

Home Automation: User defined rules to give simple appliances complex behaviours – Appendix C: User Manual

This manual will explain how to set up the server and use the application.

Set up the server

To set up the server, simply download the RaspberryPi Server file from the git repository. Then run the 'Server.py' file found within this file in the RaspberryPi Server via the terminal. The Raspberry Pi server will require a copy of Python 3 to be able to run the server.

Connecting to the server via the application

To use the application, the phone must have Bluetooth turned on. The first step when opening the application is to connect to the server using Bluetooth. To do this, press the 'Scan' button in the 'Bluetooth' view of the application (Figure 1). This will scan for all nearby Bluetooth devices. Connect to the server by pressing the server device in the list. If the server device is not showing up, it may be because the phone is not within range, or because either the server or mobile phone does not have Bluetooth turned on. You will know the device has connected successfully when the status bar at the top of the screen turns green. If the Pi has the Bluetooth on but is not running the server script, the device will show up in the list on the mobile application, but you will not be able to successfully connect to it. If this happens, ensure that the server code is running and try again.

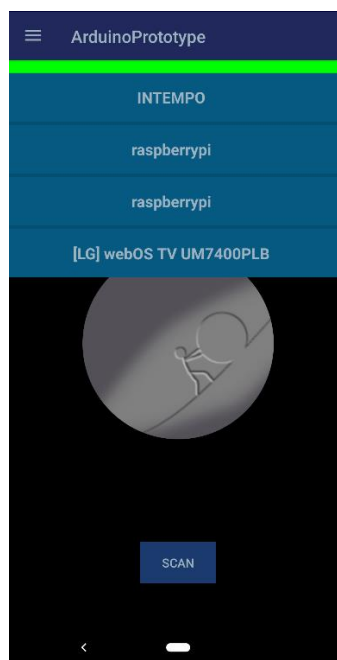


Figure 1) Bluetooth view with connection

Using the application

Once connected to the server, you will be able to use the other screens in the application. The navigation menu can be accessed by swiping to the right, or pressing the icon in the top left corner of the app. This can be used to move to other parts of the app.

The 'Sensors' view (Figure 2) contains a list of all sensors connected to the server and lists their last readings and the times of the readings. This can help you see if all sensors are operating as they should be, as they should be updating approximately every minute. The sensor list must be updated by pressing the 'Get' button found in the sensor screen.

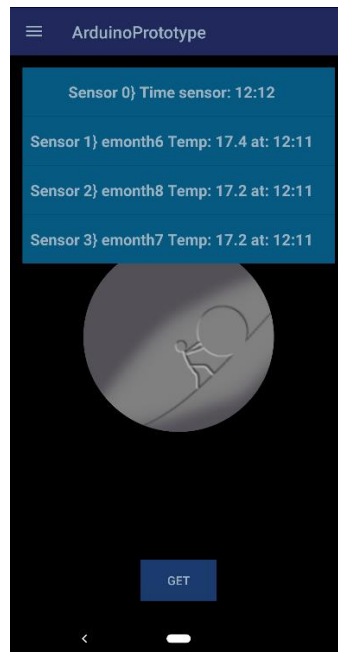


Figure 2) Sensor view

The 'Devices' view contains a list of devices in the system and controls to turn them on or off. The current device list can be retrieved by pressing 'Get' at the bottom of the screen. This will show the devices and their last estimated states. The state of the devices is not guaranteed to be the estimated state in the application as the devices can be switched off at the wall or may not 'hear' commands sent from the server. To turn a device on, press the 'On/Off' button in the bottom left of the screen so that it is green and says 'On' (Figure 3) and then press the desired device/s in the list to switch them on. To turn a device off, repeat this step but whilst the 'On/Off' button is red and says 'Off' (Figure 4). Pressing 'Get' will update the list and states, so you can see if the command has been sent.

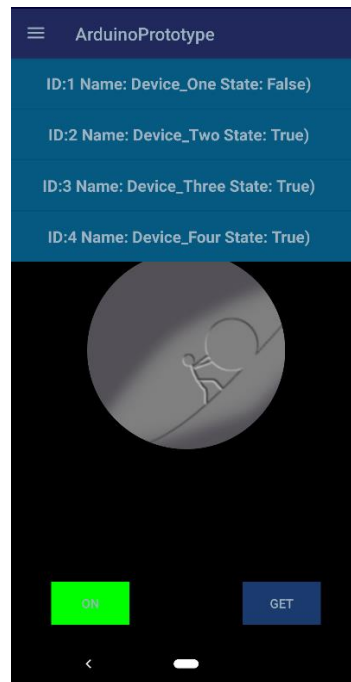


Figure 3) Device view with 'On' selected

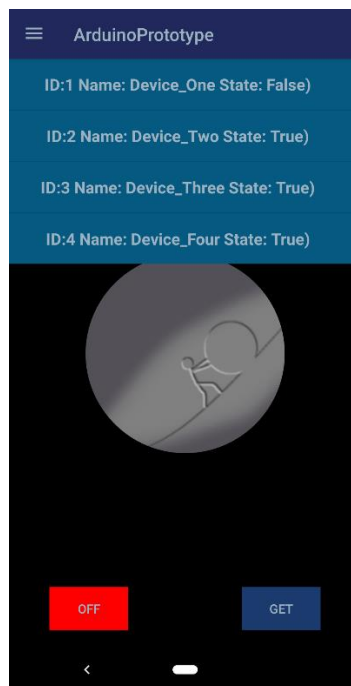


Figure 4) Device view with 'Off' selected

The 'Rules' view (Figure 5) contains the list of user-created rules on the server and controls to create or delete rules. Press the 'Get' button to retrieve this list from the server. To delete a rule, press the 'Delete' button in the bottom left of the screen so it turns green and then press the rules in the list that you wish to delete. Press the 'Delete' button to switch off the delete mode. Retrieve the rule list again by pressing the 'Get' button again to check that the rules have successfully been deleted.

Warning: Deletes cannot be undone, so any rules accidentally deleted will have to be created again.

To create a new rule, press the 'New Rule' button in the bottom left of the 'Rules' view. This will take you to the 'Add Rule' view (Figure 6). Each created rule can only control one device.

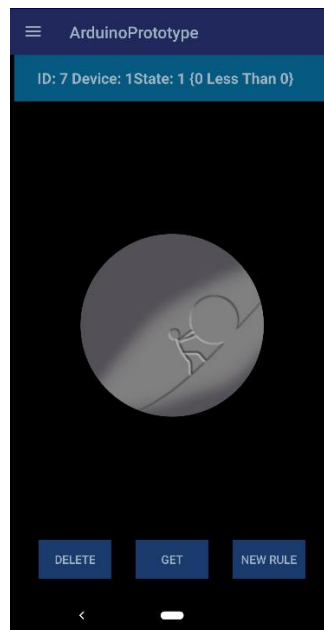


Figure 5) Rule view

To create a rule, first select which device you wish to control from the list of devices. Next, select which state you would like this device to turn to by pressing the 'State' button, either 'On' or 'Off'. The type of rule can be selected using the list under the device list. This can be either using temperature or time. Selecting temperature will use a sensor to trigger the rule, whereas using time will trigger the rule at a certain time of day.

To create a temperature rule, the sensor that will act as the trigger must be chosen from the sensor list. The operator should also be chosen from the operator list. This can be less than, equals, or greater than. The value at which the rule should trigger should also be input in the value box.

To create a time rule, follow the same steps as temperature but no sensor needs to be selected as the rule will use time, not sensor readings. To choose the time that the rule triggers at, press the value box. This will bring up a clock in which a time can be chosen by moving the hands to the desired places.

When you have selected all the appropriate fields and are ready to add the rule, you **must press the 'Add' button before the 'Send' button**. Pressing the 'Add' button appends the rule just created to the rule to be sent to the server. The rule can be seen in the rule text. At this point, you can now add a new part to the rule or send the rule to the server to be added.

To add a new part, simply repeat the steps above before pressing 'Send' and choose a connector from the connectors list to join the two rules together. This can be 'And', 'Or', or 'Not'. An 'And' requires all parts of the rule to be true before it triggers. An 'Or' requires only one part to be true. A 'Not' will trigger when the new part is not true. **Again, the 'Add' button must be pressed to add the new rule part to the rule before sending it.**

To send the rule, press the 'Send' button when you are satisfied with the rule displayed in the rule text. See Figure 7 for an example rule with multiple parts. This will send the rule to the server and add it. It will also reset the 'Add Rule' view. To see if the rule has been created successfully, return to

the 'Rule' view and press the 'Get' button to update the list. The new rule should be added to the list. Figure 8 shows the example rule added to the rule list.

To clear a rule and restart, simply press the 'Clear' button in the 'Add Rule' view.

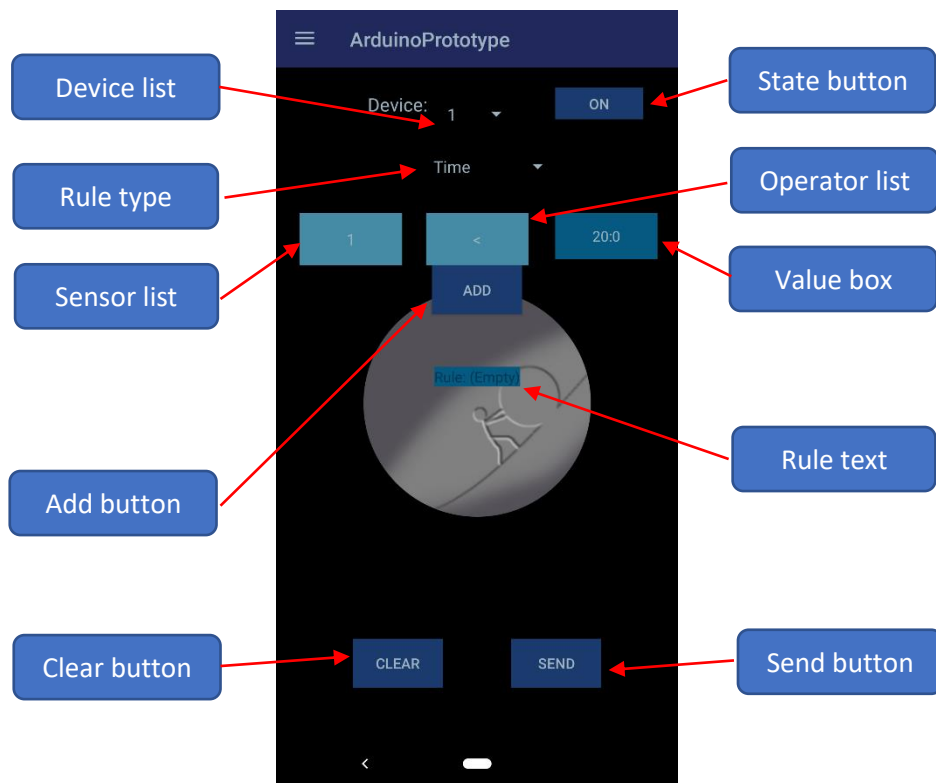


Figure 6) Add Rule view

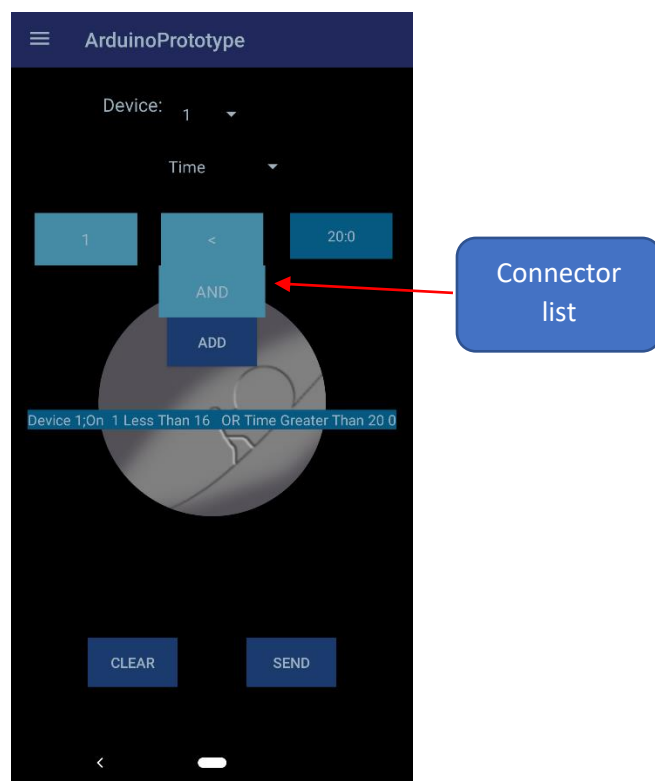


Figure 7) Example rule ready to be sent

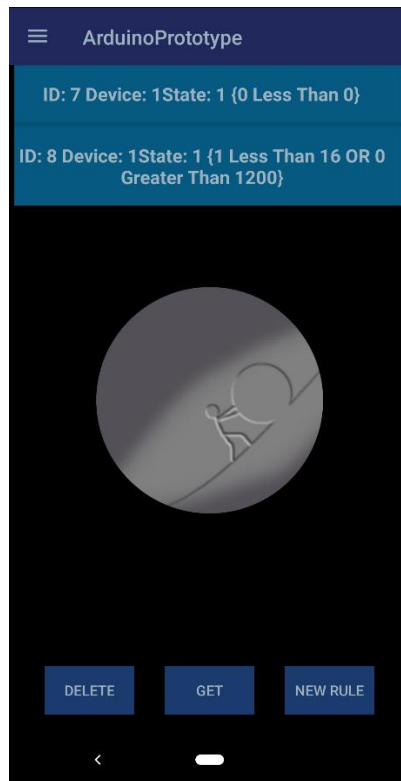


Figure 8) The new rule is added to the rule list

If pressing the 'Get' button in any of the views does not update or retrieve the lists, you may be disconnected from the server. Check your connection by returning to the 'Bluetooth' view and check that the status bar at the top is green.