

ACCURANCE-3D

Anti-Tailgate / Anti-Piggyback Sensor System

Model No : Control Box A3001CB

:TOF Sensor A3001S

Specifications and Operation examples

(Version Draft 0.16)

Specifications and Model names are not fixed yet. 2014, October 07. Rik Murata



OPTEX CO., LTD.



Contents -----

Introduction System contents

1. Part Names	4
2. Specifications	5
2-1. Outer Dimensions	5
2-2. Common Specifications	6
2-3. LED Indications	7
2-3-1. Control Box A3001CB	7
2-3-2. TOF Sensor A3001S	8
2-4. Control Box A3001CB Specifications	9
2-4-1 Control Box A3001CB basic Specifications	9
2-4-2. Control Box A3001CB terminal configurations	10
2-4-3. Input / Output Signal diagram	11
2-5. Time of Flight Sensor A3001S Specifications	11
2-6. Operation Method	13
2-6-1. Disassembly method of Top Case	13
2-6-2. Assembly method of Front Case	13
3. Installation	14
3-1. Installation dimensions (an example for Interlock Application)	14
3-1-1. Mounting position of A3001S TOF sensor	14
3-1-2. How to mount TOF Sensor	16
3-2. Wiring	17
3-2-1. Wiring between Control Box and TOF Sensor	17
4.Initial Setting	20
4-1.PC Setting	20
4-1-1. Before Initial Setting	20
4-1-2.LAN Connection	20
4-1-3. PC Setting – TCP/IP	21
4-1-5. PC Setting - Remote Desktop Connection	22
4-2. Initial Setting of ACCURACE-3D application	29
4-2-1. Date & Time Adjustment	29
4-2-2. Installer Setting	30
4-2-3. Door Setting	32
4-2-4. Security Settings	33
4-2-5. Output Status	34
4-2-6. Output Log / Delete Log	
4-2-7. Installer Logout	
5. Operation Checking	
6. Troubleshooting	
7. How to remove battery safely	



Introduction

A3001 is Anti-Tailgate/Anti-Piggyback sensor system that uses Time Of Flight technology.

This product can only be incorporated with the size limited Interlock door.

Note that the product does not prevent unauthorized entry physically.

The product is designed to register only and therefore not to prevent property loss and casualty, or physical damage.

Please note that the manufacturer and distributors are not liable for any densification by any damages.

System contents

The following items are contained in this system: Control Box A3001CB TOF sensor A3001S



1. Part Names

Control Box A3001CB



< A3001CB >

NOTE: Keypads are not available yet, in October, 2014.

At lower left side: Power inputs(2), 2 Power output sockets for A3001S, 2 keypad terminals(2x4),

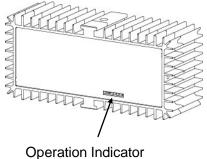
2ch x 5 inputs, 2ch x 8 outputs

At lower center: RS-232C interface, USB 2.0 x 4, Ethernet(RJ-45) x 2

LAN #1(Left) "192.168.1.250" with DHCP server LAN#2(Right) "192.168.2.250" with DHCP server

NOTE: You need to connect PC using "Remote desktop function" to see the display on A3001CB.

TOF Sensor A3001S



Power Indicator Power Supply LAN Connector

Front Side

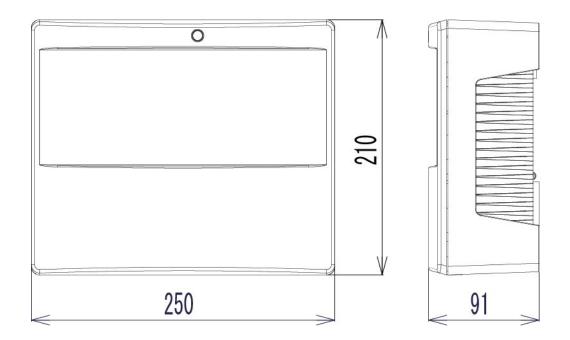
Back Side



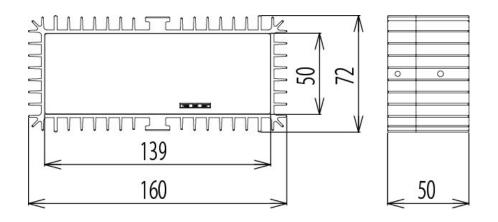
2. Specifications

2-1. Outer Dimensions

Control Box A3001CB



TOF Sensor A3001S





2-2. Common Specifications

Items	Specifications	Remarks
Ambient operating temperature	-10°C - +50°C	
Ambient operating humidity	0% - 80%	No condensation
Ambient operating illuminance	0lx - 100,000lx	
Installation location	Indoor	
Sensor mounting height	2.3m - 2.6m	A3001S for 2.9m height
Applicable door	size limited Interlock door for example, 1 x 1.5m	
Maximum detection height of person	2.05m	Depends on installation height
Power supply	24VDC (±10%)	
Power consumption	TOF Sensor : 10-20W (typ.) Control box : 10-20W (typ.)	Max power consumption is 50-70W for Control Box and 2 TOF sensors.



2-3. LED Indications

2-3-1. Control Box A3001CB

Mode	Position of LED	LED Color	LED status	Function		
Operation	Next to Power switch	Green	ON	Power ON		
		Green	Blinking at 2Hz	Learning Door Position		
		Green	ON	Position Initialization Complete		
		Red	Blinking at 2Hz	Operating System starting up		
Start up	On Control Box	Red	ON	Operating System start up Complete		
Start up	On Control Box	Orange	Blinking at 2Hz	Sensor Initialization		
		Orange	ON	Sensor Initialization Complete		
		Green				
		Red	ON for 2sec.	TOF System ready to run		
		Orange				
Operation	On Control Box	Green	Blinking at 2Hz	AIR Detection		
Operation	On Control Box	Green	ON	AIR Non Detection		
		Orange	ON for 0.2sec.	Zero output		
		Orange	ON for 2sec.	One Person output		
Output	On Control Box	Red	ON for 2sec.	More Person output		
		Orange Red	ON for 2sec.	Suspicious output		
			Simultaneous	When NOT communicating		
	On Control Day	Red	Blinking at 2Hz	(e.g. LAN disconnection, hardware/software defect)		
Error	On Control Box	Orange	Alternative	Inquifficient Deflection		
		Red	Blinking at 2Hz	Insufficient Reflection		



2-3-2. TOF Sensor A3001S

Mode	Position of LED	Color	LED status	Function			
Operation	Back side of TOF Sensor	Green	ON	Power-ON			
		Green		During Power Up			
	Front side of	Red	ON for 2sec.	During Power-Up (first 2sec)			
Start-Up	TOF Sensor	Blue		(IIISt 2Sec)			
	TOF Sellsul	Blue	Simultaneous	When NOT communicating			
		Red	Blinking at 2Hz	When NOT communicating			
Operation	Front side of	Green	Blinking at 2Hz	AIR Detection			
Operation	TOF Sensor	Green	ON	AIR Non Detection			
		Blue	ON for 0.2sec.	Zero output			
	Front side of	Blue	ON for 2sec.	One Person output			
Output			TOF Sensor			Red	ON for 2sec.
	TOF Sellsoi	Blue	ON 6 0	Occasionionione automat			
		Red	ON for 2sec.	Suspicious output			
		Blue	Simultaneous	When NOT communicating			
Error	Front side of	Red	Blinking at 2Hz	(e.g. LAN disconnection,)			
Error	TOF Sensor	Blue	Alternative	La sufficient Deflection			
		Red	Blinking at 2Hz	Insufficient Reflection			



2-4. Control Box A3001CB Specifications

2-4-1 Control Box A3001CB basic Specifications

Items	Specifications	Remarks		
Power supply	24VDC (±10%)			
Power consumption	10-20W (typ.)			
Basic System	Embedded PC			
OS	Embedded Windows			
Start-up time	60 - 120 Sec			
Dimensions	W:250mm H:210mm D:91mm			
Mass	1,800g	Without LCD		
Mounting method	3 Screws			
Monitor	None			
ROM	Compact flash 2G byte			
SSD	80GB	For DATA storage.		
LAN 1	Ethernet (Gigabit) RJ-45	Fixed IP with DHCP Server (192.168.1.250)		
LAN 2	Ethernet (Gigabit) RJ-45	Fixed IP with DHCP Server (192.168.2.250)		
USB	USB 2.0 4ch	only with special password		
Real-time clock	Provided	*Life expectancy of battery (CR2032) to be considered as weaken batteries may cause initialization of date and time setting.		
Power switch	Provided			
Power indicator	Green LED			
Output indicators	3 LEDs (Green, Red, Orange) x 2ch			
I/O (for door PLC controller)	I/O board (2ch Primary, Secondary) 5 inputs x 2ch 8 outputs x 2ch	See 1-4.		
I/O Outputs 1-5	outputs	Photo MOS Output		
I/O Outputs 6	Heartbeat output 0.33Hz	30V DC 0.05A(Max) Active Sink		
I/O Output 7-8	Spare outputs Close			
I/O Input 1-4	Outer door contact	Photo coupler Input		
I/O Input 5	Spare input	24VDC		



2-4-2. Control Box A3001CB terminal configurations

Keypad terminal configuration

	51							
	Keypad							
	1	2	3	4				
Primary	+5V	TXD	RDX	GND				
Secondary	+5V	TXD	RDX	GND				

NOTE: Keypads are not available yet, Oct. 2014.

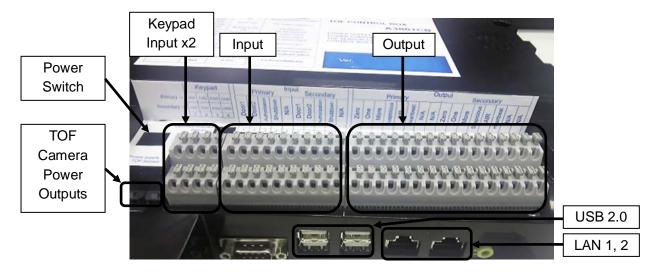
Input terminal configuration

	Input								
	Primary				Seco	ndary		Com	imon
1	2	3	4	5	6	7	8	9	10
Door1	N/A	Authorization	N/A	Door 1	N/A	Authorization	N/A	Other sensor	Shutdown

Output terminal configuration

	Output														
	Primary									Seco	ndary				
1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Zero	One	More	Suspicious	AIR	Heartbeat	N/A	N/A	Zero	One	More	Suspicious	AIR	Heartbeat	N/A	N/A

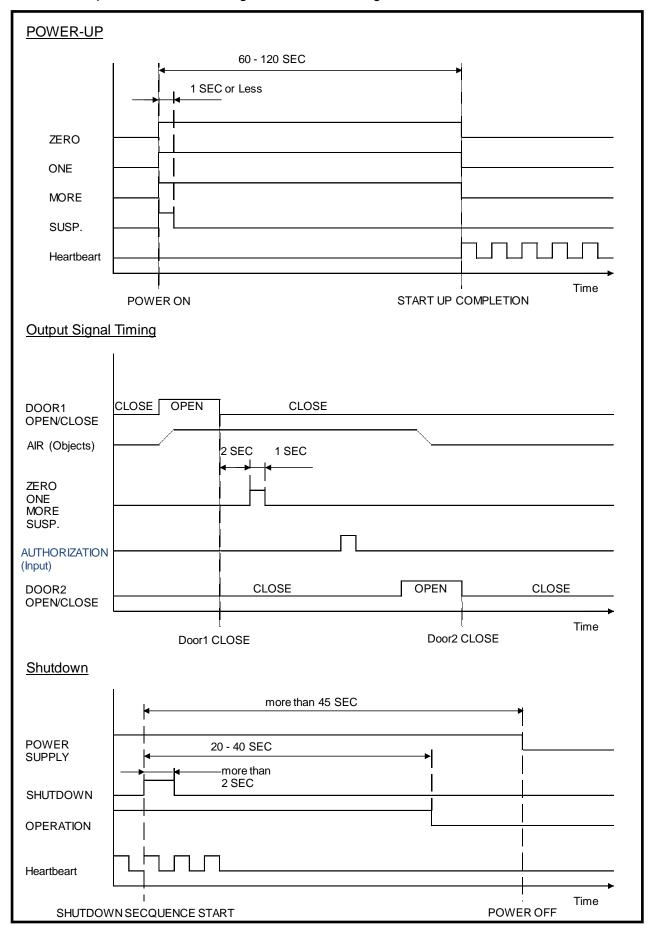
NOTE: "N/A" terminal can be used for the customer's usage.





2-4-3. Input / Output Signal diagram

Heartbeat output makes a 0.33 Hz signal as a heartbeat signal.





2-5. Time of Flight Sensor A3001S Specifications

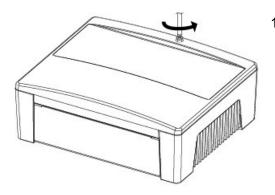
Items	Specifications	Remarks
Detection method	Time Of Flight	
Light source	IR LED	
Image pixels	176 (H) 132 (V)	
Angle of view	Horizontal: approx. 70 degrees Vertical: approx. 55 degrees	
Power supply	24VDC (±10%)	Supplied from Control Box
Dimensions	160mm (W) 72mm (H) 50mm(D)	Excluding cable
Mass	600g	
Mounting method	Screwed on SMB(*) or ceiling panel 1/4 inch Screw * 2	(*)Sensor Mounting Box
Power indicator	Green LED	
Output indicators	3 LEDs (Green, Red, Blue)	
I/O	LAN 1ch (Ethernet) RJ-45	

NOTE: 50 degree x 40 degree version is considered for the higher mounting height up to 4m.

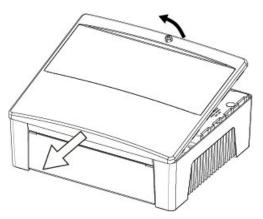


2-6. Operation Method

2-6-1. Disassembly method of Top Case

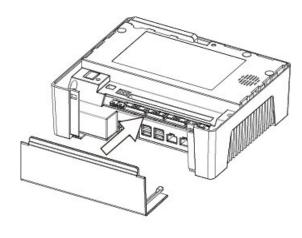


Turning the screw on the upper side of body.*The screw does not come off.

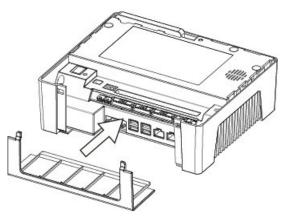


2. Take off two nails by picking up Top Case as shown in the figure on the left.

2-6-2. Assembly method of Front Case



1. Front Case can be used in 2 ways by assembly direction.



2. For front wiring assembly Front Case as shown in the figure on left lower, for back wiring assembly Front Case as shown in the figure on left upper.

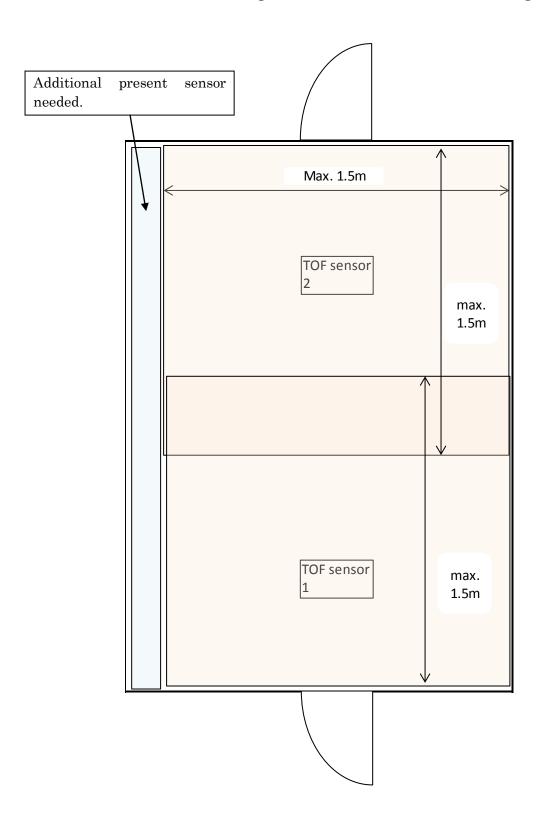


3. Installation

3-1. Installation dimensions (an example for Interlock Application)

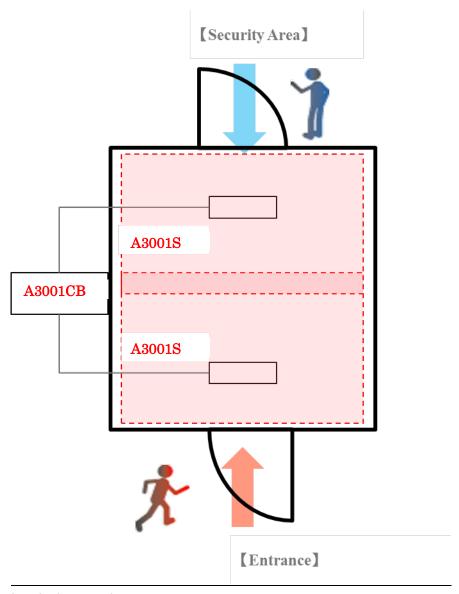
3-1-1. Mounting position of A3001S TOF sensor

A3001S TOF sensor installation height: 2.3 – 2.6m (Standard) 2.6 - 2.9m (Higher version)





(Installation Example for Interlock Application)



Interlock example

A3001CB can control two TOF sensors, A3001S at the same time.

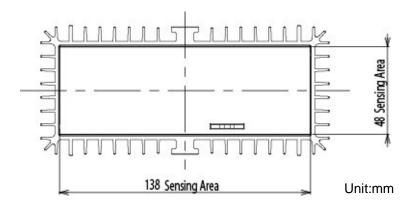


3-1-2. How to mount TOF Sensor

When mount TOF Sensor, ensure that there is no obstacle in the Sensing Area (138mm*48mm) as shown in the figure below, and don't cover 30mm above TOF Sensor.

*Make sure that avoid contact of a part of the door (ex.brush) with the surface of Sensing area.

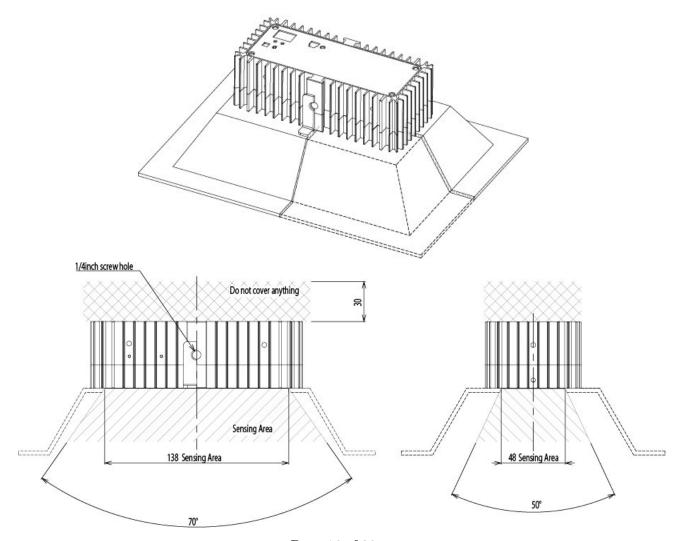
*Keep TOF Sensor not to feel static electricity to restrain the dust adhesion to a Sensing area.



If ceiling height is lower than 2.3m, make a mounting jig such as shown in the below.

*The following drawing is reference information.

Actually, please mounting based on the usage of the door, each law and regulation.



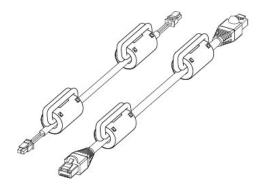
Page 16 of 39



3-2. Wiring

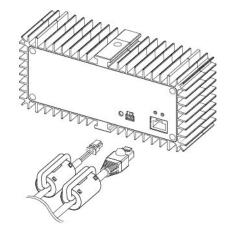
3-2-1. Wiring between Control Box and TOF Sensor

Connect the Control Box and TOF Sensor with the provided Sensor Power Cable and LAN Cable.



1. Prepare Sensor Power Cable and LAN Cable as shown in the figure on the left.

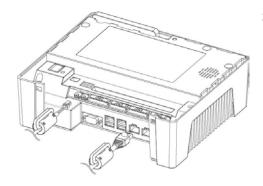
*When use two units of TOF Sensor, prepare 2set of each cable.



2. Insert both cables to back of the TOF Sensor as shown in the figure on the left.

Insert the connectors all the way until the lock is in place.

To remove connectors, pull out cables while pressing the locks.



3. Insert both cables to the Control Box as shown in the figure on the left.

Insert the connectors all the way until the lock is in place.

To remove connectors, pull out cables while pressing the locks.

*When use one unit of TOF Sensor, please connect to LAN1 (left side)

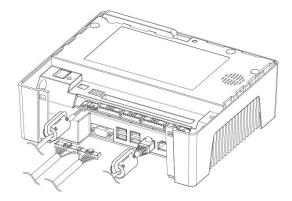
4. When all cables are connected, TOF Sensor wiring is completed.



3-2-2. Wiring between Control Box and Door Controller

Connect the Control Box and Door Controller with the Cables.

1. Prepare the I/O Cables to connect I/O outputs/Inputs.



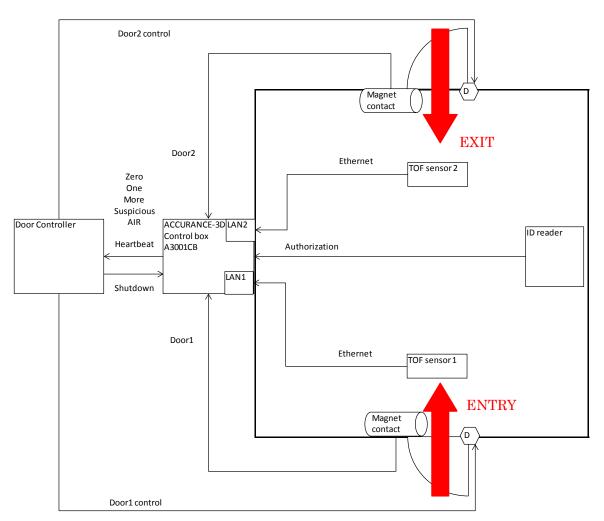
- 1. Connect the cables into the terminals on A3001CB and Door Controller or Door contact sensors.
 - *Making sure to insert PRIMARY side firstly.

 When use one unit of TOF Sensor, use PRIMARY side only.

2. This completes the wiring between the Control Box and Door Controller.



(Installation example for Interlock Application)



< Wiring configuration between Door controller >



4.Initial Setting

4-1.PC Setting

4-1-1. Before Initial Setting

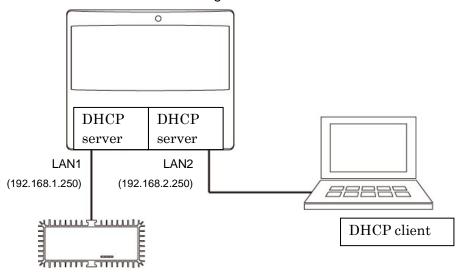
This product is installed and configured through wired LAN (Ethernet). Separately prepare a Windows PC and LAN cable for configuration of settings (installation). And when use two units of TOF Sensor, prepare Ethernet hub (*1).

In addition, use Remote Desktop Connection (*2) for settings.

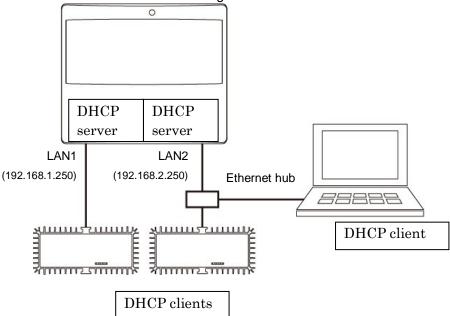
- (*1) Please use more than transmission rate of 1Gbps.
- (*2) This product has been confirmed to work with Remote Desktop Connection (Windows XP, Windows VISTA, Windows 7, Windows 8)

4-1-2.LAN Connection

In case of 1 TOF sensor usage:



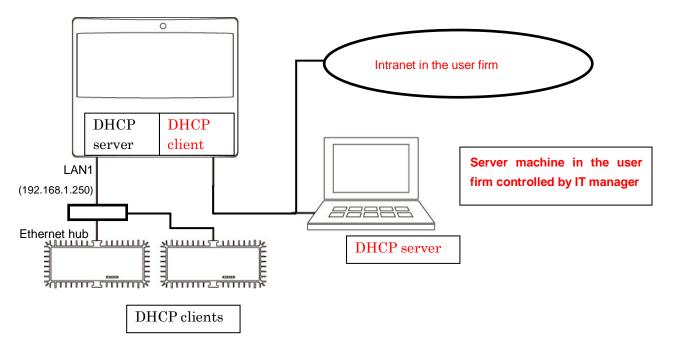
In case of 2 TOF sensors usage:



*After the initial setting, disconnect Ethernet hub.



In case of connecting to a intranet in the user firm.



NOTE: In this case IT manager of the intranet need to know MAC address of A3001CB. MAC address is indicated on the product.

NOTE: Ethernet interfaces are used as DHCP servers with static IP now, AUGUST 2014. OPTEX have a plan to make a static IP system without DHCP server only on LAN#2 later, but not now.

4-1-3. PC Setting - TCP/IP

To change setting from the factory setting, configure the wired LAN (TCP/IP) setting of your PC as follows:

Disable the proxy setting.

Enable one wired LAN only and disable all others, when not performing properly with multiple connections.

Disable a firewall since the firewall may influence the operation.

For the procedures of LAN setting of the PC, see the manual for your PC.

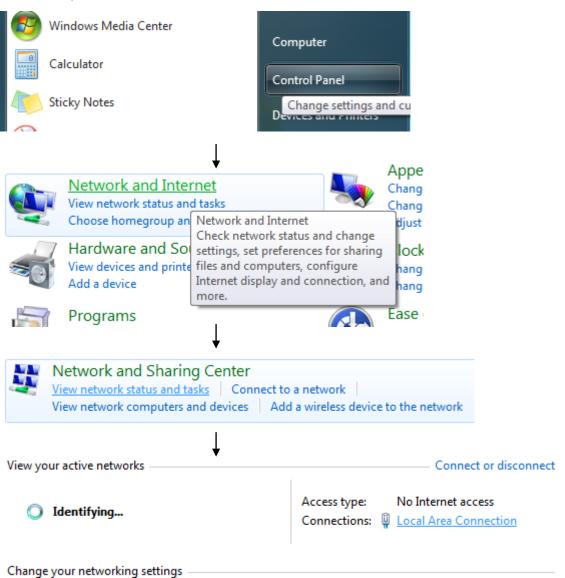
NOTE: Ethernet interfaces are used as DHCP servers with static IP now, September 2014. OPTEX have a plan to make a static IP system without DHCP server only on LAN#2 later, but not now.



4-1-5. PC Setting - Remote Desktop Connection

4-1-5-1. PC Network Setting

Click Control Panel -> Network and Internet -> view network status and tasks -> Local Area Connection, and show the status of Local Area Connection.



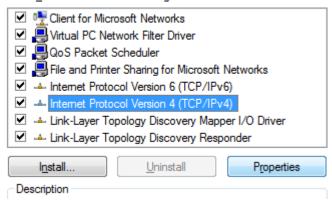


Click Properties of Local Area Connection Status.

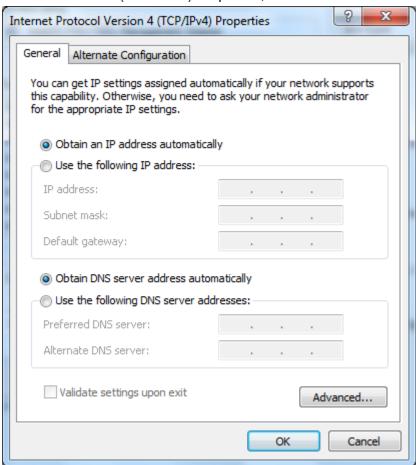


Select Internet Protocol Version 4 (TCP/IPv4) of Local Area Connection Status Properties, and click Properties.

This connection uses the following items:



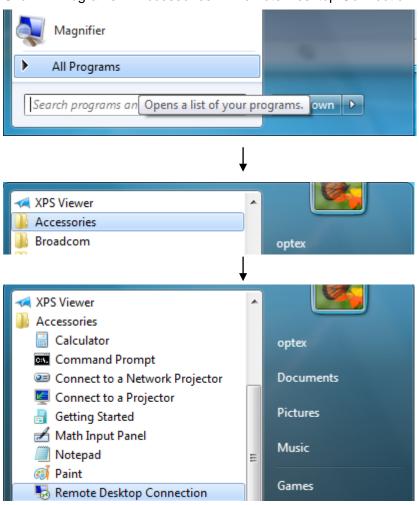
Select Obtain an IP address automatically and Obtain DNS server address automatically of Internet Protocol Version 4 (TCP/ IPv4) Properties, and click OK.



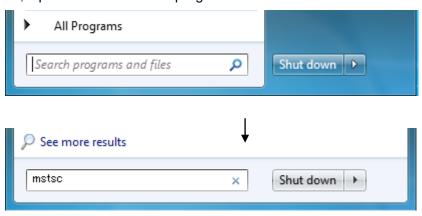


4-1-5-2. Start-up Remote Desktop Connection

Click All Programs -> Accessories -> Remote Desktop Connection from Start menu.

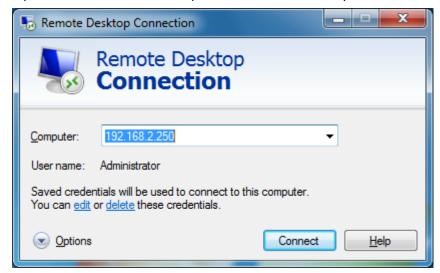


Or, input "mstsc" to Search programs and files of Start menu.

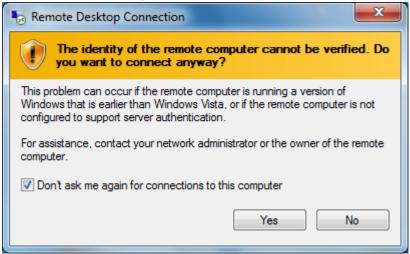




Input '192.168.2.250' to Computer: of Remote Desktop Connection, and click Connect.



Select Don't ask me again for connections to this computer, and click Yes.

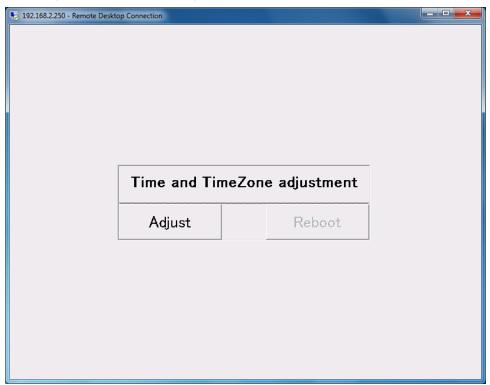




Input 'Administrator' to User name, "accurance" to Password, and click OK.



After Log On, the screen changes to ACCURANCE-3D application.



^{*}For ACCURACE-3D application setting, see 4-2 "Initial Setting of ACCURACE-3D application".



4-1-5-3. Automatic Log On of Remote Desktop Connection

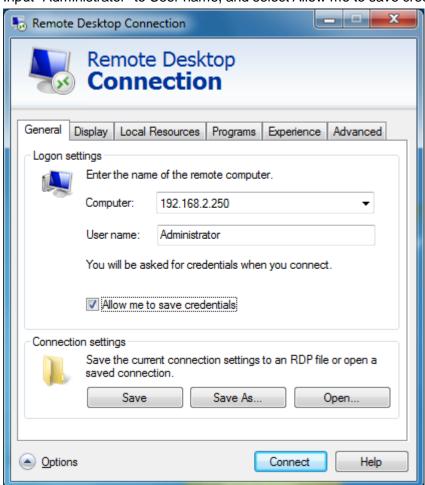
Reconnection of Remote Desktop Connection is necessary at the time of setting of the ACCURACE-3D application.

Performing the following setting is recommended.

Click Option of Remote Desktop Connection.



Input "Administrator" to User name, and select Allow me to save credentials, and click Connect.



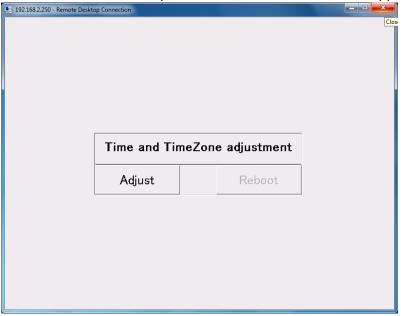
When asked "Do you trust this remote connection?", select Don't ask me again for connections to this computer, and click Connect.

Input 'accurance' to Administrator Password, click OK.

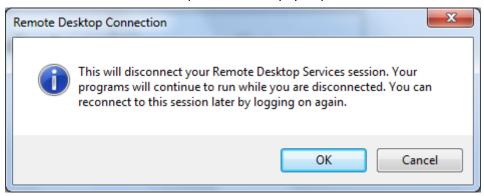


4-1-5-4. Remove of Remote Desktop Connection

Click X of Remote Desktop Connection in the corner on the upper right.



When asked "Remote Desktop Connection" pops up, click OK.





4-2. Initial Setting of ACCURACE-3D application

4-2-1. Date & Time Adjustment



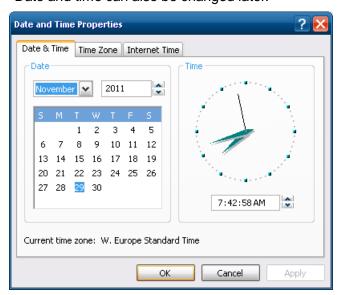
Firstly, adjust the time. Click Adjust as shown in the figure of on the left.

Click Time Zone, and the following figure below appears. Select the Area and click Apply.



Return to Date & Time, please confirm the setting of date and time.

*Date and time can also be changed later.



After adjusting date and time, click OK. And click Reboot on the first screen.

Wait for a while (2-3 minutes) for Control Box to reboot.

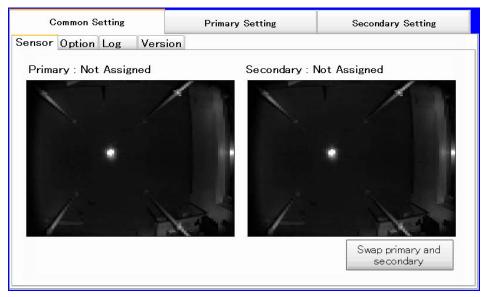
*When set to Automatic Log On of Remote Desktop Connection, reconnect the Control Box automatically. But User name and Password may need to be entered.

*For the setting of Automatic Log On of Remote Desktop Connection see 4-1-5-3 "Automatic Log On of Remote Desktop Connection" about the setting.

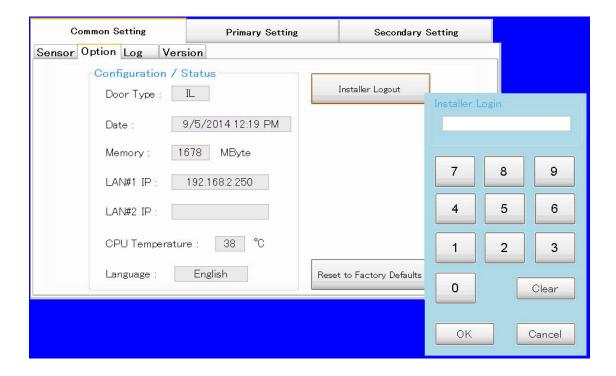


4-2-2. Installer Setting

After reboot Control Box, Click Option as shown in the figure on the below.



Click Installer Login as shown in the screen on the right.



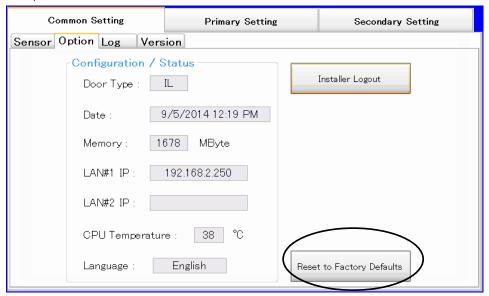
After typing the password, press OK on the password-typing screen.

After Login "Login successful" appears, click OK.

Password is "1111" now. It is temporary.

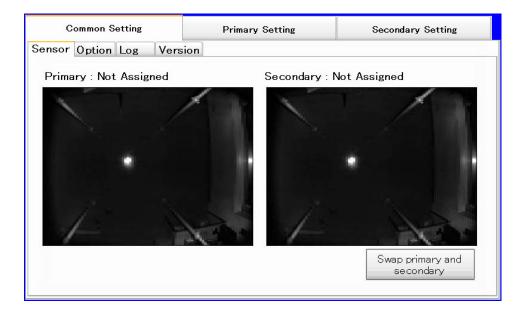


When logged in, and the background of the screen (This manual is printed black and white) becomes blue, and the buttons are added.



When using two units of TOF Sensor, please check that Primary and Secondary are set respectively for each TOF Sensors.

When not correctly set, click button of "Swap primary and secondary".





4-2-3. Door Setting



< Before Position Setting >

Sensor Direction

Select the direction of the sensor.

Select whether the installation is for detection from the non-secured side to the secured side or from the secured side to the non-secured side.

Mounting Height / Diameter

Select the values of Height Under Canopy and Door Diameter.

Set rest position

Confirm the Door Position is at the rest position, and click the button.

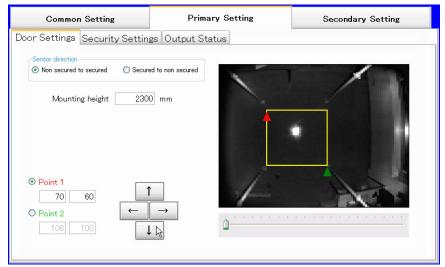
Door Position Setting

Point 1 (left-side upper position)

Select the "Point 1" button and click the left-side upper position shown on the floor on the screen as shown in the figure above (on the picture I wrote an appropriate detection zone). This position can be fine-adjusted by using the arrow buttons on the screen.

Point 2 (right-side lower position)

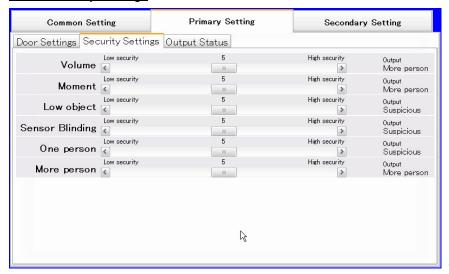
Select the "Tip of End Position" button to click the right-side lower position shown on the floor on the screen as shown in the figure above. This position can be fine-adjusted by using the arrow buttons on the screen.



< After Position Setting >



4-2-4. Security Settings



< Parameter Setting >

NOTE: Default setting is All=5.

This product has six sensitivity adjustments: Volume, Moment, Low object, Sensor Blinding, One person and More persons.

All sensitivity controls have the options of 1 to 9 and the factory settings for all controls are 5.

Changing these settings allows the adjustment of piggy-backing sensitivity.

Increasing the sensitivity setting value makes the piggy-backing sensitivity higher but may increase the possibility of false rejection.

Decreasing the sensitivity setting value makes the piggy-backing sensitivity lower but decreases the possibility of false rejection.

*Values are reference only, and vary depending on the installation environment.

Volume

The piggyback detection is influenced more by other parameters such as "More persons" and "Moment" when choosing Low.

When "Volume" rejection occurs, Red LED turns on for 2 sec indicating "More persons" output.

Moment

The piggyback detection is influenced by setting of other parameters such as More persons" and "Volume" when choosing Low.

When "Moment" rejection occurs, Red LED turns on for 2 sec indicating "More persons" output.

Low object

If a "Low Object" rejection occurs, the blue and red LED will illuminate for 2 seconds indicating "Suspicious" output.

Sensor Blinding

When a "Sensor Blinding" rejection occurs the blue and red LED will illuminate for 2 seconds indicating "Suspicious" output.

One person

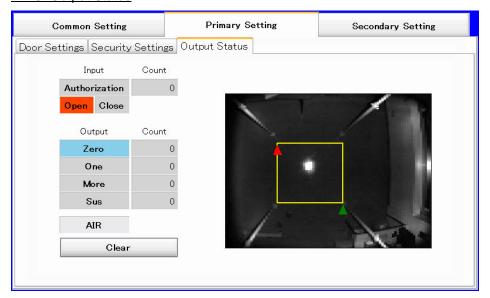
If the "One Person" is not recognized, a rejection occurs and the blue and red LED will illuminate for 2 seconds indicating "Suspicious" output.

More person

If a "More Person" rejection occurs, the red LED will illuminate for 2 seconds indicating "More Person" output.



4-2-5. Output Status



This product counts each output.

Authorization

When an authorization signal is received from Door Controller, the background color turns into red. It shows the number of authorization.

Zero, One, More, Sus

Each background color is changed by output result.

It shows the number of output.

AIR

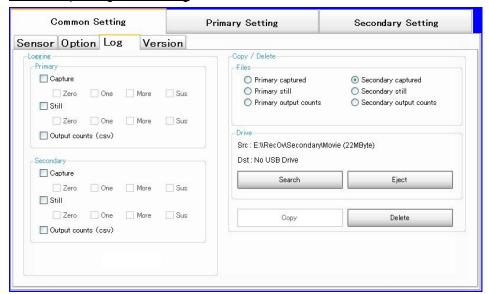
When outputting AIR Detection, the background color turns into red.

Reset the number of the counts with "Clear" button.

*When using two units of TOF Sensor, please set Secondary Setting in the same way as above.



4-2-6. Output Log / Delete Log



This product records authorization logs with capture data.

Note: As capturing video is heavy load do not set it unless necessary.

Logging Setting

Select 'Capture' or 'Still' both for PRIMARY and SECONDARY, and select the output result 'Zero' 'One' 'More' 'Sus' to be recorded.

When wishing to record the number of outputs, select 'Output counts (csv.)'.

- *The logging is stopped automatically when;
- -The memory of SSD is full.
- -The temperature of Control Box becomes high.

The log can be output to an external device via the USB ports on Control Box.

Cancel Log

Cancel the setting of Log as described in 1. Ready to Log.

Select Log

Select the output logs to be copied from Files as shown on the screen.

Connect external memory to USB port on the Control Box.

After connecting external memory, click 'Search' button at Drive section on the screen.

When the memory device is recognized, the memory information is shown at Dst:.

Src: shows the capacity of output Log, confirm the capacity of the external memory as shown Dst:.

Output Log

After confirming the capacity of memory is enough for the capacity of output log, click 'Copy' at the bottom right on the screen.

Please wait until finish output Log.

Remove External Memory Device

When completing output of the Log, click 'Eject' inside of Drive on the screen.

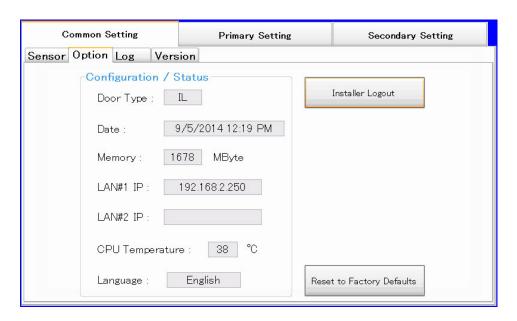
When the memory device is disconnected, remove the device.

Delete Log



Select output log from 'Files', and click 'Delete' at bottom right on the screen.

4-2-7. Installer Logout



When finish all settings, click the button of "Installer Logout".

When logged out, and the background of the screen becomes gray, and the three buttons will disappeared.

5. Operation Checking

When all settings have been made, enable the "free in" (non-authorization) mode of the door and check the operations as described below:

Rotate the door with no object (person) to detect. Make sure that the blue indicator LED is illuminated for 0.2 seconds.

Let one person enter the door. Make sure that the blue indicator LED is illuminated for 2.0 seconds. Let two people enter the door (piggy-backing). Make sure that the red indicator LED is illuminated for 2.0 seconds.

If the above outputs show no problem, switch the door mode to the authorization mode and perform the same test. In the authorization mode, the door stops at the detection of two people entering together (piggy-backing) and prevents the entry. Try several different ways of entry (ex.: one person with a bag in hand) and make sure that there is no false rejection.

If there is any problem found in the detection or any site-specific problem, see 4-2-5 "Sensitivity Setting" to change the sensitivity setting as required.

This completes operation checking.



6. Troubleshooting

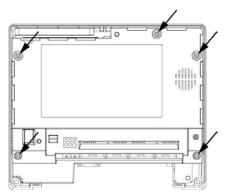
Problem	Check if	Corrective action
Does not operate	Power indicator (green	Check the wiring between TOF Sensor and
Doco not oporato	LED) of Control Box and	Control Box.
	TOF Sensor is on.	See 3-2"Wiring"
	TOT Sensor is on.	Check the switch of Control Box is turned on.
		Check the switch of door system is turned on.
		Check the wiring between Control Box and
		door system.
		When use one unit of TOF Sensor, use PRIMARY side only.
Door suddenly stops	Transmission rate of	Use Ethernet Hub with 1Gbps or higher.
	Ethernet Hub is more than	Remove Ethernet Hub and connect LAN
	1Gbps.	cable directly to Control Box and TOF
	Ethernet Hub is removed.	Sensor.
Problem relating to init	ial settings	
No Remote Desktop	ACCURACE-3D A3001CB	Check the wiring between Control Box and
Connection	application screen	PC.
	(4-1-5-4) is appeared.	See 3-2-1"Wiring between Control Box and PC"
		Check the switch of Control Box is turned on.
		Check the setting of PC.
		4-1-5."PC Setting - Remote Desktop Connection".
No image on the	The power indicator (green	Check the wiring between TOF Sensor and
_	LED) of TOF Sensor is on.	Control Box.
screen	Red and Blue LED of the	Control Box.
	TOF Sensor are	
Wrong dotaction	Simultaneously blinking.	
Wrong detection Door stops at Plus	Primary and Secondary	Swap Primary and Secondary.
•	are set respectively for	
position	I	See 4-2-2"Installer Setting"
Many Folso rejection	each TOF Sensors. Front side of TOF Sensor	Wipe the front side of TOF Sensor with a
Many False rejection	is clean.	•
		damp cloth.
	(No dust, no scratch)	Change TOF Sensor.
	Door Setting (4-2-3) is set	Check the setting of Door setting.
Problem relating to Le	correctly	See 4-2-3"Door Setting"
Problem relating to Log Cannot record Log /	SSD is set	Check the connection of SSD.
_		
no logged file saved	Logging is set	Check the setting of Logging
	The memory of CCD is full	See 4-2-6"Output Log / Delete Log"
One and the second	The memory of SSD is full	Delete existing log files.
Cannot copy Log	External memory device is	Check the connection of external memory
files	set	device.
		Check the capacity of external memory
		device is enough for output log files.



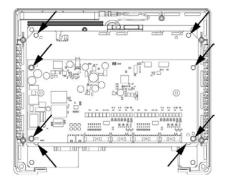
7. How to remove battery safely

Control Box has a button-type battery on inside material. When you replace and/or dispose the battery, please see below;

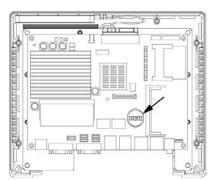
And, make sure turn off the power of the Control Box and disassemble wirings.



Disassemble 5 screws as shown in the figure on the left. And take out the cover.



Next, disassemble 8 screws as shown in the figure on the left.



Replace and/or dispose the battery (CR2032) on the material as shown in the figure on the left.

When dispose the old battery, please treat it according to the local law.



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Specifications Draft *.** OCTOBER 2014

59-1900-00