0.0.3-alpha1 document

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MyController.org
The Open Source Controller

Author(s)	Product Version	Date
Jeeva Kandasamy	0.0.3-alpha1	February-2016

Introduction

MyController.org is a controller for the sensors world! Primarily it was developed to MySensors.org project. Later changed it's architecture to support other projects also. Considered system resources in mind on development. As a result even we can run it on Raspberry PI very first model.

You can control/monitor various sensors with this controller. As this controller is a web application server you can access from anywhere if you have internet connection. It has various features like, firmware control for nodes, alarms, timers., etc. For further details dig into each section.

Technology

MyController.org is Java based web application server.

- Web Server : TJWS
- REST-API : Jboss RestEasy
- Database : h2 database
- Front-end : AngularJS, PatternFly

Installation

System Requirements

MyController.org server is very lightweight, It required very less resource,

- Disk : 30 MB (may require more space, when we store metrics data for long time)
- RAM : 40 MB
- Java SE : 1.8 or later

Test done up to 5 nodes and 30 sensors with the above configuration._

Supported Platforms

We can run it in any platform which supports Java. So far it has been tested in the following platforms, Kindly share your success stories on other platforms we can add it here.

- Linux
- Windows
- Raspberry PI (Oracle Java recommend)

Download

Executable download is available in two formats, zip and tar.gz. You can download suitable compressed flavor for you.

- mycontroller-standalone-0.0.3-alpha1-bundle.zip
- mycontroller-standalone-0.0.3-alpha1-bundle.tar.gz

Kindly visit releases page of MyController.org to get latest version.

Configuration

Extract downloaded bundle where exactly do you want to run. Configuration file is located in `mycontroller/conf`

File name: `mycontroller.properties`

Temporary file

```
mcc.tmp.location=tmp/
```

You can change default location and file name. This file used as server temporery location. Used for the operation such as backup, restore, etc.,

Database Configuration

```
mcc.db.h2db.location=../conf/mycontroller ①
```

① You can change default location and file name. File will be stored with the file extension `.h2.db`. Do not add file extension.

Web server configuration

```
mcc.web.bind.address=0.0.0.0 ①
mcc.web.enable.https=true  ②
mcc.web.http.port=8443  ③
mcc.web.file.location=../www/  ④
mcc.web.ssl.keystore.file=../conf/keystore.jks  ⑤
mcc.web.ssl.keystore.password=mycontroller  ⑤
mcc.web.ssl.keystore.type=JKS  ⑤
```

① bind interface address. by default it will bind with all the available interface.

② Enable/disable https. Only one protocol supported at a time. true - `https`, false - `http`.

③ Port number of `http/https` to access MyController.org server.

④ web files location, no need to touch this one.

⑤ If `https` is enabled these fields are mandatory.

Default URL: `https://<ip>:8443` (ex: `https://localhost:8443`)

Default username/password: `admin/admin`

Important: Change default `mcc.web.ssl.keystore.file` and `mcc.web.ssl.keystore.password` and `https` protocol is recommended

MQTT broker configuration

```
mcc.mqtt.broker.enable=true ①
mcc.mqtt.broker.bind.address=0.0.0.0 ②
mcc.mqtt.broker.port=1883 ③
mcc.mqtt.broker.websocket.port=7080 ④
mcc.mqtt.broker.persistent.store=../conf/moquette/moquette_store.mapdb ⑤
```

① Enable/disable inbuilt MQTT broker. by default it will be enabled. `true`- enabled, `false` - disabled

② bind interface address. by default it will bind with all the available interface.

③ MQTT broker port

④ websoicket port

⑤ internal use. no need to touch this one.

Logger configuration

Configuration File Name: `logback.xml`

Default log file location: `logs/mycontroller.log`

Start/Stop Server

Executable scripts are located in `mycontroller/bin/`

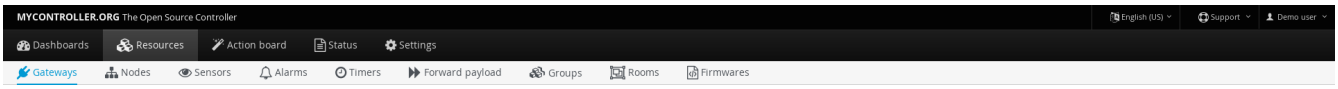
- Linux
  - Start : `./start.sh`
  - Stop : `./stop.sh`
- Windows
  - Start : Double click on `start.bat`
  - Stop : `Ctrl+C`
- Other Platforms
  - navigate to 'mycontroller/bin/'
  - `java -Xms8m -Xmx40m -Dlogback.configurationFile=../conf/logback.xml -Dmc.conf.file=../conf/mycontroller.properties -jar ../lib/mycontroller-standalone-0.0.3-alpha1-single.jar`

Login

Enter valid username and password to log in to MyController.org server.

Default username is `admin` and password is `admin`

Menus



Menu divided in to two parts.

1. Main menu
2. Sub menu

If you navigate to main menu you will see sub menus.

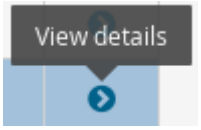
Across pages

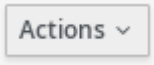
You can see the following icons across pages.

- 

- Filters

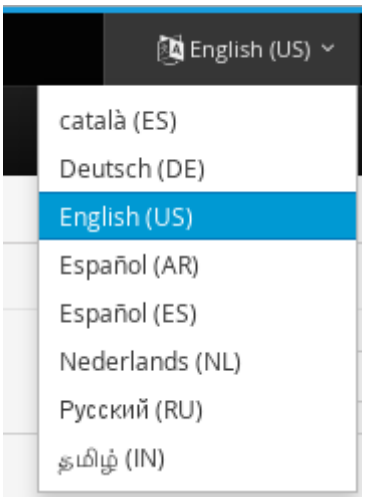
    - You change filter with available options.
    - Filter works with AND operation and case sensitive.
- 

 - Sort
    - you can sort based on fields listed in this menu
    -  - Ascending order
    -  - Descending order
    - To change order click on this icon
- 

 - View details
    - click this icon to know more about specified item
- 

 - Actions
    - page to page list of actions will be different
    - Select item(s) and perform action with this menu
- Icons
    -  - Enabled
    -  - Disabled
    -  - Up
    -  - Down

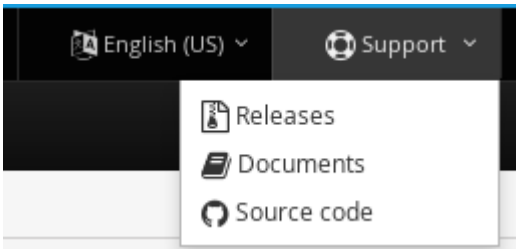
Language (locale)



MyController supports multiple locales. You can change to your language by selecting top right

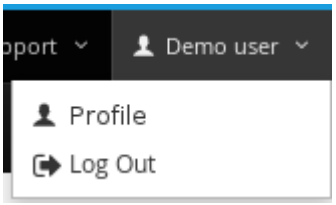
corner of language menu.

Support



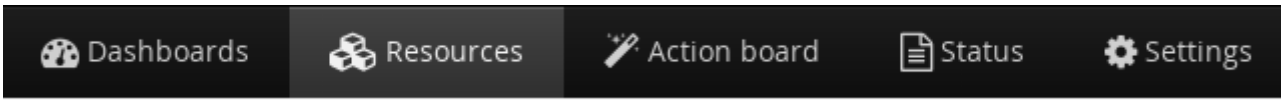
- `Releases` - take you to MyController.org releases page
- `Documents` - take you to MyController.org documents page
- `Source code` - take you to MyController.org source code page

Utility menu



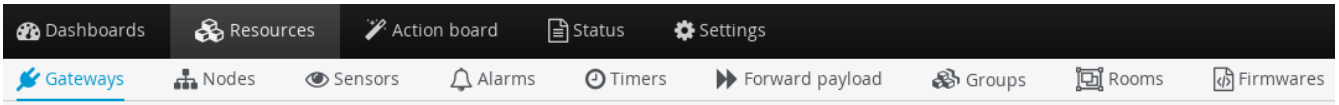
- `Profile` - take you to profile page. you can change password, email id and name.
- `Log out` - safely log out from MyController.org server

Resources



Under resources you can do almost all actions related to sensors. Like adding gateway, node, sensors, alarms, timers, firmwares, rooms, etc.,

Gateway



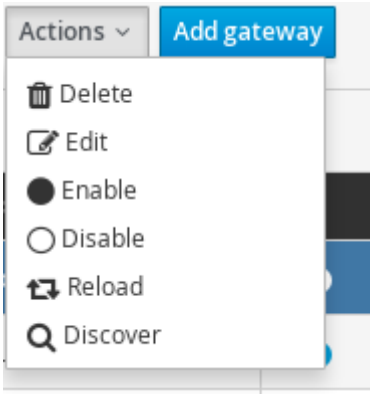
You can add remove any number of gateways. Supports 3 type of gateways

1. Serial gateway
2. Ethernet gateway
3. MQTT gateway

Add gateway

Navigate to `Gateways` menu and click `Add gateway`.

Gateways actions



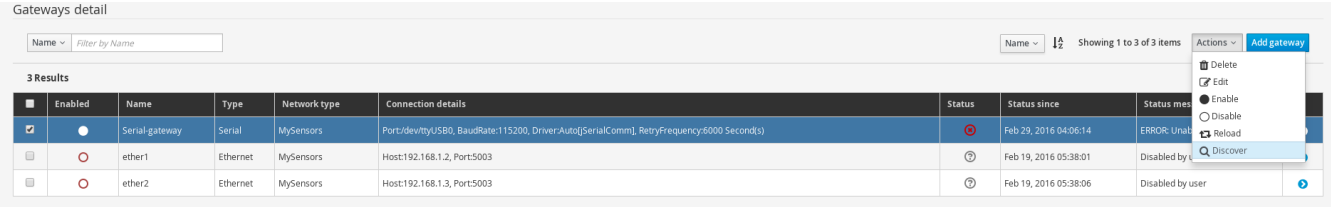
Gateway supports multiple actions. Select an item from the list and choose the desired action.

- `Reload` - reload operation performs stop and start of the gateways.

`Reload` can happen only for enabled gateways.

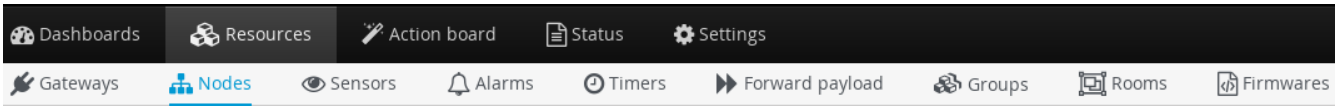
When you delete gateway. All the resources belongs to the gateways will be removed permanently. Always do backup when you perform this kind of operation.

Auto discover



Discovers available nodes on this gateway. Select a gateway, under actions select `Discover`. If your gateways supports discover available nodes will be added automatically.

Node



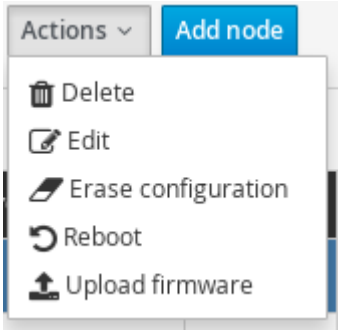
Under this page you can see node information's like, Node EUI(Node Id), Node Name, Node Type, Firmware Version, MySensors Version, Battery Level, Assigned firmware, etc.,

Add manually

Navigate to node page, by clicking 

button you can add new node.

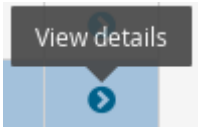
Actions



- `Delete` - delete node
- `Erase configuration` - Ask node to erase complete configuration.
- `Reboot` - reboot the node
- `Upload firmware` - Request node to get firmware update

When you delete a node. All the resources belongs to the node will be removed permanently. Always do backup when you perform this kind of operation.

Node details

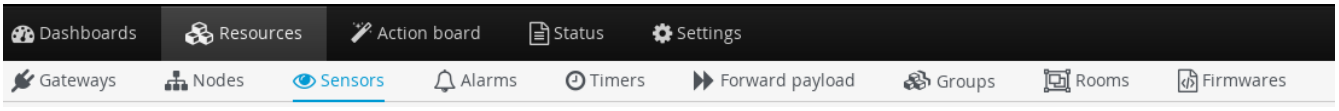
When you click 

icon you will complete node details. includes battery usage report.

Mapping Firmware

Before doing this action, firmware should be added in MyController.org. Refer Firmware section to add new firmware. To update selected firmware in to selected node perform `Reboot` or `Update firmware` action.

Sensors



Navigate to sensors Page. In this page you see sensor details like Gateway Id, Node EUI, Sensor Id, Name, Type, Variable Type, Last seen. You can add, edit and delete sensors from here.

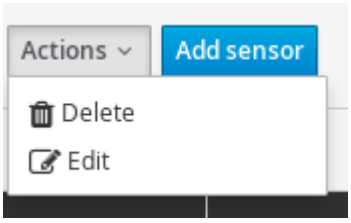
Add sensor

We can add sensors in two methods, via node and manually. If node sends any data related to

sensors and if the sensor detail is not available in MyController.org new sensor will added automatically. To add new sensor manually click on the buttom 

If MyController.org receives any data related to sensor that you have added already will be overwritten.

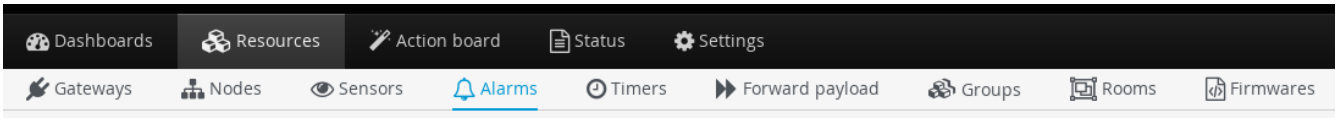
Actions



- `Delete` - delete selected sensor
- `Edit` - edit selected sensor

Deletion sensor will delete all the data relevance to that sensor. We cannot recover it back.

Alarms



Click on the button 

to add new alarm.

- `Name` - name of the alarm definition
- `Enabled` - enable/disable this alarm definition
- `Disable when trigger` - will be disabled automatically when trigger
- `Ignore duplicate` - ignore subsequent triggers. Will trigger again at least condition should not satisfy once.
- `Resource` - Select a resource, Supported resources,
  - `Gateway` - based on gateway status
  - `Node` - based on node status
  - `Sensor variable` - based on sensor variable value
  - `Resources group` - based on resources group status
- `Trigger when` - is a condition.
- `Dampening` - With dampening feature we can control trigger further. Types,
  - `None` - dampening option disabled

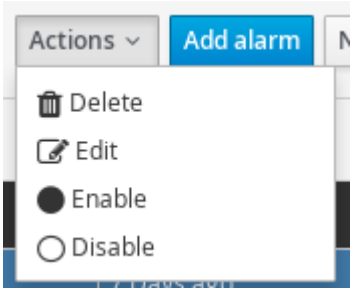
- `Consecutive` - If the condition satisfies continuously for N occurrences.
- `Last N evaluations` - If the condition mets N occurrences in X evaluations.
- `Active time` - If the condition stays active in the specified time.

- `Notifications` - We can add any number of notifications for a alarm definition.

For `Gateway` and `Node` operations will be monitored every 30 seconds once. Changes will not reflect immediately in alarm. It take maximum of 30 seconds.

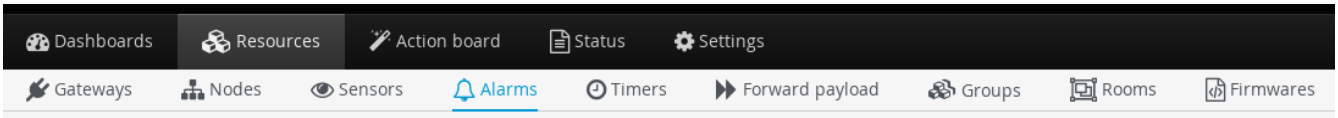
For ON/OFF device `0` and `1` should be a threshold value. If you enter ON or OFF will treat as string and it never fire.

Actions



- `Enable` - enable selected items
- `Disable` - disable selected items
- `Delete` - delete selected item

Notifications



Navigate to alarm page and click on 

button.

Add notifications

To add new notification click on the button 

- `Name` - name of the notification
- `Enabled` - enable/disable notification.
- `Public access` - allow to use other users
- `Type` - type of notification
  - `Send payload` - Do resource operations.

- `Send SMS` - send SMS
- `Send email` - send email
- `Pushbullet note` - send pushbullet note

Send payload

- Select resource and update payload
- `delay time in seconds` update this field with delay time. Using this option payload will send to the resource after x seconds of delay. If you do not want delay leave this field as blank.
- on the payload you can use `Special operations`. Refer Special operations section for further details.

Send SMS

For SMS we can use Plivo or Twilio vendors. When you create trail account you will get some credit. To use SMS notifications you should configure either Plivo or Twilio SMS API settings under "Settings-→Notifications-→SMS.

- `Phone numbers` - Give destination numbers with '+' with country code then mobile number without any space. If you want to give more than one number use comma(,)
- `Custom message` - If you leave this field blank, default message will be generated. You can apply `keys` for this filed.

Send email

To send email, SMTP email settings should be configured under "Settings-→Notifications-→Email"

- `Subject` - subject of this email. Mandatory field. You can apply `keys` for this filed.
- `Email(s)` - list of email address with comma(,) separated.

Pushbullet note

To send pushbullet note, Pushbullet settings should be configured under "Settings-→Notifications-→Pushbullet"

- `Devices` - comma(,) separated device `iden`. If you leave blank will send to all the devices.
- `Title` - Title of the pushbullet note. You can apply `keys` for this filed.
- `Custom message` - You can add your own custom message. If you leave this field blank default message will be taken. You can apply `keys` for this filed.

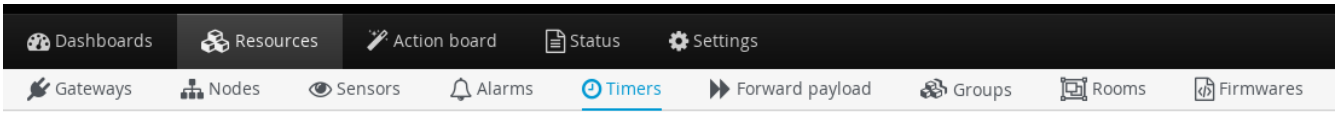
Notification supports custom messages. You can use the following keys on your message. This key will be replaced with real values. Example: "Alarm `${aName}` triggered."

When a notifications is in disabled state. Even alarm triggers with this notification. Notification will not be executed.

Supported keys on message

- `${aName}` - Alarm definition name
- `${aResource}` - Resource name in alarm definition condition
- `${aCondition}` - Alarm condition details
- `${aValue}` - Actual value of the resource at the time of trigger
- `${aTriggeredAt}` - Alarm triggered time
- `${notificationName}` - Notification name

Timers

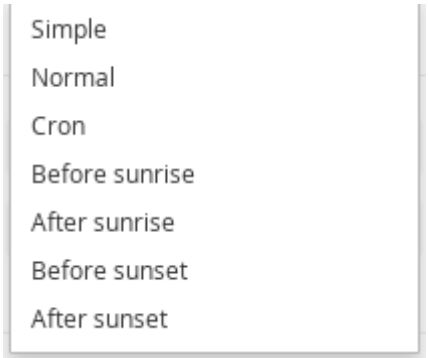


With the timer you can schedule timely operations for `Gateways`, `Nodes`, `Sensor variables`, `Resources group`, `Alarm definition` and `Timer`. Different types of timers are supported by MyController.org. You can schedule a timer till seconds. Means you can schedule a task for time `21:45:23` like that. By Clicking button 

you will be taken to add timer page.

- `Name` - name of the timer
- `Enabled` - enable/disable the timer
- `Timer type` - type of the timer
- `Resource` - do action on this resource
- `Validity` - validity of the timer. If you leave blank never get expired.

Timer types



Simple

Simple timer operates with `Repeat interval` and `Repeat count`. Specify repeat interval in seconds. If you want to run this job count less specify `Repeact count` as `-1`

Normal

Normal is a very basic and classic timer. You can select "Normal" in the type drop down.

Cron

Cron is for advanced users. It is simple and easy. After selected "Cron" if you put cursor on cron expression text box, you will get pop-up with detailed tips. Here we are using quartz-scheduler cron tab, visit Quartz-Scheduler page for further detailed configuration

Quartz-Scheduler cron supports from seconds.

Before Sunrise, After Sunrise, Before Sunset and After Sunset

If your task based on Sunrise and Sunset you have to go with this option. Say you want to control your garden light based on your sun rise and sun set time. You can use this option. You can specify time offset.

Frequency

3 types of frequencies supported by MyController.org

1. Daily – you can select all the 7 days or day(s) only you want to run
2. Weekly – Select a day in week
3. Monthly – Select a day in month

Time

Time format: `HH:mm:ss`

`HH` – hour in 24 hours format (0~23)

`mm` – minutes (0~59)

`ss` – seconds (0~59)

For sunrise and sunset options "Time" will react differently. If you select After Sunrise and After Sunset time will be added with "Time" mentioned in task + "Sunrise" or "Sunset" time. If you select "Before Sunrise or Before Sunset" "Time" mentioned in task will be subtracted from actual "Sunrise or Sunset" time.

Payload

Set payload for that timer. When your timer triggers payload entered here will sent to selected resource. Payload supports special operations also, have look for detailed information of `Special operations`

Validity

You may feel you do not want to run this job all the time and want to run only on particular

window period. In that case you can select validity. You can select "Validity From" and "Validity To" or only either or nothing. If you do not select any validity that job will be treating like never end. If you select only "Validity From" job will run from that date and never end. If you select only "Validity To" that job will start immediately and will end on the specified date.

Special operations

While defining payload you can assign following special operations, All the special operation reads last received/sent value from target senor and doing this operation on top of that value and sends to target sensor.

Toggle

By assigning the value: `Toggle` You can select this operation. It is doing toggle operation. This will be useful for 'BINARY' devices. For example if switch is `ON` it will be turned `OFF` vise versa.

Increment

By assigning the value: `++` You can select this operation. Adding 1 with the value. Example: last rx/tx value is 45, on resulting this operation will send 46 to target sensor.

Decrement

By assigning the value: `--` You can select this operation. Subtracting 1 with the value. Example: last rx/tx value is 45, on resulting this operation will send 44 to target sensor.

Addition

By assigning the value: `+3` You can select this operation. Here + meant for addition and 3 is the value should add. Example: last rx/tx value is 45, on resulting this operation will send 48 to target sensor.

Subtraction

By assigning the value: `-4` You can select this operation. Here - meant for addition and 3 is the value should add. Example: last rx/tx value is 45, on resulting this operation will send 48 to target sensor.

Multiplication

By assigning the value: `*2` You can select this operation. Here * meant for multiplication and 2 is the value should multiple. Example: last rx/tx value is 45, on resulting this operation will send 90 to target sensor.

Division

By assigning the value: `/3` You can select this operation. Here / meant for division and 3 is the value should divide by. Example: last rx/tx value is 45, on resulting this operation will send 15 to target sensor.

Modulus

By assigning the value: `%4` You can select this operation. Here % meant for modulus and 3 is the value used for modulus. Example: last rx/tx value is 45, on resulting this operation will send 1 to target sensor.

Reboot

By assigning the value: `reboot` You can select this operation. On this operation target node will be rebooted.

Reload

By assigning the value: `reload` You can select this operation. On this operation target resource will be rebooted.

Enable

By assigning the value: `enable` You can select this operation. On this operation target resource will be enabled.

Disabled

By assigning the value: `disable` You can select this operation. On this operation target resource will be disabled.

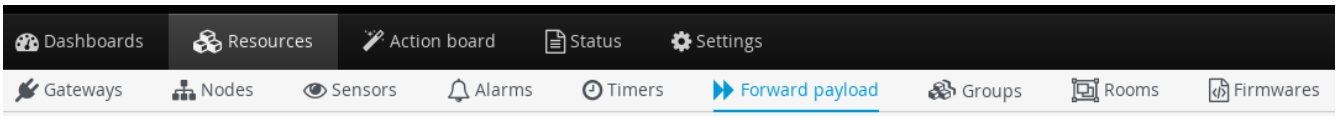
ON

By assigning the value: `ON` You can select this operation. On this operation target resource will be ON.

OFF

By assigning the value: `OFF` You can select this operation. On this operation target resource will be OFF.

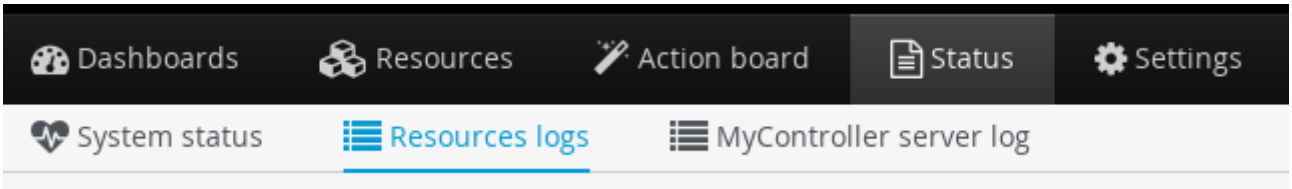
Forward Payload



You can forward the data received by this sensor to another sensor directly without any condition. This will be useful when you want to send your sensor data to multiple sensors. No need to do any code change on sensor side. Simply add an entry in MyController.org and be happy, MyController.org will take care.

This operation supported across gateways too.

Resources logs



In this page you can understand whats going on about a particular resource.

STAY TUNED... DOCUMENTS WILL BE UPDATED DAY BY DAY

Source Code

MyController.org is an Open Source project. You can contribute/download source code on Github repository

Issue management

Are you facing issue? Wan to file new feature request? Want to give ideas? You are welcome to Github Issues page

License

Apache License version 2.0

```
                    Apache License
              Version 2.0, January 2004
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