



2019 Request to Enter System with STO

30014: R3





Any robot in motion is dangerous. Do not modify the STO Request to enter system without ARI's prior approval. The system is only affective when connected by an ARI service engineer.

Note: This manual explains how to use and operate the Well-Lih request to enter system with STO (Safe Torque Off). This system allows users to enter and exit the safety guarding of ARI robot guarding mid cycle without the robot's losing position or stopping autorun. This works by de-energizing the motors and drives in the robot while the guarding is open. Absolute encoders always keep the robots current drive position, even when the robot is powered down. This allows the robot to pick up from the previous position where the drives were deenergized and continue the cycle.

Document version

Version no.	Date of revision
V 1.0	8-20-19
V 2.0	12-26-19
V 3.0	06-25-20

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1.0 Specification of Safety Lock

◆**Note** : Safety lock can be purchased from ARI

Safety Lock : AZM161SK12/12RKA-024

Actuator : AZM 161-B6 (Adjustable)

Waterproof connector : PG21

Brand : SCHMERSAL

Place of Origin : Germany

Technical Parameters

- Rated voltage : DC24V
- Lock mode : Power-on & lock
- Locked-In Force : 30N

Technical chart:

Remark :



Confirm Disconnection



Action



No action



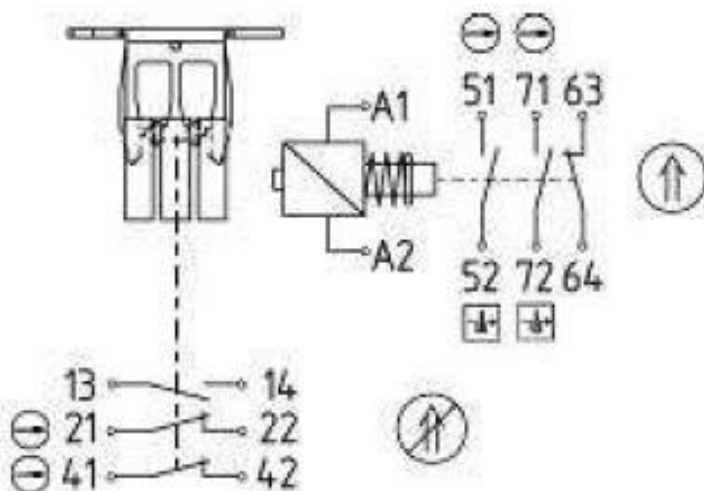
Normally open contact



Normally closed contact



Safety Lock



13	14	21	22	41	42	51	52	63	64	71	72	A1	A2
----	----	----	----	----	----	----	----	----	----	----	----	----	----

Button Box Composition

- Note: Button box and related accessories could be purchased from WELL-LIH or provided by customers.

1.1 The button box is composed of emergency stop button, Request Entry ON/OFF Button and indicator push button.

1.2 Specification of Emergency Stop Button :

XB2BR42: **3sets** Normal close contacts, as shown below

- Note: Recommend using Schneider.



Emergency stop button

1.3 Specification of Request Entry ON/OFF Button :

XB2BD21C: **1set** Normal open contact, 2gears, as shown below:

- Note: Recommend using Schneider.



Request Entry ON/OFF Button

1.4 Specification of Indicator Push Button :

XB2BW36B1C: **1set** Normal open contact, DC24V Indicator Push Button, as shown below:

◆Note: Recommend using Schneider.

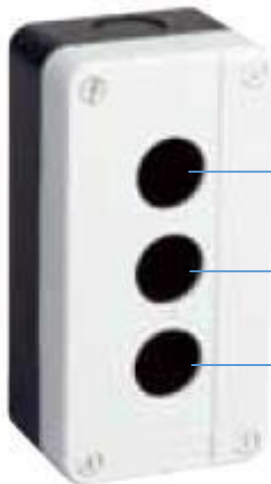


Indicator push button

1.5 Specification of 3-hole button box :

XALB03C: as shown below:

- Note: Recommend using Schneider.



Emergency Stop Button

Request Entry ON/OFF Button

Indicator push button

3-hole button box



Request to Enter System with STO

1.6 Mounting Hardware:

Note: All Mounting Hardware should come with the request to enter kit. If the hardware is missing or to order a replacement please contact parts@absoluterobot.com

1. (10) M6 x 15mm Allen bolts
2. (10) M6 Lock Washers
3. (2) M5x16mm Flat head hex drive
4. (10) M6 spring channel nuts P/N: 34.16.0631 (from MK)
5. (2) M5 spring Channel nuts P/N: 34.16.0531 (from MK)

2.0 How to Connect Wires for Request to Enter System

2.1 Extension Connector of Guard Door

- PL4 is signal connector of safety lock.
- PL5 is signal connector of button box.

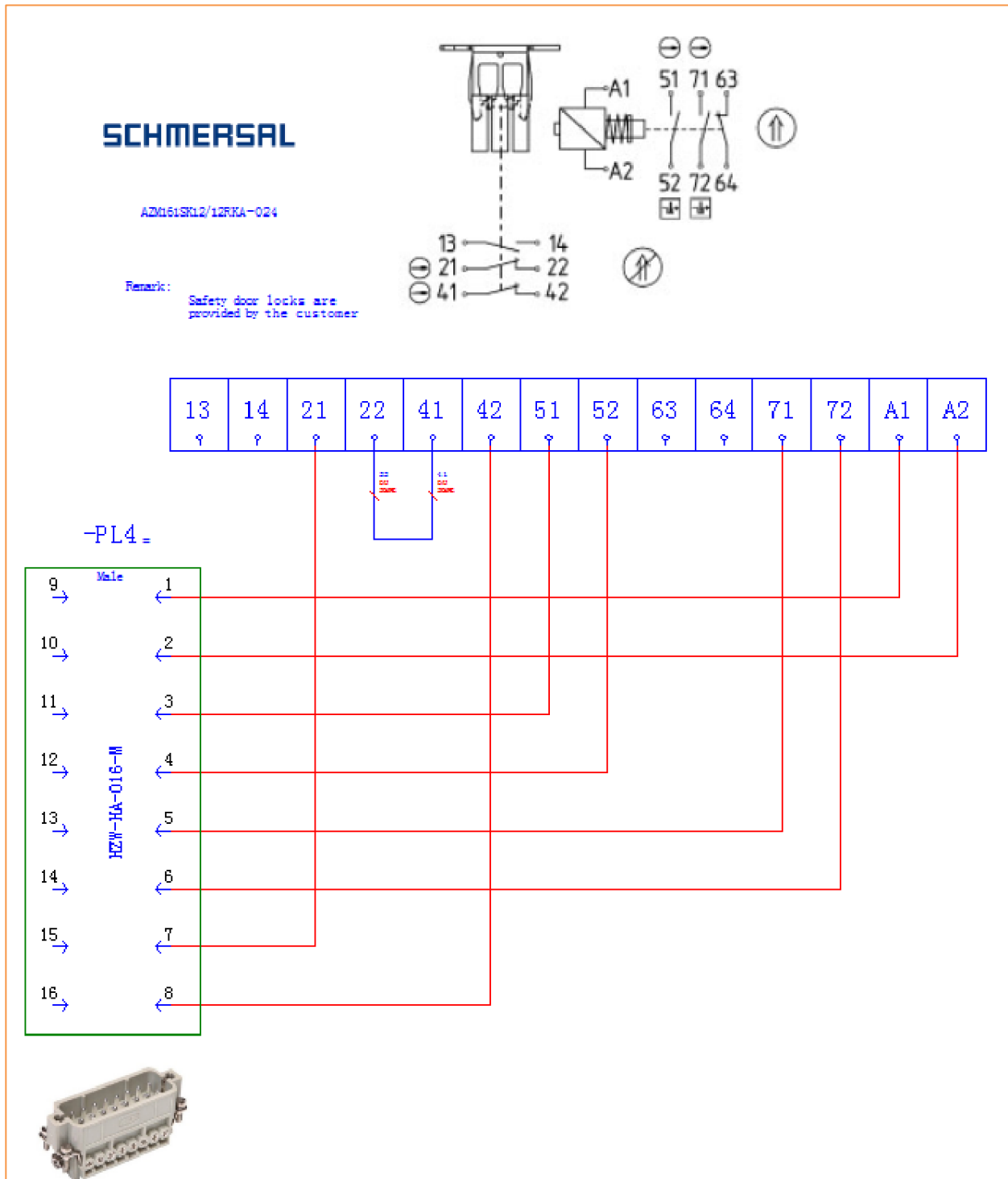


2.2 Signal Connection of Safety Lock

STEP 1 : Remove the PL4 connector.

STEP 2 : Remove jumper from the PL4 connector (retain 22#, 41# jumper).

STEP 3 : Connect the wires according to the below wiring diagram:

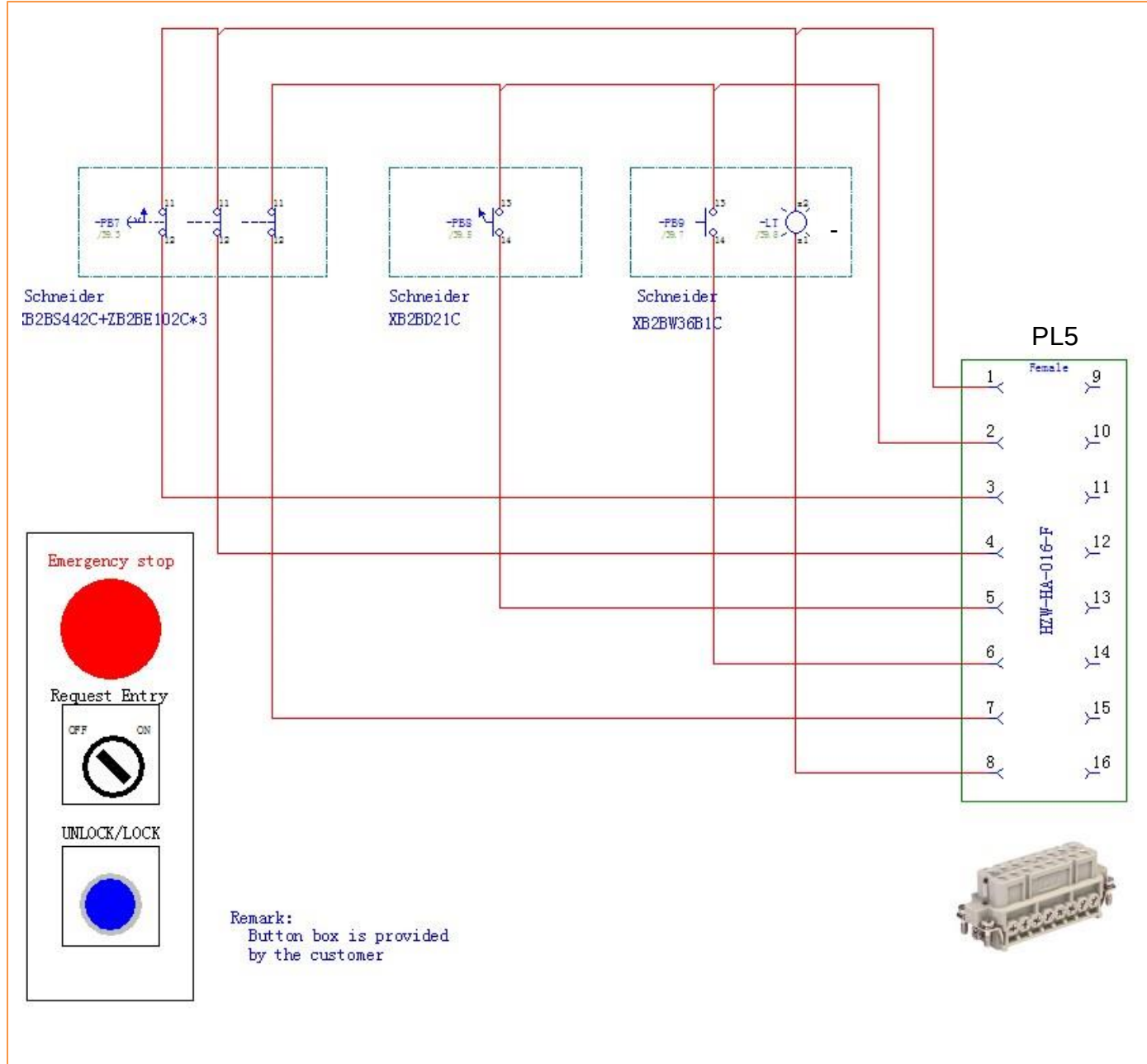


2.3 Signal Connection of Button Box

STEP 1 : Remove the PL5 connector.

STEP 2 : Remove the jumper inside the PL5 connector.

STEP 3 : Connect the wires according to the below wiring diagram:



3.0 How to Test Connection to Confirm Proper Operation

3.1 Inputs

Enter "Input Port Table (Function > Function Set > Advanced > Input List)"

STEP 1 :

- **< Input port number 9> (LFE Protective Door)**

The factory configuration signal is DI9 on the #1 expansion module.

Close the guard door, the signal is connected.

Open the guard door, the signal is interrupted.

STEP 2 :

- **< Input port number 107> (Door Switch Request)**

The factory configuration signal is DI27 on GUS controller.

Turn the "**Door Switch Request**" to "ON", the signal is interrupted.

Turn the "**Door Switch Request**" to "OFF", the signal is connected.

STEP 3 :

- **< Input port number 108> (Door Lock Confirm)**

The factory configuration signal is DI28 on GUS controller.

Press the button "**Door Lock Confirm**", the signal is connected.

Release the button "**Door Lock Confirm**", the signal is interrupted.

STEP 4 :

- **< Input port number 109> (Ext_EMG_Stop)**

The factory configuration signal is DI29 on GUS controller.

Press the button "**Ext_EMG_Stop**", the signal is interrupted.

Reset the button "**Ext_EMG_Stop**", the signal is connected.



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Input List (Function > Function Set > Advanced > Input List):

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<109> Ext_EMG_Stop

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Enable MotorFactory SetsAdvancedReset OrderAxis PortInput ListOutput ListPassword

☐ <90> EOAT BCD_3_In	90	☐ <100> RSV_100	100	☐ <110> RSV_110	110
☐ <91> EOAT BCD_4_In	91	☐ <101> RSV_101	101	☐ <111> RSV_111	111
☐ <92> EOAT BCD_5_In	92	☐ <102> RSV_102	102	☒ <112> {Door Closed}	9
☐ <93> EOAT BCD_6_In	93	☐ <103> RSV_103	103	☐ <113> {Request Entry}	107
☐ <94> EOAT BCD_7_In	94	☐ <104> RSV_104	104	☐ <114> {Door Lock Confirm}	108
☐ <95> EOAT BCD_8_In	95	☐ <105> RSV_105	105	☐ <115> RSV_115	115
☐ <96> BCD_SO Date send finis	96	☐ <106> RSV_106	106	☐ <116> RSV_116	116
☐ <97> BCD_RC Confirm to run	97	☐ <107> Request Entry	107	☐ <117> RSV_117	117
☐ <98> BCD_TB Ejector back	98	☐ <108> Door Lock Confirm	108	☐ <118> RSV_118	118
☐ <99> RSV_99	99	☐ <109> Ext_EMG_Stop	109	☐ <119> RSV_119	119

Preview

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3.2 Output List

Enter "Output Port Table (Function > Function Set > Advanced > Output List)"

STEP 5 :

- **< Output port number 14> (Door lock)**

The factory configuration signal is DO14 on the 1# expansion module.

Turn the **"Door Switch Request"** to "OFF", press the button **"Door Lock Confirm"**, output this signal, lock the guard door.

STEP 6 :

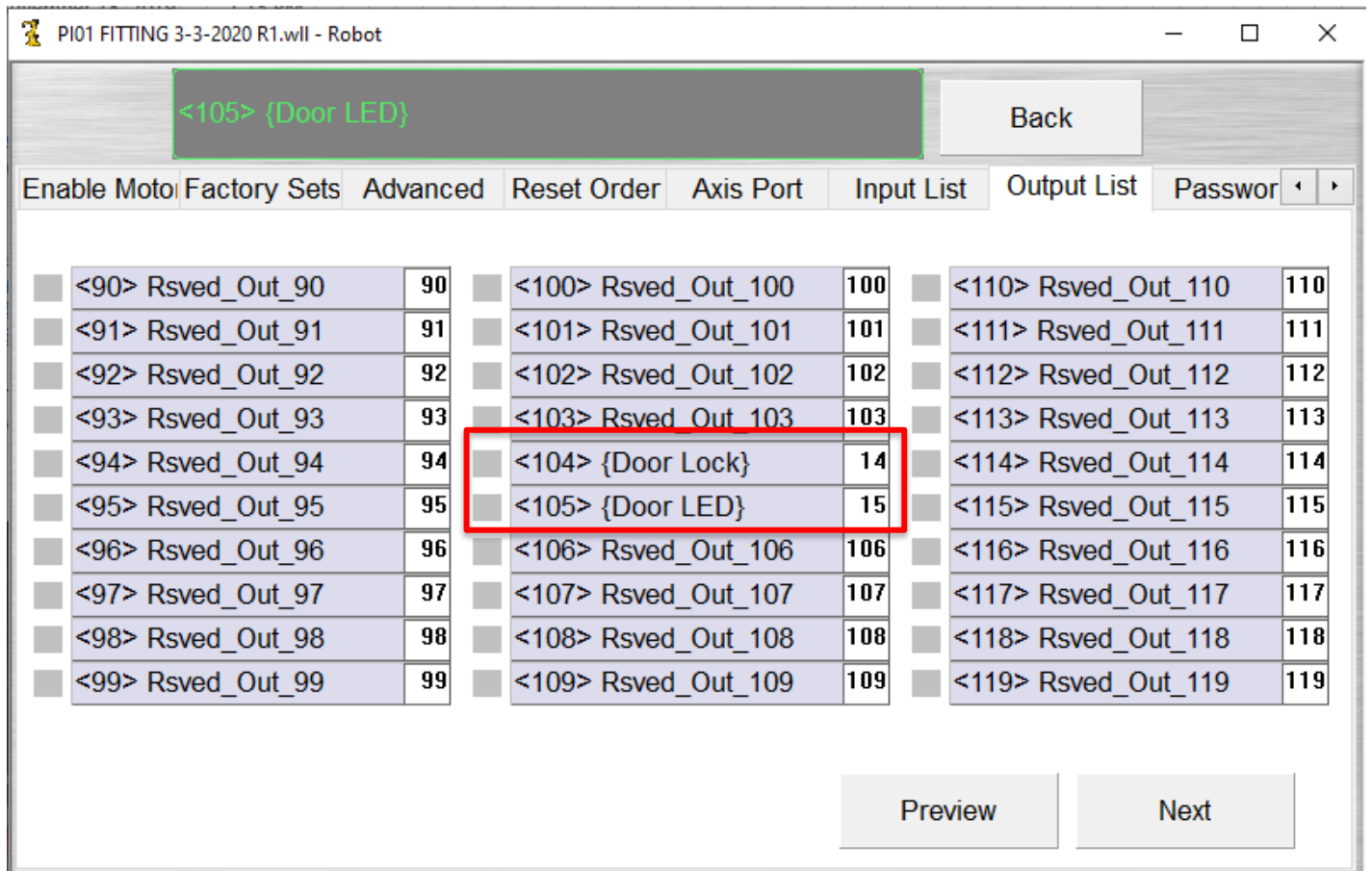
- **< Output port number 15> (Door LED: located on the indicator push button)**

The factory configuration signal is DO15 on the 1# expansion module.

Open the guard door, output this signal.

Close the guard door, stop output.

Output List (Function > Function Set > Advanced > Output List):



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<105> {Door LED}

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Enable Motor Factory Sets Advanced Reset Order Axis Port Input List Output List Password

<90> Rsved_Out_90	90	<100> Rsved_Out_100	100	<110> Rsved_Out_110	110
<91> Rsved_Out_91	91	<101> Rsved_Out_101	101	<111> Rsved_Out_111	111
<92> Rsved_Out_92	92	<102> Rsved_Out_102	102	<112> Rsved_Out_112	112
<93> Rsved_Out_93	93	<103> Rsved_Out_103	103	<113> Rsved_Out_113	113
<94> Rsved_Out_94	94	<104> {Door Lock}	14	<114> Rsved_Out_114	114
<95> Rsved_Out_95	95	<105> {Door LED}	15	<115> Rsved_Out_115	115
<96> Rsved_Out_96	96	<106> Rsved_Out_106	106	<116> Rsved_Out_116	116
<97> Rsved_Out_97	97	<107> Rsved_Out_107	107	<117> Rsved_Out_117	117
<98> Rsved_Out_98	98	<108> Rsved_Out_108	108	<118> Rsved_Out_118	118
<99> Rsved_Out_99	99	<109> Rsved_Out_109	109	<119> Rsved_Out_119	119

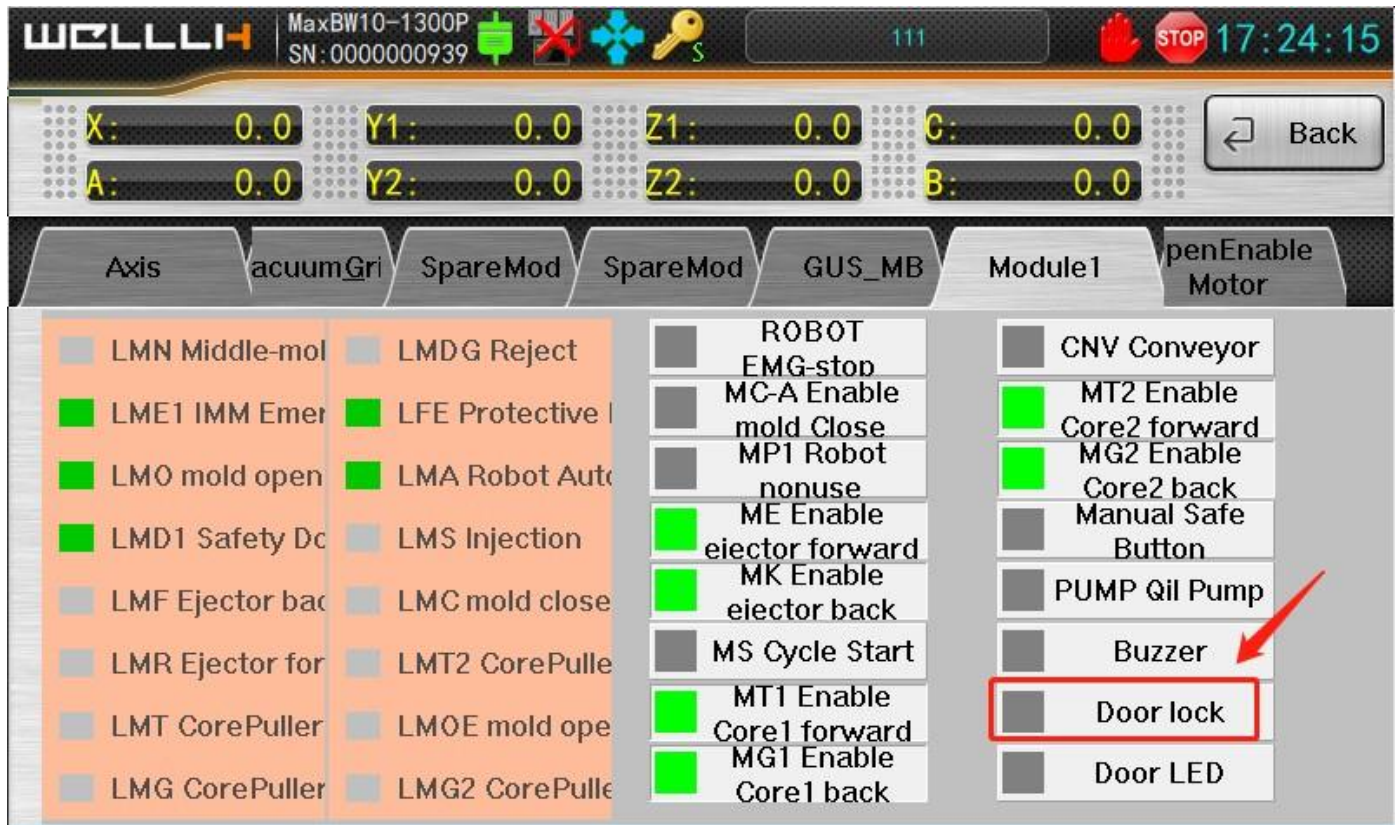
Preview Next

4.0 How to Open and Close the Guard Door

4.1 How to Open the Guard Door in "Manual Mode"

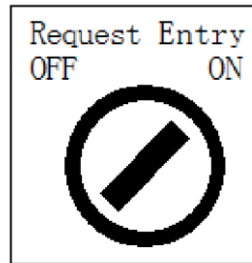
4.1.1 Lock or Unlock the Guard Door Lock in Manual Mode

Click "Door lock" on the "Module 1" interface to directly lock or unlock the guard door lock, as shown below :

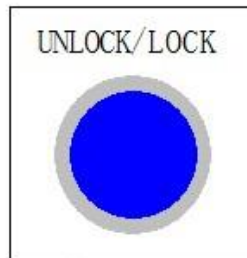


4.1.2 Lock or Unlock the Guard Door Using Guard Door's Button

STEP 1 : Turn "Request Entry ON/OFF Button" to "ON" (Request to open the door).

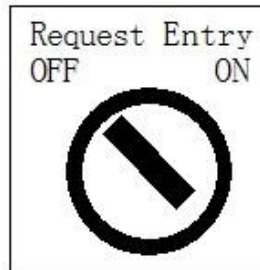


STEP 2 : Press "Indicator push button" to lock or unlock the guard door.

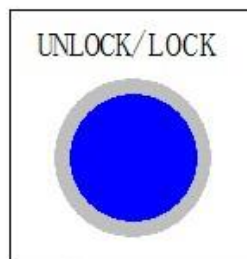


4.2 How to Close the Guard Door in "Manual Mode"

STEP 1 : Turn "Request Entry ON/OFF Button" to "OFF" (Request to close the door).

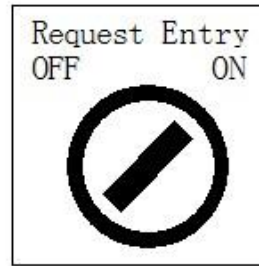


STEP 2: Press "Indicator push button" to lock or unlock the guard door.



4.3 How to Open the Guard Door in "Autorun Mode"

STEP 1 : Turn "Request Entry ON/OFF Button" to "ON" (Request to enter guard door).

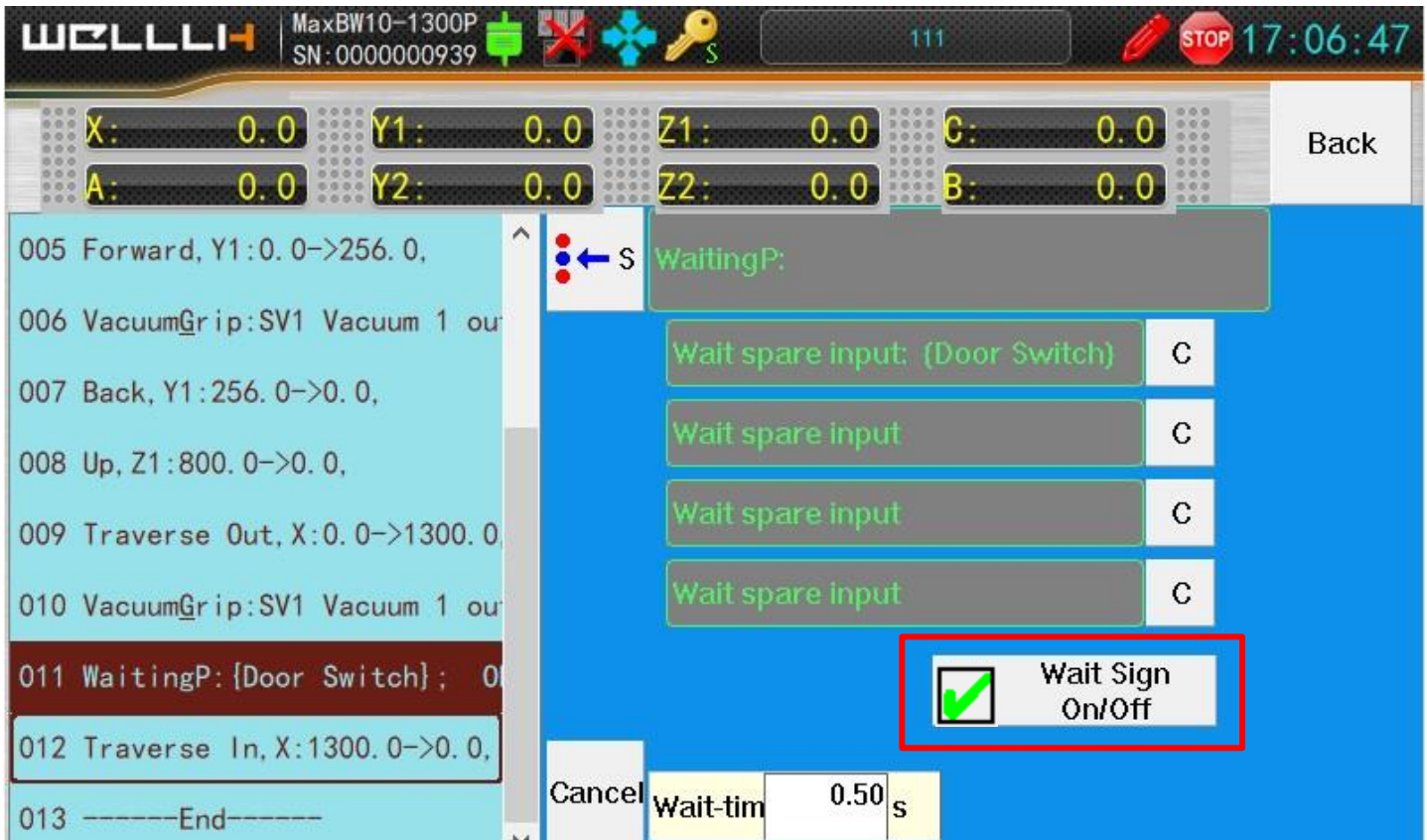


STEP 2 : Wait for the robot to finish the current routine.

◆Special Note: The program needs to teach "wait" {Door Switch} to the position where the customer needs to stop (for example: the out-mold position to put the product, or the standby position, etc.)

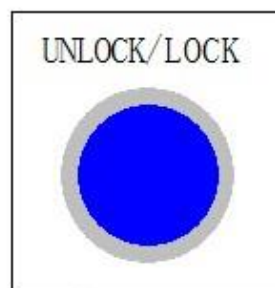


Add a Wait signal to Wait for **“Door Switch”** to **“ON”**
 (This refers to the request to enter switch being switched to **“OFF”**)



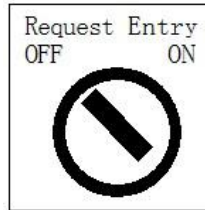
The screenshot shows the WELLLI control interface. At the top, there's a status bar with 'MaxBW10-1300P', 'SN: 0000000939', and a 'STOP' button. Below this, there's a grid of coordinates: X: 0.0, Y1: 0.0, Z1: 0.0, C: 0.0, A: 0.0, Y2: 0.0, Z2: 0.0, B: 0.0. A 'Back' button is on the right. The main area displays a sequence of steps: 005 Forward, Y1:0.0->256.0, 006 VacuumGrip:SV1 Vacuum 1 out, 007 Back, Y1:256.0->0.0, 008 Up, Z1:800.0->0.0, 009 Traverse Out, X:0.0->1300.0, 010 VacuumGrip:SV1 Vacuum 1 out, 011 WaitingP: {Door Switch}; 0, 012 Traverse In, X:1300.0->0.0, and 013 -----End-----. A 'WaitingP' dialog box is open, showing four 'Wait spare input' fields, each with a 'C' button. The first field is labeled 'Wait spare input: (Door Switch)'. A red box highlights a 'Wait Sign On/Off' checkbox, which is checked. At the bottom, there's a 'Cancel' button and a 'Wait-tim' field set to '0.50 s'.

STEP 3 : Press “Indicator push button” to lock or unlock the guard door lock.

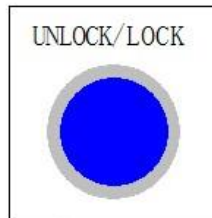


4.4 How to Close the Guard Door in "Autorun Mode"

STEP 1 : Turn "Request Entry ON/OFF Button" to "OFF" (Request to close the door).



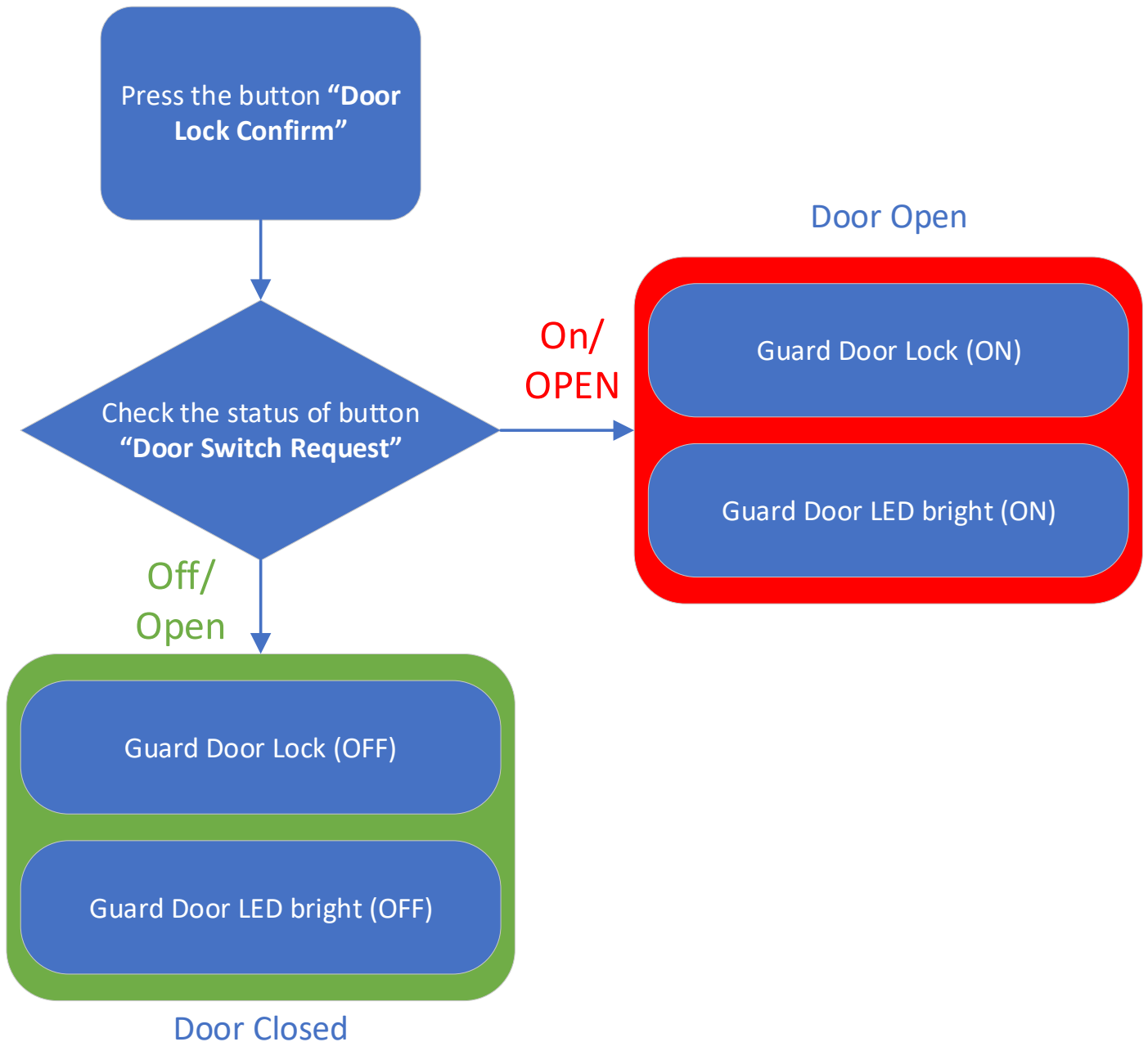
STEP 2 : Press "Indicator push button" to lock or unlock the guard door.



◆Special note: After opening the guard door, the servo drive STO is disabled to ensure personal safety. If the actual position of the axis changes, it needs to return to the "standby point" again, otherwise it will not be able to do the "Autorun" operation.

5.0 Control Principle of Guard Door

5.1 Control Principle of Lock and Unlock of Guard Door



6.0 Troubleshooting Request to Enter System

6.1 Basic Troubleshooting Steps

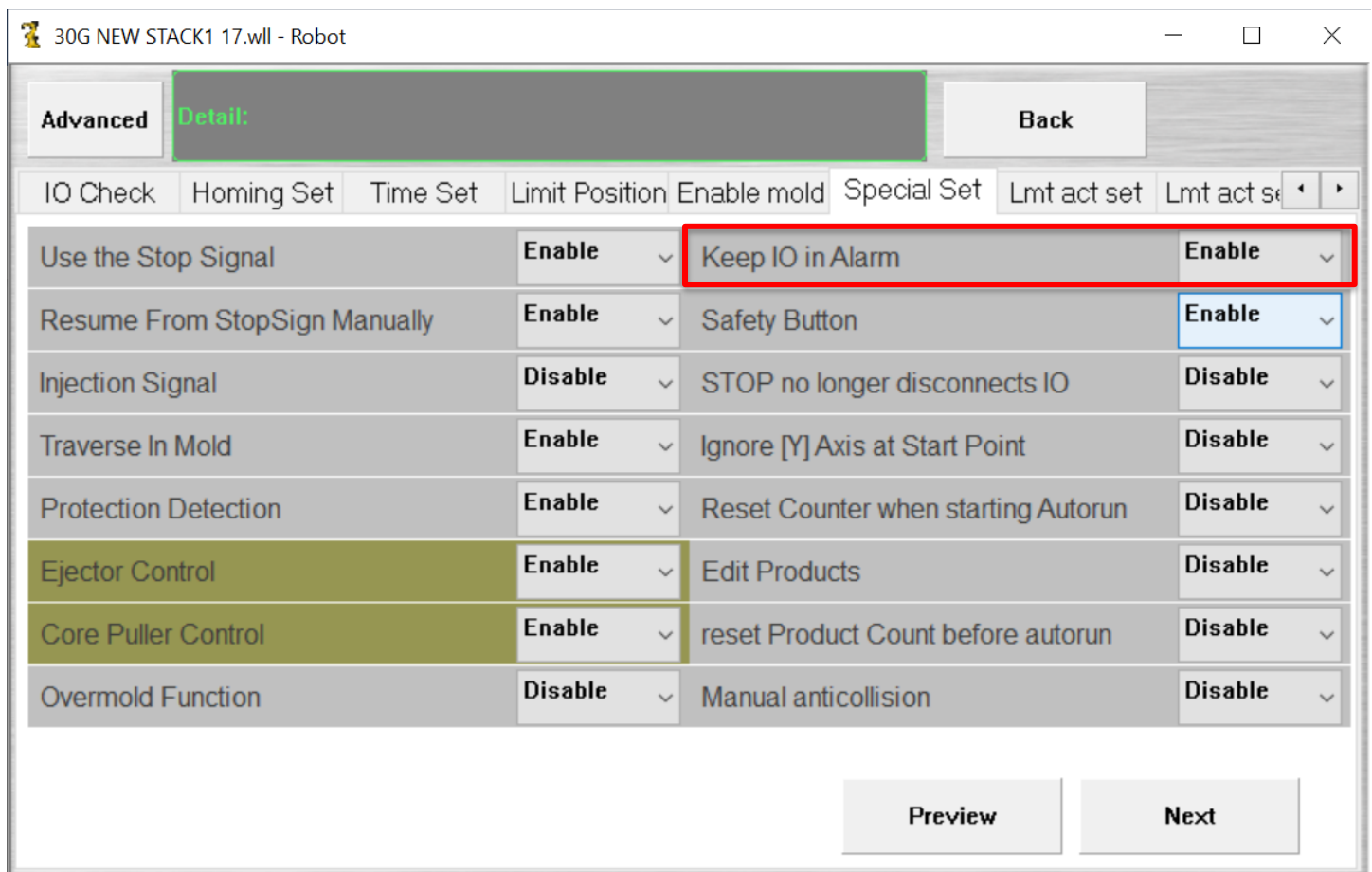
1. Make sure the door is closed.
2. Confirm the system is plugged into the robot
3. Port address's set correctly (see 7.3)
4. Wiring correct (check circuit diagrams)

6.2 Short Entry Time

Problem: The request to enter button flickers rapidly. Leaving no time to enter.

Solution: Make sure *Keep IO in Alarm* is enabled

Go to: Function > Function Set > Special Set



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IO Check	Homing Set	Time Set	Limit Position	Enable mold	Special Set	Lmt act set	Lmt act set
Use the Stop Signal	Enable	▼	Keep IO in Alarm	Enable	▼		
Resume From StopSign Manually	Enable	▼	Safety Button	Enable	▼		
Injection Signal	Disable	▼	STOP no longer disconnects IO	Disable	▼		
Traverse In Mold	Enable	▼	Ignore [Y] Axis at Start Point	Disable	▼		
Protection Detection	Enable	▼	Reset Counter when starting Autorun	Disable	▼		
Ejector Control	Enable	▼	Edit Products	Disable	▼		
Core Puller Control	Enable	▼	reset Product Count before autorun	Disable	▼		
Overmold Function	Disable	▼	Manual anticollision	Disable	▼		

Preview Next



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6.3 Door Lock and LED port address:

Problem: Request to Enter System dos not function out of the box when plugged in. Setting Request to Enter to On and pressing the Blue Indicator Push Button results in no action.

Note: If your request to Entry is working, Do not change this setting. Port numbers may change between software versions.

Please contact ARI technical support for assistance: service@absoluterobot.com

Solution: Robot outputs for Output <104> {Door Lock} and <105> {Door LED} may be set to the wrong port numbers. Older software versions may have these on different ports, but they can be easily changed.

Be sure to set the Ports to the following:

Check the following under (Function > Function Set > Advanced > Output List)

- <104> {Door Lock} Set to 14
- <105> {Door LED} Set to 15

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<105> {Door LED}

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Enable Motor Factory Sets Advanced Reset Order Axis Port Input List Output List Password

<90> Rsved_Out_90	90	<100> Rsved_Out_100	100	<110> Rsved_Out_110	110
<91> Rsved_Out_91	91	<101> Rsved_Out_101	101	<111> Rsved_Out_111	111
<92> Rsved_Out_92	92	<102> Rsved_Out_102	102	<112> Rsved_Out_112	112
<93> Rsved_Out_93	93	<103> Rsved_Out_103	103	<113> Rsved_Out_113	113
<94> Rsved_Out_94	94	<104> {Door Lock}	14	<114> Rsved_Out_114	114
<95> Rsved_Out_95	95	<105> {Door LED}	15	<115> Rsved_Out_115	115
<96> Rsved_Out_96	96	<106> Rsved_Out_106	106	<116> Rsved_Out_116	116
<97> Rsved_Out_97	97	<107> Rsved_Out_107	107	<117> Rsved_Out_117	117
<98> Rsved_Out_98	98	<108> Rsved_Out_108	108	<118> Rsved_Out_118	118
<99> Rsved_Out_99	99	<109> Rsved_Out_109	109	<119> Rsved_Out_119	119

Preview Next