IIOTSYS™
IoTSwitch

User Manual
iiotsys™ IoT Switch (Product)
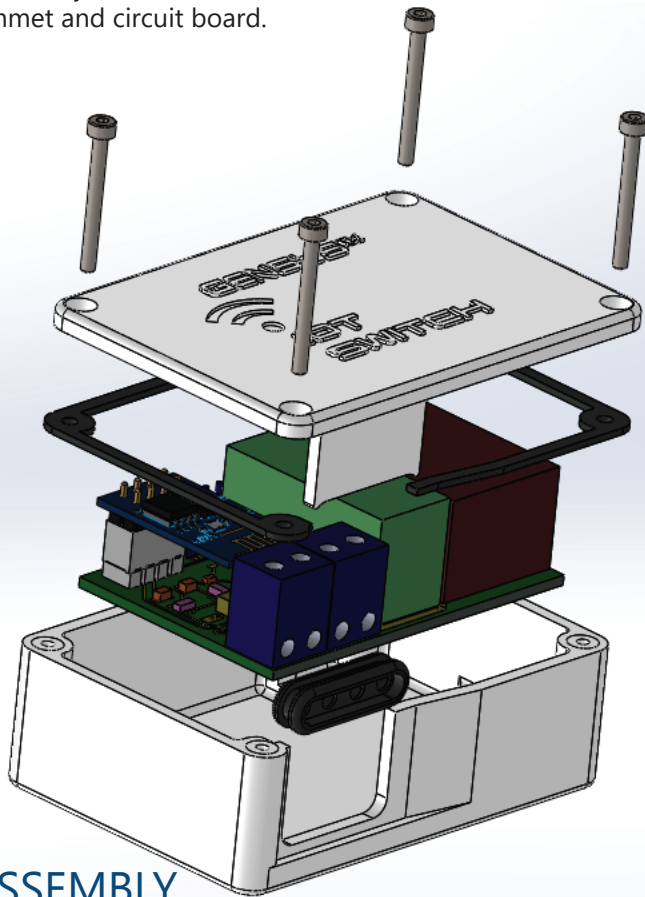
User Manual: iiotsys™ IoT Switch (Product)

DISASSEMBLY

Remove the 4 cap screws using the hex key (allen key) provided. Or alternatively a flat 1.5mm screwdriver. Remove the lid, dust seal, grommet and circuit board.

ASSEMBLY

Prepare the electrical wires stripping 3-4 mm of the insulation away. Twist or solder the exposed wires to ease insertion.

Press the electrical wires through the grommet recesses provided. Insert the wires into the terminal block and tighten the terminal screws.

Insert the circuit board into the case ensuring that the board rests on the board holders on the bottom of the case and does not protrude above the top of the bottom casing.

When inserting the board slide the grommet into the casing ensuring the grommet side recesses are aligned.

Ensure the jumper is in the normal operation position and that the control chip is level and firmly inserted into the RS232 slot.

Place the lid onto the casing ensuring that the lid tongue engages the grommet top recess.

Insert the dust seal one corner at a time between the lid and the casing and placing a cap screw through the lid, seal screw hole on the seal and into the casing threaded holes, turn by hand to feel the thread engage, repeat until all corners are in place and all cap screws are loosely inserted.

Tighten the cap screws so that the lid is a loose fit. Check the alignment on the dust seal and the lid tongue into the grommet recess.

Gently tighten the cap screws one at a time until the lid engages the dust seal evenly.

Ensure that the lid is not over-tightened as the seal will begin to bulge. A firm fit is all that is necessary.

WIRING DIAGRAM

Please refer to the packaging of your product and ensure the correct model for the connections below.

INLINE IoTSwitch

Example Uses:
- Geysers
- Lights
- Appliances

CAUTION:
For domestic use only.
Ensure mains are switched off before installation.
Comply with voltage and amperage markings at all times.
Do not expose the product to rain, use it near water or in damp or wet conditions.
For installation by qualified electrician only.

IN-LINE IoTSwitch Wiring Diagram

TERMINAL BLOCK

L **Mains Supply**
100 ~ 240 VAC
N 50 ~ 60Hz

N **Switched Load**
100 ~ 240 VAC
L 50 ~ 60Hz
Max. 15A

ISOLATED IoTSwitch

Example Uses:
- Driveway Gates
- Garage Doors
- Alarm Systems

⚠ **DANGER**
RISK OF ELECTRIC SHOCK
Disconnect mains supply before connecting or disconnecting terminals

ISOLATED IoTSwitch Wiring Diagram

TERMINAL BLOCK

L **Mains Supply**
100 ~ 240 VAC
N 50 ~ 60Hz

COMMON **Switched Contacts**
0 ~ 240 VAC
NORMALLY 0 ~ 100 VDC
OPEN Max. 15A

NOTE!

- After installation download the iiotsys™ IoT Switch Mobile App *or download our free home automation server* iiotsys™ IoT Switch (Web Application) *to configure your new* iiotsys™ IoT Switch.
- Advanced Manual or custom configuration only is done using the native web user interface available on the iiotsys™ IoT Switch.

FACTORY RESET ⚠ *For your safety and to avoid possible electrical shock please use a plastic tool when pressing the tactile button.*

Generation One IoT Switch circuit boards (PCB) - (Jumper pin headers ONLY);
Power down the IoT Switch, remove the jumper from normal mode position, power up the IoT Switch, then place the jumper in the programming mode position within the first 30 seconds after powering up, observe blue led flash indicates that the factory default settings have been restored. Remove the jumper from the programming mode position and place the jumper in the normal mode position. Proceed to assemble and setup.

Generation Two IoT Switch circuit boards (PCB) - (Tactile switch button OR Jumper pin headers);
Power down the IoT Switch, power up the IoT Switch and press and hold the tactile switch within the first 30 seconds after powering up, observe blue led flash indicates that the factory default settings have been restored. Release the tactile switch and proceed to assemble and setup. Jumper method can also be used as per Generation One PCB's.

⚠ *Please note that powering up the PCB with the Jumper **already** in programming position or tactile button pressed places PCB in programming mode.*
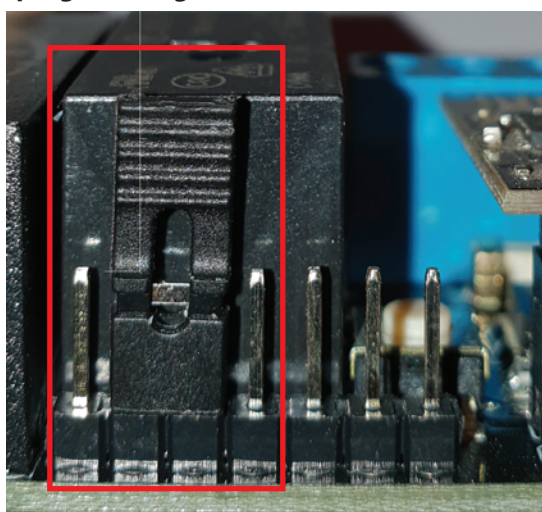
Generation One PCB (NO tactile button)
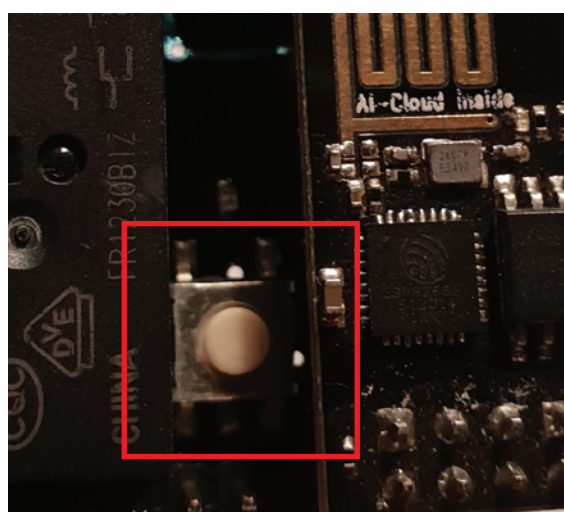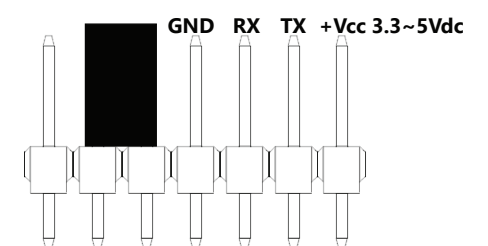

Generation Two PCB (Has tactile button)
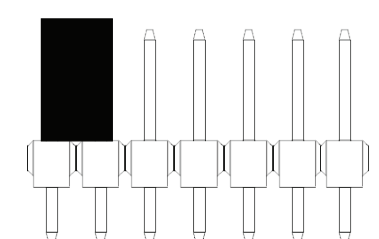

Jumper pin header placement (programming mode)

Tactile Switch Placement

Programming Mode

GND RX TX +Vcc 3.3~5Vdc

Normal Mode

Rev 1.0

http://www.kldtechnologies.co.za

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This iiotsys™ IoT Switch is designed to be setup using a Mobile Application available on Google Play Store or by use of our free software home automation server iiotsys™ (Web Application). Please download the User Manual for iiotsys™ IoT Switch (Mobile App) or iiotsys™ IoT Switch (Web Application).

This section is provided to cover the native web based user interface published and accessible on each of your iiotsys™ IoT Switches.

WARNING! - Please adhere at all times to the electrical specification limits of the IoTSwitch Model that you have purchased.
CAUTION! - Changing parameters or values with the web server interface can cause the IoTSwitch to become out of Sync with the Android Application.

Step 1: Connect directly to your IoT Switch

Power up your IoTSwitch and locate the default SSID Wi-Fi network **IoTSwitchCloud** from your mobile or Laptop. Connect to this SSID with the default password **IoTSwitchCloud.**

IoTSwitchCloud Secured
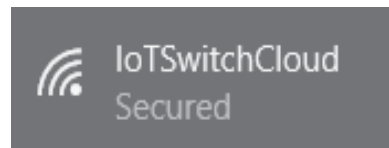
Tips! - Ensure you have no proxy gateway enabled on your internet browser and that all applications are closed. Ensure DHCP settings are enabled on your WiFi adapter. Choose auto-reconnect option. Setup one IoTSwitch at a time.
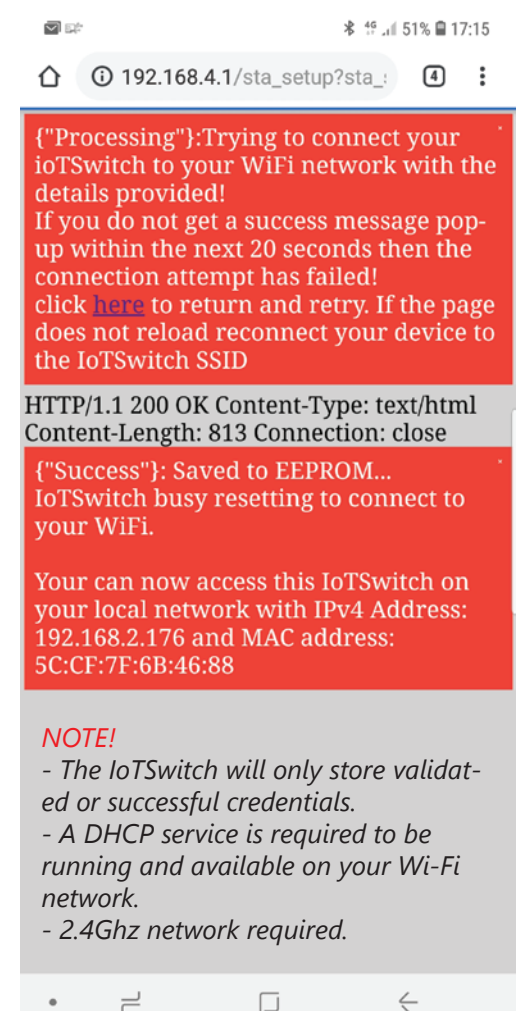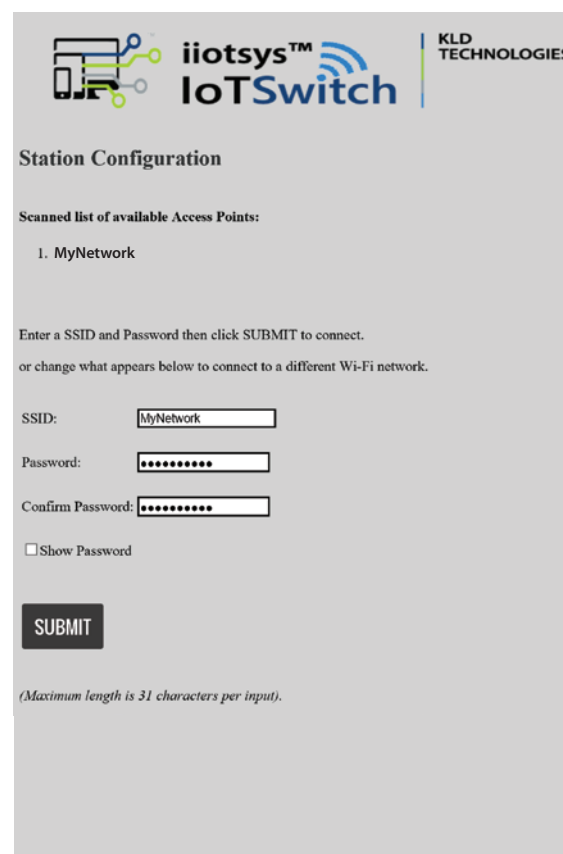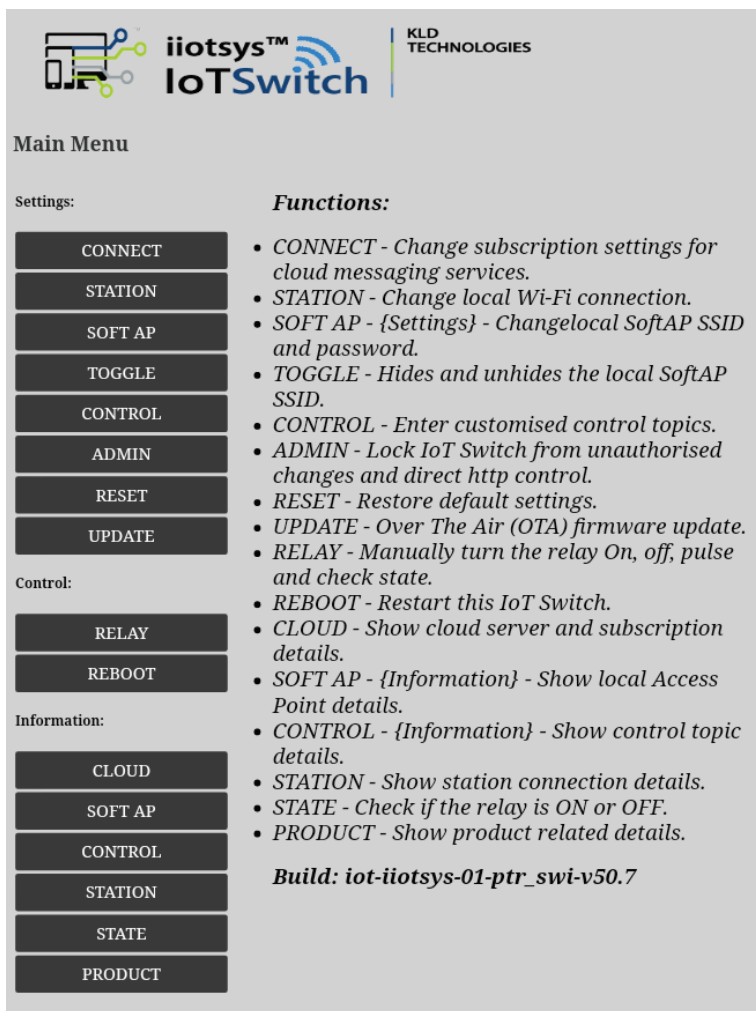
Step 2: Connect your IoTSwitch to the local Wi-Fi network

Once connected to **IoTSwitchCloud** open a web browser to default IPv4 address url **http://192.168.4.1**

Main Menu

Settings:
- CONNECT
- STATION
- SOFT AP
- TOGGLE
- CONTROL
- ADMIN
- RESET
- UPDATE

Control:
- RELAY
- REBOOT

Information:
- CLOUD
- SOFT AP
- CONTROL
- STATION
- STATE
- PRODUCT

Functions:
- *CONNECT - Change subscription settings for cloud messaging services.*
- *STATION - Change local Wi-Fi connection.*
- *SOFT AP - {Settings} - Changelocal SoftAP SSID and password.*
- *TOGGLE - Hides and unhides the local SoftAP SSID.*
- *CONTROL - Enter customised control topics.*
- *ADMIN - Lock IoT Switch from unauthorised changes and direct http control.*
- *RESET - Restore default settings.*
- *UPDATE - Over The Air (OTA) firmware update.*
- *RELAY - Manually turn the relay On, off, pulse and check state.*
- *REBOOT - Restart this IoT Switch.*
- *CLOUD - Show cloud server and subscription details.*
- *SOFT AP - {Information} - Show local Access Point details.*
- *CONTROL - {Information} - Show control topic details.*
- *STATION - Show station connection details.*
- *STATE - Check if the relay is ON or OFF.*
- *PRODUCT - Show product related details.*

Build: iot-iiotsys-01-ptr_swi-v50.7

Click the **STATION** menu option from the menu. Enter your local network Wi-Fi SSID and a password then click submit.
If the IoT Switch was previously connected to a network the details will be visible in the fields and can be changed.

Station Configuration

Scanned list of available Access Points:

1. MyNetwork

Enter a SSID and Password then click SUBMIT to connect.
or change what appears below to connect to a different Wi-Fi network.

SSID: MyNetwork
Password: ••••••••••
Confirm Password: ••••••••••
☐ Show Password

SUBMIT

(Maximum length is 31 characters per input).

After sucessful connection the local IPv4 address and MAC address will be shown.

192.168.4.1/sta_setup?sta_:

{"Processing"}:Trying to connect your ioTSwitch to your WiFi network with the details provided!
If you do not get a success message pop-up within the next 20 seconds then the connection attempt has failed!
click here to return and retry. If the page does not reload reconnect your device to the IoTSwitch SSID

HTTP/1.1 200 OK Content-Type: text/html Content-Length: 813 Connection: close

{"Success"}: Saved to EEPROM... IoTSwitch busy resetting to connect to your WiFi.

Your can now access this IoTSwitch on your local network with IPv4 Address: 192.168.2.176 and MAC address: 5C:CF:7F:6B:46:88

NOTE!
- The IoTSwitch will only store validated or successful credentials.
- A DHCP service is required to be running and available on your Wi-Fi network.
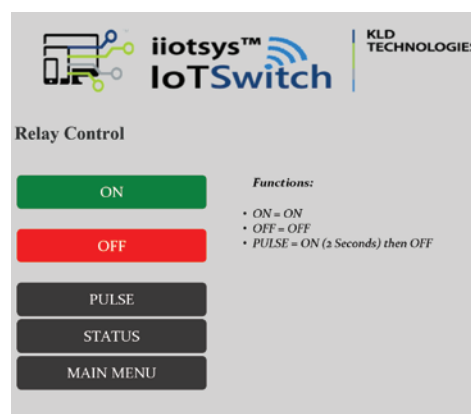*- 2.4Ghz network required.*

Step 3: Control your IoTSwitch

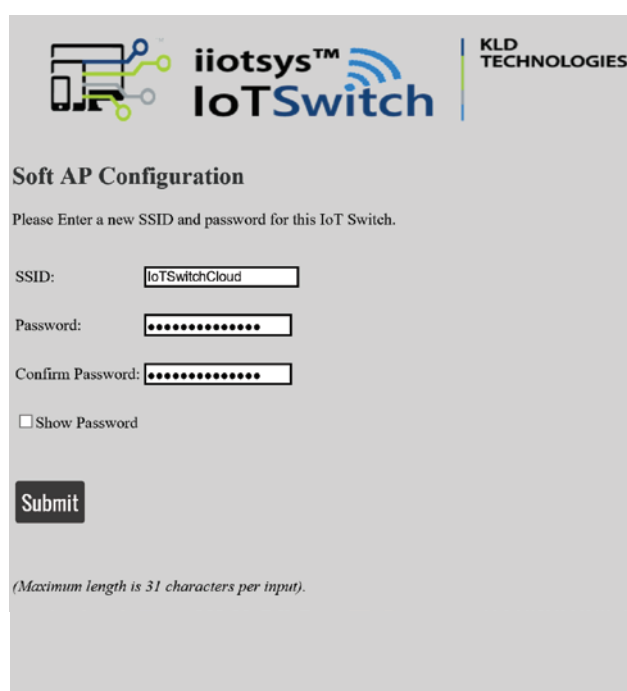Using a web browser connect to the local IPv4 address obtained in step 2. Click on the **RELAY** menu button

The **IoT Switch Relay Control** menu will allow direct control of the IoTSwitch relay. Step 3 is sufficient if you only wish to connect directly to your IoTSwitch from your device using a web browser to control it. Step 3 concludes all that needs to be done if all you require is standalone type control.
Please see the bullet points on the right of the **IoTSwitch Relay Control** menu screenshot for a description of all the functions.

Relay Control
- ON
- OFF
- PULSE
- STATUS
- MAIN MENU

Functions:
- *ON = ON*
- *OFF = OFF*
- *PULSE = ON (2 Seconds) then OFF*

- **ON** button will turn the IoTSwitch relay on.
- **OFF** button will turn the IoTSwitch relay off.
- **PULSE** button will turn the IoTSwitch relay on for one second and then off again.
- **STATUS** button will provide a pop-up showning you whether the relay is currently **ON** or **OFF.**
- **MAIN MENU** button will return you to the previous menu.

Step 4: Change the IoT Switch access point SSID and password

Soft AP Configuration

Please Enter a new SSID and password for this IoT Switch.

SSID: IoTSwitchCloud
Password: ••••••••••••••
Confirm Password: ••••••••••••••
☐ Show Password

Submit

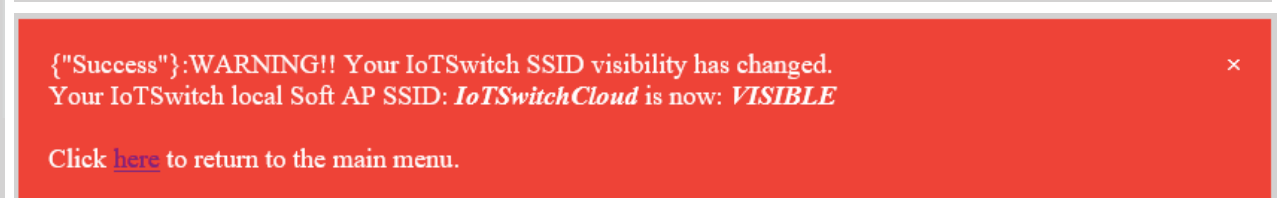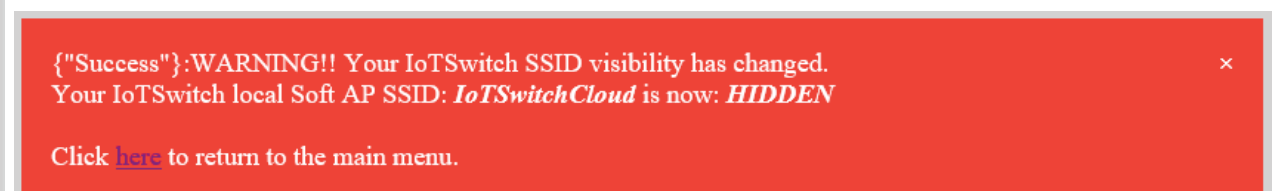*(Maximum length is 31 characters per input).*

Click the **SOFT AP** button.

Enter a new SSID and password for your IoT Switch and click the submit button.

To hide the SSID from being visible or broadcast click on the **TOGGLE** menu button on the **MAIN MENU**.

NOTE!
*- The **TOGGLE** function hides and unhides the IoT Switch SSID..*

{"Success"}:WARNING!! Your IoTSwitch SSID visibility has changed. Your IoTSwitch local Soft AP SSID: *IoTSwitchCloud* is now: *HIDDEN*   ✕

Click here to return to the main menu.

{"Success"}:WARNING!! Your IoTSwitch SSID visibility has changed. Your IoTSwitch local Soft AP SSID: *IoTSwitchCloud* is now: *VISIBLE*   ✕

Click here to return to the main menu.

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Step 5: Connect your IoT Switch to a MQ server broker service

Cloud Configuration

Please input the details below to connect your IoT Switch to a MQ cloud server.

Server: [   ]

Port: [   ]

Key: [   ]

Email: [   ]

Username: [   ]

Password: [   ]

Confirm Password: [   ]

☐ Show Password

[Submit]

*(Maximum length 31 characters per input except **Port:** which is 9 characters.)*

The ioTSwitch can also be controlled from cloud services, custom home automation systems that support MQTT protocol. The requirement for this section is both local Wi-Fi network and internet access for any related cloud services.

Click on the **CONNECT** menu button.

Enter the required details and click submit. The IoTSwitch validates the credentials given and if sucessful will store and apply the information entered. After sucessful completion the IoTSwitch will then register with the cloud services and you will be able to control the IoTSwitch using the default MQ control commands. *(see step 6).*

NOTE! - When the IoTSwitch is configured in cloud function and the relay is manually controlled it will disconnect the cloud registration temporarily to avoid conflicting commands being received. Please ensure that if you wish to return to cloud control then you return to the main menu before exiting the web browser session or alternatively reboot the device.

The IoTSwitch adheres to the following standards.
Mq Service: **server:port**
Mq Username: **email:username**
Mq Username: **virtualhost:username**
Mq Password: **password**
Mq Key: **Key**
*Mq Payload: (***ON,OFF,PULSE,STATE,STATUS,REBOOT,RESET***) or any custom control command set.*

IoTSwitch listens to all topics (#) for it's specific topic (Key) and executes based on relevant payload (command)

Step 6: Customising MQ cloud control commands

Control Configuration

Please input the desired custom control topics per function.

ON: [   ]
OFF: [   ]
PULSE: [   ]
STATE: [   ]
STATUS: [   ]
REBOOT: [   ]
RESET: [   ]
ADDRESS: [   ]
LOCK: [   ]
UNLOCK: [   ]
UPDATE: [   ]

[Submit]

Or Restore defaults:

[Restore]

(Maximum length is 9 characters per input.)

Click the **CONTROL** menu button.
Enter the desired control commands corresponding to the required functions. To restore default commands at any time simply click the **Restore** button. **ON**, **OFF** and **PULSE** functions have already been covered in Step 3.
STATE command publishes a **ON** or **OFF** state back to the key value as topic entered in step 5.
STATUS command publishes **ONLINE** to **SYSMON** topic if the IoTSwitch is registered with the MQ cloud service.
REBOOT command reboots the switch.
RESET command factory resets the IoTSwitch.
ADDRESS command publishes the local IPv4 address back to the **SYSYMON** topic.
LOCK command locks the Web user interface of the IoT Switch.
UNLOCK command unlocks the Web user interface of the IoT Switch.
UPDATE command starts OTA (Over The Air) firmware update.
On first registration the IoTSwitch product information is published to the **SYSMON** topic.
NOTE!
- MQ LOCK command becomes the password and the username remains admin.

Step 7: Applying local access security

Admin Configuration

Lock down your IoT Switch

WARNING!!! This will lock unauthorised access.
All menus will now require password entry.
Adding existing switch in app will be prohibited
Set username **admin** and password **admin** to restore default access

Enter a new Username and Password then click SUBMIT to set.

Change existing credential below then click SUBMIT to change.

Username: [admin]
Password: [•••••]
Confirm Password: [•••••]

☐ Show Password

[SUBMIT]

(Maximum length is 10 characters per input).

Click the **ADMIN** menu button.

Enter a username and a password.
Click **SUBMIT** to apply.
To remove security simply set the username and password back to admin.
Once a username and password is set a login will be required to access the IoT Switch web menus and display information.

LOGIN

[User name]

[Password]

[LOGIN]

GENERAL INFORMATION

Main Menu

Settings:

[CONNECT]
[STATION]
[SOFT AP]
[TOGGLE]
[CONTROL]
[ADMIN]
[RESET]
[UPDATE]

Control:

[RELAY]
[REBOOT]

Information:

[CLOUD]
[SOFT AP]
[CONTROL]
[STATION]
[STATE]
[PRODUCT]

The menu is broken into three main sections. A **Settings:** section where configuration parameters or details can be changed. A **Control:** section where manual control on the IoTSwitch relay is then permitted or to reboot the switch. A **Information:** section where any of the set details parameters or state or status can be displayed.

- **UPDATE** button will initiate a OTA (Over The Air) firmware update Internet access required.

- **REBOOT** button will reboot the IoTSwitch, any settings that were previously sucessfully set will not be lost.

- **RESET** button will restore all settings to factory default.

NOTE!
- When setting a username and password (Step 7) this will prevent any discovery of information on your IoT Switch for your local Wi-Fi network credentials by the Mobile App or Home Automation server Web UI Applications. Remove security to re-enable the IoT Switch to be added by these applications.

The IoT Switch can be controlled in both standalone and cloud configurations. For standalone mode steps 1 through 3 need to be completed. For standalone and cloud control steps 1 through 5 need to be completed. Please note that steps 4 and 7 are optional to enhance the security and uniqueness of your IoTSwitch preventing unauthorised access.

Also note that step 6 is also an optional enhancement for either security or the need to customise the IoTSwitch for your specific needs.

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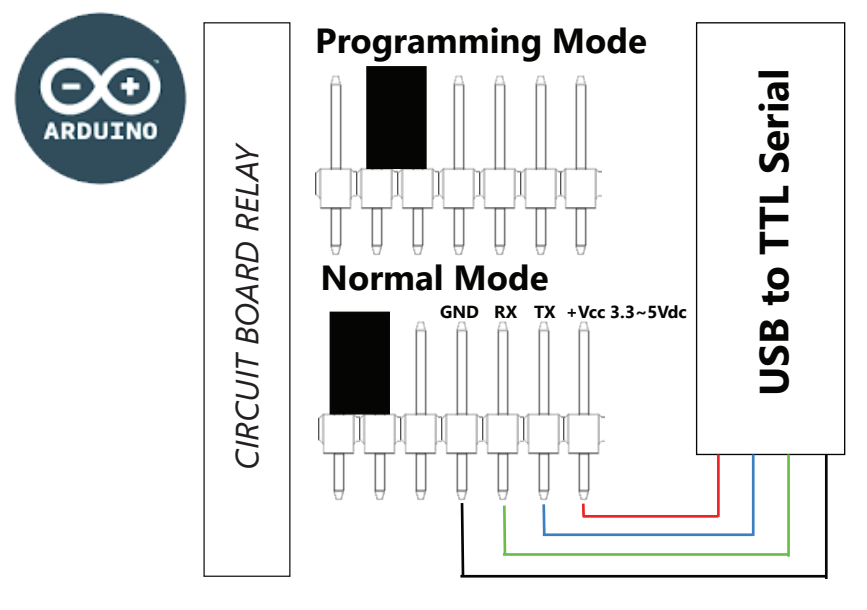## PROGRAMMING

WARRANTY NOTIFICATION
There is no need to programme this unit, however in the interests of supporting DIY enthusiasts this unit can be programmed using a USB to Serial TTL device. Should you choose to programme this IoTSwitch to suit your own purposes then the warranty will be voided.

ENTERING PROGRAMMING MODE
Power down your IoTSwitch, place the jumper in the programming mode position as shown in the diagram below. Connect your USB to TTL serial adapter to the GND, RX, TX and +Vcc inputs on the IoTSwitch as shown in the diagram below. The board can acomodate being powered from your USB port using 3.3Vdc or 5Vdc and the relay will also function with no need to connect the IoTSwitch to a mains supply. Power up the IoTSwitch by plugging in the USB Adapter into your PC.

ARDUINO CONNETION SPECIFICATIONS

Board: "Generic ESP8266 Module"

Flash Mode: "QIO"

Flash Size: "512K (no SPIFFS)"

Debug port: "Disabled"

Debug Level: "None"

lwIP Variant: "v2 Lower Memory"

Reset Method: "ck"

Crystal Frequency: "26 MHz"

Flash Frequency: "40MHz"

CPU Frequency: "80 MHz"

Builtin Led: "2"

Upload Speed: "115200"

ARDUINO

CIRCUIT BOARD RELAY

Programming Mode

Normal Mode

GND   RX   TX   +Vcc 3.3~5Vdc

USB to TTL Serial

FEATURES

Provided valid local Wi-Fi details were stored the IoTSwitch will consistently check and re-connect to your local Wi-Fi network if needed. This ensures that if you have a power or network outage on your local Wi-Fi network that the IoTSwitch will actively re-connect.

The IoT Switch will monitor interferrance and reconnect to your local Wi-Fi network on an alternative channel. This ensures that if new network noise or interferrance ocurrs the IoT Switch will remain connected.

The IoT Switch will monitor for channel jamming and reconnect to your local Wi-Fi network. This ensures that if certain channels are jammed or over congested the IoT Switch will remain connected.

Provided valid Cloud details were stored the IoTSwitch will consistently check its subscription to the MQ services, if it is not subscribed it will then first check the Wi-Fi connection and then re-subscribe to the MQ cloud services. This ensures that your IoTSwitch is always available subject to any power or network outages.

From first boot (power down and power up) there is a 30 second reset window to facilitate a hard reset of your IoTSwitch. Please refer to the **FACTORY RESET** section.

GENERAL INFORMATION

KLD Technologies website also offers a free home automation server that can be easily integrated with all of our IoTSwitches and voice enabled with Amazon Voice Services (Amazon Echo - AKA - Alexa) and Google Home. Images are available for Raspberry Pi 3 B+ as well as Linux virtual home automation server appliance software. Simply download and implement. Home automation servers and images are based on OpenHab2 home automation platforms providing a central server for your home, reachble and compatible through any browser, Android or IOS mobile device.

The OpenHAB Mobile App is also available from Google Play Store and Apple Store free of charge. Addtionally our images and virtual servers will include local MQ server broker to support local, cloud or hybrid configurations.

Contact our sales team for more clarity or a demonstration.

Below is a example screenshot of the OpenHab Application with several IoTSwitches configured.

Android (Mobile Device)	Internet Explorer (Browser)	Firefox (Browser)
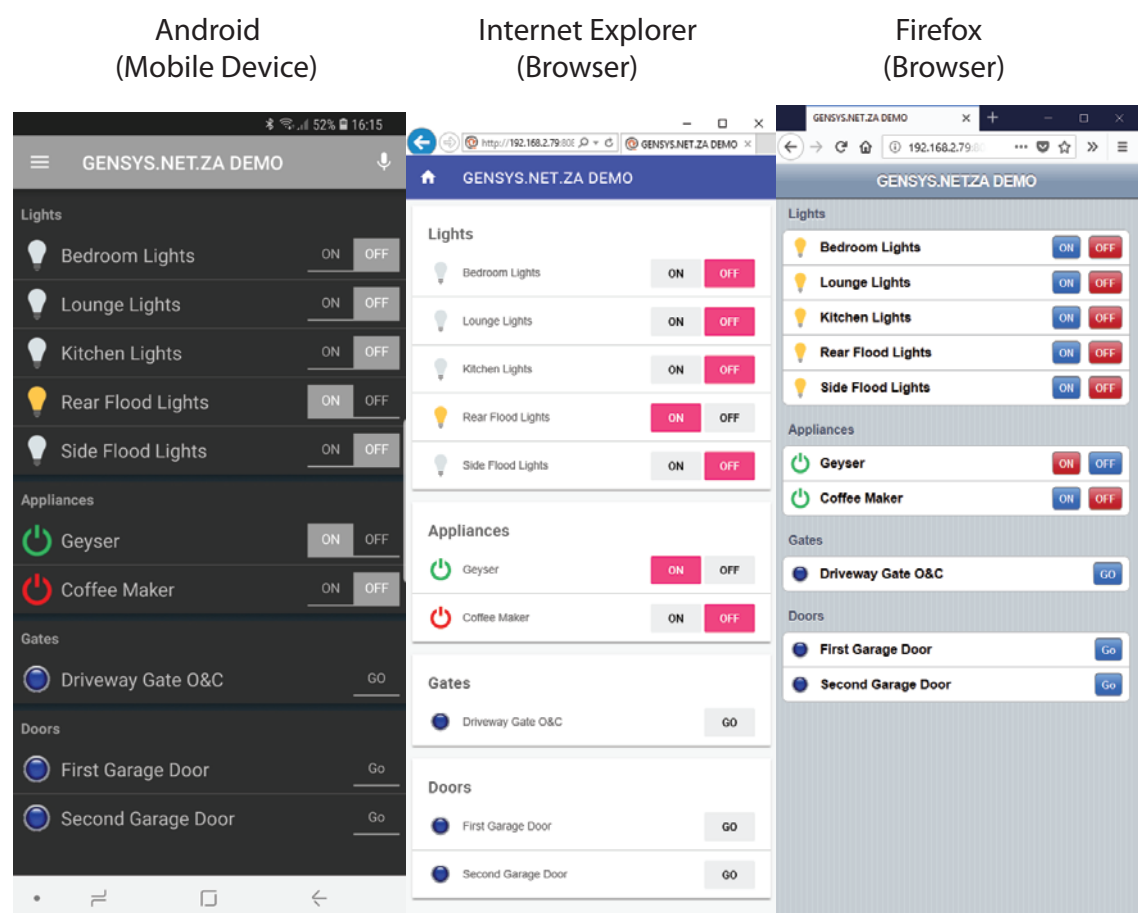
FIRMWARE UPDATE

There are two methods to update the firmware.
Method 1: OTA (Over The Air): This method can be initiated by clicking the UPDATE button on the IoT Switch Web User Interface, or by clicking the UPDATE FIRMWARE button located in the switch detail for your IoT Switch in the Mobile App. This method does not erase any settings and configuration data on the IoT Switch.

Method 2: USB to TTL (Adapter): This method requires a USB to TTL adapter, using the downloaded flash utility and firmware *.bin file from our website, the IoT Switch is placed in programming mode, USB to TTL connected, Flash utility select COM port, BAUD rate and *.bin file, click UPDATE FIRMWARE, confirm OK to proceed, progress indicator shows progress. This method erases settings and configuration data on the IoT Switch. IoT Switch configuration can be restored using the Mobile App, openHAB server, or re-configured as a new IoT Switch.

TESTING & SAFETY

IIoTSwitch has been tested with the following uses:
• **Geysers:** 150l Dual Element 3Kw continious cycle. (Use of electrical contactor recommended)
• **Kettles:** 13-14A current Draw
• **Pool Motors:** 1Kw Continious cycle
• **Driveway gate motors**
• **Garage door motors**
• **Lights and Floodlights:** 5 - 8A Halogen as well as LED
• **Strike locks**
• **Alarm Systems**
• **Electric Fences**
There are unlimited uses for this device within the electrical specifications. IoTSwitches fail in an off state (PTR Model) and open circuit (SWI Model).

THANK YOU

Thank you for purchasing the iiotsys™ IoT Switch, we trust that this device will at last bring the Internet of things into your space!