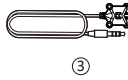
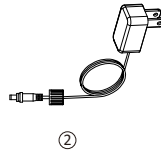
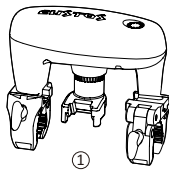


BALL VALVE SERVO INSTALLATION GUIDE

PACKAGE CONTENTS

- ① Ball Valve Servo (BVS)
- ② Power Adapter
- ③ Water Detection Probe 55.1 inch
- ④ Spacer



BEFORE YOU INSTALL

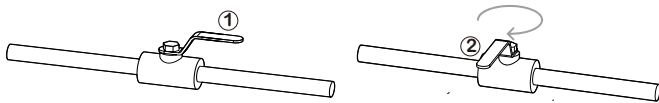
Install this actuator on ball valves only.
At least 1.25" space between valve handle and pipe required.
ALWAYS CLOSE THE VALVE FIRST!



Use with 1/2" - 1 1/4" ball valves only.
Do NOT use on other types of valves.

BALL VALVE SERVO INSTALLATION

1. CLOSE VALVE



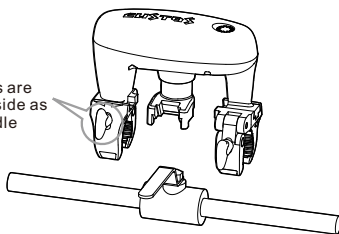
Rotate the handle from position ① to position ② to turn off your valve

2. PREPARE YOUR BVS

Position the BVS over the top of the handle of ball valve

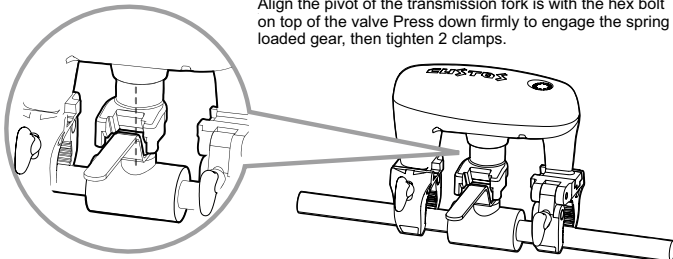


Make sure the knobs are facing on the same side as the water valve handle

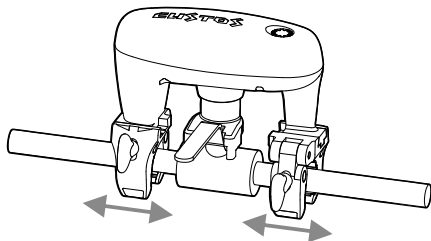


3. INSTALL BVS ON YOUR VALVE

Align the pivot of the transmission fork is with the hex bolt on top of the valve. Press down firmly to engage the spring loaded gear, then tighten 2 clamps.



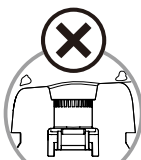
if you have oversized valve or your valve has adjacent pipe elbow, you may slide any or both clamps in or out to fit the space.



Check the transmission fork mechanic engagement by visual
You SHOULD NOT see the PATTERN on the top of transmission fork, if you do, you may not install it securely, please double check, make sure you have pushed the BVS down enough for a secured installation.

Otherwise you have a rare ultra low profile valve, the handle is too low for spring loaded mechanic to engage, in this case, please put the Spacer ① between the hex bolt head of the valve ② and the transmission fork.

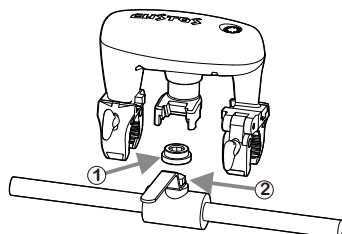
If you don't see the pattern without Spacer, DO NOT use the Spacer.



PATTERN SEEN



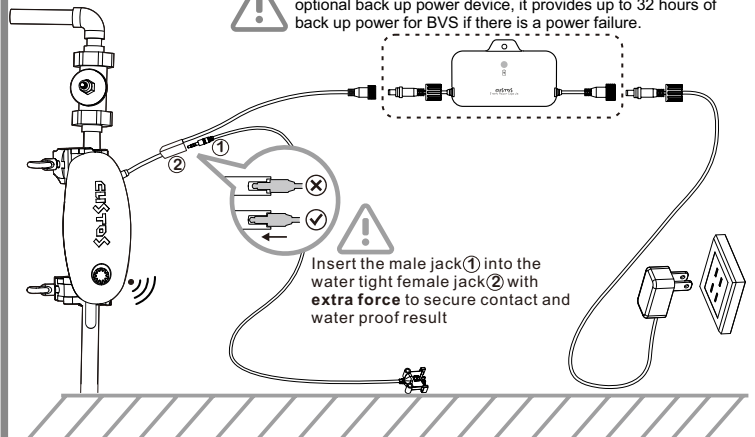
PATTERN NOT SEEN



4. CONNECT SPC AND POWER ADAPTER



If you have purchased Smart Power Capsule, connect it between Ball Valve Servo and power adapter. SPC is the optional back up power device, it provides up to 32 hours of back up power for BVS if there is a power failure.



Insert the male jack ① into the water tight female jack ② with **extra force** to secure contact and water proof result



If you are installing the Ball Valve Servo outdoor, you may consider to disable the touch sensing button to prevent it activated from rain drops or pets.

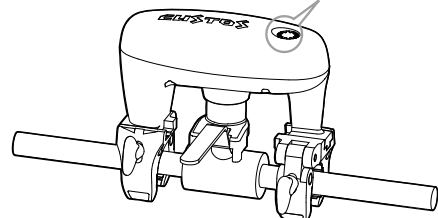
To Disable the button:

Tap and hold the touch sense button for 3 beeps, then quickly tap 3 times in a row. If successful, the Yellow LED will flash once, then the Red LED with 1 beep. The LED will slowly flashing Yellow indicating the touch sense button has been locked.

To Re-Enable the button:

Tap and hold the touch sense button for 3 beeps, then quickly tap 3 times in a row. If successful, the Yellow LED will flash once, then the Red LED with 3 beeps. LED will then slowly flashing Green indicating the touch sense button has been unlocked.

Touch Sense Button



Contents

1 INTRODUCTION	1
1.1 Custos BVS	1
1.2 Connectors & Interfaces.....	1
2 SPECIFICATIONS	1
2.1 Physical Specifications.....	1
2.2 Hardware Specifications	1
3 WORKING MODE & FEATURES.....	1
3.1 Standalone Mode.....	1
3.2 Network Mode	1
3.3 Ball Valve Actuator.....	1
3.4 Water Leak Sensor & Alarm	1
3.5 Ambient Temperature Sensor.....	1
4 KEY & INDICATORS BEHAVIOR	1
4.1 Touch Sense Button	1
4.2 Visual Indicator	1
4.3 Sound Indicator	1
5 TOUCH SENSE BUTTON KEYLOCK.....	1
5.1 Touch Sense Button Keylock Enable	1
5.2 Touch Sense Button Keylock Disable.....	1
6 WATER VALVE OPERATION	1
6.1 Manual Calibration Valve Position	1
6.2 Turn Valve to OPEN	2
6.3 Turn Valve to CLOSE	2
6.4 Pause OPEN/CLOSE Operation	2
6.5 Resume OPEN/CLOSE Operation	2
7 WATER LEAK SENSOR & ALARM	2
7.1 Water Leak Detection & Alarm	2
7.2 Water Leak Alarm Cancellation	2
8 TEMPERATURE SENSOR	2
9 APPENDIX.....	2
9.1 System Event Status	2
9.2 Touch Sense Button Keylock	2
9.3 Operation Mode	2
9.4 Water Valve Operation & Status.....	2
9.5 Water Leak Event & Alarm	3
9.6 Patents	3
9.7 Cautions	3
9.8 Warranty	3
9.9 Disclaimer	3

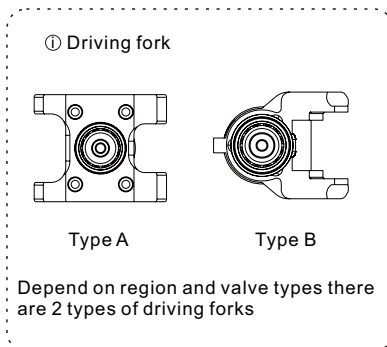
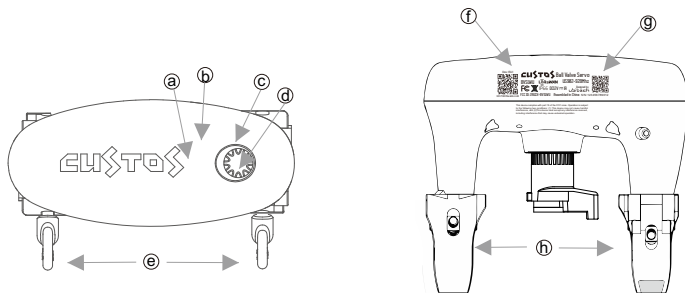
1 INTRODUCTION

1.1 Custos BVS

Custos Ball Valve Servo "Custos BVS" is capable for outdoor deployment for controlling water valve OPEN / CLOSE. It also supports auto CLOSE valve when water leak is detected by Local Leak Sensor Probe.

1.2 Connectors & Interfaces

Terminology	Description
Ⓐ Sound indicator	Buzzer
Ⓑ Temperature sensor	Built-in temperature sensor
Ⓒ Visual indicators	3 Colors LED with green, yellow & red
Ⓓ Touch sense button	Network, water valve and alarm operations
Ⓔ Knob	Use to adjust Clamp widths
Ⓕ Device EUI	Device EUI
Ⓖ Product label	Product info and serial number
Ⓗ Clamp	Clamp on water pipe. Max 1-1/4 inch
Ⓘ Driving fork	Couple with valve handle
Ⓛ Power connector	DC 12V / 1A in
Ⓚ Dust cover	Prevent Dust and Water
Ⓜ Leak sensor connector	Local leak sensor probe



2 SPECIFICATIONS

2.1 Physical Specifications

Parameter	Value
Model No.	BVSLWU (US)/ BVSLWE (EU)
Dimensions	14.8x9.6x13.3mm
Weight	BVS Unit: 603g
Body Color	White
Knob Color	Light blue
Waterproof & Dustproof	IP66 level / Outdoor deployment
Usage	For Indoor and Outdoor Water Valve On/Off
Operation Temperature	14~122 °F (-10~+50°C)
Relative Humidity	8%~80%

2.2 Hardware Specifications

Parameter	Value
RF Module	Sx1261
RF Distance	40m/131inch (Indoor) /120m/394inch(Outdoor)
Region Frequency	US: 915, FCC CFR47 Part 15.249 EU: 868
Motor Torque Power	Adaptive torque output max: 8n.m
Water Leak Sensor	Local Water Leak Sensor Probe
Temperature Sensor	Built-in temperature sensor, Range from -40°C to +125°C / (-40°F to +257°F)
Action Button	Touch Sense Button x 1
LED & Sound Indicator	3 colors LED. (Green, Yellow & Red); Buzzer (Max. 85dB)
Power Supply	AC-DC: AC (110V 60Hz / 220V 50Hz); DC (12V / 1A)
Power Consumption	Standby: ~10mA@12VDC=0.12W Full Operation: Max~700mA@12VDC=8.4W

3 WORKING MODE & FEATURES

3.1 Standalone Mode

- The LED indicator stays with Yellow blinking without joining the LoRaWAN network or lose the network connection.
- Support OTAA, Water Valve Operation, Water Leak detection & Alarm.

3.2 Network Mode

- LED indicator stays in Green Heartbeat "Fade-in & Fade-out" after joined LoRaWAN network.

3.3 Ball Valve Actuator

- Support OPEN, CLOSE, PAUSE
- RESUME during OPEN/CLOSE operation.
- Manual Calibration position of valve handle. (Only support operate by Touch Sense Button)
- Water Valve will be closed automatically once Local Water Leak Sensor Probe is triggered.

3.4 Water Leak Sensor & Alarm

- Water Leak Alarm will be activated and to CLOSE Water Valve automatically once Local Water Leak is detected.
- Once Local Water Leak is detected then BVS will also send out Heartbeat through LoraWAN network.

3.5 Ambient Temperature Sensor

- By default, BVS sends temperature report automatically to gateway when every 1°C or 1.8°F degree changed.

4 KEY & INDICATORS BEHAVIOR

4.1 Touch Sense Button

- Short Press: One click comes with one short beep sound.
- Long Hold: Press and holding the key. "Come with 1 x short beep sound per second"

4.2 Visual Indicator

- 3 Colors LED: GREEN, YELLOW & RED
- ON Event: ON, quick blinking and slow blinking and "Fade-in & Fade-out"

4.3 Sound Indicator

Buzzer: Long & short beep sound.

5 TOUCH SENSE BUTTON KEYLOCK

Custos BVS is capable for outdoor deployment. To prevent mis-operation by rain drop, end-user can enable Touch Sense Button Keylock function to forbid the operation of Touch Sense Button until to disable the keylock function.

5.1 Touch Sense Button Keylock Enable

- After enabled Touch Sense Button Keylock function, Custos BVS will ignore all key events excepting Touch Sense Button Keylock Disable function (Refer to 5.2)
- Start: Long hold Touch Sense Button 3 seconds then short click 3 times.
 - Process: Yellow LED on 1 second then Red LED on 1 second with 3 beeps
 - Success: Yellow LED Fade-in and Fade-out.

5.2 Touch Sense Button Keylock Disable

- Start: Long hold Touch Sense Button 3 seconds then short click 3 times.
- Process: Green/Yellow/Red LED blink one by one with 3 beeps.
- Success: LED indicator resume previous status. (Green LED slow blinking or Yellow LED blinking)

6 WATER VALVE OPERATION

6.1 Manual Calibration Valve Position

- Calibration function will identify the correct OPEN/CLOSE position and torque force, it will avoid excess stress applied to the valve. By default, BVS will perform Auto-calibration when re-power on every time.
- Start: Long Hold Touch Sense Button 5 seconds, then short click 5 times.
 - Processing: Water Valve run OPEN and CLOSE 1-2 cycles, Yellow LED blinking and quick short beep sound keep continue.
 - Success: The LED indicator changes to Yellow LED blinking.

6.2 Turn Valve to OPEN

Turn Valve to OPEN position and let water run through the pipe.

- Start: Short click Touch Sense Button 1 time.
- Processing: Water Valve turning to OPEN position, Green Heartbeat LED "Fade-in & Fade-out" and short beep sound keep continue.
- Success: The LED indicator changes to Yellow LED blinking

6.3 Turn Valve to CLOSE

Turn Valve to CLOSE position and don't let water run through the pipe.

- Start: Short click Touch Sense Button 1 time.
- Processing: Water Valve turning to CLOSE position, Yellow Heartbeat LED "Fade-in & Fade-out" and short beep sound keep continue.
- Finished: The LED indicator changes to Yellow LED blinking

6.4 Pause OPEN/CLOSE Operation

Pause only take effect during OPEN or CLOSE operation.

- Start: Short click Touch Sense Button 1 time.
- Processing: Yellow LED blinking and Valve stop operation.

6.5 Resume OPEN/CLOSE Operation

Resume only take effect during Pause operation.

- Start: Short click Touch Sense Button 1 time.
- Finished: Valve resume to operation (Continue to Opening / Closing) and LED indicator changes to LED Yellow/Green Heartbeat.

7 WATER LEAK SENSOR & ALARM

7.1 Water Leak Detection & Alarm

Custos BVS comes with Local Leak Sensor Probe and support following functions, in short, once Water Leak is detected, Water Leak Alarm will be activated, hence the water valve will be closed spontaneously, at this moment all other operations will not be accepted except Water Leak Alarm Cancellation.

- Activated Water Leak Alarm
 - RED LED fast blinking.
 - Fast beep sound.
- CLOSE Water Valve automatically
- Send out Heartbeat
- Water Valve keeps in CLOSE position
- The operation is forbidden temporarily until perform Water Alarm Cancellation operation. (Refer 7.2)

7.2 Water Leak Alarm Cancellation

Water Leak Alarm Cancellation operation only accepted when Local Water Leak Sensor Probe is no longer detected water.

- Start: Long hold Touch Sensor Button 2 seconds
- Success: The LED indicator changes to previous status. (Yellow LED blinking or Green LED slow blinking and buzzer goes silence.)
- Send out Heartbeat

8 TEMPERATURE SENSOR

- By default, Custos BVS will send out Heartbeat automatically when temperature in 1°C or 4°F change of ambient temperature.
- Custos will send out °F in US version and °C for other versions.

9 APPENDIX

Terminology, all events and operations details including action key event, LED and buzzer

9.1 System Event Status

Event	Detail	LED	Buzzer
System Ready	BVS is Ready to operate after power on or reset.	Green LED ON 2 seconds	2 beep sounds
Standalone mode heartbeat	Standalone Heartbeat without network connection	Yellow LED blinking	---
Event Success	Finished operation and success	Green LED ON 2 seconds	Short beep x 2
Event Error	Operation fail or not available	RED LED blinking 3 times	Long beep x 3
Event Timeout	Operation timeout	RED LED ON	1" Pulse sound

9.2 Touch Sense Button Keylock

Event	Action/Status	Key Action	LED Status	Buzzer Status
Keylock Enable	Enable Lock Key Function	Hold 3 seconds & click 3 times	Yellow LED ON 1 second Red LED ON 1 second	Long beep x 1
	Success--"In Network Mode"	---	Yellow LED Fade-in & Fade out	---
	Success--"In Standalone Mode"	---	Yellow LED Fade-in & Fade out	---
Keylock Disable	Disable Lock Key Function	Hold 3 seconds & click 3 times	Green/Yellow/Red LED blink one by one with 3 beeps	Long beep x 3
	Success--"In Network Mode"	---	Green LED slow blinking	---
	Success --"In Standalone Mode"	---	Yellow LED blinking	---

9.3 Operation Mode

Operation Mode	Function	Description	Key Action		Operation Support	
			Long	Short	Standalone	Network
Water Valve Manual Operation	Open	Control water valve to full open	---	1	Support	Support
	Close	Control water valve to full close	---	1	Support	Support
	Pause	Pause only works during open/close operation	---	1	Support	Support
	Resume	Resume to previous during Pause operation	---	1	Support	Support
	Auto-calibration	Perform calibrate position and torque force	5	5	Support	Support
Water Leak Alarm	Trigger to close valve	Auto close water valve	---	1	Support	Support
	Alarm Cancellation	Resume to normal operation mode if no alarm triggered	2	---	Support	Support

9.4 Water Valve Operation & Status

Event	Action / Status	Key Action	LED Status	Buzzer Status
OPEN Valve	Start OPEN (Valve in closed position)	Click 1 time	Yellow LED keep blinking	---
	Processing	---	Yellow LED keep blinking	Keep short beep
	Success	---	Green LED ON 1 second	Short beep x 2
	Next status (In Network Mode)	---	Green LED slow blinking	---
	Next status (In Standard Mode)	---	Yellow LED slow blinking	---
CLOSE Valve	Start CLOSE (Valve in open position)	Click 1 time	Green LED ON 1 second	1" Pulse sound
	Processing	---	Yellow LED keep blinking	Keep short beep
	Success	---	Green LED ON 1 second	Short beep x 2
	Next status (In Network Mode)	---	Green LED slow blinking	---
	Next status (In Standard Mode)	---	Yellow LED slow blinking	---
PAUSE Operation	PAUSE Only available during Open/Close operation	Click 1 time	Green LED ON 1 second	Short beep x 1
	Processing--"In Network Mode"	---	Yellow LED slow blinking	---
	Next status -- "In Network Mode"	---	Green LED keep blinking	---
	Processing -- "In Standalone Mode"	---	Yellow LED keep blinking	---
	Next status -- "In Standalone Mode"	---	Yellow LED keep blinking	---
RESUME Operation	Start RESUME available during Open/Close operation	Click 1 time	Green LED ON 1 second	Short beep x 1
	Next Status -- Return Open/Close	---	Yellow/Green LED blinking	Keep short beep
Manual Calibration	Start Manual Calibration	Hold 5 sounds & click 5 times	---	---
	Processing--Open&Close 1-2 cycles	---	Yellow LED keep blinking	Keep short beep
	Next status -- "In Network Mode"	---	Green LED slow blinking	---
	Next status -- "In Standalone Mode"	---	Yellow LED keep blinking	---

9.5 Water Leak Event & Alarm

Event	Action/Status	Key Action	LED Status	Buzzer Status
Leak Sensor Probe Triggered	Start Water Leak Alarm	---	RED LED fast blinking	Fast beep sound
	Processing -- Close Water Valve automatically	---	RED LED fast blinking	Fast beep sound
	Alarm Cancellation	Long hold 2 seconds	Green LED blinking 2 times	Short beep x 2
Leak Alarm Cancellation	Success cancellation	---	Green LED blinking 3 times	Short beep x 3
	Next Status--"In Network Mode"	---	Green LED slow blinking	---
	Next Status -- "In Standalone Mode"	---	Yellow LED blinking	---

9.6 Patents

Patent 1: US 11,233,501 B1
Patent 2: US 10,995,876 B2

9.7 Cautions

MOVING PARTS WARNING: Keep hands, hair and all loose articles of clothing away from moving parts. Moving parts can cause serious injury. Maintain a safe distance from the product during its operation to eliminate risk of injury.

POWER SUPPLY WARNING: The power supply is for indoor use only. Only use power supply included with your product. Do not attempt to repair or use a damaged power supply. Do not immerse the power supply in water or subject it to physical abuse. Inspect the power supply regularly for cable, plug damage.

CORRECT DISPOSAL OF BATTERIES IN THIS PRODUCT: This marking on the product, accessories or literature indicates that the product and its electronic accessories should not be disposed of with other household waste. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their government office, for details of where and how they can take these items for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product and its electronic accessories should not be mixed with other wastes for disposal.

This marking on the battery, manual or packaging indicates that the batteries in this product should not be disposed of with other household waste. Where marked, the chemical symbols Hg, Cd or Pb indicate that the battery contains mercury, cadmium or lead above the reference levels in EC Directive 2006/66. If batteries are not properly disposed of, these substances can cause harm to human health or the environment.

SAFE USAGE GUIDELINES: Do not modify or open the product except for battery removal and replacement. Do not disassemble or attempt to service this product. This product is safe under normal and reasonably foreseeable misuse operating conditions. Always use both hands while operating the product. This is not a children's product and is not intended for use by children. Product must be returned to the manufacturer for any service or repair. Long periods of repetitive motion using the product may be associated with nerve, tendon or muscle injury in your hands, wrists, arms, shoulders, neck or back. See a qualified health professional for pain, numbness, swelling, burning, cramping or stiffness.

9.8 Warranty

STATEMENT OF WARRANTY: 1 Year Limited Warranty

Ubitech Limited ("Ubitech") warrants to the original retail purchaser ("Purchaser") that the Ubitech (the "Product") will be free of defects in materials or workmanship under use for one (1) year from the date of purchase (the "Warranty period").

For the Purchaser only, if the Product fails to perform as specified during the Warranty Period due to defective parts or faulty workmanship, Ubitech will repair or replace the defective or damaged parts of the Product. Normal wear and tear is not covered nor is abnormal use, misuse, mishandling, faulty installation, improper shipping, damage caused by disasters such as fire, flood or earthquake, neglect, accident or tampering. This warranty covers only normal use in the United States or Canada.

To obtain warranty service during the Warranty Period, call Ubitech Customer Service +852-81008500 or email: help@ubitech.hk for instructions on sending damaged parts and documentation for a Return Merchandise Authorization (RMA). Products returned to Ubitech for repair or replacement without authorization will be returned at the sender's expense. All warranty claims must be accompanied by a legible copy of the original receipt showing date and details of purchase.

THIS WARRANTY IS NOT TRANSFERABLE, AND, TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW IS IN LIEU OF ALL OTHER WARRANTIES, REPRESENTATIONS AND CONDITIONS, EXPRESSED OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. NO OTHER PERSON OR REPRESENTATIVE IS AUTHORIZED TO MAKE ANY OTHER WARRANTY ON BEHALF OF UBITECH OR ASSUME FOR UBITECH ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF THIS PRODUCT. IN NO EVENT WILL CUSTOS BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT, INCLUDING DAMAGES DUE TO UBITECH'S NEGLIGENCE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY.

DO NOT RETURN THIS PRODUCT TO THE STORE OR WEBSITE FROM WHICH IT WAS PURCHASED If you believe the product is defective, has a missing or broken part or are having difficulty with it please contact Ubitech as listed above for a quick and efficient solution to the problem.

FCC STATEMENT: This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient or relocate the receiving antenna; increase the separation between the equipment and the receiver; connect the equipment into an outlet on a circuit different from that to which the receiver is connected. Consult the dealer or an experienced radio/TV technician for help.

Warning: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment. Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

IC STATEMENT: This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

9.9 Disclaimer

DISCLAIMER

We hereby disclaim that the product is not a substitute for homeowner insurance, customers still need to purchase relevant insurance, due to installation conditions, environment and other reasons beyond our control, we cannot guarantee that the product/solution can 100% prevent water leakage in all situations damage, users losses will be beyond of our liability. Ubitech assumes no responsibility for any errors that may appear in this manual. Information contained herein and in the set-up guide is subject to change without notice.

Ubitech logo is registered trademark of Ubitech Limited

CUSTOMER SERVICE

If you have any questions, our trained Customer Service Department is happy to assist you 24 hours a day, 7 days a week. Contact Ubitech Customer Service as follows:

Address: Flat 12, 7/F Block A, Hi-Tech Industrial Centre,

5-21 Pak Tin Par Street, Tsuen Wan, N.T. Hong Kong

Email: help@ubitech.hk

Call: +852-81008500

Contact us if you have any questions



<https://www.facebook.com/groups/283898176125297>

ubitech



<http://www.ubitech.hk>