X-RAY INSPECTION SYSTEM

Part 3. Operation Manual

sec
e-beam pioneer

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- Violation of the instructions provided in this manual when moving, installing, operating, or repairing the system
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- Structural modification may affect radiation protection.
■ Accidents or disasters beyond human control

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1. Precautions before Using the System

1.1 Basic Notification

Read this manual carefully and operate the system according to the procedure not to have failures (malfunctions, errors, etc.) when using the system.

⚠️	Before operating the system, carefully read the installation manual. Be sure to have a thorough understanding of the material described in [**Part 1. Safety and Precautions**].

📖	To operate the system, you must be familiar with dangerous cases and operational procedure.

⚠️	■ After installation, ensure that that the test has successfully been completed without problems before operating the system. ■ Before supplying the power, check whether the power is correctly connected. ■ Check whether the control panels and sensors are correctly connected before supplying the power. ■ Before operation, check the position of the emergency stop switch.

1.1.1 System Condition

1) Make sure that the keys are inserted into correct slots.

2) Check for factors that can cause operational problems in the system.
3) Check the computer monitor and keyboard.

■ Display the current system status. Change a parameter and view the updated parameter. You can also manually operate the equipment.

4) Warning Lamp

Indicates the operation status of the system with a red lamp. The red lamp turns on when the system is operating while X-rays are on.

1.1.2   Control Panel

Figure 1-1 Control panel of the PC unit

Name		Description
POWER		Turns on and off the power supply to the system, PC unit, turbo pump, and diaphragm pump unit. (this is not applicable to the power supply to the X-ray unit).
X-RAY		Turns the X-ray unit on and off.
EMERGENCY		Used in the event of a serious failure that can damage the system (to return to normal operation, turn clockwise).
MOTION	X-Y AXIS	Use the joystick to control movement of the work table right/left (X axis) or front/back (Y axis).
	Z AXIS	Use the joystick to control movement of the entire work table up/down (Z axis)
	ROTATION/TILT	Use the joystick to control rotation (R axis) or tilt (T axis) of the entire work table.
FUNCTION	LOAD	Use the button to move each axis to the spot ideal for loading and unloading the target
	NEXT	Use the button to move each axis step by step to specified spots.
	BACK	Use the button to move each axis backwards step by step to specified spots.
	GOOD	Use the button to save inspection result for the inspection target as "Good."
	N.G	Use the button to save inspection result for the inspection target as "Not Good."

1.1.3 Safety Devices

XeyeSystem has been designed to ensure maximum safety against X-rays. The system is equipped with a failsafe device that uses a control program to detect opening of door. This device cuts off power to the X-ray generator if the front door is open.

⚠️ **WARNING**	**XeyeSystem guarantees safety from X-rays. But it is still recommended for users to keep in mind the following cautions:** **1) Before opening the door, check the power supply status of the X-ray generator.** **2) Be sure to check the door status before turning on the X-ray generator.**

1.2 Emergency Measures

When a risk or unstable state is detected during operation, press the emergency stop switch on the control panel. Before operating the system, be familiar with the position of the emergency stop switch and its usage.

Figure 1-2 Emergency Stop Switch

Switch Name	Description
Emergency Stop Switch	■ When pressed, the X-ray generator and the motors for each axis are stopped. ■ However, power supply to the control PC and the monitor is not disconnected in order to check if the system is normally operational. ■ To apply power and resume operation, turn the Emergency stop switch to release and then turn the POWER and X-RAY switches clockwise up to the **STRAT** position.

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2. Program Menu

Check the following before launching the operation software.

Caution	**Power Supply** The Operation Software has a separated power supply for each of the units, including the controller (PC). Turning on the PC unit may not turn on the power supply to the equipment motor and I/O, and the X-ray unit. Make sure that the POWER switch on the control panel unit is On.

2.1 Starting up the Program

2.1.1 Loading the program

>> Run SMT_AXI_6100P.exe on the desktop.

2.2 Main Screen

2.2.1 Basic Configuration
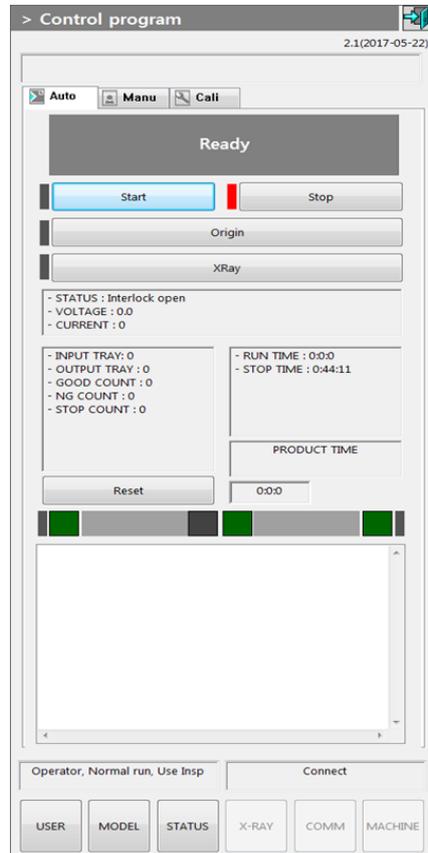
Name	Description
Auto	Automatic operation panel
Manu (Manual)	Manual operation panel
Cali (Calibration)	Calibration panel
USER	Configures user privileges.
Model	Creates or edits a model for inspection.
STATUS	Displays the motor and I/O condition.
X-RAY	Configures and turns on or off the X-ray.
COMM	Changes or views settings for LAN communication between loaders and unloaders.
MACHINE	Sets the machine position.

2.2.1.1   USER
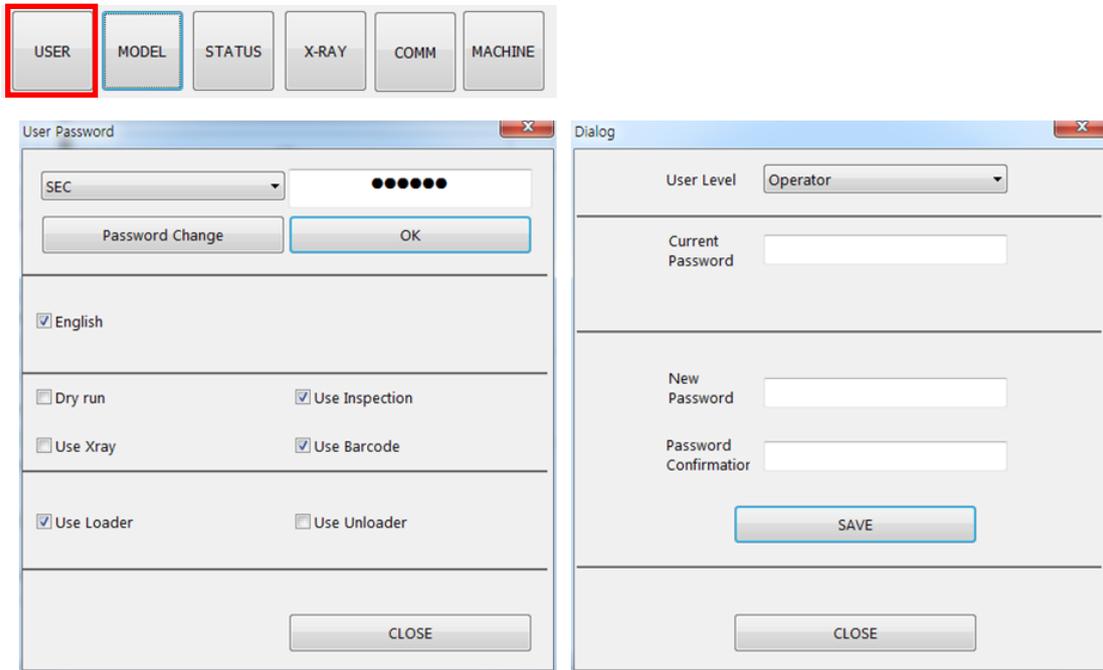
Name	Description
Password Change	Changes the password for a user ID.
English	Changes the display language to English (changes error message language from Korean to English).
Dry run	Turns on or off test run mode (tests operation without an object for inspection).
Use Xray	Turns on or off the X-ray status checking function (whether the X-ray current and voltage have reached the threshold can be checked).
Use Barcode	Selects whether to use bar codes (if this option is deselected, a password is automatically created using the current time).
Use Inspection	Selects whether to sync with the inspection program (checks the standby function for the inspection results response).
Use Loader	Turns on or off communication with the loader.
Use Unloader	Turns on or off communication with the unloader.

2.2.1.2　Model
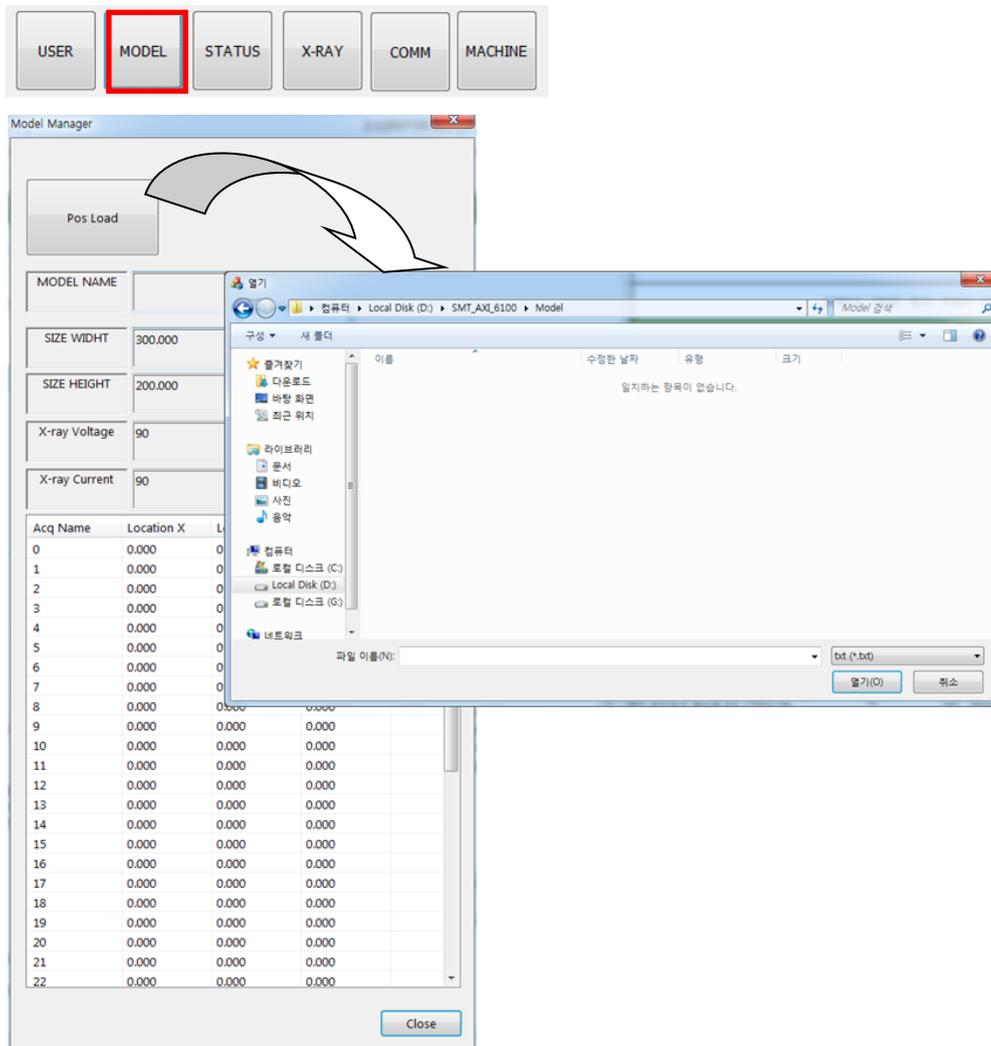
Name	Description
Pos Load	Loads a model file (.txt) created using the inspection program.
MODEL NAME	Shows the name of the model currently loaded.
SIZE WIDTH / SIZE HEIGHT	Shows the width and height of the tray.
X-ray Voltage / Current	Shows the voltage and current of the model currently loaded.
Acq Name	Number of each point.
Location X	Shows the X axis coordinate for each point.
Location Y	Shows the Y axis coordinate for each point.
Location Z	Shows the Z axis coordinate for each point.

2.2.1.3 STATUS
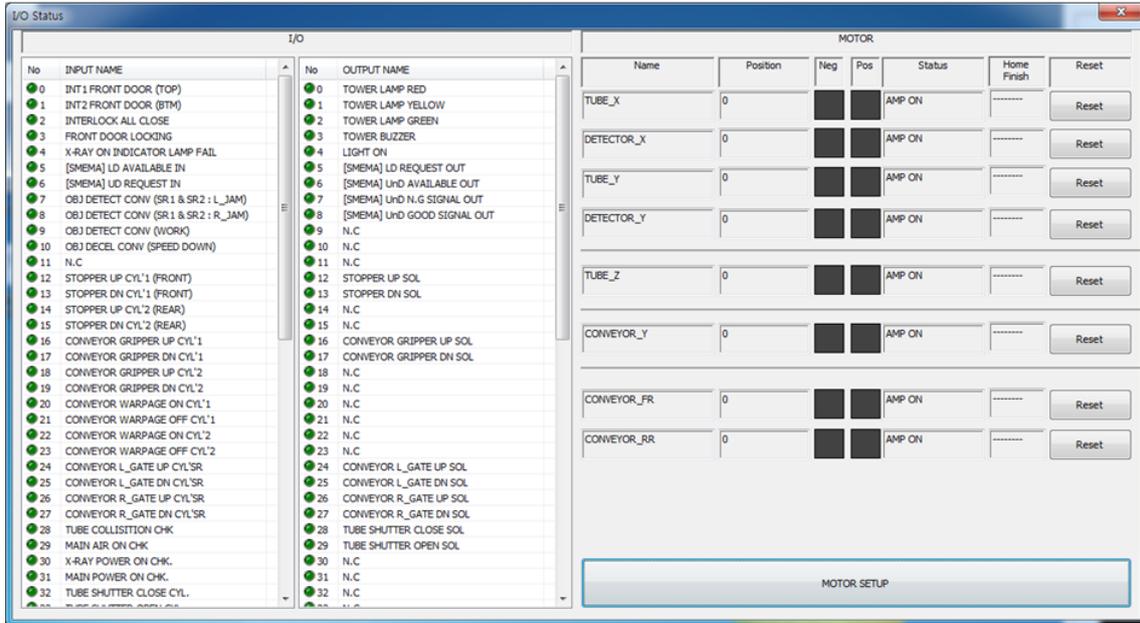
Name		Description
I/O INPUT		Shows the status in which signals have been received from the outside (sensor status).
I/O OUTPUT		Shows the status in which signals are being sent from the control program (cylinder/lamp).
MOTOR	NAME	Shows the name of each motor.
	POSITION	Shows the current position coordinates for each motor.
	NEG	Shows the negative sensor detection status of each motor.
	POS	Shows the positive sensor detection status of each motor.
	STATUS	Shows the status of each motor (e.g. amp on or off, amp fault).
	HOME FINISH	Shows whether returning each motor to home position has been completed.
	RESET	Reset button for use when an amp fault occurs on a motor.
MOTOR SETUP		Sets the parameter for each motor.

2.2.1.3.1. MOTOR SETUP
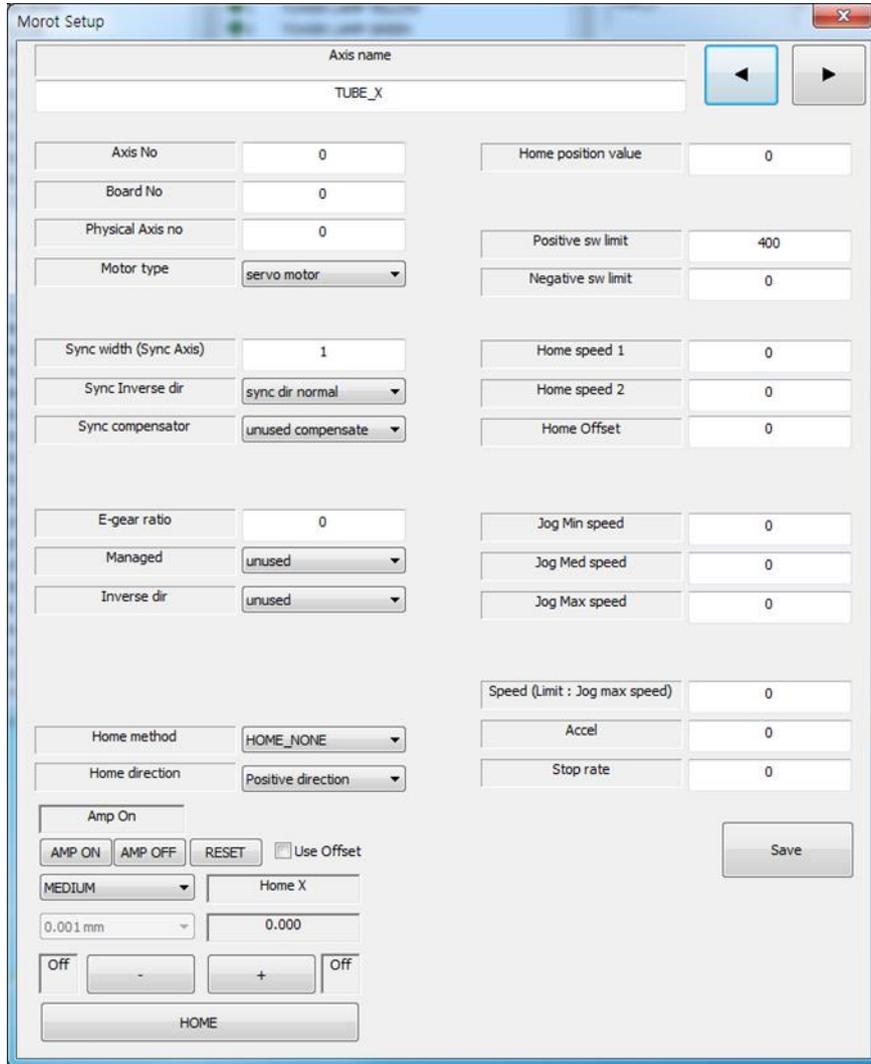
Name	Description
Axis name	Motor name
Axis number	Number of each axis (in the program)
Board No.	Board number set for the axis
Physical Axis No	Individual number set for the board (individual number inside the board)
Motor type	Type of each motor (servo or step)
Sync width (sync Axis)	Axis number for synchronization
Sync Inverse dir	Sets the directional relationship between the master and slave axes that are synced.

Name	Description
Sync compensator	Turns on or off the position calibration function for synced axes.
E-gear ratio	Pulse value used to move 1 mm per axis.
Managed	This option is set to "used" by default.
Inverse dir	Sets the direction.
Home method	Sets the method to return to home position. (HOME NONE, HOME LIMIT, LIMIT ONLY, HOME ONLY).
Home direction	Sets the direction when returning to home position. (Positive or Negative).
Home position value	Sets the position value after having returned to home position.
Positive sw limit	Sets the positive software limit.
Negative sw limit	Sets the negative software limit.
Home speed 1	Sets initial feed speed when returning to home position.
Home speed 2	Sets specific speed after touching the sensor when returning to home position.
Home Offset	Sets the relative movement distance after having returned to home position.
Jog Min. speed	Sets the minimum jog speed.
Jog Med. speed	Sets the medium jog speed.
Jog Max. speed	Sets the maximum jog speed.
Speed (Limit: Jog Max. speed)	Default speed when moving the machine\
Accel	Sets the acceleration value.
Stop rate	Sets the stable stop value.

2.2.1.3.2. JOG
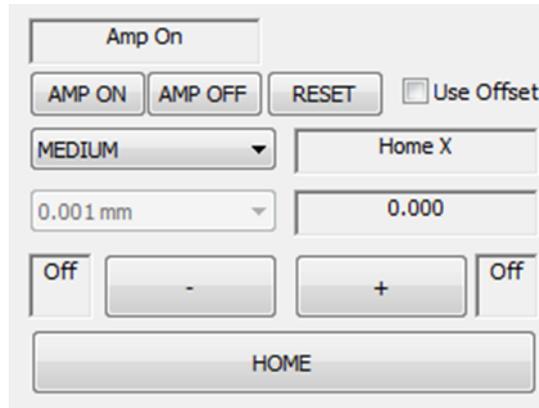
Name	Description
AMP ON / AMP OFF	Turns on or off the amp for each axis of the motor.
RESET	Resets the alarm when a motor error occurs.
SLOW / MEDIUM / FAST	Selects a jog feed speed.
Home X / Home O	Shows the presence of a home position and the motor status.
Use Offset	Turns on or off the relative movement function in offset mode.
+ / - buttons	Triggers a jog movement command.
Home button	Triggers a command to return the motor axis to home position.

2.2.1.4 X-RAY
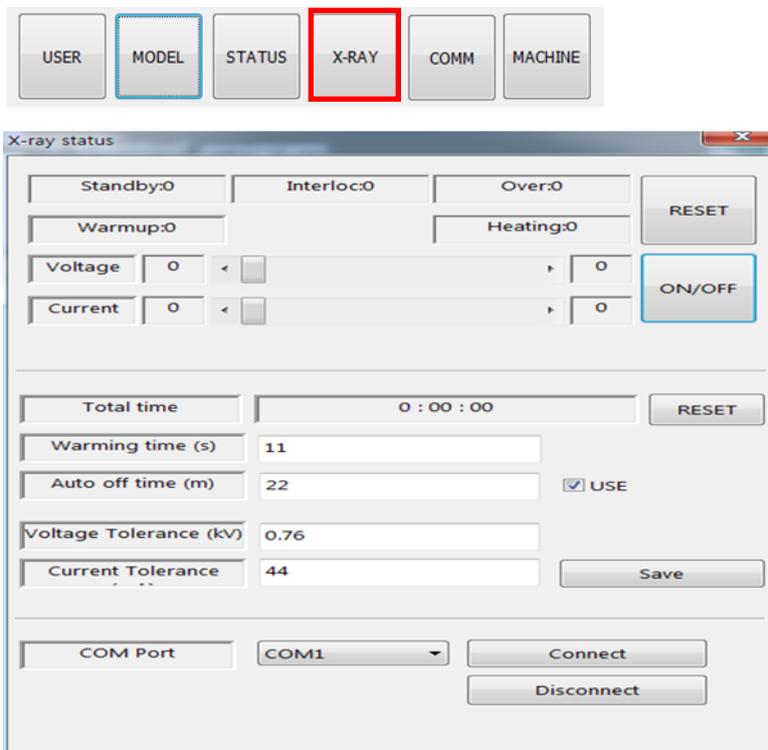
Name	Description
Standby	Shows the standby status of the X-ray controller.
Interlock	Views the door lock status.
Over	Shows the overcurrent status.
Warmup	Shows whether X-ray stabilization is required.
Heating	Shows whether X-ray is being heated.
X-ray voltage/current scroll	Scroll to adjust voltage and current.
X-RAY ON/OFF	Turns on or off the X-ray.
Total Time	Total duration of X-ray use
Warming Time	Duration for which X-ray is stabilized (unit: seconds)
Auto Off Time / Use	Selects "Use" to automatically close the X-ray when there is no input for a specified period of time (unit: minutes).
Voltage Tolerance	Displays an error message when the X-ray voltage rises above the specified value.
Current Tolerance	Displays an error message when the X-ray current rises

Name	Description
	above the specified value.
SAVE	Saves changed settings.
COM Port	Specifies the COM port to be connected to the X-ray controller.
Connect / Disconnect	Connects or disconnects the controller from the currently selected port.

2.2.1.5 COMM
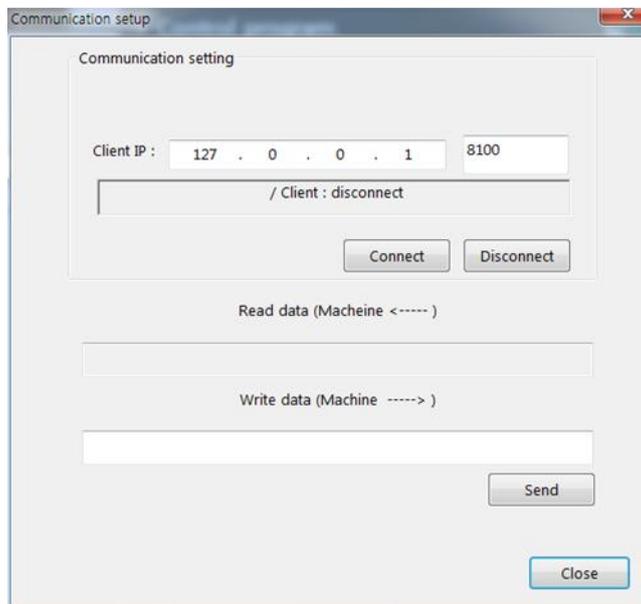
Name	Description
Client IP and port	Sets the IP and port number for the computer that will communicate with the loader and unloader.
Client: disconnect	Shows the connection status of LAN communication.
Connect / Disconnect buttons	Connects or disconnects the communication.
Read data (machine <----------)	Displays characters sent from the loader or unloader.
Write data (Machine ---------->)	The window to enter data to be sent from the X-ray machine to the loader or unloader.
Send button	Sends data under "Write data" to the connected machine.

2.2.1.6 MACHINE
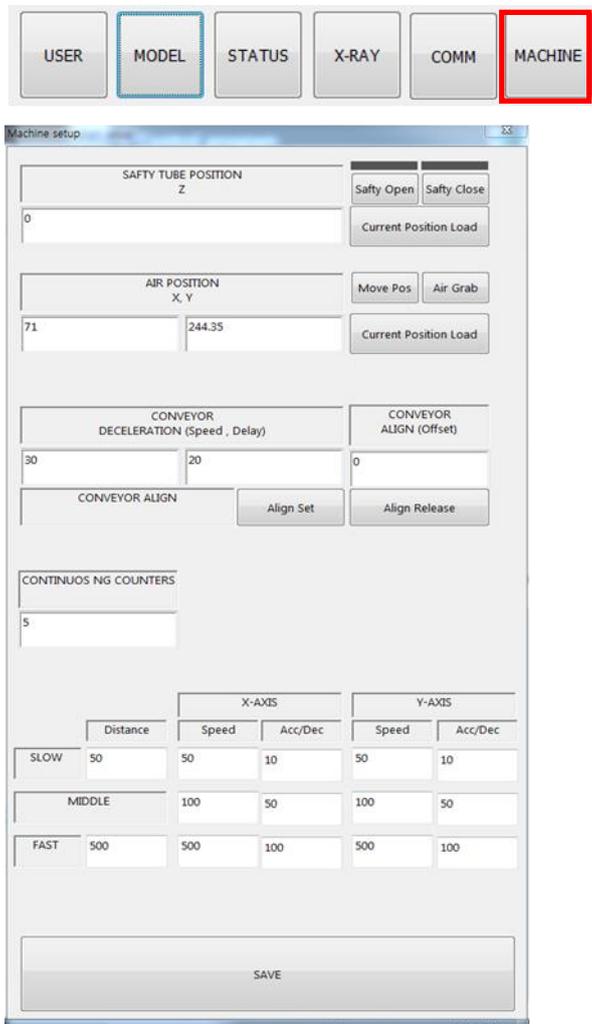
Name	Description
SAFTY TUBE POSITION Z	Z-axis position value used to shut down the shutter of the X-ray tube
AIR POSITION	Position value for air image capture (position for image correction)
CONVEYOR DECELERATION	Sets the speed and deceleration of the conveyor when the deceleration sensor is detected.
CONVEYOR ALIGN(OFFSET)	Sets the offset feed quantity used to activate conveyor alignment when the product reaches the inspection position.

Name	Description
CONTINUOUS NG COUNTERS	This function stops the conveyor if the specified number of errors occurs.
Shutter Open / Shutter Close	Turns on and off the X-ray tube shutter.
Align Set / Align Release	Checks the conveyor alignment.
SLOW/MIDDLE/FAST	Sets moving speed by distance.
Distance	■ SLOW: Moves at the speed specified on the right when the moving distance is below the specified value.
	■ MIDDLE: Moves at the speed specified on the right when the moving distance is between Slow and Fast.
	■ FAST: Moves at the speed specified on the right when the moving distance is above the specified value.

2.3 Auto Screen

2.3.1 Screen Overview
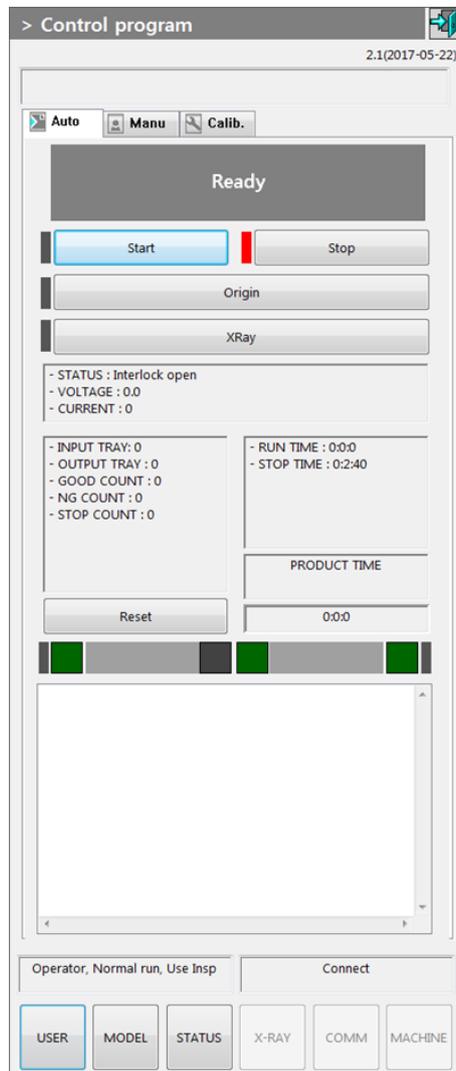
Name	Description
Start	Starts automatic run.
Stop	Stops automatic run.
X-ray On / Warmup-need/Over.	Turns on or off the X-ray.
Count Reset	Resets all counters.
Origin	Restarts all motor axes.

- STATUS : Interlock open
- VOLTAGE : 0.0
- CURRENT : 0

Name	Description
STATUS	Status
VOLTAGE	Voltage
CURRENT	Current

- INPUT TRAY: 0
- OUTPUT TRAY : 0
- GOOD COUNT : 0
- NG COUNT : 0
- STOP COUNT : 0

Name	Description
INPUT TRAY.	Number of trays in use
OUTPUT TRAY	Number of discharged trays
GOOD COUNT	Number of individual parts that have passed inspection
NG COUNT	Number of individual parts that have failed inspection
STOP COUNT	Number of stops

- RUN TIME : 0:0:0
- STOP TIME : 0:2:40

Name	Description
RUN TIME	Operating duration
STOP TIME	Overall time the system was not in operation

●

PRODUCT TIME

0:0:0

Name	Description
PROCUCT TIME	Product discharge time

2.4 Manual Screen

2.4.1 Screen Overview
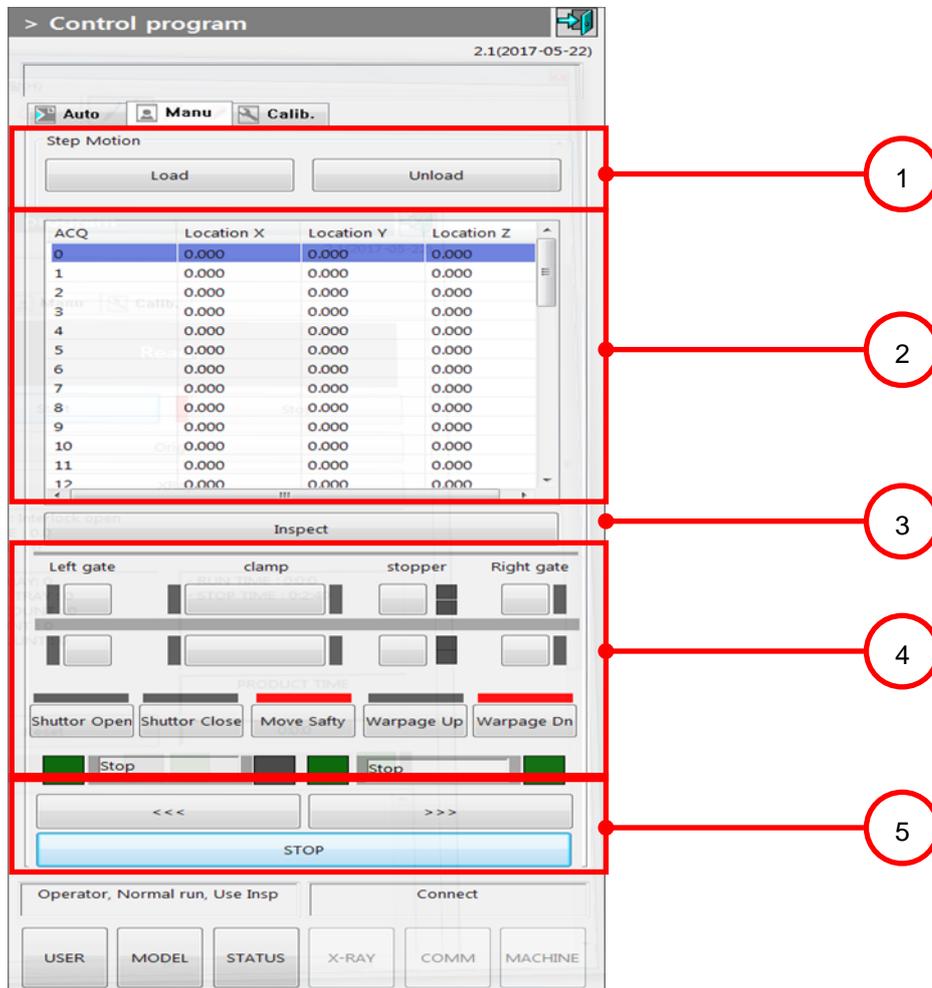
No.	Name	Description
1	Load / Unload	Loads or unloads a product using a step motion.
2	Teaching List	Shows the inspection position and speed of the current model. Move to the next model by a double-click.
3	Inspect button	Grips and inspects a product at the same time.
4	Cylinder sensor status and control buttons	Operates cylinders for the gate, clamp, and stopper.
5	Conveyor sensor status and control buttons	Operates the conveyor roller.

Name	Description
Load	Moves a product from the loader to the inspection position.
Unload	Discharges a product via the unloader.

Name	Description
Teaching list	Moves to the selected position by a double-click.
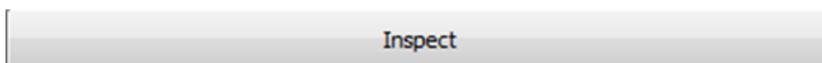
Name	Description
Inspect	Performs screening and inspection at the position selected under the Teaching list.
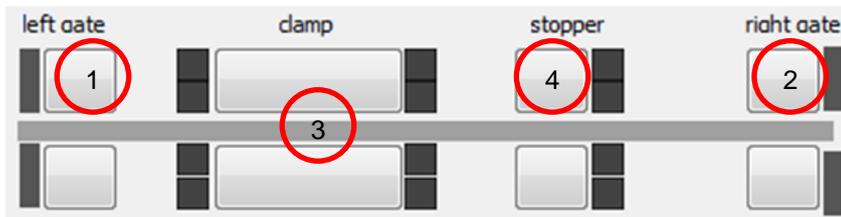
No.	Name	Description
1	Left gate	Raises or lowers the cylinder for the left-side gate. Note that moving the cylinder is not possible if the tube shutter is open.
2	Right gate	Raises or lowers the cylinder for the right-side gate. Note that moving the cylinder is not possible if the tube shutter is open.
3	Clamp	Raises or lowers the cylinder that clamps a product.
4	Stopper	Raises or lowers the cylinder that stops the conveyor when a product is transported by the conveyor.

Name	Description
Tube Shutter Open/Close	This shutter shields X-ray radiation and works only when the left and right gates are closed.
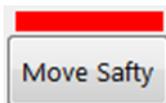
Name	Description
Move Safety	Moves the tube to preset safe position.

Name	Description
Warpage Up/Down	A cylinder that provides a solid base for a product and prevent the bottom from sagging.

* Make sure to move the tube in Warpage Up state to prevent the tube from colliding the cylinder.

Name	Description
Conveyor roller operation	Operates the conveyor roller using clockwise/counter clockwise.
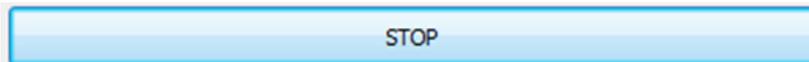
Name	Description
Stop	Stop button

2.5 Calibration Screen

2.5.1 Screen Overview
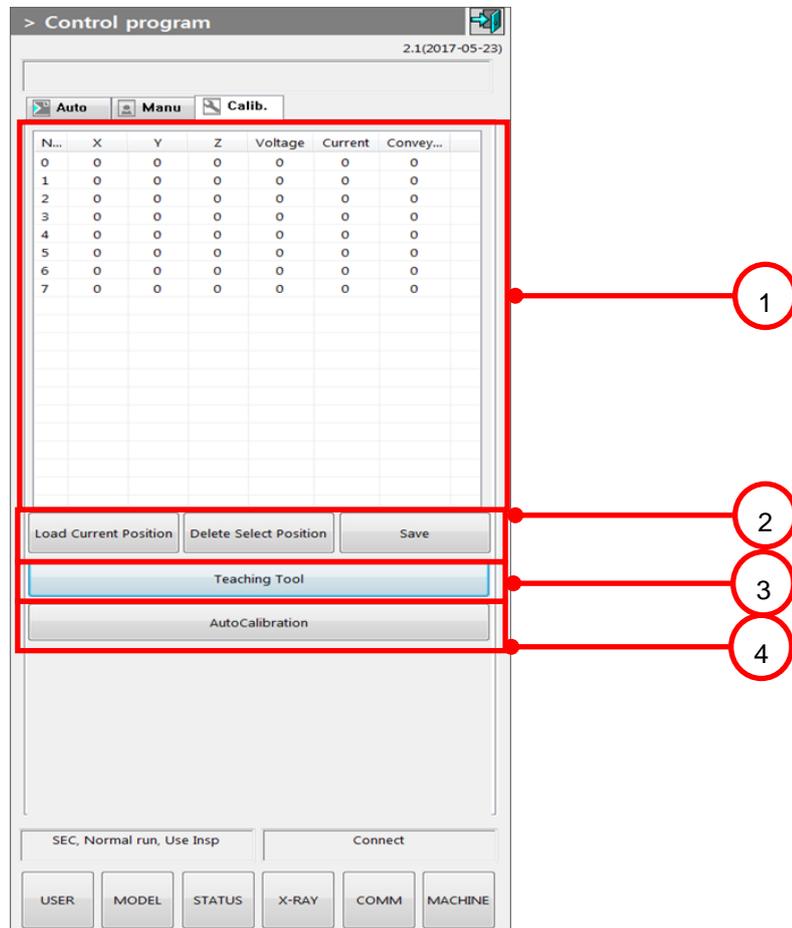
No.	Name	Description
1	Calibration List	Saves the position, voltage, current, and conveyor width for each point for use during transfer.
2	Load Current Position	Loads the current X, Y, Z, voltage, current, and conveyor width to the selected point.
	Delete Select Position	Deletes values saved for the selected point.
	Save	Saves the current calibration list.
3	Teaching Tool	Jog moving tool
4	Auto Calibration	Moves to the target point for calibration and start calibration automatically.

2.5.1.1 Teaching Tool
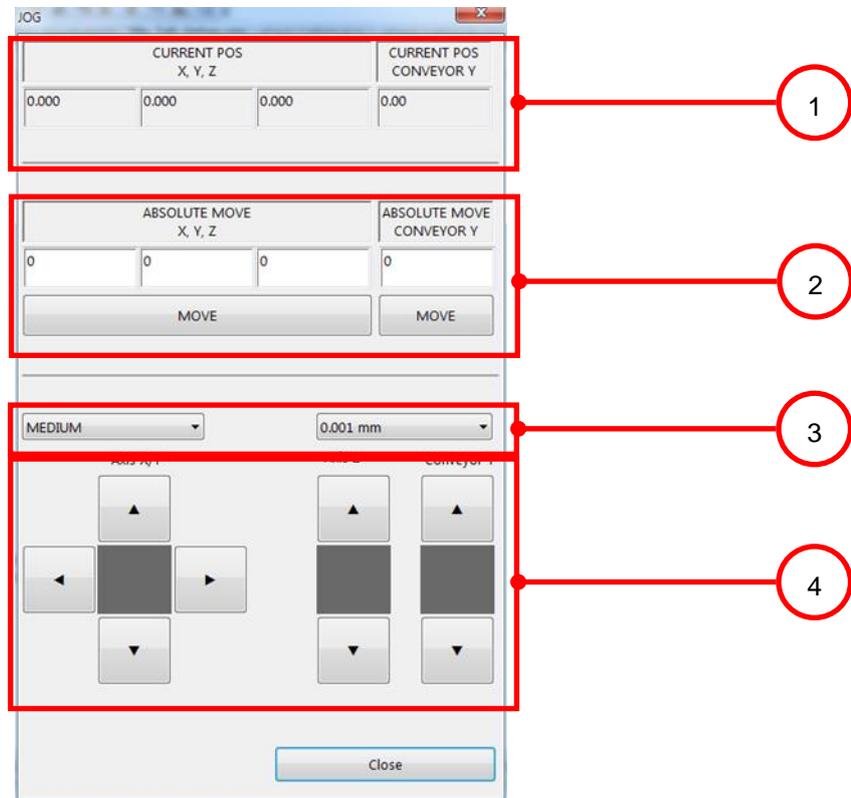
No.	Name	Description
1	Current Position	Shows the current position values for the X, Y, and Z conveyor width.
2	ABS Move	Enters the target position for moving and moves to the target position.
3	Velocity / Offset	Selects a speed and a distance to move using jog.
4	Jog	Moves each axis.

3. Error Code List

Alarm ID	Category	Alarm Text	How to turn off alarms
1	Err_IO_Board_Open	Resetting the I/O board failed.	Check the I/O DeviceNet communication unit.
2	Err_Motion_Board_Open	Resetting the motion board failed.	Check the MMC controller hardware condition.
10	Err_Door_Open	Safety door is open.	Close the door and proceed with inspection.
11	Err_Front_Door_Locking	Front door locker is open.	Close the front door and proceed with inspection.
12	Err_Rear_Door_Top_Locking	Rear [upper] door locker is open.	Close the upper door and proceed with inspection.
13	Err_Rear_Door_Bottom_Locking	Rear [lower] door locker is open.	Close the lower door and proceed with inspection.
14	Err_Xray_Power_On	X-ray power is off.	Turn on the X-ray power.
15	Err_Xray_FailTo_Lamp	Lamp failure in the X-ray.	Check the X-ray and the LED lamp
16	Err_Main_Power_On	Problem with the main power source.	Check that the main power is on.
17	Err_Main_Air_On	Problem with air supply.	Check that the main air fan is on.
18	Err_XRayCoolerFlow	Problem with the X-ray cooler.	Check the X-ray cooler.
20	Err_Machine_In_Working	Machine is already operating.	Stop the machine and restart it.
21	Err_Module_Response_Timeout	Response time for the command between control modules has expired.	Check the operating speed set for the machine.
22	Err_Module_Home_Motion	Failed to reset all axes for the machine.	Reset the machine. If this fails, reset it again.

Alarm ID	Category	Alarm Text	How to turn off alarms
30	Err_Axis_Home_Not_Detect	Failed to locate the home position of the axis.	Amp fault or home position sensor malfunction.
31	Err_Axis_Home_Timeout	Home position timeout error for the axis.	Returning to home position has timed out.
32	Err_Axis_Motion_Done	The axis is moving.	Stop the axis and try again.
33	Err_Axis_In_Error	Error in the axis.	Reset the amp for the axis and then reset the machine.
34	Err_Axis_Amp_Disable	The axis is in the AMP off state.	Turn on the axis amp and reset the machine.
35	Err_Axis_Amp_Fault	The axis is in the AMP falter state.	Reset the amp for the axis and then reset the machine.
36	Err_Axis_Motion_Timeout	The axis failed to complete moving within the specified time.	The axis failed to reach home position within specified time.
37	Err_Axis_Cylinder_Timeout	The cylinder failed to complete the action within specified time.	Cylinder sensor malfunctions.
38	Err_Axis_Invalid_Position	The axis did not reach the target position.	The axis failed to reach home position within specified time.
39	Err_Axis_Homing_Already_InProgress	The axis is already returning to the origin point.	The axis is initializing
40	Err_Axis_TargetPos_Is_Over_Limit	The target position is beyond the limit.	Specified movement value went over the limit.
41	Err_Axis_HW_Neg_Limit	"Hardware limit (Negative)" is currently selected.	The axis has been detected by the limit (Negative) sensor.

Alarm ID	Category	Alarm Text	How to turn off alarms
42	Err_Axis_HW_Pos_Limit	"Hardware limit (Positive)" is currently selected.	The axis has been detected by the limit (Positive) sensor.
43	Err_Axis_SW_Neg_Limit	"Software limit (Negative)" is currently selected.	The axis has been detected by the software limit (Negative) sensor.
44	Err_Axis_SW_Pos_Limit	"Software limit (Positive)" is currently selected.	The axis has been detected by the software limit (Positive) sensor.
200	Err_Viewer_Home_Not_Detect	The viewer module reset has not been completed.	The viewer module reset is required.
201	Err_Viewer_Teach_Pos	Viewer module failed to move to specified position.	Viewer module failed to move (interference due to collision).
202	Err_Viewer_ZAxis_Limit	Z axis limit problem during SOD movement of the viewer module.	Viewer module failed to move along Z axis (interference due to collision).
203	Err_Viewer_Motion_Done	Viewer module is operating.	Stop the viewer module before performing a command.
204	Err_Viewer_AxisTX_Error	Problem with the viewer tube X axis.	Viewer tube failed to move along X axis (interference due to collision).
205	Err_Viewer_AxisDX_Error	Problem with the viewer detector X axis.	Viewer detector failed to move along X axis (interference due to collision).
206	Err_Viewer_AxisTY_Error	Problem with the viewer tube Y axis.	Viewer tube failed to move along Y axis (interference due to collision).

Alarm ID	Category	Alarm Text	How to turn off alarms
207	Err_Viewer_AxisDY_Error	Problem with the viewer detector Y axis.	Viewer detector failed to move along Y axis (interference due to collision).
208	Err_Viewer_AxisTZ_Error	Problem with the viewer tube Z axis.	Viewer tube failed to move along Z axis (interference due to collision).
400	Err_Conveyor_Home_Not_Detect	Reset of the conveyor module has not been completed.	Reset of the conveyor module is required.
401	Err_Conveyor_L_Gate_Open	The conveyor's left gate is open.	Check that the left gate is closed.
402	Err_Conveyor_R_Gate_Open	The conveyor's right gate is open.	Check that the right gate is closed.
403	Err_Conveyor_L_Gate_Close	The conveyor's left gate is closed.	Check that the left gate is open.
404	Err_Conveyor_R_Gate_Close	The conveyor's right gate is closed.	Check that the right gate is open.
405	Err_Conveyor_L_Gate_Diff	Problem with the conveyor's left gate sensors.	Sensors fail to detect difference when the left gate is open and closed.
406	Err_Conveyor_R_Gate_Diff	Problem with the conveyor's right gate sensors.	Sensors fails to detect difference when the right gate is open and closed.
407	Err_Conveyor_Safty_Shutter_Open	Conveyor X-ray shutter is open.	Check the conveyor X-ray shutter open status sensor.
408	Err_Conveyor_Safty_Shutter_Close	Conveyor X-ray shutter is closed.	Check the conveyor X-ray shutter closed status sensor.

Alarm ID	Category	Alarm Text	How to turn off alarms
409	Err_Conveyor_Safty_Shutter_Diff	Problem with the conveyor X-ray shutter status sensors.	Sensors fail to detect difference when the conveyor X-ray shutter is open and closed.
410	Err_Conveyor_L_Stopper_Up	Conveyor stopper is raised.	Check that the conveyor stopper sensors detect properly when the stopper is raised and lowered.
411	Err_Conveyor_L_Stopper_Dn	Conveyor stopper is lowered.	Check that the conveyor stopper sensors detect properly when the stopper is raised and lowered.
412	Err_Conveyor_L_Stopper_Diff	Problem with the conveyor stopper sensors.	Sensors fail to detect difference when the conveyor stopper is raised and lowered.
413	Err_Conveyor_Clamp1_Up	Conveyor clamp 1 is raised.	Check that the conveyor clamp 1 sensors detect properly when the clamp is raised and lowered.
414	Err_Conveyor_Clamp1_Dn	Conveyor clamp 1 is lowered.	Check that the conveyor clamp 1 sensors detect properly when the clamp is raised and lowered.
415	Err_Conveyor_Clamp1_Diff	Problem with the conveyor clamp 1 sensors.	Sensors fail to detect difference when conveyor clamp 1 is raised and lowered.
416	Err_Conveyor_Clamp2_Up	Conveyor clamp 2 is raised.	Check that the conveyor clamp 2 sensors detect properly when the clamp is raised and lowered.

Alarm ID	Category	Alarm Text	How to turn off alarms
417	Err_Conveyor_Clamp2_Dn	Conveyor clamp 2 is lowered.	Check that the conveyor clamp 2 sensors detect properly when the clamp is raised and lowered.
418	Err_Conveyor_Clamp2_Diff	Problem with the conveyor clamp 2 sensors.	Sensors fail to detect difference when conveyor clamp 2 is raised and lowered.
419	Err_Conveyor_Warpage1_On	Conveyor warpage 1 is raised.	Check that the conveyor warpage 1 sensors detect properly when the warpage is raised or lowered.
420	Err_Conveyor_Warpage1_Off	Conveyor warpage 1 is lowered.	Check that the conveyor warpage 1 sensors detect properly when the warpage is raised or lowered.
421	Err_Conveyor_Warpage1_Diff	Problem with the conveyor warpage 1 sensors.	Sensors fail to detect difference when conveyor warpage 1 is raised and lowered.
422	Err_Conveyor_Warpage2_On	Conveyor warpage 2 is raised.	Check that the conveyor warpage 2 sensors detect properly when the warpage is raised or lowered.
423	Err_Conveyor_Warpage2_Off	Conveyor warpage 2 is lowered.	Check that the conveyor warpage 2 sensors detect properly when the warpage is raised or lowered.

Alarm ID	Category	Alarm Text	How to turn off alarms
424	Err_Conveyor_Warpage2_Diff	Problem with the conveyor warpage 2 sensors.	Sensors fail to detect difference when conveyor warpage 2 is raised and lowered.
425	Err_Conveyor_Left_Tray_Jam_Exist	Conveyor's left jam sensor detected an object.	Conveyor's left jam sensor detected something.
426	Err_Conveyor_Left_Tray_Jam_No_Exist	Conveyor's left jam sensor did not detect an object.	Conveyor's left jam sensor detected nothing.
427	Err_Conveyor_Right_Tray_Jam_Exist	Conveyor's right jam sensor detected an object.	Conveyor's right jam sensor detected something.
428	Err_Conveyor_Right_Tray_Jam_No_Exist	Conveyor's right jam sensor did not detect an object.	Conveyor's right jam sensor detected nothing.
429	Err_Conveyor_Work_Tray_Exist	Conveyor work detected an object.	Conveyor work sensor detected something.
430	Err_Conveyor_Work_Tray_No_Exist	Conveyor work did not detect an object.	Conveyor work sensor detected nothing.
431	Err_Conveyor_Work_PCB_Not_Data_Exist	Product data is present in conveyor work (check the sensor).	Conveyor work shows that there is no product but data exists.
432	Err_Conveyor_Left_Timeout	Product failed to reach the (left) conveyor in time.	Load of the product to the left conveyor has failed. Check the machine.
433	Err_Conveyor_Right_Timeout	Product failed to reach the (right) conveyor in time.	Discharge of the product to the right conveyor has failed. Check the machine.
434	Err_Conveyor_Right_Tray_Exist_etc	Conditions related to presence of a product on the (right) conveyor do not match.	Presence of a product on the right conveyor does not match the sensor detection results. Check the machine.

Alarm ID	Category	Alarm Text	How to turn off alarms
435	Err_Conveyor_Motion_Done	Conveyor module is operating.	Stop the conveyor and restart it.
436	Err_Conveyor_AxisY_Error	Problem with the conveyor width axis.	There is a problem with the conveyor width control axis.
437	Err_Conveyor_AxisFR_Error	Problem with the conveyor roller front axis.	Conveyor roller alarm has gone off (Front).
438	Err_Conveyor_AxisRR_Error	Problem with the conveyor roller rear axis.	Conveyor roller alarm has gone off (Rear).
439	Err_Conveyor_ModelSize_Height	Conveyor height axis does not match the model size.	Conveyor width does not match the actual product (check width adjustment).
500	Err_XRay_FailTo_TurnOn	Failed to turn on the X-ray.	Failed to turn on the X-ray (check the X-ray controller).
426	Err_XRay_Check_Status	Failed to check the X-ray status.	X-ray status check failed (check the X-ray controller).
427	Err_XRay_FailTo_Set_Voltage	Failed to set the X-ray voltage and current.	X-ray voltage and current do not reach the set values.
428	Err_XRay_Not_StandBy	X-ray is not in STAND BY mode.	X-ray is not in standby state.
429	Err_Xray_Over	X-ray is in Over state.	X-ray is in Over state. Reset the X-ray.
430	Err_Xray_Heating	X-ray is being heated.	X-ray is being heated (X-ray radiation starts after heating is completed).
431	Err_Xray_Need_Warmup	X-ray warm-up has not been completed.	Perform X-ray warm-up.

Alarm ID	Category	Alarm Text	How to turn off alarms
432	Err_Xray_Temp_Interlock	X-ray temperature is not stable.	X-ray is being heated (X-ray radiation starts after heating is completed).
433	Err_Xray_Interlock_L_Gate	Impossible to open the left gate and shutter at the same time when the X-ray is on.	X-ray shutter and left gate cannot be opened at the same time.
434	Err_Xray_Interlock_R_Gate	Impossible to open the right gate and shutter at the same time when the X-ray is on.	X-ray shutter and right gate cannot be opened at the same time.
435	Err_Xray_ON	X-ray is on.	Turn off the X-ray and proceed.
436	Err_Xray_ON_TIMEOUT	Failed to turn on the X-ray.	Failed to turn on the X-ray (check the X-ray controller).
437	Err_Xray_OF_TIMEOUT	Failed to turn off the X-ray.	Failed to turn off the X-ray (check the X-ray controller).
600	Err_A2M_Group_Index	Incorrect group number from inspection.	Incorrect group number is found when synced with the inspection program.
601	Err_A2M_Teach_Index	Incorrect teaching number from inspection.	Incorrect teaching number is found when synced with the inspection program.
602	Err_A2M_Inspection_Finish	There is a product that has not been inspected.	There is a product that has failed to acquire inspection results.
700	Err_Barcode_Read	Failed to read bar code.	Bar code cannot read.
701	Err_Barcode_Info	No bar code information	Remove the product and reload it.

Part 3. Operation Manual