Wireless Valve Controller

RA10 UM

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1. Introduction

The RA10 is a Wireless Valve Controller for Netvox ClassC type devices based on the LoRaWAN open protocol and is compatible with the LoRaWAN protocol.

It can control the valve open/close status remotely or manually such as the water valve, gas valve, ball valve…etc.

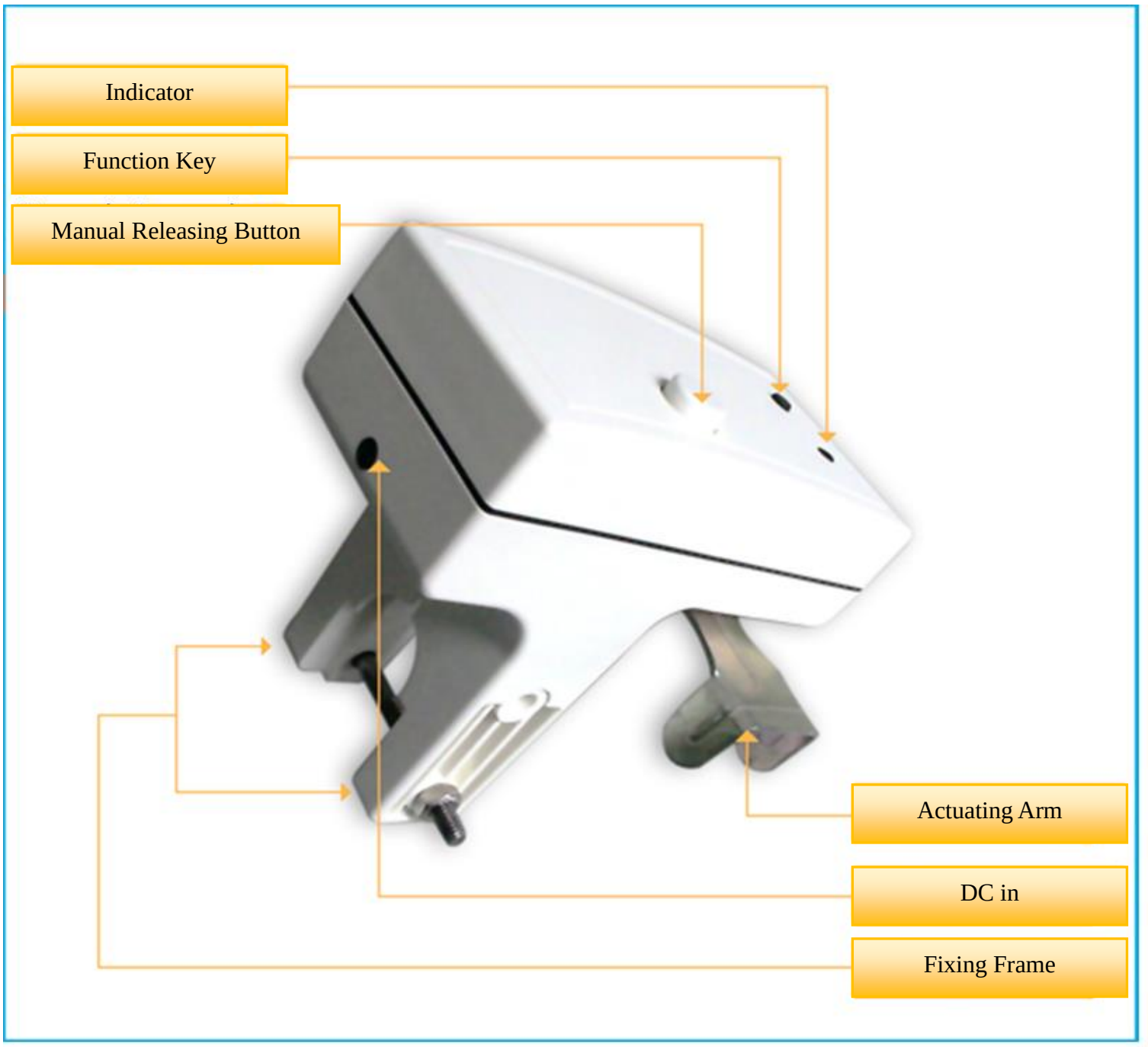
LoRa Wireless Technology:

LoRa is a wireless communication technology famous for its long-distance transmission and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation method greatly increases to expand the communication distance. Widely used in long-distance, low-data wireless communications. For example, automatic meter reading, building automation equipment, wireless security systems, industrial monitoring. Main features include small size, low power consumption, transmission distance, anti-interference ability and so on.

LoRaWAN:

LoRaWAN uses LoRa technology to define end-to-end standard specifications to ensure interoperability between devices and gateways from different manufacturers.

2. Appearance



3. Product characteristics

- Compatible with LoRaWAN standard
- 12V DC power supply
- Simple operation and setting
- Compatible with LoRaWAN™ Class C
- Frequency hopping spread spectrum
- Configuration parameters can be configured via a third-party software platform, data can be read and alerts can be set via SMS text and email (optional)
- Applicable to third-party platforms: Actility/ThingPark, TTN, MyDevices/Cayenne
- Control various valves

4. Operating instruction

On/Off

Power on / Turn on	Plug the 12V DC adaptor and indicator will flash once
Power off	Unplug the 12V DC adaptor

Network Joining

Never joined the network (Or at factory setting)	Turn on the device to search the network. The green indicator stays on: success The green indicator remains off: fail
Had joined the network (Not at factory setting.)	Turn on the device to search the previous network. The green indicator stays on: success The green indicator remains off: fail

Function Key

Press and hold for 5 seconds	Restore to factory setting The green indicator flashes for 10 times: success The green indicator remains off: fail
Press once	The device is in the network: report data The device is not in the network: the green indicator remains off

Manual Releasing Button

Press and hold the manual button	Control the actuating arm by manual

5. Report data

The device will immediately send a version packet report along with an uplink packet including on/off status.

The device sends data in the default configuration before any configuration is done.

Default setting:

MaxTime: Max Interval = 900s

MinTime: Min Interval = 2s

The status has changed, it will be reported at MinTime.

The status has not changed, the data will be reported regularly at MaxTime.

Note:

Please refer Netvox LoRaWAN Application Command document and Netvox Lora Command Resolver

http://cmddoc.netvoxcloud.com/cmddoc to resolve uplink data.

Report sending cycle period

Min Interval (Unit: second)	**Max Interval (Unit: second)**
Any value between 1~65535	Any value between 1~65535

Example of uplink

FPort：0x06

Bytes	1	1	1	Var(Fix=8 Bytes)
	Version	DeviceType	ReportType	NetvoxPayLoadData

Version– 1 bytes –0x01——the Version of NetvoxLoRaWAN Application Command Version

DeviceType– 1 byte – Device Type of Device

ReportType – 1 byte –the Presentation of the NetvoxPayLoadData，according the devicetype

NetvoxPayLoadData– Fixed bytes (Fixed =8bytes)

Version	**DeviceType**	**ReportType**	**NetvoxPayLoadData**	
0x01	0x71	0x01	OnOff(1Byte, OFF_0x00,ON_0x01)	Reserved(7Bytes,fixed 0x00)

Ex.

Uplink:01710100000000000000000 // The status is off.

Uplink:01710101000000000000000 // The status is on.

Example of Report configuration

FPort：0x07

Bytes	1	1	Var(Fix =9 Bytes)
	CmdID	DeviceType	NetvoxPayLoadData

CmdID– 1 byte

DeviceType– 1 byte – Device Type of Device

NetvoxPayLoadData– var bytes (Max=9bytes)

Description	**Device**	**Cmd ID**	**DeviceType**	**NetvoxPayLoadData**		
Off	RA10	0x90	0x71	Reserved (9Bytes,Fixed 0x00)		
On		0x91		Reserved (9Bytes,Fixed 0x00)		
Toggle		0x92		Reserved (9Bytes,Fixed 0x00)		
ConfigReportReq		0x01		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	Reserved (5Byte,Fixed 0x00)
ConfigReportRsp		0x81		Status (0x00_success)	Reserved (8Bytes,Fixed 0x00)	
ReadConfigReportReq		0x02		Reserved (9Bytes,Fixed 0x00)		
ReadConfigReportRsp		0x82		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	Reserved (5Byte,Fixed 0x00)

Ex.

a. Turn off the actuating arm

   Downlink: 907100000000000000000

b. Turn on the actuating arm

   Downlink: 917100000000000000000

c. Toggle the actuating arm (When you don’t know the current state of the actuating arm, you can control the reverse direction)

   Downlink: 927100000000000000000

d. Setting MinTime is 2 seconds, MaxTime is 300 seconds

   Downlink: 01710002012C0000000000

   Response: 817100000000000000000 (Successful)

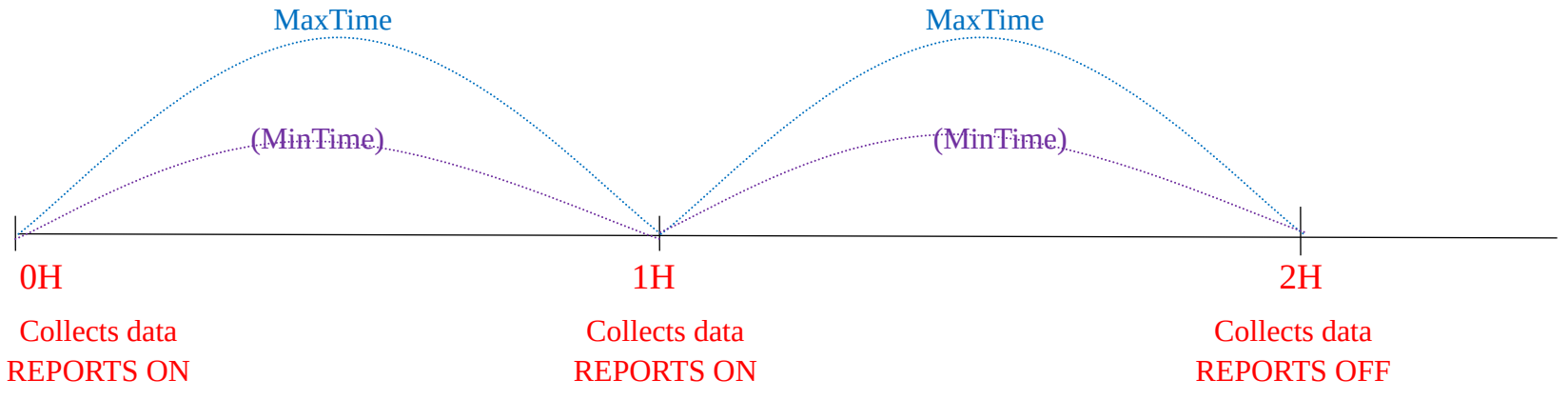
e. Reading MinTime and MaxTime

   Downlink: 027100000000000000000

   Response: 82710002012C0000000000 (Current configuration)

Example for MinTime/MaxTime logic:

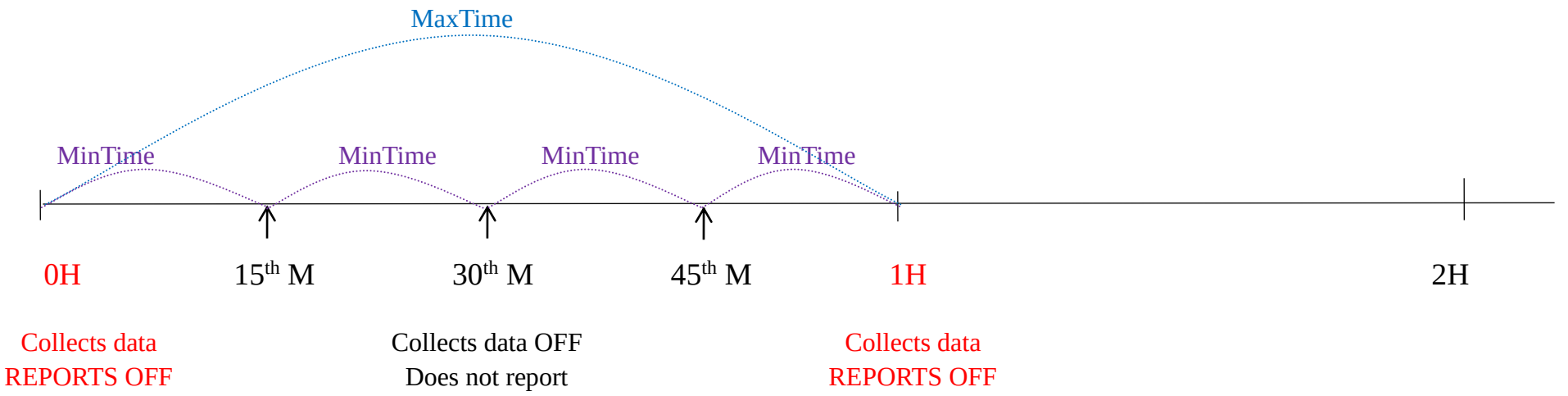
Example#1 based on MinTime = 1 Hour, MaxTime= 1 Hour



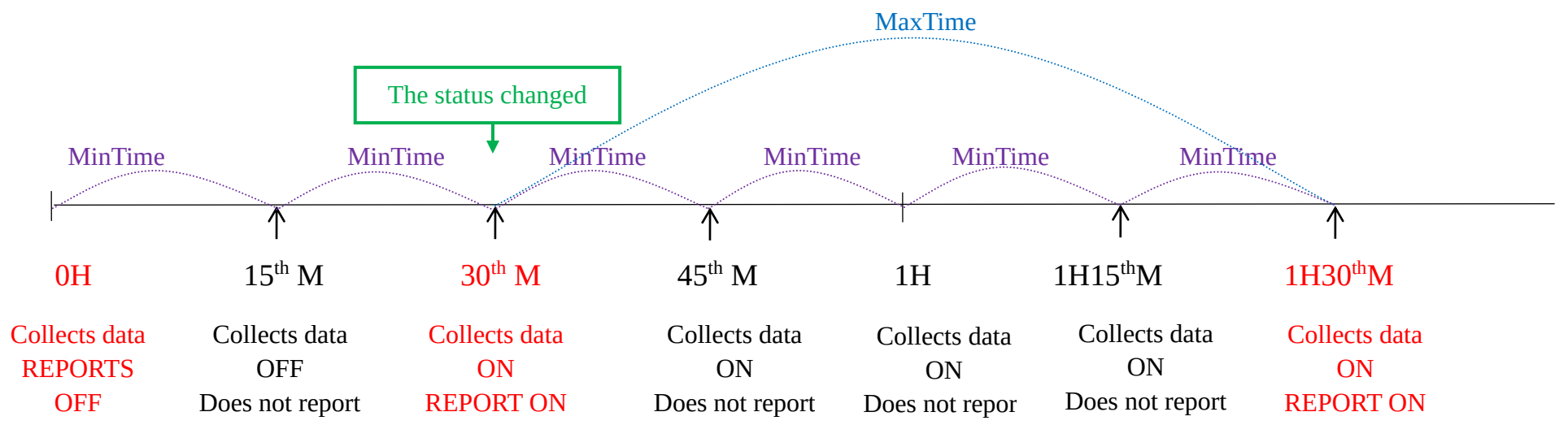
Note:

MaxTime=MinTime. Data will only be report according to MaxTime (MinTime) duration regardless ON/OFF value.

Example#2 based on MinTime = 15 Minutes, MaxTime= 1 Hour



Example#3 based on MinTime = 15 Minutes, MaxTime= 1 Hour



Note:

The status has changed, it will be reported at MinTime and recommend the MinTime Interval set as 2 seconds

6. Installation method

1. The RA10 (Wireless Valve Controller) can be installed on gas line or water lines to control the opening or closing of pipeline valves.

Way to install:

a. Loosen the fixing screw of the frame, and press “manual releasing button”, then twist the actuating arm to make the valves to be the same direction as actuating arm.
b. Put the fixing frame on the pipe (as shown below), and then tighten the fixing screw. (as shown below)

Note:

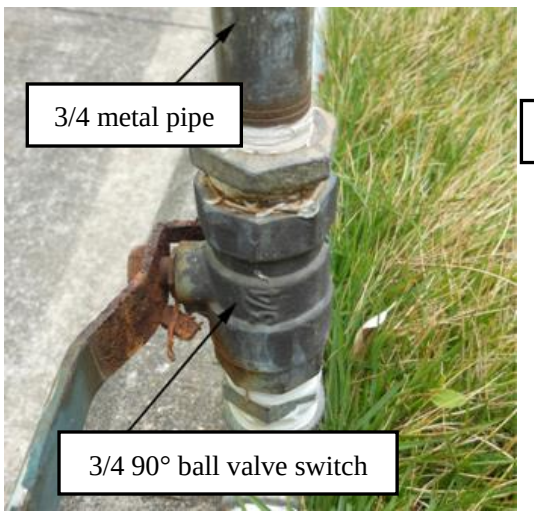
(1) Place the screw washer on the inside to tighten the screw.
(2) Do not install the device in a box made of metal or in an environment with other electrical equipment to avoid affecting the wireless transmission signal of the device.
(3) The actuating arm maximum torque should be 7.5kgf and the angle should be 90 °.
(4) If the “manual releasing button” would not be able to release and rebound completely, then please push the on/off valve handle back gently, and it could release the rebound fully.

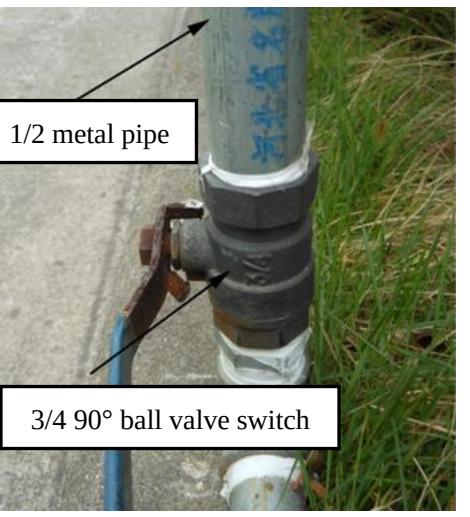
2. When the state of the actuating arm of the valve controller changes, the data will be reported at MinTime. On the other hand, if the status has not changed, the data will be reported regularly at MaxTime.

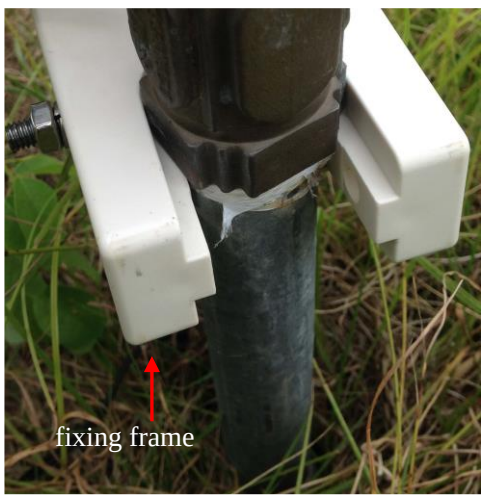
RA10 could be apply to the following situation:

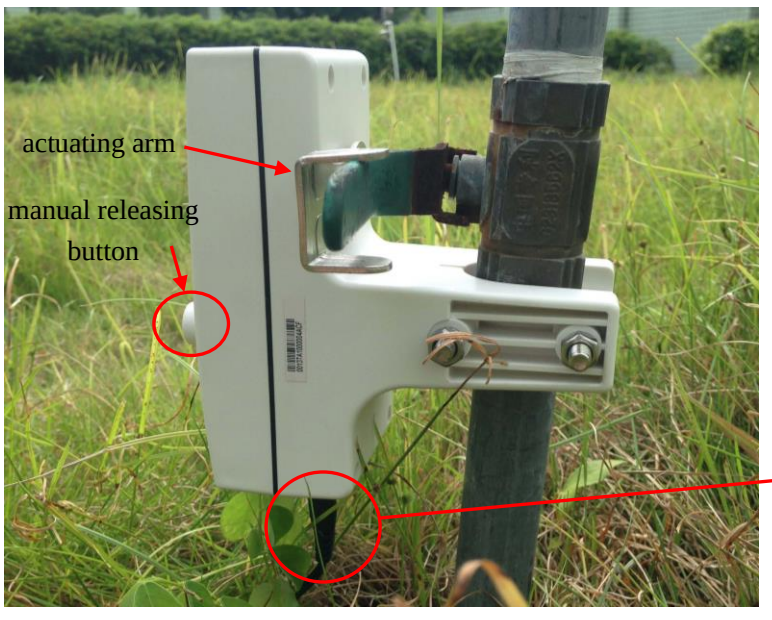
- Water lines in the kitchen, gas lines
- Water lines in the park
- Apply to the line of 3/4 and 1/2 (US inch) regulation

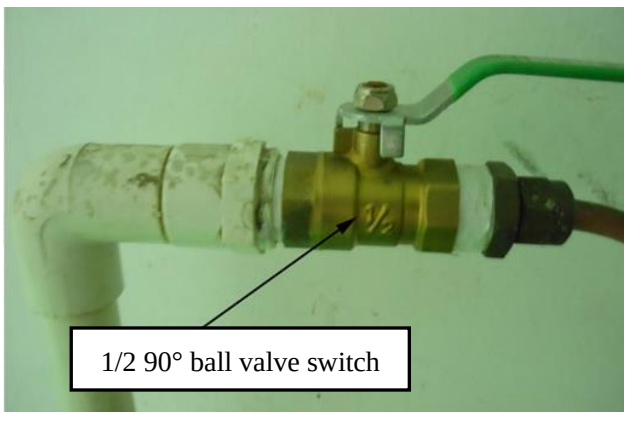
RA10 could be applied to every place that has water lines or gas lines, and would like to fulfill remotely control along with controlling the opening and closing of the valve.

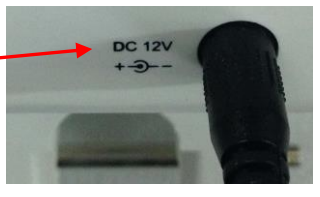












7. Maintenance and maintenance

Kindly pay attention to the following in order to achieve the best maintenance of the product:

• Keep the device dry. Rain, moisture, or any liquid, might contain minerals and thus corrode electronic circuits. If the device gets wet, please dry it completely.

• Do not use or store the device in dusty or dirty environment. It might damage its detachable parts and electronic components.

• Do not store the device under excessive heat condition. High temperature can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.

• Do not store the device in places that are too cold. Otherwise, when the temperature rises to normal temperature, moisture will form inside, which will destroy the board.

• Do not throw, knock or shake the device. Rough handling of equipment can destroy internal circuit boards and delicate structures.

• Do not clean the device with strong chemicals, detergents or strong detergents.

• Do not apply the device with paint. Smudges might block in the device and affect the operation.

• Do not throw the battery into the fire, or the battery will explode. Damaged batteries may also explode.

All of the above applies to your device, battery and accessories. If any device is not working properly, please take it to the nearest authorized service facility for repair.