	30.0	30.0	30.0	30.0
40Kg						40.0	40.0	40.0	40.0	40.0
50Kg						50.0	50.0	50.0	50.0	50.0
40Kg						40.0	40.0	40.0	40.0	40.0
30Kg						30.0	30.0	30.0	30.0	30.0
20Kg						20.0	20.0	20.0	20.0	20.0
10Kg						10.0	10.0	10.0	10.0	10.0
0Kg						0.0	0.0	0.0	0.0	0.0

	Scale C				
	1	2	3	9	10
0Kg	0.0	0.0	0.0	0.0	0.0
10Kg	10.0	10.0	10.0	10.0	10.0
20Kg	20.0	20.0	20.0	20.0	20.0
30Kg	30.0	30.0	30.0	30.0	30.0
40Kg	40.0	40.0	40.0	40.0	40.0
50Kg	50.0	50.0	50.0	50.0	50.0
40Kg	40.0	40.0	40.0	40.0	40.0
30Kg	30.0	30.0	30.0	30.0	30.0
20Kg	20.0	20.0	20.0	20.0	20.0
10Kg	10.0	10.0	10.0	10.0	10.0
0Kg	0.0	0.0	0.0	0.0	0.0

Exit

Figure 141
Device testing selections - List of measurements

Scanner

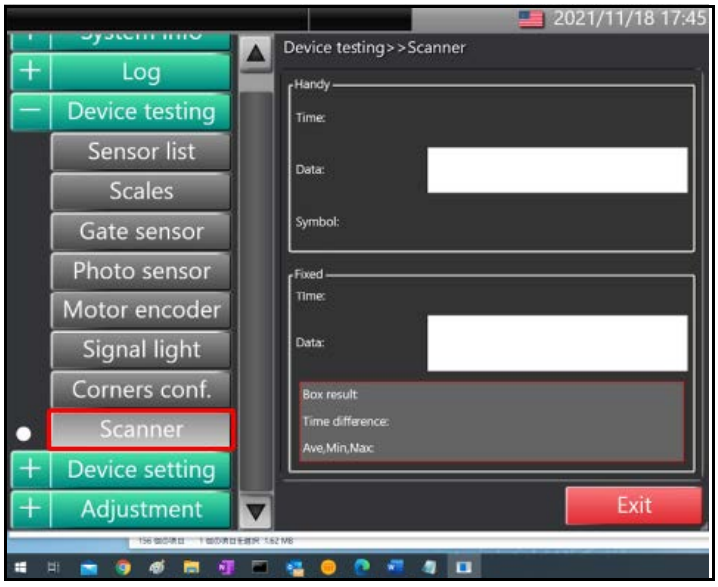


Figure 142
Device testing selections - Scanner

The **Scanner** screen displays time and data of any measurements taken by the scanner connected to the device whether hand scanner or fixed.

Device setting (available to admin/engineer)

The following options are available to administrator and service engineer logins under **Device setting**:

Display

Figure 143
Device setting selections - Display

The **Display** screen provides various setting options for the CS 200 SQ display interface. The following are the available settings:

Machine number: The machine number setting allows a numeric value between **1** and **99** to be assigned to the machine. If no number is set, the machine will default to **1**.

Measurement display: By tapping the down arrow, the measurement display may be set to either **Volume weight** or **Total dimension**.

Design: There are three design preferences that can be adjusted: **the background color**, **background image**, or **logo image**.

Background color: Tap **[Color]** to adjust the set background color for the display.

Background image: Tap **[Import]** to upload an image to display in the background. Images must be in a recognizable format with dimension of **1024x724 pixels**.

Logo image: Tap **[Import]** to upload an image to display as a logo in the display. Images must be in a recognizable format with dimension of **598x95 pixels**.

Scale warm-up time: At start up, the scales need time to warm up before accurate measurements may be taken. For this reason, the system provides a warm-up time before items are allowed to run. The default warm-up time is **480 seconds**, but a time value between **0 and 3600 seconds** can be set.

Conveyor start warning time: The conveyor start warning time sets the time at which the buzzer will sound, alerting everyone in the area that the machine is now in use. The default is **5 seconds**, but a value can be set between **0 and 60 seconds**.

Login passcode: The login passcode setting allows for a password to be set when logging in as an administrator. The default is a null value, but any passcode may be entered from **0 to 99999999**.

System reboot: The system reboot set a time at which the system will reboot.

Sound

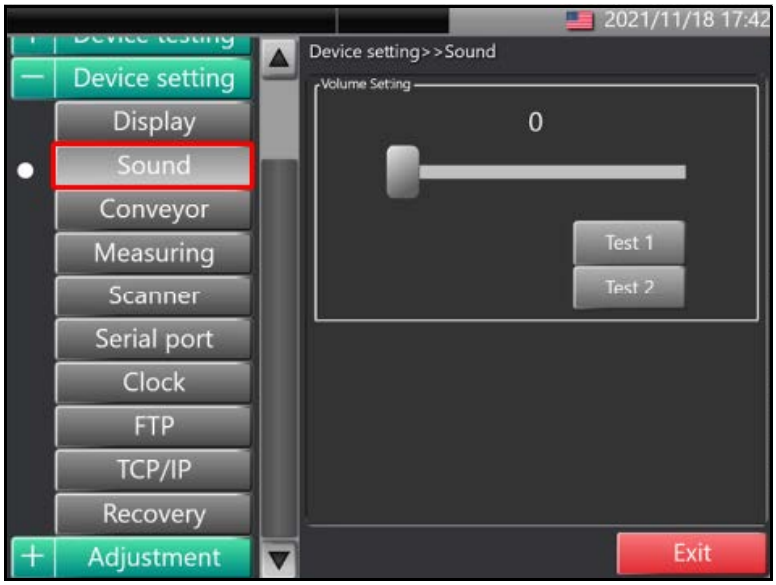


Figure 144
Device setting selections - Sound

The **Sound** screen displays settings for sound. Use the adjustment bar to set the volume setting. Tap **[Test 1]** or **[Test 2]** to preview the indicator sound.

Conveyor

Figure 145
Device setting selections - Conveyor

The **Conveyor** screen provides settings for the conveyor. The following are the available settings:

Preset speed: The preset speed sets the transport speed of the conveyor in units of meters per minute. The default speed is **50 m/min**, but can be set to a value between **-160 m/min and 160 m/min**.

Event to stop the conveyor: the event to stop the conveyor section provides a list of events that will result in an automatic stop of the conveyor. By checking the box next to the event, the system will automatically stop when the event is triggered. The default state for each event is unchecked.

The following stop event options are available:

System error: The conveyor stops when a system error occurs.

Measurement error: Conveyor stop will occur in the event of an error in measuring length.

Weighing error: Conveyor stop will occur in the event of an error in measuring weight.

Scanner error (receiving): If data received from the scanner is interrupted, the conveyor stops.

Scanner error (no read): If the scanner has an error that prevents it from reading the barcode, the conveyor stops.

Scanner error (multi read): If the scanner receives multiple reads, the conveyor stops.

Digital speed: With the Digital speed setting, the conveyor speed can be set for three states: **RH**, **RM**, and **RL**. If the signal for one of the three states is **ON**, the conveyor will transport at the corresponding speed. Each state can be set to a value between **-160 to 160 m/min**. By default the **RH**, **RM**, and **RL** states are set to **90**, **70**, and **45 m/min**, respectively.

Analog speed: With the analog setting, the conveyor speed can be set for the two analog input states: **0V** and **10V**. Each state can be set to a value between **-160 to 160 m/min**. By default the **0V** state is set to **30 m/min** and the **10V** state is set to **90 m/min**.

Motor acceleration/deceleration time: Start and stop time for the conveyor can be set by motor acceleration/deceleration time setting. The start and stop time can be set to a value between **0.5 to 10.0 seconds**. The default for both start and stop times is **6.0 seconds**.

Measuring

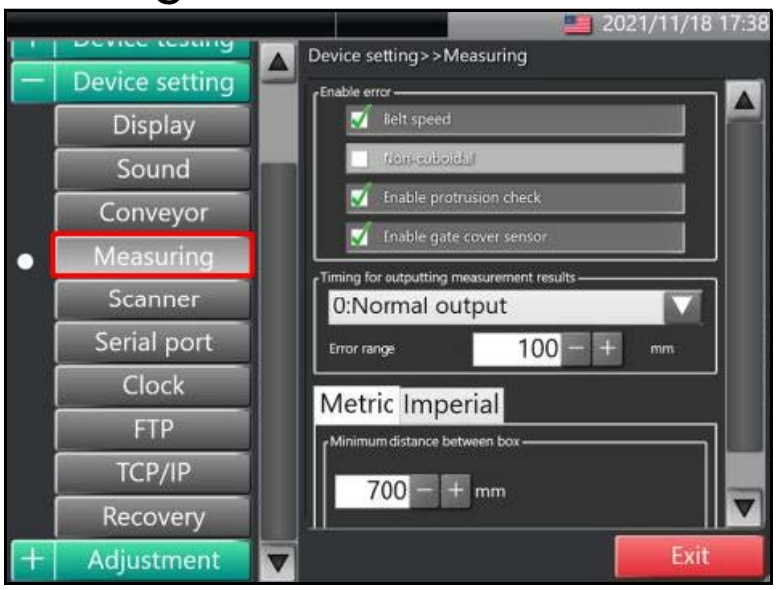


Figure 146
Device setting selections - Measuring

The **Measuring** screen provides settings for measuring and measurement outputs. The following are the available settings:

Enable error: The enable error setting displays a list of available error triggers. Set the desired trigger by checking the box next to the respective error. The following are the available error triggers:

Belt speed: An error is triggered when the transport speed fluctuates beyond acceptable values during operation. The belt speed error is active by default.

Non-cuboidal: An error is triggered if dimensions or weight measured varies by 25% above accepted values. The error is not active by default.

Enable protrusion check: An error is triggered when rubbing occurs on the conveyor. The error is active by default.

Enable gate cover sensor: An error is triggered if cover is not in place at start up. The error is active by default.

Timing for outputting measurement results: Tap ▽ to select one of three modes: **rear output**, **output delay**, and **front output**.

	Mode	Default	Value Range
0	Rear output	100 mm	0 to 9999 mm
1	Output delay	100 s	0 to 9999 s
2	Front output	2000mm	0 to 9999 mm

Units toggle: The units toggle allows for the setting of measuring units between Metric and Imperial with metric as default.

Minimum distance between box: The distance between one object and the next along the convey may be set with default set to **700 mm**.

Scanner

Figure 147
Device setting selections - Scanner

The **Scanner** screen provides settings for the scanners that are connected to the system. Tap the down arrow (▽) to select a scanner to connect.

Selecting the Fixed tab will display the following setting options for a fixed scanner:

Selection	Setting options	Default setting
Baud rate (bps)	4800, 9600, 19200, 38400, 115200	115200
Data bit	7, 8	8
Sop bit	1, 2	1
Parity	even, odd, none	none
Flow control type	none, hardware, XON/XOFF	none
Minimum	-10,000 to 10,000	-1000
Maximum	-10,000 to 10,000	0

Selecting the Handy tab will display a scanner setting barcode with the option to enable a hand-held scanner. To enable the barcode check the box next to **Enable**.

Serial Port

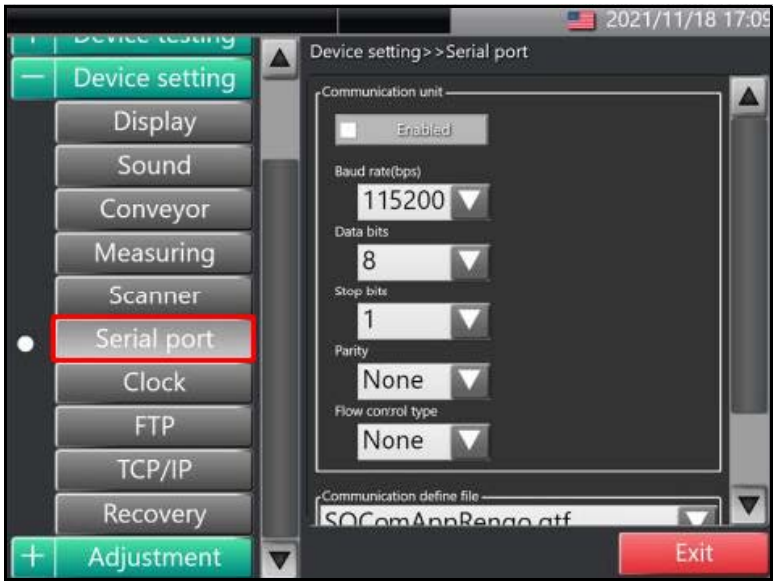


Figure 148
Device setting selections - Serial port

To enable output of measurement result via the RS-232 serial port, check the box next to **Enabled**. The following options are available for output:

Selection	Setting options	Default setting
Baud rate (bps)	4800, 9600, 19200, 38400, 115200	115200
Data bit	7, 8	8
Sop bit	1, 2	1
Parity	even, odd, none	none
Flow control type	none, hardware, XON/XOFF	none

Clock

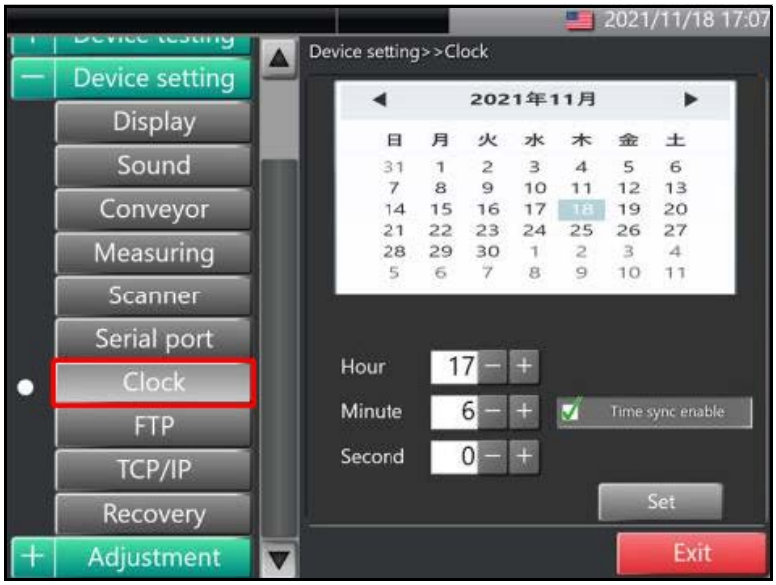


Figure 149
Device setting selections - Clock

From the **Clock** screen, the time and calendar setting may be set. Use the left and right arrows above the calendar to select a month. Highlight the day by tapping the date in the displayed calendar month. Use the **[+]** and **[-]** buttons to set the **Hour**, **Minute**, and **Second.** Once the time is entered correctly, tap **[Set]** to save settings.

FTP

Figure 150
Device setting selections - FTP

The FTP screen displays options for FTP transmission of data. The following settings are available:

Result upload: Enable FTP transmission of measured values.

Transmission interval: Use the **[+]** and **[-]** buttons to set the interval of transmissions in minute increments.

Address: Enter the IP Address of the connection destination in the text field.

File name: Enter the output file name in the text field.

User: Enter the user name for the FTP connection in the text field.

Password: Enter the password for the FTP connection in the text field.

Passive mode: Check the box to enable passive mode where available. The default setting is no check (active mode).

SSL mode: Check th box to enable active encryption.

Communication define file: Define the communication file by tapping the down arrow (▽) and selecting from the list.

TCP/IP

Figure 151
Device setting selections - TCP/IP

The TCP/IP screen displays option for TCP/IP transmission of data. The following settings are available:

Use DHCP: Check the box to enable Dynamic Host Configuration Protocol (DHCP) to automatically distribute IP address for transmission. If not enabled, a fixed user defined address will be used.

IP address: Use the **[+]** and **[-]** buttons to set the SQ IP address.

Mask: Use the **[+]** and **[-]** buttons to set the SQ subnet mask.

Gateway: Use the **[+]** and **[-]** buttons to set the SQ gateway.

Use DNS: Check the box to enable the use of Domain Name System (DNS) to translate domain names to IP addresses.

Apply setting now: Tap to apply current settings to system.

Recovery

Figure 152
Device setting selections - Recovery

The Recovery screen displays a history of setting changes. This screen can be used to recover previous settings and import/export settings. The following options are available:

Recovery: Select from the history of setting changes the settings you wish to recover. Tap **[Recovery]** to set selected changes from history as the new settings.

Import: Tap **[Import]** to upload setting from another system.

Export: Tap **[Export]** to send the selected setting values to a prepared USB memory.

Adjustment

The following selections are available to all logins under the **Adjustment** menu:

Span

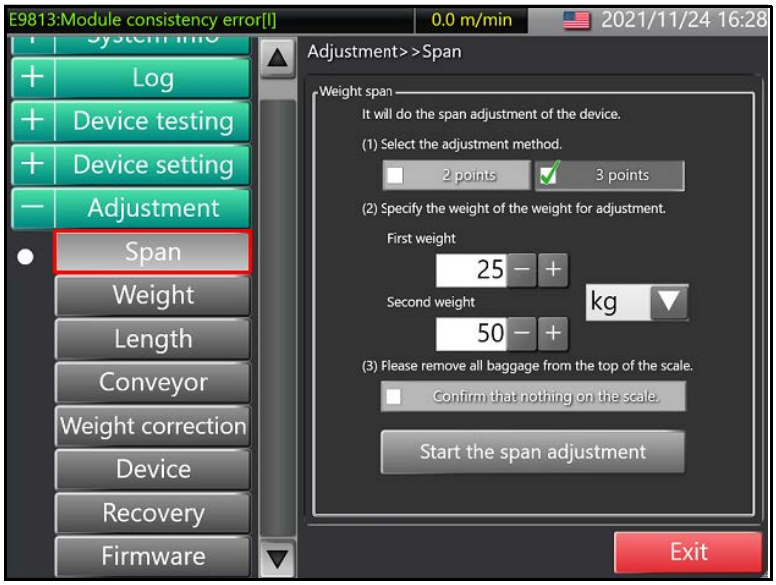


Figure 153
Adjustment selections - Span

The **Span** screen displays settings for weight adjustment. The following options are available:

Select the adjustment method: Choose from 2-point adjustment (zero and span adjustment in one position) and 3-point adjustment (zero and span adjustment in two positions).

Specify the weight of the weight for span adjustment: When 2-point adjustment is selected, one weight must be set. When 3-point adjustment is selected, two weights must be set.

Choose the units by tapping the down arrow (▽). Use the **[+]** and **[-]** buttons to set the weight.

Please remove all baggage from the top of the scale: Ensure nothing is currently on the scale, then check the box next to **"Confirm that nothing on the scale"**. Tap **[Start the span adjustment]** to begin adjustment.

Weight

Figure 154
Adjustment selections - Weight

The Weight screen displays measurement settings for weight data. Depending on the measurement system selected in **Device setting -> Measurement** (see "Measuring" on page 110). The following are options:

Rounding: Tap the down arrow (▽) to select the method for rounding values. Available options are **invalid**, **truncate**, **rounding**, and **round up**. The default is *rounding*.

Unit: Tap the down arrow (▽) to select the units for measurement. Available options are **g**, **kg**, and **lb**.

Multi-range: Use the **[+]** and **[-]** buttons to set weight ranges for measurements. The weight ranges can be set for **Scale (light)**, **Boundary**, and **Scale (heavy)**.

	Default (metric)	Default (Imperial)
Scale (light)	50 g	0.1 lb
Division	5000 g	10.0 lb
Scale (heavy)	100 g	0.2 lb

Maximum/Minimum: Use the **[+]** and **[-]** buttons to set maximum and minimum ranges for weight measurement.

	Default (metric)	Default (Imperial)
Minimum measured value	0 g	0.0 lb
Maximum measured value	50,000 g	110.0 lb

Tracking range: Use the **[+]** and **[-]** buttons to set the tracking range for weight measurement.

	Setting range	Default
Metric	0.1 to 10,000 g	25.0 g
Imperial	0.1 to 100.00 lb	0.05 lb

Volume weight: Use the **[+]** and **[-]** buttons to set the volume weight factor for weight measurement.

	Setting range	Default
Metric	1 to 10,000 g	6,000 g
Imperial	1 to 1,000 lb	138 lb

Action: Boxes may be checked to enable the actions **automatic rezero**, "**scale C when tracking, B is zero**", and **do tracking**.

- **Automatic rezero:** If the target object is transported 20m and the gate sensor does not respond, it will automatically reset the scale to zero. The option is enabled by default.
- **Scales C tracking B zero:** When scale C is zero, scale B will automatically be set to zero. The option is enabled by default.
- **Enable tracking:** Set the scale to tracking. The option is enabled by default.

Weight moving average filter: Tap the down arrow (▽), to select the weight filter method used by the scales. Available options are **short span** (old method) and **long span** (new method). The default is *long span*.

Length

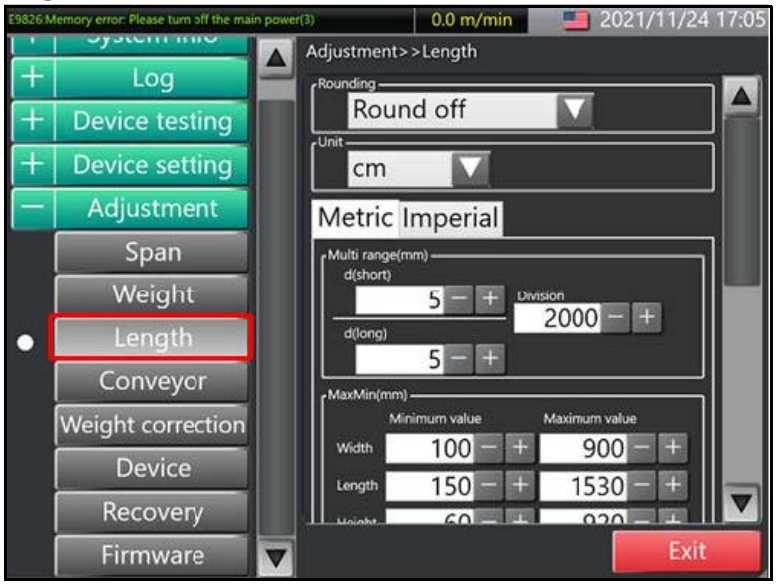


Figure 155
Adjustment selections - Length

The Length screen displays measurement settings for dimensioning data. Depending on the measurement system (metric or imperial) selected in **Device setting -> Measurement** (see "Measuring" on page 110). The following are options:

Rounding: Tap the down arrow (▽) to select the method for rounding values. Available options are **invalid**, **truncate**, **rounding**, and **round up**. The default is *rounding*.

Unit: Tap the down arrow (▽) to select the units for measurement. Available options are **mm, cm, m,** and **in**. The default is *mm* for metric and *in* for imperial.

Multi-range: Use the **[+]** and **[-]** buttons to set dimensioning ranges for measurements. The dimensioning ranges can be set for **Scale (short)**, **Division**, and **Scale (long)**.

	Default (metric)	Default (Imperial)
Scale (short)	5 mm	0.2 in
Division	2000 mm	70.0 in
Scale (long)	5 mm	0.2 in

Maximum/Minimum: Use the **[+]** and **[-]** buttons to set maximum and minimum ranges for dimensioning measurement.

	Default (metric)	Default (Imperial)
Minimum measured value (width)	100 mm	4.0 in
Maximum measured value (width)	900 mm	35.4 in
Minimum measured value (length)	150 mm	6.0 in
Maximum measured value (length)	1530 mm	60.0 in
Minimum measured value (height)	60 mm	2.4 in
Maximum measured value (height)	920 mm	36 in

Offset of the box size: Use the **[+]** and **[-]** buttons to set the desired universal offset for box size.

	Setting range	Default
width (metric)	-100.0 to 100.0 mm	0.0 mm
width (imperial)	-10.00 to 10.00 in	0.00 in
length (metric)	-100.0 to 100.0 mm	0.0 mm
length (imperial)	-10.00 to 10.00 in	0.00 in
height (metric)	-100.0 to 100.0 mm	0.0 mm
height (imperial)	-10.00 to 10.00 in	0.00 in

Conditional offset of box size: Offsets to box size may be set for specified conditions: **speed** and **length**.

Condition 1 creates a desired offset if the speed reaches or exceeds a set amount. Condition 2 creates a desired offset when target exceeds a set length. Check the box next to the condition you wish to enable.

	Setting range	Default
Condition 1 (metric)	0 to 160 m/min	100 m/min
Condition 1 (imperial)	0 to 450 ft/min	300 ft/min
Condition 2 (metric)	0 to 2000 mm	2000 mm
Condition 2 (imperial)	0 to 80.00 in	0.00 in

Use the **[+]** and **[-]** buttons to set the desired conditional offset for box size.

	Setting range	Default
width (metric)	-100.0 to 100.0 mm	0.0 mm
width (imperial)	-10.00 to 10.00 in	0.00 in
length (metric)	-100.0 to 100.0 mm	0.0 mm
length (imperial)	-10.00 to 10.00 in	0.00 in
height (metric)	-100.0 to 100.0 mm	0.0 mm
height (imperial)	-10.00 to 10.00 in	0.00 in

Conveyor

Figure 156
Adjustment selections - Conveyor

The Conveyor screen displays settings for adjusting conveyor controls. Adjustments can be made to the conveyor **motor speed ratio** and **encoder.**

Motor speed ratio adjustment: Use the **[+]** and **[-]** buttons to set the ratio of the speed output to the conveyor motor.

	Setting range	Default
Conveyor A	-100 to 100%	0.0%
Conveyor B	-100 to 100%	0.0%

Encoder adjustment: Use the **[+]** and **[-]** buttons to set the conveyor coefficient setting to be used to calculate the conveyor speed.

	Setting range	Default
Conveyor A	1 to 9999	1628
Conveyor B	1 to 9999	1628

Weight correction

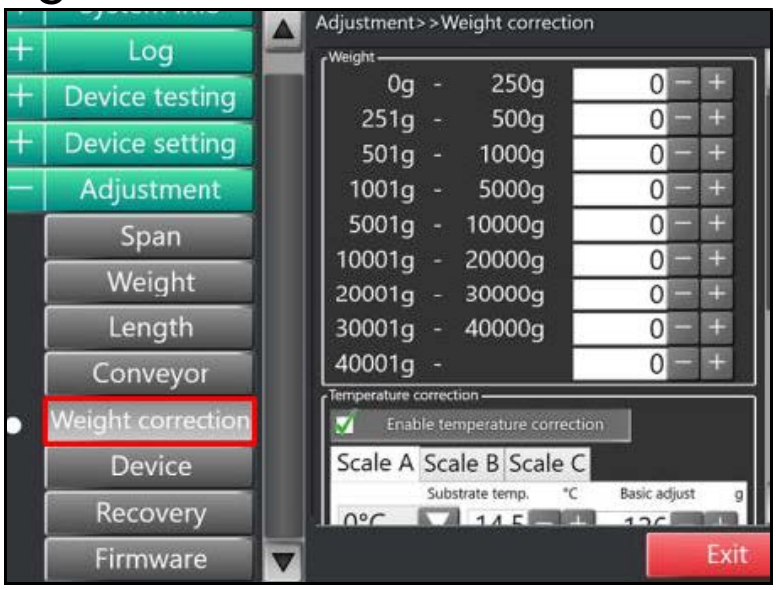


Figure 157
Adjustment selections - Weight correction

The **Weight** screen provides options for the adjustment of weight measurements for specific weight ranges and conditions.

Weight: Use the **[+]** and **[-]** buttons next to each weight range to set weight correction for that weight range.

Temperature correction: Check the box next to **"Enable temperature correction"** to allow weight correction for different target weights.

Select the scale to adjust, then tap the down arrow (∇) to select a temperature. Available temperature options include: **0°C**, **5°C**, **10°C**, **20°C**, and **40°C**.

- **Substrate temp:** Use the **[+]** and **[-]** buttons to set the thermistor detection temperature of the A/D control board at each temperature. The set temperature will determine the temperature compensation table to be used.
- **Basic adjust:** Use the **[+]** and **[-]** buttons to set the base correction value for each temperature.

- **Target weight:** Use the **[+]** and **[-]** buttons to select weight to be adjusted.
- **Adjust weight:** Use the **[+]** and **[-]** buttons to set weight adjustment for each target weight.

Device

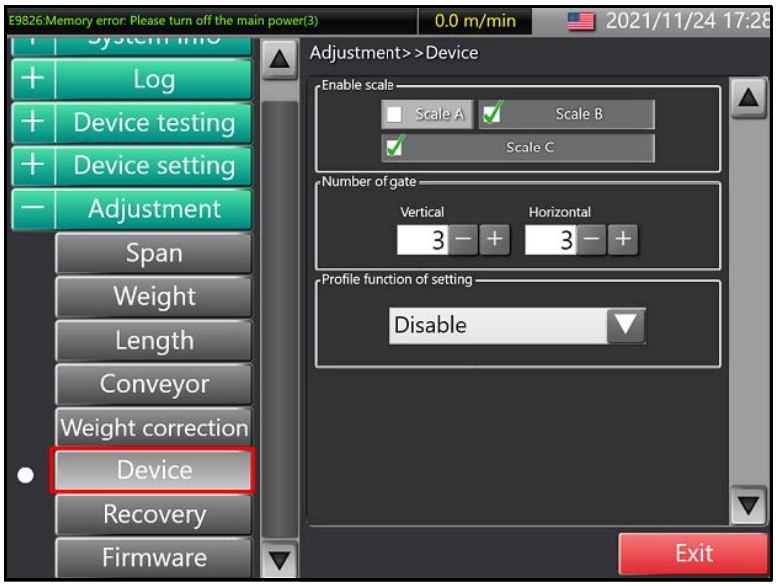


Figure 158
Adjustment selections - Device

The **Device** screen displays settings to adjust the number of gate sensor boards for each scale.

Enable scale: Check the box next to **Enable scale** to select the scales you wish to adjust. By default, scales B and C are enabled.

Number of gates: Use the **[+]** and **[-]** buttons to set the number of vertical and horizontal gates. By default, each are set to 3 gates.

Recovery

Figure 159
Adjustment selections - Device

The **Recovery** screen displays the Maintenance setting history. This screen can be used to recover previous settings and import/export settings. The following options are available:

Recovery: Select from the Maintenance setting history the settings you wish to recover. Tap **[Recovery]** to set that as the new settings.

Import: Tap **[Import]** to upload setting from another system.

Export: Tap **[Export]** to send the selected setting values to a prepared USB memory drive.

Firmware

Figure 160
Adjustment selections - Firmware

The **Firmware** screen displays the current firmware installed on the 200 SQ and provides options for importing and deleting firmware files.

Import: Tap **[Import]** to generate a text file for the installation and displays it in the list.

Delete: Select the text file displayed in the list you wish to delete, then tap **[Delete]**.

Update: Select the desired text file displayed in the list, then tap **[Update]** to update the firmware.

CHAPTER 4
DISASSEMBLING

Display

Removing display from main unit

Complete the following steps to remove the display from the CS 200 SQ:

1. To disconnect the input connectors from the conveyor to the display, unplug **connectors A**, **B**, and **C** from the display as shown in the figure.

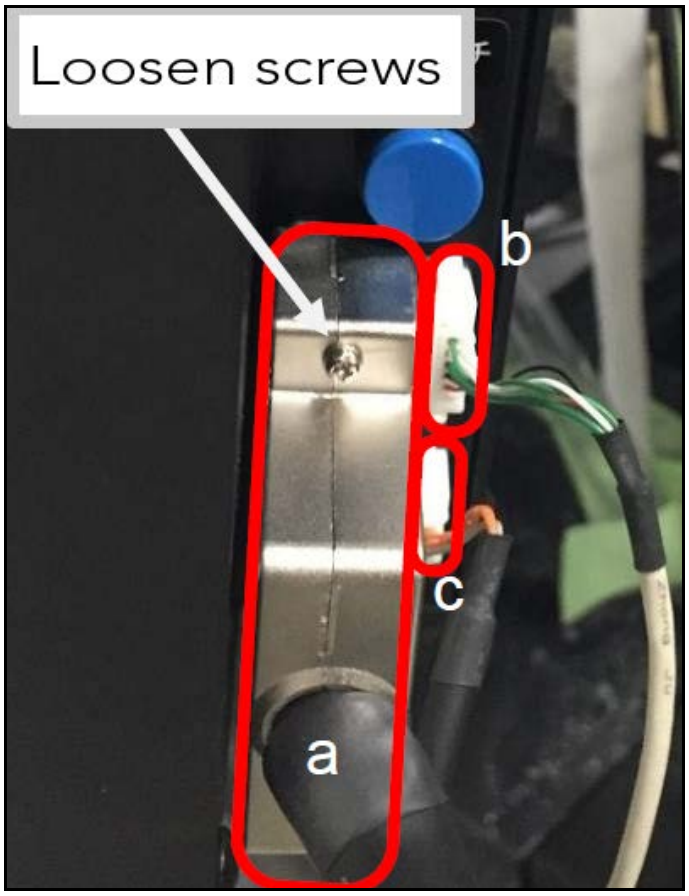


Figure 161
Removing display - Connector screws

2. **Connector A** is secured at two points on either side of the connector head by screws. Use a precision screwdriver to remove the screws and disconnect the cable.

3. Remove the **9 screws** on the back of the display. Once these screws are removed, the display can be removed from the main unit.

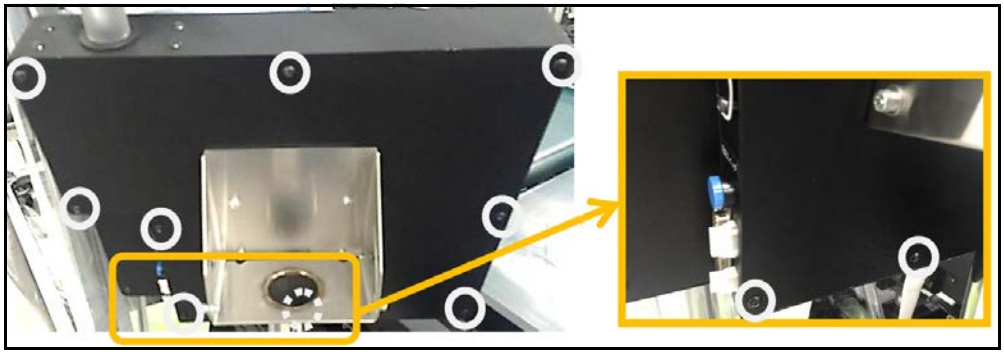


Figure 162
Removing display - Back of display

4. With the display removed from the main unit, the internal components of the display may be accessed, including: **the indicator board**, t**ouchscreen relay board**, and **mother board**.

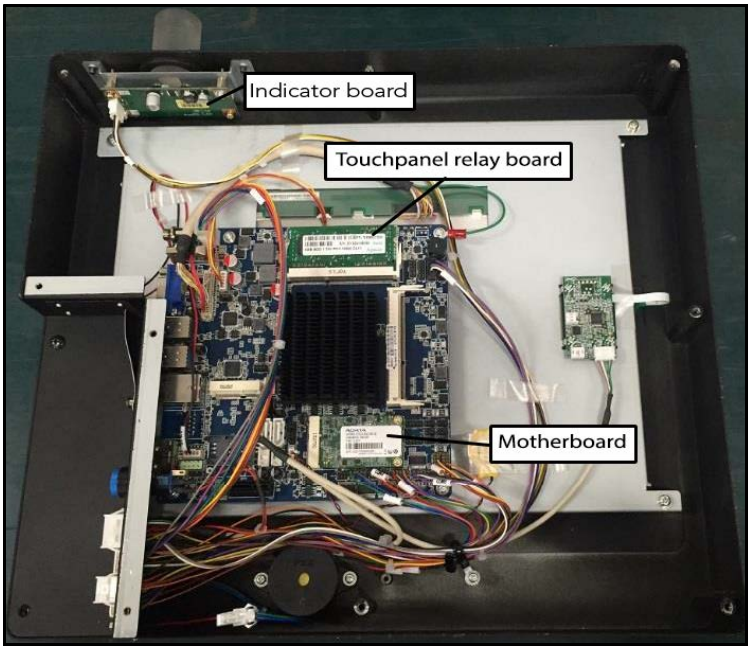


Figure 163
Removing display - Display internals

Relay board

1. Remove the display from the main unit (see "Removing display from main unit" on page 128).

2. Peel off the filament tape connected to the touchscreen relay board. Do not throw away the tape as it will be reused with the new board.

3. Remove the **4 screws** securing the relay board to the display, then turn it over.

4. Unplug the flat cable from the relay board.

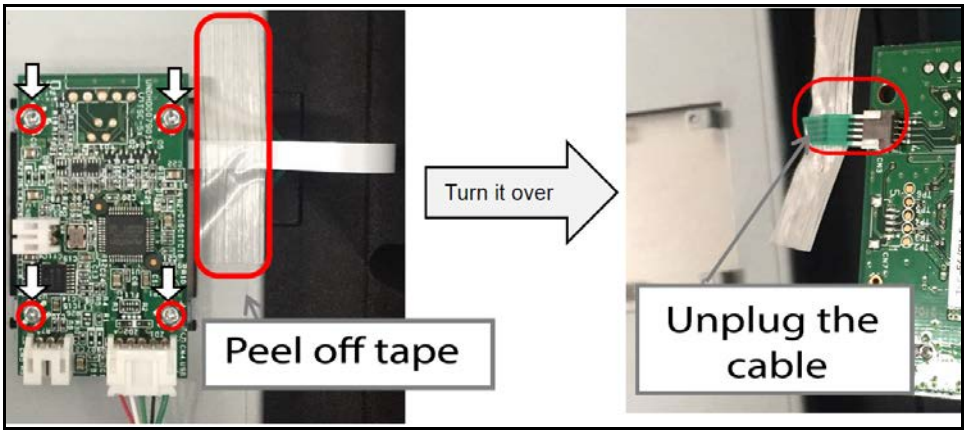


Figure 164
Removing display - Relay board

Removing the touchscreen

Before removing the touchscreen, **SHEET AA(DISP_15LCD)** must be removed and cannot be reused. When replacing the touchscreen, be sure to order **SHEET AA(DISP_15LCD)** along with the touchscreen (**part number: 41025908000100**).

1. Disconnect the touchscreen relay board (see "Relay board" on page 130).

2. Peel off the surface sheet with the TERAOKA logo. This sheet will need to be replaced.

3. Remove the touch panel.

Figure 165
Removing display - Touchscreen removal

Removing indicator board

1. Remove the display from the main unit (see “Removing display from main unit” on page 128).

2. Disconnect the cable from the board.

3. Remove the **4 screws** securing the board to the display, then remove board.

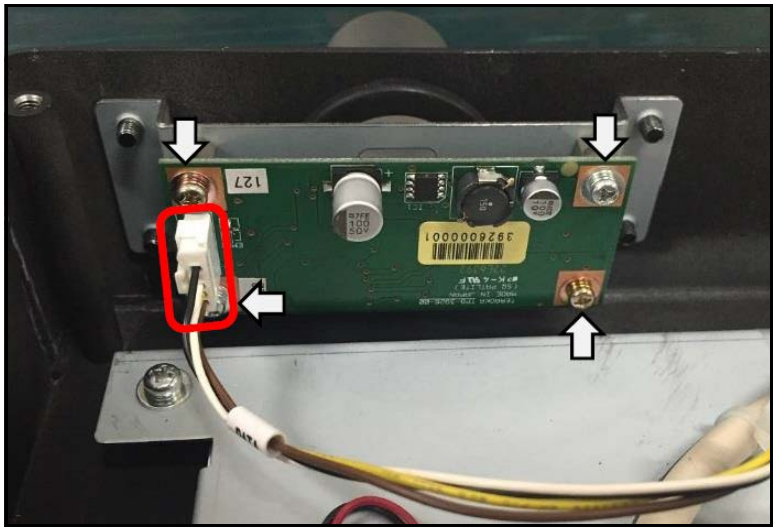


Figure 166
Removing display - Indicator board

Mother board

1. Remove the display from the main unit (see "Removing display from main unit" on page 128).

2. Remove the **2 screws** shown in the figure, then turn the sheet metal over as illustrated in the figure:

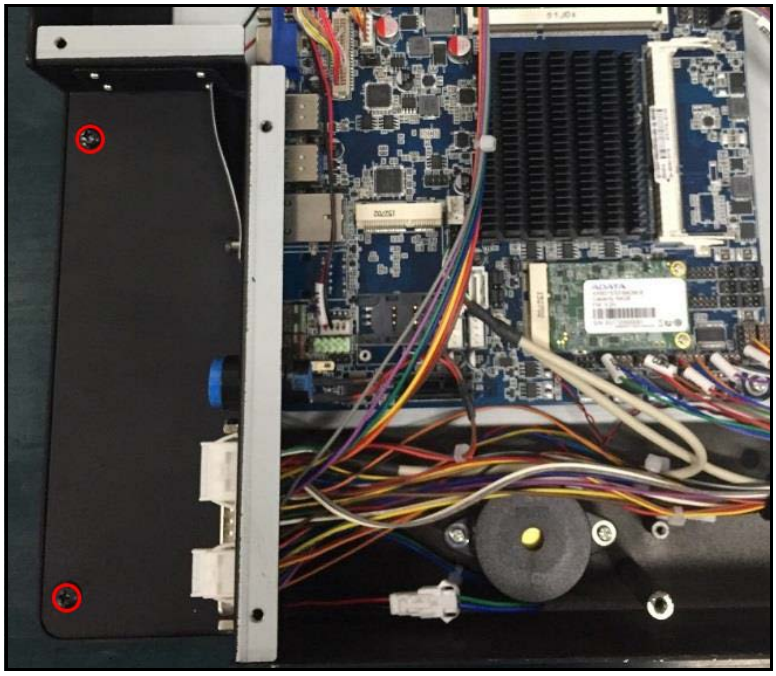


Figure 167
Removing display - Mother board

3. Carefully disconnect the **12 connectors** illustrated in the following figure:

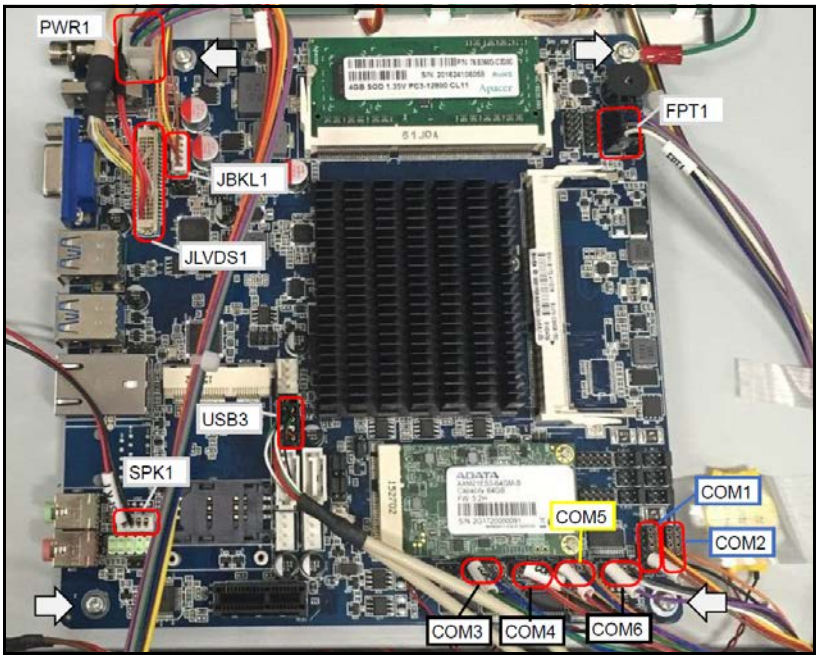


Figure 168
Removing display - Motherboard connectors

4. Remove the **4 screws** at the four corners to remove the mother board from the display.

5. Remove the floating memory by spreading the pin in the direction shown in the figure.

Figure 169
Removing display - Removing memory

6. To remove the **SSD**, first remove the 2 screws securing it to the mother board. Once free, the SSD may be removed.

Figure 170
Removing display - Removing SSD

7. Install the SSD and memory in the new mother board.

Replacing LCD

1. Remove the display from the main unit (see “Removing display from main unit” on page 128).

2. Remove the touchscreen relay board (see “Relay board” on page 130).

3. Remove the 2 screws shown in the figure, then turn the sheet metal over as illustrated in the figure.

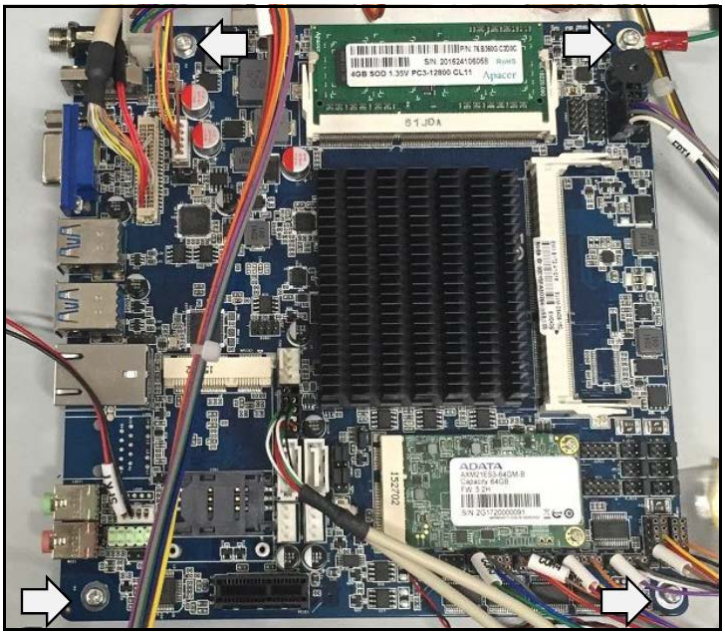


Figure 171
Removing display - Mother board removal

4. Remove the **4 screws** at the four corners to remove the mother board from the display.

NOTE *The cables and wires do not need to be removed from the mother board. Once the 4 screws are removed, it can be set aside so that the LCD may be accessed.*

5. Peel off the **2 pieces of filament tape** securing the cables indicated in the figure. Do not throw the tape away as it will be reused.

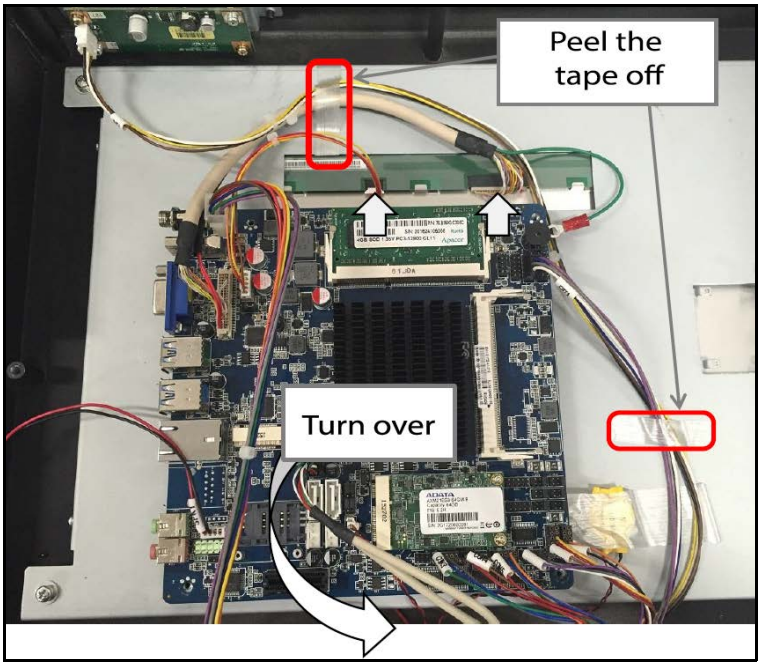


Figure 172
Removing display - Removing motherboard from LCD

6. Disconnect the indicated cables from the back of the LCD and turn the mother board toward you. This will prevent cables form becoming entangled.

7. Remove the **4 screws** at each corner of the LCD, then remove the LCD and the sheet metal frame containing it from the display.

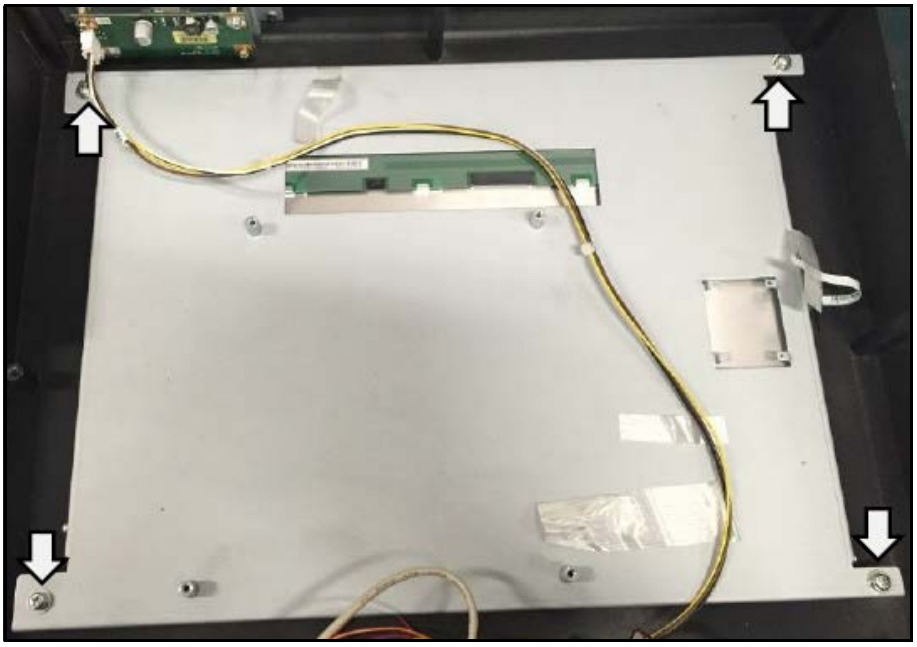


Figure 173
Removing display - Removing LCD and frame

8. Remove the **4 screws** that secure the LCD in the sheet metal frame.

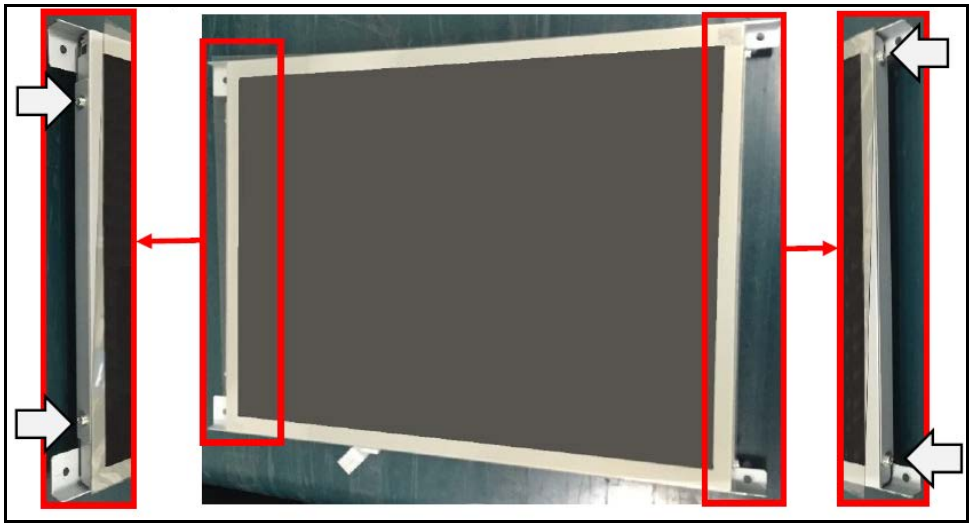


Figure 174
Removing display - Separating LCD from frame

9. The LCD is now free from the display and can be replaced.

Figure 175
Removing display - LCD removed from sheet metal

Control box

Preparation before replacement

1. Pinch the knob on the power switch cover on the back of the main unit and pull it to open the cover. When you release the knob on the power switch cover the door will close automatically.

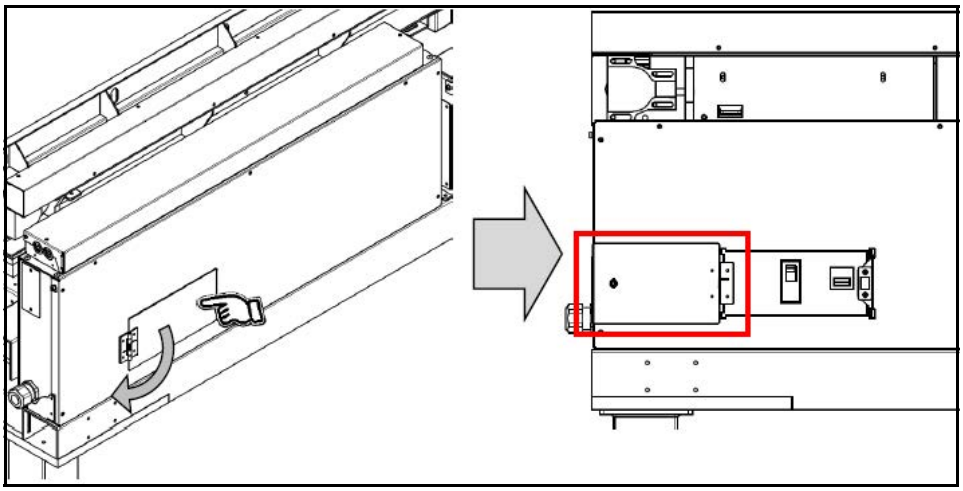


Figure 176
Control box - Main breaker

2. Toggle the main breaker to **OFF** to completely turn off the CS 200 SQ.

Figure 177
Control box - Main breaker

NOTE

To stop everything but the transport of the conveyor, cut the power supply of each board and continue the conveyor movement. Weighing will not take place while the boards are powered off.

3. Remove the **7 screws** on the side panel.

4. Remove cover by gently lifting and pulling toward you.

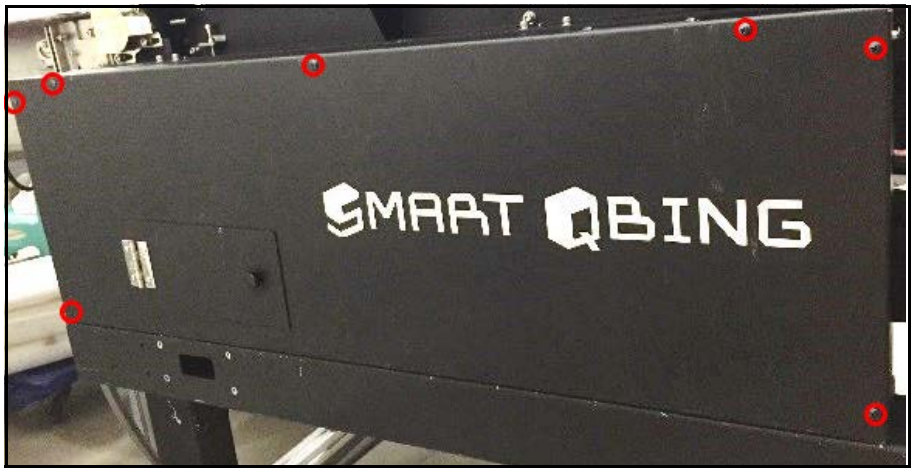


Figure 178
Control box - Removing side panel

Figure 179
Control box - Removing side panel

5. To turn off the power to the main board, press the **SW1 button**. To turn off the power of the transfer board, press the **SW2 button**. When the

switch is toggled off, the red LED directly above the switch will turn off, indicating the power is off.

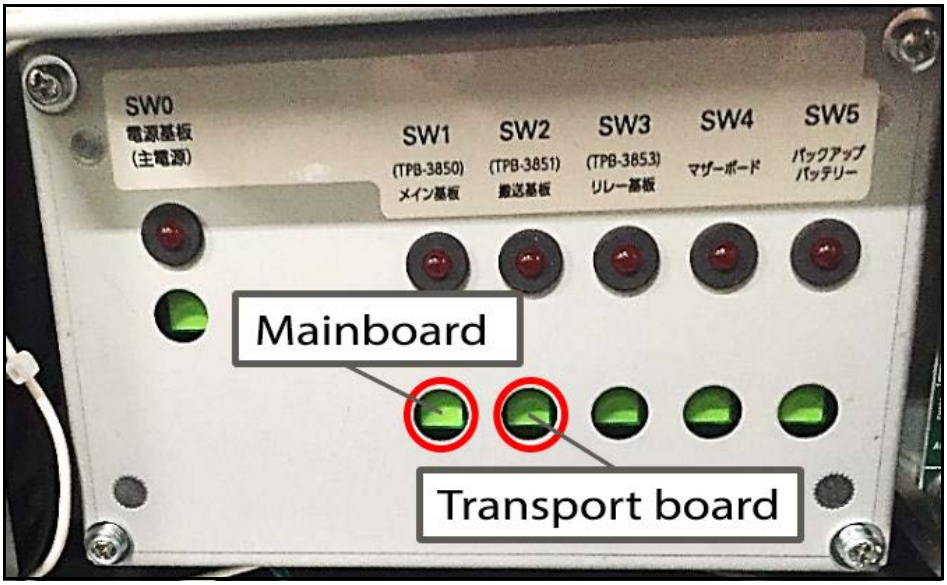


Figure 180
Control box - Board switches

Mother board

The control box contains the mother board and transport board. Before servicing the mother board, ensure the power is turned off to the control box (see "Preparation before replacement" on page 139). Perform the following steps to access and service the mother board:

1. Locate the control box under the gate on the back of the conveyor.

2. Remove the **7 screws** on the cover of the control box.

Figure 181
Control box - Removing control box cover

3. Gently lift and pull the cover to remove.

4. The main board is on the left side. When the LED is lit, the main board is energized.

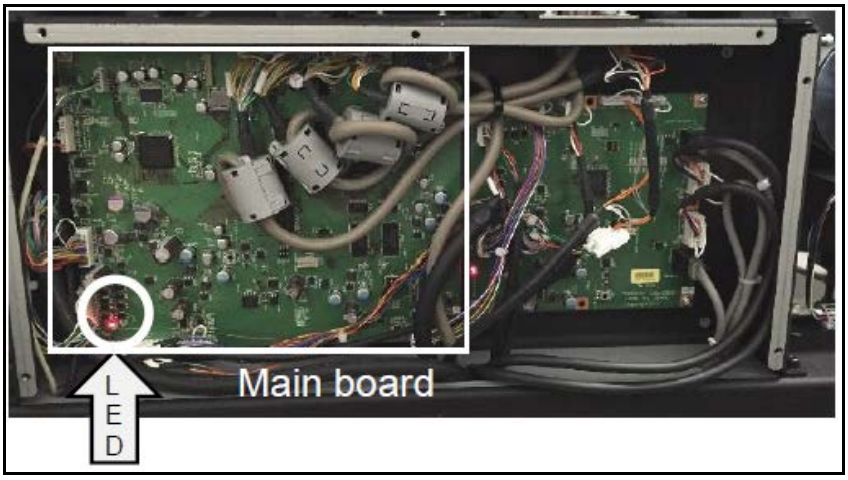


Figure 182
Control box - Motherboard

5. Remove the **11 connectors** indicated in the figure.

NOTE *When replacing the board, be sure to remove the MicroSD card attached to the original board and attach it to the main board after replacement.*

6. Remove the main board after removing the **4 screws** at the four corners.

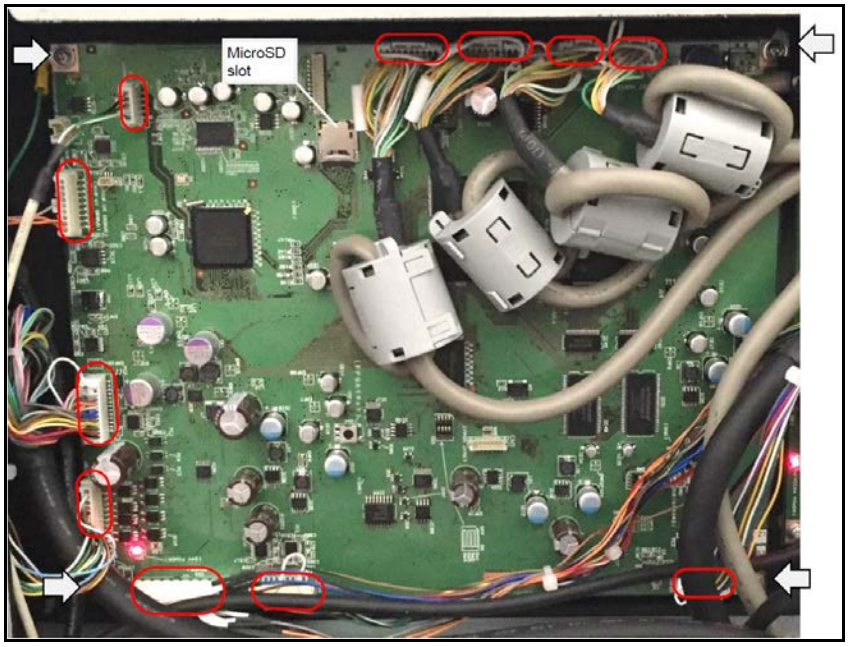


Figure 183
Control box - Removing motherboard

Transport board

Before servicing the transport board, ensure the power is turned off to the control box (see "Preparation before replacement" on page 139). Perform the following steps to access and service the transport board:

1. There is a control box under the gate on the back.

2. Remove the **7 screws** securing the cover.

Figure 184
Control box - Removing control box cover

3. Gently lift and pull cover to remove.

4. The transport board is on the right side of the control box. When the LED is lit, the main board is energized.

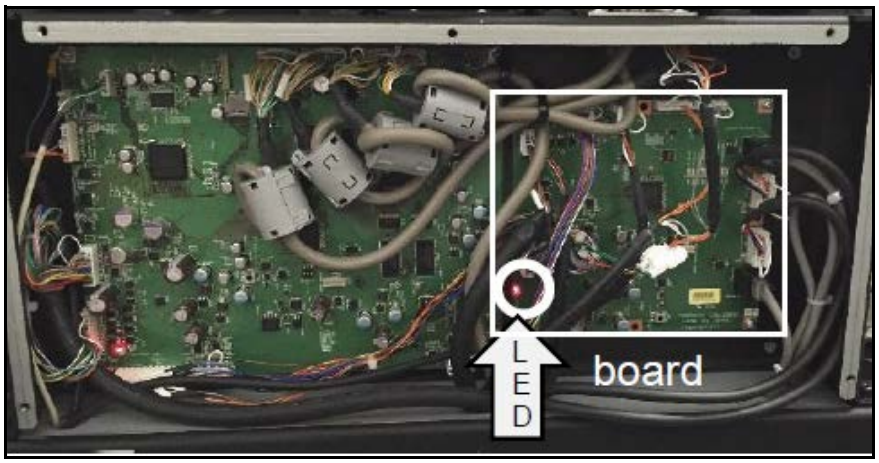


Figure 185
Control box - Transport board

5. Remove the connectors indicated by the figure.

6. Remove the transport board after removing the **4 screws** at the corners of the board.

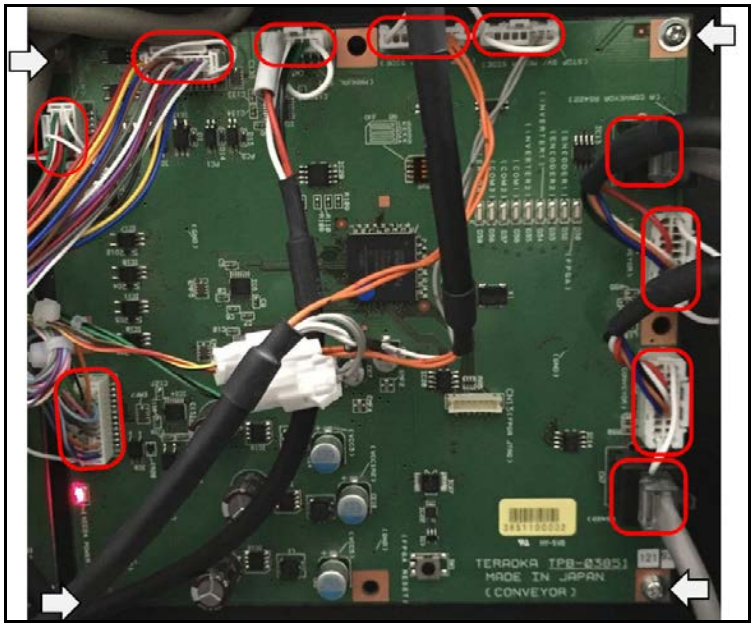


Figure 186
Control box - Removing transport board

A/D Box

Preparation before replacement

1. Pinch the knob on the power switch cover on the back of the main unit and pull it to open the cover. When you release the knob on the power switch cover the door will close automatically.

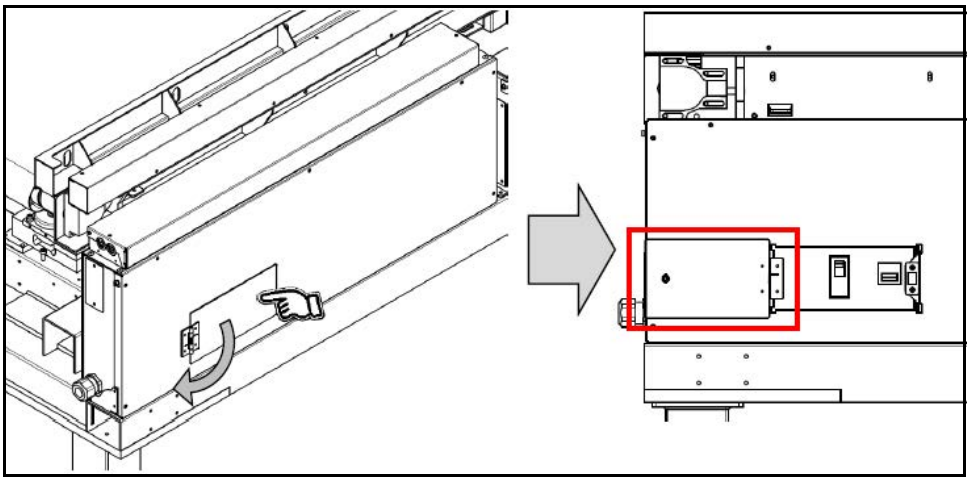


Figure 187
A/D BOX - Main breaker cover

2. Toggle the main breaker to **OFF** to completely turn off the CS 200 SQ.

Figure 188
A/D BOX - Main breaker

NOTE *To stop everything but the transport of the conveyor, cut the power supply of each board and continue the conveyor movement. Weighing will not take place while the boards are powered off.*

3. Remove the **7 screws** on the side panel.

4. Remove cover by gently lifting an pulling toward you.

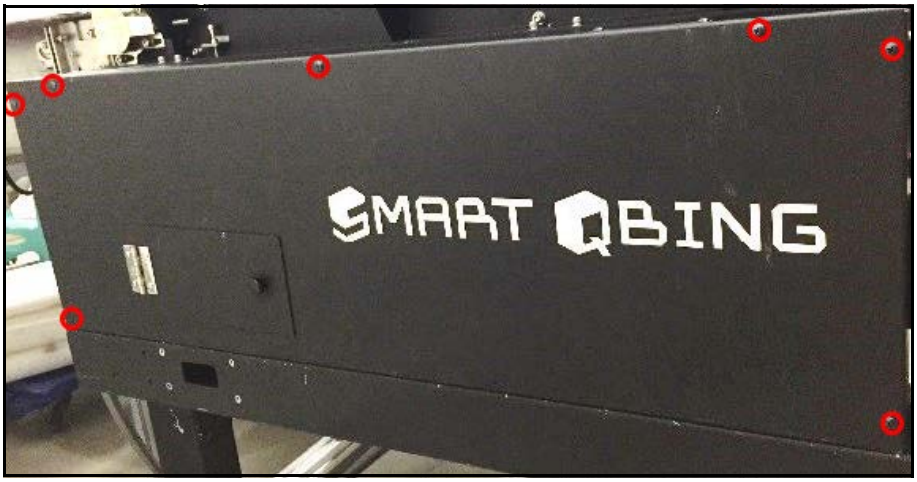


Figure 189
A/D BOX - Removing side panel

5. To turn off the power to the **A/D board**, press the **SW1 button**. When the switch is toggled off, the red LED directly above the switch will turn off, indicating the power is off.

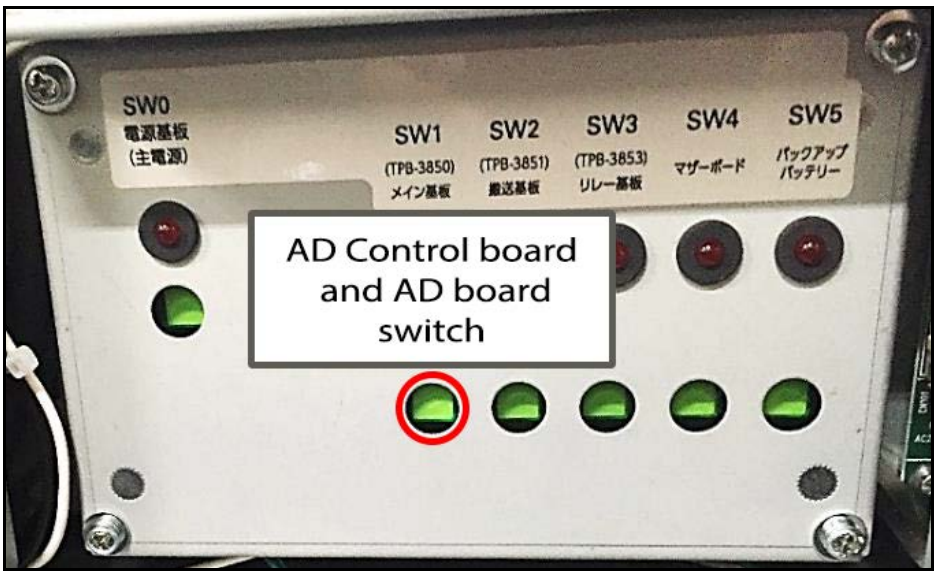


Figure 190
A/D BOX - Board switches

Accessing A/D BOX

The **A/D BOX** contains an **A/D board** and an **A/D control board**. Before servicing the A/D BOX, ensure the power is turned off (see "Preparation before replacement" on page 146). Perform the following steps to access and service the components of the A/D Box:

1. Open the power box cover housing the A/D BOX.

2. Remove the **4 screws** securing the sheet metal covering on the right side of the A/D BOX and slide the sheet metal out.

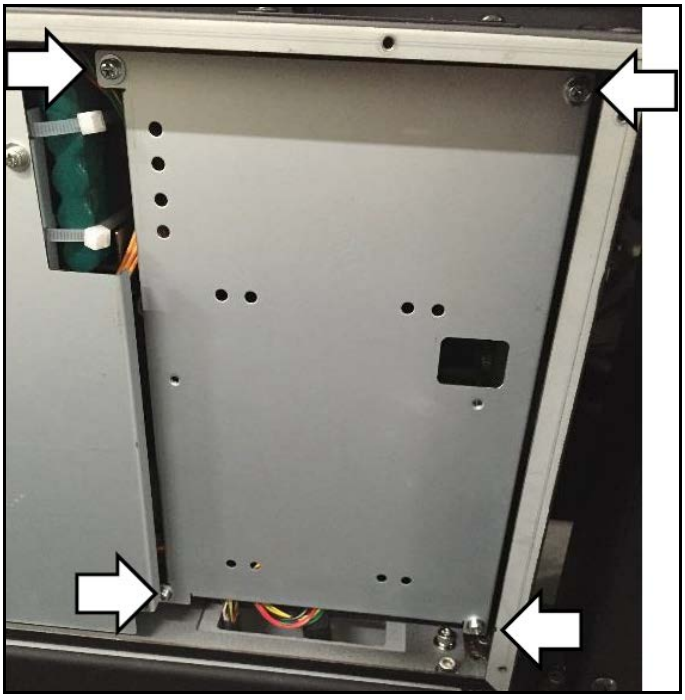


Figure 191
A/D BOX - Right side cover

3. Remove the **2 hexagonal cap screws** at the bottom right of the A/D BOX as indicated in the figure.

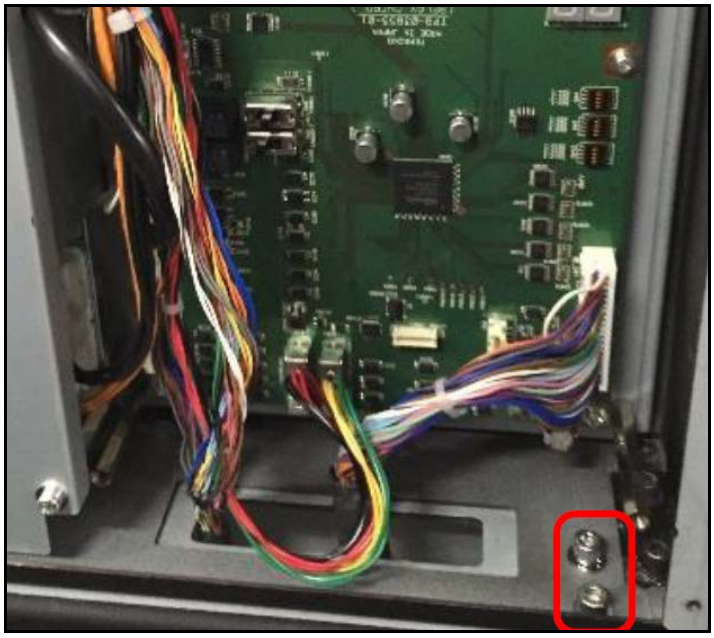


Figure 192
A/D BOX - Right side hexagonal screws

4. Remove the **4 screws** securing the sheet metal on the left side of the A/D Box and slide out the sheet metal.

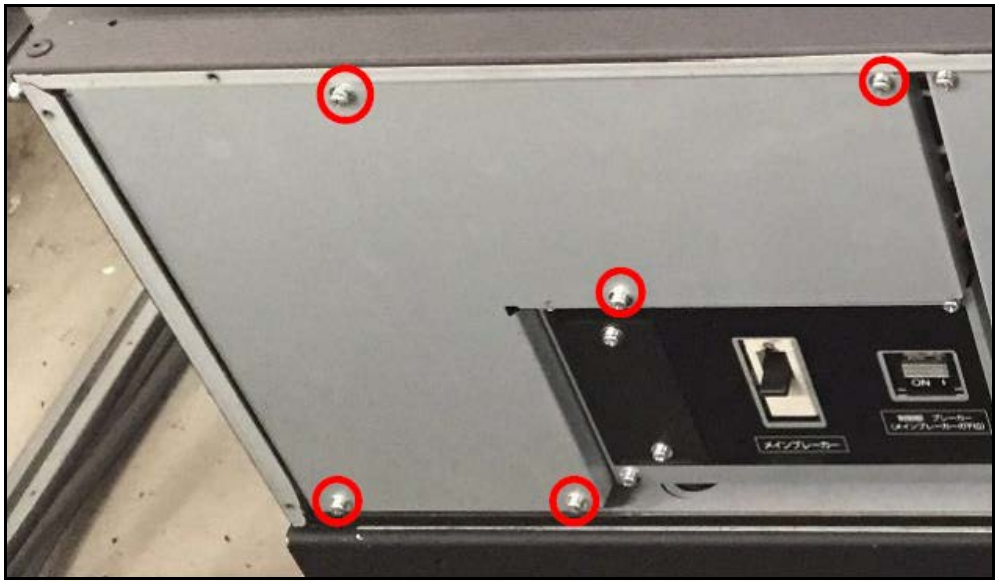


Figure 193
A/D BOX - Left side cover

5. Remove the **2 hexagonal cap screws** at the bottom left as indicated in the figure.

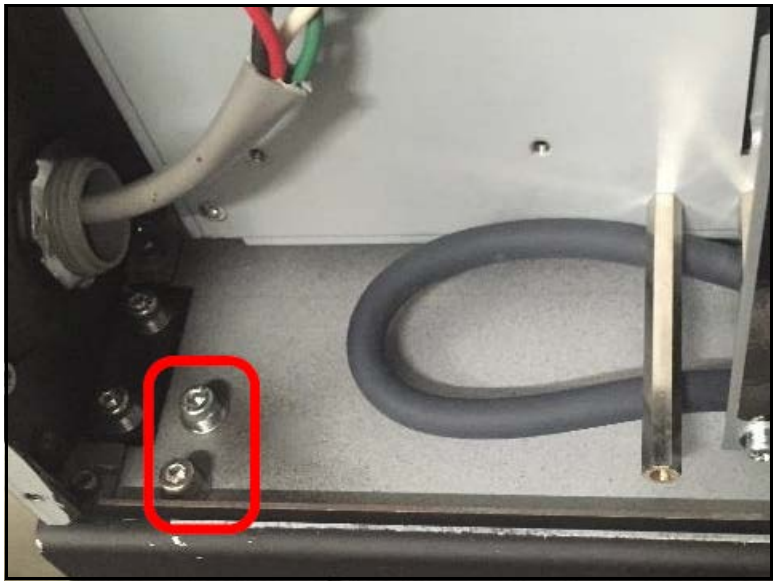


Figure 194
A/D BOX- Left side hexagonal screws

6. Lift the power supply box up slightly and tilt the A/D BOX toward you.

Figure 195
A/D BOX - Removing A/D BOX

7. Remove the **2 UL clamps** on the right side of the A/D BOX as indicated in the figure. This will free the wires on the back of the A/D BOX.

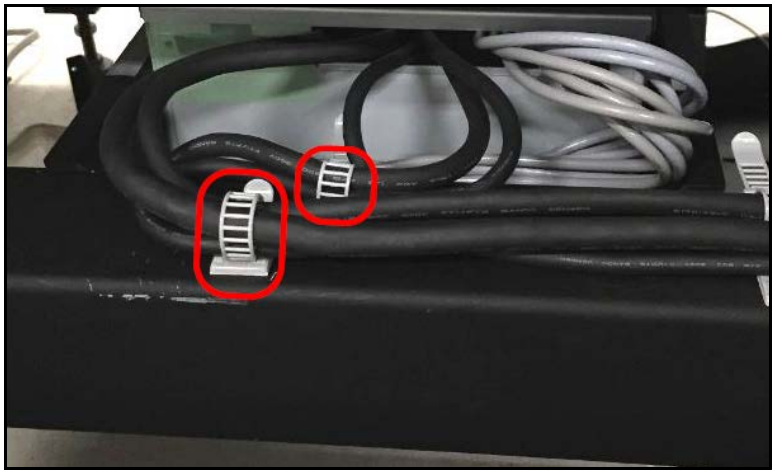


Figure 196
A/D BOX - UL clamps

8. Remove the **4 hexagonal cap screws** on the sides of the A/D BOX. This will allow the A/D BOX to move freely.

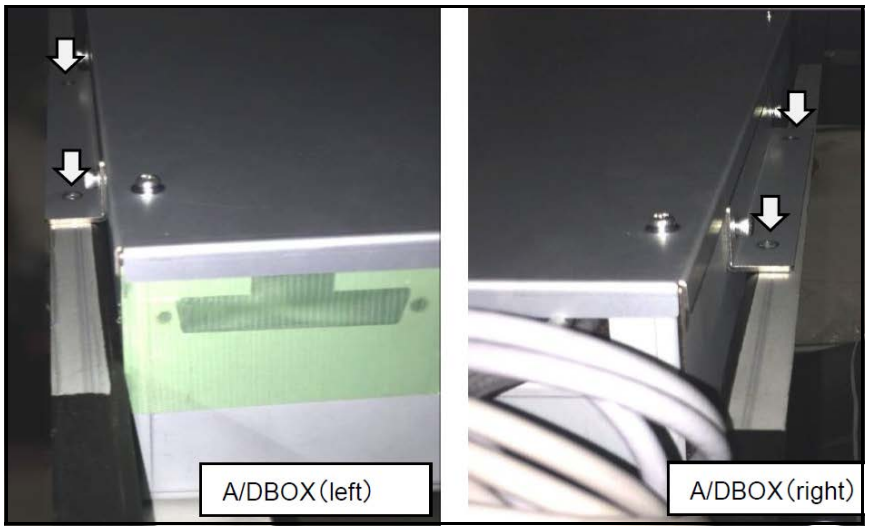


Figure 197
A/D BOX - Side screws

9. Carefully remove the A/D BOX, pulling it slowly toward you.

Figure 198
A/D BOX - Removing box

10. Remove the **4 screws** securing the upper cover of the A/D BOX, then slide the cover off.

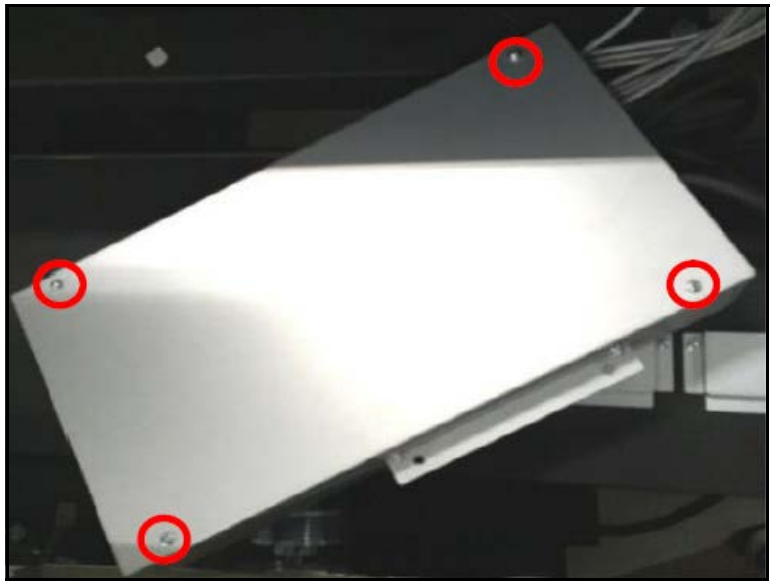


Figure 199
A/D BOX - Cover

11. Slide cover off to reveal AD board.

Figure 200
A/D BOX - A/D box cover removed

A/D board replacement

Before performing replacement work for the A/D board, ensure the power has been toggled off (see "Preparation before replacement" on page 146) and remove the A/D BOX for easy access (see "Accessing A/D BOX" on page 148). Complete the following steps to replace the A/D board:

1. The A/D board for scale B and C are secured with **2 screws** each.

2. Remove these screws along with the **4 screws** at the bottom of the board to detach the A/D board from the sheet metal frame.

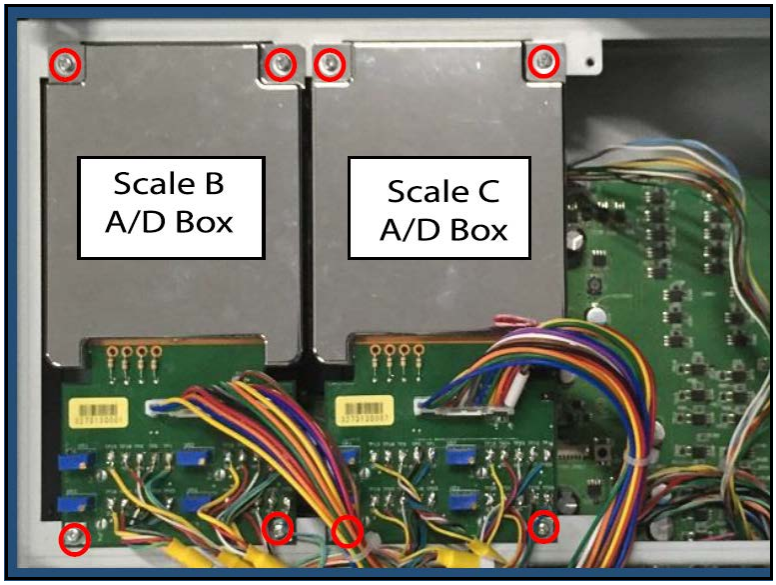


Figure 201
A/D BOX - A/D Board

3. Disconnect the cable indicated in the figure and remove the indicated load cell wires soldered to the board. The board can now be removed.

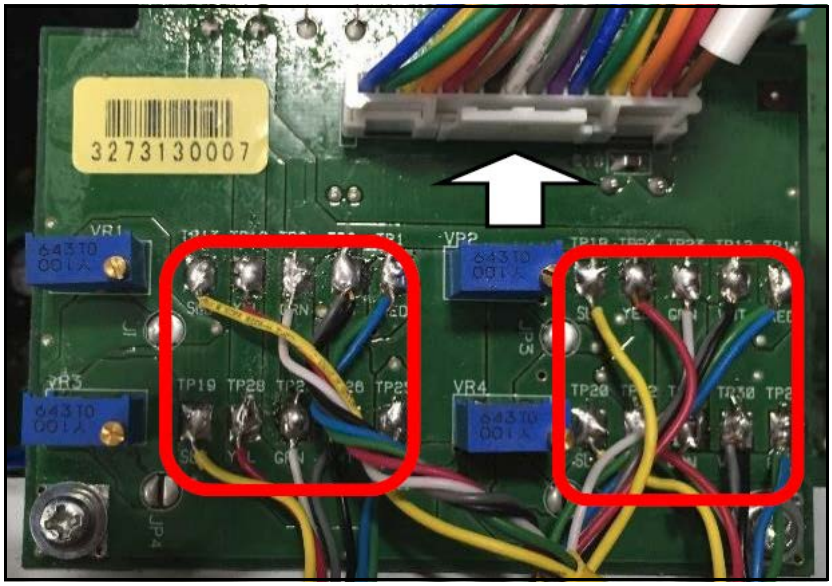


Figure 202
A/D BOX - Removing A/D board

A/D control board

Before performing replacement work for the A/D control board, ensure the power has been toggled off (see "Preparation before replacement" on page 146) and remove the A/D BOX for easy access (see "Accessing A/D BOX" on page 148). Complete the following steps to replace the A/D control board:

1. Remove the **2 screws** on either side of the A/D Box to free it from the sheet metal frame.

2. Turn the box over to expose the backside.

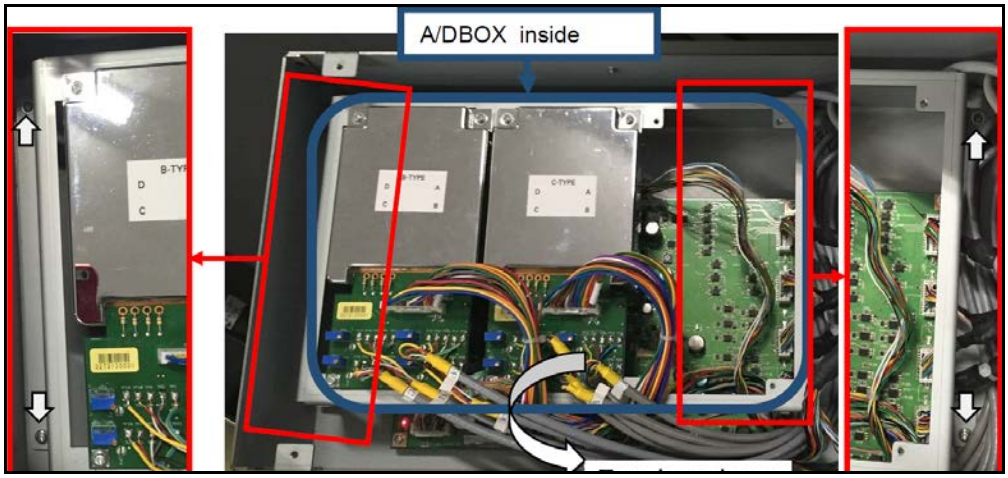


Figure 203
A/D BOX - Control board

3. Remove the **6 screws** securing the control board to the A/D BOX and disconnect the **8 connectors** as indicated in the figure.

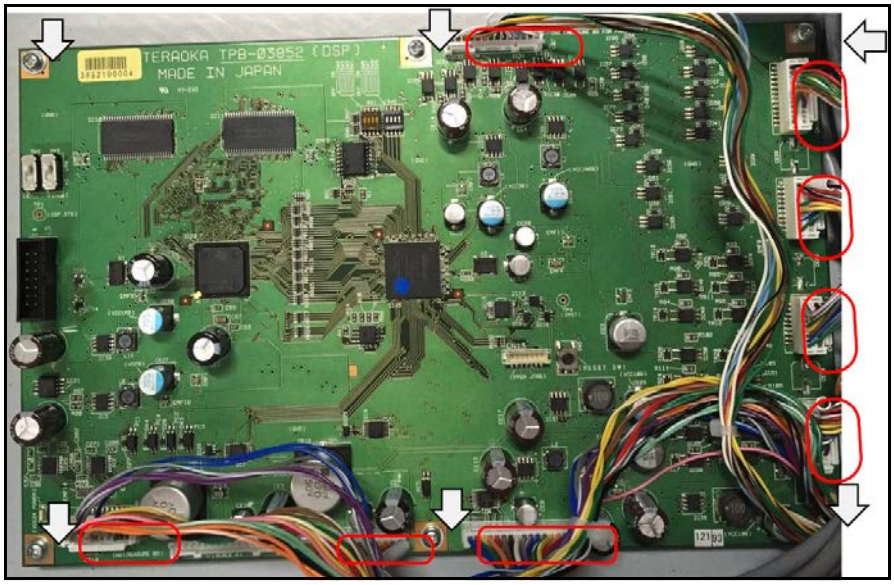


Figure 204
A/D BOX - Removing control board

4. The control box may now be replaced.

Gate sensor board

Bottom gate (receiver)

The receiving side of the gate consists of three sensor boards. These sensors receive light emitted by the upper gate. Together with the side gates, the sensor data obtained determines the dimensions of an object in 3-dimensional space. When servicing the sensor(s), only remove the board(s) being serviced.

1. Lift up the handle of the lower gate cover.

2. Pull the cover toward you and remove it.

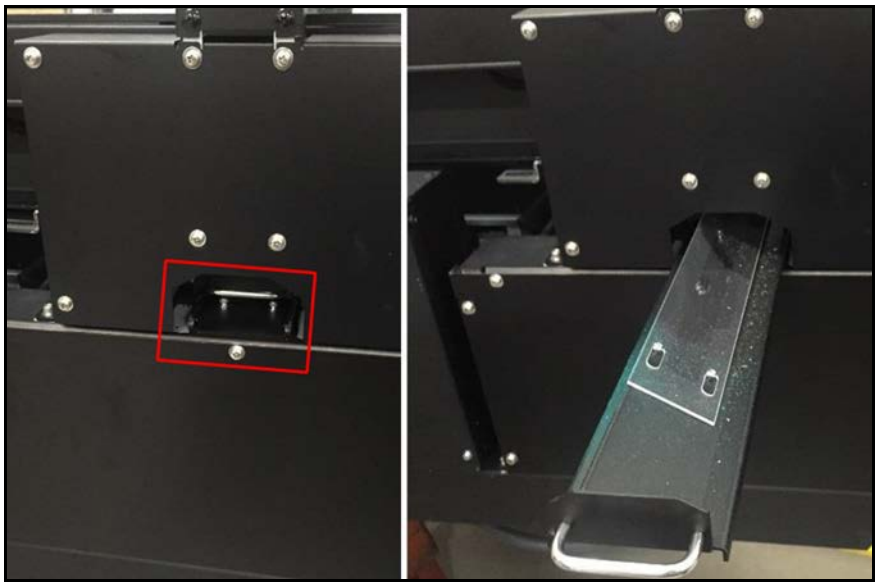


Figure 205
Gate sensor board - Accessing boards (bottom gate)

3. To remove the front and back covers, remove the **8 screws** securing each cover.

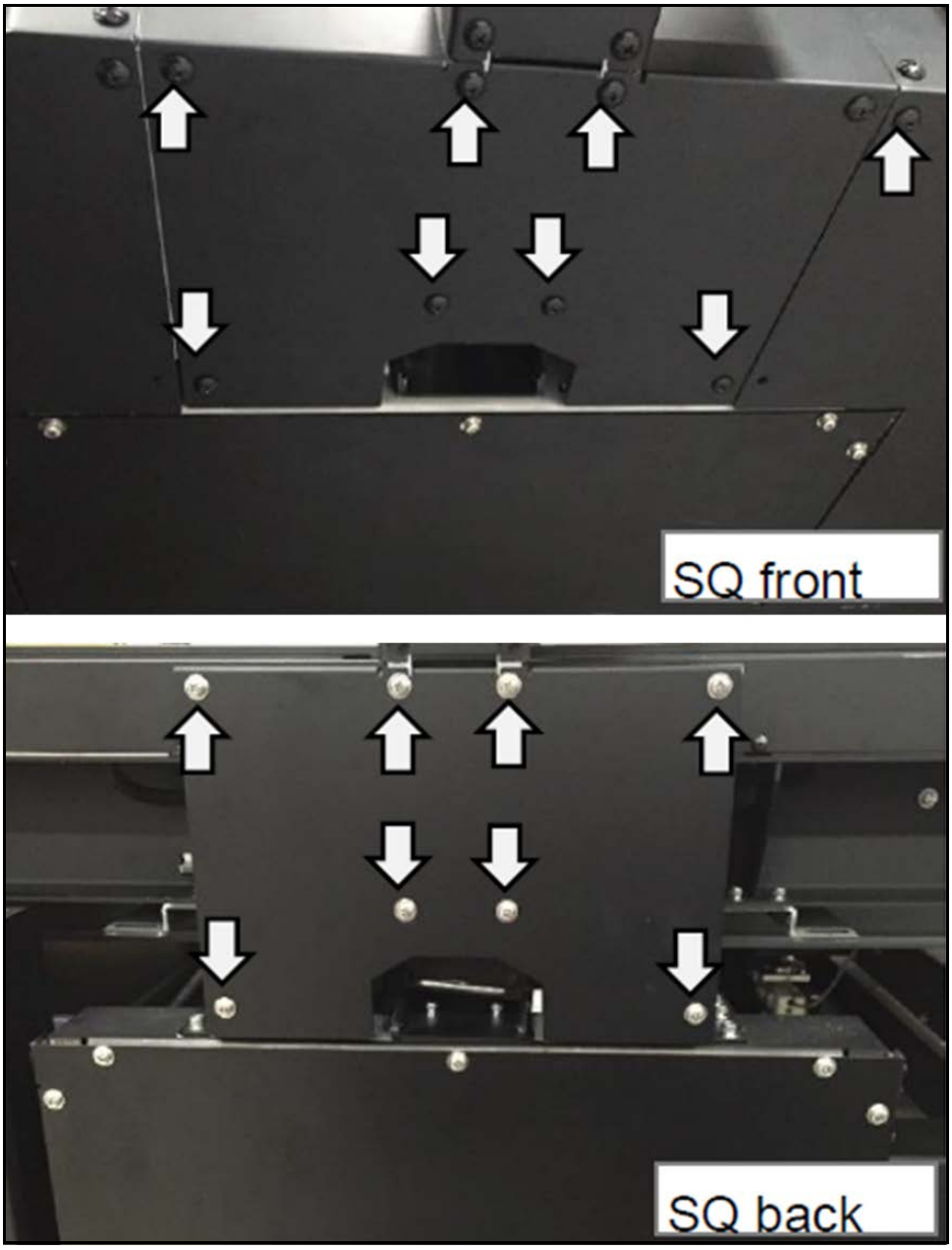


Figure 206
Gate sensor board - Removing covers (bottom gate)

4. Remove the **2 hexagonal cap screws** on the front and back side.

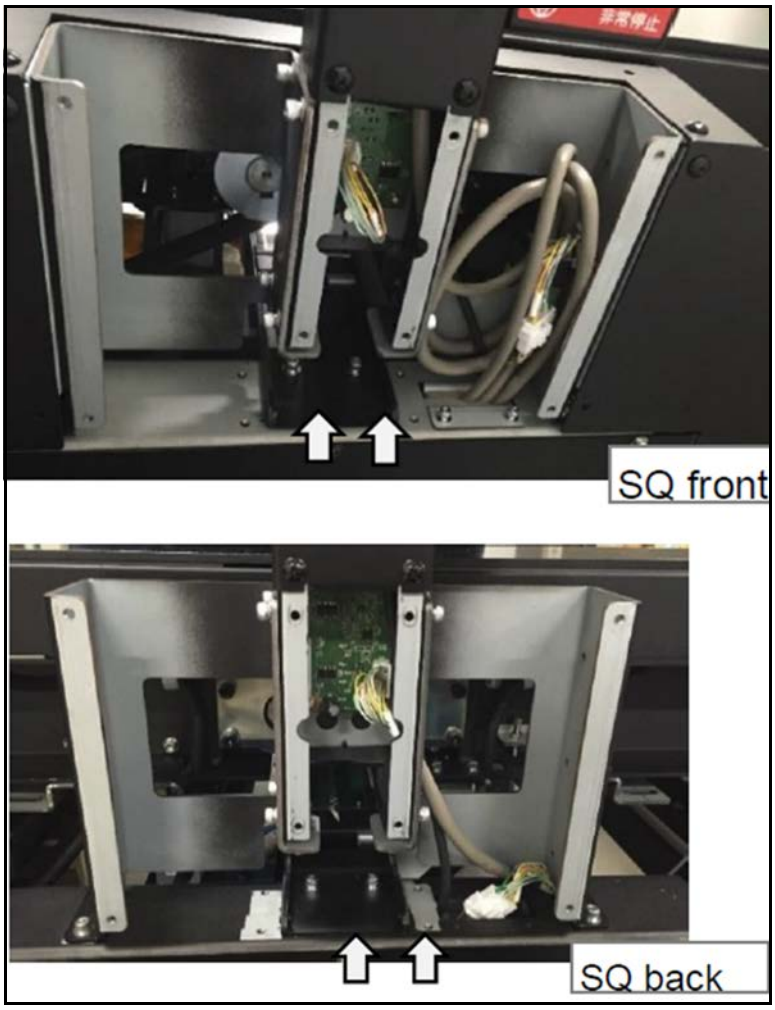


Figure 207
Gate sensor board - Cap screws (bottom gate)

5. Remove the connector on the front side as shown in the figure.

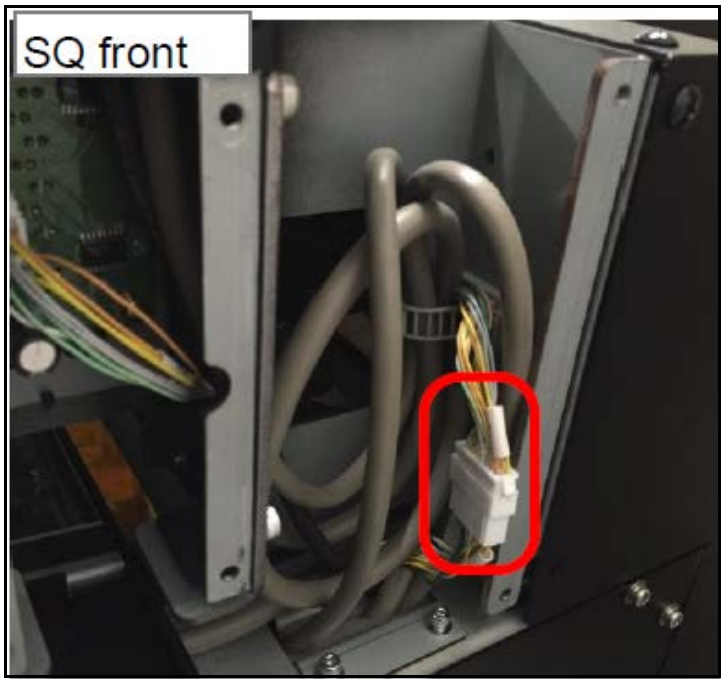


Figure 208
Gate sensor board - Gate connector (bottom gate)

6. Lift the gate sensor unit slightly and pull out to remove.

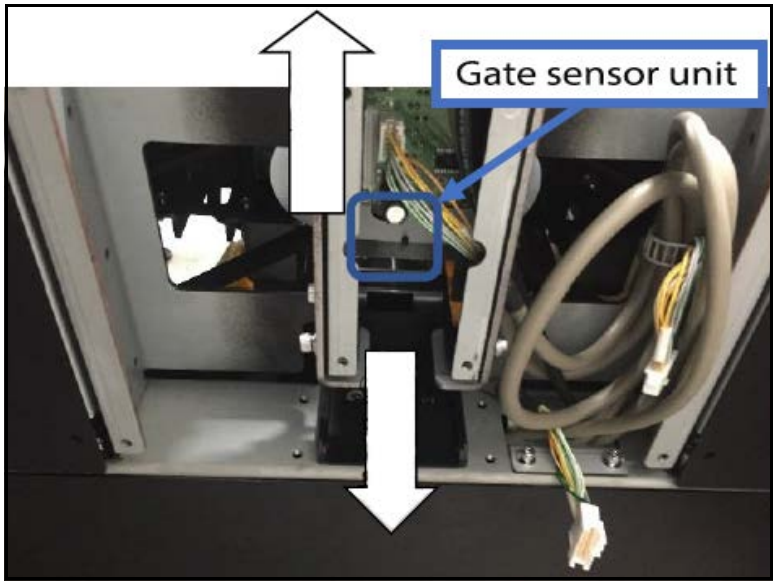


Figure 209
Gate sensor board - Removing gate (bottom gate)

7. Remove the acrylic covering from the gate sensor. Then, lift out the sensor.

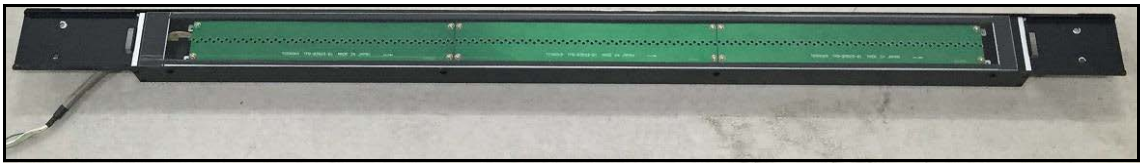


Figure 210
Gate sensor board - Removing gate (bottom gate)

NOTE *The gate sensor consists of three boards. Only remove the board(s) that require(s) servicing.*

8. To replace the gate sensor board, remove the **4 screws** securing the blinker to the board.

Figure 211
Gate sensor board - Gate blinker (bottom gate)

9. Remove the **4 hexagonal column head screws** to detach the board.

Figure 212
Gate sensor board - Column head screws (bottom gate)

10. Turn over the board to reveal the connection underneath. Disconnect the connectors as indicated in the figure to remove board.

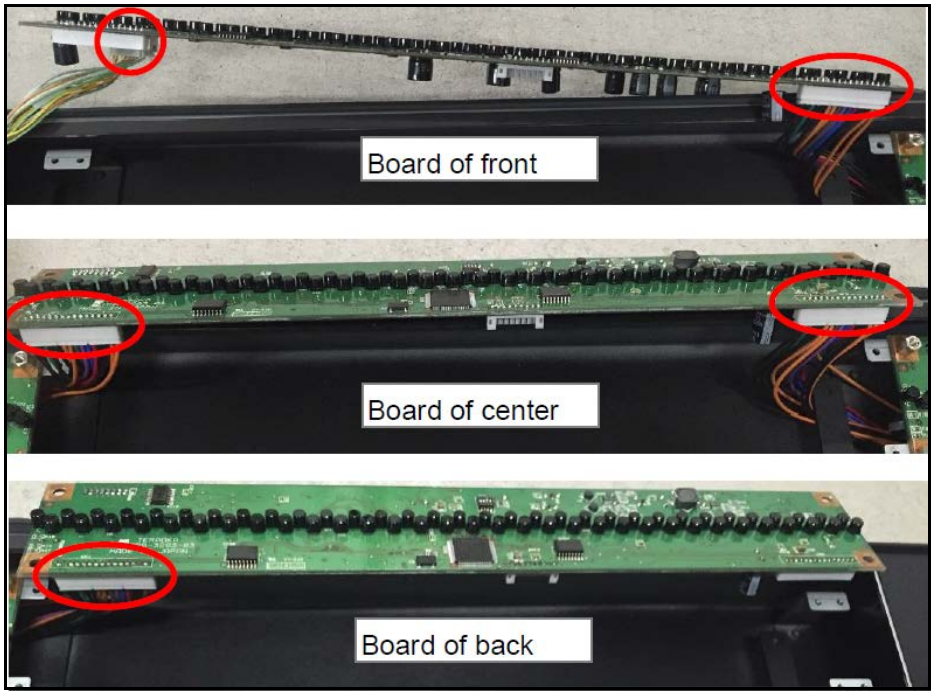


Figure 213
Gate sensor board - Board connectors (bottom gate)

11. When installing new board, set **DipSW2** according to the placement of the board as follows:

Board Placement	SW1	SW2	SW3	SW4
Back side	OFF	OFF	ON	OFF
Center	OFF	ON	OFF	OFF
Front side	OFF	OFF	OFF	OFF

Figure 214
Gate sensor board - Dip SW2

Gate side (receiving)

The receiving side of the gate consists of three sensor boards. These sensors receive light emitted by the opposite side gate. Together with the top and bottom gates, the sensor data obtained determines the dimensions of an object in 3-dimensional space. When servicing the sensor(s), only remove the board(s) being serviced.

1. Remove the **8 screws** on the receiving side of the main unit.

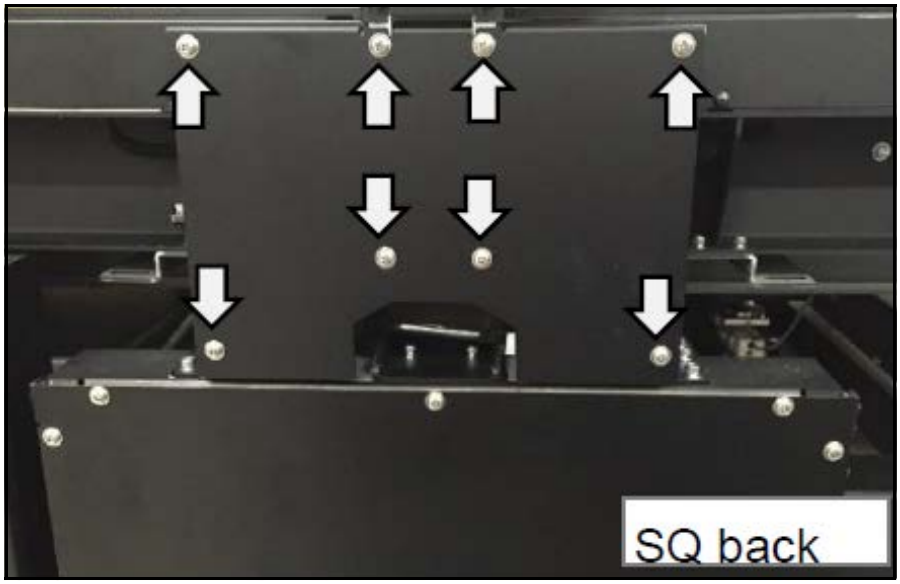


Figure 215
Gate sensor board - Side cover (receiving)

2. Remove the **8 screws** along the receiving side of the gate. Slide to remove cover, exposing the sensor boards.

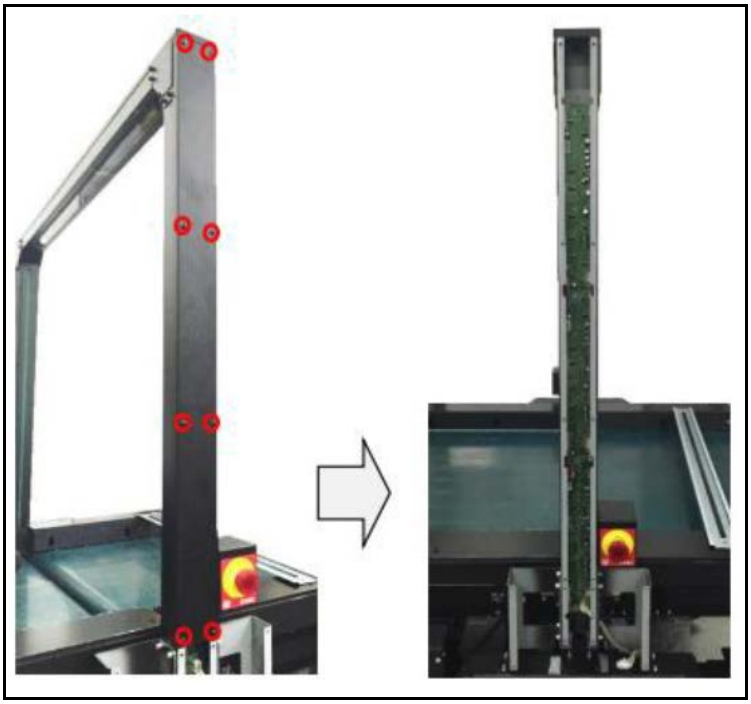


Figure 216
Gate sensor board - Sensor boards (receiving)

3. Remove the **4 screws** at each corner of the board to be serviced.

4. Turn board over to detach the connectors and remove board. The center and lower boards have two connectors.

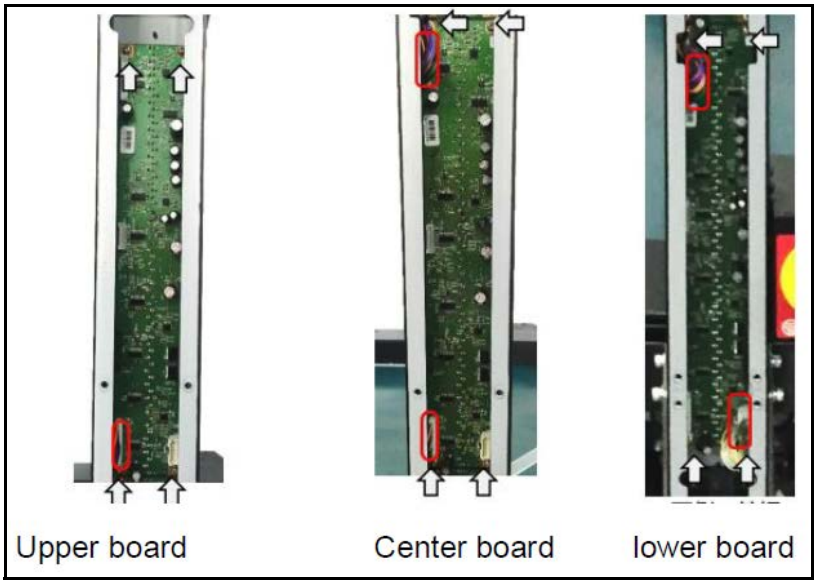


Figure 217
Gate sensor board - Board removal (receiving)

5. When installing the new board, set **DipSW2** according to the placement of the board as follows:

Board Placement	SW1	SW2	SW3	SW4
Upper	OFF	OFF	ON	OFF
Center	OFF	ON	OFF	OFF
Lower	OFF	OFF	OFF	OFF

Figure 218
Gate sensor board - Dip SW2 (receiving)

Gate side (emitting)

The emitting side of the gate consists of three light emitting boards. These boards emit light that will be received by the opposite side gate. Together

with the top and bottom gates, the sensor data obtained determines the dimensions of an object in 3-dimensional space. When servicing the sensor(s), only remove the board(s) being serviced.

1. Remove the **8 screws** on the emitting side of the main unit.

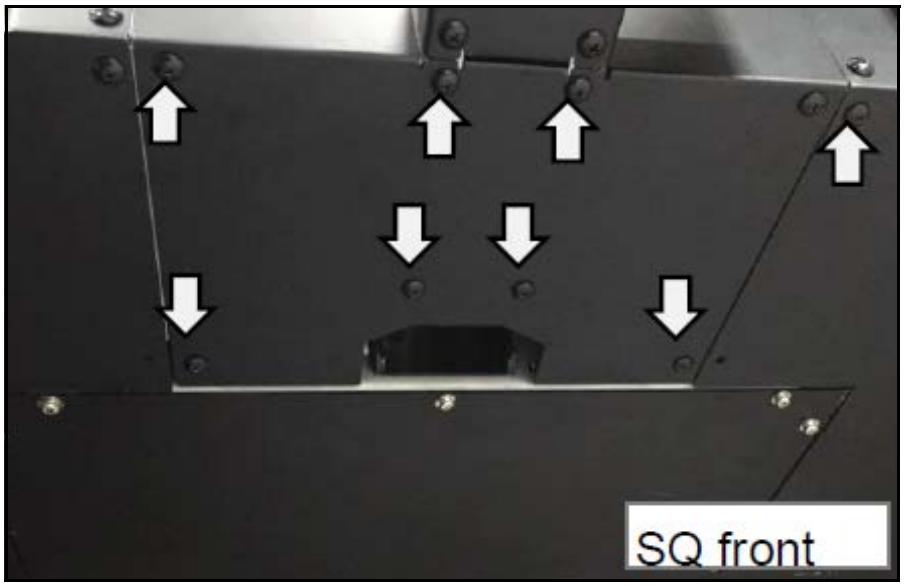


Figure 219
Gate sensor board - Side cover (emitting)

2. Remove the **8 screws** along the emitting side of the gate. Slide to remove cover, exposing the sensor boards.

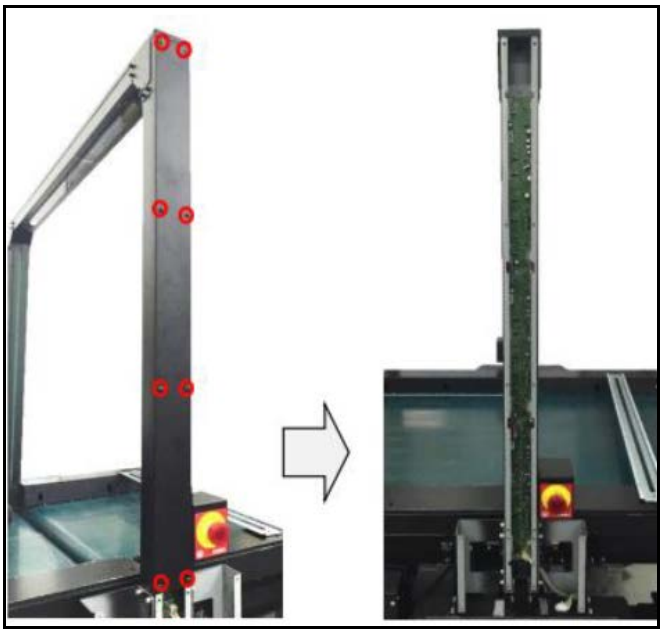


Figure 220
Gate sensor board - Sensor boards (emitting)

3. Remove the **4 screws** at each corner of the board to be serviced.

4. Turn board over to detach the connectors and remove. The upper board has one connector. The center and lower boards have two connectors.

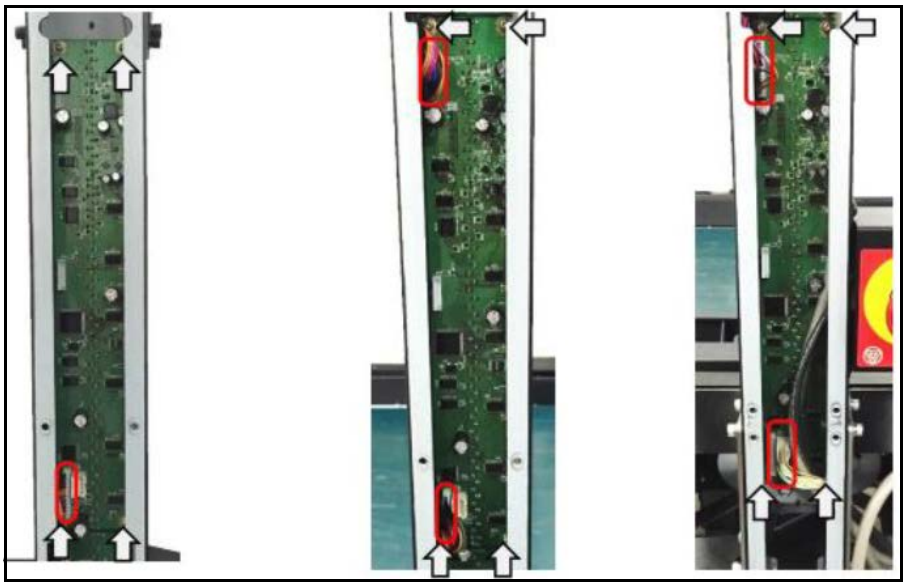


Figure 221
Gate sensor board - Board removal (emitting)

5. When installing new board, set **Dip SW2** according to the placement of the board as follows:

Board Placement	Level 1	Level 2	Level 3	Level 4
SW1	OFF	OFF	OFF	OFF
SW2	OFF	OFF	ON	ON
SW3	OFF	ON	OFF	ON
SW4	ON - master/ OFF - slave			

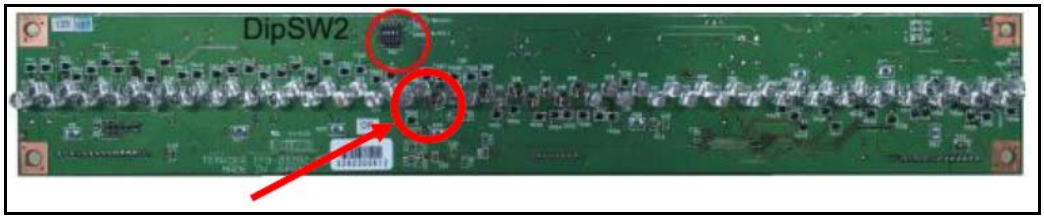


Figure 222
Gate sensor board - Dip SW2 (emitting)

Upper gate (emitting)

The upper gate consists of three light emitting boards. These boards emit light that will be received by the bottom gate. Together with the side gates, the sensor data obtained determines the dimensions of an object in 3-dimensional space. When servicing the sensor(s), only remove the board(s) being serviced.

1. Remove the **8 screws** along the top of the upper gate, then gently take off cover.

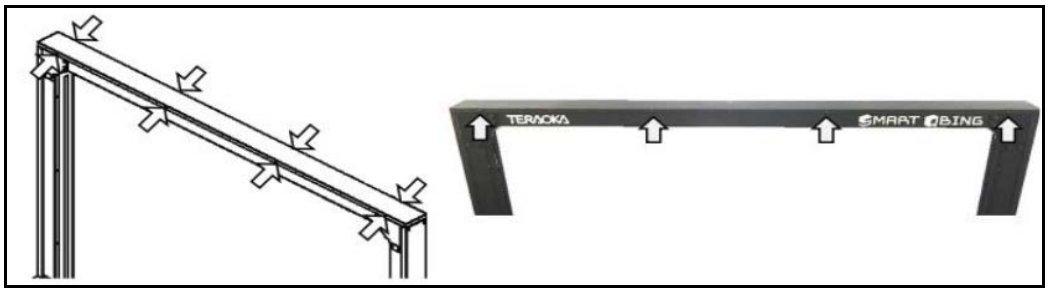


Figure 223
Gate sensor board - Cover screws (upper gate)

2. Disconnect the connectors for the board you are serving. The backside board has one connector. The center and front boards have two connectors.

3. Remove the **4 screws** at each corner of the board and replace with new board.

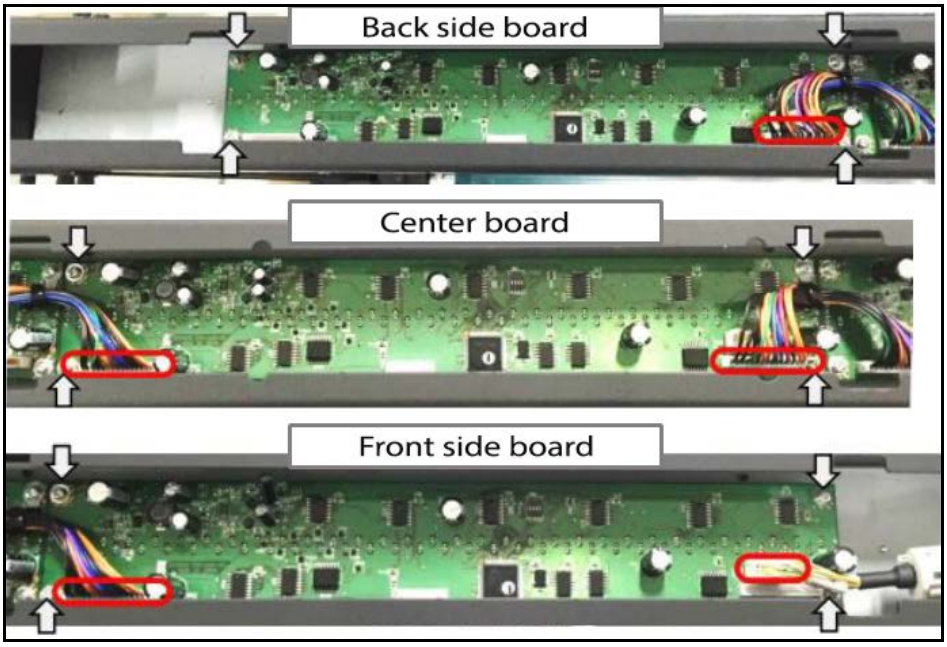


Figure 224
Gate sensor board - Connectors (upper gate)

4. When installing new board, set **Dip SW2** according to the placement of the board as follows:

Board Placement	Level 1	Level 2	Level 3	Level 4
SW1	OFF	OFF	OFF	OFF
SW2	OFF	OFF	ON	ON
SW3	OFF	ON	OFF	ON
SW4	ON - master on front board/ OFF - slave on center and back board			

Figure 225
Gate sensor board - Dip SW2 (upper gate)

Passage sensor board

Along both **conveyor A** and **convey B**, a series of sensors are positioned on either side to detect the presence of an object. One side contains emitter boards and the other contains receiver boards. These make up the passage sensors.

Conveyor A emitter

Conveyor A contains two types of emitters: **TPB-3863 (small)** and **TPB-3865 (large)**. Complete the following steps to service the emitter boards for conveyor A:

1. Remove the **3 screws** along the top of the emitter side rail of conveyor A, then remove cover.

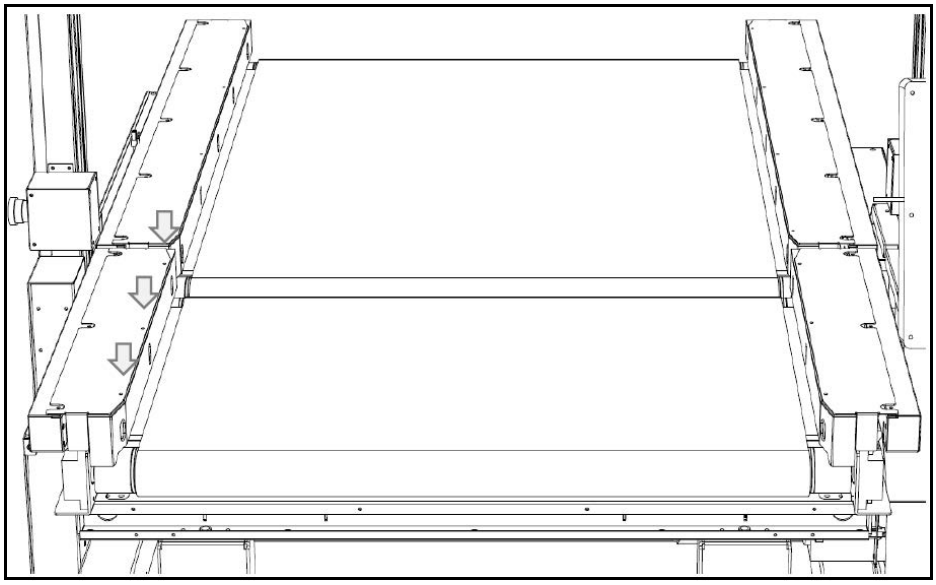


Figure 226
Conveyor A emitter - Cover screws

2. Remove the **3 screws** on the top side and the **2 screws** at the side of the inner rail component. Gently remove the cover.

3. Both the **TPB-3865 (large)** and **TPB-3863 (small)** board will be exposed. Each board requires its own procedure to remove.

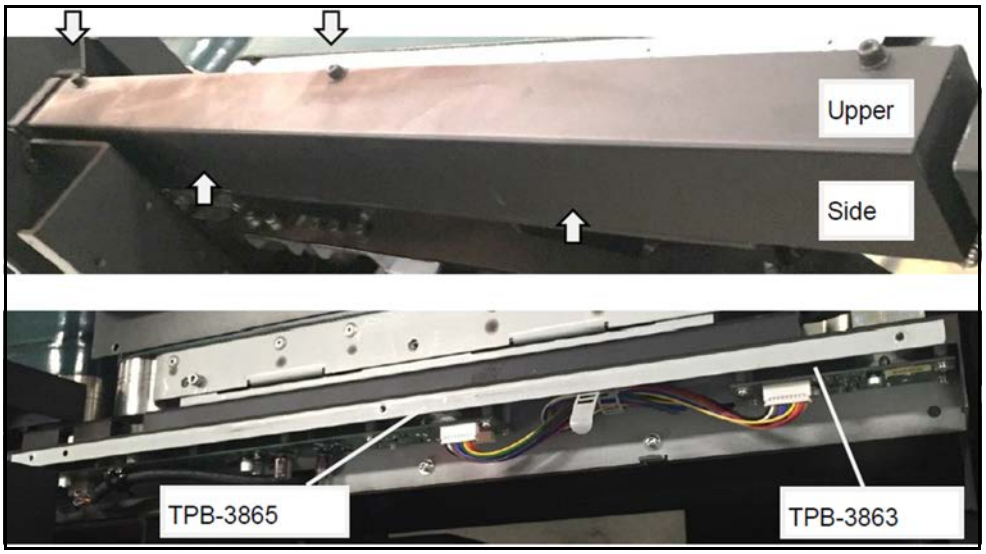


Figure 227
Conveyor A emitter - Exposed boards

4. Remove the **4 screws** securing the sheet metal frame to the main unit as indicated in the figure.

5. Tilt the sheet metal up to gain better access to the boards.

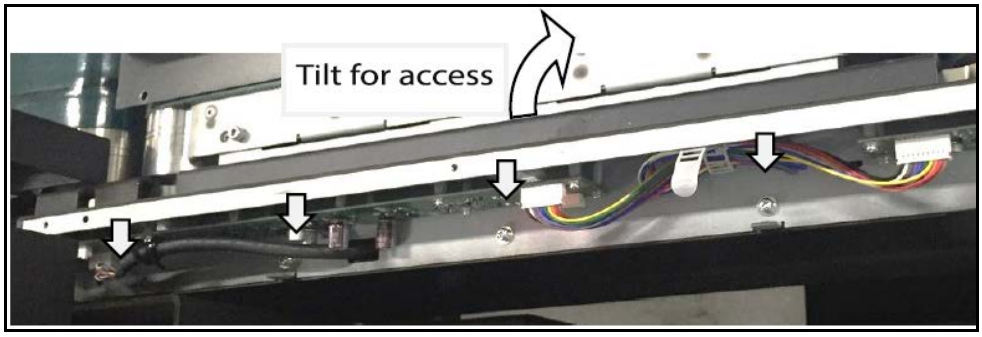


Figure 228
Conveyor A emitter - Accessing boards

Removing the TPB-3863 (small) board

1. When servicing the **TPB-3863 (small) board**, remove the connector indicated in the figure.

Figure 229
Conveyor A emitter - TPB-3863 (small) board

2. Remove the **4 screws** at each corner of the board to detach the board from the sheet metal frame.

3. Replace with new board.

Replacing the TPB-3865 (large) board

1. When servicing the **TPB-3865 (large) board**, remove the **2 connectors** indicated in the figure.

2. Remove the **8 screws** securing the board to the sheet metal frame.

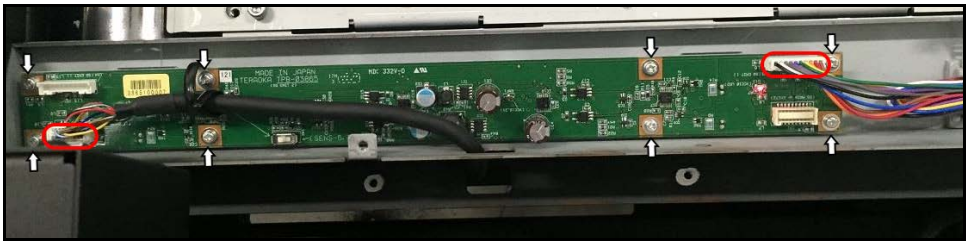


Figure 230
Conveyor A emitter - TPB-3865 (large) board

3. Before replacing the board, set **SW1** on the new board. The **SW1** setting differs depending on the installation location. Set the switch on the left side (**SENS-2, 3, 4, 5**).

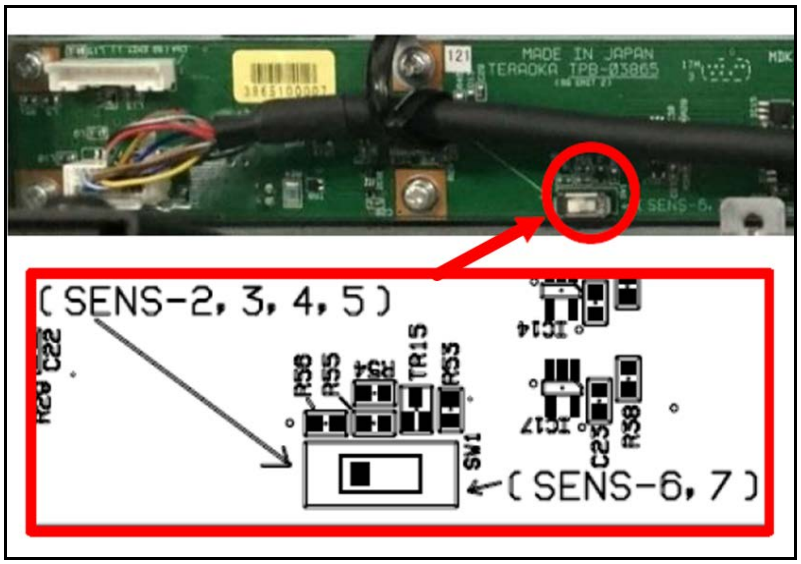


Figure 231
Conveyor A emitter - SW1

Conveyor B emitter

Conveyor B contains two types of emitters: **TPB-3863 (small)** and **TPB-3865 (large)**. Complete the following steps to service the emitter boards for conveyor B:

1. Remove the **4 screws** along the top of the emitter side rail of conveyor B. Then, remove cover.

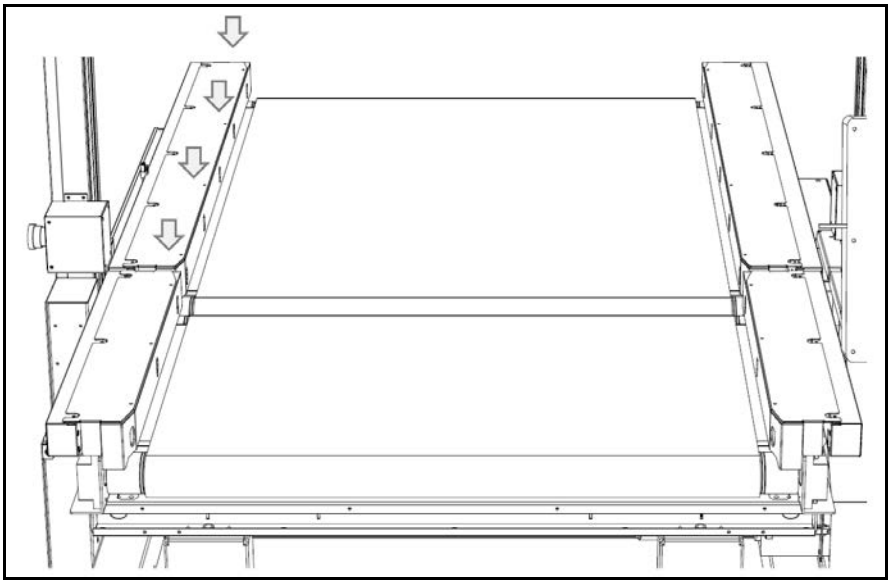


Figure 232
Conveyor B emitter - Cover screws

2. Remove the **5 screws** on the top side and the **4 screws** at the side of the inner rail component. Gently remove the cover.

3. Boards left **TPB-3865 (large)**, right **TPB-3865 (large)** and **TPB-3863 (small) boards** will be exposed. Each board requires its own procedure to remove.

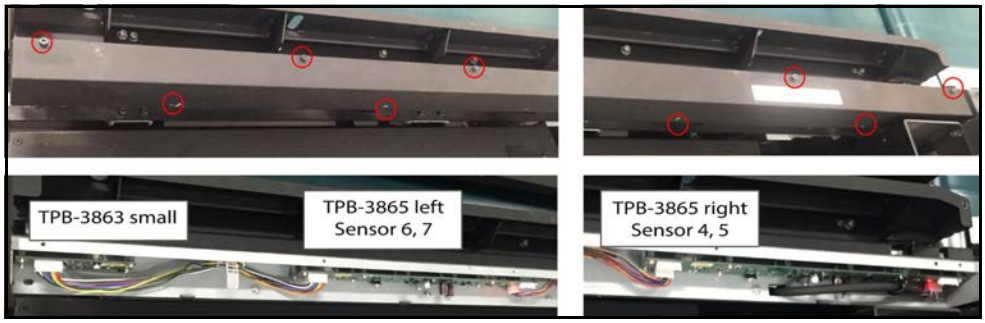


Figure 233
Conveyor B emitter - Exposed boards

4. Remove the **5 screws** securing the sheet metal frame to the main unit as indicated in the figure.

5. Tilt the sheet metal up to gain better access to the boards.

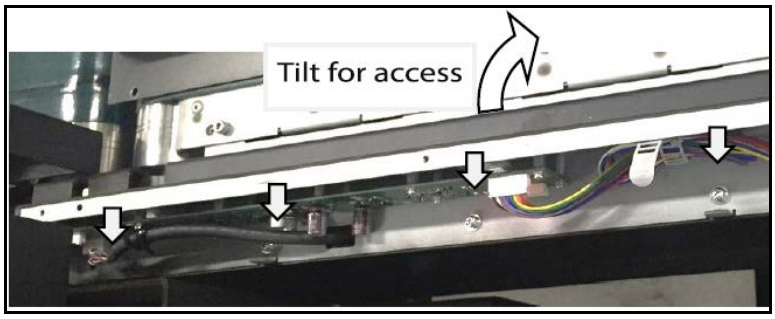


Figure 234
Conveyor B emitter - Accessing boards

Removing the TPB-3863 (small) board

1. When servicing the **TPB-3863 (small) board**, remove the connector indicated in the figure.

Figure 235
Conveyor B emitter - TPB-3863 (small) board

2. Remove the **4 screws** at each corner of the board to detach the board from the sheet metal frame.

3. Replace with new board.

Replacing the left TPB-3865 (large) board

1. When servicing the left **TPB-3865 (large) board**, remove the **2 connectors** indicated in the figure.

2. Remove the **8 screws** securing the board to the sheet metal frame.

Figure 236
Conveyor B emitter - Left TPB-3865 (large) board

3. Before replacing the board, set **SW1** on the new board. The **SW1** setting differs depending on the installation location. Set the switch on the right side (**SENS-6,7**).

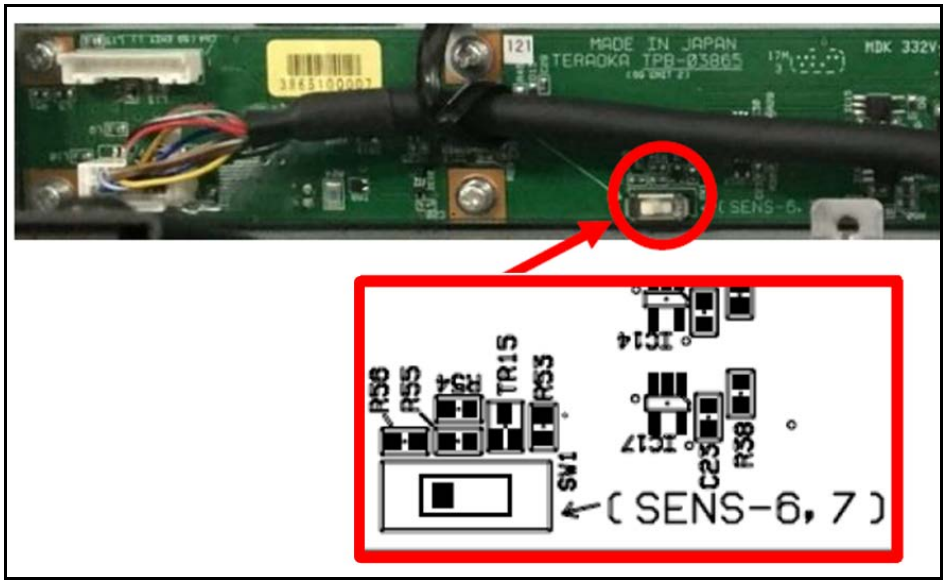


Figure 237
Conveyor B emitter - SW1 *(SENS - 6, 7)*

Replacing the right TPB-3865 (large) board

1. When servicing the **TPB-3865 (large) board**, remove the **2 connectors** indicated in the figure.

2. Remove the **8 screws** securing the board to the sheet metal frame.

Figure 238
Conveyor B emitter - Right TPB-3865 (large) board

3. Before replacing the board, set **SW1** on the new board. The **SW1** setting differs depending on the installation location. Set the switch on the left side (**SENS-2, 3, 4, 5**).

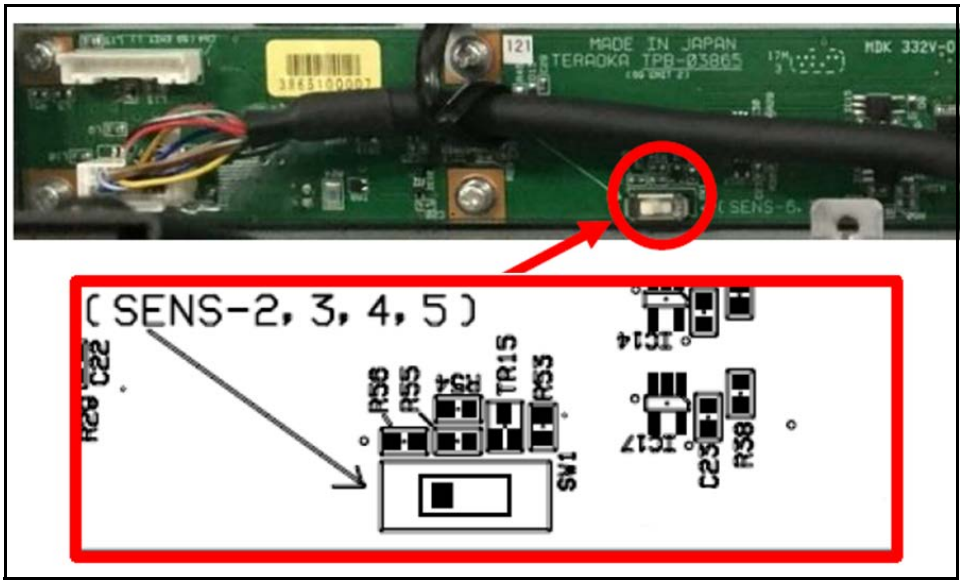


Figure 239
Conveyor B emitter - SW1 *(SENS-2, 3, 4, 5)*

Conveyor A receiver

Conveyor A contains two types of receivers: **TPB-3864 (small)** and **TPB-3866 (large)**. Complete the following steps to service the boards for conveyor A:

1. Remove the **3 screws** along the top of the receiver side rail of conveyor A. Then, remove cover.

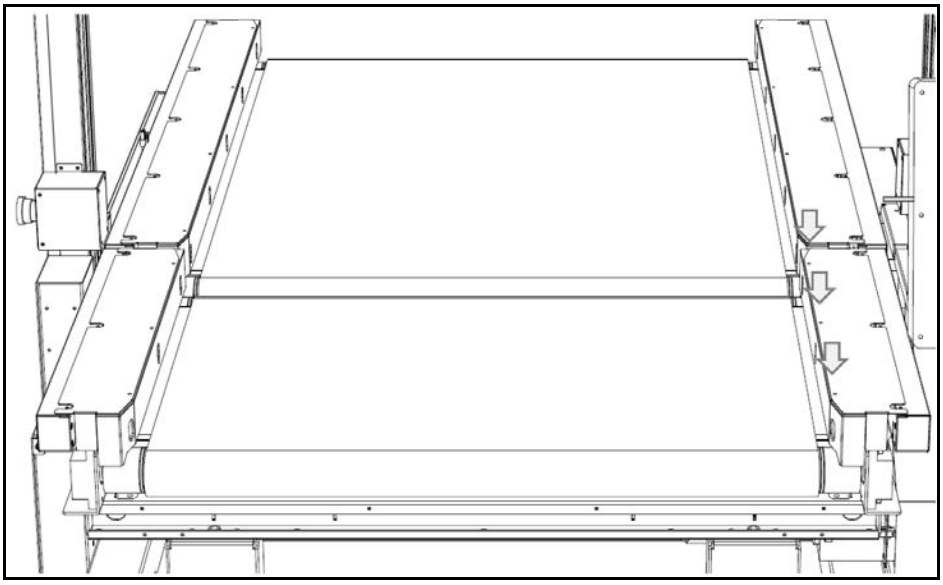


Figure 240
Conveyor A receiver - Cover screws

2. Remove the **2 screws** on the upper side and the **2 screws** at the side of cover next to gate.

3. Remove the **2 hexagonal cap screws** indicated in the figure and remove the cover next to the gate.

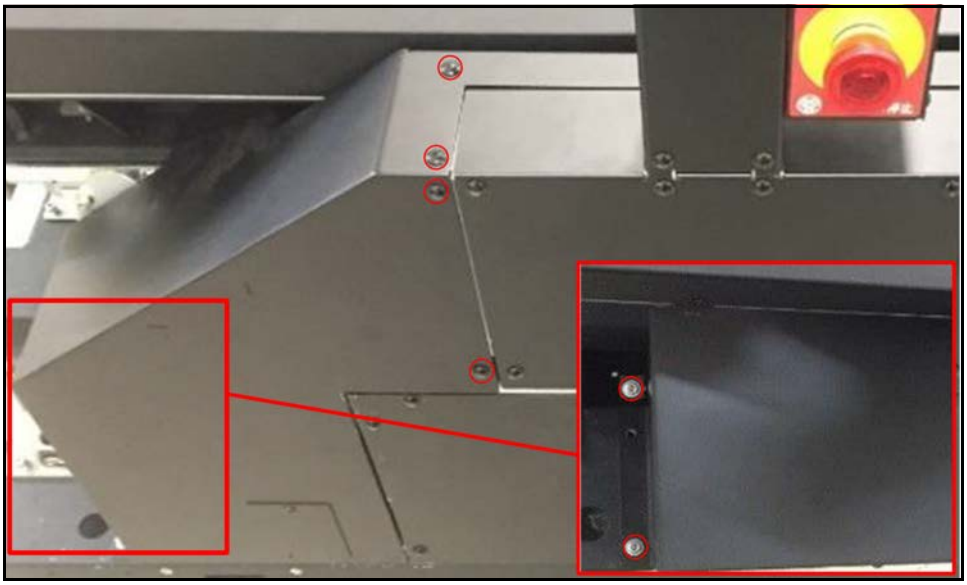


Figure 241
Conveyor A receiver - Hexagonal cap screws

4. Remove the **3 screws** on the top side and the **2 screws** at the side of the inner rail component. Gently remove the cover.

5. Both the **TPB-3866 (large)** and **TPB-3864 (small) board** will be exposed. Each board requires its own procedure to remove.

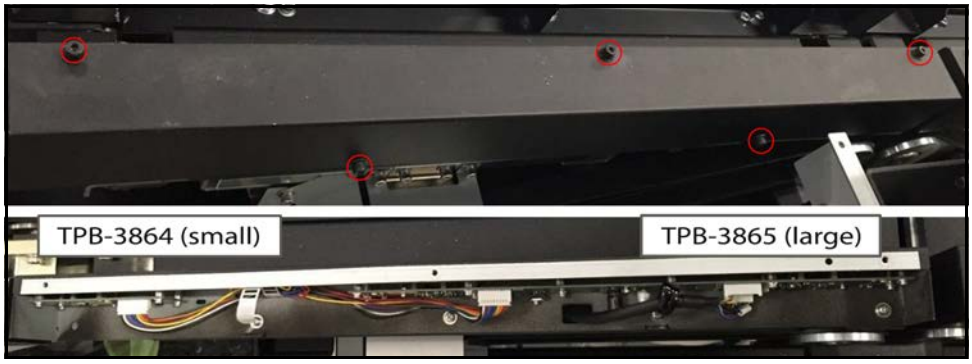


Figure 242
Conveyor A receiver - Exposed boards

6. Remove the **4 screws** securing the sheet metal frame to the main unit as indicated in the figure.

7. Tilt the sheet metal up to gain better access to the boards.

Figure 243
Conveyor A receiver - Accessing boards

Removing the TPB-3864 (small) board

1. When servicing the **TPB-3863 (small) board**, remove the connector indicated in the figure.

2. Remove the **4 screws** at each corner of the board to detach the board from the sheet metal frame.

Figure 244
Conveyor A receiver - TPB-3864 (small) board

3. Replace with new board.

Replacing the TPB-3866 (large) board

1. When servicing the **TPB-3866 (large) board**, remove the **2 connectors** indicated in the figure.

2. Remove the **10 screws** securing the board to the sheet metal frame.

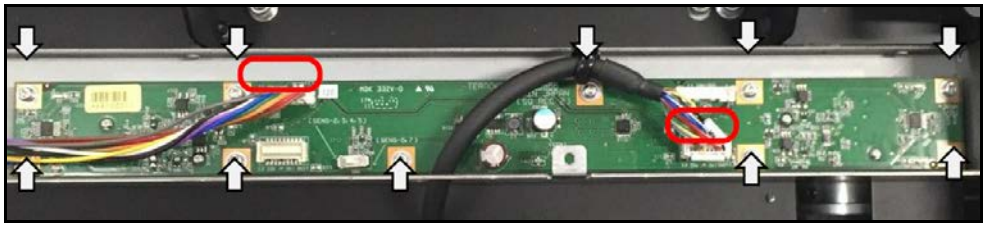


Figure 245
Conveyor A receiver - TPB-3866 (large) board

3. Before replacing the board, set **SW5** on the new board. The **SW5** setting differs depending on the installation location. Set the switch on the left side (**SENS-2, 3, 4, 5**).

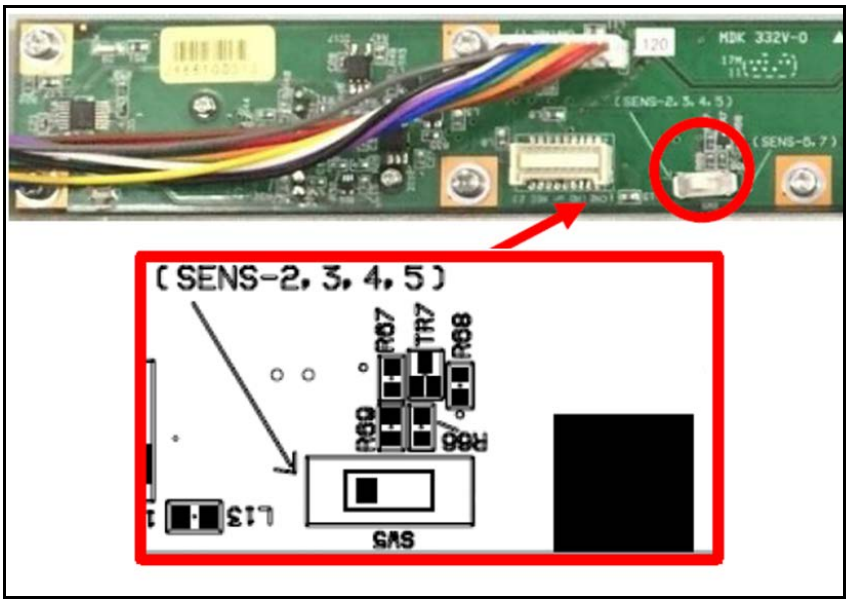


Figure 246
Conveyor A receiver - SW5 (SENS-2, 3, 4, 5)

Conveyor B receiver

Conveyor B contains two types of receivers: **TPB-3864 (small)** and **TPB-3866 (large)**. Complete the following steps to service the boards for conveyor B:

1. Remove the **4 screws** along the top of the receiver side rail of conveyor B, then remove cover.

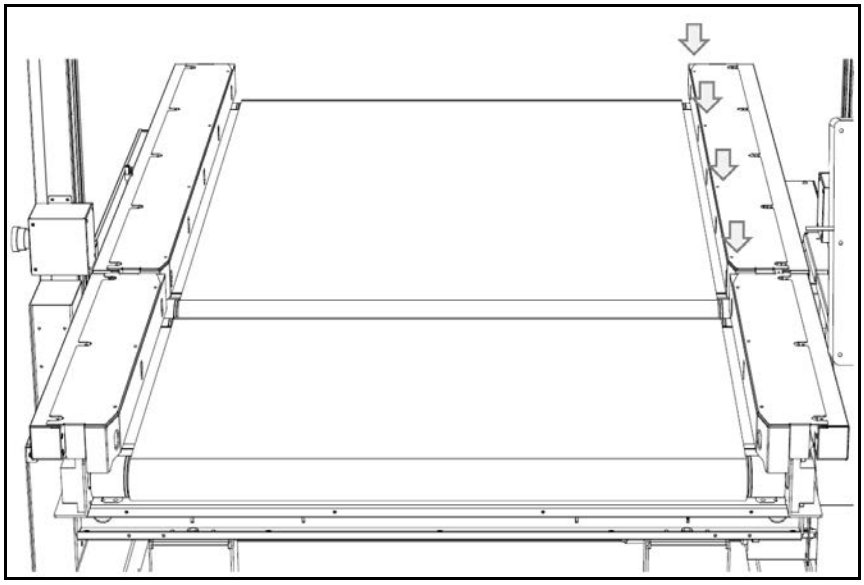


Figure 247
Conveyor B receiver - Cover screws

2. Remove the **2 screws** on the upper side and the **2 screws** at the side of cover next to gate.

3. Remove the **2 hexagonal cap screws** indicated in the figure. Then, remove the cover next to the gate.

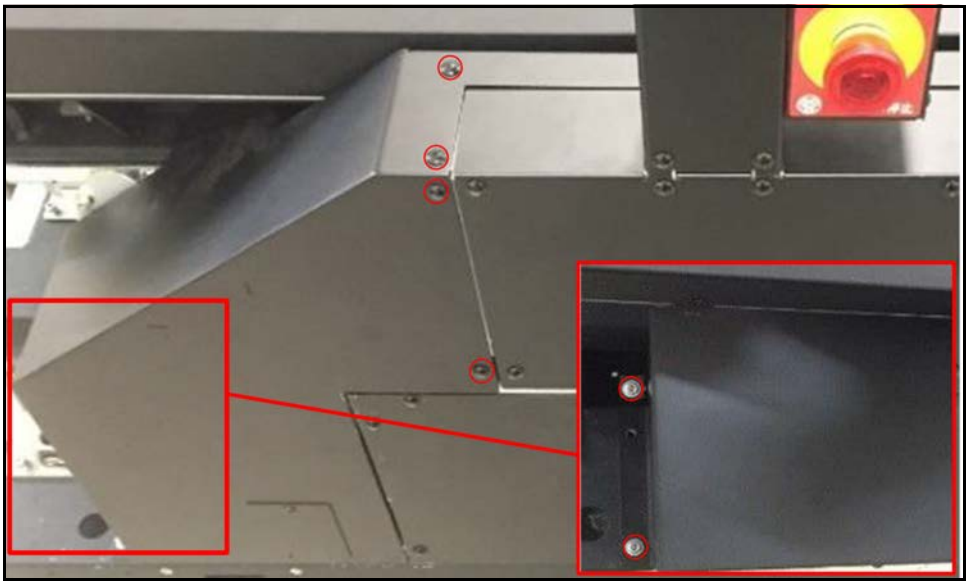


Figure 248
Conveyor B receiver - Hexagonal cap screws

4. Remove the **5 screws** on the top side and the **4 screws** at the side of the inner rail component. Gently remove the cover.

5. Boards left **TPB-3866 (large)**, **right TPB-3866 (large)** and **TPB-3864 (small) boards** will be exposed. Each board requires its own procedure to remove.

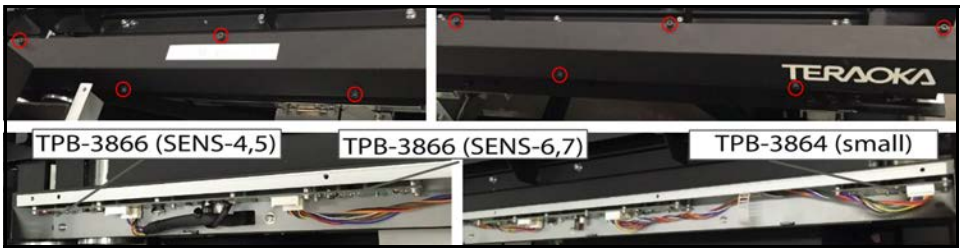


Figure 249
Conveyor B receiver - Exposed boards

6. Remove the **5 screws** securing the sheet metal frame to the main unit as indicated in the figure.

7. Tilt the sheet metal up to gain better access to the boards.

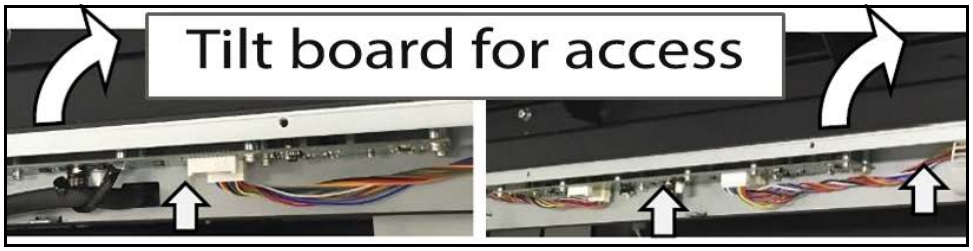


Figure 250
Conveyor B receiver - Accessing boards

Removing the TPB-3864 (small) board

1. When servicing the **TPB-3864 (small) board**, remove the connector indicated in the figure.

2. Remove the **4 screws** at each corner of the board to detach the board from the sheet metal frame.

Figure 251
Conveyor B receiver - TPB-3864 (small) board

3. Replace with new board.

Replacing the right TPB-3866 (large) board

1. When servicing the left **TPB-3866 (large) board**, remove the **2 connectors** indicated in the figure.

2. Remove the **10 screws** securing the board to the sheet metal frame.

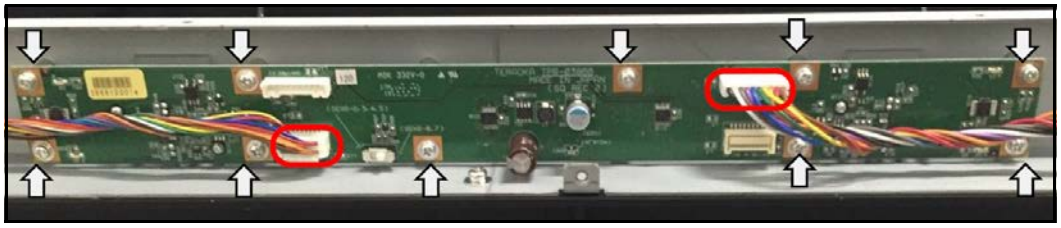


Figure 252
Conveyor B emitter - Right TPB-3866 (large) board

3. Before replacing the board, set **SW5** on the new board. The **SW5** setting differs depending on the installation location. Set the switch on the right side (**SENS-6,7**).

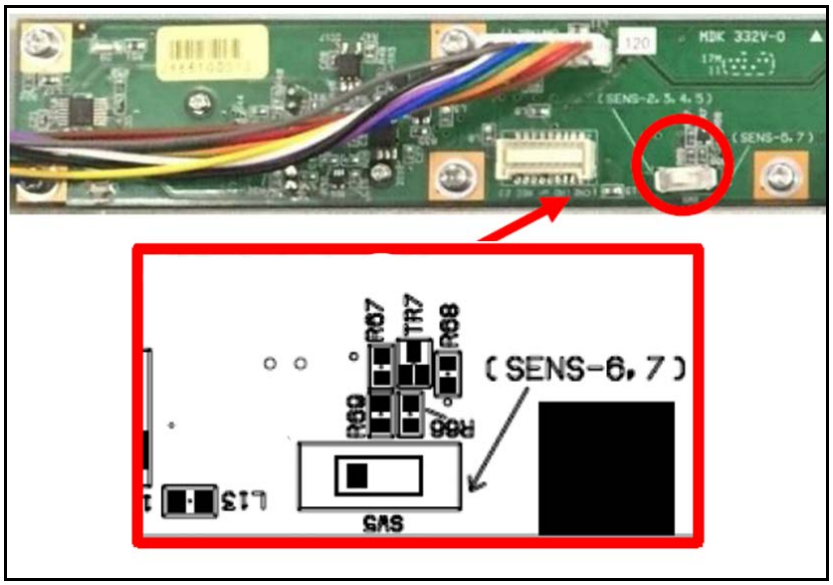


Figure 253
Conveyor B receiver - SW5 *(SNS - 6, 7)*

Replacing the left TPB-3866 (large) board

1. When servicing the **TPB-3866 (large) board**, remove the **2 connectors** indicated in the figure.

2. Remove the **10 screws** securing the board to the sheet metal frame.

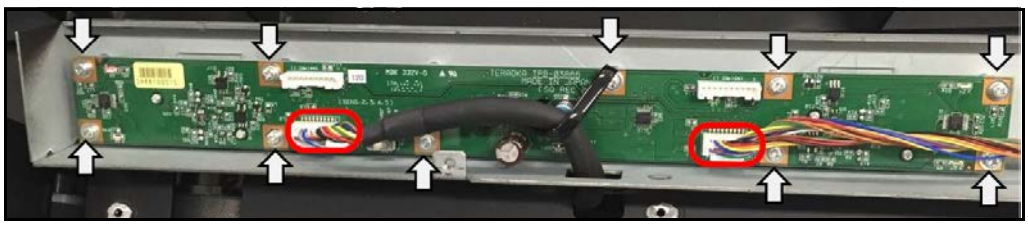


Figure 254
Conveyor B emitter - Left TPB-3866 (large) board

3. Before replacing the board, set **SW5** on the new board. The **SW5** setting differs depending on the installation location. Set the switch on the left side (**SENS-2, 3, 4, 5**).

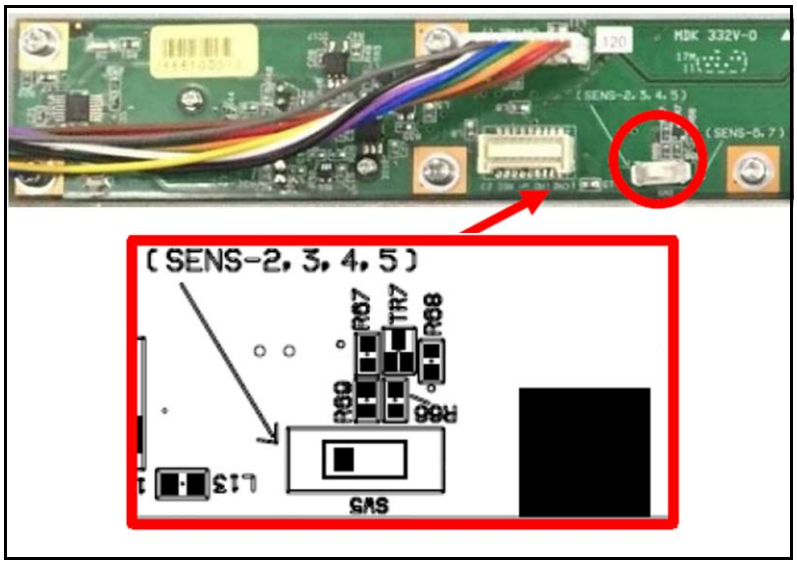


Figure 255
Conveyor B emitter - SW5 *(SENS-2, 3, 4, 5)*

Inverter

1. Remove the **5 screws** securing the cover for the conveyor's inverter and gently lift and pull off cover.

Figure 256
Inverter - Cover screws

2. Remove the **2 hexagonal cap screws** that secure the inverters to the sheet metal frame.

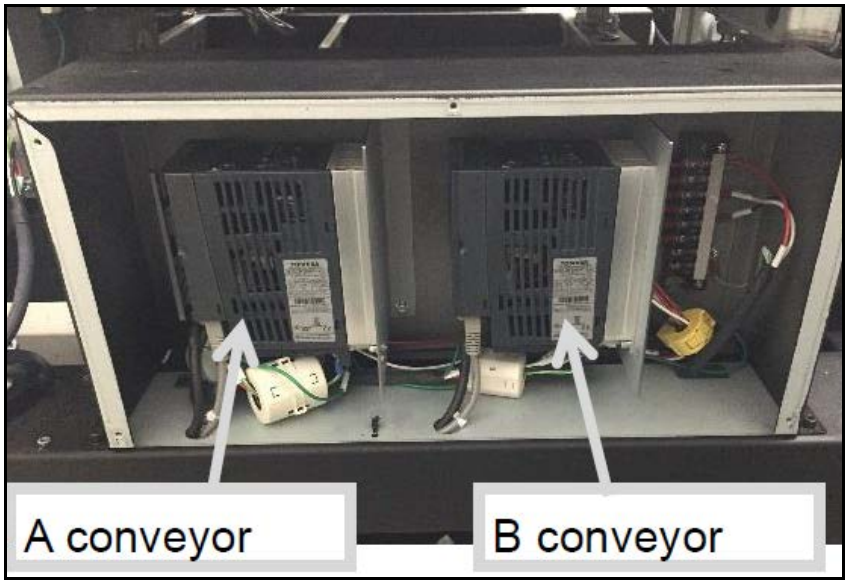


Figure 257
Inverter - Cover removed

3. Detach the inverter and sheet metal frame from the main unit.

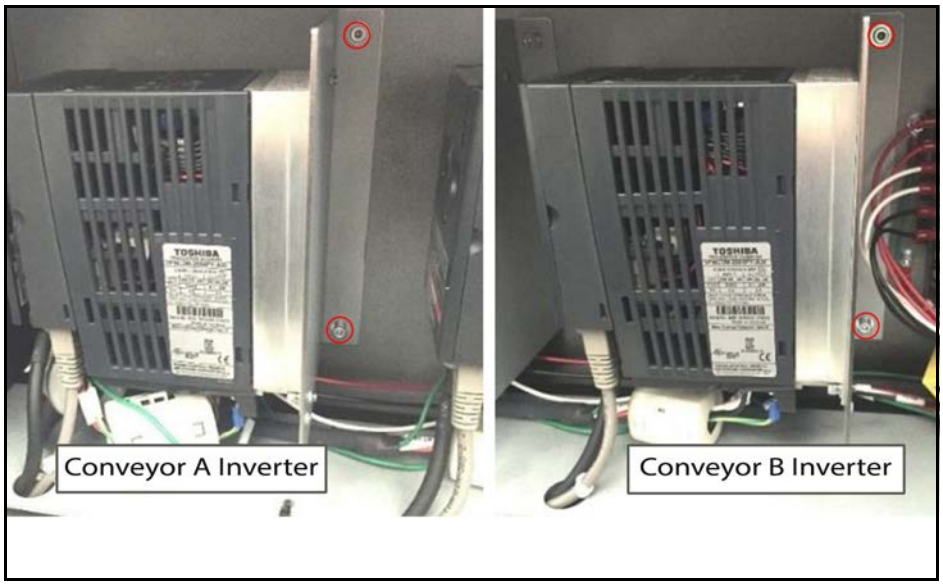


Figure 258
Inverter - Removing inverter

NOTE *Once the inverter is detached from the main unit, the removal procedure is the same for both conveyors A and B.*

4. Open the inverter cover and disconnect the communication cable.

Figure 259
Inverter - Cable

5. Loosen the screws on the **5 terminals CC**, **F**, **R**, **S1**, and **S2**.

6. Pull out each wire.

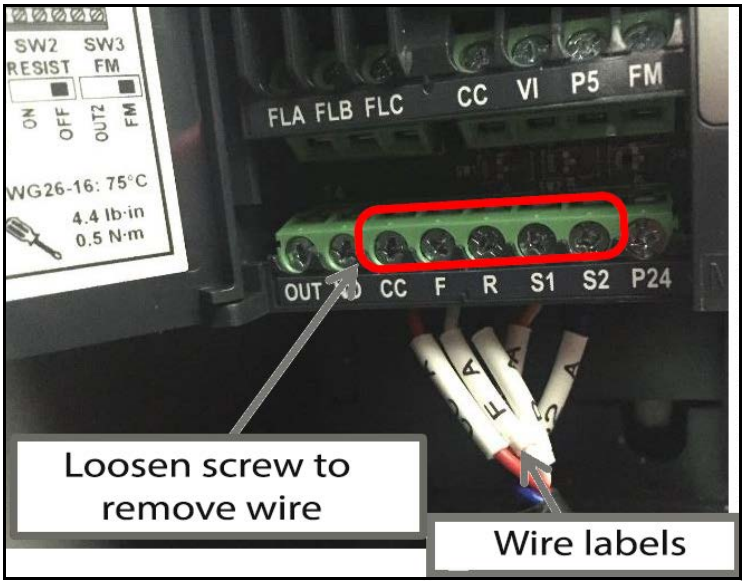


Figure 260
Inverter - Terminals

NOTE *Each wire is labeled according to its corresponding terminal and the conveyor it connects to, i.e. "CC A" connects to terminal CC of conveyor A.*

7. Insert the driver into the hole at the bottom of the inverter, indicated in the figure.

8. Slide to remove the cover, revealing connector terminals.

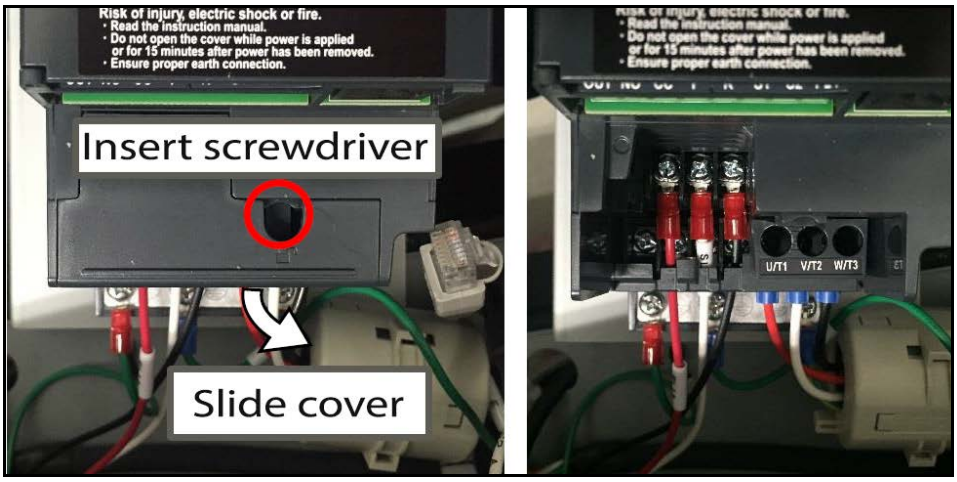


Figure 261
Inverter - Revealing bottom terminals

9. Remove the **3 screws** along the sheet metal to disconnect the wires as indicated in the figure.

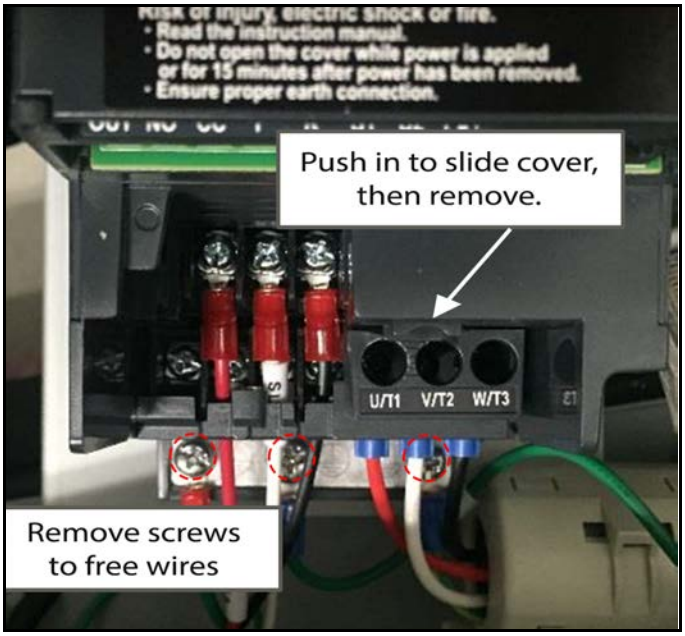


Figure 262
Inverter - Sheet metal screws

10. Push cover as shown in the figure and remove by lifting it diagonally upward. Three more terminals marked with blue will be revealed.

11. Remove the **6 screws** holding the red and blue wires in place.

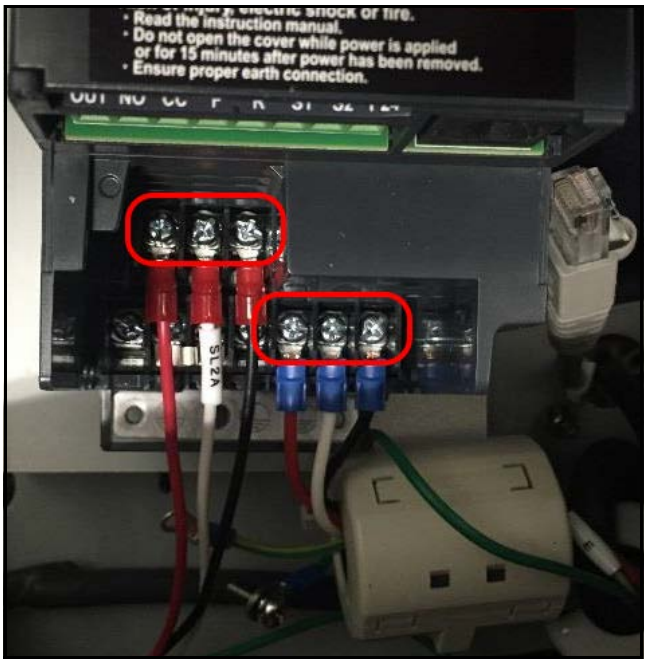


Figure 263
Inverter - Connections revealed

12. Remove the **2 hexagonal cap screws** on the upper left and lower right of the inverter as indicated in the figure. This will free the inverter from the sheet metal.

Figure 264
Inverter - Removing frame

Drive belt

Conveyor A drive belt

The drive belt for conveyor A is located on the receiving side of the CS 200 SQ. Complete the following steps to remove the drive belt for servicing.

1. Remove the **2 screws** on the upper side and the **2 screws** at the side of the cover next to gate.

2. Remove the **2 hexagonal cap screws** indicated in the figure. Then, remove the cover next to the gate.

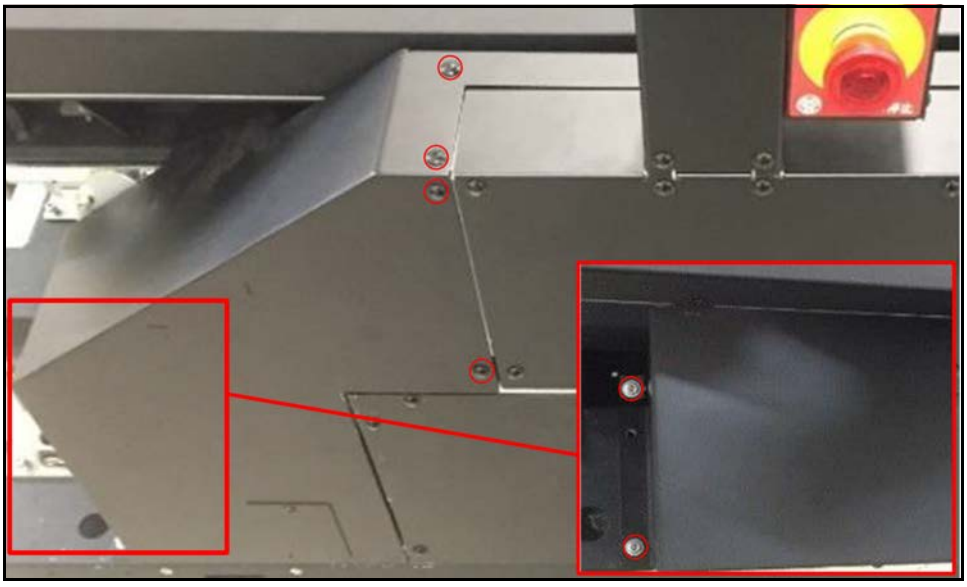


Figure 265
Conveyor A drive belt - Cover screws

3. Remove the main motor pulley cover.

4. Remove the **3 hexagonal cap screws** on the left side of the motor pulley cover and the **2 hexagonal cap screws** on the top.

5. Gently, pull off cover revealing the motor pulley system.

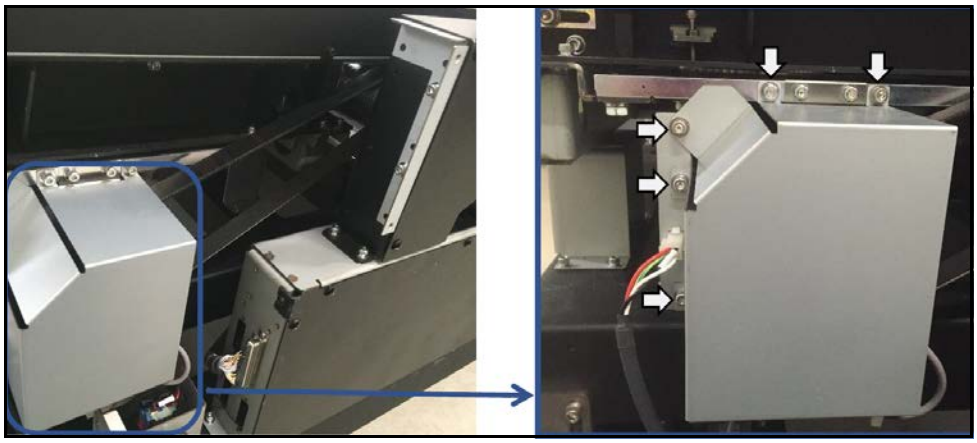


Figure 266
Conveyor A drive belt - Motor pulley cover

6. Remove the **2 hexagonal cap screws** securing the sheet metal frame for the encoder.

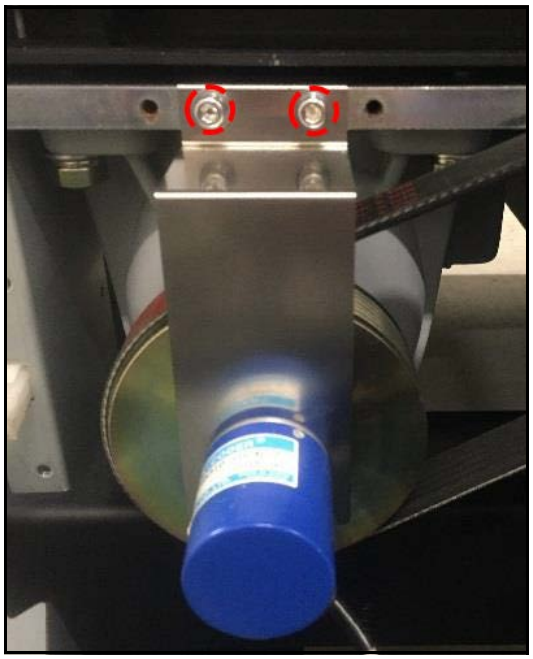


Figure 267
Conveyor A drive belt - Encoder

7. Carefully, pull the encoder and sheet metal frame away from the main unit. The main motor will now be exposed.

8. Mark the position of the main motor mount with a marker. It is important to indicate this position, so the motor can be repositioned correctly after belt replacement.

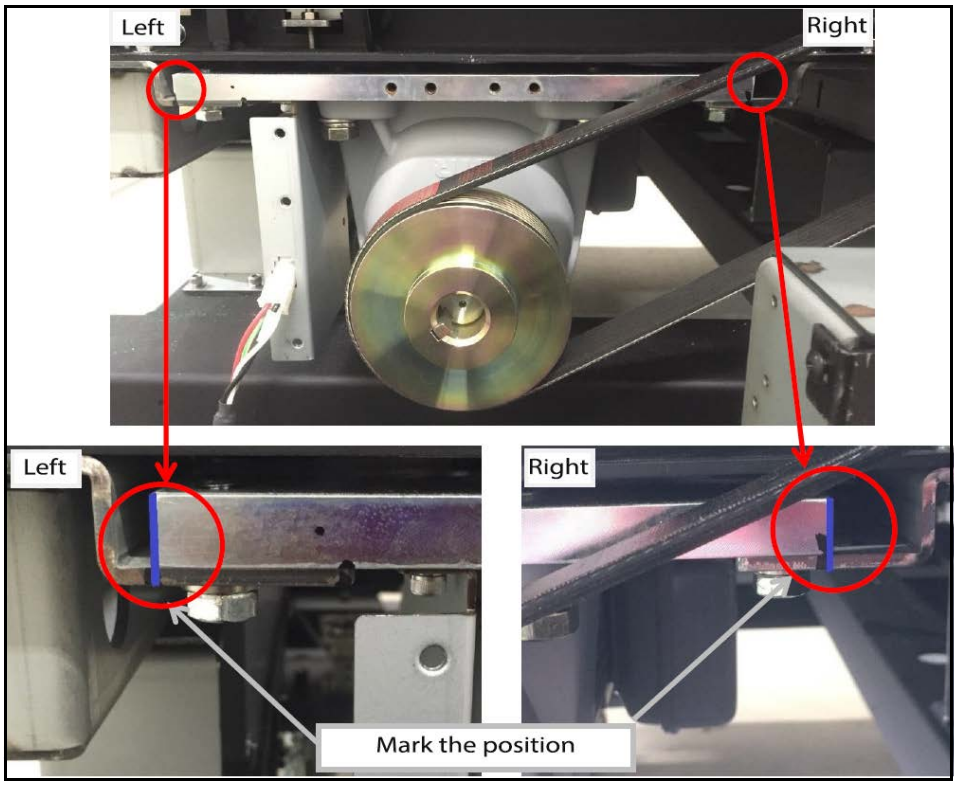


Figure 268
Conveyor A drive belt - Main motor

9. There are **4 sheet metal bolts** securing the motor to the main unit. Loosen the **2 bolts** on the left side by making **4 to 5 turns**.

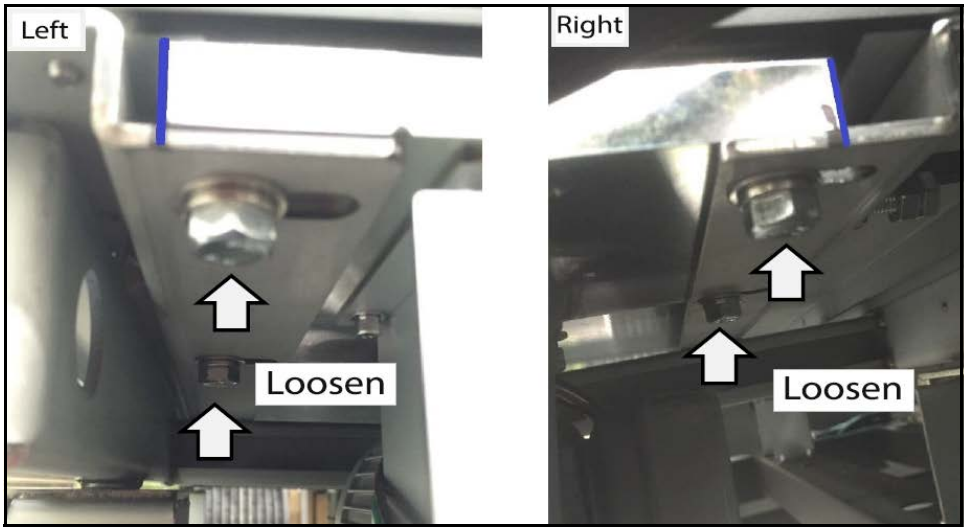


Figure 269
Conveyor A drive belt - Left mount bolts

10. After loosening the left mount bolts, loosen the right mount bolts by making **4 to 5 turns**.

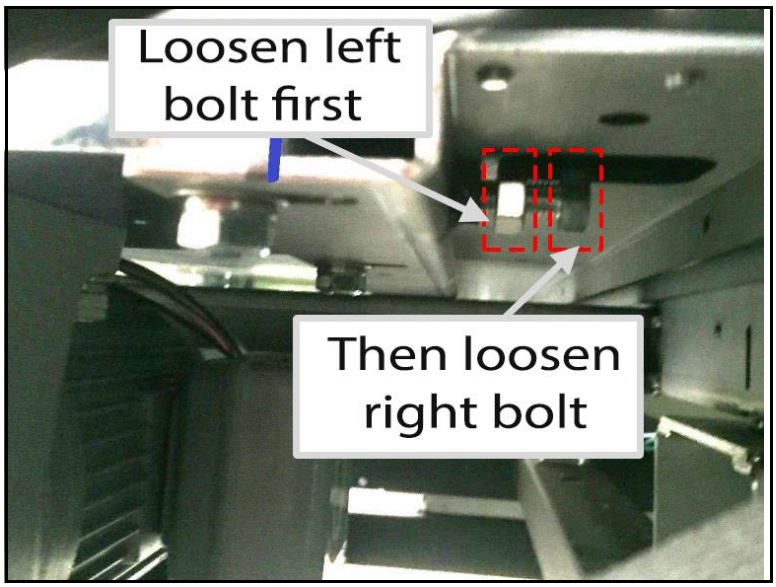


Figure 270
Conveyor A drive belt - Right mount bolts

11. Slide the motor to the right along with the marked sheet metal.

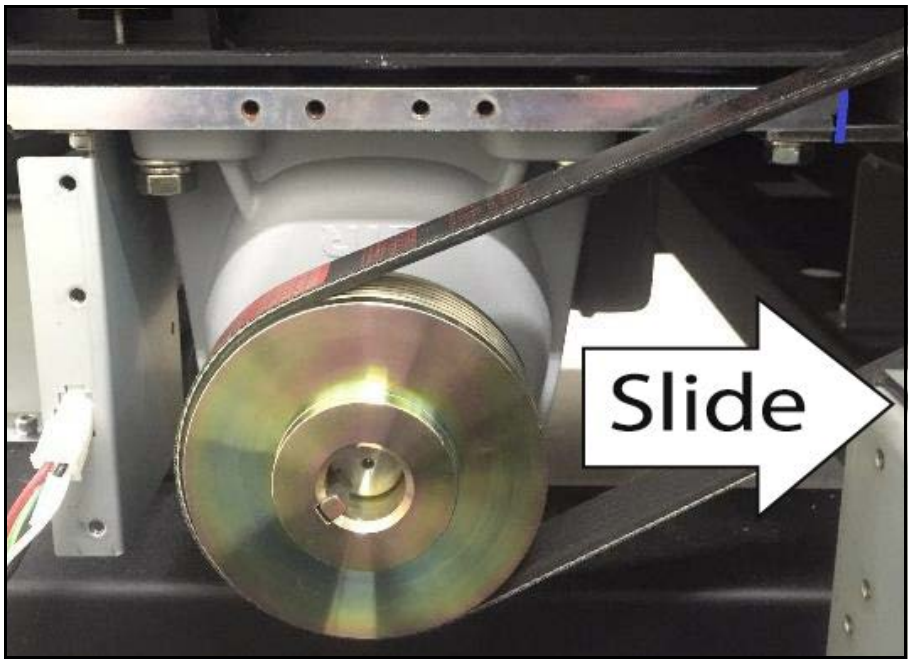


Figure 271
Conveyor A drive belt - Sliding motor

12. Carefully, pull the belt from the motor pulley and rollers, sliding it away from the main unit. Once free, the belt may be serviced or replaced.

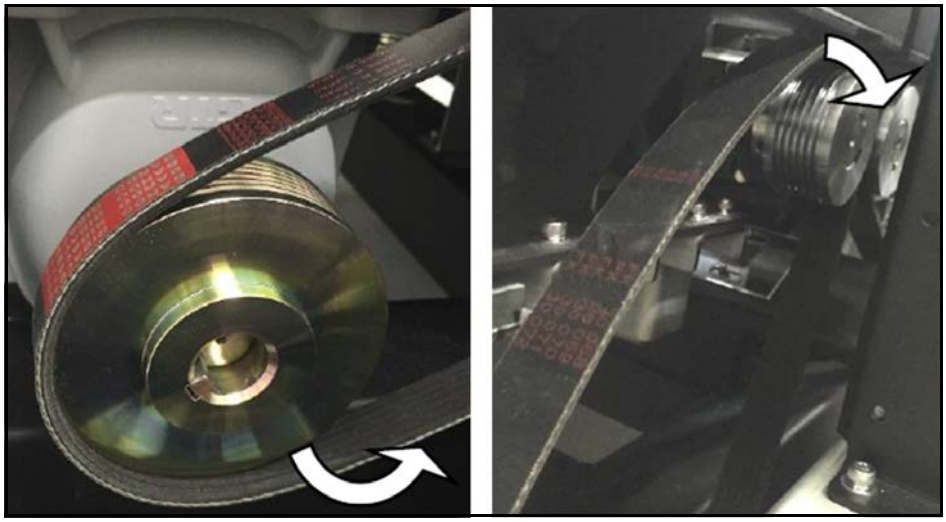


Figure 272
Conveyor A drive belt - Removing belt

Conveyor B drive belt

The drive belt for conveyor B is located on the receiving side of the CS 200 SQ. Complete the following steps to remove the drive belt for servicing.

1. Remove the **2 screws** on the upper side and the **2 screws** at the side of cover next to gate.

2. Remove the **2 hexagonal cap screws** indicated in the figure and remove the cover next to the gate.

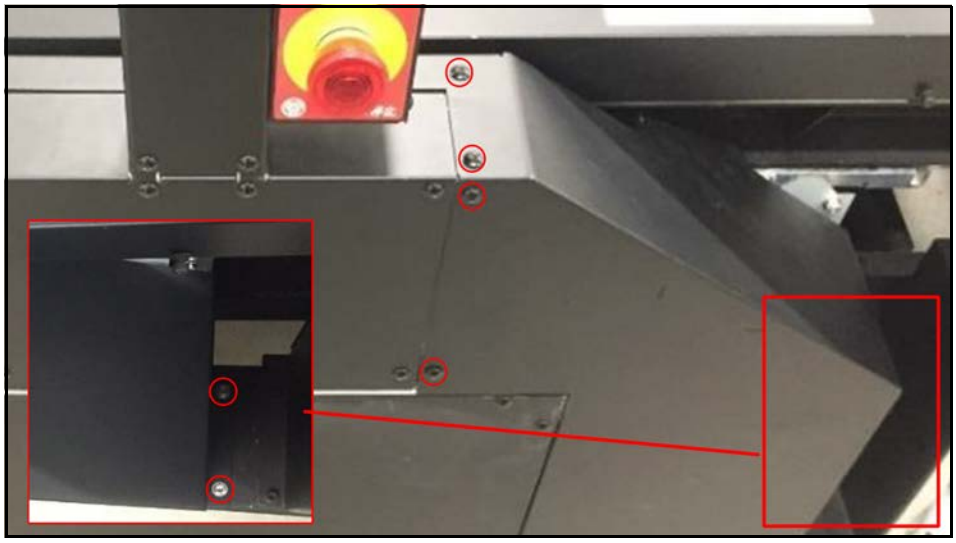


Figure 273
Conveyor B drive belt - Cover screws

3. Remove the main motor pulley cover.

4. Remove the **3 hexagonal cap screws** on the right side of the motor pulley cover and the **2 hexagonal cap screws** on the top.

5. Gently, pull off cover revealing the motor pulley system.

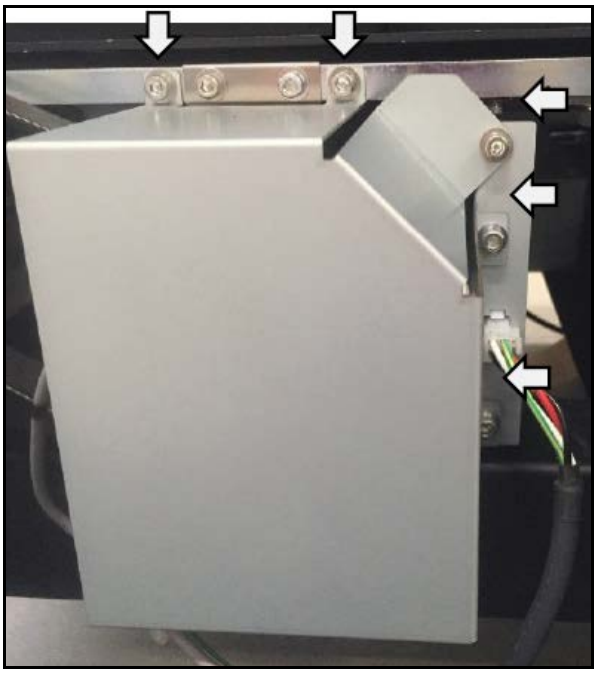


Figure 274
Conveyor B drive belt - Motor pulley cover

6. Remove the **2 hexagonal cap screws** securing the sheet metal frame for the encoder.

7. Carefully, pull the encoder and sheet metal frame away from the main unit. The main motor will now be exposed.

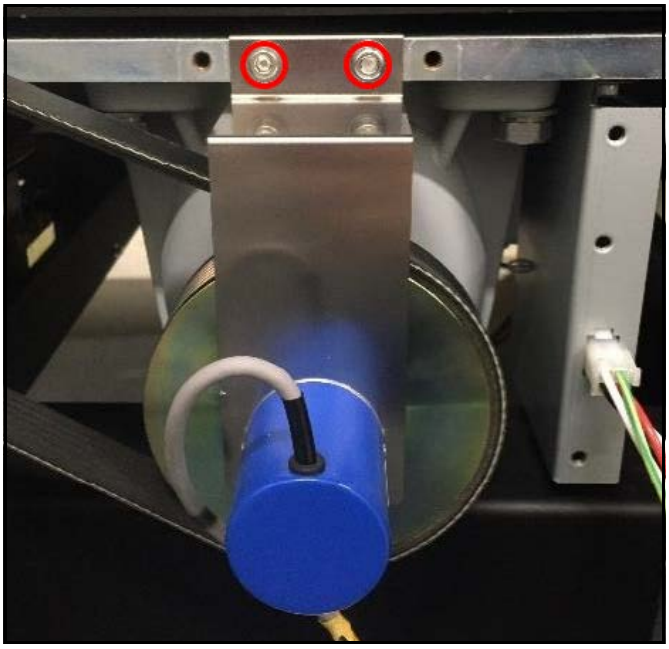


Figure 275
Conveyor B drive belt - Encoder

8. Mark the position of the main motor mount with a marker. It is important to indicate this position, so the motor can be repositioned correctly after belt replacement.

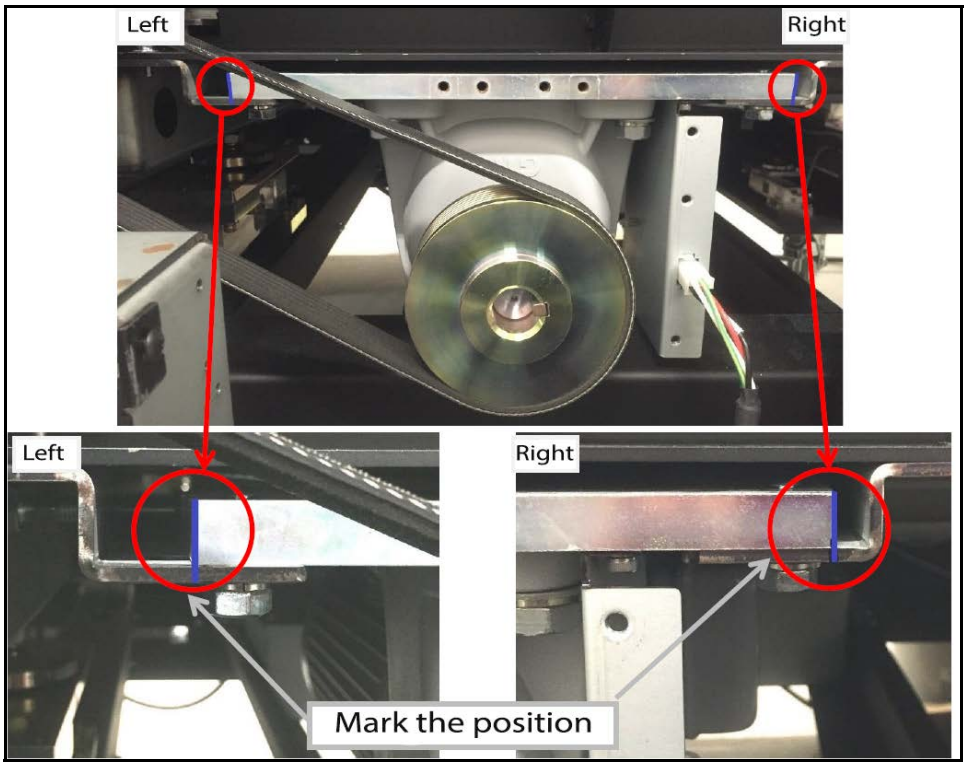


Figure 276
Conveyor B drive belt - Main motor

9. There are **4 sheet metal bolts** securing the motor to the main unit. Loosen the **2 bolts** on the right side by making **4 to 5 turns**.

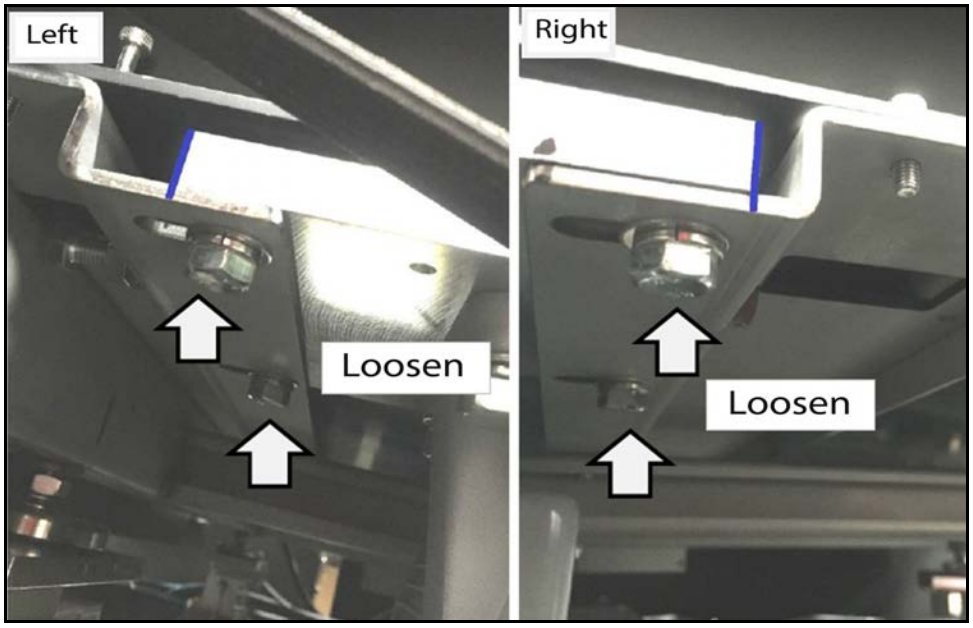


Figure 277
Conveyor B drive belt - Left mount bolts

10. After loosening the right mount bolts, loosen the **2 left mount bolts** by making **4 to 5 turns**.

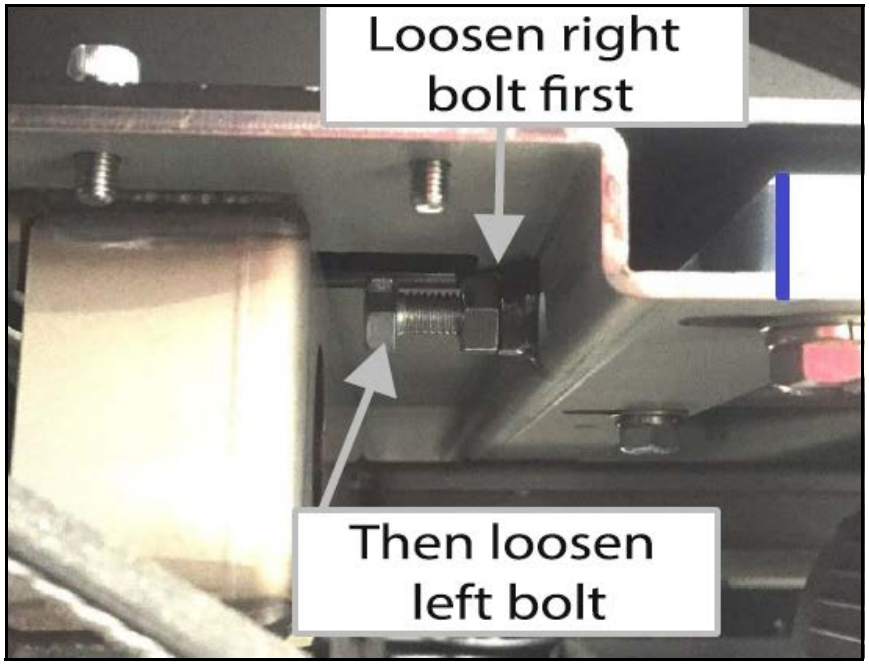


Figure 278
Conveyor B drive belt - Right mount bolts

11. Slide the motor to the left along with the marked sheet metal.

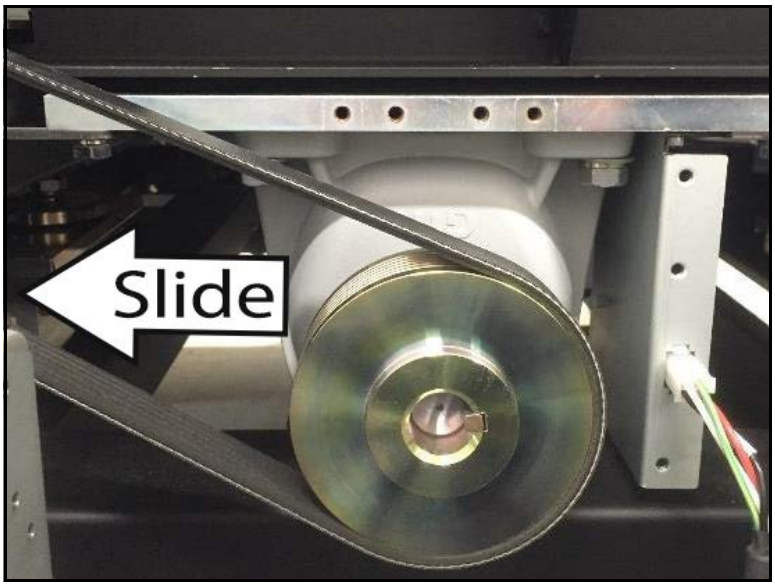


Figure 279
Conveyor B drive belt - Sliding motor

12. Carefully, pull the belt from the motor pulley and rollers, sliding it away from the main unit. Once free, the belt may be serviced or replaced.

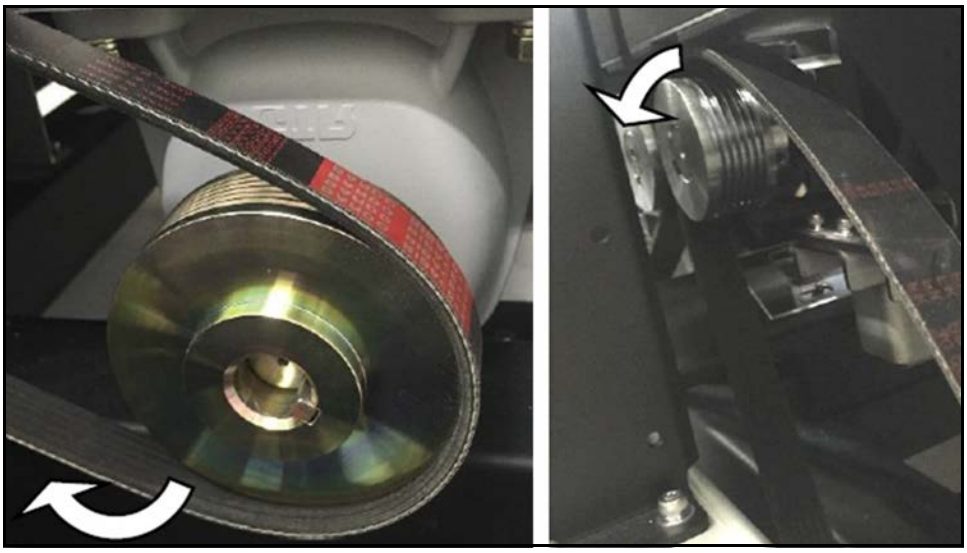


Figure 280
Conveyor B drive belt - Removing belt

Main motor

Conveyor A main motor

The main motor is located within the main motor pulley system. To remove the main motor, first remove the encoder and belt for conveyor A (see "Conveyor A drive belt" on page 192).

NOTE

Even though the belt is not being replaced, it is still important to mark the position of main motor mount before removing the belt. These markings will be used when the belt is reattached following motor servicing.

1. Before pulling out the main motor, unplug the connector as shown in the figure.

2. Tilt the front facing side of the main motor slightly upward, then pull together with the sheet metal frame to remove it.

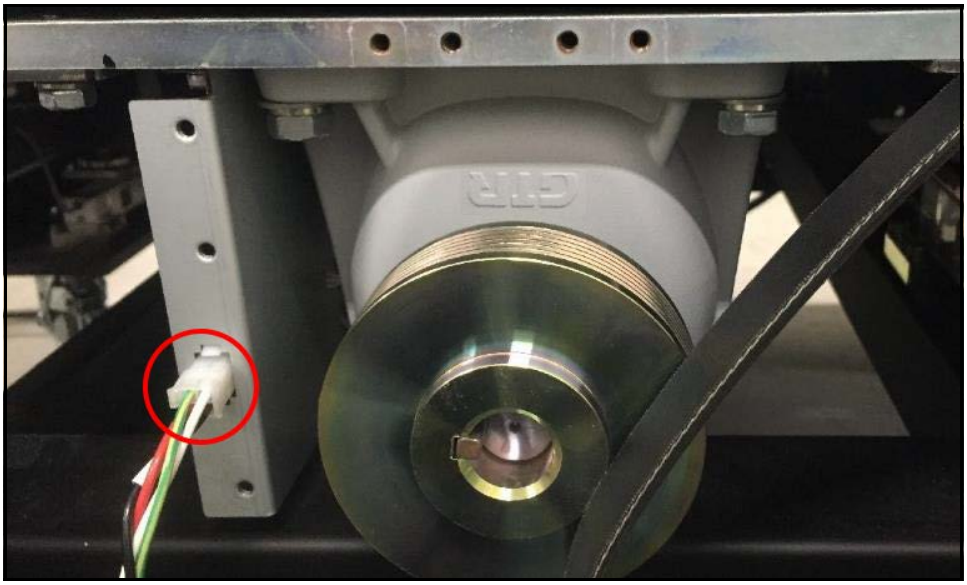


Figure 281
Conveyor A motor - Removing motor

3. Remove the motor connector from the sheet metal frame by holding the side pins of the receiving end of the connector with pliers while pulling through the frame.

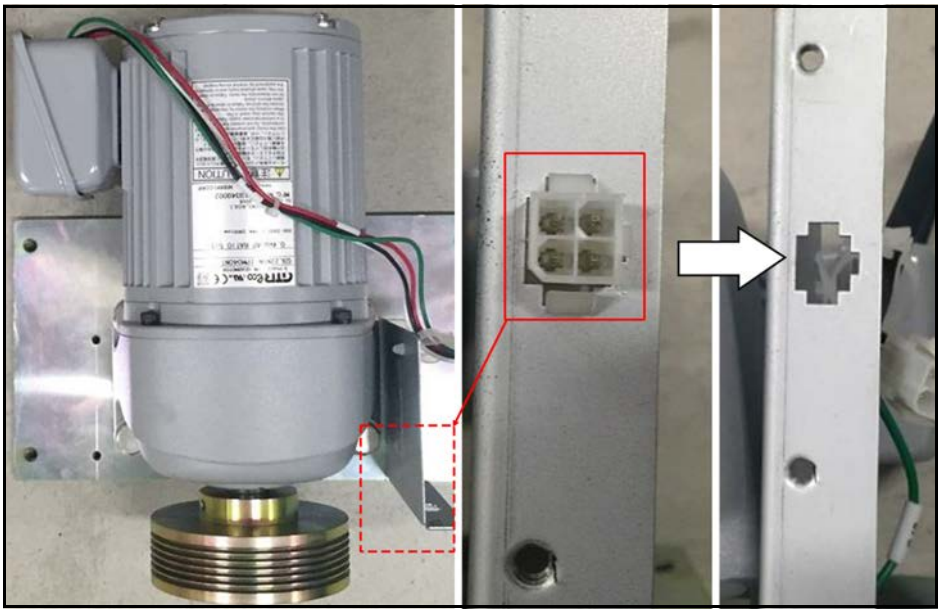


Figure 282
Conveyor A motor - Removing connector (receiving end)

4. Detach the rest of the connector from the sheet metal frame by loosening the plastic clamp securing it.

5. Remove the **hexagonal cap screw** securing the ground wire to the sheet metal frame.

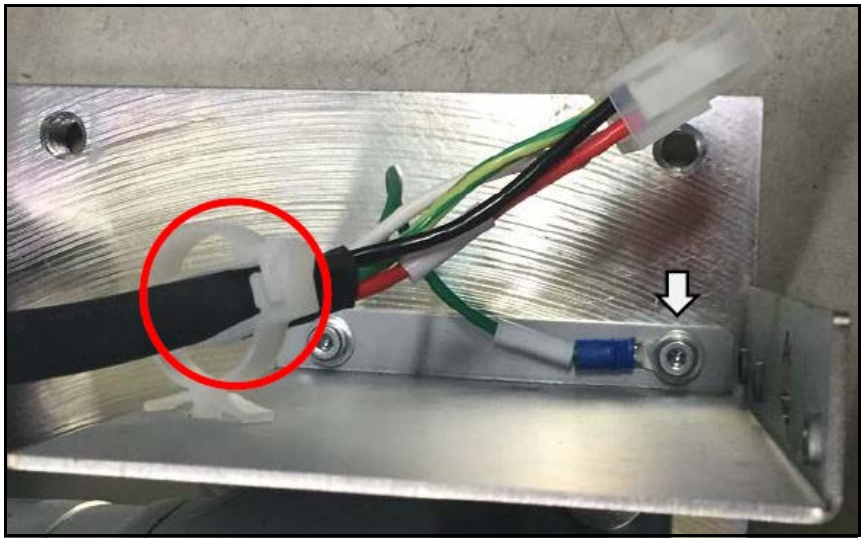


Figure 283
Conveyor A motor - Removing connector

6. Remove the **4 hexagonal bolts** securing the main motor to sheet metal frame.

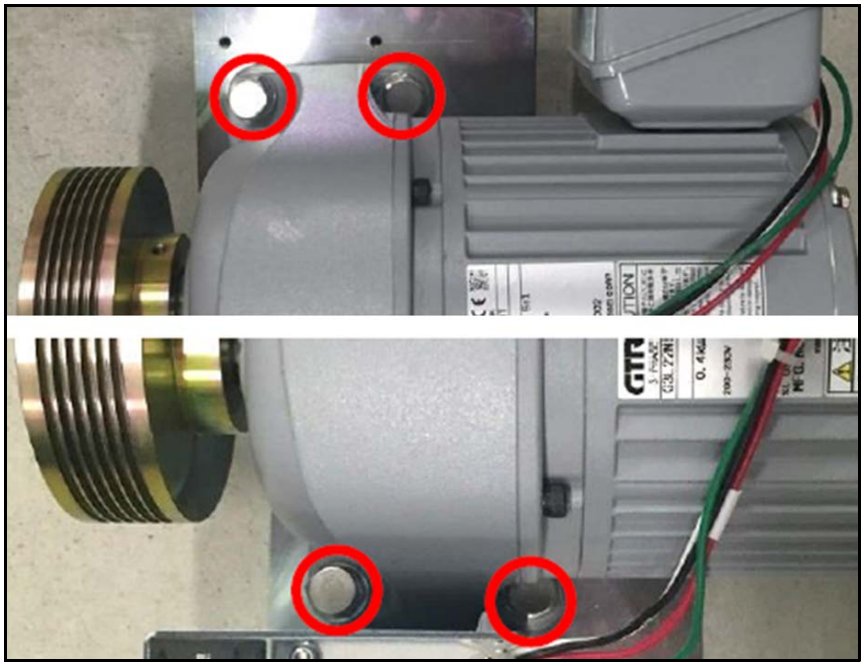


Figure 284
Conveyor A motor - Hexagonal bolts

7. Remove main motor for servicing or replacement.

Conveyor B main motor

The main motor is located within the main motor pulley system. To remove the main motor, first remove the encoder and belt for conveyor B (see "Conveyor B drive belt" on page 197).

NOTE

Even though the belt is not being replaced, it is still important to mark the position of main motor mount before removing the belt. These markings will be used when the belt is reattached following motor servicing.

1. Before pulling out the main motor, unplug the connector as shown in the figure.

2. Tilt the front facing side of the main motor slightly upward, then pull together with the sheet metal frame to remove it.

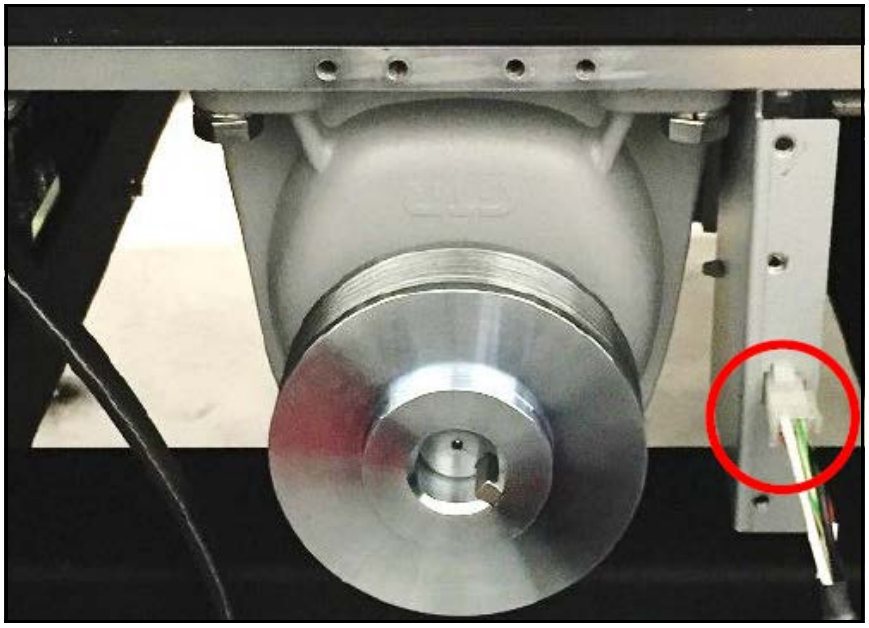


Figure 285
Conveyor B motor - Removing motor

3. Remove the motor connector from the sheet metal frame by holding the side pins of the receiving end of the connector with pliers while pulling through the frame.

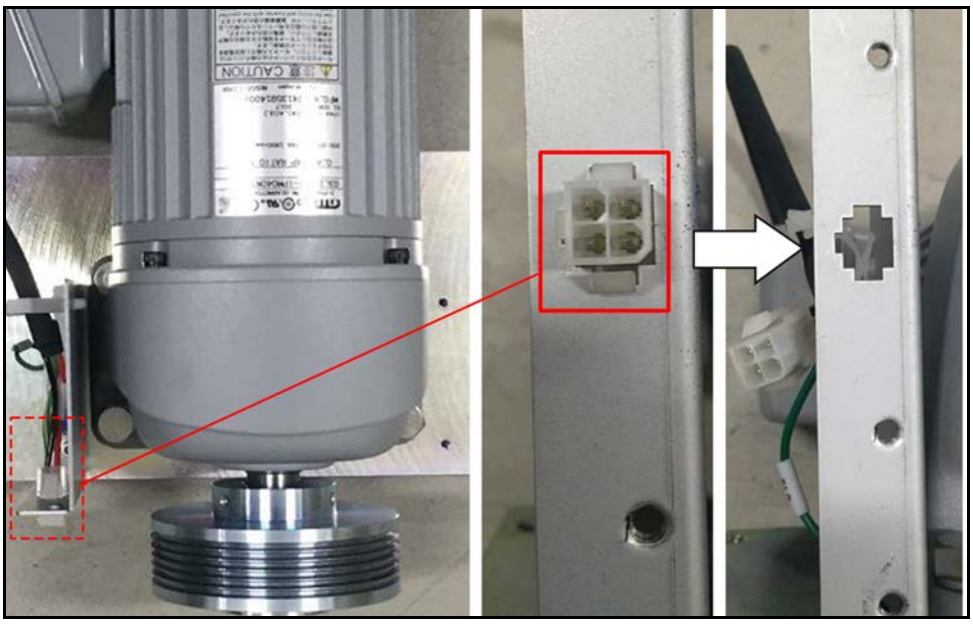


Figure 286
Conveyor B motor - Removing connector (receiving end)

4. Detach the rest of the connector from the sheet metal frame by loosening the plastic clamp securing the connector.

5. Remove the **hexagonal cap screw** securing the ground wire to the sheet metal frame.

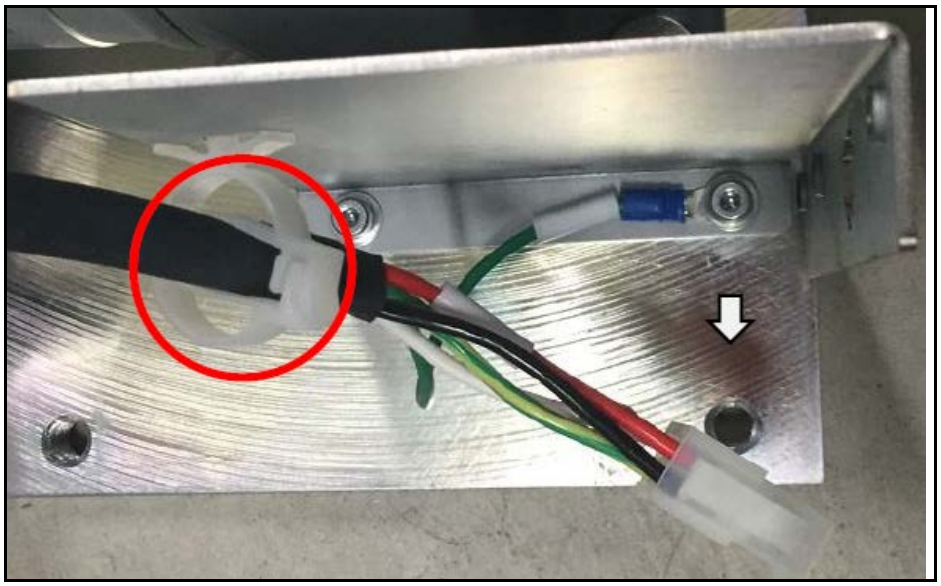


Figure 287
Conveyor B motor - Removing connector

6. Remove the **4 hexagonal bolts** securing the main motor to sheet metal frame.

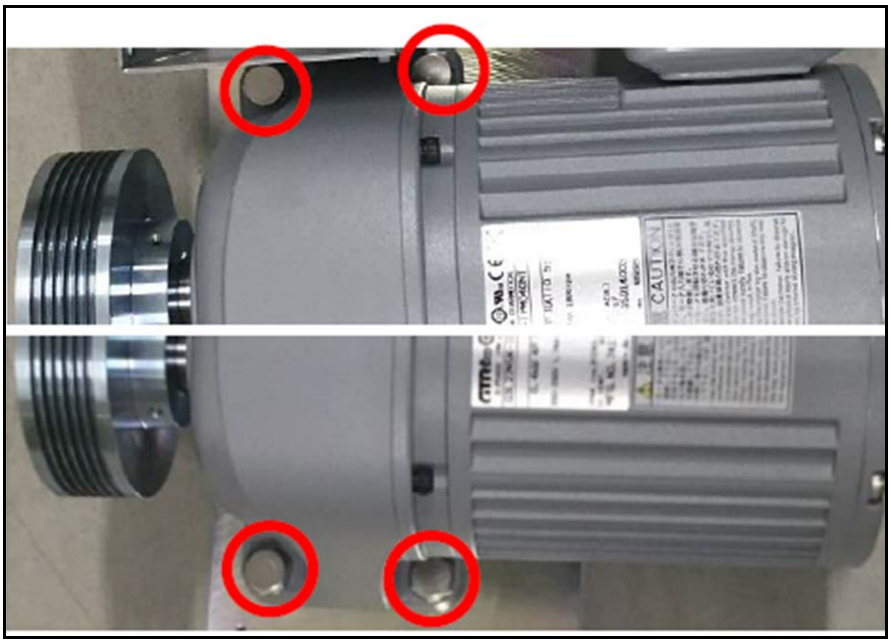


Figure 288
Conveyor B motor - Hexagonal bolts

7. Remove main motor for servicing or replacement.

Roller/ transport belt

Conveyor A driven roller

1. Remove the **6 screws** and pull off the cover.

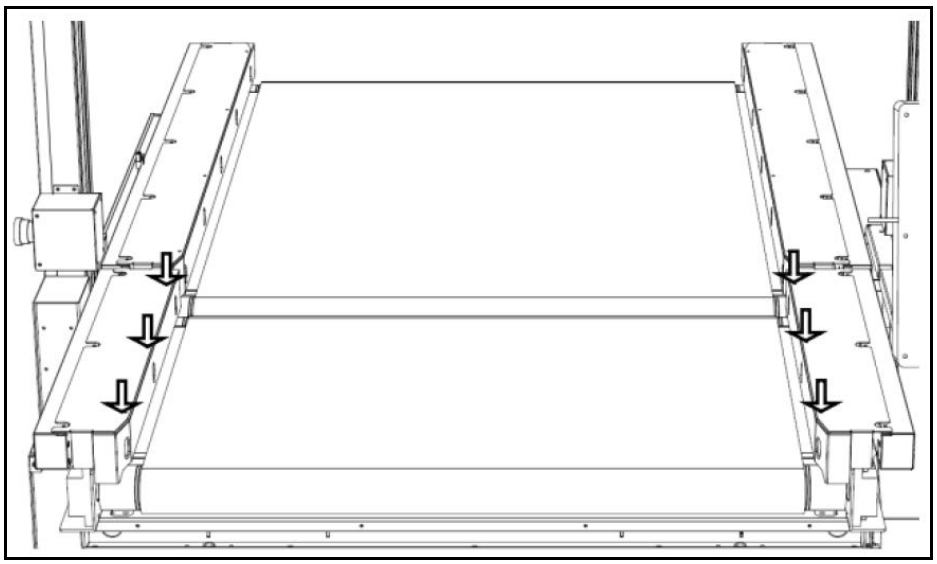


Figure 289
Conveyor A driven roller - Cover screws

2. Remove the guide on the back side of the main unit by removing the **3 hexagonal cap screws**.

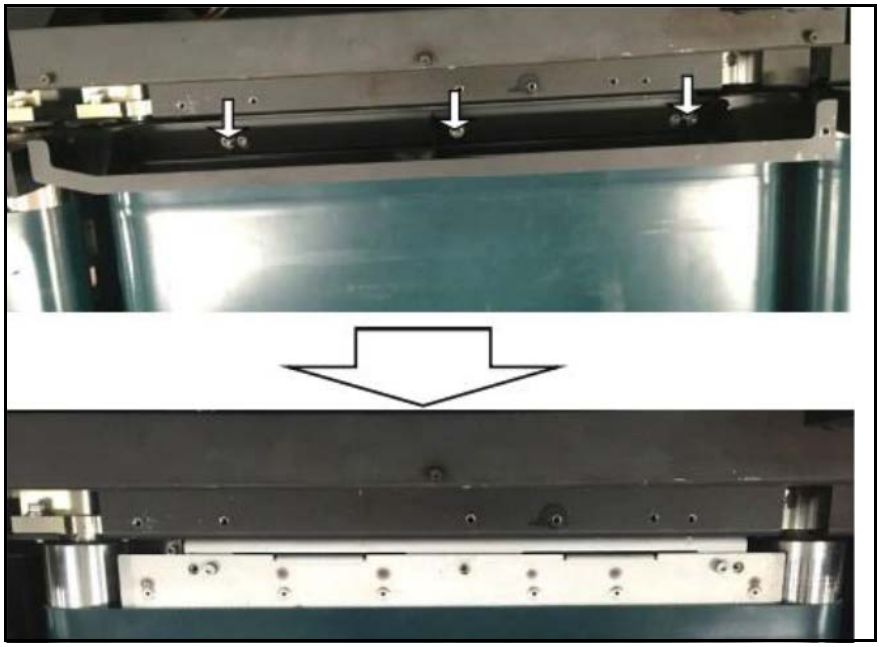


Figure 290
Conveyor A driven roller - Removing guide (back side)

3. Remove the guide on the front side of the main unit by removing the **3 hexagonal cap screws**.

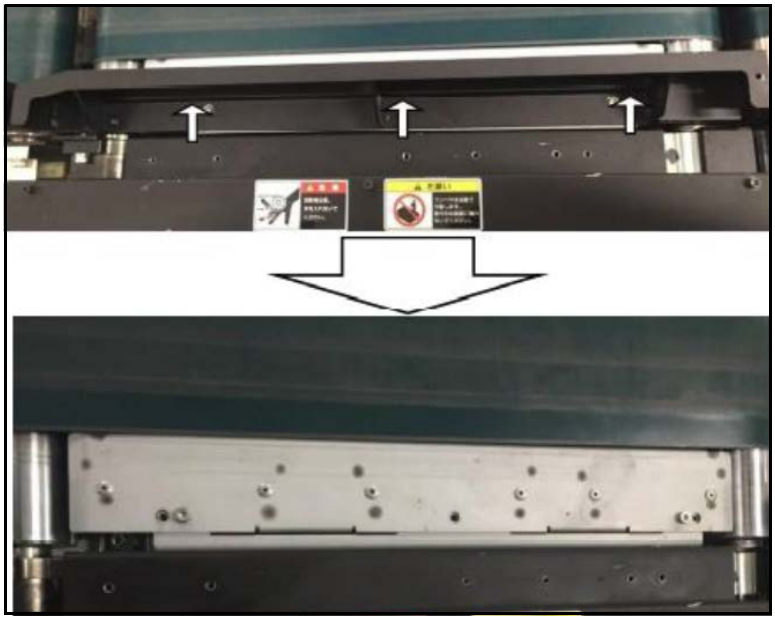


Figure 291
Conveyor A driven roller - Removing guide (front side)

4. Use sticker/tape and pen to mark the position of each adjuster as illustrated in the figure.

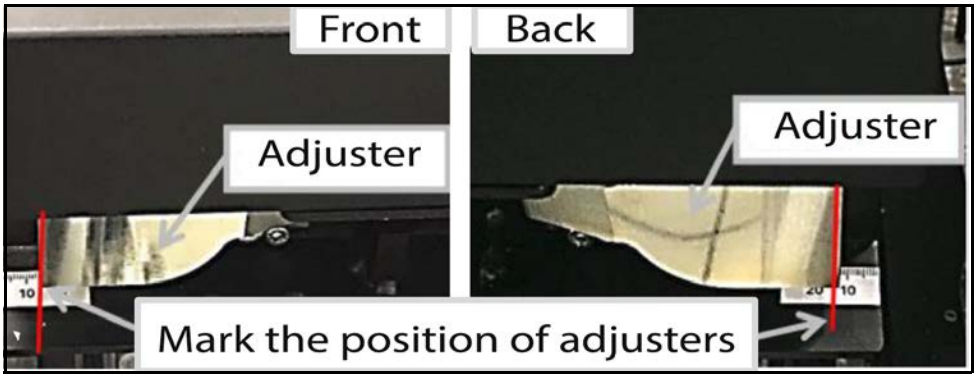


Figure 292
Conveyor A driven roller - Marking adjustment

5. Loosen the **4 hexagonal screws** that secure each adjuster (8 screws in total).

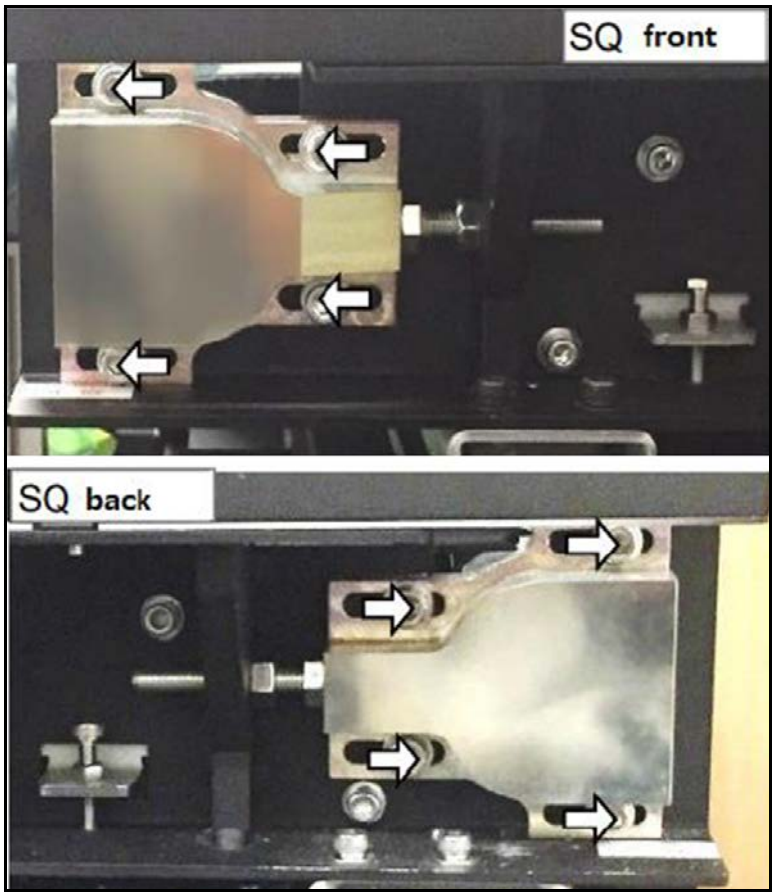


Figure 293
Conveyor A driven roller - Loosening adjusters

6. Loosen the hexagonal nut that secures the frame to the position of the bolt head.

7. To loosen belt tension, tighten the hexagonal bolt near the adjuster by turning it in the direction indicated by the arrow in the figure.

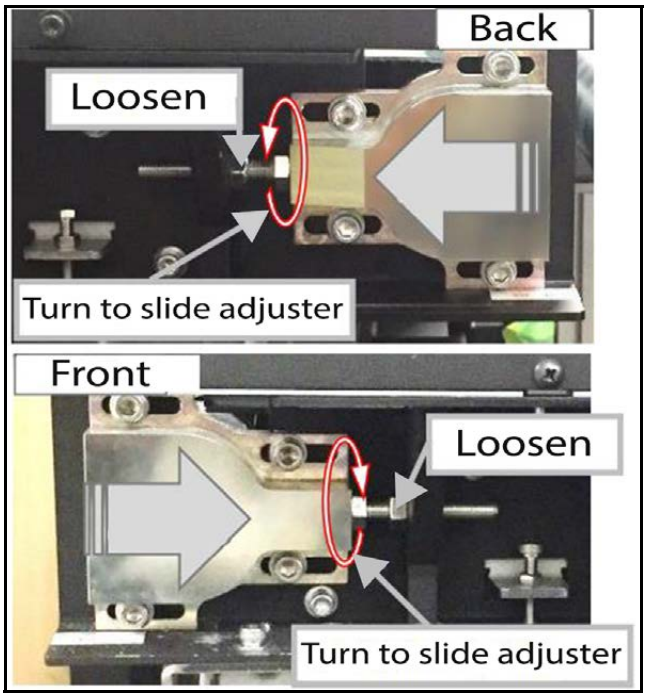


Figure 294
Conveyor A driven roller - Loosen belt tension

8. Remove each adjuster by removing the **4 loosened hexagonal screws**.

9. Lift the driven roller up and pull toward the side as depicted in the figure.

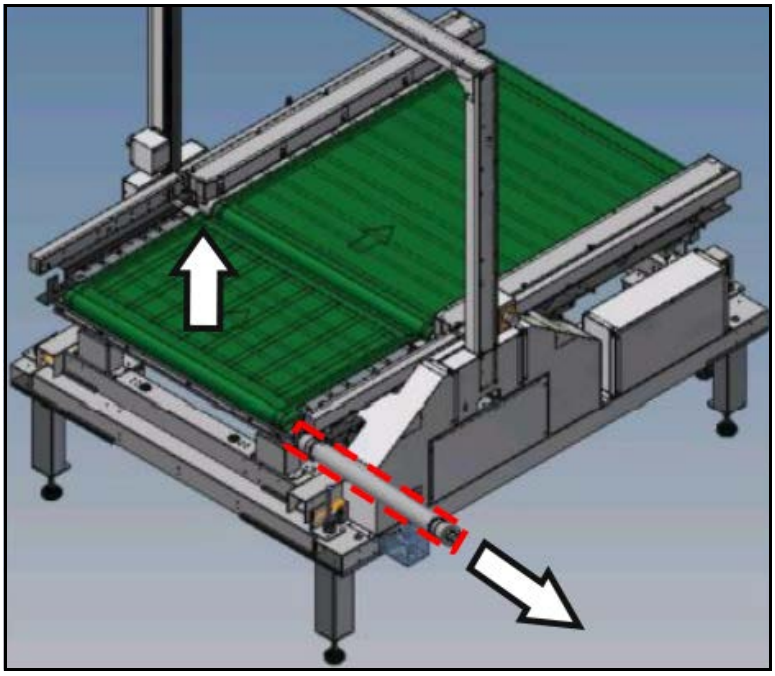


Figure 295
Conveyor A driven roller - Removing roller

10. The driven roller is now free to be serviced or replaced.

Conveyor A drive roller

1. Remove the driven roller (see “Conveyor A driven roller” on page 208).
2. Remove the drive roller belt (see “Conveyor A drive belt” on page 192).

3. Remove the **8 screws** and remove the back cover.

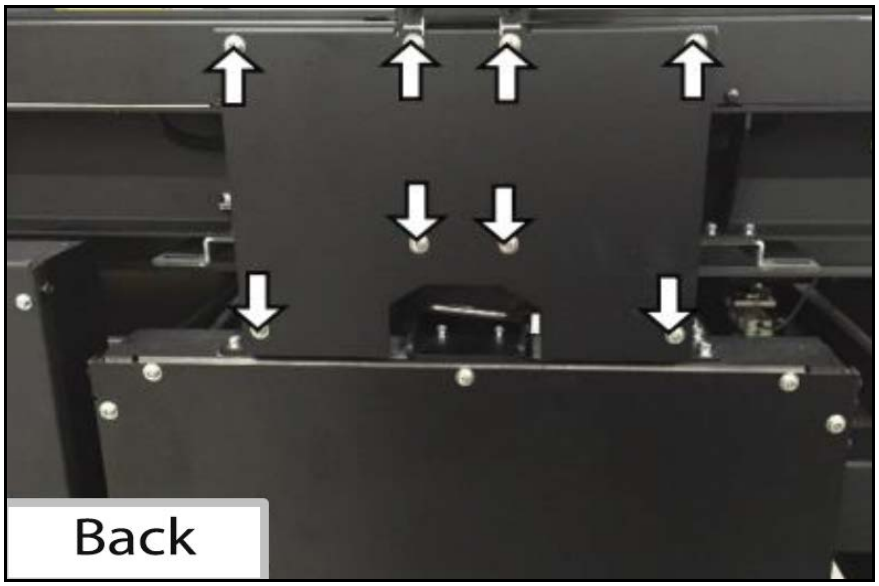


Figure 296
Conveyor A roller - Removing back cover

4. Loosen the **2 immobilizers** and pull out the pulley from the roller.

5. Pinch the key attached to the roller with pliers and remove.

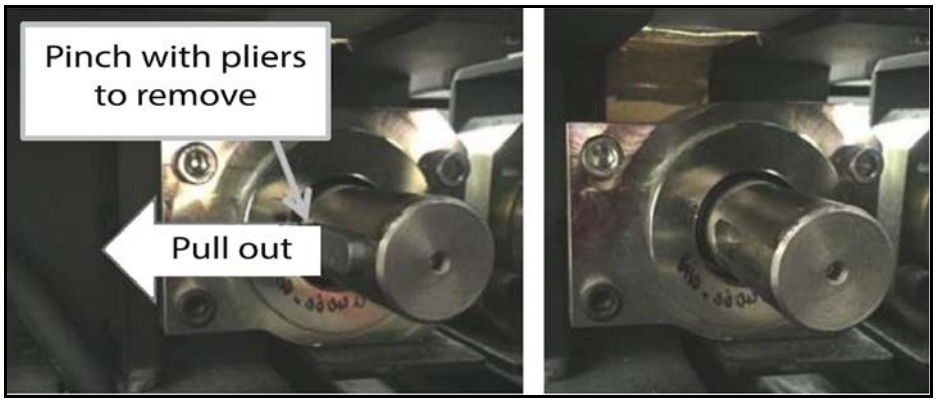


Figure 297
Conveyor A roller - Removing pulley

6. Remove the **4 hexagonal screws** at each end of the bearing unit and remove unit.

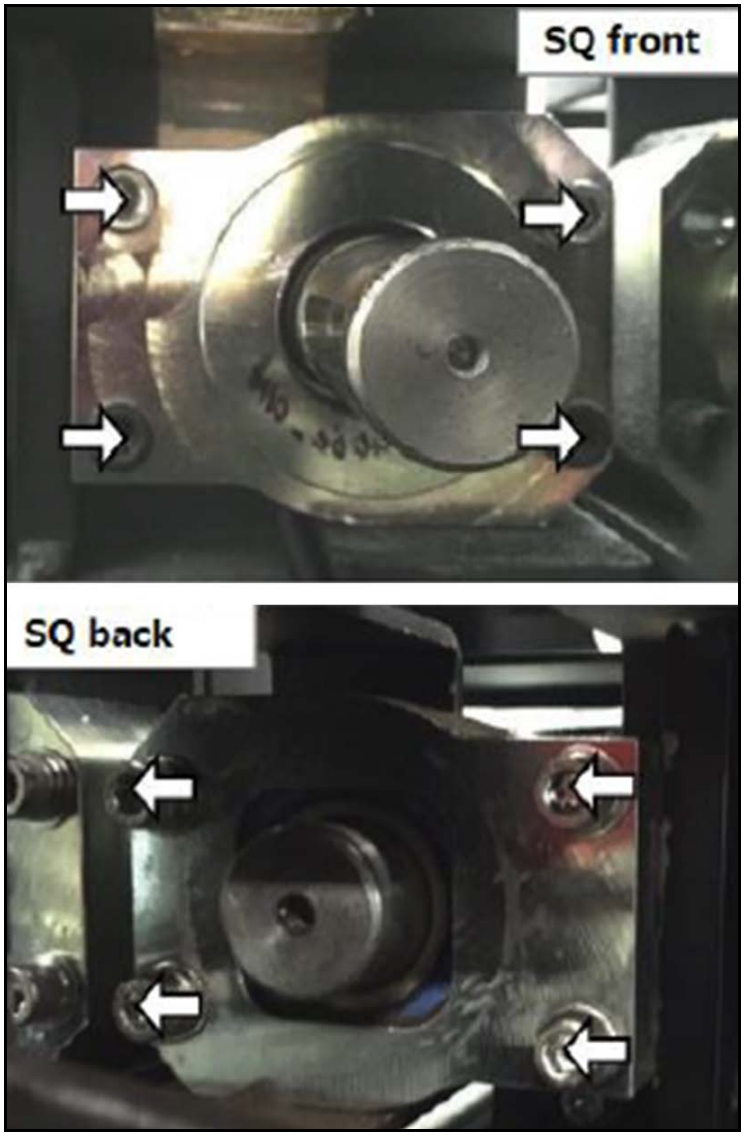


Figure 298
Conveyor A roller - Bearing unit

7. Lift the drive roller and pull to remove it as indicated in the figure.

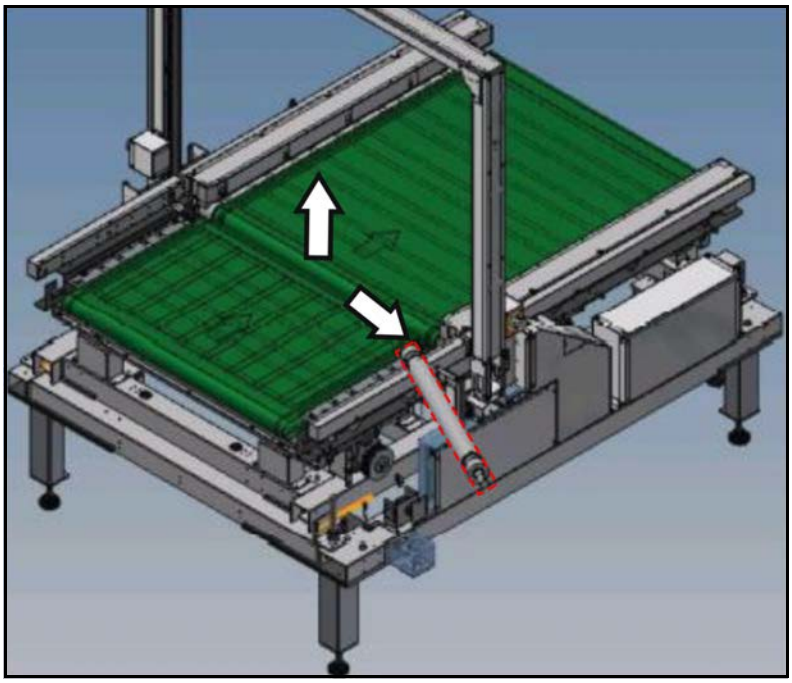


Figure 299
Conveyor A roller - Removing drive roller

Conveyor A transport belt

1. Remove the driven roller (see "Conveyor A driven roller" on page 208).
2. Remove the drive roller (see "Conveyor A drive roller" on page 212).

3. Remove the **4 hexagonal screws** that secure the top plate.

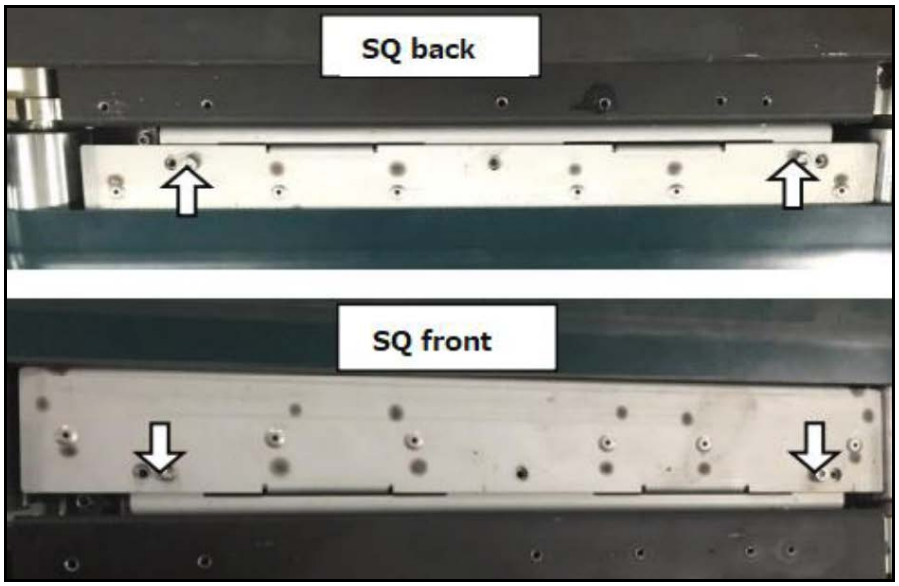


Figure 300
Conveyor A Transport belt - Removing top plate

4. Lift one side of conveyor and pull transport belt to remove.

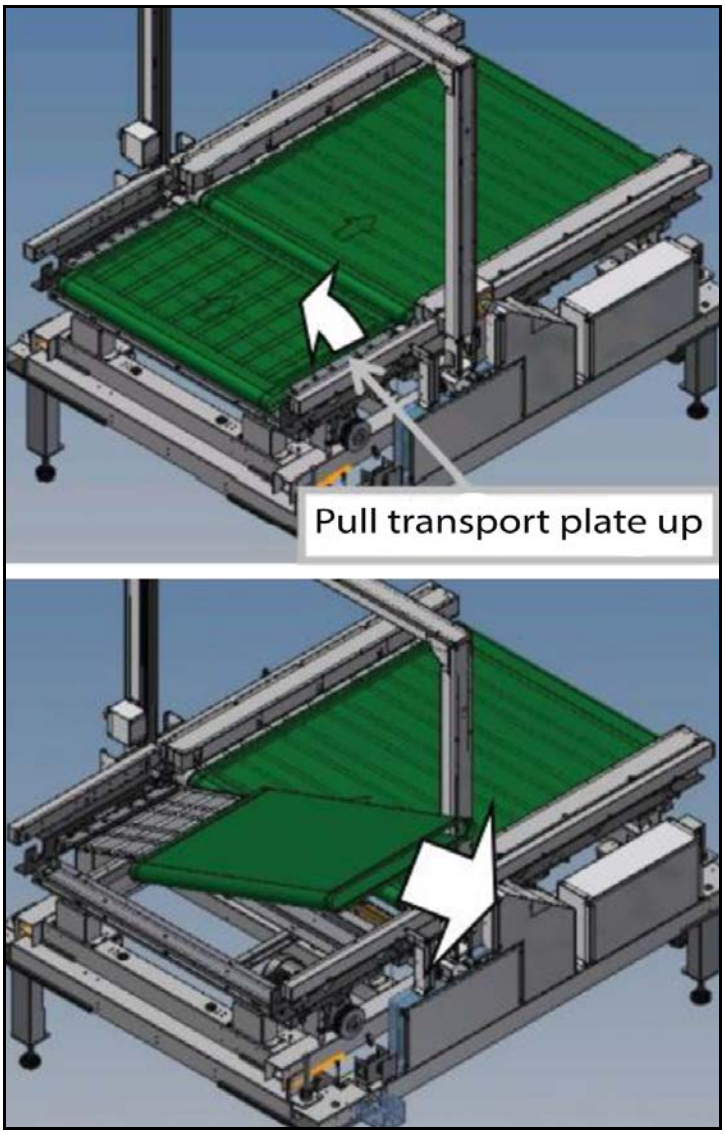


Figure 301
Conveyor A Transport belt - Removing transport belt

5. After removing the transport belt, gently set top plate back in place.

Conveyor B driven roller

1. Remove the **8 screws** and pull off the cover.

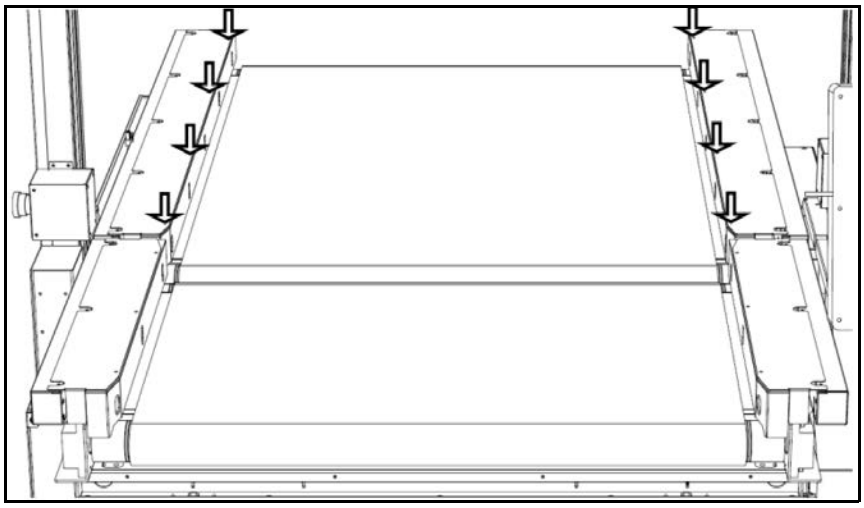


Figure 302
Conveyor B driven roller - Cover screws

2. Remove the guide on the back side of the main unit by removing the **6 hexagonal cap screws**.

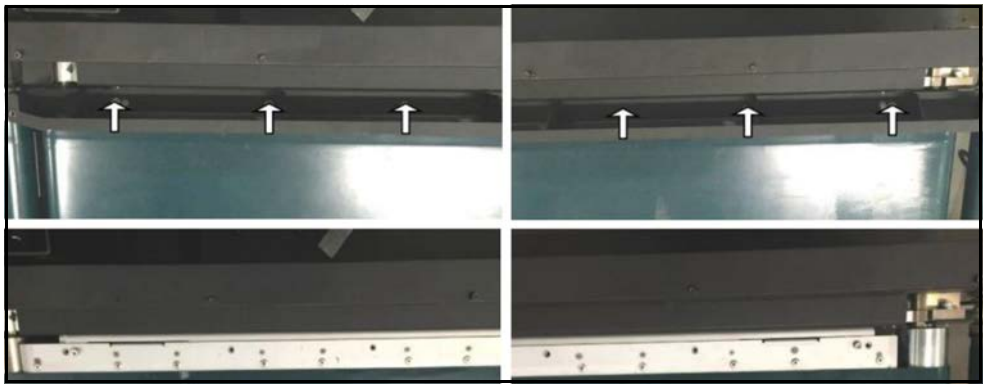


Figure 303
Conveyor B driven roller - Removing guide (back side)

3. Remove the guide on the front side of the main unit by removing the **6 hexagonal cap screws**.

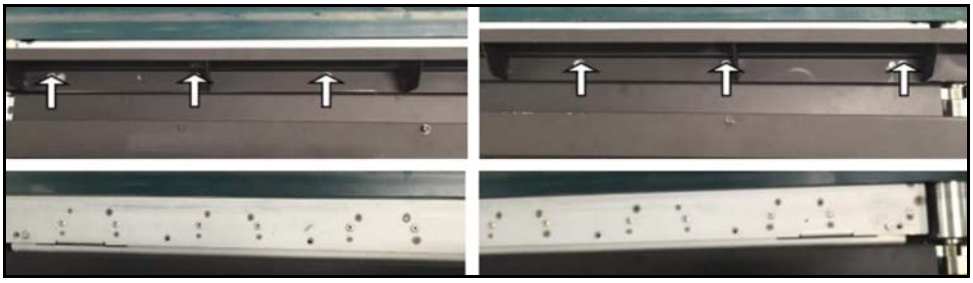


Figure 304
Conveyor B driven roller - Removing guide (front side)

4. Use sticker/tape and pen to mark the position of each adjuster as illustrated in the figure.

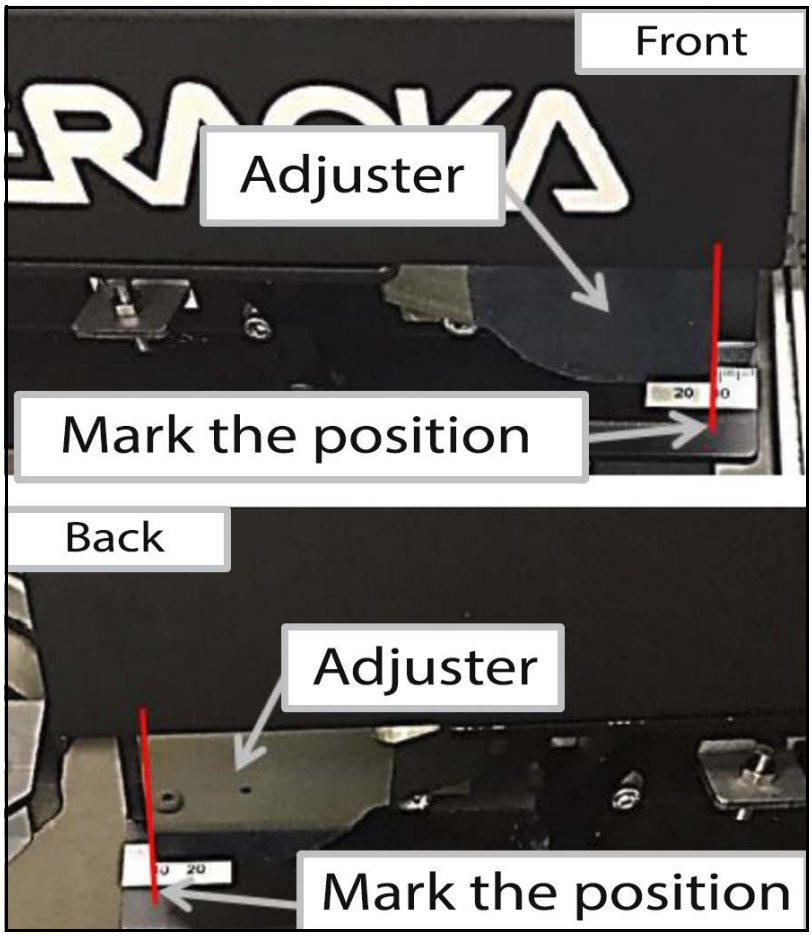


Figure 305
Conveyor B driven roller - Marking adjustment

5. Loosen the **4 hexagonal screws** that secure each adjuster (8 screws in total).

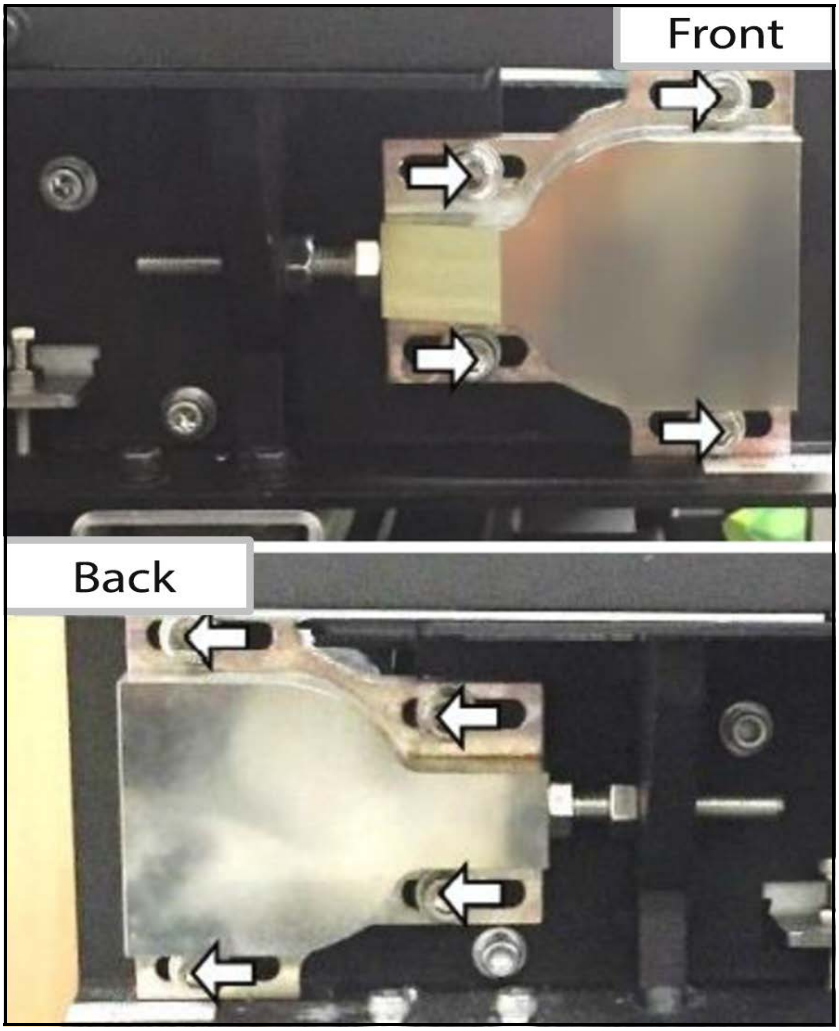


Figure 306
Conveyor B driven roller - Loosening adjusters

6. Loosen the hexagonal nut that secures the frame to the position of the bolt head.

7. To loosen belt tension, tighten the hexagonal bolt near the adjuster by turning it as shown in the figure.

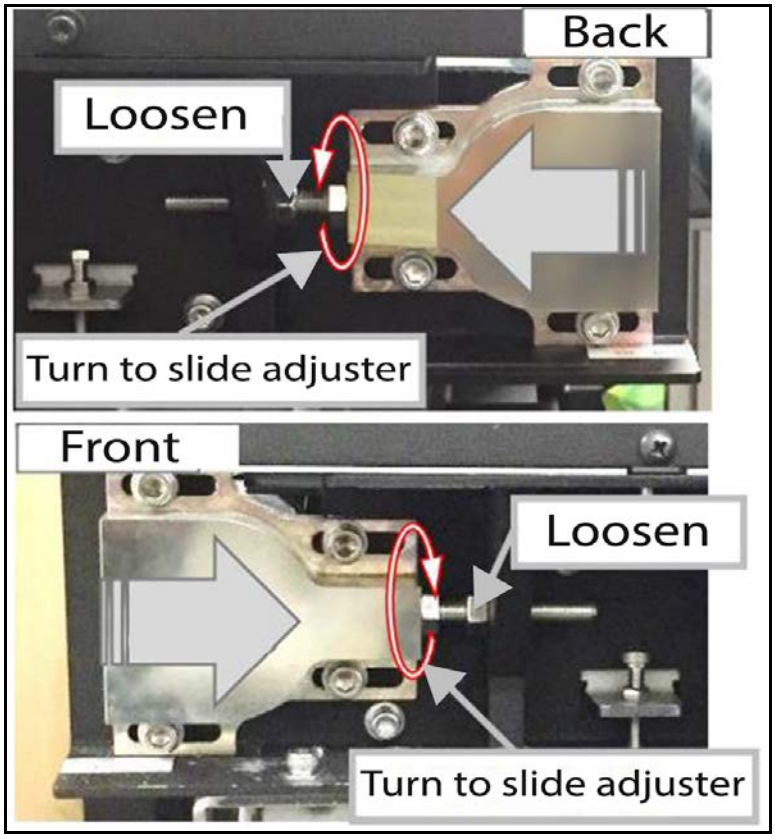


Figure 307
Conveyor B driven roller - Loosen belt tension

8. Remove each adjuster by removing the **4 loosened hexagonal screws**.

9. Lift the driven roller up and pull toward the side as depicted in the figure.

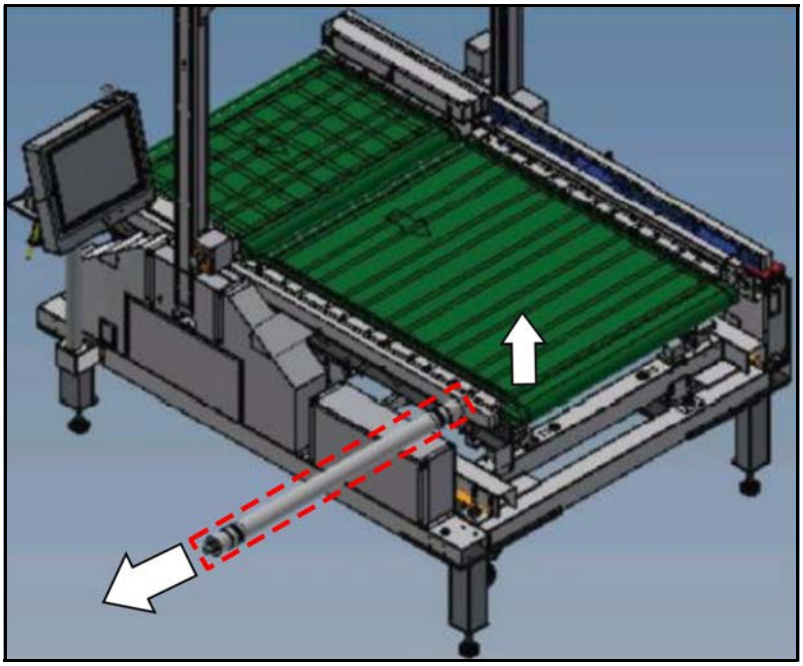


Figure 308
Conveyor B driven roller - Removing roller

10. The driven roller is now free to be serviced or replaced.

Conveyor B drive roller

1. Remove the driven roller (see “Conveyor B driven roller” on page 218).
2. Remove the drive roller belt (see “Conveyor B drive belt” on page 197).

3. Remove the **8 screws** and remove the back cover.

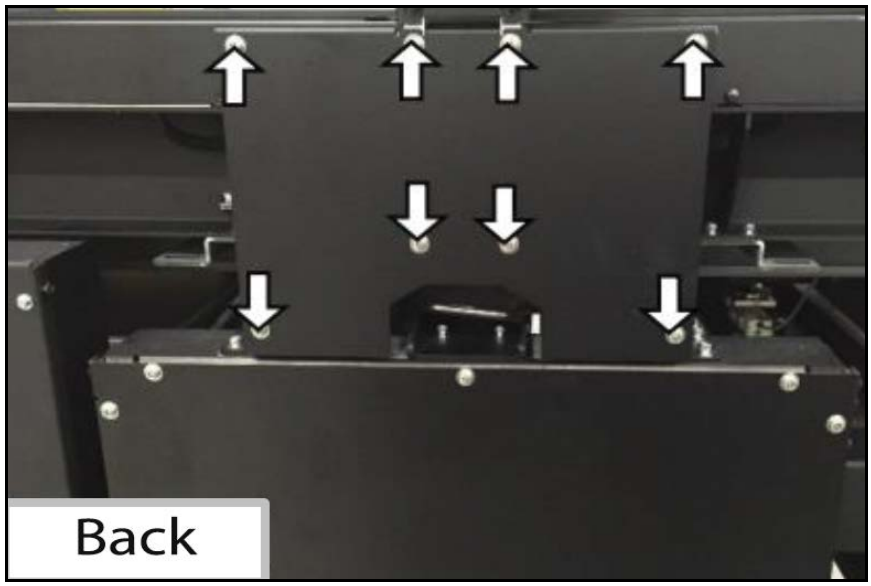


Figure 309
Conveyor B drive roller - Removing back cover

4. Loosen the **2 immobilizers** and pull out the pulley from the roller.

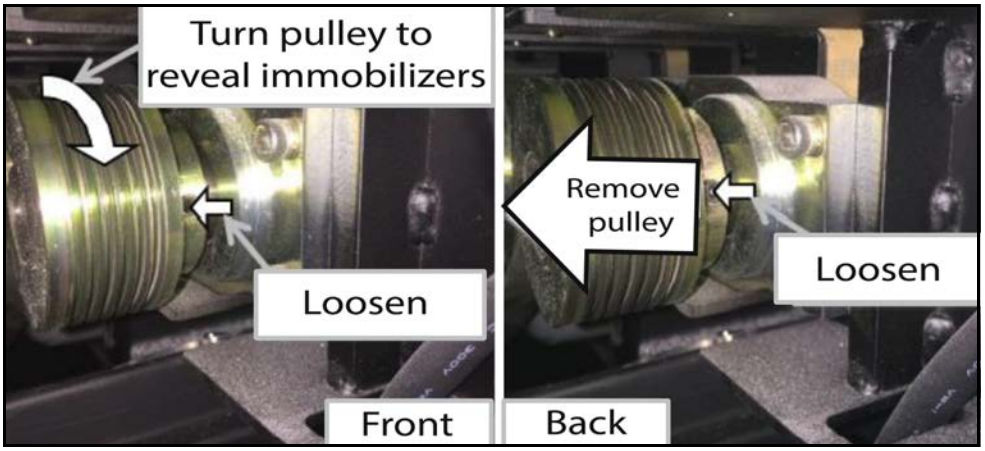


Figure 310
Conveyor B drive roller - Loosening immobilizers

5. Pinch the key attached to the roller with pliers and remove.

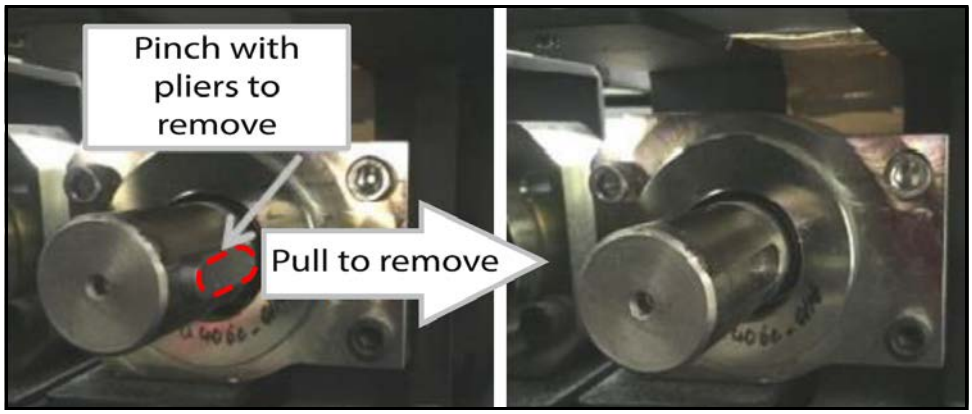


Figure 311
Conveyor B drive roller - Removing pulley

6. Remove the **4 hexagonal screws** at each end of the bearing unit and remove unit.

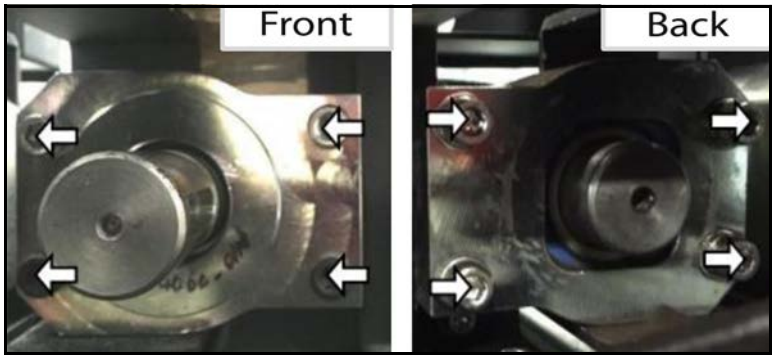


Figure 312
Conveyor B drive roller - Bearing unit

7. Lift the drive roller and pull to remove it as indicated in the figure.

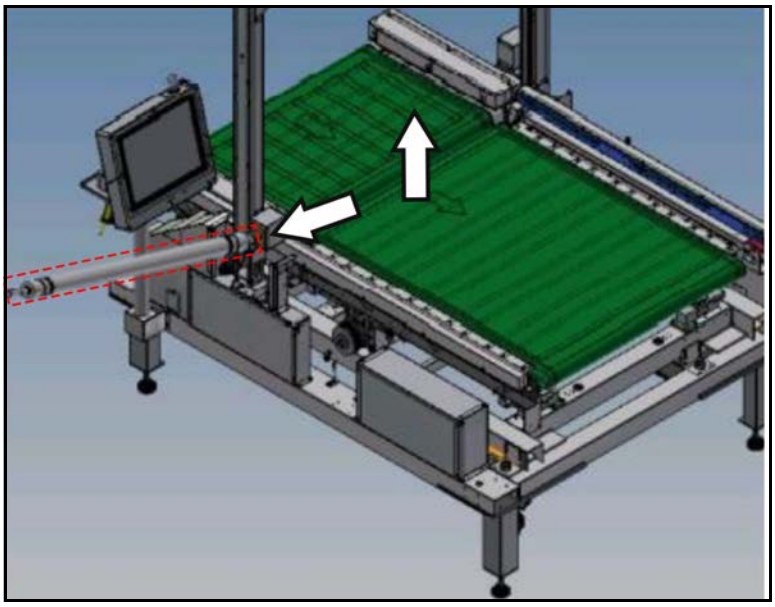


Figure 313
Conveyor B drive roller - Removing drive roller

Conveyor B transport belt

1. Remove the driven roller (see "Conveyor B driven roller" on page 218).
2. Remove the drive roller belt (see "Conveyor B drive belt" on page 197).
3. Remove the **4 hexagonal screws** that secure the top plate.

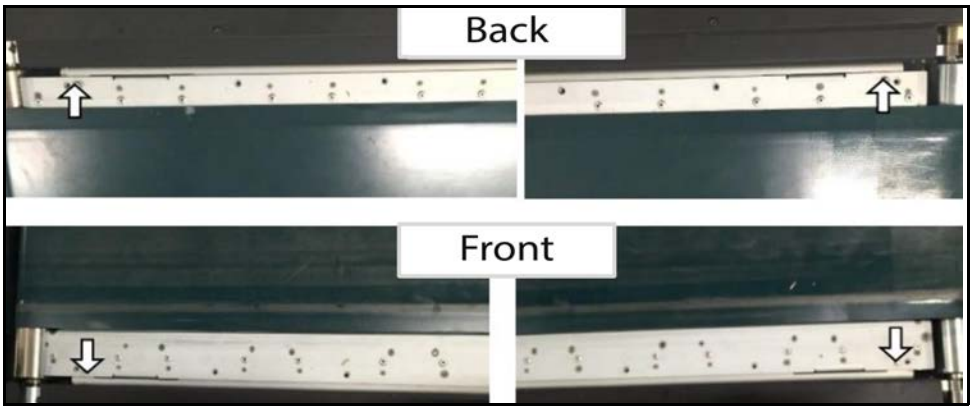


Figure 314
Conveyor B Transport belt - Removing top plate

4. Lift one side of conveyor and pull transport belt to remove.

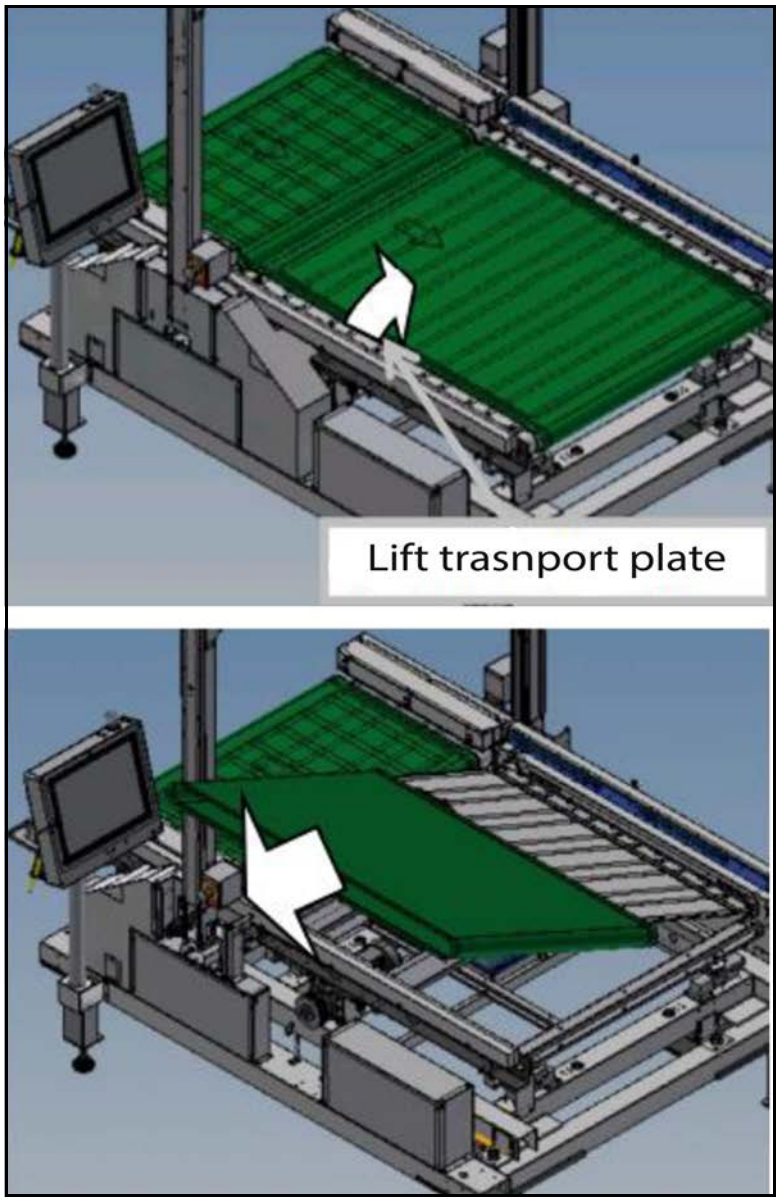


Figure 315
Conveyor B Transport belt - Removing transport belt

5. After removing the transport belt, gently set top plate back in place.

CHAPTER 5
BOARDS & PARTS

Block diagram

Display

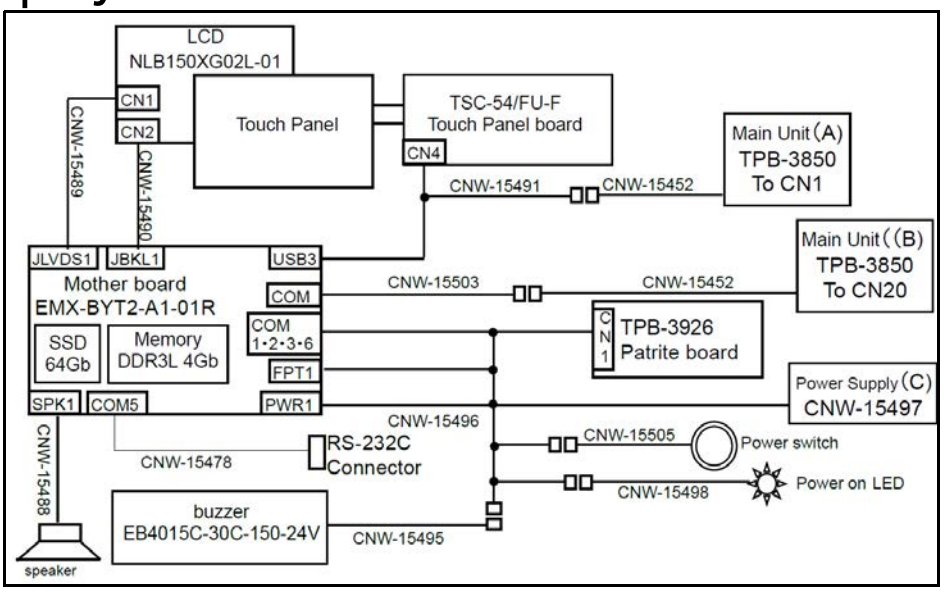


Figure 316
Block diagram - Display

Inverter

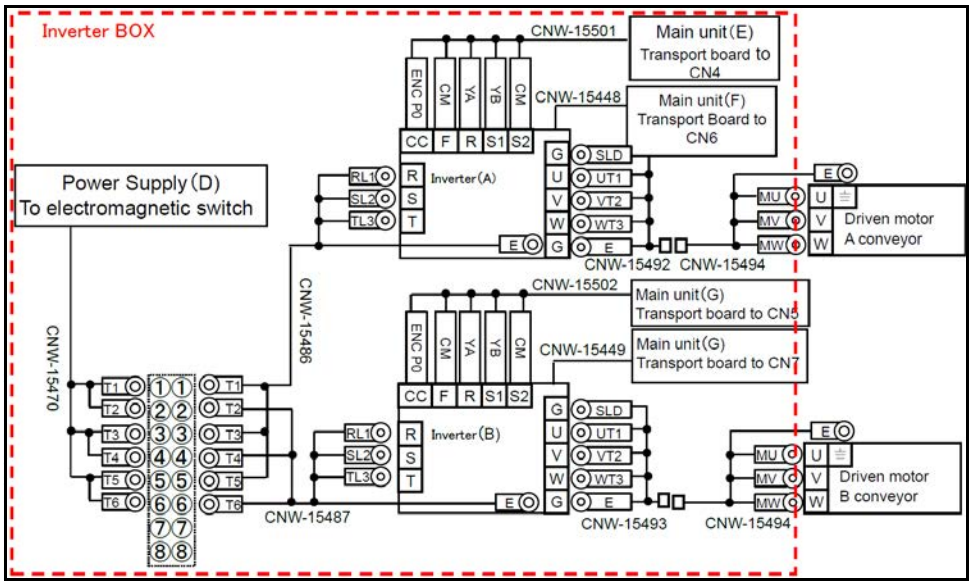


Figure 317
Block diagram - Inverter

Power supply

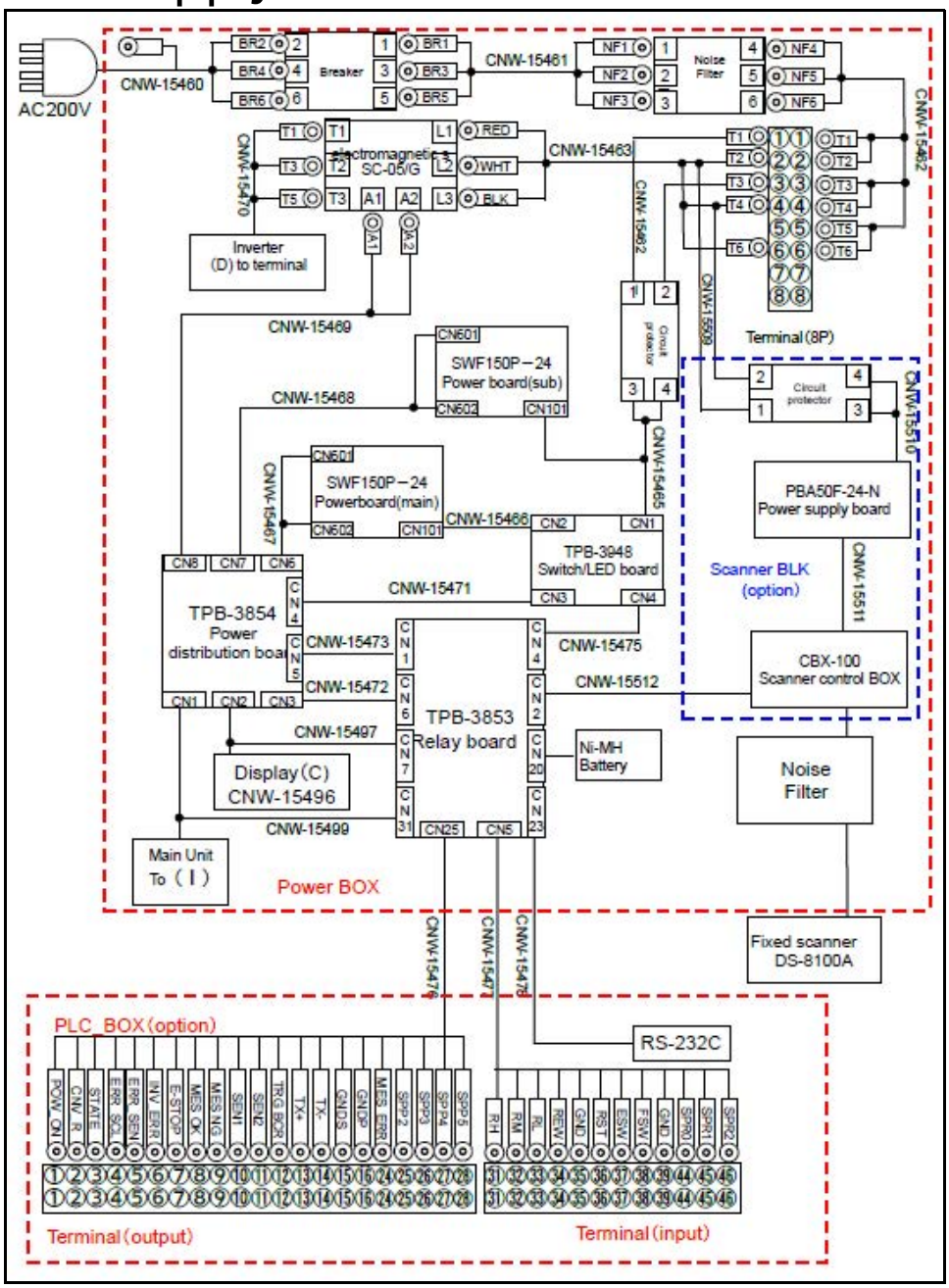


Figure 318
Block diagram - Power supply

Main unit

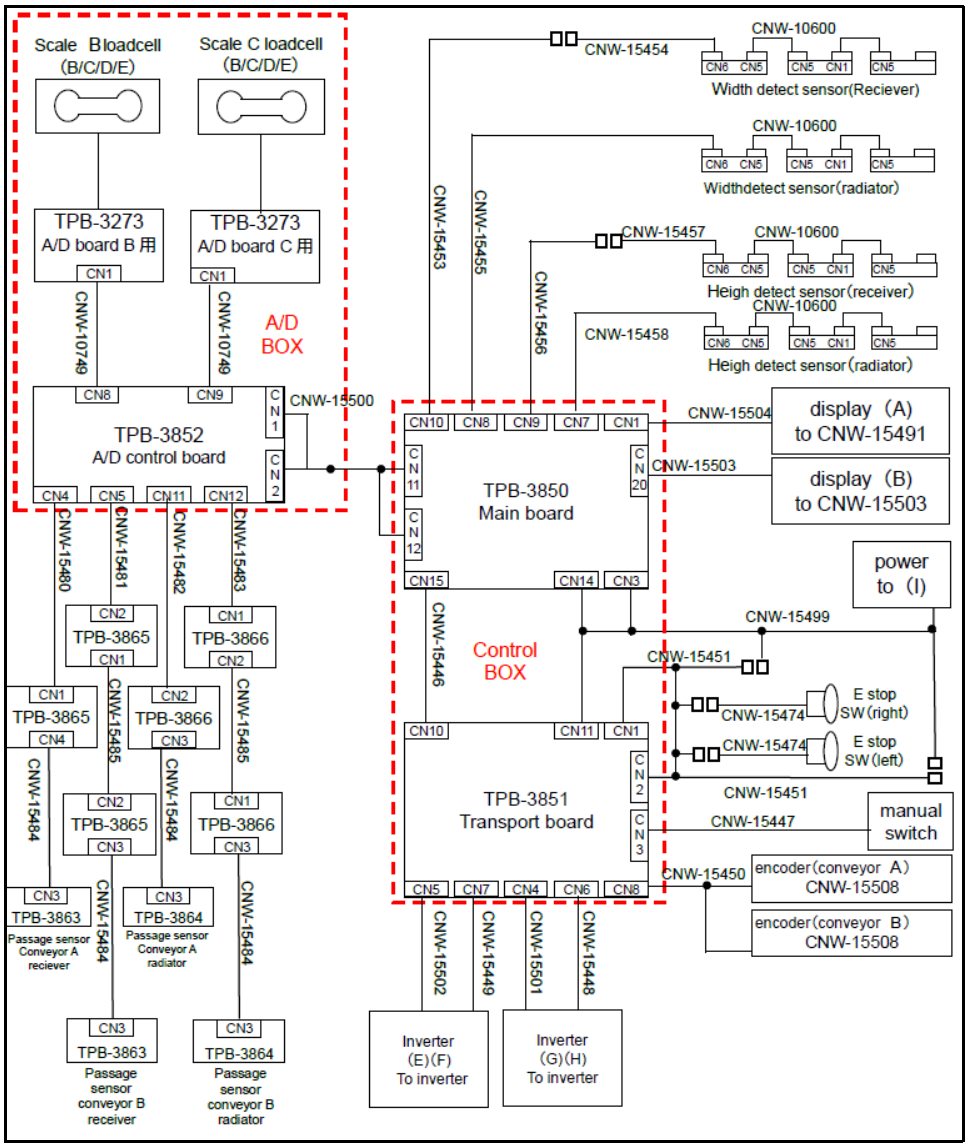


Figure 319
Block diagram - Main unit

Boards

Main board: TPB-3850

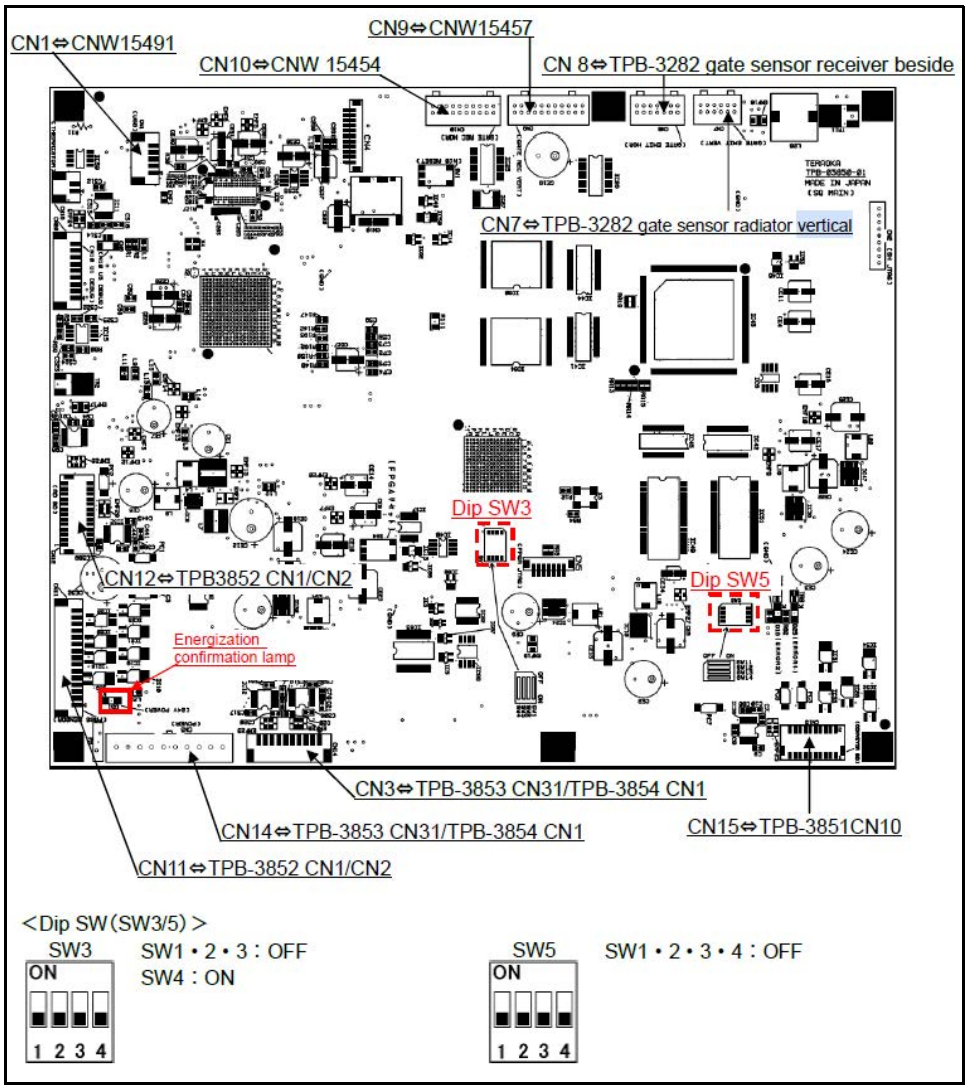


Figure 320
Boards- Main board (TPB-3850)

Transport board: TPB-3851

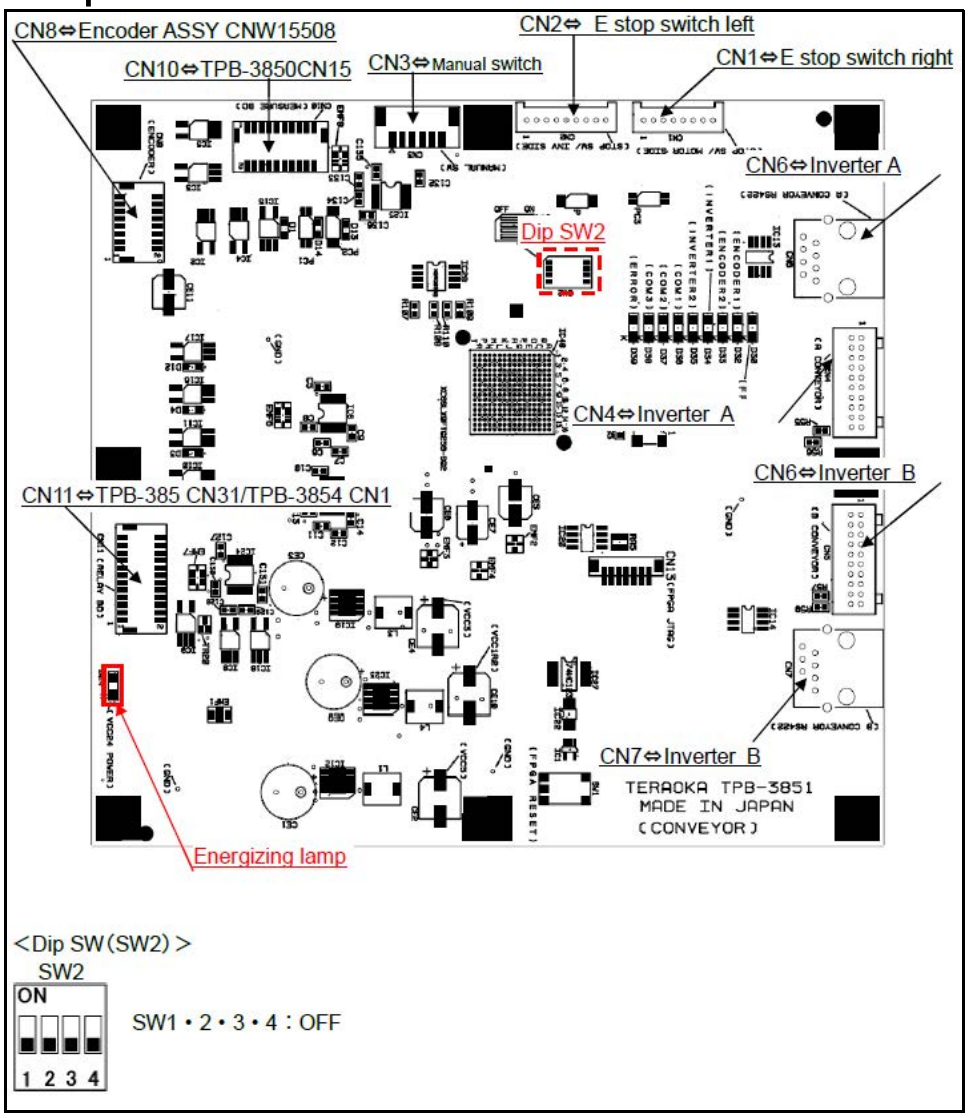


Figure 321
Boards- Transport board (TPB-3851)

A/D board: TPB-3273

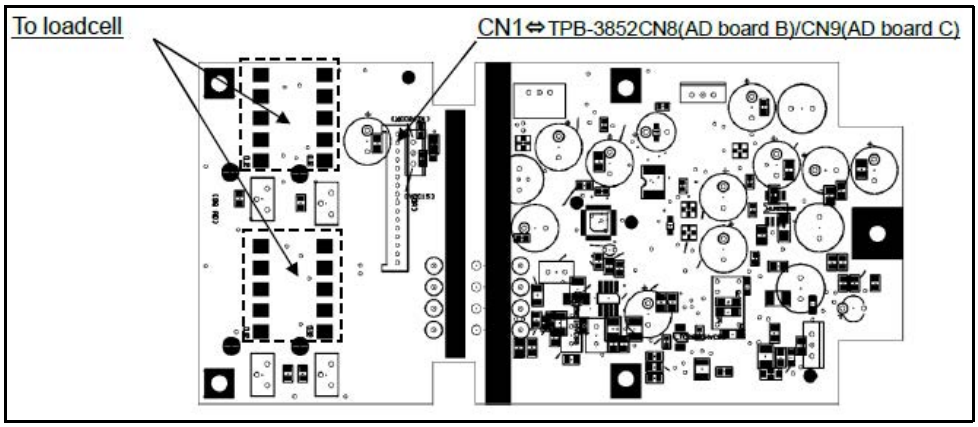


Figure 322
Boards- A/D board (TPB-3273)

A/D control board: TPB-3852

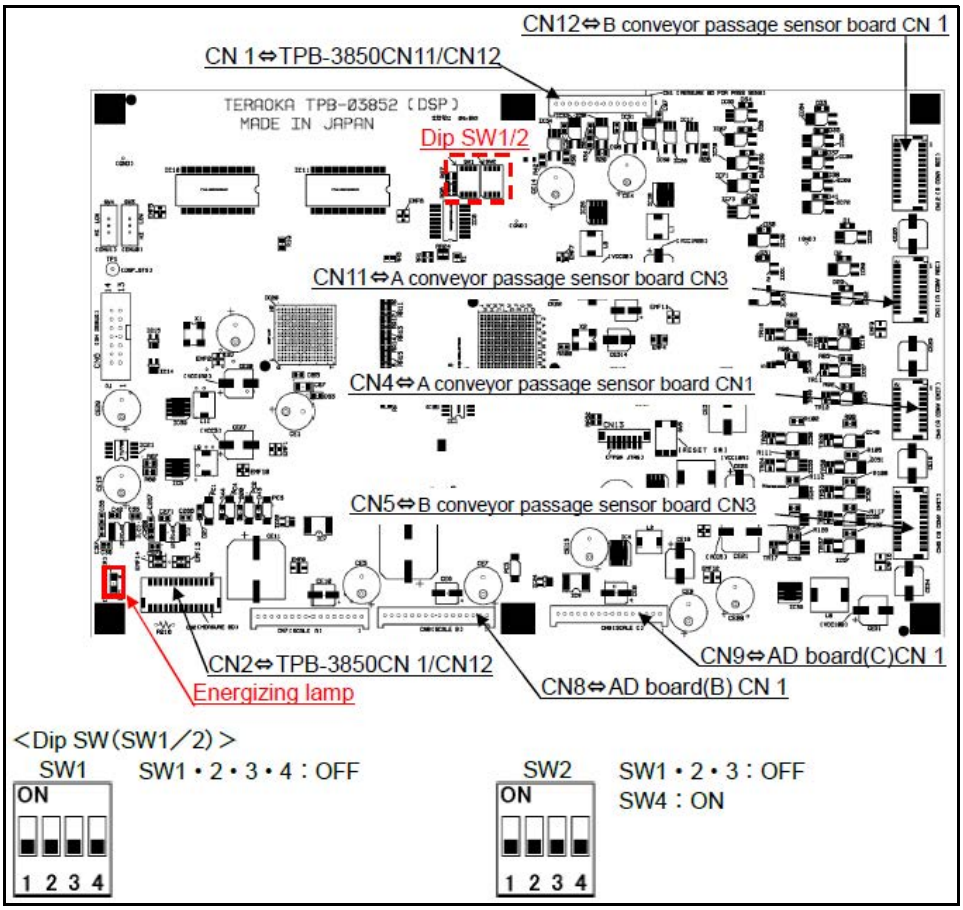


Figure 323
Boards- A/D board (TPB-3852)

Relay board: TPB-3853

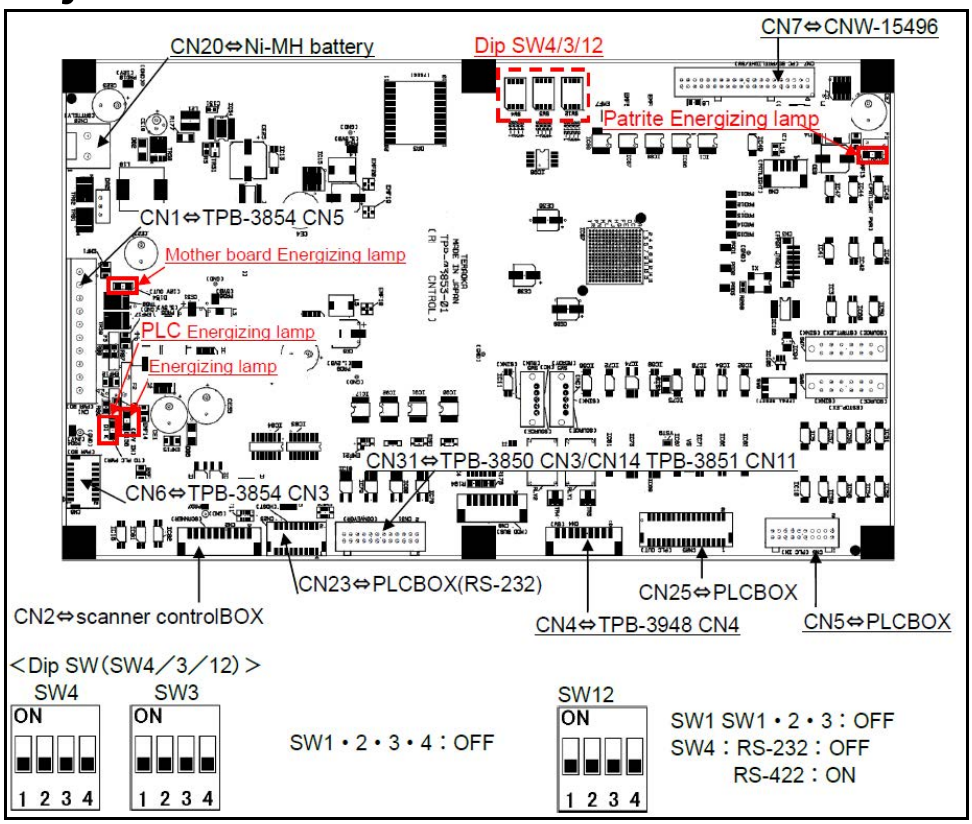


Figure 324
Boards- Relay board (TPB-3853)

Power distribution board: TPB-3854

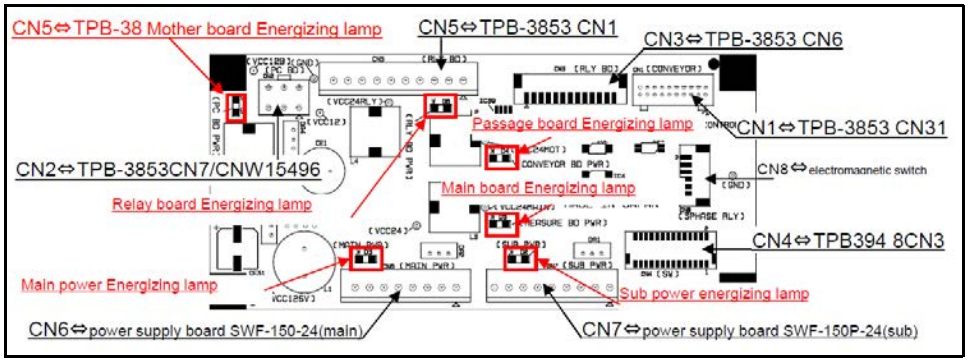


Figure 325
Boards- Power distribution board (TPB-3854)

Gate sensor (emitter) board: TPB-3282

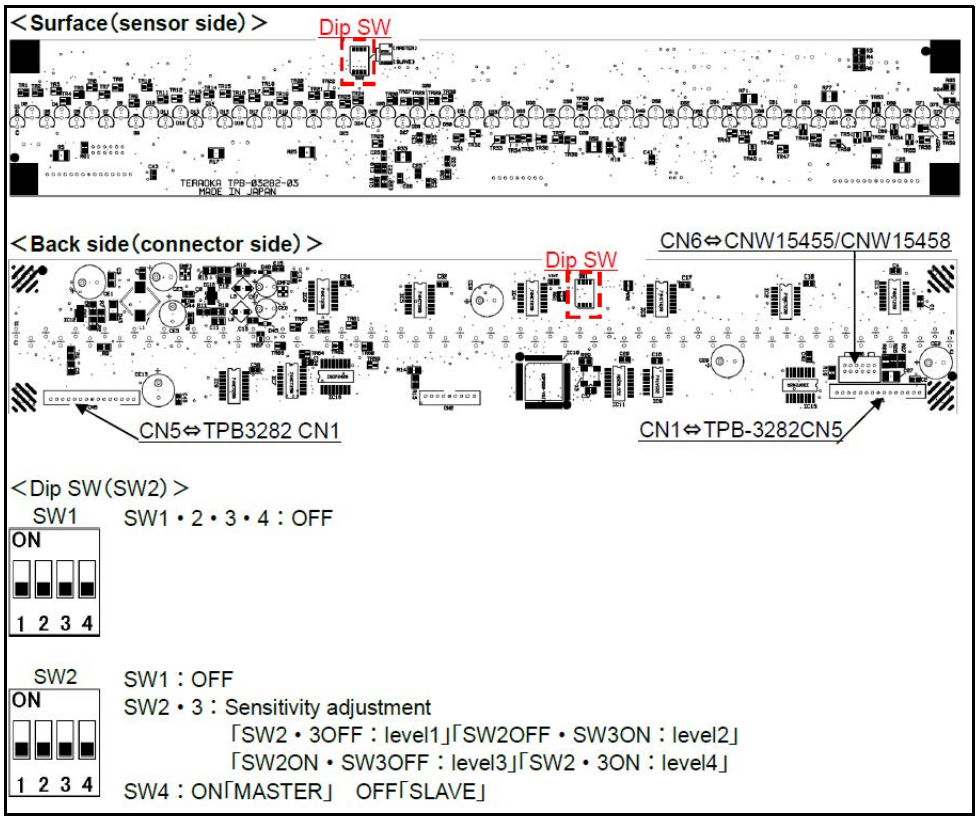


Figure 326
Boards- Gate sensor (emitter) board (TPB-3282)

Gate sensor (receiver) board: TPB-3283

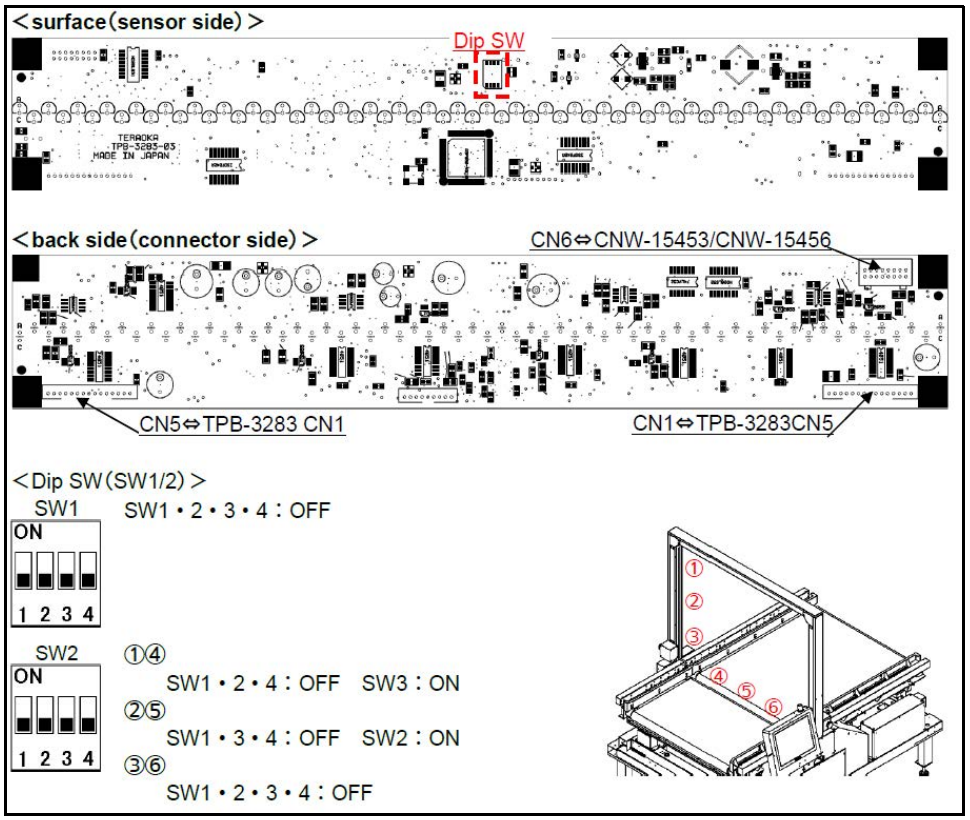


Figure 327
Boards- Gate sensor (receiver) board (TPB-3283)

Passage sensor (emitter) board: TPB-3863

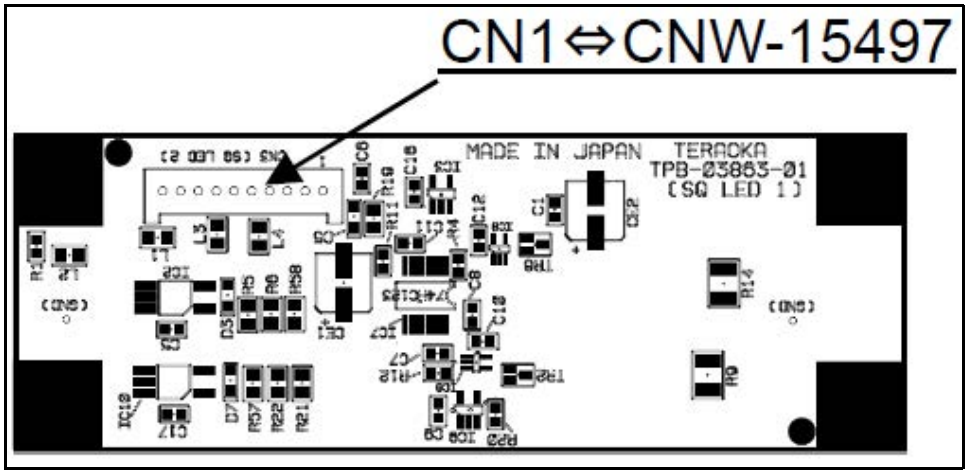


Figure 328
Boards- Passage sensor (emitter) board (TPB-3863)

Passage sensor (receiver) board: TPB-3864

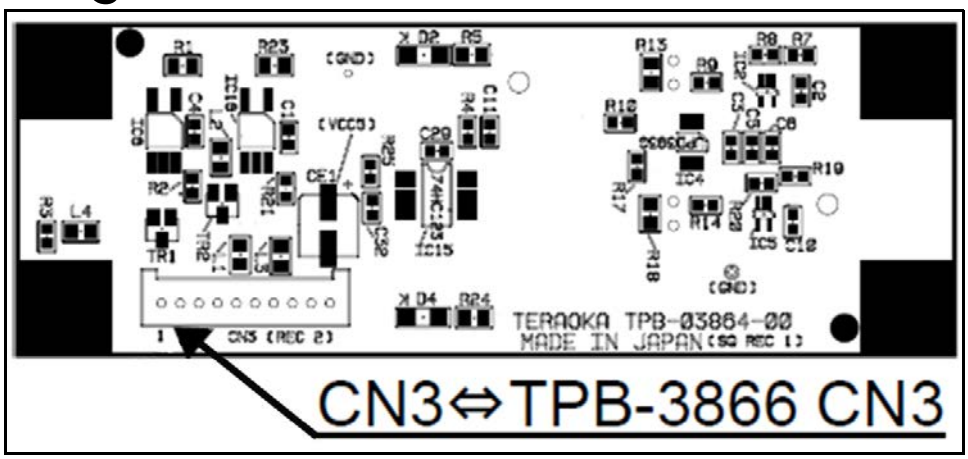


Figure 329
Boards- Passage sensor (receiver) board (TPB-3864)

Passage sensor (emitter) board: TPB-3865

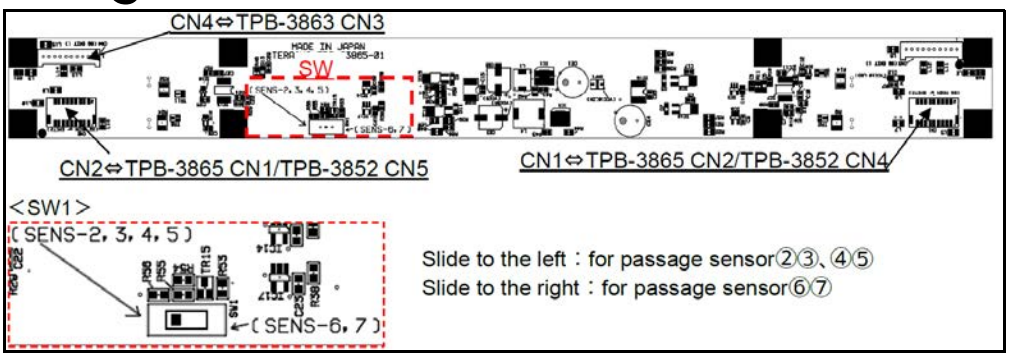


Figure 330
Boards- Large passage sensor (emitter) board (TPB-3865)

Passage sensor (receiver) board: TPB-3866

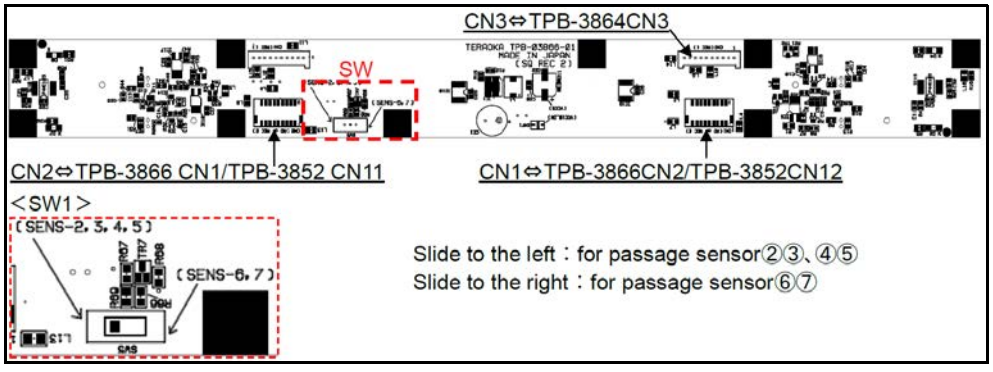


Figure 331
Boards- Large passage sensor (receiver) board (TPB-3866)

Stack-lite board: TPB-3926

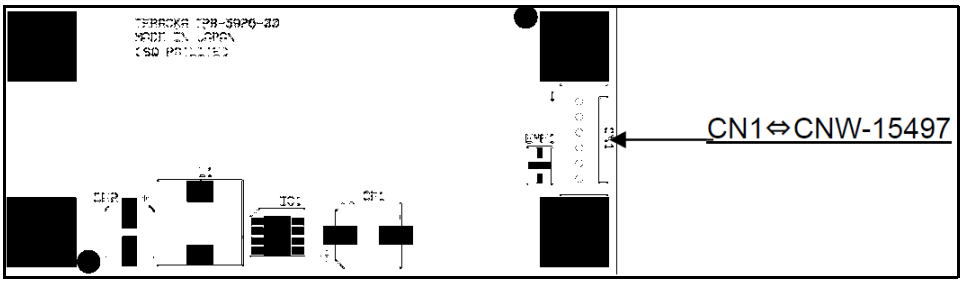


Figure 332
Boards- Stack-lite (TPB-3926)

Switch/LED board: TPB-3948

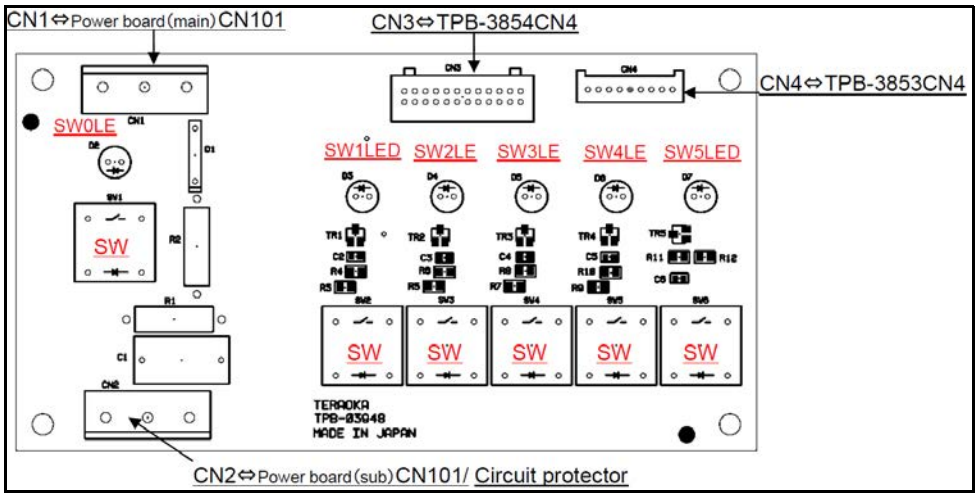


Figure 333
Boards- Switch/LED board (TPB-3948)

Details of each switch

SWLED ON is active state, OFF is inactive state.

SW0 **Power supply board (main power supply):** Toggling switch stops power to the power supply board (main).

SW1 **Main board:** Toggling switch stops power supply to the main board.

SW2 **Transport board:** Toggling switch stops power to the transfer board.

SW3 **Relay board:** Toggling switch stops power to the relay board.

❖ *When replacing the relay board, turn off SW3 and SW5.*

SW4 Mother board: Toggling switch stops power to the mother board.

❖ *When replacing the motherboard, turn SW4 and SW5 OFF.*

SW5 Backup battery: Toggling switch stops power to the relay board from mother board.

Power board: SWF150P-24

Figure 334
Boards- Power board (SWF150P-24)

Touch panel relay board: TSC-54/RU-F

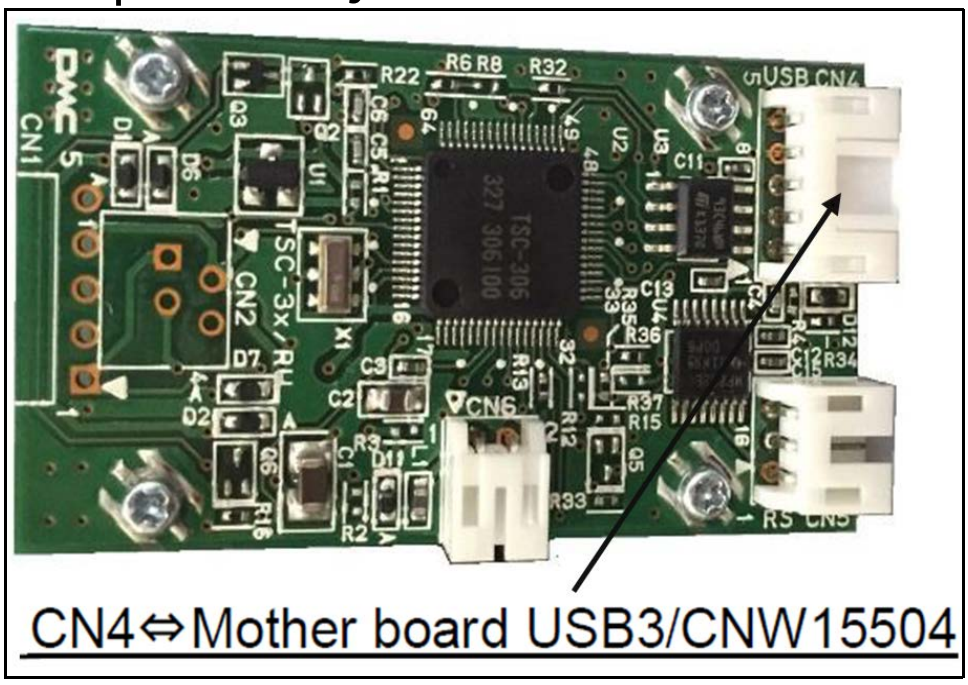


Figure 335
Boards- Touch panel relay board (TSC-54/RU-F)

SSD: AXM21ES3-64GM-B

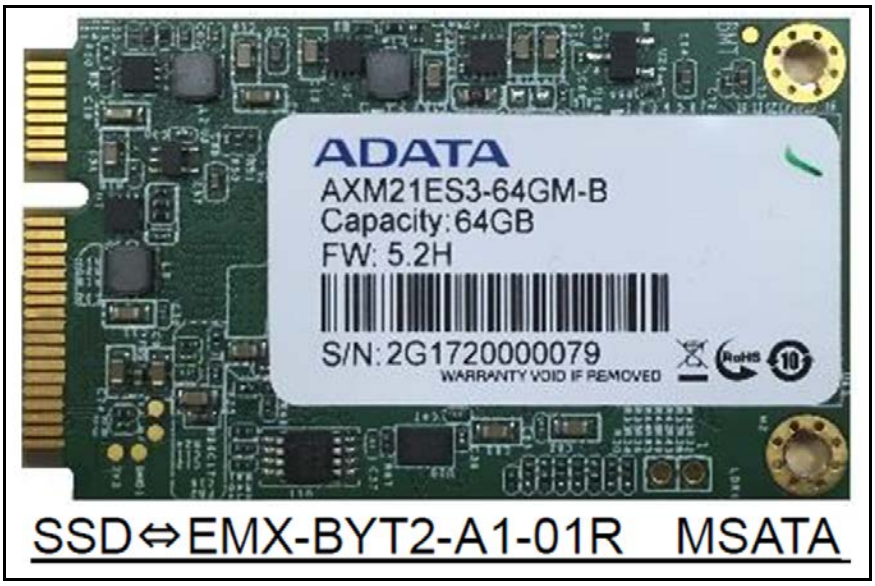


Figure 336
Boards- SSD (AXM21ES3-64M-B)

Memory: PC3-12800 4GB

Figure 337
Boards- Memory (PC3-12800 4GB)

Motherboard: EMX-BYT2-A1-01R

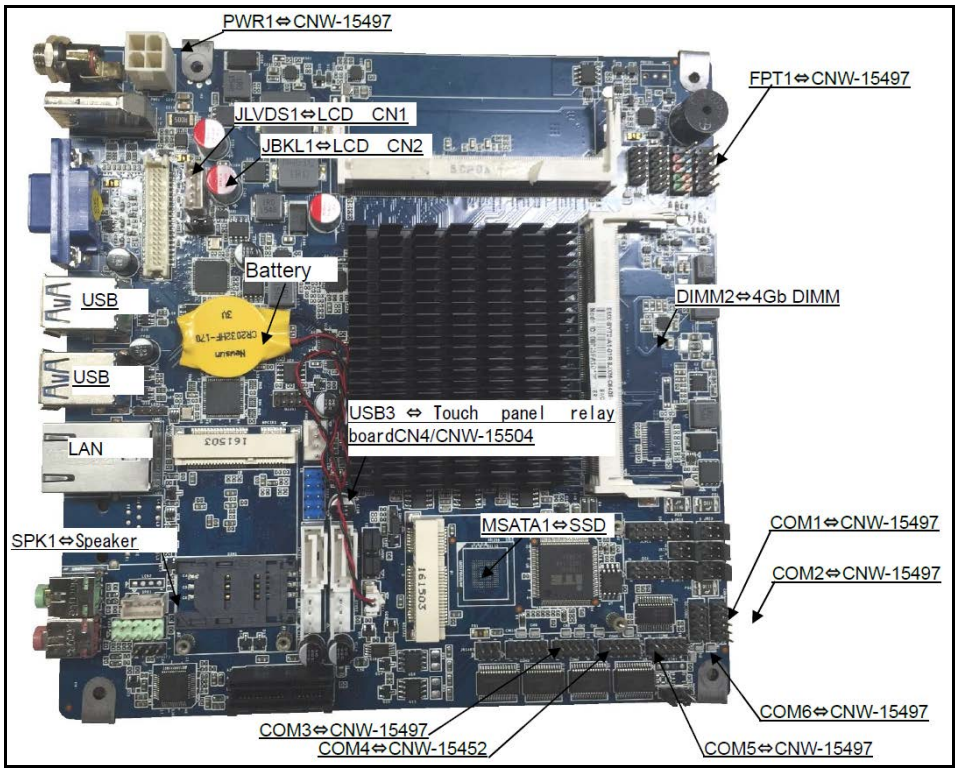


Figure 338
Boards - Motherboard (EMX-BYT2-A1-01R)

Wire & Connectors

CNW-15445-00

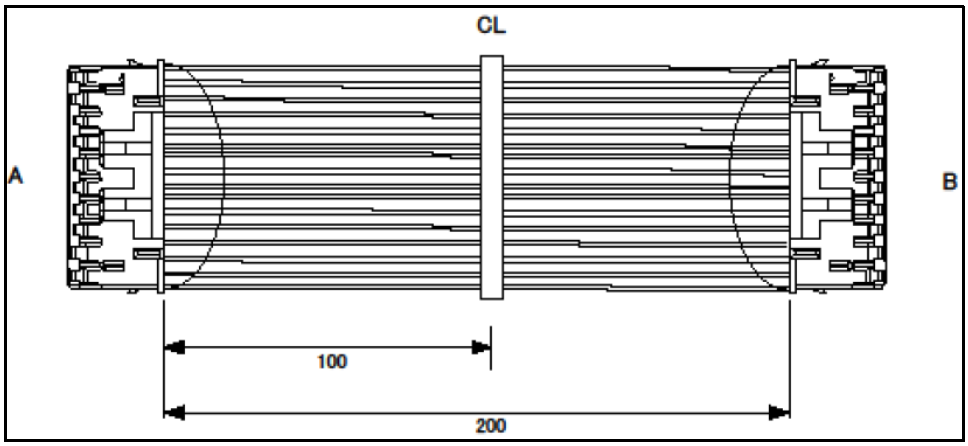


Figure 339
Boards - CNW-15445-00

Parts Number: 20CNW001544500				
A: TPB-03850 (CN15)			B: TPB-03851 (CN10)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC5ENC	WT	A20	TEST_CONVEYOR
A2	ENC1_A	RD	B2	ENC1AO
A3	ENC1_B	OR	B3	ENC1BO
A4	ENC2_A	YE	B4	ENC2AO
A5	ENC2_B	GN	B5	ENC2BO
A6	SEN1A	BL	B6	SEN1
A7	GNDS	PL	B7	GNDS
A8	GNDS	GR	B8	GNDS
A9	VCC24CONV	WT	B9	VCC24MAIN
A10	VCC24CONV	BK	B10	VCC24MAIN
A11	GNDP	BR	B11	GNDP
A12	GNDP	RD	B12	GNDP
A13	RXMAIN	OR	B13	TXMAIN
A14	TXMAIN	YE	B14	RXMAIN
A15	TXD_FPGABOTH	GN	B15	RXD_FPGFLASH
A16	RXD_FPGAINV	BL	B16	TXD_FPGAFLASH
A17	SELCONV1	PL	B17	SELCONV1
A18	SELCONV2	GR	B18	SELCONV2
A19	GNDP	WT	B19	GNDP

CNW-15447-01

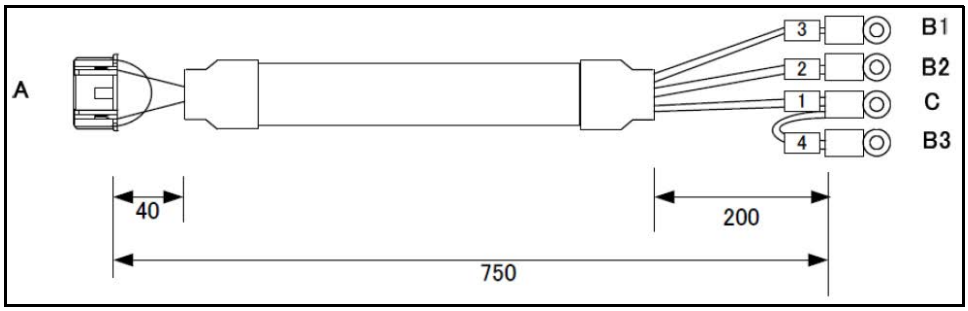


Figure 340
Boards- CNW-15447-01

Parts Number: 20CNW001544701				
A: TPB-03851 (CN3)			B: Direction Indicator Switch	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC24IN	WT	A6	TEST-SW
A2	FWD	-	B1	FWD
A3	REV	-	B2	REV
A4	CM	-	C	CM
C	CM	BK	B3	CM
A5	FG	GN	-	SHIELD

CNW-15448-01

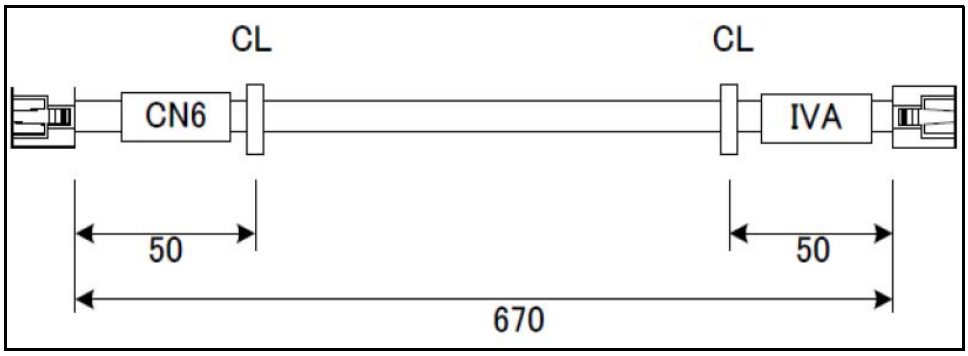


Figure 341
Boards- CNW-15448-01

Parts Number: 20CNW001544801				
A: TPB-03851 (CN5)			B: VF-nC3M	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A4	D+INVA	WT	B4	D+
A5	D-INVA	-	B5	D-
A8	SG	-	B8	SG

CNW-15449-01

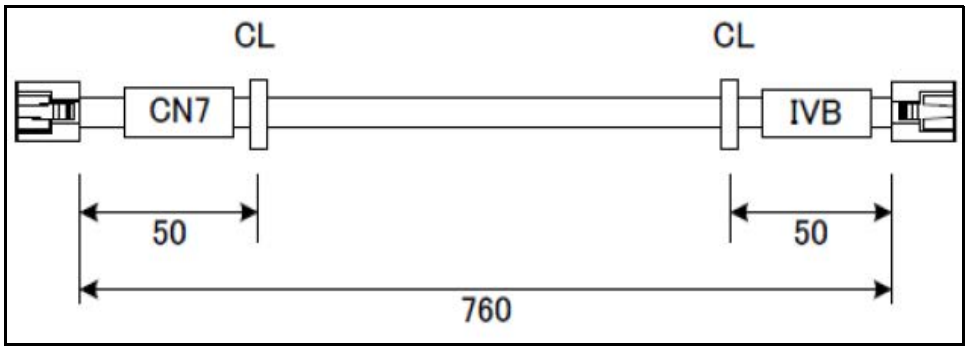


Figure 342
Boards - CNW-15449-01

Parts Number: 20CNW001544901				
A: TPB-03851 (CN7)			B: VF-nC3M	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A4	D+INVA	WT	B4	D+
A5	D-INVA	-	B5	D-
A8	SG	-	B8	SG

CNW-15450-01

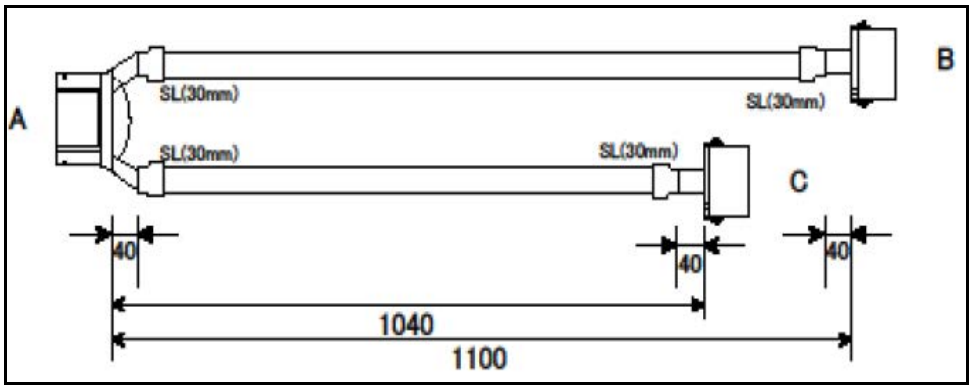


Figure 343
Boards - CNW-15450-01

Parts Number: 20CNW001545001				
A: TPB-03851 (CN8)			B,C: CNW-15508 (ENCORDER ASSY)	
A connector			B/C connector	
No.	Signal	CLR	No.	Signal
A1	VCC5ENC	WT	A16	TEST_ENC
A2	VCC5ENC		B1	P0
A4	ENC1AI		B2	YA
A5	GNDS		B3	CM
A6	ENC1BI		B4	YB
A7	GNDS		B5	CM
	SHIELD	GN	B6	SHIELD
A8	GNDP	GN		SHIELD
A9	VCC5ENC		C1	P0
A11	ENC2AI		C2	YA
A12	GNDS		C3	CM
A13	ENC2BI		C4	YB
A14	GNDS		C5	CM
	SHEILD	GN	C6	SHIELD
A15	GNDP	GN		SHIELD

CNW-15451-00

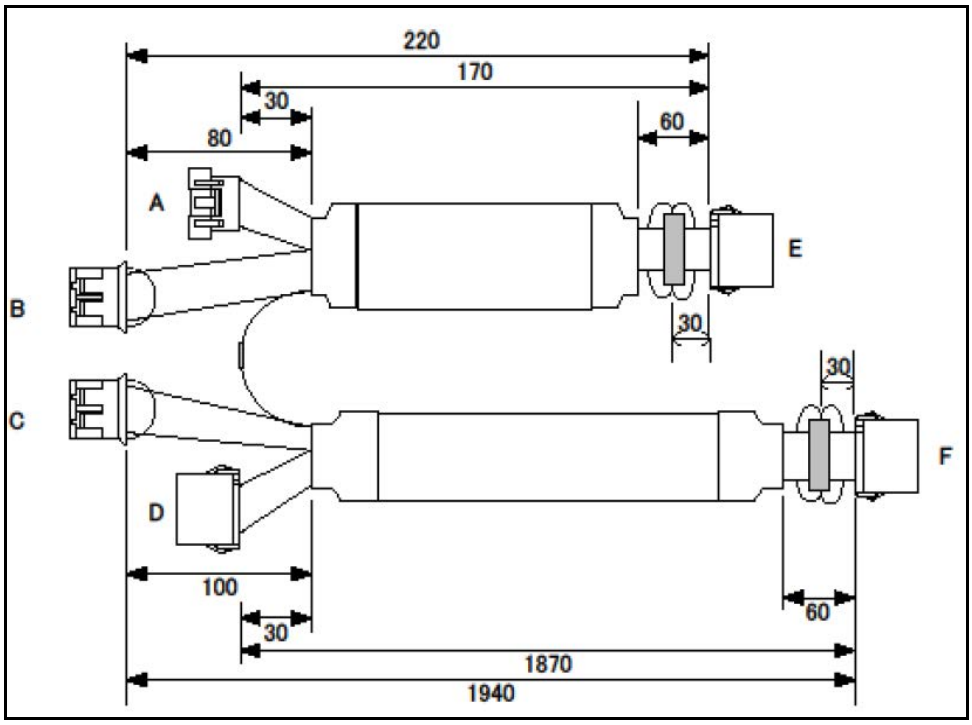


Figure 344
Boards- CNW-15451-00

Parts Number: 20CNW001545100				
A: CNW-15499			B,C: CNW-15508 (ENCORDER ASSY)	
D: CNW-15499			E,F: CNW-15474	
A/B/C/D/E connector			B/C/E/F connector	
No.	Signal	CLR	No.	Signal
A1	VCC24		E1	IN24V
A2	VCC24		E2	IN24V
B1	VCC24_IN	WT	B8	TEST_MSTOP
B5	VCC24_LED		E5	LED24V
B7	GNDP		E6	GND
E3	OUT24V		F1	IN24V
E4	OUT24V		F2	IN24V
C1	VCC24_IN	WT	C9	TEST_ISTOP
C7	VCC24_LED		F5	LED24V
C8	GNDP		F6	GND

Parts Number: 20CNW001545100				
A: CNW-15499			B,C: CNW-15508 (ENCORDER ASSY)	
D: CNW-15499			E,F: CNW-15474	
A/B/C/D/E connector			B/C/E/F connector	
No.	Signal	CLR	No.	Signal
D1	STOP		F3	OUT24V
D2	STOP		F4	OUT24V

CNW-15452-01

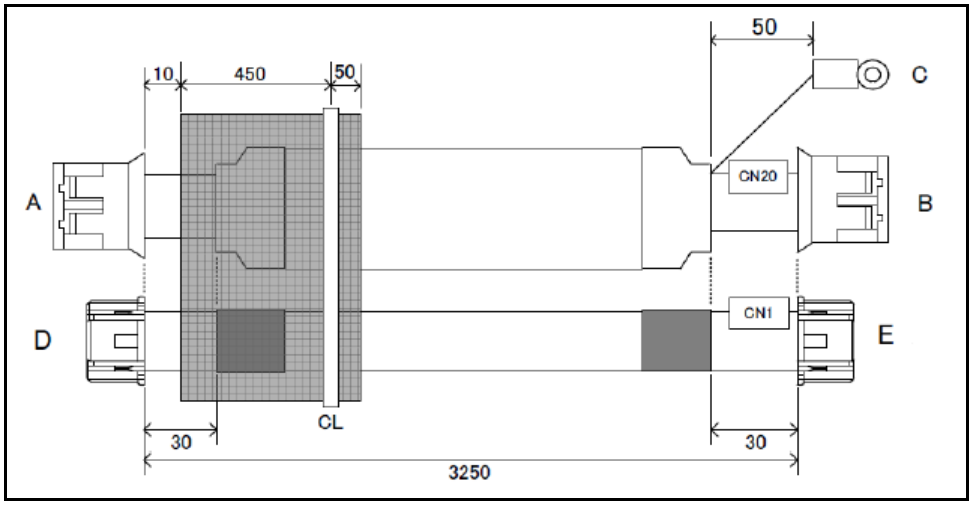


Figure 345
Boards - CNW-15452-01

Parts Number: 20CNW001545201				
A: CNW-15503 B, B: TPB-03850 (CN20), C: EARTH, D: CNW-15491, E:TPB-03850 (CN1)				
A connector			B/C connector	
No.	Signal	CLR	No.	Signal
A1	NRXD		B1	U1-TXD
A2	NTXD		B2	U1-RXD
A3	GND		B7	GNDS
	SHIELD	GN	C1	SHIELD
D1	D+	GN	E1	USBD+
D2	D-	WT	E2	USBD-
D4	GND	BK	E4	GNDS

Parts Number: 20CNW001545201				
A: CNW-15503 B, B: TPB-03850 (CN20), C: EARTH, D: CNW-15491, E:TPB-03850 (CN1)				
A connector			B/C connector	
No.	Signal	CLR	No.	Signal
D5	VBUS	RD	E5	USBVBUS
D3	SHIELD	GN		SHIELD
	SHIELD	GN	E3	SHIELD

CNW-15453-00

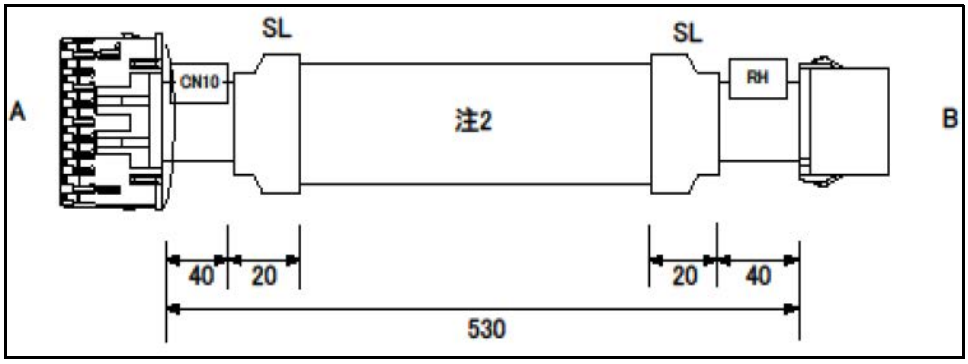


Figure 346
Boards - CNW-15453-00

Parts Number: 20CNW001545300				
A: TPB-03850 (CN10)			B: CNW-15454	
A connector			B/C connector	
No.	Signal	CLR	No.	Signal
A1	VCC24IN	WT	A20	TEST_GATE_SNSH
A2	GATE_H1-		B1	CLK-
A3	GATE_H2-		B2	DATA-
A4	GATE_H1+		B3	CLK+
A5	GATE_H2+		B4	DATA+
A6	VCC24GATE	BL	B5	VCC24GATE
A7	VCC24GATE	PL	B6	VCC24GATE
A8	VCC24GATE	GR	B7	VCC24GATE
A11	GND		B10	GND
A12	GND		B11	GND

Parts Number: 20CNW001545300				
A: TPB-03850 (CN10)			B: CNW-15454	
A connector			B/C connector	
No.	Signal	CLR	No.	Signal
A13	GND		B12	GND
A14	GND		B13	GND
A15	STARTHI-		B14	STARTHI-
A16	STARTHI+		B15	STARTHI+
A19	FG	GN		SHIELD

CNW-15454-01

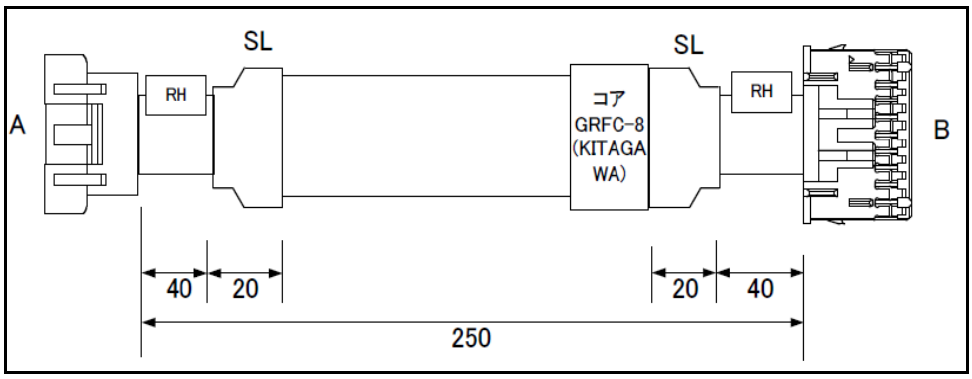


Figure 347
Boards- CNW-15454-01

Parts Number: 20CNW001545401				
A: CNW-15453			B: TPB-03283 (CN6)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	CLK-		B1	CLK-
A2	DTATA-		B2	DTATA-
A3	CLK+		B3	CLK+
A4	DATA+		B4	DATA+
A5	VCC24GATE		B5	VCC24GATE
A6	VCC24GATE		B6	VCC24GATE
A7	VCC24GATE		B7	VCC24GATE
A8	VCC24GATE		B8	VCC24GATE
A9	VCC24GATE		B9	VCC24GATE

Parts Number: 20CNW001545401				
A: CNW-15453			B: TPB-03283 (CN6)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A11	GND		B10	GND
A12	GND		B11	GND
A13	GND		B12	GND
A14	GND		B13	GND
A15	STARTHI-		B14	RID1-
A15	STARTHI+		B15	RID1+
A16	FG	GN	B16	SHIELD

CNW-15455-01

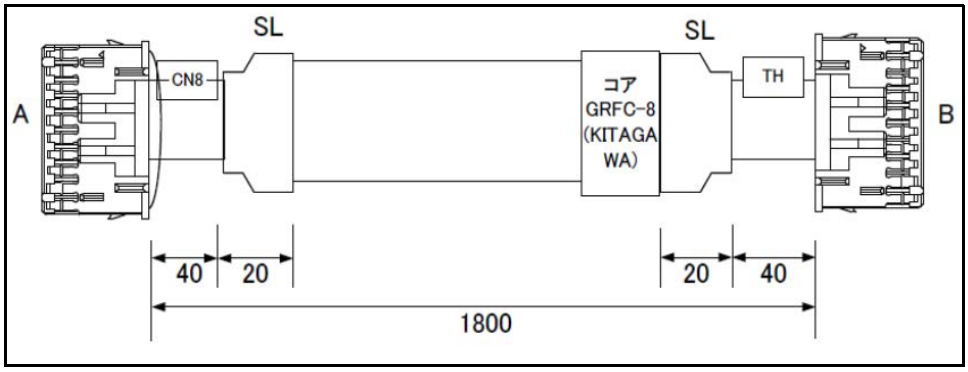


Figure 348
Boards - CNW-15455-01

Parts Number: 20CNW001545501				
A: TPB-03850 (CN8)			B: TPB-03282 (CN6)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC24IN		B1	TEST_GATE_LEDH
A2	VCC24GATE		B2	VCC24GATE
A3	VCC24GATE		B3	VCC24GATE
A4	VCC24GATE		B4	VCC24GATE
A5	VCC24GATE		B5	VCC24GATE
A6	GATELED_H-		B6	GATELED_H-
A7	GATELED_H+		B7	GATELED_H+
A8	GND		B8	GND

Parts Number: 20CNW001545501				
A: TPB-03850 (CN8)			B: TPB-03282 (CN6)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A9	GND		B9	GND
A11	GND		B10	GND
A12	GND		B11	GND
A13	FG		B12	GND

CNW-15456-00

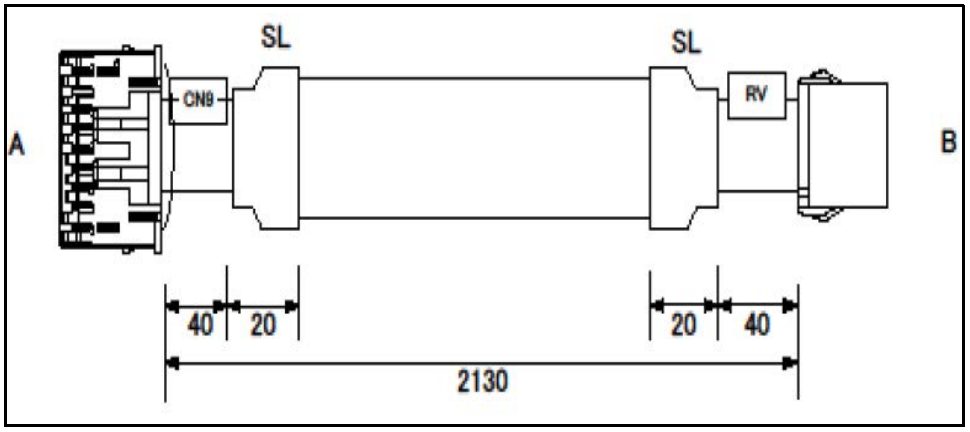


Figure 349
Boards- CNW-15456-00

Parts Number: 20CNW001545600				
A: TPB-03850 (CN9)			B: CNW-15457	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC24IN	WT	B1	TEST_GATE_SNSV
A2	GATE_V1-		B2	CLK-
A3	GATE_V2-		B3	DATE-
A4	GATE_V1+		B4	CLK+
A5	GATE_V2+		B5	DATE+
A6	VCC24GATE		B6	VCC24GATE
A7	VCC24GATE		B7	VCC24GATE
A9	VCC24GATE		B8	VCC24GATE
A10	VCC24GATE		B9	VCC24GATE

Parts Number: 20CNW001545600				
A: TPB-03850 (CN9)			B: CNW-15457	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A11	GND		B10	GND
A12	GND		B11	GND
A13	GND		B12	GND
A14	GND		B13	GND
A16	STARTVI-		B14	STARTV-

CNW-15457-01

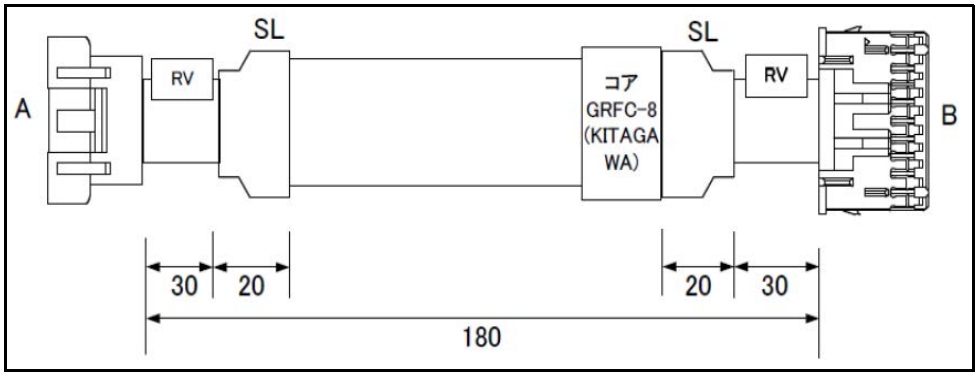


Figure 350
Boards- CNW-15457-01

Parts Number: 20CNW001545701				
A: CNW-15456			B: TPB-03283 (CN6)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	CLK-		B1	CLK-
A2	DATA-		B2	DATE-
A3	CLK+		B3	CLK+
A4	DATA+		B4	DATE+
A5	VCC24GATE		B5	VCC24
A6	VCC24GATE		B6	VCC24
A7	VCC24GATE		B7	VCC24
A8	VCC24GATE		B8	VCC24
A9	VCC24GATE		B9	VCC24

Parts Number: 20CNW001545701				
A: CNW-15456			B: TPB-03283 (CN6)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A10	GND		B10	GND
A11	GND		B11	GND
A12	GND		B12	GND
A13	GND		B13	GND
A14	STARTVI-		B15	RID1-
A15	STARTVI+		B16	RID1+
A16	FG	GN		SHIELD

CNW-15458-01

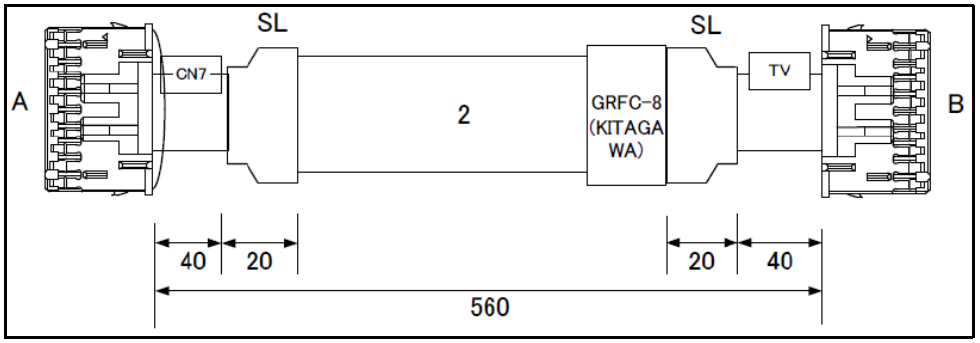


Figure 351
Boards- CNW-15458-01

Parts Number: 20CNW001545801				
A: TPB-03850 (CN7)			B: TPB-03282 (CN6)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC24IN	WT	A12	TEST_GATE_LEDV
A2	FG	GN		SHIELD
A3	VCC24GATE		B1	VCC24GATE
A4	VCC24GATE		B2	VCC24GATE
A5	VCC24GATE		B3	VCC24GATE
A6	GATELED_V-		B6	GATELED_V-
A7	GATELED_V+		B7	GATELED_V+
A8	GND		B8	GND

Parts Number: 20CNW001545801				
A: TPB-03850 (CN7)			B: TPB-03282 (CN6)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A9	GND		B9	GND
A10	GND		B10	GND
A11	GND		B11	GND

CNW-15460-01

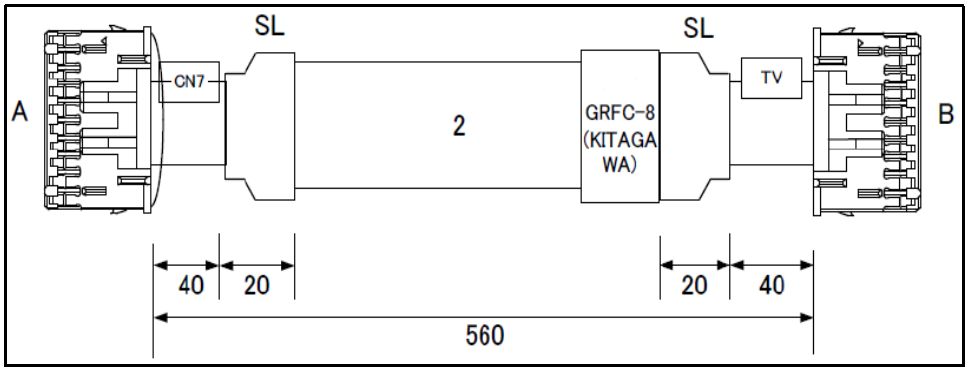


Figure 352
Boards- CNW-15460-01

Parts Number: 20CNW001546001				
A: AC outlet			B: BREAKER(BW32AAG-3P020)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	X	RD	B1	BR-2
A2	Y	BL	B2	BR-4
A3	Z	BK	B3	BR-6
A4	E	YE/GN	B4	GRAND

CNW-15461-00

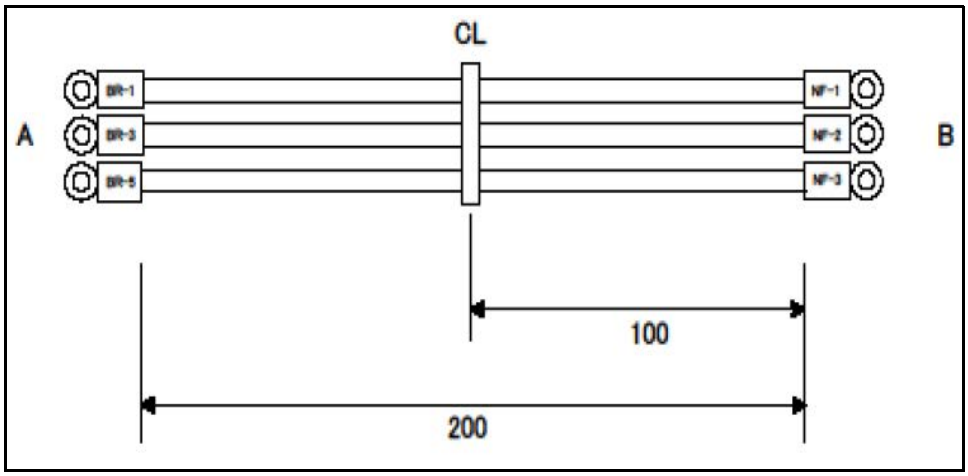


Figure 353
Boards- CNW-15461-00

Parts Number: 20CNW001546100				
A: BREAKER(BW32AAG-3P020)			B: NoiseFilter(TAH-20-683)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
1	BR-1	RD	1	NF-1
2	BR-3	WT	2	NF-2
3	BR-5	BK	3	NF-3

CNW-15462-00

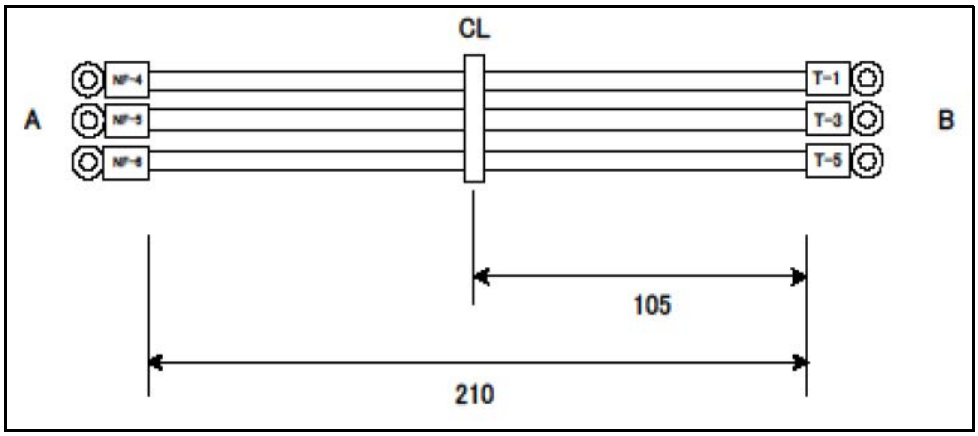


Figure 354
Boards- CNW-15462-00

Parts Number: 20CNW001546200				
A: NoiseFilter(TAH-20-683)			B: Terminal(ML-20-8P)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
1	NF-4	RD	1	T-1
2	NF-5	WT	2	T-3
3	NF-6	BK	3	T-5

CNW-15463-00

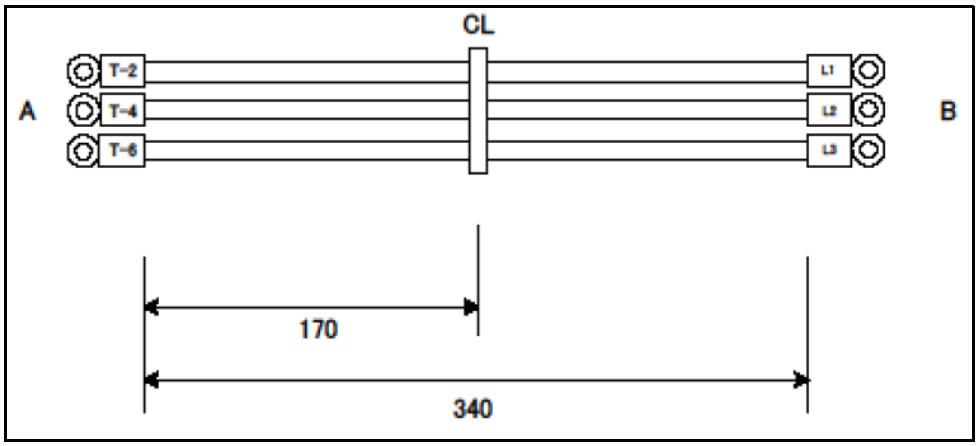


Figure 355
Boards- CNW-15463-00

Parts Number: 20CNW001546300				
A: Terminal (ML-20-8P)			B: electronic switch (SC-05/G)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
1	T-2	RD	1	L1
2	T-4	WT	2	L2
3	T-6	BK	3	L3

CNW-15464-01

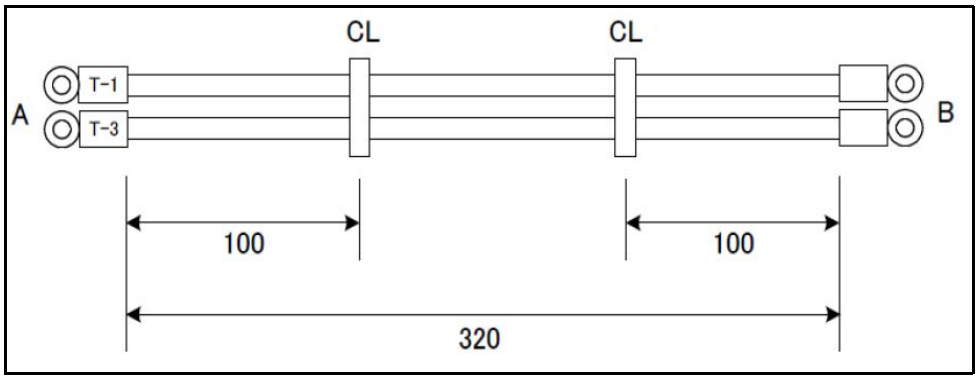


Figure 356
Boards- CNW-15464-01

Parts Number: 20CNW001546401				
A: terminal			B: circuit protector (BAC-201201)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
1	T-1	WT	1	SP-1
2	T-3	BK	2	SP-2

CNW-15465-01

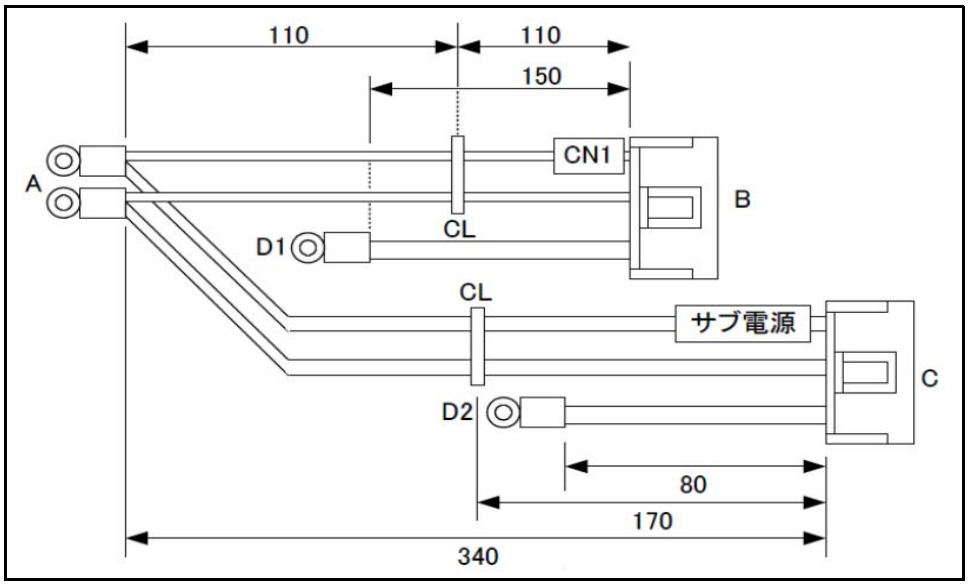


Figure 357
Boards- CNW-15465-01

Parts Number: 20CNW001546501				
A: circuit protector(BAC201201) B: switch/LED board, C: sub power board (SWF-150P-24)				
A connector			B/C connector	
No.	Signal	CLR	No.	Signal
A1	SP-3	WT	B1	N
A1	SP-3	WT	C1	N
A2	SP-4	BK	B3	L
A2	SP-4	BK	C3	L
D1	PG	GN	B5	PG
D2	PG	GN	C5	PG

CNW-15466-01

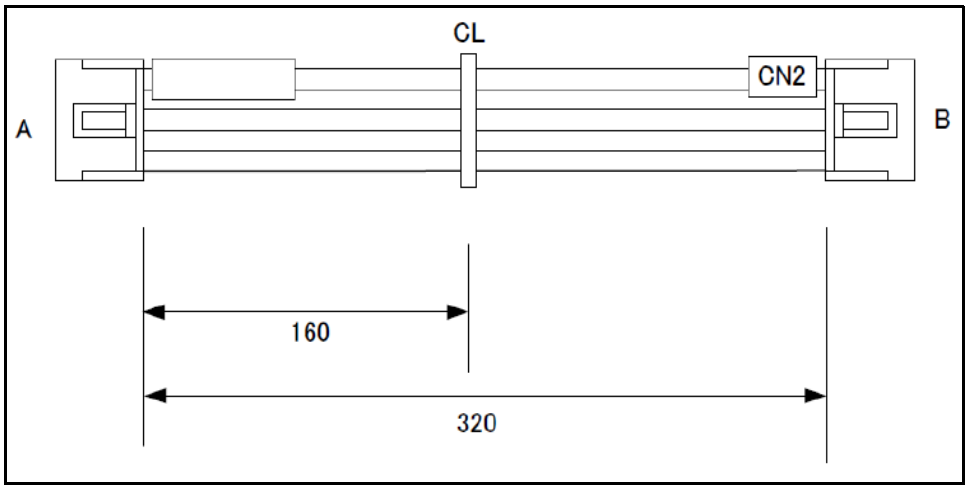


Figure 358
Boards- CNW-15466-01

Parts Number: 20CNW001546601				
A: switching power supply (SWF150P-24 CN101)			B: switch board CN2	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	AC (L)	WT	B1	L
A2	AC (N)	BK	B2	N
A3	PG	GN	B5	PG

CNW-15467-01

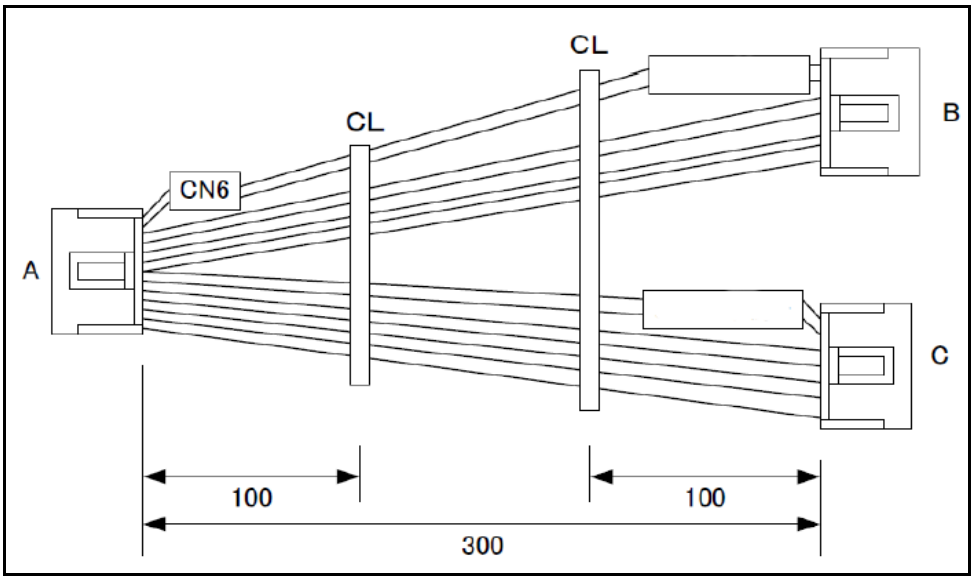


Figure 359
Boards- CNW-15467-01

Parts Number: 20CNW001546701				
A: TPB-3854 (CN6), B: SWF150P-24 (CN601), C: SWF150P-24 (CN602)				
A connector			B/C connector	
No.	Signal	CLR	No.	Signal
A1	VCC24A	OR	B1	V+
A2	VCC24A	OR	B2	V+
A3	VCC24A	OR	B3	V+
A4	VCC24A	OR	B4	V+
A5	GND	BK	C1	V-
A6	GND	BK	C2	V-
A7	GND	BK	C3	V-
A8	GND	BK	C4	V-

CNW-15468-01

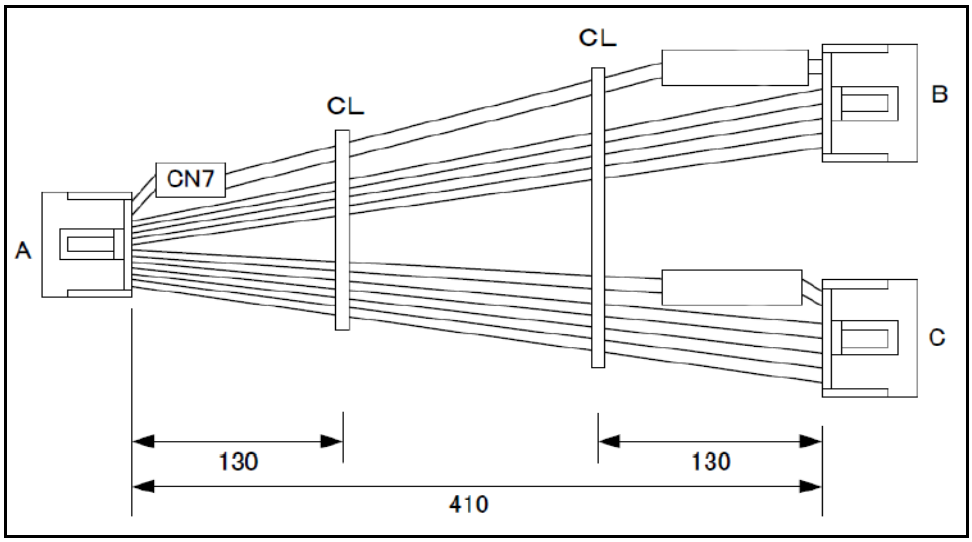


Figure 360
Boards- CNW-15468-01

Parts Number: 20CNW001546801				
A: TPB-3854 (CN7), B: SWF150P-24 (CN601), C: SWF150P-24 (CN602)				
A connector			B/C connector	
No.	Signal	CLR	No.	Signal
A1	VCC24A	OR	B1	V+
A2	VCC24A	OR	B2	V+
A3	VCC24A	OR	B3	V+
A4	VCC24A	OR	B4	V+
A5	GND	BK	C1	V-
A6	GND	BK	C2	V-
A7	GND	BK	C3	V-
A8	GND	BK	C4	V-

CNW-15469-00

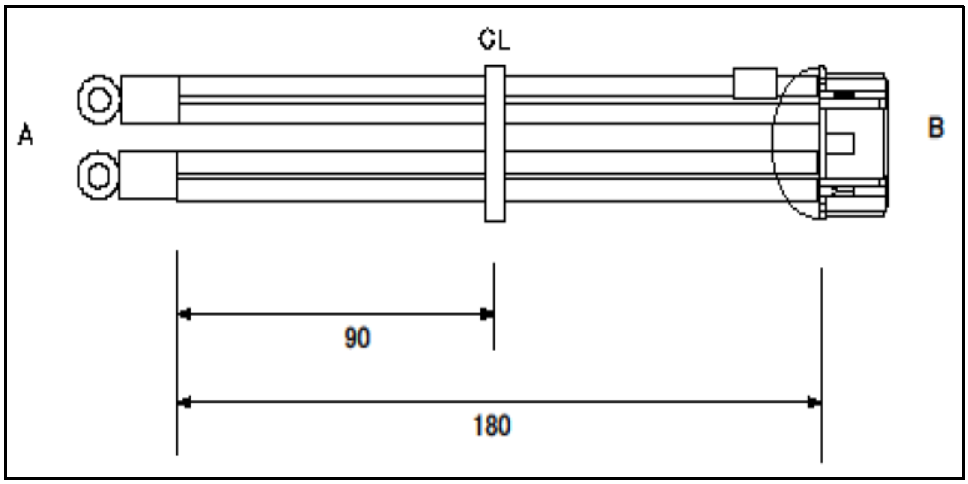


Figure 361
Boards- CNW-15469-00

Parts Number: 20CNW001546900				
A: Power switch (SC-4-1/G)			B: TPB-03854 (CN8)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
B6	EM_RELAY_CONECT	WT	B1	VCC_24N
A1	A1	RD	B2	ESW_IN
A1	A1	OR	B3	ESW_IN
A2	A2	YE	B4	GND
A2	A2	GN	B5	GND

CNW-15470-00

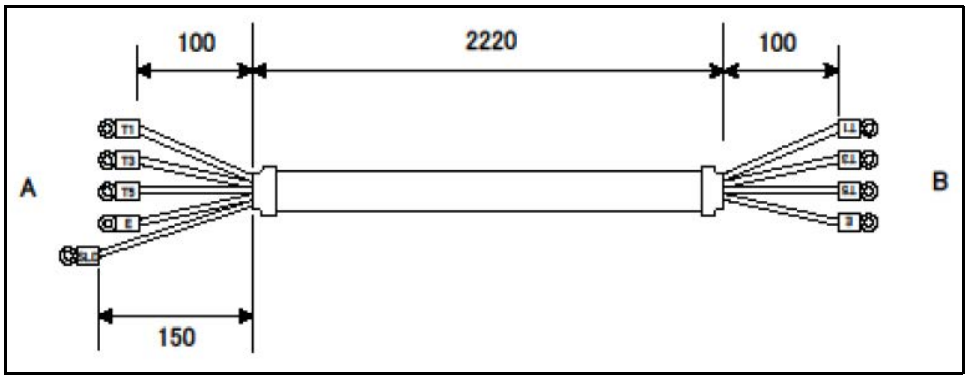


Figure 362
Boards- CNW-15470-00

Parts Number: 20CNW001547000				
A: Power switch (SC-05/G)			B: INV BOX terminal (ML-20-8P)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	T1	RD	B1	T1
A2	T3	WT	B2	T3
A3	T5	BK	B3	T5
A4	E	YE/GN	B4	EARTH
A5	SHIELD	GN	B5	SHIELD

CNW-15471-00

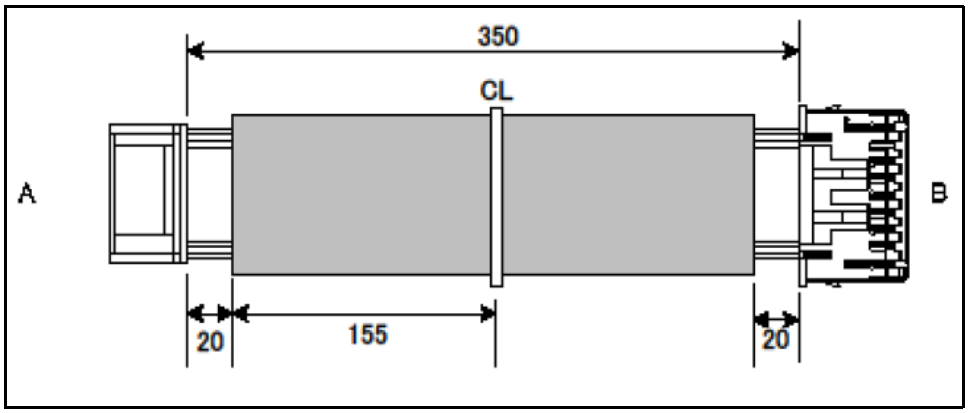


Figure 363
Boards- CNW-15471-00

Parts Number: 20CNW001547100				
A: TPB-03854 (CN4)			B: switch/LED board	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC24_3	WT	A28	PWR_BD_SW_CN
A2	MAIN_PWR_SW	OR	B1	MAIN_PWR_SW
A3	MAIN_PWR_SW	OR	B2	MAIN_PWR_SW
A4	GNDP	BL	B3	GNDP
A5	GNDP	BL	B4	GNDP
A6	VCC24	RD	B5	VCC24
A7	LEDK	BK	B6	LEDK
A8	MOTO_PWR_SW	OR	B7	MOTO_PWR_SW
A9	MOTO_PWR_SW	OR	B8	MOTO_PWR_SW
A10	GNDP	BL	B9	GNDP
A11	GNDP	BL	B10	GNDP
A12	VCC24	RD	B11	VCC24
A13	LED_K	BK	B12	LED_K
A14	RLY_PWR_SW	OR	B13	RLY_PWR_SW
A15	RLY_PWR_SW	OR	B14	RLY_PWR_SW
A9	MOTO_PWR_SW	OR	B8	MOTO_PWR_SW

CNW-15472-00

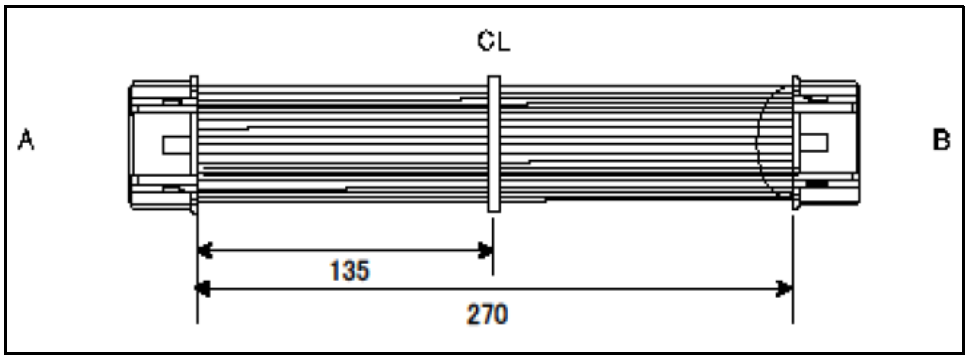


Figure 364
Boards- CNW-15472-00

Parts Number: 20CNW001547200				
A: TPB-03854 (CN3)			B: TPB-03853 (CN6)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC24_3	BR	B2	VCC24_3
A2	MAIN_PWR_CONECT	RD	B3	MAIN_PWR_CONECT
A3	E-SW MON	OR	B4	E-SW MON
A4	E-SW CUT	YE	B5	E-SW CUT
A5	E_SW CUT	GN	B6	E_SW CUT
A6	E-SW Q	BL	B7	E-SW Q
A7	E-SW Q	PL	B8	E-SW Q
A8	EM_RELAY_CONECT	GR	B9	EM_RELAY_CONECT
A9	PWR_BD_MB_CN	WT	B10	PWR_BD_MB_CN
A10	PWR_BD_SW_CN	BK	B12	PWR_BD_SW_CN
A11	LOST24V	BR	B13	LOST24V
A12	LOST24V	RD	B14	LOST24V
A13	GNDP	OR	B15	GNDP
B1	VCC24_3	WT	B16	VCC24_3

CNW-15473-00

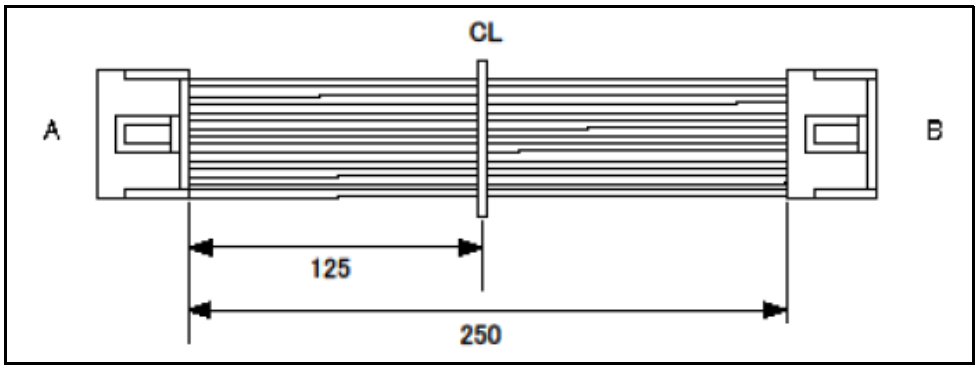


Figure 365
Boards- CNW-15473-00

Parts Number: 20CNW001547300				
A: TPB-03854 (CN5)			B: TPB-03853 (CN1)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC24RLY	OR	B1	VCC24
A2	VCC24RLY	OR	B2	VCC24
A3	VCC24RLY	OR	B3	VCC24
A4	GNDP	BK	B4	GNDP
A5	GNDP	BK	B5	GNDP
A6	GNDP	BK	B6	GNDP
A7	VCC12	RD	B7	VCC12
A8	VCC12	RD	B8	VCC12
A9	GNDP	BK	B9	GNDP
A10	GNDP	BK	B10	GNDP

CNW-15474-00

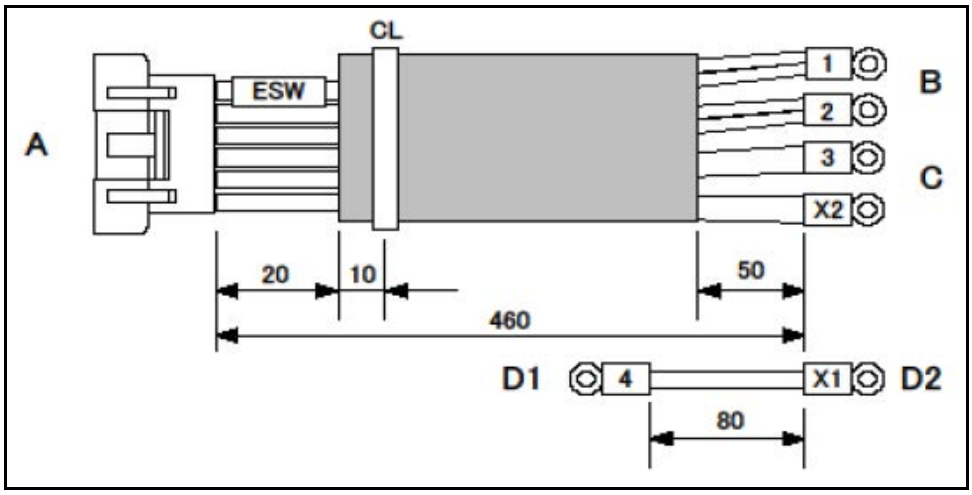


Figure 366
Boards- CNW-15474-00

Parts Number: 20CNW001547300				
A: TPB-03854 (CN5)			B: TPB-03853 (CN1)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	IN24V	BR	B1	1
A2	IN24V	RD	B1	1
A3	OUT24V	OR	B2	2
A4	OUT24V	YE	B2	2
A5	LED24V	GN	C1	3
A6	GNDP	BL	C2	X2
D1	4	PL	D2	X1

CNW-15475-01

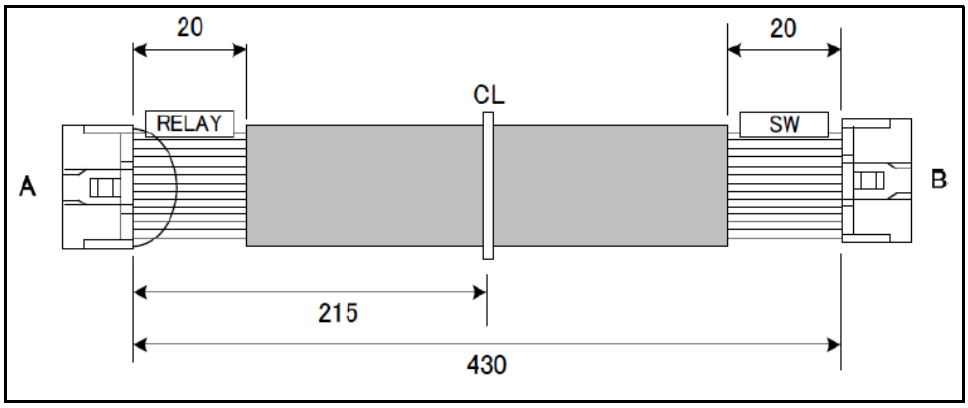


Figure 367
Boards- CNW-15475-01

Parts Number: 20CNW001547401				
A: TPB-03853 (CN4)			B: switch/LED board (CN4)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC24_3	WT	A9	SW_CONECT
A2	VCC12_SW	OR	B2	VCC12_SW
A3	VCC12_SW	OR	B3	VCC12_SW
A4	GNDS	BL	B4	GNDS
A5	GNDS	BL	B5	GNDS
A7	LED_A	RD	B7	LED_A
A8	LED_K	BK	B8	LED_K

CNW-15478-00

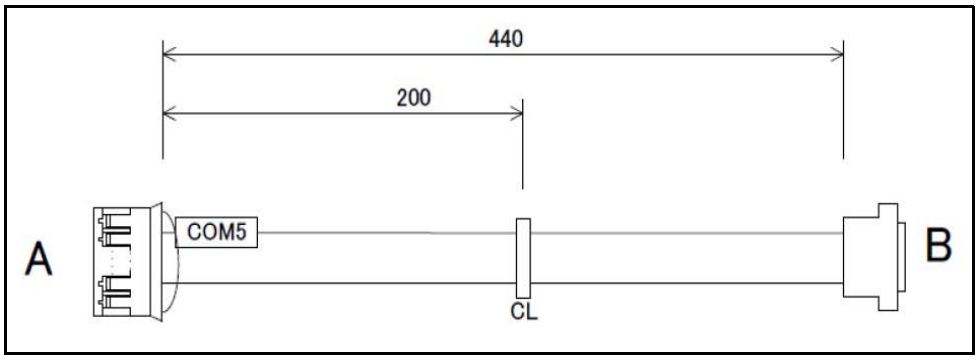


Figure 368
Boards- CNW-15478-00

Parts Number: 20CNW001547800				
A: EMX-BYT2 COM5			B: RS_232C I/F	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	NRXD	BR	B2	232RXD
A3	NDTR	OR	B4	232DTR
A4	NTXD	YE	B3	232TXD
A5	NDSR	GN	B6	232DSR
A6	GND	BL	B5	GND
A7	NCTS	PL	B8	232CTS
A8	NRTS	GR	B7	232RTS

CNW-15480-00

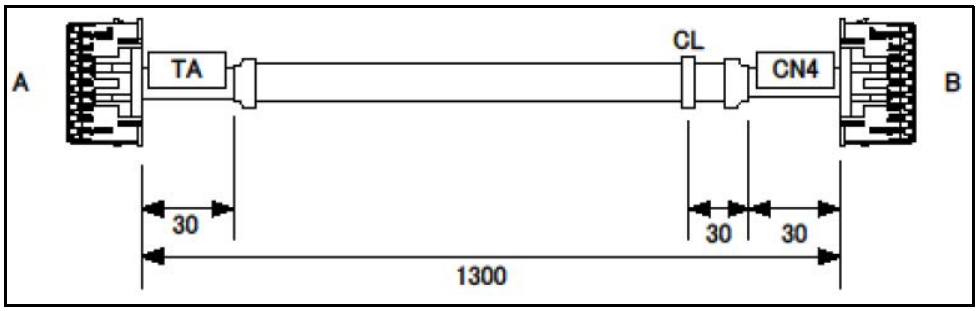


Figure 369
Boards- CNW-15480-00

Parts Number: 20CNW001546800				
A: TPB-3854 (CN7), B: SWF150P-24 (CN601), C:SWF150P-24 (CN602)				
A connector			B connector	
No.	Signal	CLR	No.	Signal
1	TEST1	-	1	TEST_LED_A
2	UP_1	-	2	LED1_UP_A
3	LOW_1	-	3	LED1_LOW_A
4	UP_2	-	4	LED2_UP_A
5	LOW_2	-	5	LED2_LOW_A
6	UP_3	-	6	
7	LOW_3	-	7	
8	UP_4	-	8	
9	LOW_4	-	9	
10	UP_5	-	10	LED_5UP_A
11	LOW_5	-	11	LED_5_LOW_A
12	VCC10IN	-	12	VCC10A_2
13	VCC10IN	-	13	VCC10A_2
14	VCC10IN	-	14	VCC10A_2
15	GND	-	15	GNDP

CNW-15481-00

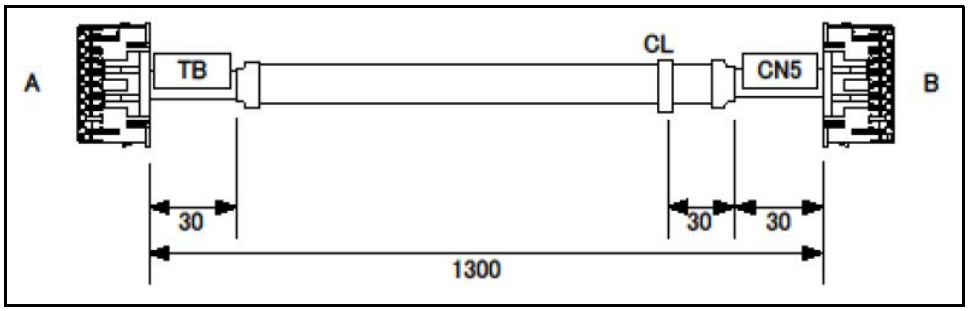


Figure 370
Boards- CNW-15481-00

Parts Number: 20CNW001548100				
A: TPB-03865 (CN2)			B: TPB-03852 (CN5)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
1	TEST1	-	1	TEST_LED_B
2	UP_1	-	2	LED1_UP_B
3	LOW_1	-	3	LED1_LOW_B
4	UP_2	-	4	LED2_UP_B
5	LOW_2	-	5	LED2_LOW_B
6	UP_3	-	6	LED3_UP_B
7	LOW_3	-	7	LED3_LOW_B
8	UP_4	-	8	LED4_UP_B
9	LOW_4	-	9	
10	UP_5	-	10	LED_5UP_A
11	LOW_5	-	11	LED_5_LOW_A
12	VCC10IN	-	12	VCC10A_2
13	VCC10IN	-	13	VCC10A_2
14	VCC10IN	-	14	VCC10A_2
15	GND	-	15	GNDP

CNW-15482-00

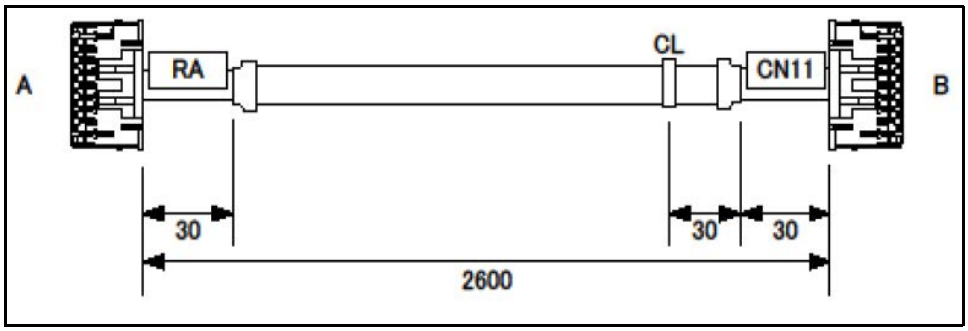


Figure 371
Boards- CNW-15482-00

Parts Number: 20CNW001548200				
A: TPB-03866 (CN2)			B: TPB-03852 (CN11)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
1	TEST1	-	1	TEST_SENS_A
2	UP_1	-	2	SENS1_UP_A
3	LOW_1	-	3	SENS1_LOW_A
4	UP_2	-	4	SENS2_UP_A
5	LOW_2	-	5	SENS2_LOW_A
6	UP_3	-	6	
7	LOW_3	-	7	
8	UP_4	-	8	
9	LOW_4	-	9	
10	UP_5	-	10	SENS5_UP_A
11	LOW_5	-	11	SENS5_LOW_A
12	VCC10IN	-	12	VCC10A_2
13	VCC10IN	-	13	VCC10A_2
14	VCC10IN	-	14	VCC10A_2
15	GND	-	15	GNDP
9	LOW_4	-	9	

CNW-15483-00

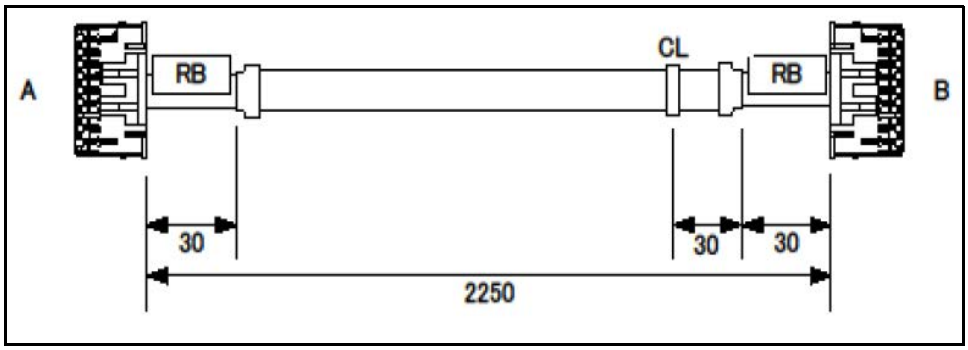


Figure 372
Boards- CNW-15483-00

Parts Number: 20CNW001548300				
A: TPB-03866 (CN1)			B: TPB-03852 (CN12)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
1	TEST1	-	1	TEST_SENS_B
2	UP_1	-	2	SENS1_UP_B
3	LOW_1	-	3	SENS1_LOW_B
4	UP_2	-	4	SENS2_UP_B
5	LOW_2	-	5	SENS2_LOW_B
6	UP_3	-	6	SENS3_UP_B
7	LOW_3	-	7	SENS3_LOW_B
8	UP_4	-	8	SENS4_UP_B
9	LOW_4	-	9	SENS4_LOW_B
10	UP_5	-	10	SENS5_UP_B
11	LOW_5	-	11	SENS5_LOW_B
12	VCC10IN	-	12	VCC10B_2
13	VCC10IN	-	13	VCC10B_2
14	VCC10IN	-	14	VCC10B_2
15	GND	-	15	GNDP
9	LOW_4	-	9	SENS4_LOW_B

CNW-15484-01

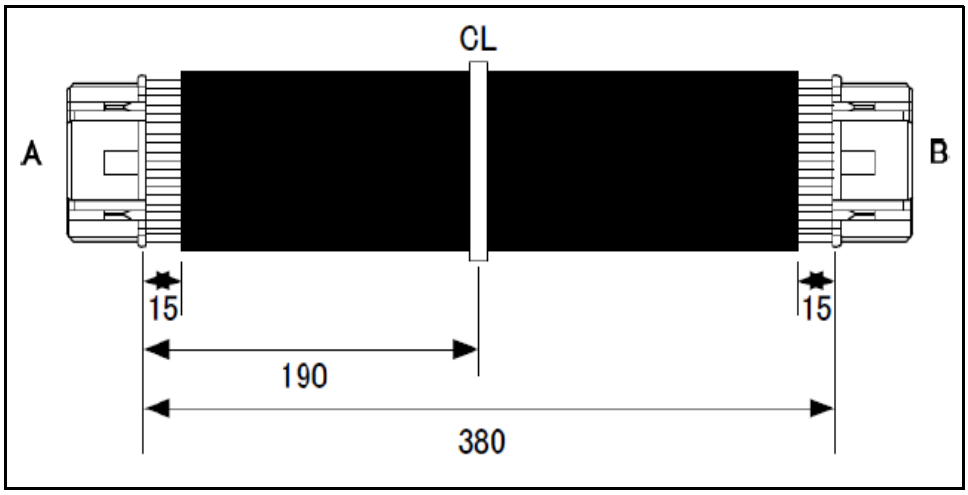


Figure 373
Boards- CNW-15484-01

Parts Number: 20CNW001548401				
A: TPB-03865 or TPB-03866			B: TPB-03863 or TPB-03854	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	TEST1	BR	B1	TEST1
A2	LED5UP	RD	B2	LED5UP
A3	LED5LOW	OR	B3	LED5LOW
A4	VCC5	YE	B4	VCC5
A5	VCC5	GN	B5	VCC5
A6	GND	BL	B6	GND
A7	GND	PL	B7	GND
A8	VCC10IN	GR	B8	VCC10IN
A9	GND	WT	B9	GND
A10	TEST2	BK	B10	TEST2

CNW-15485-01

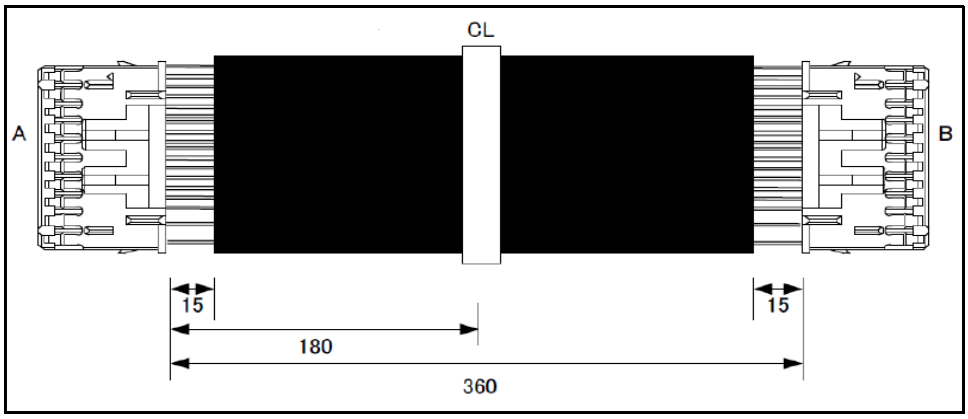


Figure 374
Boards- CNW-15485-01

Parts Number: 20CNW001548501				
A: TPB-03865 or TPB-03866			B: TPB-03865 or TPB-03866	
A connector			B connector	
No.	Signal	CLR	No.	Signal
1	TEST1	BR	1	TEST1
2	UP_1	RD	2	UP_1
3	LOW_1	OR	3	LOW_1
4	UP_2	YE	4	UP_2
5	LOW_2	GN	5	LOW_2
6	UP_3	BL	6	UP_3
7	LOW_3	PL	7	LOW_3
8	UP_4	GR	8	UP_4
9	LOW_4	WT	9	LOW_4
10	UP_5	BK	10	UP_5
11	LOW_5	BR	11	LOW_5
12	VCC10IN	RD	12	VCC10IN
13	VCC10IN	OR	13	VCC10IN
14	VCC10IN	YE	14	VCC10IN
15	GND	GN	15	GND

CNW-15486-00

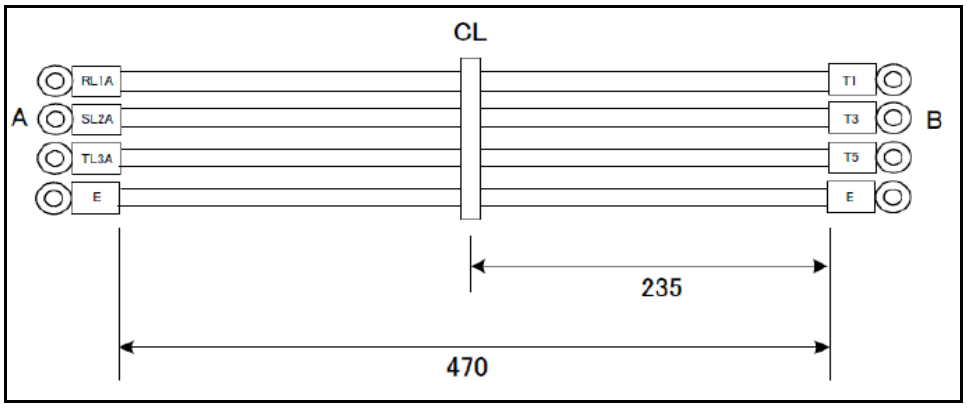


Figure 375
Boards- CNW-15486-00

Parts Number: 20CNW001548601				
A: Inverter A(VF-nC3M)			B: Inverter BOX terminal (ML-20-8P)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	RL1A	RD	B1	T1
A2	SL2A	WT	B2	T3
A3	TL3A	BK	B3	T5
A4	EARTH	GN	B4	EARTH

CNW-15487-00

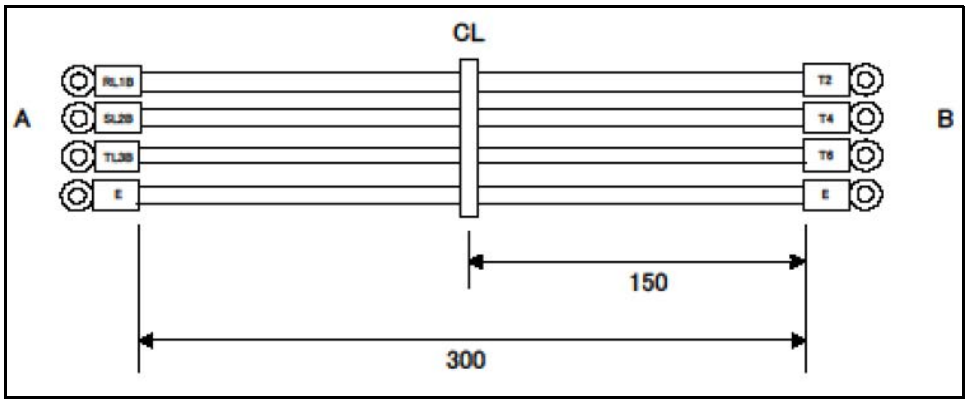


Figure 376
Boards- CNW-15487-00

Parts Number: 20CNW001548700				
A: Inverter B(VF-nC3M)			B: Inverter BOX terminal (ML-20-8P)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	RL1B	RD	B1	T2
A2	SL2B	WT	B2	T4
A3	TL3A	BK	B3	T6
A4	EARTH	GN	B4	EARTH

CNW-15488-00

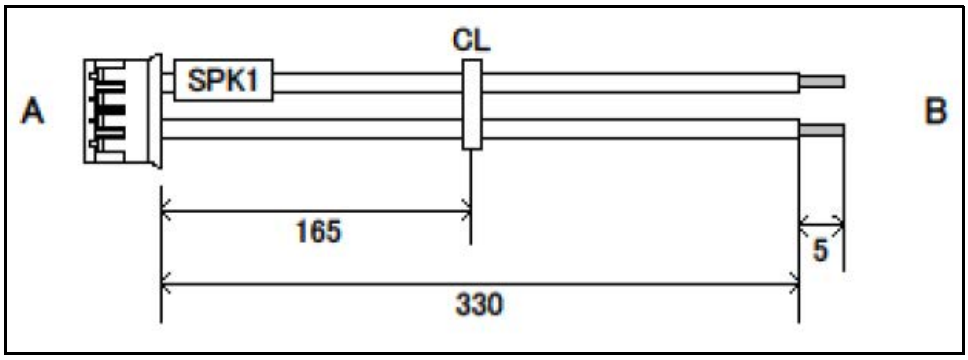


Figure 377
Boards- CNW-15488-00

Parts Number: 20CNW001548800				
A: EMX-BYT2 SPK1 B			B: speaker (W4020CPA)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	LSPK+	RD	B1	LSPK+
A2	LSPK-	BK	B2	LSPK-
A3	RSPK+	-		
A4	RSPK-	-		

CNW-15489-00

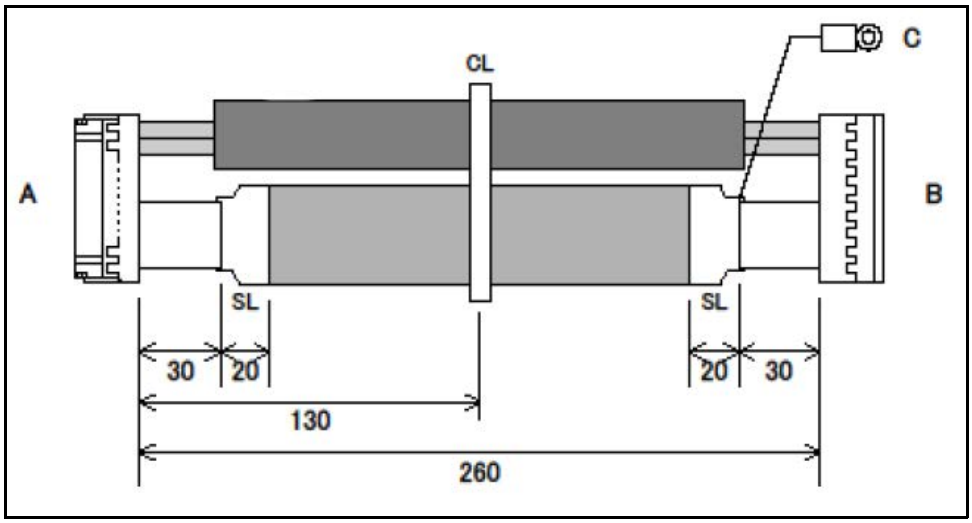


Figure 378
Boards- CNW-15489-00

Parts Number: 20CNW001548900				
A: EMX-BYT2JLVDS1			B: NLB150XG02L-01 (CN1)	
A connector			B/C connector	
No.	Signal	CLR	No.	Signal
A1	+3.3V	BR	B1	LVDS_DATAP4
A2	+5V	RD	-	LVDS_DATAN5
A3	+3.3V	OR	B2	LVDS_DATAN4
A4	+5V	YE	-	GND
A5	EDP_DDC_SCL	GN	-	GND
A6	EDP_DDC_DAT	BL		LVDS_DATAP7
A7	GND	PL	B3	LVDS_DATAP6
A8	GND	GR	B4	LVDS_DATAN7
A9	LVDS_DATAP1	WT	B9	LVDS_DATAN6
A10	LVDS_DATAP0	BK	B6	GND
A11	LVDS_DATAN1	BR	B8	
A12	LVDS_DATAN0	RD	B5	GND
A13	GND	OR	B7	LVDS_CLK2P
A14	GND	YE	B10	LVDS_CLK1P
A15	LVDS_DATAP3	GN	B18	LVDS_CLK2N
A16	LVDS_DATAP2		B12	LVDS_CLK1N
A17	LVDS_DATAN3		B17	GND

Parts Number: 20CNW001548900				
A: EMX-BYT2JLVDS1			B: NLB150XG02L-01 (CN1)	
A connector			B/C connector	
No.	Signal	CLR	No.	Signal
A18	LVDS_DATAN2		B11	GND
A19	GND		B13	+12V
A20	GND		B16	+12V
A21	LVDS_DATAP5		-	-

CNW-15490-00

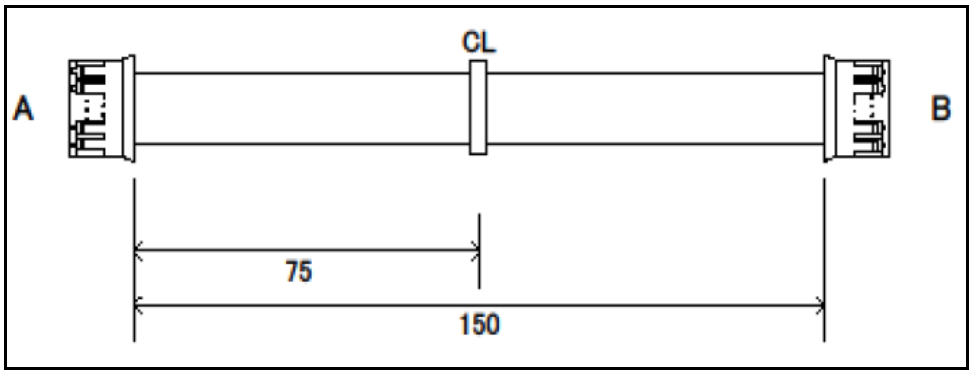


Figure 379
Boards- CNW-15490-00

Parts Number: 20CNW001549000				
A: EMX-BYT2 JBKL1			B: NLB150XG02L-01 (CN2)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	12V	BR	B5	VDD
A2	GND	RD	B4	GND
A3	LVDS_BKLTEN	OR	B3	BRTC
A4	LVDS_BKLADJ	YE	B2	PWM
A5	+5V	-	B1	NC

CNW-15491-00

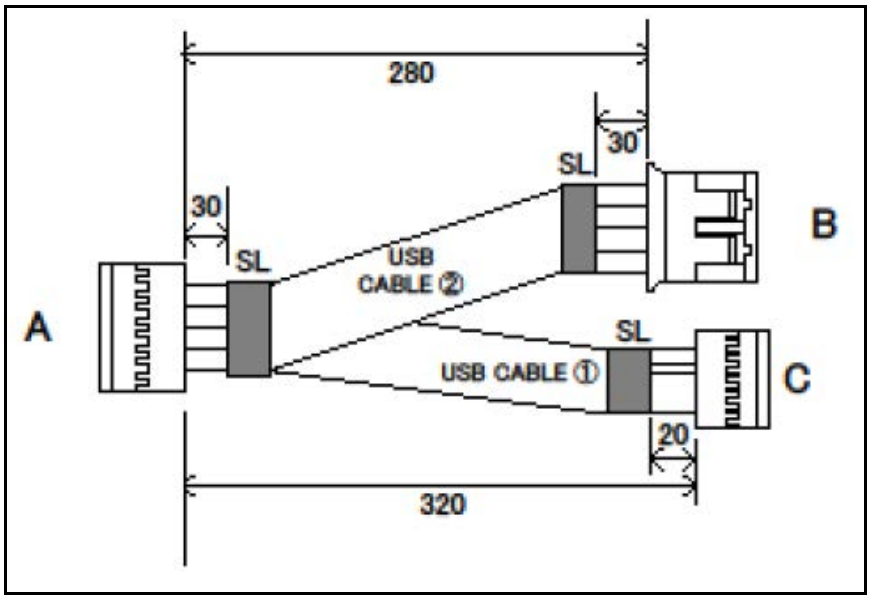


Figure 380
Boards- CNW-15491-00

Parts Number: 20CNW001549100				
A: EMX-BYT2 USB3, B: CNW-15504, C: TSC-54/RU-F CN4				
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	+V5A_USB01	RD	C1	VBUS
A2	+5A_USB01	RD	B5	USBVBUS
A3	USB_DN1	WT	C2	D-
A4	USB_DN0	WT	B2	USBD-
A5	USB_DP1	GN	C3	D+
A6	USB_DP0	GN	B1	USBD+
A7	GND	BK	C4	GND
A8	"	BK	B4	USBGND
A9	-	-	-	-
A10	-	-	-	-

CNW-15492-00

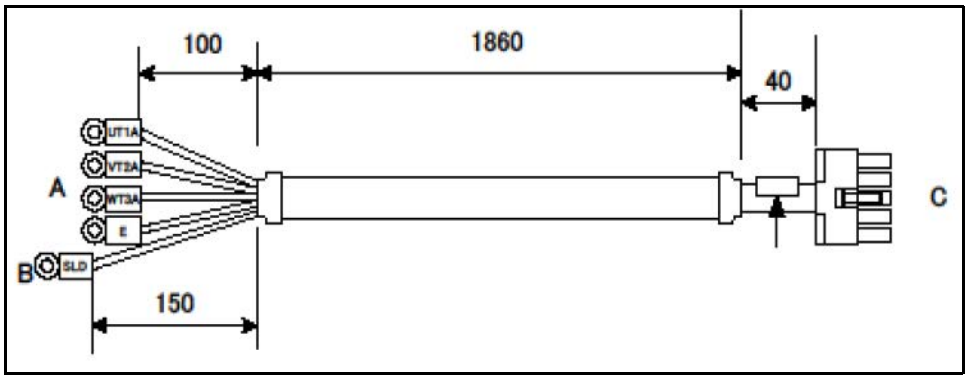


Figure 381
Boards- CNW-15492-00

Parts Number: 20CNW001549200				
A,B: INVERTER(VF-nC3M)			C: RELAY POINT	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	UT1A	RD	C1	MU
A2	VT2A	WT	C2	MV
A3	WT3A	BK	C3	MW
A4	EARTH	GN	C4	EARTH
B	SHIELD	GN		SHIELD

CNW-15493-00

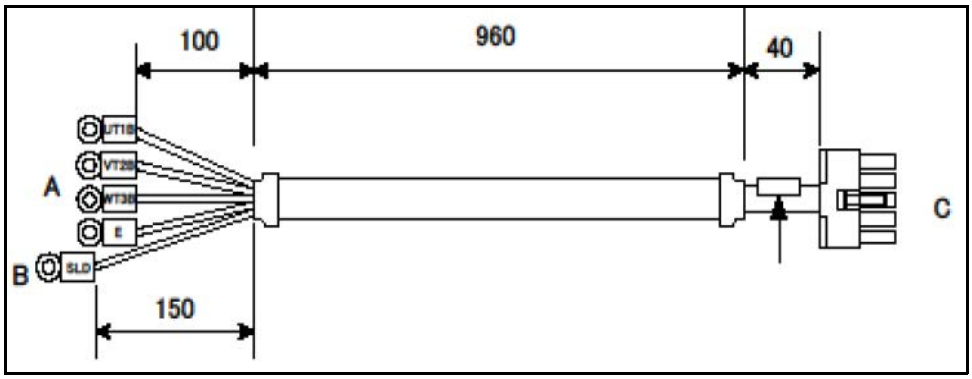


Figure 382
Boards- CNW-15493-00

Parts Number: 20CNW001549300				
A,B: INVERTER(VF-nC3M)			C: RELAY POINT	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	UT1B	RD	C1	MU
A2	VT2B	WT	C2	MV
A3	WT3B	BK	C3	MW
A4	E	GN	C4	EARTH
B	SHIELD	GN		SHIELD

CNW-15494-00

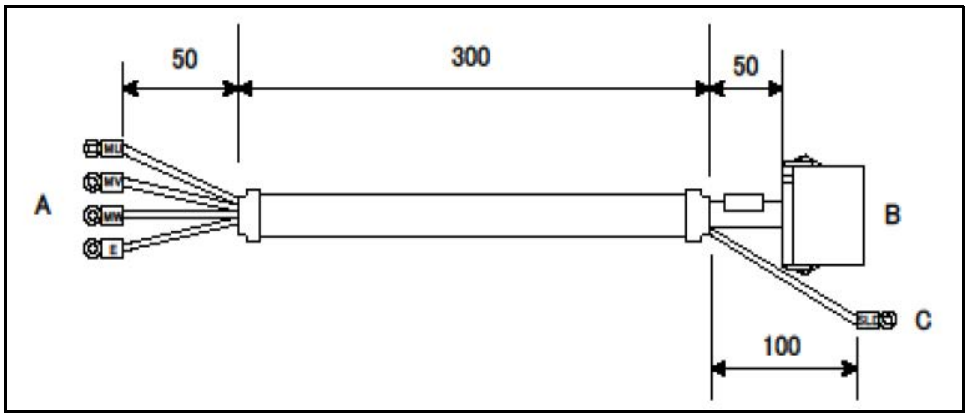


Figure 383
Boards - CNW-15494-00

Parts Number: 20CNW001549400				
A: GEARD MOTOR, B: RELAY POINT, C: SHIELD				
A connector			B/C connector	
No.	Signal	CLR	No.	Signal
A1	MU	RD	B1	IU
A2	MV	WT	B2	IV
A3	MW	BK	B3	IW
A4	EARTH	GN	B4	EARTH
	SHIELD	GN	C	SHIELD

CNW-15495-00

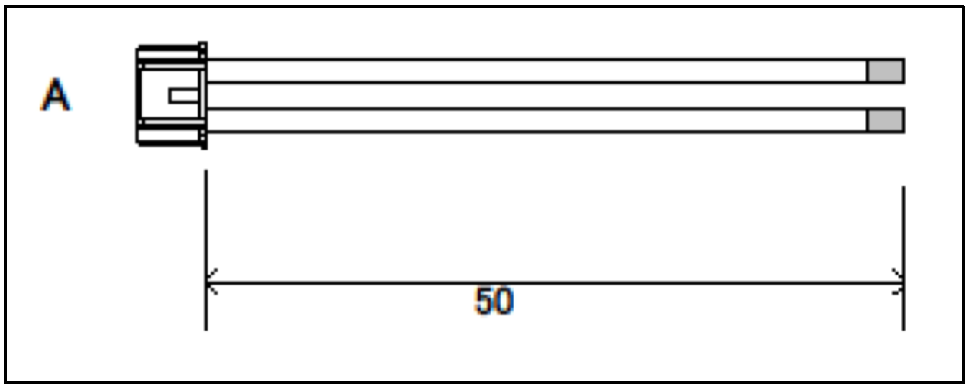


Figure 384
Boards- CNW-15495-00

Parts Number: 20CNW001549500				
A: CNW-15496			B: EB4015C-30C150-24V	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC5	RD	B1	BUZ+
A2	BUZ_CUT	BK	B2	BUZ-

CNW-15496-01

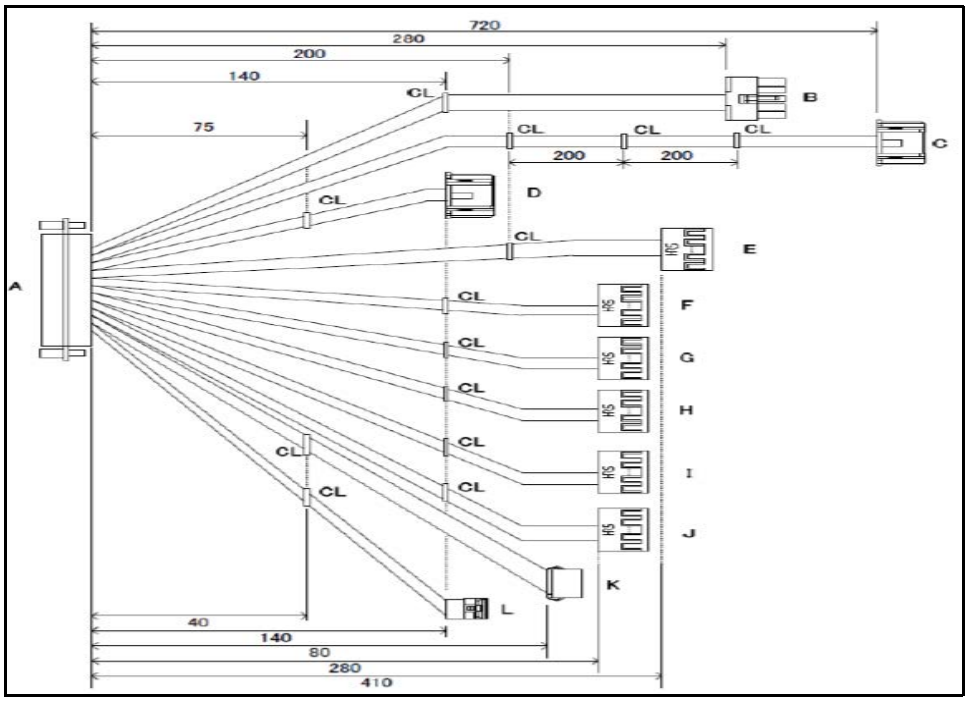


Figure 385
Boards- CNW-15496-01

Parts Number: 20CNW001549601				
A: DsuB connector			B~L: connectors	
A connector			B/L connector	
No.	Signal	CLR	No.	Signal
A1	GND	BR	B1	GND
A2	GND	RD	B1	GND
A3	GND	OR	B2	GND
A4	GND	YE	B2	GND
A5	+VIN_12	GN	B3	+VIN_12
A6	+VIN_12	BL	B3	+VIN_12
A7	+VIN_12	PL	B4	+VIN_12
A8	+VIN_12	GR	B4	+VIN_12
A9	VCC24IN	WT	C3	VCC24IN
A10	GND	BK	C5	GND
A11	LED_CNT	BR	C1	LED_CNT
A12	VCCBZ	RD	D1	VCCBZ
A14	LED_CNT	YE	C2	LED_CNT

Parts Number: 20CNW001549601				
A: DsuB connector			B~L: connectors	
A connector			B/L connector	
No.	Signal	CLR	No.	Signal
A15	BUZ_CNT	GN	D2	BUZ_CNT
A16	+PWR_BNT	BL	E5	+PWR_BNT
A17	+RESET	PL	E6	+RESET
A18	-PWR_LED	GR	E3	-PWR_LED
A19	+PWR_LED	WT	E1	+PWR_LED
A20	NRXD	BK	F1	NRXD
A21	NRXD	BR	G1	NRXD
A22	NTXD	RD	G4	NTXD
A23	NTXD	OR	F4	NTXD
A24	GND	YE	G6	GND
A25	NRXD	GN	H1	NRXD
A26	NTXD	BL	H4	NTXD
A27	NDSR	GR	H5	NDSR
A32	NRXD	RD	I1	NRXD
A33	NCTS	OR	I7	NCTS
A34	NTXD	YE	I4	NTXD
A35	NRTS	GN	I8	NRTS
A36	GND	BL	I6	GND
A37	NRXD	PL	J1	NRXD
A38	NCTS	GR	J7	NCTS
A39	NTXD	WT	J4	NTXD
A40	NRTS	BK	J8	NRTS
A41	POWSW	BR	K1	POWSW
A42	GNDS	RD	K2	GNDS
A45	POWLED_A	GN	L1	POWLED_A
A46	POWLED_K	BL	L2	POWLED_K

CNW-15497-01

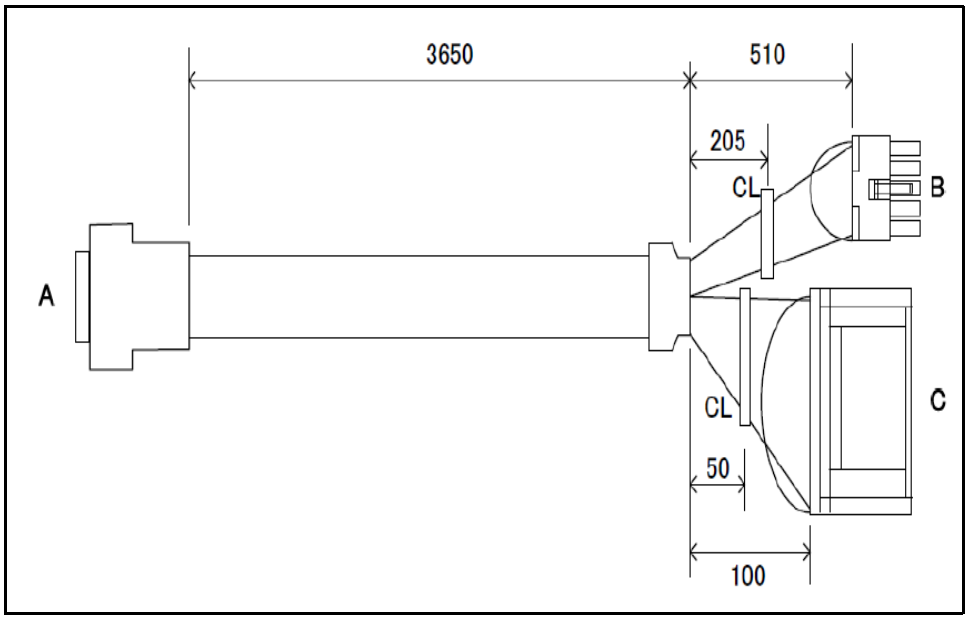


Figure 386
Boards- CNW-15497-01

Parts Number: 20CNW001549701				
A: DDU-50SF-F0+DD-C4J13-S1 (DsuB connector), B: TPB-03854 (CN2), C: TPB-03853(CN7)				
A connector			B/L connector	
No.	Signal	CLR	No.	Signal
B1	VCC24_3	WT	B6	PWR_BD_CN
A1	GNDP		B5	GNDP
A2	GNDP		B5	GNDP
A3	GNDP		B4	GNDP
A4	GNDP		B4	GNDP
A5	VCC12		B3	VCC12
A6	VCC12		B3	VCC12
A7	VCC12		B2	VCC12
A8	VCC12		B2	VCC12
A9	VCCPATHLIGHT		C2	VCCPATHLIGHT
A10	GNDP		C3	GNDP
A11	LEDO		C4	LEDO
A12	VCCBZ		C5	VCCBZ
A13	N.C.		C6	GNDP

Parts Number: 20CNW001549701				
A: DDU-50SF-F0+DD-C4J13-S1 (DsuB connector), B: TPB-03854 (CN2), C: TPB-03853(CN7)				
A connector			B/L connector	
No.	Signal	CLR	No.	Signal
A14	LEDR		C7	LEDR
A15	BZ		C8	BZ
A16	XPWBTN_MB		C9	XPWBTN_MB
A17	SYS_RST		C10	SYS_RST
A18	XPS_ON		C11	XPS_ON
A19	LED+		C12	LED+
A20	MBRX1		C13	MBRX1
A21	MBRX2		C14	MBRX2
A22	MBRX2		C15	MBTX2
A23	MBTX1		C16	MBTX1
A24	GNDP		C17	GNDP
A25	MBRX3		C18	MBRX3
A26	MBTX3		C19	MBTX3
A27	SHUT_DOWN		C20	SHUT_DOWN
A28	MBRX4		-	N.C
A29	MBCTS4		-	N.C
A30	MBTX4		-	N.C
A31	MBRTS4		-	N.C
A32	MBRX5		C25	MBRX5
A33	MBCTS5		C26	MBCTS5
A34	MBTX5		C27	MBTX5
A35	MBRTS5		C28	MBRTS5
A36	GNDS		C29	GNDS
A37	MBRX6		C30	MBRX6
A38	MBCTS6		C31	MBCTS6
A39	MBTX6		C32	MBTX6
A40	MBRTS6		C33	MBRTS6
A41	POWSW		C34	POWSW
A42	GNDS		C35	GNDS
A43	SHUTDWSW		-	SHUTDWSW
A44	GNDS		-	GNDS
A45	POWLED_A		C38	POWLED_A

Parts Number: 20CNW001549701				
A: DDU-50SF-F0+DD-C4J13-S1 (DsuB connector), B: TPB-03854 (CN2), C: TPB-03853(CN7)				
A connector			B/L connector	
No.	Signal	CLR	No.	Signal
A46	POWLED_K		C39	PWLED_K
C1	VCC24_3	WT	C40	MB_SIG_CONE CT

CNW-15498-01

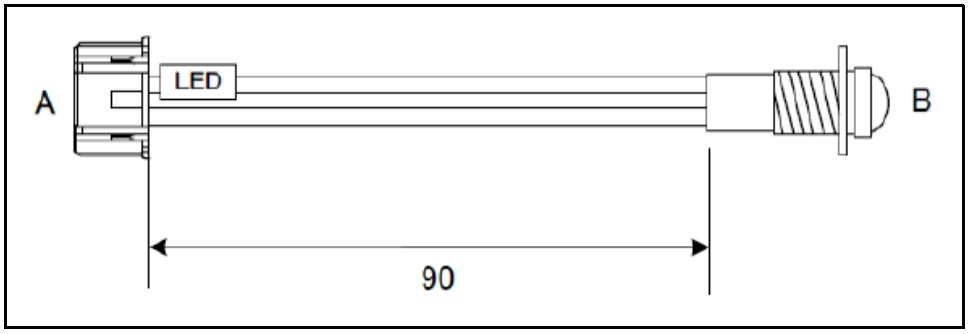


Figure 387
Boards- CNW-15498-01

Parts Number: 20CNW001549801				
A: CNW-15496			B: LED	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC3	RD	B1	VCC3
A2	LED_CHG	BK	B2	GND

CNW-15499-01

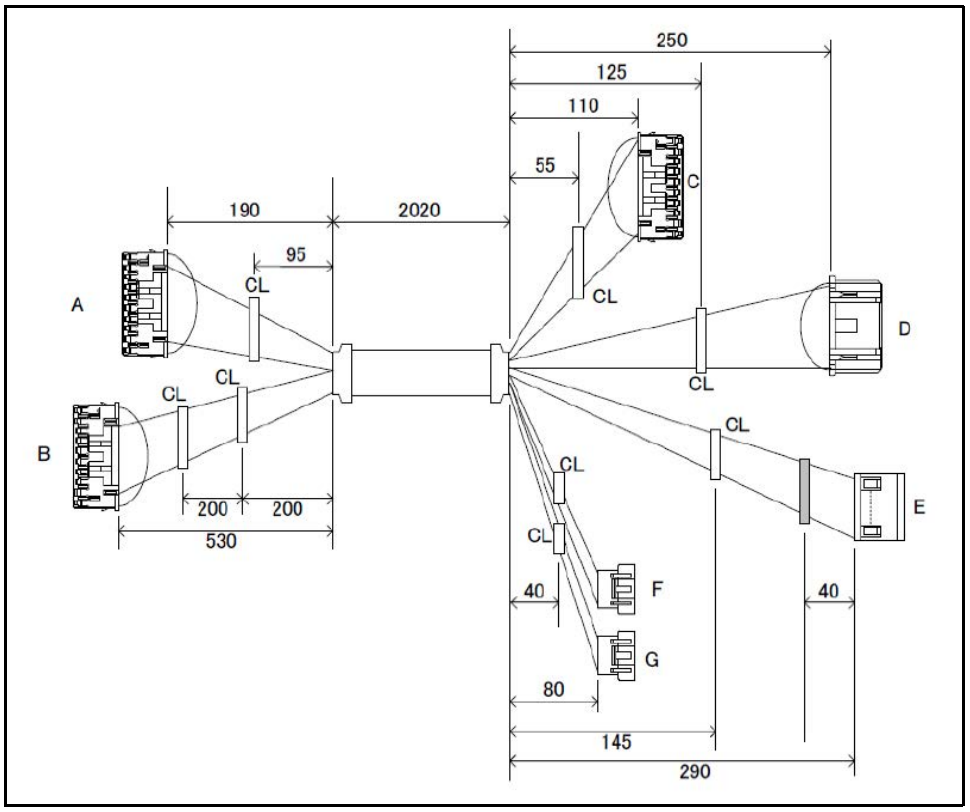


Figure 388
Boards - CNW-15499-01

Parts Number: 20CNW001549901				
A: TPB-03853(CN31), B: TPB-03854(CN1), C: TPB-03851(CN11), D:TPB-03850(CN14), E: TPB-03850(CN3), F/G: E stop switch board				
A/B/C/D connector			B/C/D/F/G connector	
No.	Signal	CLR	No.	Signal
A1	VCC24_3	WT	A24	MAIN_CONECT
A2	RX_MAIN1		D5	COM2RX
A3	TX_MAIN1		D3	COM2TX
A4	RX_MAIN2		D7	COM2RX2
A5	TX_MAIN2		D6	COM2TX2
A6	RX_INV1		C11	RXINV
A7	TX_INV1		C10	TXINV
A8	RX_PLC1		C3	RXRELAY1
A9	TX_PLC1		C2	TXRELAY1
A10	RX_PLC2		C13	RXRELAY2

Parts Number: 20CNW001549901				
A: TPB-03853(CN31), B: TPB-03854(CN1), C: TPB-03851(CN11), D:TPB-03850(CN14), E: TPB-03850(CN3), F/G: E stop switch board				
A/B/C/D connector			B/C/D/F/G connector	
No.	Signal	CLR	No.	Signal
A11	RX_PLC2		C12	TXRELAY2
A12	TRG_IN1		C6	SEN10
A13	RX_INV2		C18	RXINV2
A14	TX_INV2		C17	TXINV2
A15	ENC_INI1_A		C4	ENCA
A16	ENC_IN1_B		C5	ENCB
A17	RX_N101		D4	COM1RX
A18	TX_N101		D2	COM1TX
A21	GNDS		D9	GNDS
A23	TRG		C7	TRG
B1	VCC24_3	WT	B20	MAIN_PWR_CONE_CT
B2	VCC24		G1	VCC24
B3	VCC24		G2	VCC24
B4	VCC24_MAIN	-/WT	E1	VCC24_IN
B5	VCC24MOT		C14	VCC24IN
B6	VCC24MAIN	-/WT	E2	VCC24_IN
B7	VCC24		C15	VCC24IN
B8	VCC24_MAIN	-/WT	E3	VCC24_IN
B9	VCC24MOT		C16	VCC24IN
B10	VCC24_MAIN	-/WT	E4	VCC24_IN
B11	GNDP		C21	GNDP
B12	GNDP	-/WT	E7	GNDP
B13	GNDP		C22	GNDP
B14	GNDP	-/WT	E8	GNDP
B15	GNDP		C23	GNDP
B16	GNDP	-/WT	E9	GNDP
B17	ESW_IN		F1	STOP
B18	GNDP	-/WT	E10	GNDP
B19	ESW_IN		F2	STOP
C1	VCC24IN	WT	C24	TEST_RELAY
D1	VCC3A	WT	D10	TEST_RELAY
C20	SHIELD	GN		SHIELD

CNW-15500-01

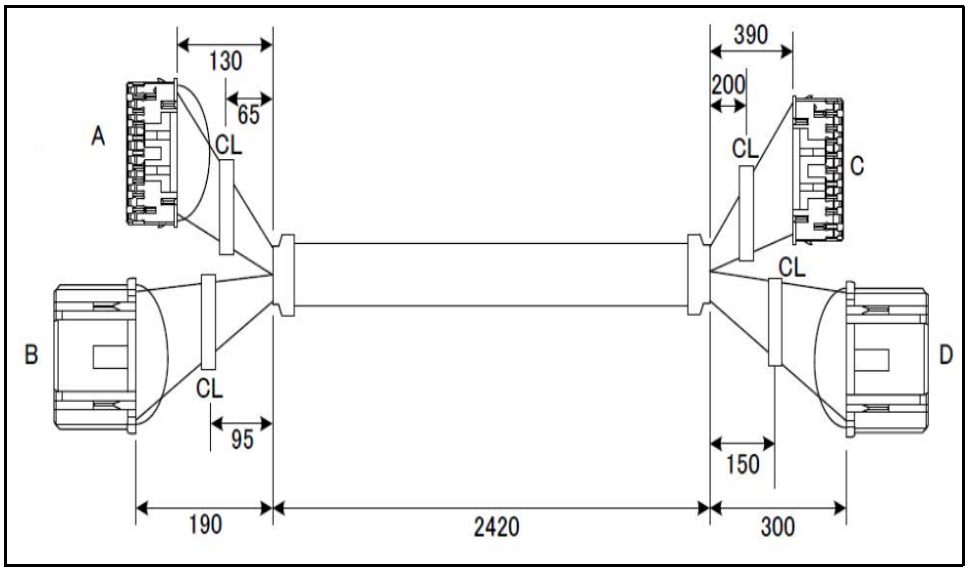


Figure 389
Boards- CNW-15500-01

Parts Number: 20CNW001550001				
A: TPB-03850(CN12), B: TPB-03850(CN11), C: TPB-03852(CN2), D: TPB-03852(CN1),				
A/B connector			C/D connector	
No.	Signal	CLR	No.	Signal
A1	VCC24IN	WT	A26	VCC24IN
A2	VCC24AD		C2	VCC24IN
A3	VCC24AD		C3	VCC24IN
A4	VCC24AD		C4	VCC24IN
A5	GNDP		C5	GNDP
A6	GNDP		C6	GNDP
A7	GNDP		C7	GNDP
A8	TXD1		C8	RXD2
A9	RXD1		C9	TXD2
A10	TXD2		C10	RXD21
A11	RXD2		C11	TXD21
A12	GNDS		C12	GNDS
A14	TXD_MLOG		C14	RXD_MLOG
A15	RXD_MLOG		C15	TXD_MLOG
A16	TXD_FPGABOTH		C16	RXD_FPGABOTH
A17	RXD_FGADSP		C17	TXD_FPGAFLASH

Parts Number: 20CNW001550001				
A: TPB-03850(CN12), B: TPB-03850(CN11), C: TPB-03852(CN2), D: TPB-03852(CN1),				
A/B connector			C/D connector	
No.	Signal	CLR	No.	Signal
A18	SELDSP1		C18	SELDSP1
A19	SELDSP2		C19	SELDSP2
A20	GNDS		C20	GNDS
A21	SHDSP		C21	SHDSP
A22	DSPRESET		C22	DSPRESET
A23	TMAD		C23	TM
B3	GNDS		D3	GNDS
B4	GNDS		D4	GNDS
B5	SEN1_O		D5	SEN1
B6	SEN2_O		D7	SEN2
B7	SEN3_O		D6	SEN3
B8	SEN4_O		D9	SEN4
B9	SEN5_O		D8	SEN5
B10	SEN6_O		D11	SEN6
B11	SEN7_O		D10	SEN7
B12	SEN8_O		D12	SEN8
B1	VCC5PASS	WT	B14	TEST_SENS
D1	VCC5	WT	D14	TEST_PASS
A25	SHIELD	GN		SHIELD

CNW-15501-01

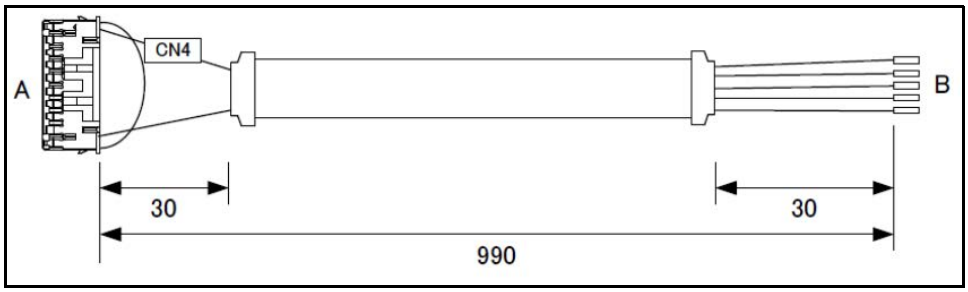


Figure 390
Boards - CNW-15501-01

Parts Number: 20CNW001550101				
A: TPB-03851 (CN4)			B: Inverter A (VF-nC3M)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC24IN	WT	A20	TEST_INVA
A10	ACONV_CM		B1	CC_A
A11	ACONV_FWD		B2	F_A
A12	ACONV_REVE		B3	R_A
A13	ACONV_X1		B4	S1_A
14	ACONV_X2		B5	S2_A

CNW-15502-01

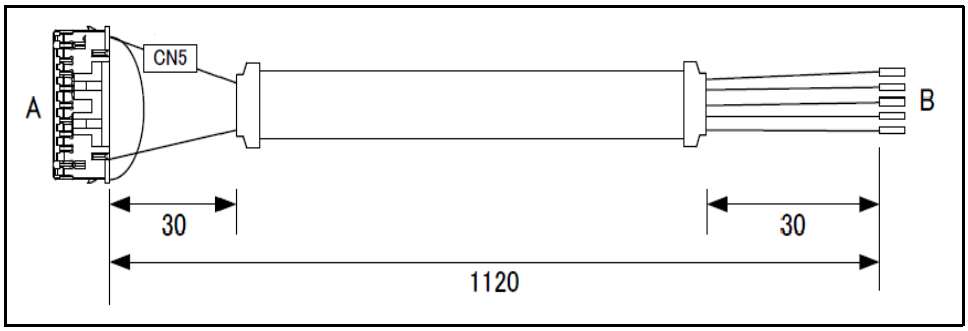


Figure 391
Boards - CNW-15502-01

Parts Number: 20CNW001550201				
A: TPB-03851 (CN5)			B: Inverter B (VF-nC3M)	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	VCC24IN	WT	A20	TEST_INVA
A10	BCONV_CM		B1	CC_B
A11	BCONV_FWD		B2	F_B
A12	BCONV_REVE		B3	R_B
A13	BCONV_X1		B4	S1_B
14	BCONV_X2		B5	S2_B

CNW-15503-01

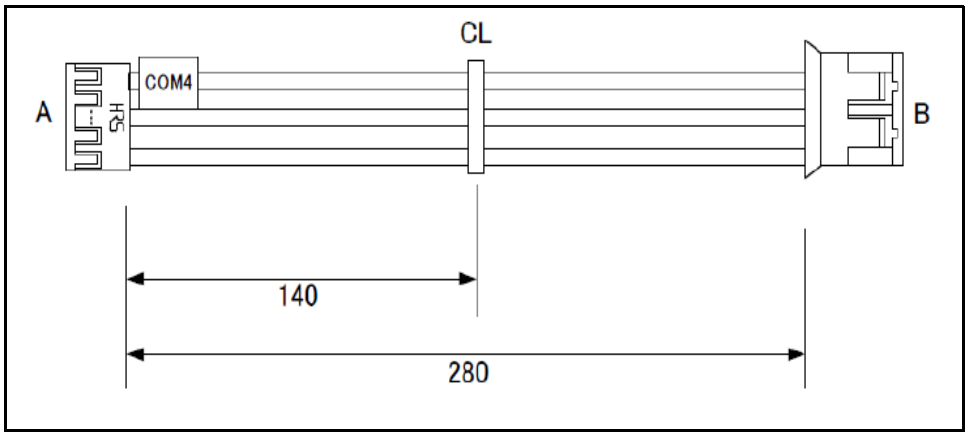


Figure 392
Boards - CNW-15503-01

Parts Number: 20CNW001550301				
A: EMX-BYT2 COM4			B: CNW-15452	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	NRXD	BR	B1	U1_TXD
A4	NTXD	RD	B2	U1_RXD
A6	GND	OR	B3	GNDS

CNW-15505-00

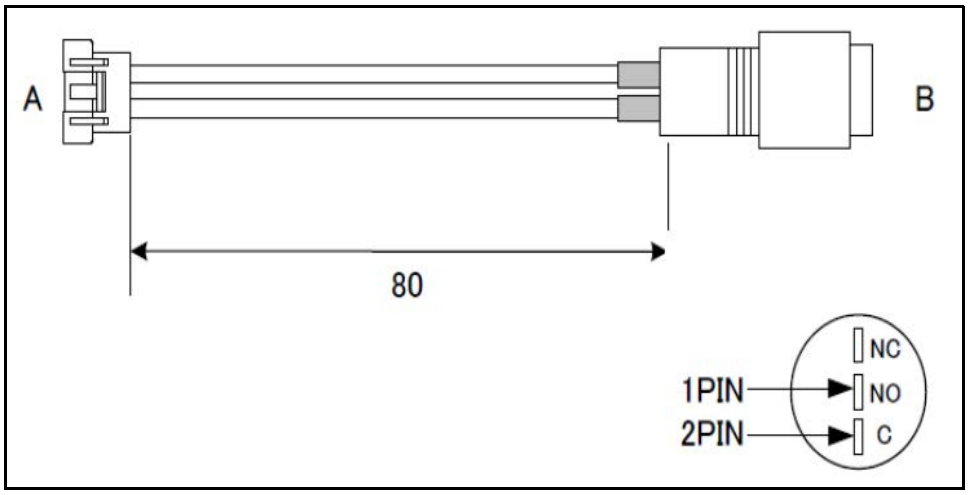


Figure 393
Boards - CNW-15505-00

Parts Number: 20CNW001550500				
A: CNW-15496			B: Power switch	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	POWSW	RD	B1	NO
A2	GNDS	BK	B2	C

CNW-15508-00

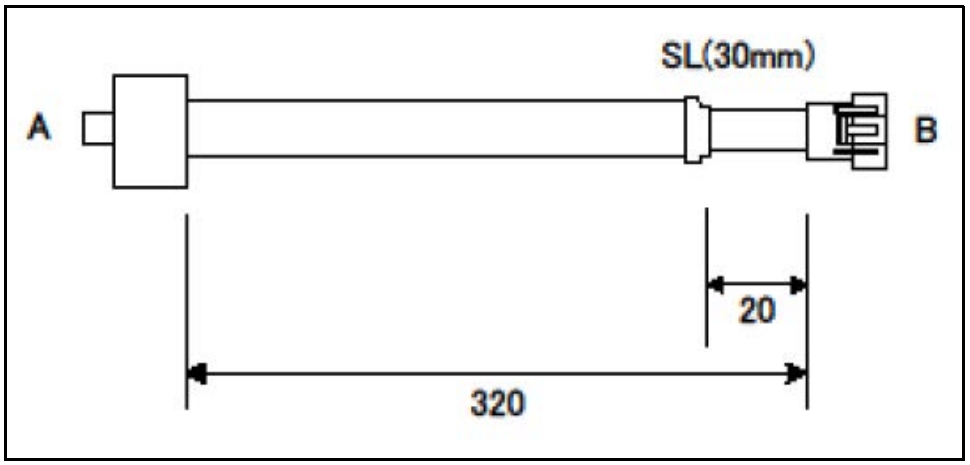


Figure 394
Boards - CNW-15508-00

Parts Number: 20CNW001550800				
A: TPB-03850			B: CNW-15491	
A connector			B connector	
No.	Signal	CLR	No.	Signal
A1	P0	RD	B1	P0
A2	YA	BL	B2	YA
A3	CM2	WT	B3	CM
A4	YB	GN	B4	YB
A5	CM3	BK	B5	CM
	SHIELD	GN	B6	SHIELD

Recommended parts

Parts list

Name	Parts Number
Mail board (TPB-3850)	41025990100100
Transport board (TPB-3851)	41025990300100
Relay board (TPB-3853)	41025990300300
Power distribution board (TPB-3854)	41025990300400
Switch board (TPB-3948)	41025990300100
B scale A/D board (TPB-3273)	41025990500100
C scale A/D board (TPB-3273)	41025990500200
A/D control board (TPB-3852)	41025990300200
Gate board receiver (TPB-3283)	41022390800400
Gate board emitter (TPB-3282)	41022390800300
Passage sensor board (small) receiver (TPB-3864)	41025990300600
Passage sensor board (large) receiver (TPB-3866)	41025990300800
Passage sensor board (small) emitter (TPB-3863)	41025990300500
Passage sensor board (large) emitter (TPB-3865)	41025990300700
Touch panel relay board (TSC-54/RU-F)	10MXASYTSC54RF
Power supply board (SWF150P-24)	10PXPWU0SWF150
LCD	10AXLCD0N15XG2
Touch panel	10EXETC04344S1
Stacklite board (TPB-3926)	41025990301100
Mother board (EMX-BYT2-A1-01R)	41025990800100
SSD (OsAPL installed)	41025990800200
Main memory (4Gb)	10MXSUBMEM4G06
Built-in battery	10BX2ND05HRTSK
Breaker	10SFBRKBW32P20
Noise filter	10FXNFLTAH2683
electromagnetic switch	10SFRLL0SC050G
Circuit protector	10S0BRK0BA2125
Emergency (E) stop SW	10SFPSW0AM2VDF
Blinker for gate (shading plate)	20TPB100362301
Blinker for pass sensor (shading plate)	41025990300900

Name	Parts Number
Drive belt (common to A and B conveyors)	30J35306PK0950
Conveyance belt (for A conveyor)	41025901500100
Conveyance belt (for B conveyor)	41025901500200
Drive roller	41025907600100
Driven roller	41025907600200
Bearing unit	41025960004100
Adjuster	41025960004000
Main motor ASSY	41025960004400
Inverter	10KXACC04PYA30
Loadcell (B scale)	41025960004200
Loadcell (C scale)	41025960004300

CHAPTER 6
LOG, FIRMWARE, DATA

Log acquisition

Common operation

Use USB memory for log acquisition:

Figure 395
Log acquisition - Measurement screen

1. With the **Measurement screen** displayed, Select **Setting** to display the **Maintenance screen** for general users.

2. Tap **[Maintenance]**.

Figure 396
Log acquisition - Maintenance

NOTE

The login user is different for **Get lot** *and* **Maintenance record log acquisition**. *Both will be presented here.*

3. With the Login screen displayed, tap **[Maintenance]** to check the box next to **Maintenance**.

Figure 397
Log acquisition - Login

4. Tap in the text field next to Password to display the Numeric keypad window.

5. Enter the pass code **8715** into the Numeric keypad window. Then tap **[Enter]**.

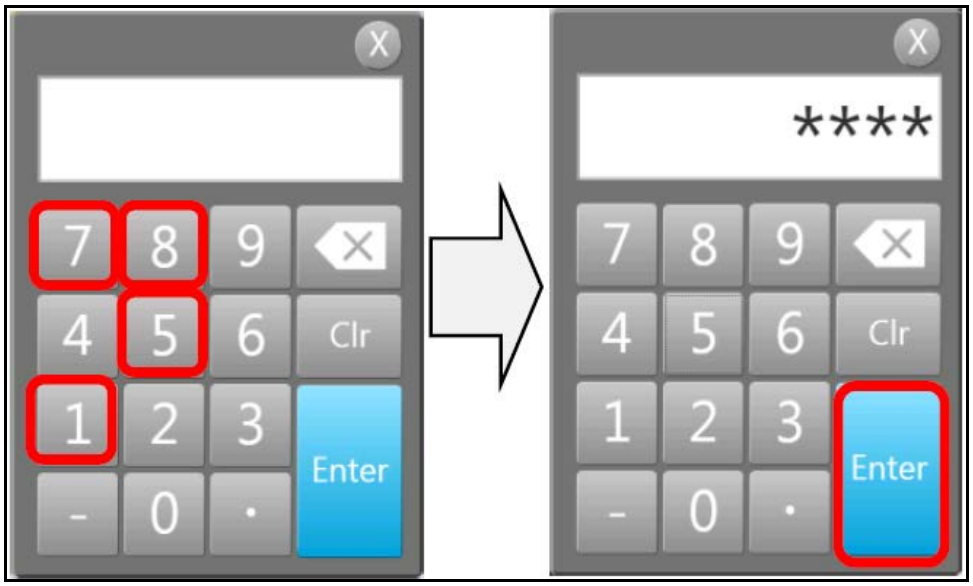


Figure 398
Log acquisition - Numeric keypad window

6. With the Login window displayed, tap **[Login]**.

Figure 399
Log acquisition - Login

7. Locate the USB ports on the right side of the display. Turn the cover clockwise to access the 4 USB ports.

8. Insert the USB memory into the open USB port.

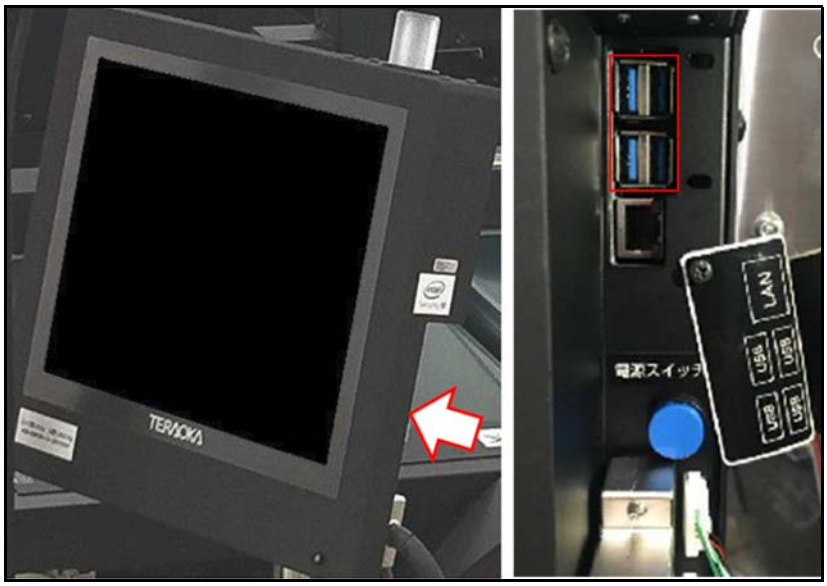


Figure 400
Log acquisition - USB ports

9. When using a secure USB, a Password authentication window will display, requesting a password. Enter the password by tapping in the text box and using the soft keyboard that will display. Tap **[Open drive]** to make the USB drive available.

Figure 401
Log acquisition - USB ports

Log acquisition operation

The Cubiscan 200 SQ maintains a log of various functions. These logs may be accessed from the **Log** menu in the side panel. This data will display in the corresponding screen and may be saved to a USB device.

Complete the following steps to display and save data to a USB drive:

1. Log acquisition can be performed from the Log menu. Tap **[+]** next to **Log** to reveal the log acquisition selections. The following selections are available:

   - Measurement
   - Mileage
   - Error recording
   - Control services
   - Display app.
   - Maintenance log

2. With **Maintenance** screen displayed, choose the data to acquire by tapping the selection beneath the **Log** menu in the side panel.

Figure 402
Log acquisition - Measurement screen

3. Logs may be acquired for only the select relevant dates or for all dates. Tap the ▽ to the right of the **Date** to select a date. All data for that date

will display a list of data for that date. Select the data you wish to retrieve, then tap **[Save]** to get the log data.

Figure 403
Log acquisition - Saving log data

4. To acquire and save all data, tap **[Save All]**.

Figure 404
Log acquisition - Retrieve all data logs

5. In either case, the Destination drive selection window will appear. Tap ∇ to the right of the drive drop down, then select the drive of the USB memory.

NOTE *When using a normal USB memory, select D drive. For secure USB memory, select E drive.*

6. Once the desired drive is chosen, tap **[OK]**.

Figure 405
Log acquisition - Drive selection

The save location for files can be found in the sub-folder designated by the number of the machine from where the data was retrieved within the folder labeled **LOGOUT**. For example, **D://LOGOUT/01** would be the folder where the data file would be located for machine 01.

The log file name will differ according to the log file saved. The following table will illustrate the general file name formats for the various log acquisition data:

Log	File name format
Measurement	mresYYYYMMDD.csv
Error recording	error.log
Control services	SQMesSrvMMDD.log
Display app.	SQDispMMDD.log
Maintenance log	SetupLog.txt

NOTE *YYYYMMDD and MMDD in the file names represent the date of the log. YYYY = the four-digit year, MM = the two-digit month, and DD = the two-digit day.*

Device setting data

Common operation

Use USB memory for log acquisition:

With the **Measurement** screen displayed, Tap **Setting** to display the **Maintenance** screen for general users.

Figure 406
Device setting data - Measurement screen

7. Tap **[Maintenance]**.

Figure 407
Device setting data - Maintenance

8. The login user is different for **Get lot** and **Maintenance record log acquisition**.

9. With the Login window displayed, tap **[Maintenance]**.

10. Tap in the text box next to **Password**.

Figure 408
Device setting data - Login

11. The Numeric keypad window will appear.

12. Enter the pass code **8715**, then tap **[Enter]**.

13. Tap **[Login]** after returning to Login window.

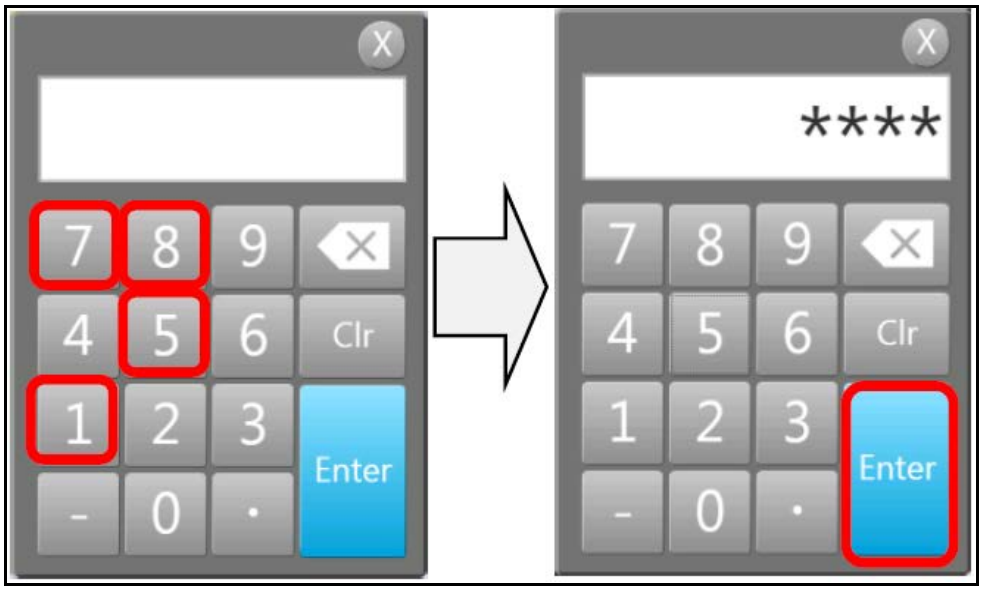


Figure 409
Device setting data - Numeric keypad window

14. Locate the USB ports on the right side of the display. Turn the cover clockwise to access the 4 USB ports.

15. Insert the USB memory into the open USB port.

Figure 410
Device setting data - USB ports

16. When using a secure USB, a Password authentication window will display, requesting a password. Enter the password by tapping in the text box and using the soft keyboard that will display. Tap **[Open drive]** to make the USB drive available.

Device setting data backup procedure

1. With the maintenance user **Maintenance** screen displayed. Tap **[+]** next to **Device settings**, then select **Recovery**. This will display the setting history.

Figure 411
Device setting data - Maintenance screen

2. To save items in the history, select the items and tap **[Export]**.

Figure 412
Device setting data - Setting history

3. the Destination drive selection window will appear. Tap ▽ to the right of the drive drop down, then select the drive of the USB memory.

NOTE *When using a normal USB memory, select D drive. For secure USB memory, select E drive.*

Figure 413
Device setting data - Destination drive select

4. After choosing a drive, tap **[OK]**. A processing message will appear briefly. The log is fully saved when the processing message disappears.

NOTE *YYYYMMDD and MMDD in the file names represent the date of the log. YYYY = the four-digit year, MM = the two-digit month, and DD = the two-digit day.*

Adjustment setting data backup procedure

1. With the maintenance user **Maintenance** screen displayed. Tap **[+]** next to **Adjustment settings**, then select **Recovery**. This will display the setting history.

Figure 414
Adjustment setting - Maintenance screen

2. To save items in the history, select the individual items and tap **[Export]**.

Figure 415
Adjustment setting - Export

3. The **Destination drive selection** window will appear. Tap ▽ to the right of the drive drop down, then select the drive of the USB memory.

NOTE *When using a normal USB memory, select D drive. For secure USB memory, select E drive.*

Figure 416
Adjustment setting- Destination drive select

4. After choosing a drive, tap **[OK]**. A processing message will appear briefly. The log is fully saved when the processing message disappears.

NOTE *YYYYMMDD and MMDD in the file names represent the date of the log. YYYY = the four-digit year, MM = the two-digit month, and DD = the two-digit day.*

Device setting data restore procedure

1. With the maintenance user **Maintenance** screen displayed. Tap **[+]** next to **Device settings**, then select **Recovery**. This will display the setting history.

Figure 417
Device setting data - Maintenance screen

2. To import files in the history, tap **[Import]**.

Figure 418
Device setting data - Import

3. The file explore will display. Select D drive (E drive for secure USB). Log files can be found in the **sq_ini** folder. Choose the folder with the corresponding machine number. Tap ∇ to the right of the drive drop down, then select the drive of the USB memory.

4. Select the file you want to import and tap **[Open]**.

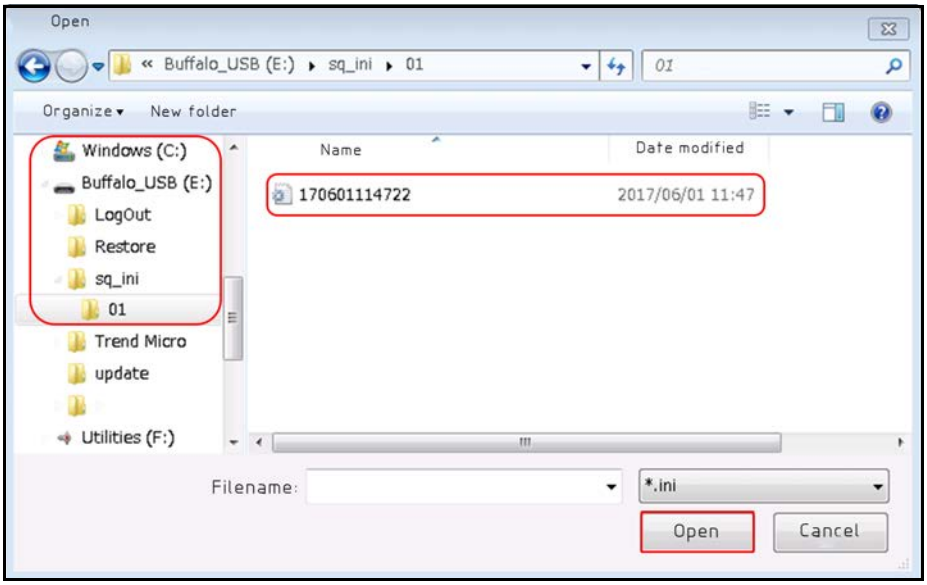


Figure 419
Device setting data - File explorer

5. Tap **[OK]** after the Process completed message appears to close the window.

6. Confirm that the file has been added to the setting change history item. You can rewrite the settings using the recovery option.

Figure 420
Device setting data - Added Files

7. Select the added file and tap **[Recovery]**.

8. Tap **[OK]** after the Processing completed window is displayed to close the window.

Figure 421
Device setting data - Recovery window

9. After returning to the System restore screen, tap **[Exit]** to log out.

10. The Finish setting confirmation screen will appear. Ensure the check box next to Logout is checked, then tap **[OK]**.

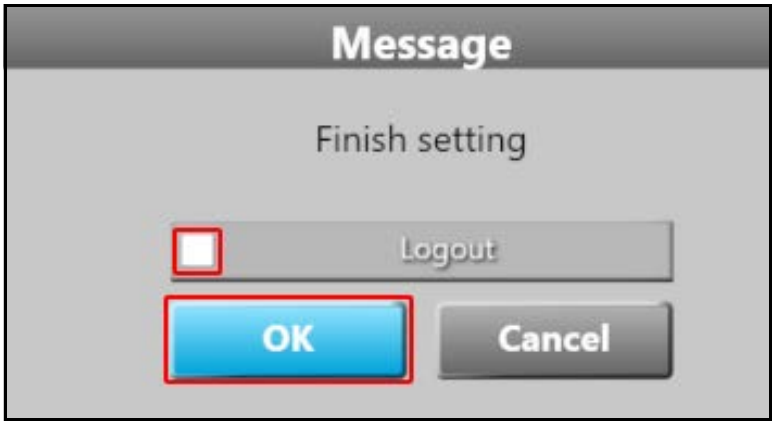


Figure 422
Device setting data - Logout

11. Exit maintenance mode and display the Update settings window.

12. Enter ***teraoaka*** in the text box next to Signature by tapping in the text box and using the on-screen keyboard. Then tap **[Update]**.

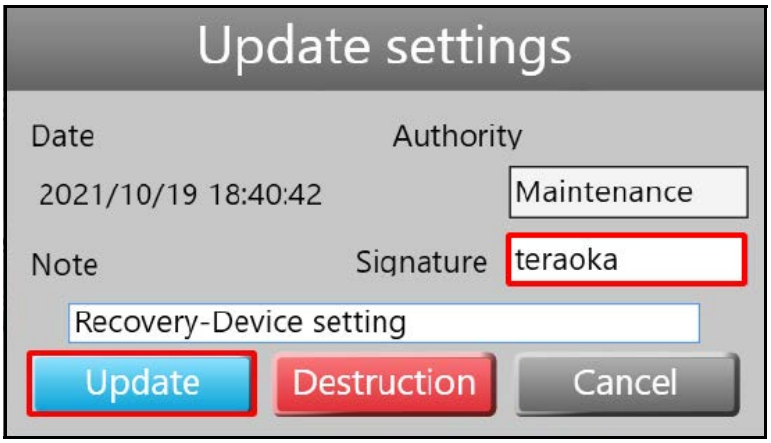


Figure 423
Device setting data - Update settings

13. Once the update is complete, the terminal will return to the measurement screen.

Adjustment setting data restore procedure

1. With the maintenance user Maintenance screen displayed. Tap **[+]** next to Adjustment settings, then select **Recovery**. This will display the setting history.

Figure 424
Adjustment setting data - Maintenance screen

2. To import files in the history, tap **[Import]**.

Figure 425
Adjustment setting data - Import

3. The file explore will display. Select D drive (E drive for secure USB). Log files can be found in the **sq_ini** folder. Choose the folder with the corresponding machine number. Tap ∇ to the right of the drive drop down, then select the drive of the USB memory.

4. Select the file you want to import and tap **[Open]**.

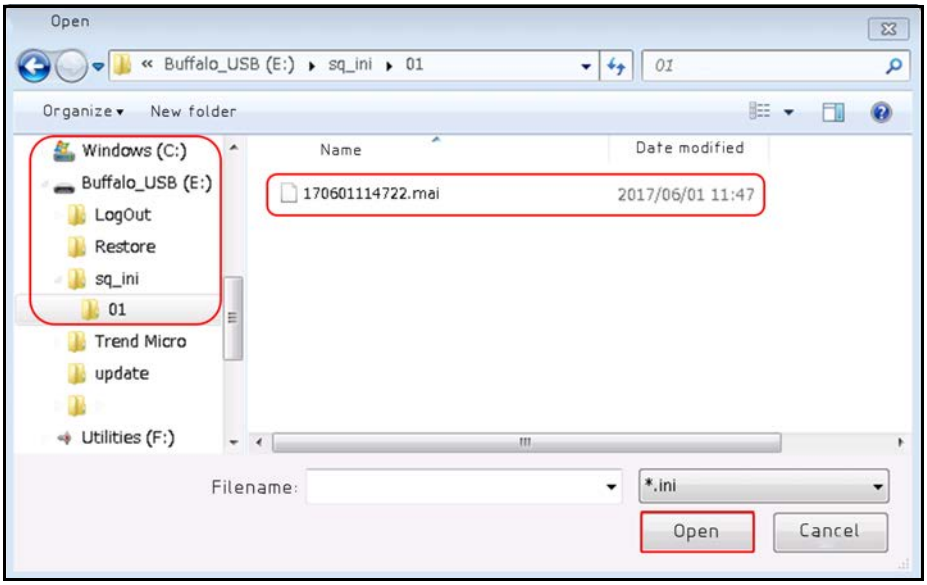


Figure 426
Adjustment setting data - File explorer

5. Tap **[OK]** after the Process completed message appears to close the window.

6. Confirm that the file has been added to the setting change history item. You can rewrite the settings by performing the restoration work.

Figure 427
Adjustment setting data - Setting history

7. Select the added file and tap **[Restore]**.

8. Tap **[OK]** after the Processing completed window is displayed to close the window.

Figure 428
Adjustment setting data - Recovery window

9. After returning to the System restore screen, tap **[Exit]** to log out.

10. The Finish setting confirmation screen will appear. Ensure the check box next to **Logout** is checked, then tap **[OK]**.

11. This will exit maintenance mode and display the **Update settings** window.

12. Enter ***teraoaka*** in the text box next to **Signature** by tapping in the text box and using the on-screen keyboard. Then tap **[Update]**.

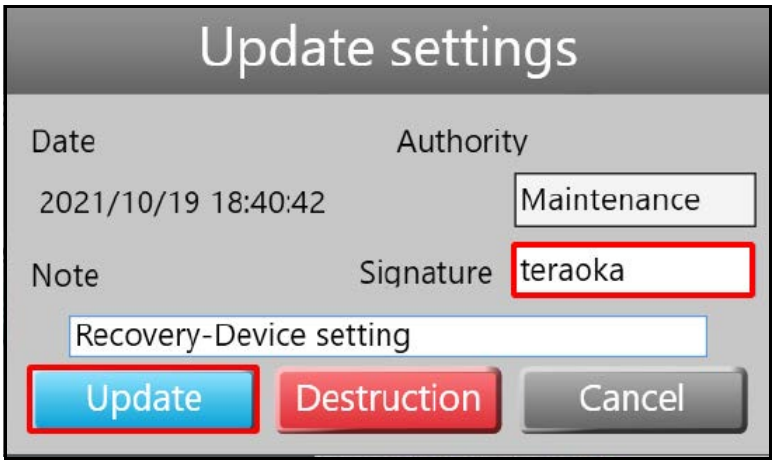


Figure 429
Adjustment setting data - Update settings

13. Once the update is complete, the terminal will return to the **Measurement** screen.

Application installation

1. Unzip the program file **SQDPVX_X_X.zip** file to create an **Update** folder.

2. Copy the entire **Update** folder directly under the USB memory. The file name will have the format **SQDPV*XXX*.zip**, where ***XXX*** represents the firmware.

3. Start the Cubiscan 200 SQ.

4. From the **Measurement** screen, stop the conveyor by tapping **[STOP]**.

Figure 430
Application installation - Measurement screen

5. Locate the USB ports on the right side of the display. Turn the cover clockwise to access the 4 USB ports.

6. Insert the USB memory into the open USB port.

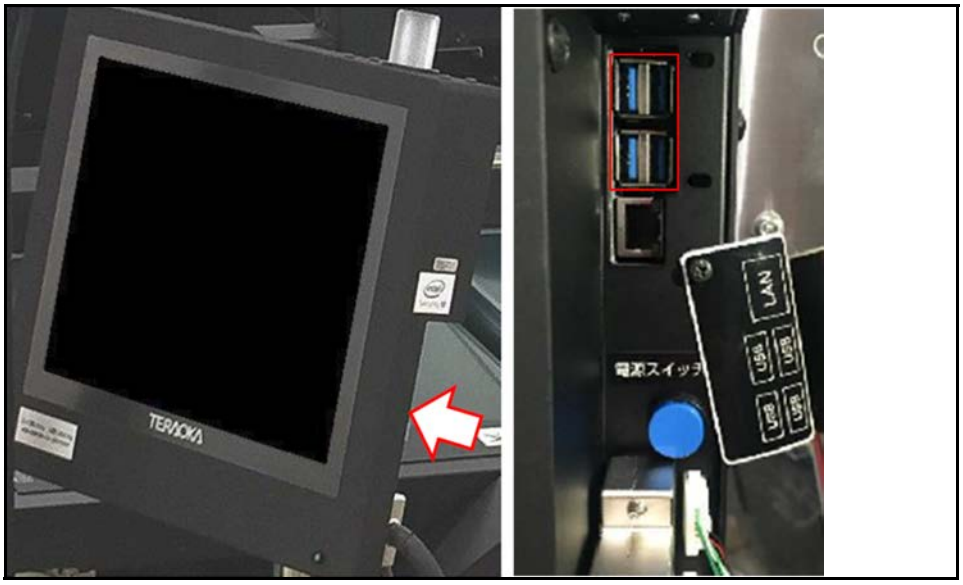


Figure 431
Application installation - USB ports

7. When using a secure USB, a Password authentication window will display, requesting a password. Enter the password by tapping in the text box and using the soft keyboard that will display. Tap **[Open drive]** to make the USB drive available.

8. A message window will display in the upper right of the screen, indicating **Update program has arrived**. Tap **[Check for updates content]**.

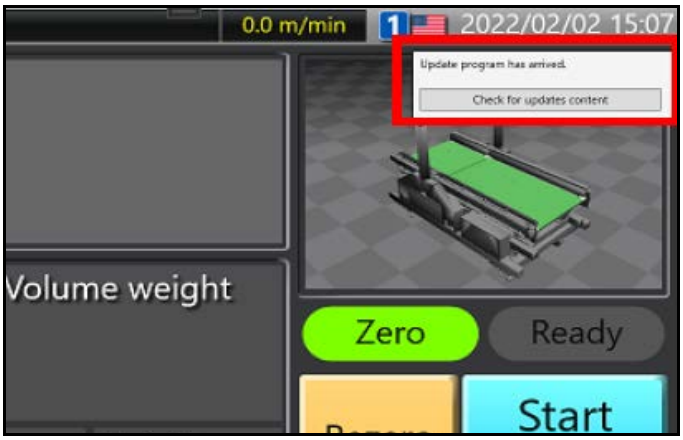


Figure 432
Application installation - Update message

9. The Update content window will then display. Tap **[Update now]**.

10. The program installation will begin.

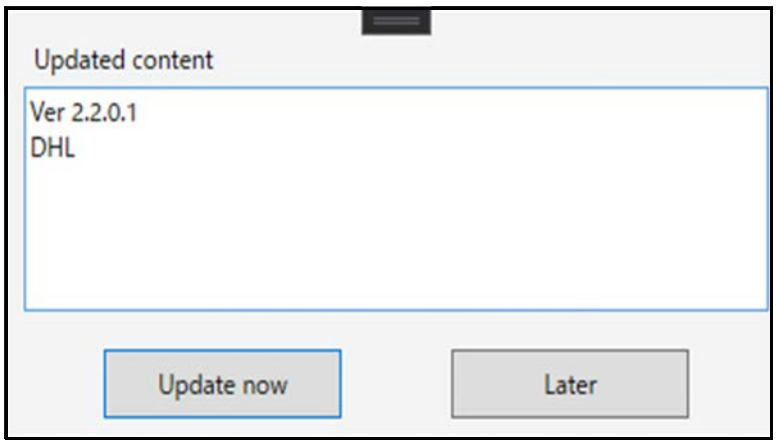


Figure 433
Application installation - Program installation

11. The Cubiscan 200 SQ will restart after installation completes.

12. Remove the USB memory before program starts. The installation is complete when the **Measurement** screen displays.

Firmware installation

Details of file:

Firmware	File (.txt)	File (.bin)
SH (Measurement control)	SH_UPDATE.txt	SH_V**XXX**.bin
N10 (Communication control)	SQ_UPDATE_AP.txt	SQ_V**XXX**.bin
The **XXX** in the file name designates the firmware version.		

1. Copy the firmware files (**txt** and **bin** files) to the USB memory. Where the save location is not specified, the file will be copied to a folder **FWUPDATE** in the USB memory.

2. With the **Measurement** screen displayed, select **Maintenance** to display the **Maintenance** screen for general users.

Figure 434
Firmware Installation - Measurement screen

3. Tap **[Maintenance]** to display **Login** window.

Figure 435
Firmware Installation - - Login window

4. With the **Login** window displayed, tap **[Maintenance]** to check box, then tap in the text field next to Password to display the Numeric keypad window.

5. Enter the pass code **8715** into the Numeric keypad window. Then tap **[Enter]**.

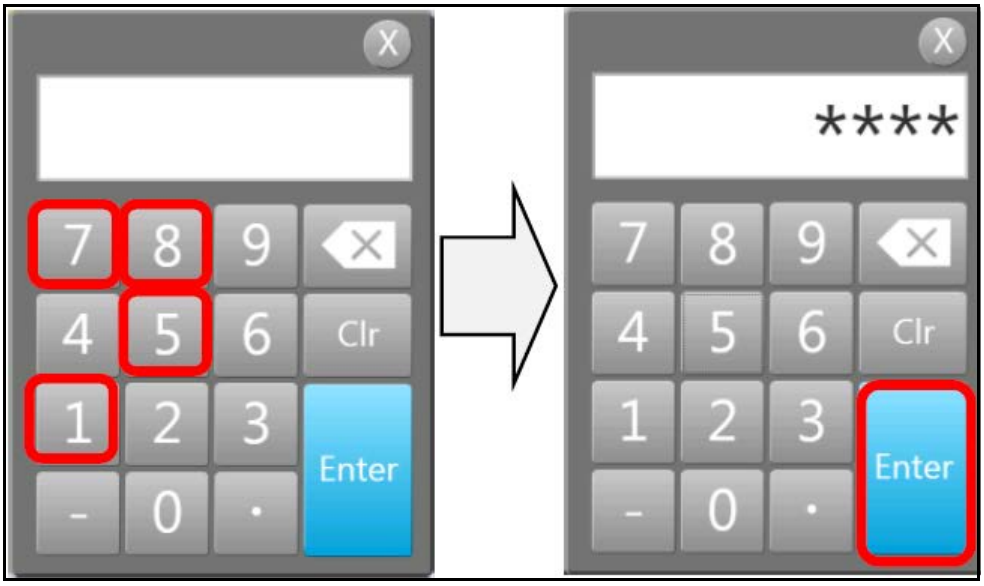


Figure 436
Firmware Installation - Numeric keypad window

6. With the login window displayed, tap **[Login]**.

Figure 437
Firmware Installation - Login

7. Locate the USB ports on the right side of the display. Turn the cover clockwise to access the 4 USB ports.

8. Insert the USB memory into the open USB port.

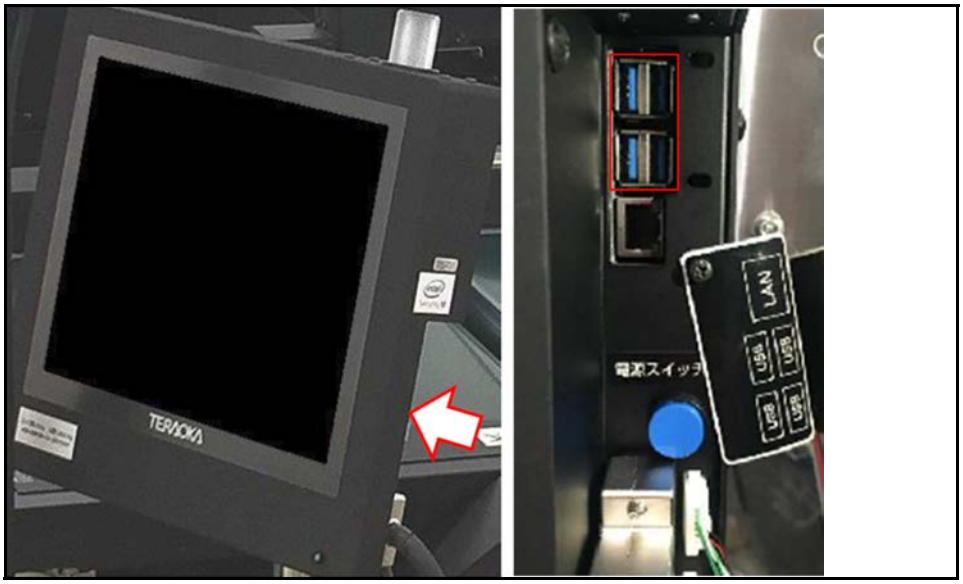


Figure 438
Firmware Installation - USB ports

9. When using a secure USB, a Password authentication window will display, requesting a password. Enter the password by tapping in the text box and using the soft keyboard that will display. Tap **[Open drive]** to make the USB drive available.

10. With the **Maintenance** screen for maintenance users displayed, tap **[+]** next to **Adjustment** to reveal selections.

11. Select **Firmware** to display the **Firmware** screen.

Figure 439
Firmware Installation - Firmware screen

12. From the **Firmware** screen, tap **[Import]** to display the File selection window.

13. Select the drive that contains the file you wish to import. Typically, the file will be found on the D drive in the folder labeled **FWUPDATE** (drive E for secure USB).

14. Tap ▽ to the right of the file type item. To import SH firmware, select **SH_UPDATE.txt**. To import N10 firmware, select S**Q_UPDATE_AP.txt.**

15. Select each file, then tap **[Open]**.

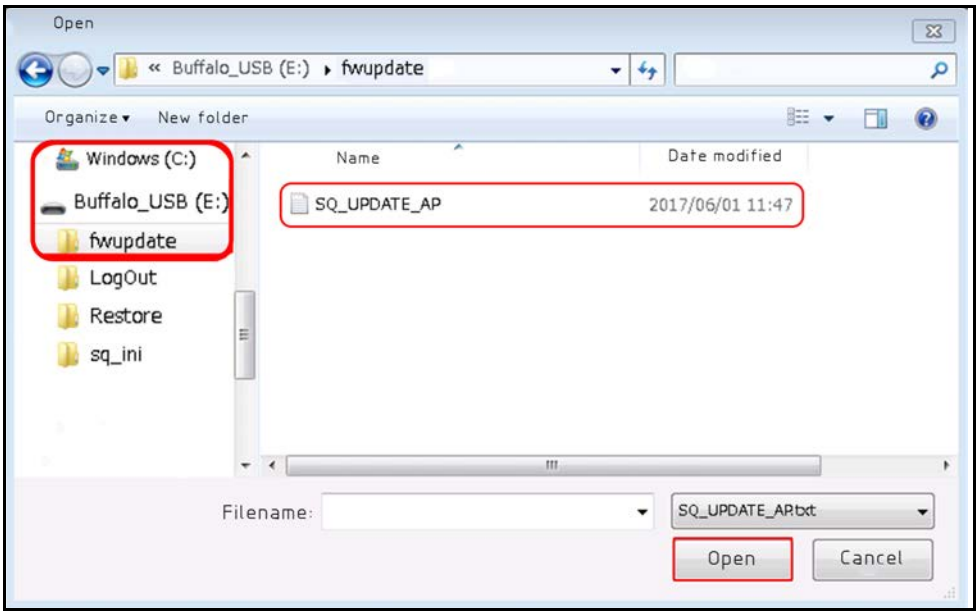


Figure 440
Firmware Installation - File selection window

16. The imported file will be displayed in the list within the update window.

17. The firmware files are only stored on the SSD, not on the board. To install the firmware on the board, select the file to be installed from the list of firmware files, then tap **[Import]**.

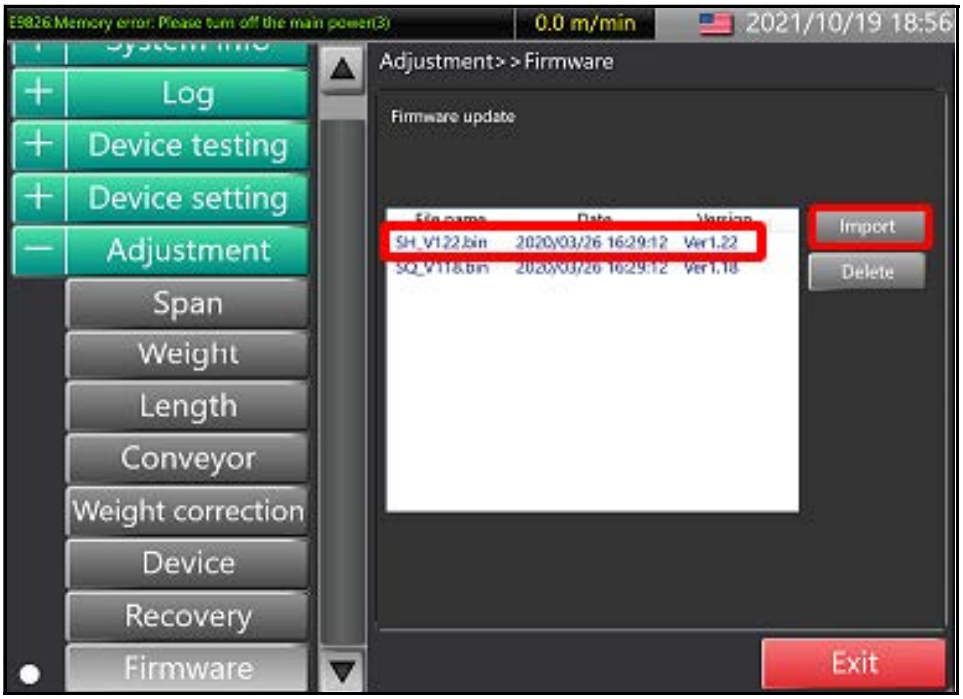


Figure 441
Firmware Installation - Firmware file selection

18. The Firmware update window will display. Tap in the text box under **Signature** using the soft keyboard, then tap **[Write]**.

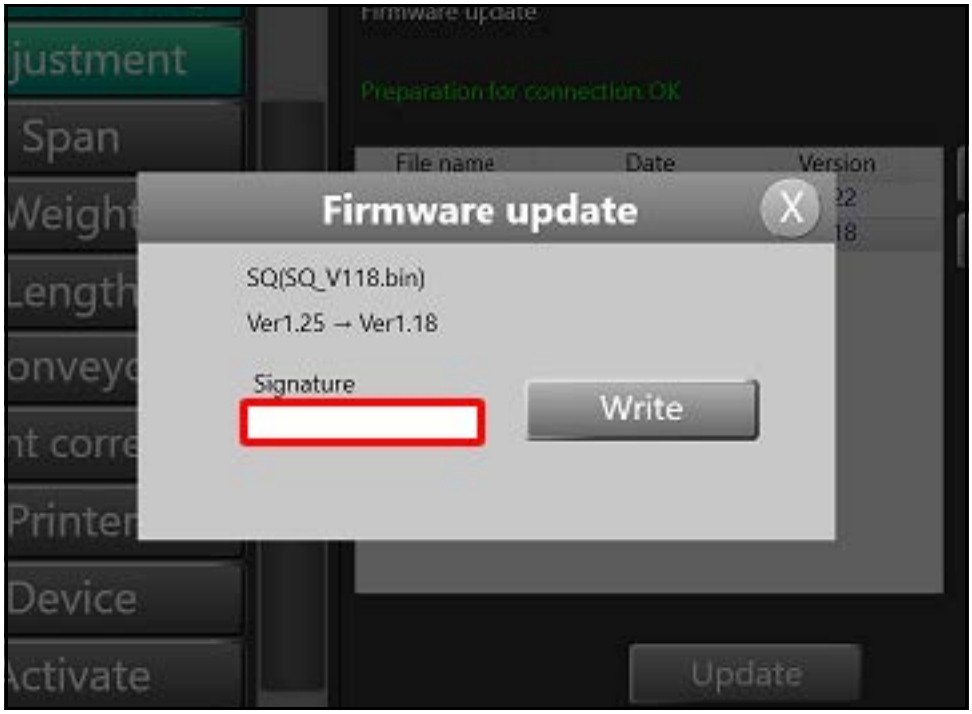


Figure 442
Firmware Installation - Firmware update window

19. A progress bar will appear at the bottom of the Firmware update window, indicating that install had begun.

20. When the install is complete, the Update success window will display. Tap **[OK]** to complete installation.

CHAPTER 7
ADJUSTMENT

Forced startup method

This procedure is only for repair work, not for customer operation. When the power is turned on, the Cubiscan 200 SQ will wait for 8 minutes to start up to prevent initial drift. You can cancel the startup waiting state by using the forced startup method.

1. Turn on the main power switch of the 200 SQ.

2. At start, the warming up notification will display.

3. With the Warming up notification displayed, swipe from the bottom left corner of the notification window to the top right.

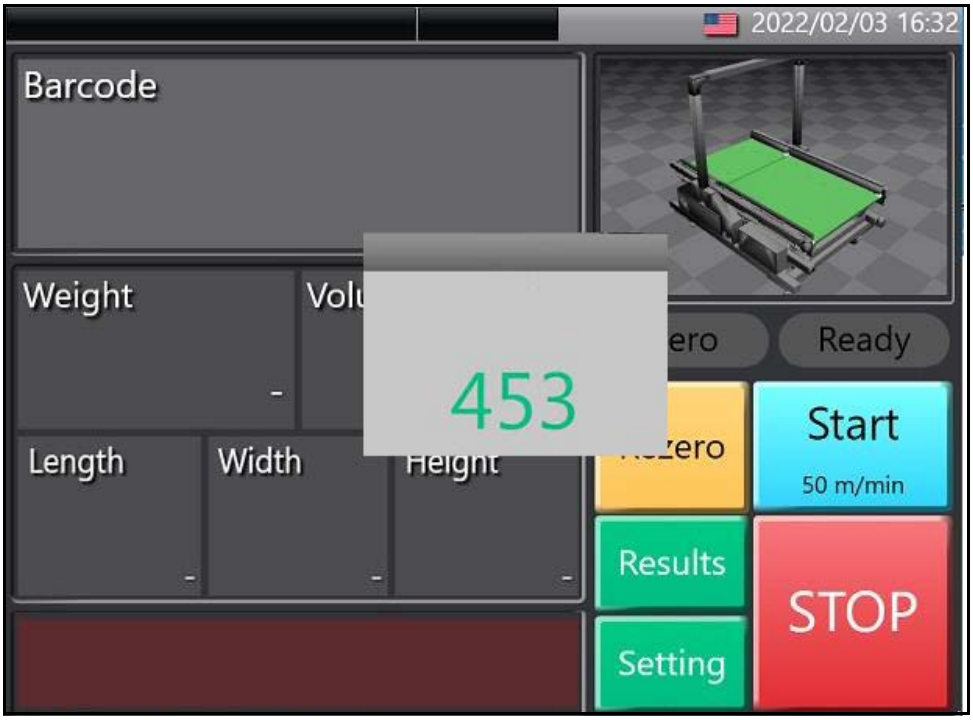


Figure 443
Forced startup method - Warm up notification

4. When the Warming up notification window closes, the Cubiscan 200 SQ is ready for use.

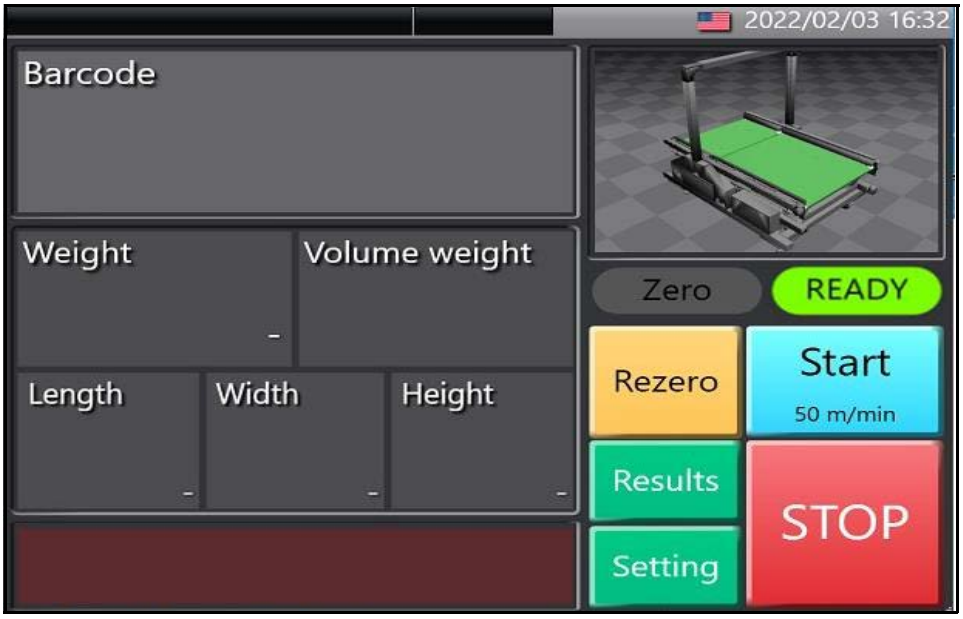


Figure 444
Forced startup method - Ready screen

Weight adjustment

There are two steps to adjust the weight: 2-point and 3-point span adjustment. It is recommended to adjust the weight with a 3-point span for accuracy.

2-Point span adjustment procedure

1. With the **Measurement** screen displayed, tap **[Setting]**.

2. From the **Maintenance** screen for general users, tap **[Maintenance]**.

Figure 445
2-Point span adjustment - Maintenance screen

3. From the Login window, tap the text box next to **Password** to display the Numeric keypad window.

Figure 446
2-Point span adjustment - Login

4. Enter the passcode **8715**, then tap **[Enter]**.

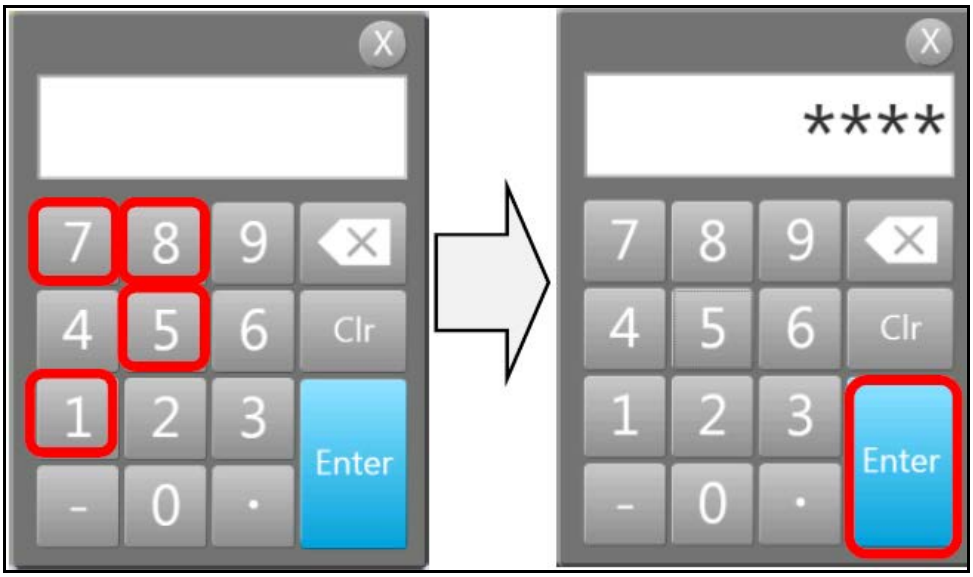


Figure 447
2-Point span adjustment - Passcode

5. At the Login window tap **[Login]**.

6. At the maintenance user **Maintenance** screen, select **Adjustment** from the left side panel and tap **[Span]**.

Figure 448
2-Point span adjustment - Adjustment

7. From the **Span adjustment** screen, check the box for 2-point adjustment method by tapping **[2 points]**.

8. Enter the value of the weight used. Then, tap ∇ next to the unit to select either **kg** or **lbs**.

9. Ensure that the weigher is free of all objects then tap to check the box **"I have confirmed that nothing is on the device".**

10. Tap **[Start span adjustment]**.

11. The Processing message will appear. After the system has done processing, you will be prompted to put a 25 kg weight on Scale B.

Figure 449
2-Point span adjustment - Span adjustment prompt

12. After placing the 25kg weight, tap **[OK]**. Again, the Processing message will appear.

13. When the system is done process a prompt swill appear indicating, **"Completed the adjustment"**. Tap **[Yes, I understand]** to confirm completion.

Figure 450
2-Point span adjustment - Adjustment completed

14. Once completion of adjustment is confirmed, the **Span adjustment** screen will appear. Tap **[Exit]**.

Figure 451
2-Point span adjustment - Exit

15. The Finish setting message window will display. Check the box next to **[Logout]** by tapping, then tap **[OK]**.

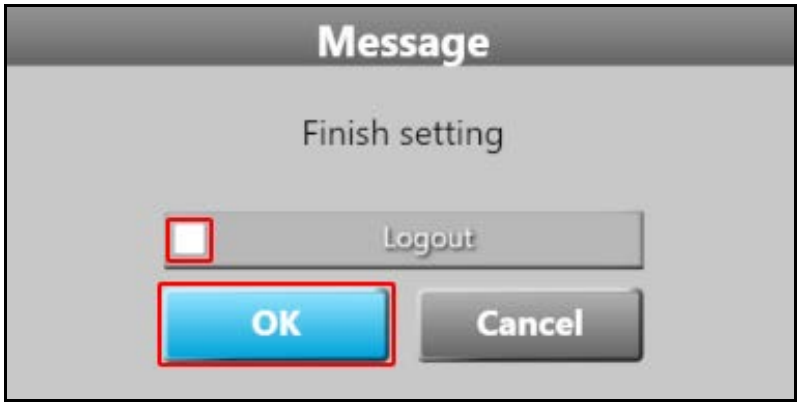


Figure 452
2-Point span adjustment - Logout

16. The Update settings window will display. Tap in the text box next to **Signature** and enter the password **teraoka** with the soft keyboard.

17. Tap **[Update]** to save the span data. If you do not press **[Update]**, the span data will be lost.

Figure 453
2-Point span adjustment - Update settings

18. The **Measurement** screen will display when the adjustment is complete.

3-Point span adjustment procedure

1. With the **Measurement** screen displayed, tap **[Setting]**.

2. From the **Maintenance** screen for general users, tap **[Maintenance]**.

Figure 454
3-Point span adjustment - Maintenance screen

3. From the Login window, tap the text box next to **Password** to display the Numeric keypad window.

4. Enter the passcode **8715**, then tap **[Enter]**.

Figure 455
3-Point span adjustment - Login

5. At the Login window tap **[Login]**.

6. At the maintenance user **Maintenance** screen, select **Adjustment** from the left side panel and tap **[Span]**.

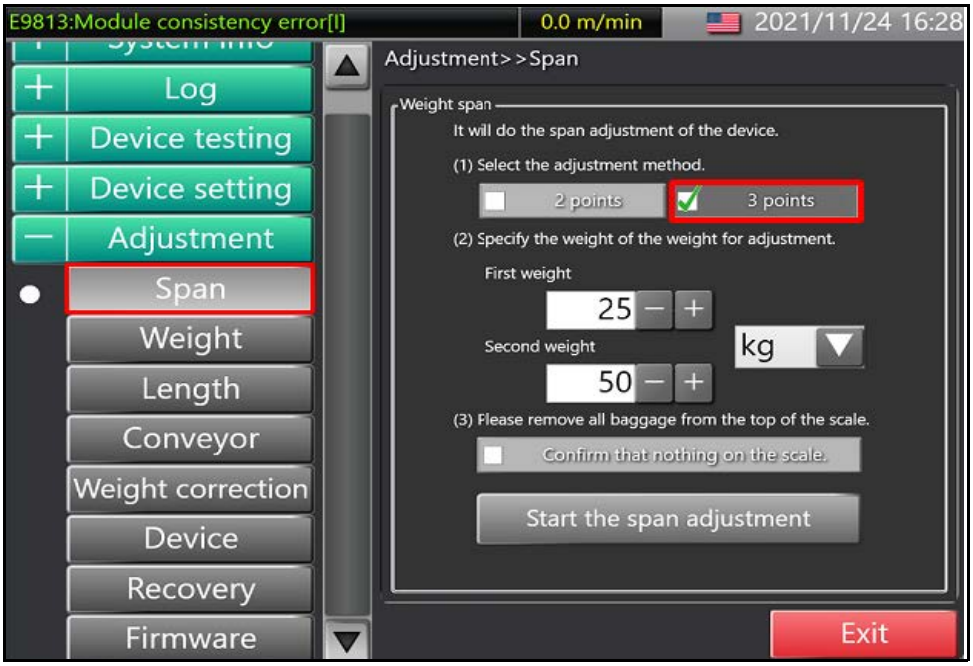


Figure 456
3-Point span adjustment - Adjustment

7. From the **Span adjustment** screen, check the box for 3-point adjustment method by tapping **[3 points]**.

8. Enter the value of the first weight used. Then, tap ∇ next to the unit to select either **kg** or **lbs**.

9. Enter the value of the second weight used. Then, tap ∇ next to the unit to select either **kg** or **lbs**.

10. Ensure that the weigher is free of all objects then tap to check the box **"I have confirmed that nothing is on the device"**.

11. Tap **[Start span adjustment]**.

12. The Processing message will appear. After the system has done processing, you will be prompted to put a 25 kg weight on Scale B.

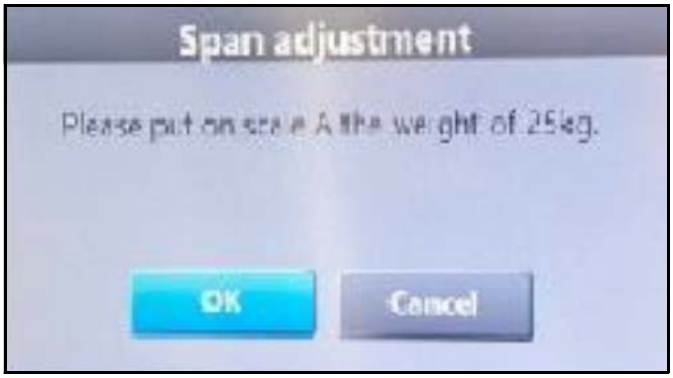


Figure 457
3-Point span adjustment - Span adjustment prompt

13. After placing the 25kg weight, tap **[OK]**. Again, the Processing message will appear.

14. After the system has done processing, you will be prompted to place the next weight on Scale B.

15. After placing the 50kg weight, tap **[OK]**. Again, the Processing message will appear.

16. When the system is done process a prompt swill appear indicating, **"Completed the adjustment"**. Tap **[Yes, I understand]** to confirm completion.

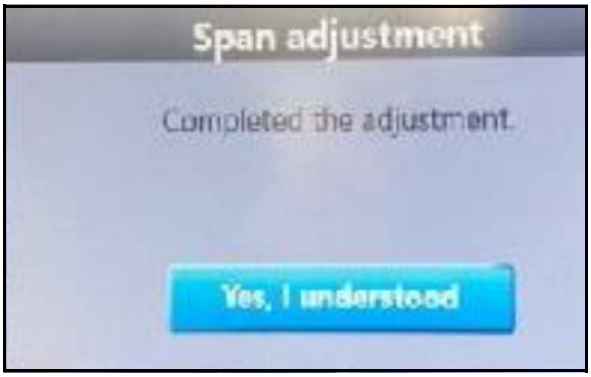


Figure 458
3-Point span adjustment - Adjustment completed

17. Once completion of adjustment is confirmed, the **Span adjustment** screen will appear. Tap **[Exit].**

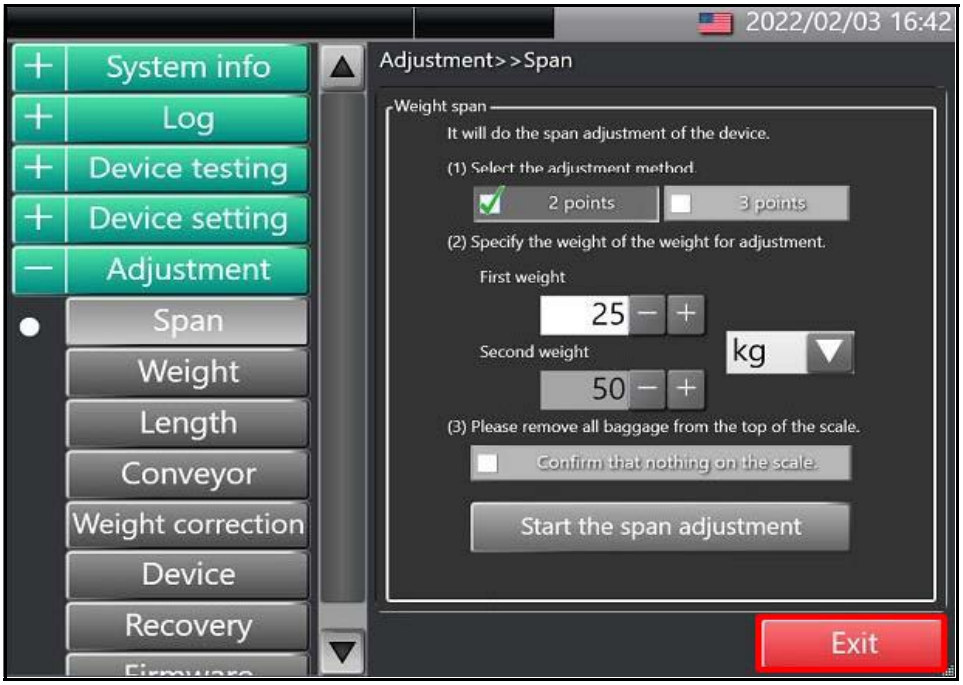


Figure 459
3-Point span adjustment - Exit

18. The Finish setting message window will display. Check the box next to **Logout** by tapping, then tap **[OK]**.

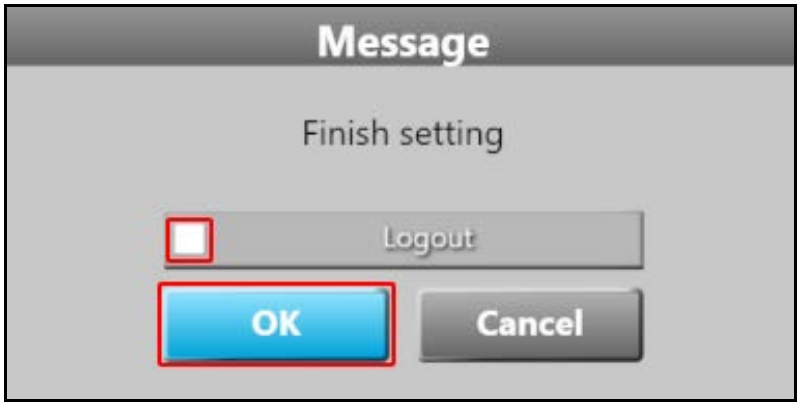


Figure 460
3-Point span adjustment - Logout

19. The Update settings window will display. Tap in the text box next to **Signature** and enter the password **teraoka** with the soft keyboard.

20. Tap **[Update]** to save the span data. If you do not press **[Update]**, the span data will be lost.

Figure 461
3-Point span adjustment - Update settings

21. The **Measurement** screen will display when the adjustment is complete.

Conveyor height/horizontal adjustment

Adjustment leg position

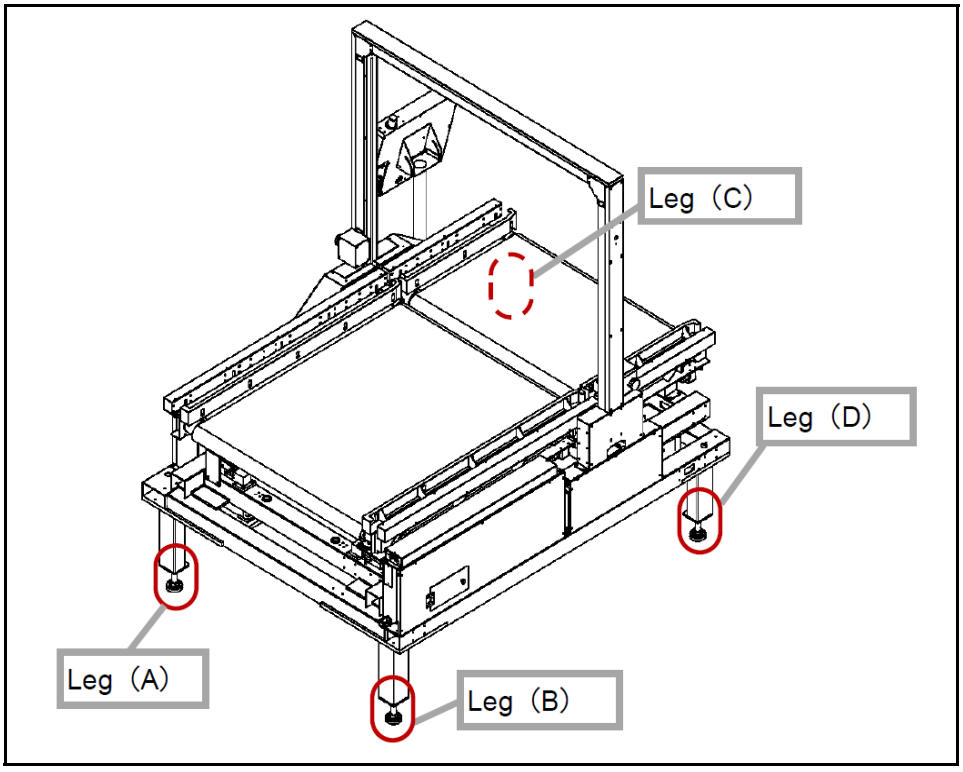


Figure 462
Adjustment leg position - Full conveyor view

Leg height adjustment procedure

1. Loosen the **nut (B)** by turning counter clockwise to unlock the leg as shown in figure.

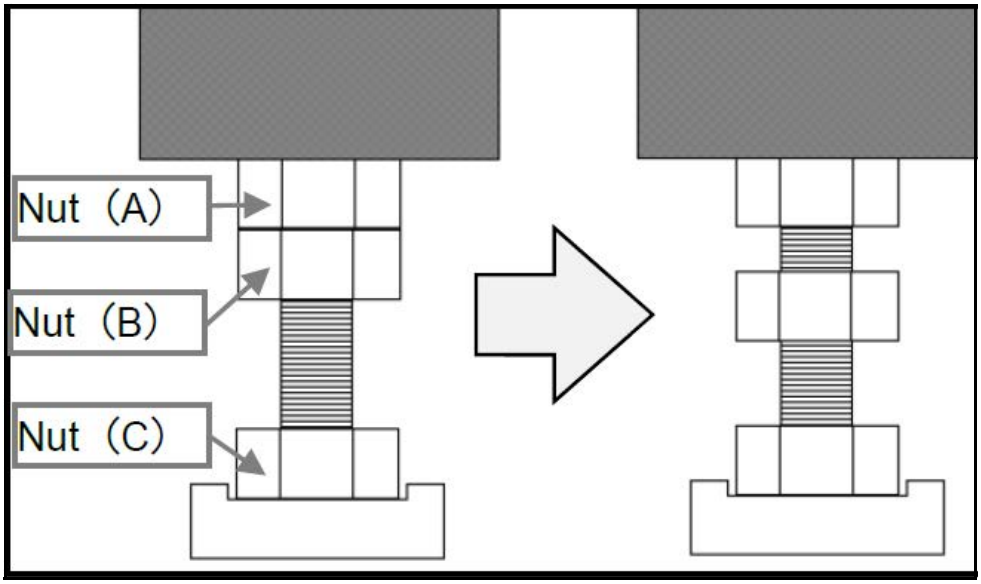


Figure 463
Leg height adjustment - Loosening nut (B)

2. Adjust leg height, by turning **nut (C)** clockwise to lower leg or counter-clockwise to raise leg.

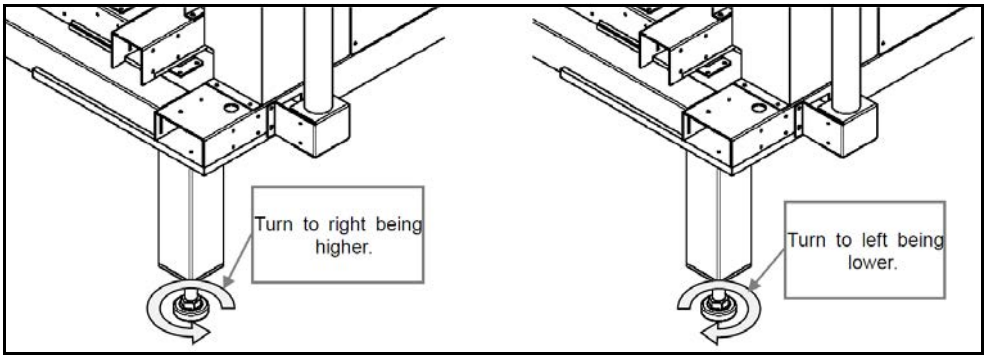


Figure 464
Leg height adjustment - Adjusting nut (C)

3. Repeat for each leg.

Horizontal confirmation adjustment method

1. Use a level to ensure the conveyor is properly leveled at each point **A** to **D** as shown in the figure.

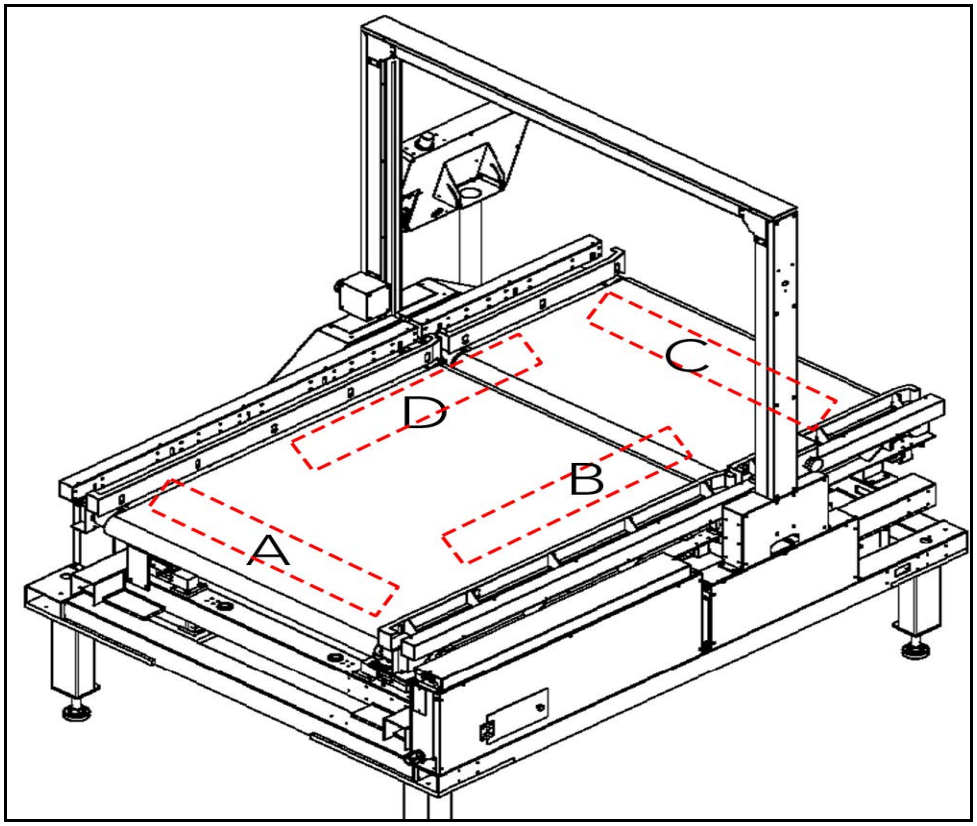


Figure 465
Horizontal confirmation - Leveling conveyor

2. If the conveyor is not level at any point, adjust the corresponding legs as needed to make that point level. The following table will help identify which legs to adjust to level each point:

Point of leveling	Legs to adjust
A	A and C
B	B and D
C	C and D
D	A and B

3. Once the four points **A** to **D** are level, ensure the conveyor is at the desired height.

4. Make any needed adjustment to the height (see "Leg height adjustment procedure" on page 353). Repeat leveling procedure, checking each of the four points of leveling.

5. After confirming conveyor is level and at the desired height, tighten l**eg nut (B)** by turning clockwise to secure the leg at the desired height.

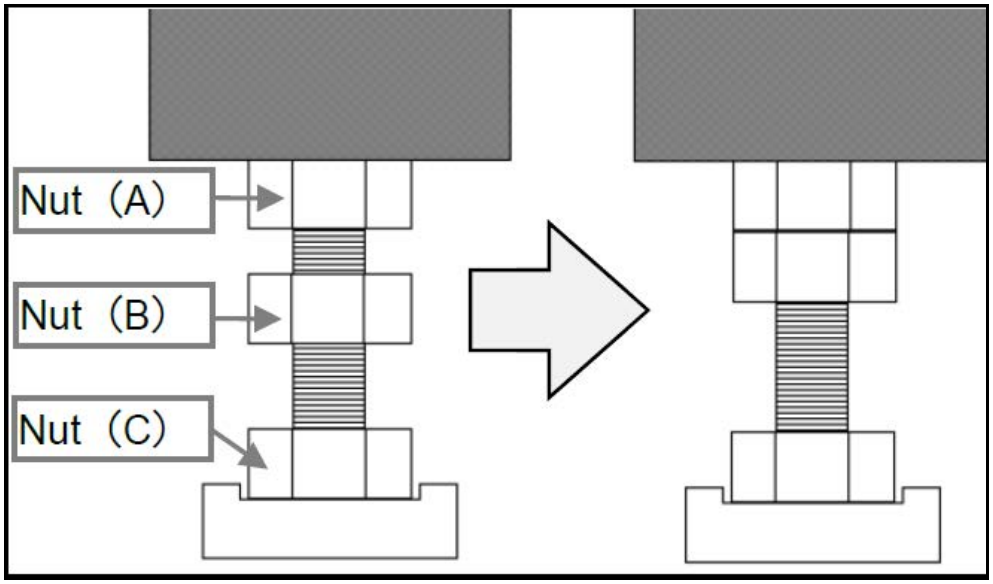


Figure 466
Horizontal confirmation- Securing nut (B)

6. Repeat for each leg.

Transport surface height adjustment

1. To adjust the height of the transport surface to match the height of a front and rear conveyor, use the procedure discussed previously to adjust height (see "Leg height adjustment procedure" on page 353).

2. After the 200 SQ is at a height that is aligned to front and rear conveyors, ensure that transport surface is level (see "Horizontal confirmation adjustment method" on page 354).

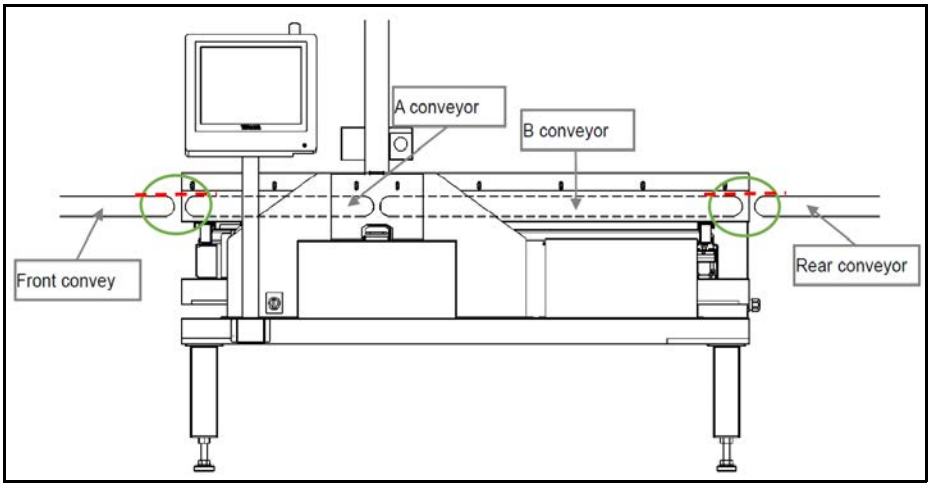


Figure 467
Transport surface height - Front and rear conveyor

NOTE

Do not raise the CS 200 SQ transport surface above the front conveyor. Collisions with conveyor may occur. Collisions from incoming objects along the conveyor may cause deviations in weighing, leading to errors in measurement.

Conveyor belt slipping adjustment

Adjuster position for belt adjustment

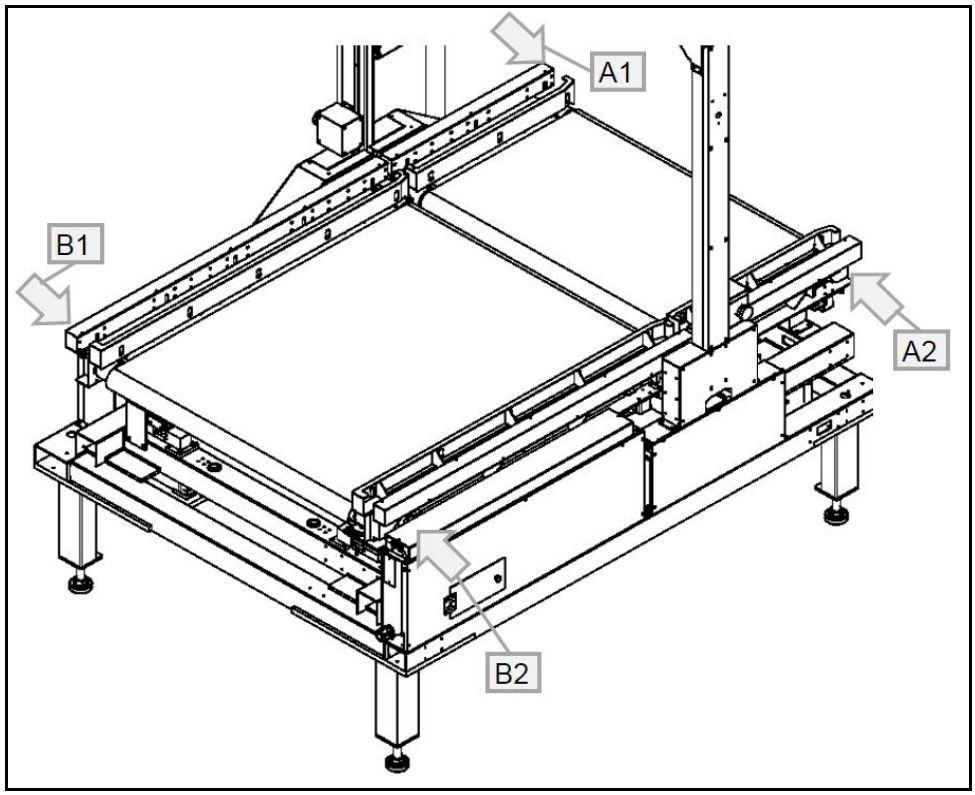


Figure 468
Belt adjustment - Adjuster position

Reference position

Check the position of the each adjuster and mark on the scale as show in the corresponding figure of each reference position:

Figure 469
Reference position - B1: B conveyor front

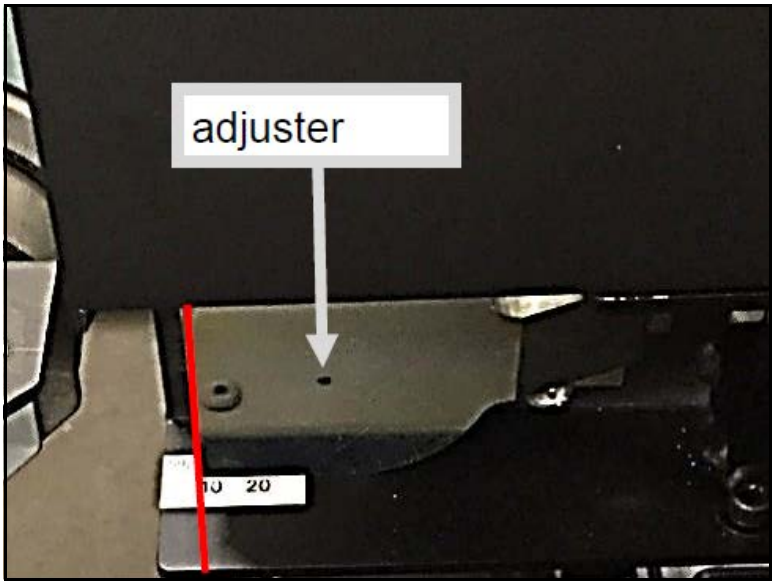


Figure 470
Reference position - B2: B conveyor back

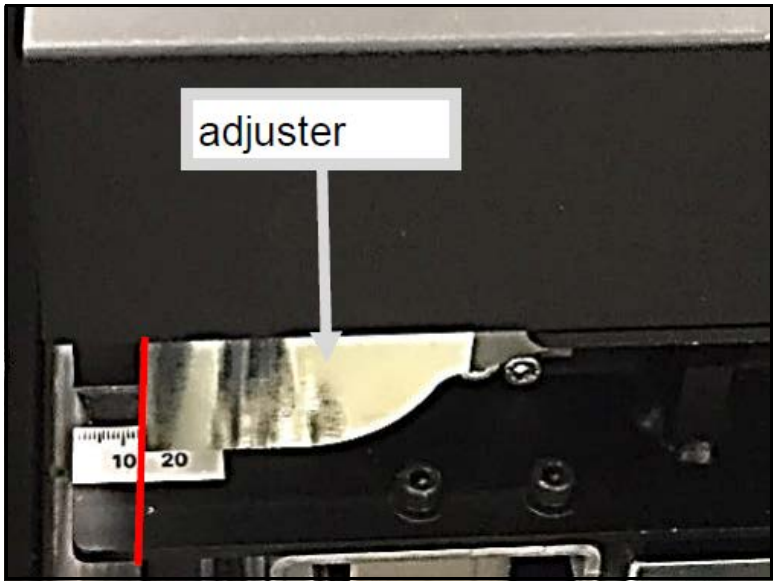


Figure 471
Reference position - A1: A conveyor front

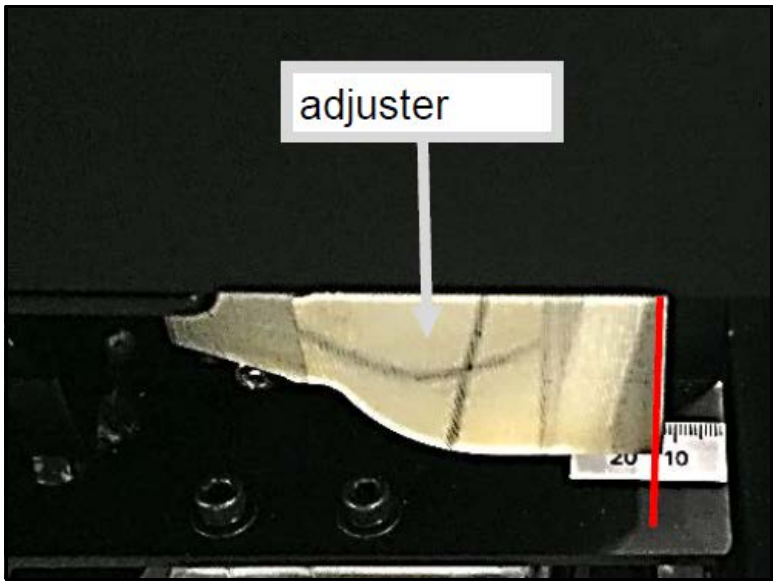


Figure 472
Reference position - A2: A conveyor back

The marked position will be the reference point to be adjusted when replacing and installing the belt and rollers. Since there are individual differences in equipment, there is no standard for the scale.

Belt slipping adjustment method

Belt slippage overview

If the tension on the belts for either conveyors differs, the belt will misalign, causing slippage. The belt will shift in the direction of stronger belt tension.

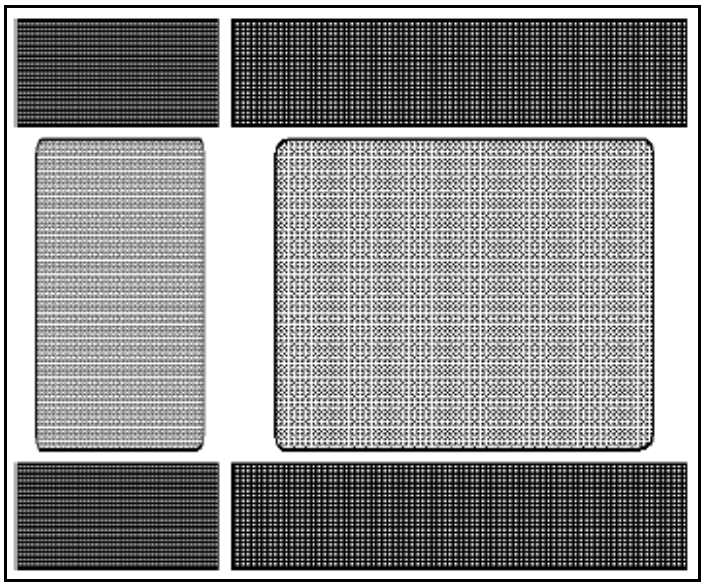


Figure 473
Belt slippage overview - Good tension

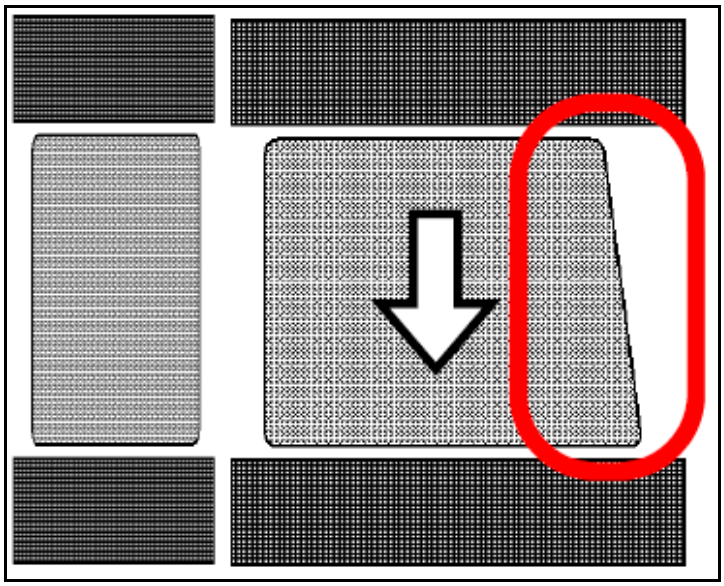


Figure 474
Belt slippage overview - Front side stretching

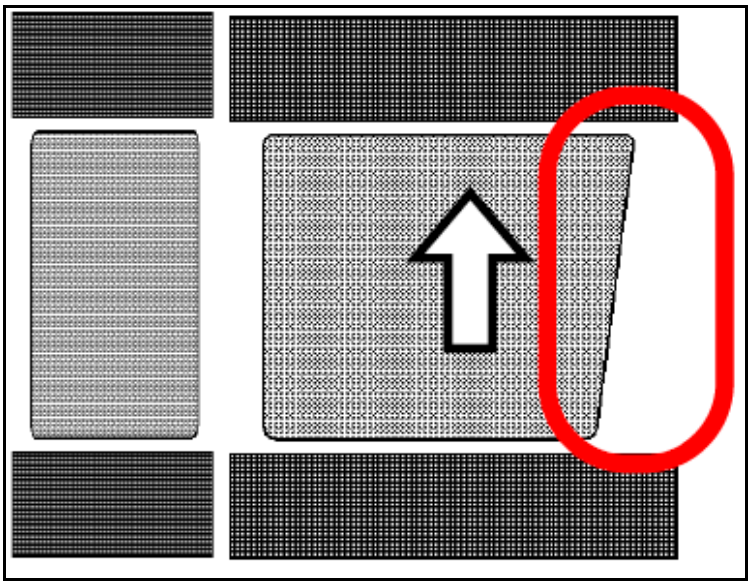


Figure 475
Belt slippage overview - Back side stretching

Conveyor A belt adjustment

1. Loosen the **4 hexagonal screws** securing the adjust on the side where the belt does not bend (the side where the belt separates).

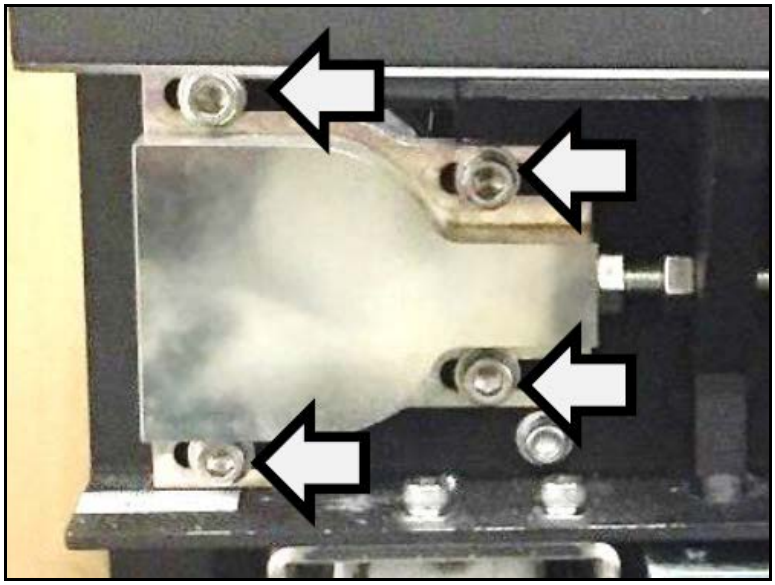


Figure 476
Conveyor A belt adjustment - A1: A conveyor front

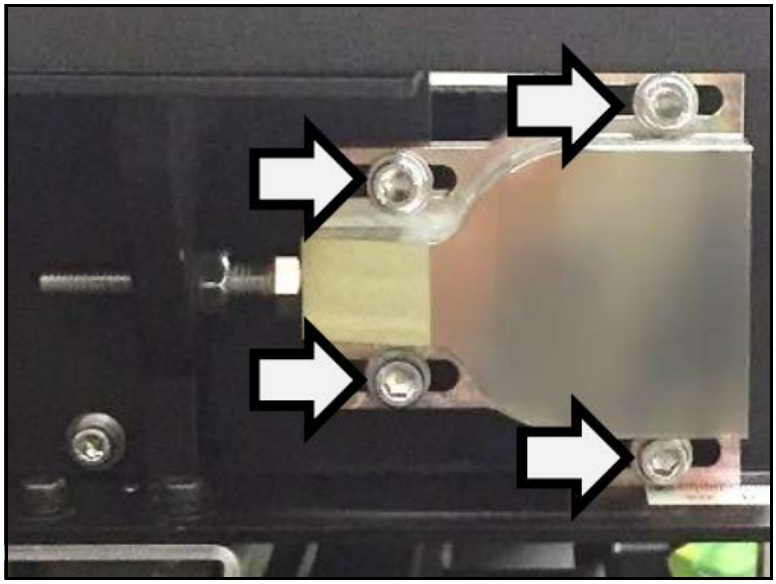


Figure 477
Conveyor A belt adjustment - A2: A conveyor back

2. Loosen **hexagonal nut (A)** affixed to the frame, then turn **bolt (B)** counter-clockwise to increase tension of belt. When turning **bolt (B)**, keep within the range of one rotation (approx. 1.25 mm).

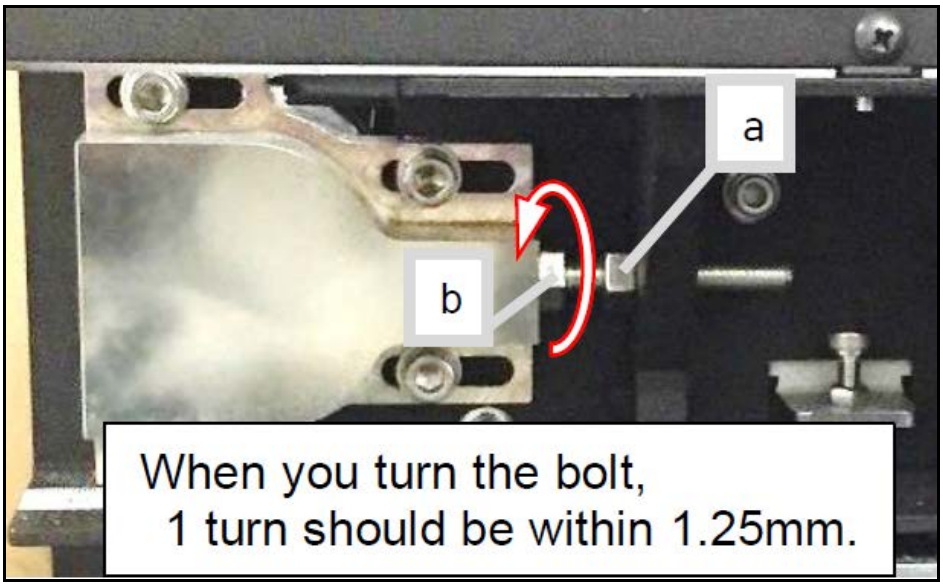


Figure 478
Conveyor A belt adjustment - Front adjustment

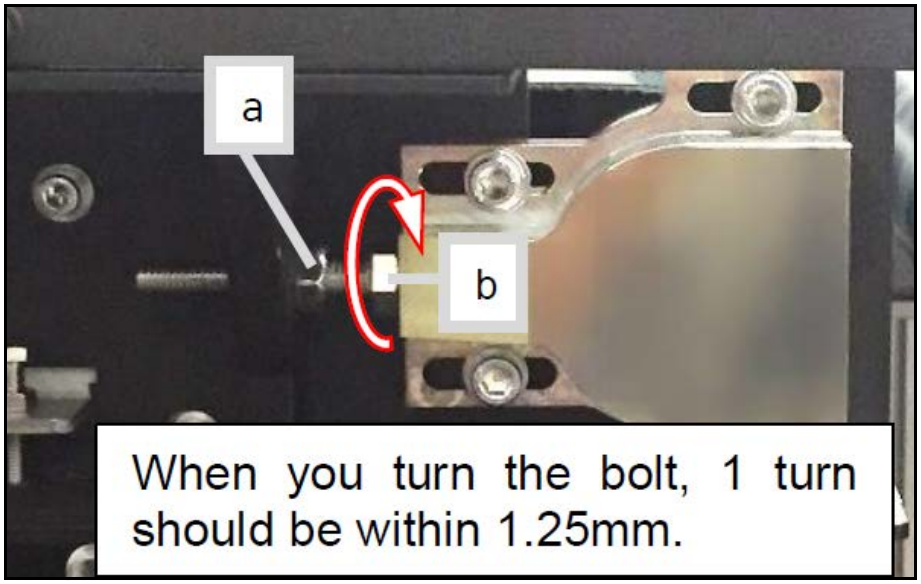


Figure 479
Conveyor A belt adjustment - Back adjustment

Conveyor B belt adjustment

1. Loosen the **4 hexagonal screws** securing the adjust on the side where the belt does not bend (the side where the belt separates).

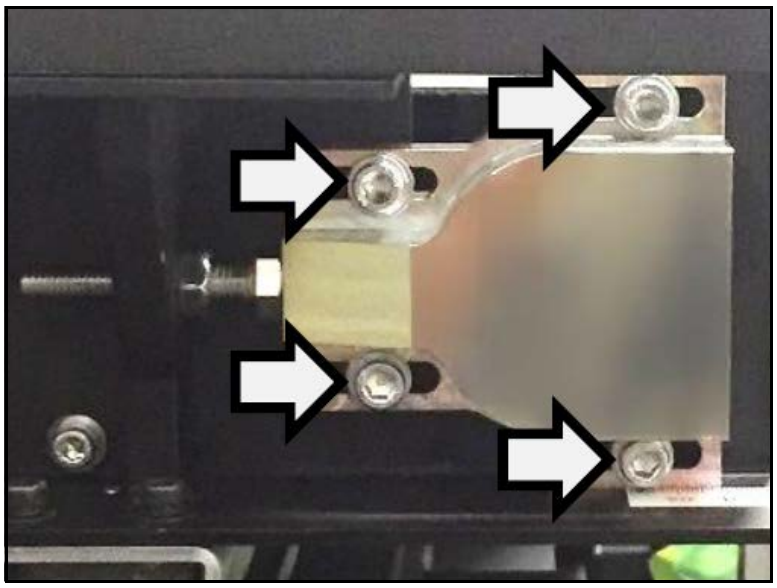


Figure 480
Conveyor B belt adjustment - B1: B conveyor front

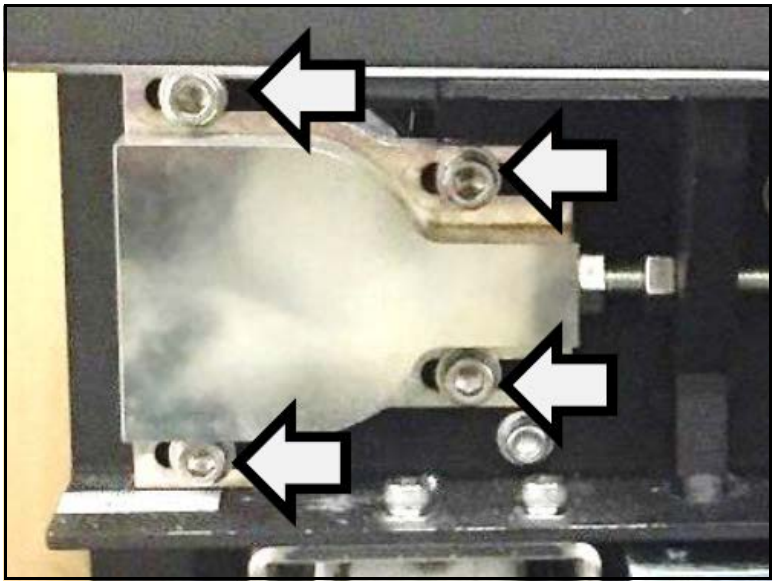


Figure 481
Conveyor B belt adjustment - B2: B conveyor rear

2. Loosen **hexagonal nut (A)** affixed to the frame, then turn **bolt (B)** counter-clockwise to increase tension of belt. When turning **bolt (B)**, keep within the range of one rotation (approx. 1.25 mm).

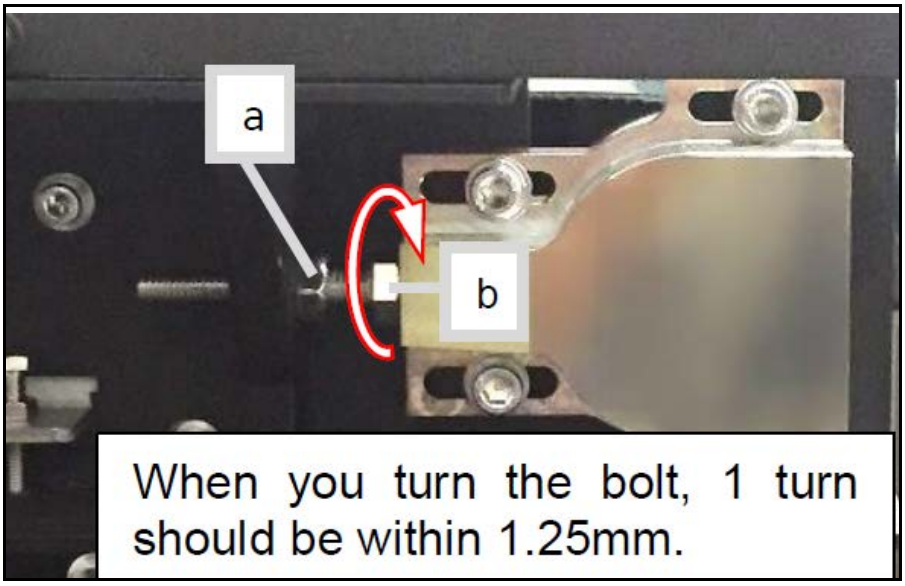


Figure 482
Conveyor B belt adjustment - Front adjustment

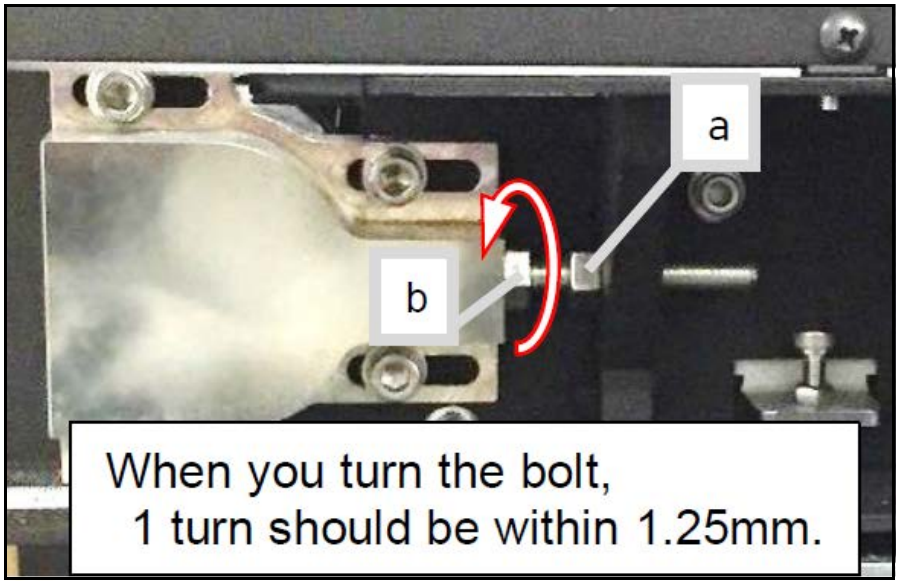


Figure 483
Conveyor B belt adjustment - Rear adjustment