

DAE Relay Board Application for Android Smart Phones

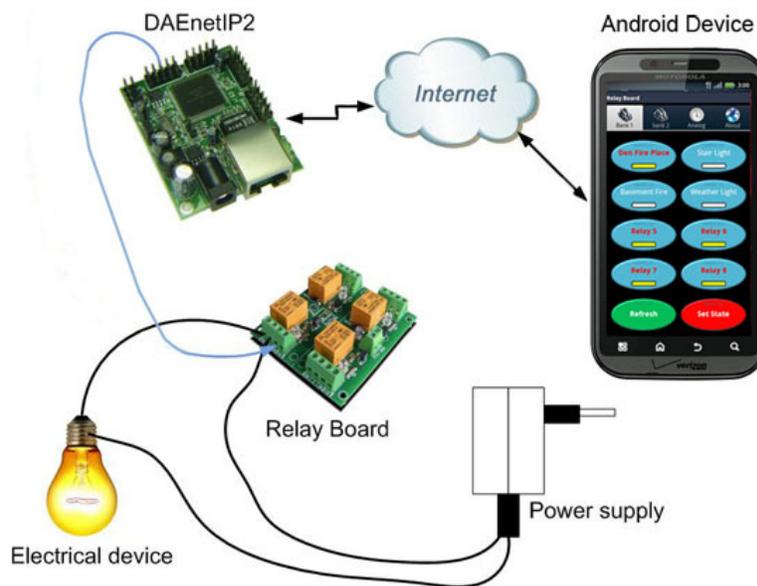
Developed by iSwitch, LLC

January 2012

Overview

The *DAE Relay Board* Application, marketed by iSwitch, LLC, is designed to be a "simple to use" Android application that offers the user mobile control of the DAEnetIP2 controller marketed by Denkovi Assembly Electronics (DAE). DAE manufactures and markets the DAEnetIP2 controller and several relay board configurations at an inexpensive price. In our testing, we have found the controller and boards to be very reliable for our home automation projects.

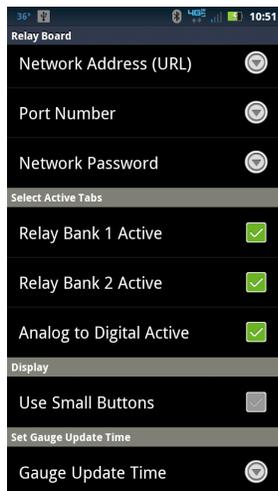
This diagram depicts the solution for mobile control of switches.





A quick setup for the board is covered below. You should be familiar with basic networking concepts and have some understanding of how to configure your router to port forward certain ports to different devices (IP address) on your network. If you are connecting your Android phone via WiFi to your network, then the setup is very simple and this may be the best way to get started.

Application Settings **Quick Setup for the Application**



Network Address – If you are accessing the board on your local network using WiFi from your phone connected to your router, then use the IP address of the board (ex: 192.168.0.10). Remember, if this is your access method, the WiFi connection is the only way you can connect to the board from the Android Smartphone.

If you are connecting across the Internet then this is the URL or Static IP address of the external side of your router (ex url: something.homeip.net). In this case, you must be familiar with configuring the router to port forward the *Port Number (161)* you are using, to the board on the local network side of the router. If you do not have a static IP address, use a dynamic DNS service. There are many free services to choose from and many routers have this service built in, all you need do is set up an account with the provider.

Port Number – It is recommended you not change this from the standard SNMP port 161. If you have a port conflict, then another port can be used.

Network Password – This must match the *“Read-Write Community String”* on the board.

Screens and Operation

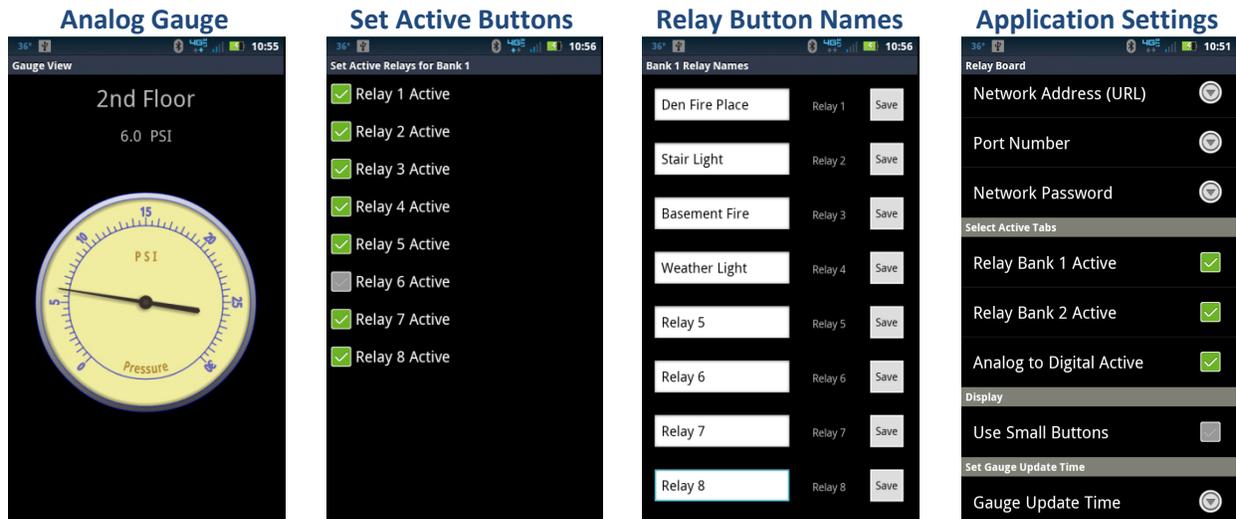
Below are the opening screen shots of each tab in the application. Bank 1 and Bank 2 tabs correspond to the two digital output headers on the DAenetIP2 controller which are normally connected to, up to 16 relays. Each of the 16 buttons can named by the user and if you choose a board with less relays you can simply go to the configuration screens and uncheck the display of all unused Tabs and/or Buttons. To control relays, simply touch the relay buttons you wish to change the state of and touch the “Set State” button to execute the setting. The “Refresh” button will set the buttons to the current relay state. The Refresh button is very helpful if you touch several buttons inadvertently and wish to re-read the current state, or if you have several Smartphones controlling the board, you can check state instantly before making changes.



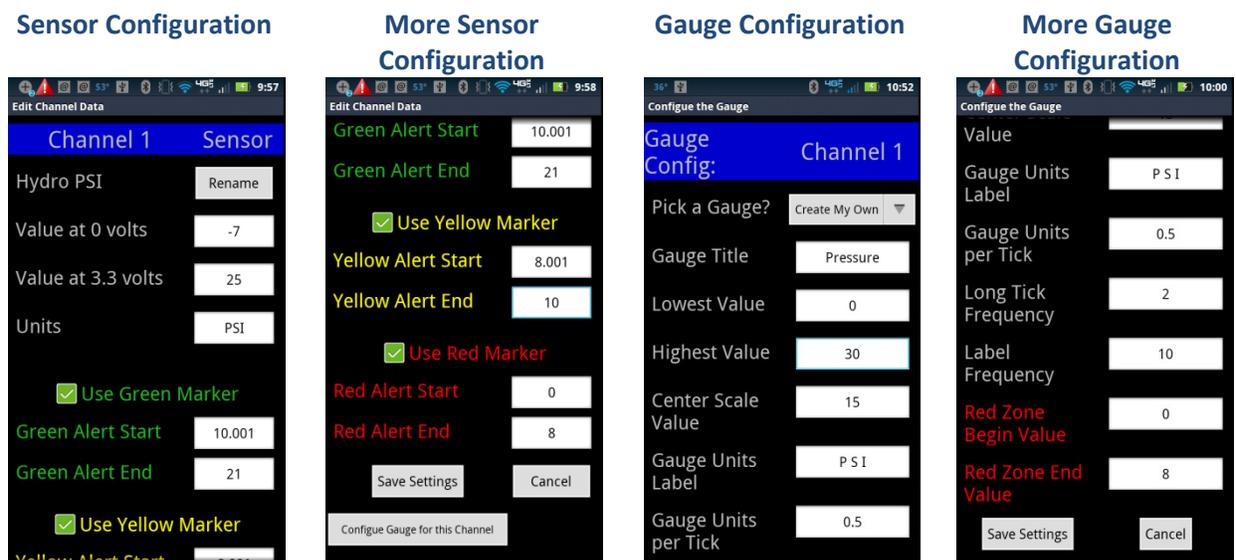
The Analog screen gives access to the 8 *Analog to digital* converter channels on the board. Each read out widget can be named and configured to many different types of sensors. Additionally, there are 3 different background colors which can be used as indicators or alerts based on the current reading of the sensor. Like the buttons, each can be named and unused widgets can be removed from the display.



If you press the widget in the Analog tab, you will be taken to an *Analog Gauge* screen (shown below) that depicts a real gauge for folks who want more ease of use. The gauge has several configurable update frequencies, 6, 8, 12, 30, and 60 seconds. This can give near real time readings if required. Also shown below are the configuration screens to display or remove and name buttons as well as the network and application settings. These screens are accessible from the *About Tab* and then press the menu key and Settings button.



The next set of screens are used to configure the sensors to the *Analog to Digital* converter channels. These screens are accessible by long pressing the widgets on the Analog Tab. Each widget used will require you to configure it to a sensor. See the screens below.





Configuration of Analog Inputs

The table below has a listing of all Sensor configuration parameters with an explanation of what each controls. Sensor configuration can be a bit complicated and may require the user to perform some calculations as sensors have many different ranges. Also you will need to have the documentation for the DAEnetIP2 Controller handy as you mate sensors to the board. *There are electrical requirements that are out of scope of this document.* You will need some electronics knowledge to mate sensors to this board and this must be done correctly or you may damage or destroy the controller. *Please be advised that this is a document to describe the software and NOT the documentation for the DAEnetIP2 Controller.* Please visit the DAE website at www.denkovi.com for the DAEnetIP2controller documentation.

Sensor Configuration Table

| Parameter | Definition |
|--------------------|---|
| Rename | Click this button to rename the channel to the user's desired name |
| Value at 0 Volts | Enter the sensor reading for 0 Volts. Example: a pressure sensor with a range of 0 to 50 psi and that outputs 0 – 5.0 volts over this range would enter a 0 psi reading for 0 volts and, a 33 psi reading for 3.3 volts. (If you use this sensor, you must use a clipping circuit to prevent the voltage from exceeding 3.3 volts or be sure the pressure will never exceed the 33 psi value.) |
| Value at 3.3 Volts | Enter the sensor reading 3.3 Volts. Example: Using a LM34A Temperature sensor with a -50 – 300 °F range the 3.3 volt value might be 280. |
| Units | If pressure, you might enter PSI, if temperature, you might enter °F or °C |
| Use Green Marker | Check if you would like to have the background of the widget changed as an alert to a particular range of sensor values. |
| Green Alert Start | Begin range of the green background. |
| Green Alert End | End range of the green background. |
| Use Yellow Marker | Check if you would like to have the background of the widget changed as an alert to a particular range of sensor values. |
| Yellow Alert Start | Begin range of the yellow background. |
| Yellow Alert End | End range of the yellow background. |
| Use Red Marker | Check if you would like to have the background of the widget changed as an alert to a particular range of sensor values. |
| Red Alert Start | Begin range of the red background. |
| Red Alert End | End range of the red background. |
| Save Settings | Save all sensor data for this channel to the database. |



| | |
|----------------------------------|---|
| Cancel | Do not save changes to the database. |
| Configure Gauge for this Channel | Moves you to the <i>Analog Gauge</i> configuration screen for this channel. |

The Analog Gauge configuration parameters can be a little complicated to get a feel for and may require some trial and error. Once the user gets a feel, gauges for all sensors and situations can be created. There are several gauge configurations the user can pick from to get started and then modify the settings as needed to create the desired gauge. Below are the descriptions of each gauge configuration parameter.

Analog Gauge Configuration

| Parameter | Definition |
|----------------------|---|
| Pick a Gauge | There are several pre-defined gauges that should meet many users' needs. |
| Gauge Title | The User name for the channel – ex: Utility Temp., Pump Pressure, Outdoor Humidity, etc. |
| Lowest Value | Lowest value for the gauge units. Ex: for a 0 – 30 psi pressure gauge , use 0 for Lowest and 30 for highest |
| Highest Value | Highest value for the gauge units. Ex: for a 60 – 120 °F temperature gauge , use 60 for Lowest and 120 for highest |
| Center Scale Value | This value is very important for the orientation of the gauge scale. The value here is usually half of the gauge range and must be an integer. In the examples above, for the pressure gauge, you best use 15. For the temperature, best use 90. The gauge will place this value at the top of the graphic. |
| Gauge Units Label | Gauge Units – ex: PSI, °F, °C, etc. |
| Gauge Units per Tick | Number of units each tick on the gauge represents. |
| Long Tick Frequency | Number of Unit Ticks for a Long Tick. Ex: Unit ticks may be 1 tick per psi for a pressure gauge. The Long Tick may be 5 Unit Ticks, thus showing a long Tick on each 5 psi interval. |
| Label Frequency | Interval for placing gauge unit numbers on the gauge. |
| Red Zone Begin Value | Unit value to begin the red marker. |
| Red Zone End Value | Unit value to end the red marker. |
| Save Settings | Saves gauge to database. |
| Cancel | Does not save changes to database. |



iSwitch, LLC

"Saving the world's energy, one watt at a time."



Hope you enjoy using this Android application and, let us know your suggestions for improvements or any feedback you may have. Please visit our website often to see what's new!

www.iSwitchLLC.com