Welfare Monitor

User Manual Ver 1.0

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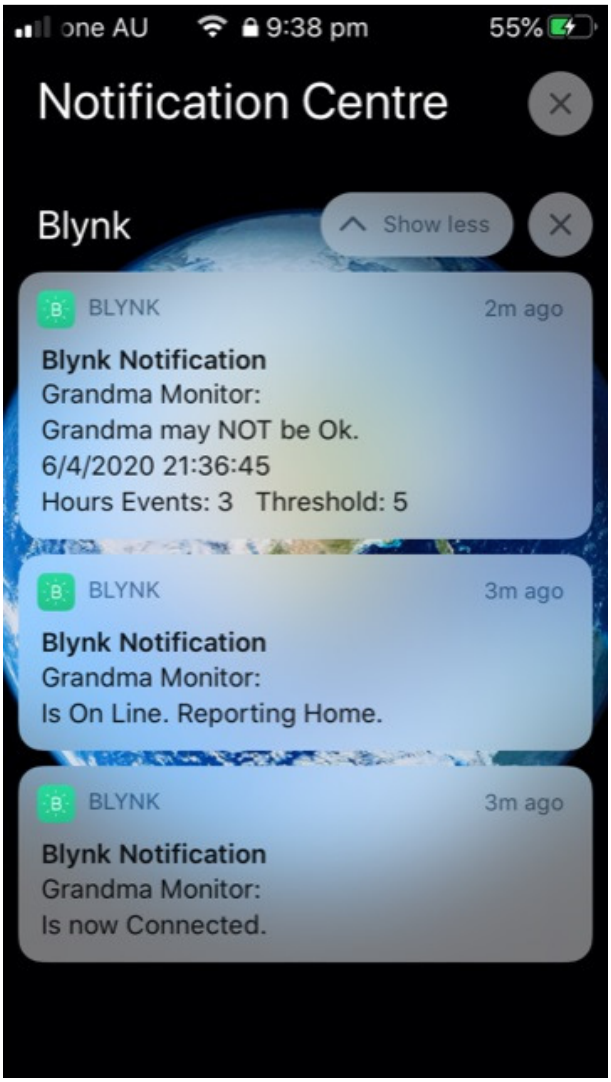
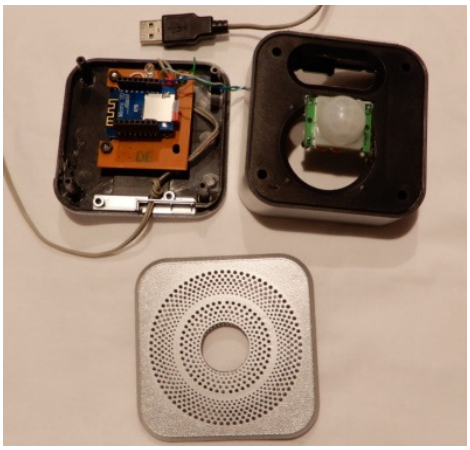


Contents

1. Conditions of use

These instructions and the software are provided without any assurance that they are fit for purpose or are completely accurate. Any person using these instructions does so at their own risk. The Author shall not be responsible in any way for the consequences of use nor if there is any loss arising. The Author's prototype is a Beta test unit that has not undergone full in service testing. Consequently, there will be bugs and problems that are apparent over time. If these conditions are not accepted then use is prohibited. E&OE.



2. Introduction

With the current Social Isolation arrangements, I needed a device that could monitor the welfare of a senior family member living alone to supplement the regular keep in touch phone calls.
This device provides the ability to remotely monitor and report the hourly movement activity. A smart phone notification message is sent if movement is below a threshold for defined active hours. Movement events are recorded hourly to A SD card and can be reviewed to establish normal activity patterns and thus identify any significant changes to activity.

The Hardware:
The Welfare Monitor comprise a passive infrared sensor (Jaycar XC4444), an ESP8266 WiFi module (Jaycar XC3802 or WeMos D1 mini) a micro SD card shield (Jaycar XC3852) and very few other components. The wiring is elementary as the SD shield plugs into the ESP8266 module.
The unit connects to an available WiFi network and uses the Blynk IoT application that will work on most smart devices wherever an Internet connection is available.

2.1 How it Works.

The PIR senses movement with the output going high on digital input pin D1 of the ESP8266. The ESP8266 connects to your WiFi network to allow remote monitoring. Events are counted per hour and if the number is less than a pre-set value between certain hours, a notification is sent to a remote smart device operated by a family member. Thus alerted, the family can contact the senior by phone or visit or alert a neighbour. The total movement events per hour are logged to a SD card file that can be reviewed on line and graphed for the current or any prior day.
The Led is flashed briefly when movement is detected and when the PIR re-sets after the timeout delay. The PIR module operates from 5V but has a 3.3V regulator on board and gives 3.3v output for compatibility with the ESP8266. The PIR time out pot should be set to about 10 seconds and the sensitivity pot to about midrange. The SD card uses the SPI interface pins and the other input/output pins are selected to avoid any pulled down pins at boot that would put the ESP into flash mode rather than normal boot.

2.2 The Monitoring Device

The remote smart device runs the Blynk IoT platform with a basic software interface comprising a main Terminal screen with RTC and Notification Widgets, two Value Displays, two Tabs and five Buttons to disable and re-enable notifications if the senior is temporarily absent from home. The second screen has a chart that plots total and daily movement events against time. The hardware can be mounted in a small enclosure such as a portable speaker. Power is supplied from a 5V 1A USB output plug pack.

If the available internet service has limited monthly data allowance then a limited data option can be set that activates the WiFi connection only for a 90 second period if an alarm message is required and also once a day when a status message is sent that confirms the system is functional and allows the remote user to interrogate the hourly movement events for the day. If the ISP data plan is generous or unlimited then this option can be turned off and the unit is continuously connected
The terminal screen understands a number of key words such as ‘H’ to show the Help, ‘S’ for Settings, ‘L’ for the hourly Event Log, ‘ST’ for statistics of the previous 35 days events and more. If the senior is to be absent from home, notifications can be temporarily turned off for a number of hours off using pre-set buttons or for longer times in the modify settings option. There is also an hourly Blackout option to cease notifications for individual hours. This is useful if the senior takes a regular daily afternoon nap resulting in gaps in movement throughout the day.

2.3 Configuration

A web page based configuration is provided on first boot up after initially loading the software sketch that permits selection of an existing WiFi network, the network Password, the Blynk Authorisation Token and the text for two notification messages (The monitored person’s Name and a ‘Not OK’ message.) This feature means that the WiFi and Blynk connection parameters do not have to be hard coded into the sketch and the unit can be re-configured without re-flashing the ESP8266.

The settings are then saved to EEPROM and are loaded on boot up. Other settings are changed using the modify settings option in the terminal screen.

See the user manual titled “Welfare Monitor Manual.doc” for more details of installing, setting up and using the Welfare Monitor.

A QR Code is provided to quickly re-create a copy of the Blynk Project. If you have Blynk already on your smart device, open the app, log in, create a new project then tap on the QR Code icon next to the Info icon at the top right of the project page and scan the QR Code for this project using the device camera. The QR Code can also be downloaded from Silicon Chip website along with the software for the ESP8266. All the sketch files need to be copied into a new folder in your Arduino sketch folder. I suggest naming it “Welfare_Monitor”. I have used the IDE tab system for each function other that the declarations, setup (), loop () and Blynk () functions. This makes it so much easier to find and modify segments of code or to re-use code by copy and paste into new projects.

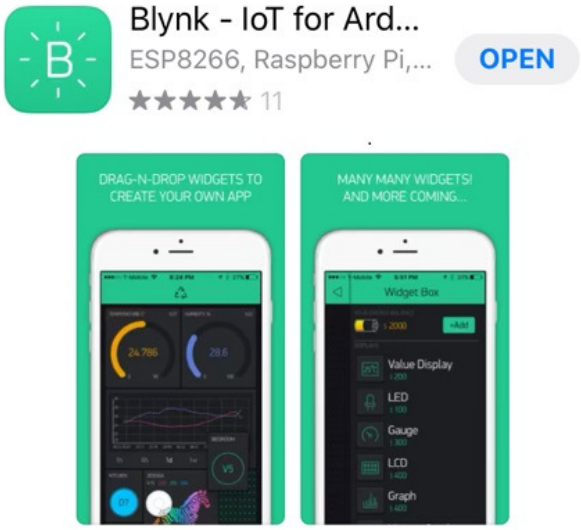
3. Software Installation

3.1 Install Blynk and the Project on your Smart Device.

- Print a copy of the Project QR code from this document or the QR Code image included in the Silicon chip download. Alternatively have this QR code open on the screen of a second device so that it can be scanned by the camera on the smart device being set up with Blynk.

- If you don't have Blynk installed, Open the Android Play Store or Apple App Store on your smart device.

  Search for Blynk in the Apps section.



- Download and Open Blynk.
  Click on the Create New Account Icon and complete the required details.
- When logged on to Blynk the New Project page should appear.
- Tap on the QR code icon at the top right and use your inbuilt camera to scan the QR code previously printed or on another screen.
- An exact copy of the Blynk project should appear on your device.
- Tap in the middle of the screen to open the project in Design Mode
- Tap on the Nut icon at the top right to open the Project Settings.
- Look for the Auth Token (may need to scroll) as you will need it for the Welfare Monitor Configuration.
- Then either email it or copy it to the clip board by tapping on the copy link (Android) or tapping on the token itself (Apple)

- Blynk may automatically email your Auth Token when a new Project is created.

TIP: Copy to clipboard as this will allow you to paste the Token easily into the Welfare Monitor Config page later and you will have an online record as well.

3.2 Install Arduino IDE on Your Computer

I you haven't already, you will need to install the Arduino Integrated Development Environment so that you can flash the ESP8266 as follows:

- Do a web search for Arduino Download. Click on the arduino.cc link and find the installer for your computer.
- Download the installer, run it to install the Arduino IDE (Integrated Development Environment).
- Click on the Arduino desktop icon to run the IDE.

3.3 ESP8266 Boards Library Installation

- Click on the Arduino desktop icon to run the IDE.
- In the IDE, Open the File Menu then Preferences.
- In the Additional Boards manager URLs, add the following line including the quotes "http://arduinoesp8266.com/stable/package_esp8266.com_index.json" and then click OK and then OK again to close the file Menu window.
- TIP: to the right of the text box is a window button. Click it to open a larger text entry box. Make sure that the URL is on a line of its own.
- Got to Tools, Board, Boards:, Boards Manager, type ESP8266 if its installed then OK if not install it when it appears (ESP8266 by ESP Community..). See Tip Below.
- When finished click OK. Go to Tools, Board, scroll down and select your ESP module (eg WeMos D1 Mini)

TIP: You must use the correct board to match your ESP8266 hardware. I used a WeMos D1 Mini that would not compile with the later versions of the board library that has a Lolin WeMos D1 Mini board listed.
Ver 2.0.0 of the ESP8266 by ESP Community… has the original WeMos D1 Mini and that worked fine for me. If you have problems compiling, then you may have to experiment with board selection.

TIP: To change the version of the installed boards file, go to Tools, Boards: Boards Manager and search for ESP8266. You will see the version installed. Click on the more info link and you will get a drop down list to select the version. Select the version and click install. Click close after completion.

3.4 BLYNK Library Installation

You will need the Blynk library installed in the Arduino IDE as follows:

- Do a web search for Search for 'Blynk GitHub'
- Click on the item "blynkkk/blynk-library: Blynk Library for embedded…."
- When the GitHub page opens, check that it is for the blynkkk/blynk-library and if so, click on the green link on the right hand side labelled clone or download.
- Click on the Download Zip link.
- A zip file will be downloaded usually to your downloads folder. Do not open or uncompress the folder.
- Open the Arduino IDE, select sketch tab, Include Library, Add.Zip Library.
- Navigate to the location where you saved the .Zip downloaded file, select and open it.
- The Blynk libraries will be added to Arduino IDE and a success message should be shown indicating that the Zip library added successfully.

3.5 Arduino Sketch Files Installation

- Open siliconchip.com.au website or the link in the article or;
- Open the Menu: Shop, Software
- In the search text box, Search for Welfare or Welfare Monitor
- Scroll to the Welfare Monitor Project entry and Click on the .Zip file link to download.
- Save the file to the down loads folder or favourite downloads location.
- Create a new folder in your Arduino Folder (Usually User\Documents\Arduino) called Welfare_Monitor or in the location where you keep your Arduino sketches such as Drop Box.
- Unzip the downloaded files into the newly created Arduino folder or other favourite location
- Open the Arduino IDE: Select Menu: File, Open and Navigate to your Welfare_Monitor folder location.
- Open the folder it and select Welfare_Monitor.ino
- Connect the Welfare Monitor to your computer with a USB cable. Make sure you have the correct board selected in Tools as well as the correct Port (Port must be open and ticked in Tools: Port).
- Compile and download it to the ESP8266.

TIP: Sometimes the Sketch compiles, but will not download with an ESP Comms error. Pressing and releasing the reset button on the ESP8266 usually fixes it. Sometimes it is necessary to hold the reset button down until the compiling progress bar (Bottom Right of the IDE) reaches the right hand side and the Uploading prompt is seen.

3.6 Configuring the WiFi, Token and Notifications

This section details the procedure for configuring the Wi-Fi SSID or Network Name, the WiFi Password, the Blynk Authorisation Token and the Notification Texts.

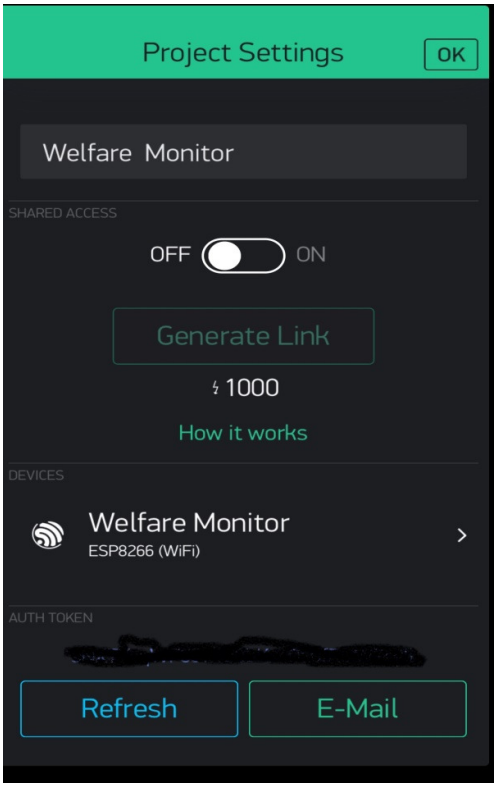
The overview of this process (complete details later) is:

- Get your Blynk Auth Token.
- Set the Welfare Monitor to Config Mode by powering on the unit and observing that the LED is on. If not, press the Config button until the LED is on.
- Go to your smart device WiFi connection screen and connect to the Welfare_Monitor Network. password is 1234wm5678)
- Open a web page at address 192.168.4.1
- Enter your WiFi Network, Password, Auth Token and Notification text in the Web pages
- Finish and switch the Monitor back to WiFi Client mode – Normal Operation.
- Reset your smart device WiFi to your local WiFi network.
- Open Blynk and start using the Welfare Monitor.

Getting the Auth Token

Before starting the configuration procedure you will need to have available your Blynk Authorisation Token for this project. When you created the Project in Blynk, the Auth Token is emailed to you. You can also find it in the screen in Blynk a new Auth Token was generated that must be available to the Arduino Sketch.

- Either open your email and select and paste the Auth Token to the clipboard or
- Open Blynk and navigate to the Welfare Monitor Project Settings screen.
- Tap on the square at the top right to take the project from run mode to design mode.
- Then tap on the Nut icon at the top right and left of the run icon.
- The Auth Token is shown on the displayed page.



TIP: you may need to scroll up to see the token.

Either

- Write it down (very carefully, it is 32 characters) or
- Tap on the E-Mail or Email all button/text to send it to the email registered when you created your Blynk account. or
- Tap on the Token itself or Copy All and this will copy it to the clipboard.

TIP: The clipboard copy method is the best option as it will allow you to paste it directly into the configuration text box required later. If you use the e-Mail method, open the received email and copy the Auth Token to the clipboard.

Return the Project to run Mode by tapping on the Triangle Icon at the top right of the screen.

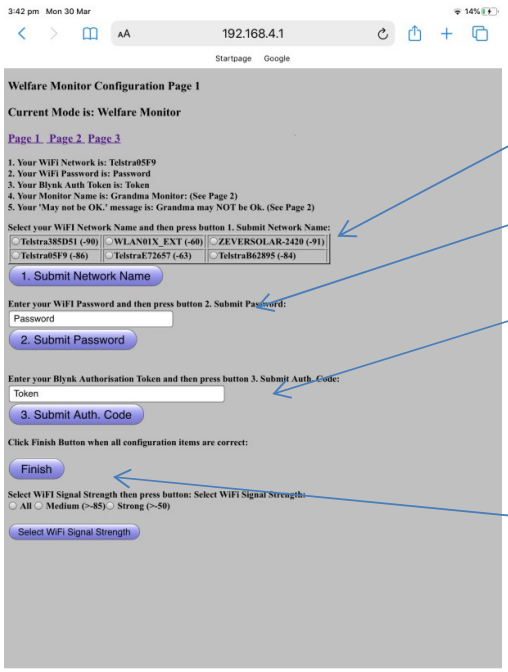
TIP: You may need to return to Project Settings to access the run Icon.

Running the Configuration feature.

To access the configuration feature, follow the following instructions

TIP: The web page configuration screens appear to be formatted OK with larger screen devices. On small screens such as Phone, you may find inconsistent formatting and may have to zoom in on the controls and text boxes to use them.

- After Flashing the Sketch and with the Welfare Monitor unit powered up for the first time, the Unit should start in Config Mode and the LED should be lit. (After the first time, to re-run the Config, press the Config button. This button toggles between normal run mode and Config mode each time it is pressed. The Led is lit when in Config mode. If this does not happen press both the Reset and Config button together for a few seconds and then release the Reset first and then a few seconds later, release the Config button).
- Open WiFi connections on your smart device and look for the Welfare_Monitor SSID.
- Enter the password 1234wm5678.
- Once connected, open a browser and enter 192.168.4.1 in the address bar. Web Page 1 of 3 should appear.



Select WiFi Network (radio button will be shown) then press button
1. Submit Network Name

Enter Password then press button
2. Submit Password

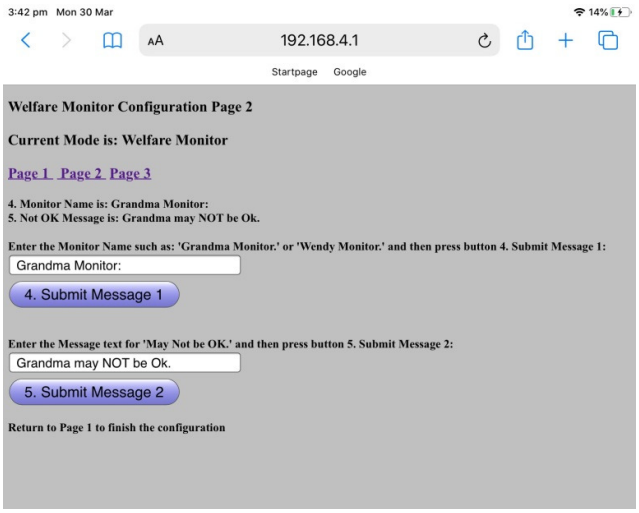
Enter or Paste Auth token then press button
3. Submit Auth Token

Go to Page 2 and enter and submit messages then return to page 1, Check each entry and press Finish button

- Set the SSID of your WiFi network. The networks are scanned by the ESP8266 and displayed with a radio button alongside each. Select the required Network. If selected properly, the associated radio button will be pressed.
- Press the button “1. Submit Network Name”. The screen should re-fresh and your Network Name should appear as Item 1 near the page top. If it doesn’t refresh press the refresh page icon in or near the address bar or repeat item 5 and 6.
- Enter your WiFi password into the WiFi Password text box.
- Press the button “2. Submit Password” The screen should re-fresh and your WiFi Password should appear as Item 2 near the page top. If it doesn’t refresh press the refresh page icon in or near the address bar or repeat item 7 and 8.
- Enter your Blynk Authorisation Token into the text box.
- TIP. Manual entry creates errors. The best method is to paste from the clip board (you should have copied it to the clip board earlier. With IOS, hold your finger on the text box until the options panel appears. Select paste.

- With Android, hold your finger on the Auth. Token text box until either a cut, paste or copy icon appears (or paste button) tap the paste icon or button.
- Press the button “3. Submit Auth Token”. The screen should re-fresh and your Auth. Token should appear as Item 3 near the page top. If it doesn’t refresh press the refresh page icon in or near the address bar or repeat item 9 and 10.

- Press Page 2 link at the top of the page for page 2.



- Enter the Monitored Person’s name or similar in the Message 1 text box. Something like “Grandma’s Monitor:” or “Wendy’s Monitor:”. This is the text that will appear first in any Notifications sent.
- Press the button “4. Submit Message 1”. The screen should re-fresh and your Message 1 should appear as Item 4 near the page top. If it doesn’t refresh press the refresh icon in or near the address bar or repeat item 12 and 13.
- Enter the “Not OK” Message 2 in the text box. Something like “Grandma may not be OK. Please check” may be suitable. This is the text that will appear in the Notifications sent when the events per hour are less than the alarm level.
- Press the button “5. Submit Message 2” The screen should re-fresh and your Message 2 should appear as Item 5 near the page top. If it doesn’t refresh press the refresh icon in or near the address bar or repeat item 14 and 15.
- If all is OK press Page 1 link at the page to return to Page 1.
- Check items 1 to 5 are all Ok then press Finish.
- The screen will attempt to refresh but will not as the unit will switch from Access point mode into Client mode and the Welfare_Monitor WiFi network is switched off.
- Change your WiFi Network on your smart device back to the usual network and open or navigate to the Blynk Welfare Monitor.
- If all is well, you should receive a Blynk Notification confirming that the Monitor is on Line

TIP: In Config mode the LED is on.
TIP: Each time you press a submit button the LED should flash.

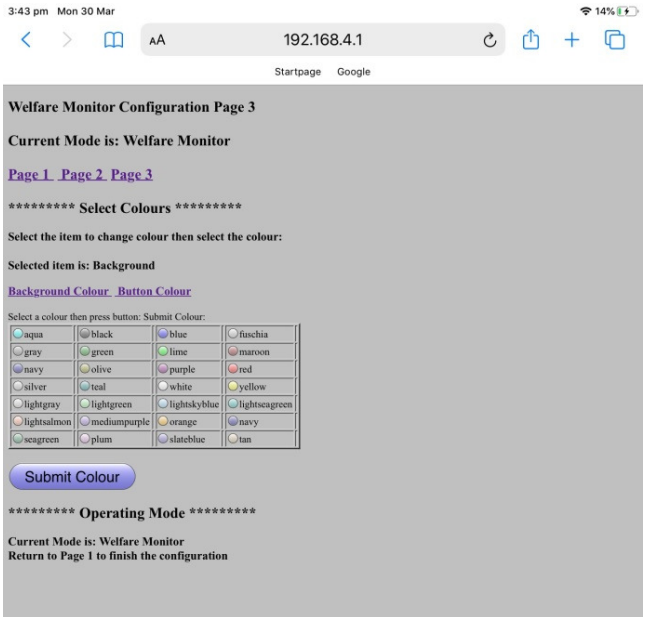
TIP if you cannot get the Welfare Monitor from Config Mode to Normal Mode or from Normal Mode to Config try this:

First Press Config Button.

If not successful then

Press both Reset and Config buttons together and then release the Reset button first and then release Config Button.

There is also a Page 3 that lets you play around with Colours. Why? Because you can!



Explanation of Notification Texts.

The Notification texts are located on Page 2 of the Web Configuration screens.

Message 1 is the text that will identify the name of the Monitor and will appear at the start of each notification message.
For example, if it is for your Grandmother then you may use: “Grandma’s Monitor”
Or if it is for your friend Peter then maybe “Peter’s Monitor”.

Message 2 is the alarm notification text if the movement counts are less than the hourly setting limit.
The message 2 could be: “Grandma may NOT be OK. Please check.”

4 Blynk Screens

Following section shows some of the Blynk screens.

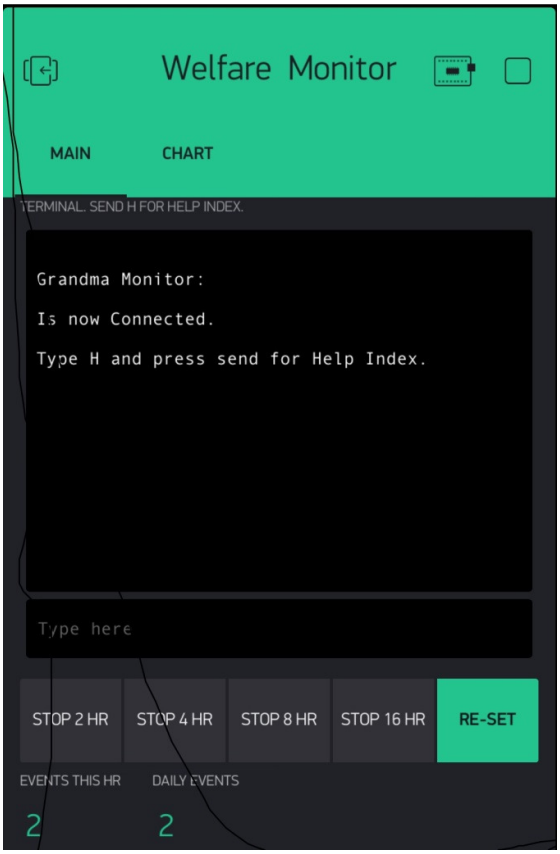
4.1 On Line Screen

On boot up, the Welfare Monitor Screen should show an On Line screen. You should also receive an On Line Notification on your smart device if the boot notification setting is on .

TIP: If you have a Limited Data Plan then immediately got into the Settings Screen. Type S (Where it says Type here) then press send. Modify Item 01 to On by Typing M011 then press send. This will set the Limited Data Plan On setting to On. 90 Seconds after you stop accessing the screens, the unit will disconnect from WiFi and Blynk but will keep on monitoring and recording Events.

If you have a generous plan then set this setting to Off.

At any time if you want to bring the unit back online from disconnection mode, you can press the reset button and the unit will re-boot. Cycling the power will also bring the unit back on line but event data since the last end of hour will be lost.



4.2 The Help Screen

The Help Screen provides an Index to the available screens.

Type the letter indicated in the “Type Here” text box and press send.

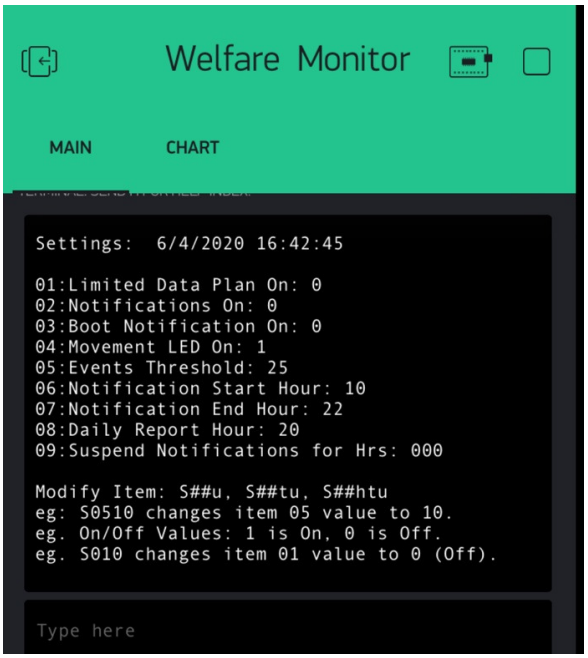
Tap Here to change into Design mode and then tap on the Nut icon to get to Project Settings.

Tap here in the Terminal main panel to close the Keypad. Scroll up or down if the text overflows the screen.

Tap here to open the Keypad. Type the command and then press send.

4.3 The Settings Screen

The settings screen allows on line changes to various settings.



To Modify a setting, Type S##htu send. Where ## is the 2 digit Item number, h is the hundreds value, t is the tens value, u is the units value. Then press send.

Thus the Syntax is:
S##u send if Item value has only 1 digit
S##tu send if Item value has 2 digits
S##htu send if Item has 3 digits

4.4 Explanation of Settings

01: Limited Data Plan On:

This is an On/Off setting 1= On, 0 = Off. Default = 0 (Off).

Setting is 1 (On): Used if the Data Plan is Limited. Actual Data use depends on the frequency of use of the Screens. As a guess, maybe 5 MB per day but I have not tested it. If you have limited data plan and turn this setting off, then monitor your usage closely to avoid excess data charges. I will not be held responsible for excess data use. You have been warned.

When this setting is on, The Welfare Monitor will only connect to the WiFi and Blynk when there is an alarm condition and also when the time of day reaches the Daily Report Hour setting.

An alarm condition is checked each hour and occurs if the previous hour event counts are lower that the Events Threshold setting and the time of Day is between the Notification Start hour and the Notification End Hour.

When the Welfare Monitor connects to Notify an alarm or Daily report in, the unit will stay active for 90 seconds before disconnecting. In this time, any use of the Screens such as Log, Graph etc will re-set the disconnection timeout for a further 90 seconds.

TIP: If set to On, there is no event data transfer to the Blynk server as there is no Internet connection resulting in the Chart function missing data.

Setting is 0 (Off): Used if the Data Plan is generous or unlimited. The Welfare Monitor will stay connected to WiFi and Blynk and re-connect if there is a drop out. This is the most useful arrangement as the monitor can be checked at any time and the Chart data is sent to the Blynk server.

02: Notification On:

This is an On/Off setting 1= On, 0 = Off. Default =1. On.

Setting is 1 (On): An alarm event will send a Notification to all smart devices that have the Welfare Monitor installed and have the same Welfare Monitor Auth Token. (Only between Notification On and Notification Off Hours). Yes, the other members of your family can have concurrent access to the Welfare Monitor. They only need to have a Blynk account (They can share yours but it is not recommended) and have the Blynk Welfare Monitor Project on their smart device, all with the same Auth Token.

Setting is 0 (Off): No Notifications will be sent.

03: Boot Notification On:

This is an On/Off setting 1= On, 0 = Off. Default =1. On.

Setting is 1 (On): A Notification will be sent whenever the device comes On Line. This occurs when the unit is powered and Blynk Connects or after a Reset.

Setting is 0 (Off): There will be no On Line notification.
Irrespective of this setting the Terminal Screen will show an 'On Line' message whenever the device comes on line.

04: Movement LED On:

This is an On/Off setting 1= On, 0 = Off. Default =1. On.

Setting is 1 (On): The LED will flash for a short duration when movement is detected and also when the PIR time out is complete.

Setting is 0 (Off): LED will not flash.

04: Events Threshold:

This is a 2 Digit Setting. 0 to 99 Range. Default =0.

The number of events per hour required to prevent an Alarm Notification.
Or;
The Event per hour threshold which if not exceeded by actual events will generate an alarm Notification.
Note Notifications will only occur between the Notification Start Hour and the Notification End Hour settings.

06: Notifications Start Hour:

This is a 2 Digit Setting. 0 to 23 Range. Default = 8.

The Start Hour when Notifications become active.
This value Cannot be higher than the Notifications end Hour.

Eg. 07 = 7 am. First possible Notification will be at 8am for the events in hour 7 to 8am
Eg. 20 = 8 pm. Last Notification will be at 8pm for the events in hour 7 to 8pm events

07: Notifications End Hour:

This is a 2 Digit Setting. 0 to 23 Range. Default = 20.
The End Hour when Notifications become inactive.
This value cannot be lower than the Notifications Start Hour.
Eg. 10 = 10 am.
Eg. 20 = 8 pm.

08: Daily Report Hour:

This is a 2 Digit Setting. 0 to 23 Range. Default = 20
This is the Hour that the Welfare Monitor sends a daily Notification to confirm that it is operating correctly.
Eg. 21 = 9 pm.

09: Suspend Notifications for Hrs:

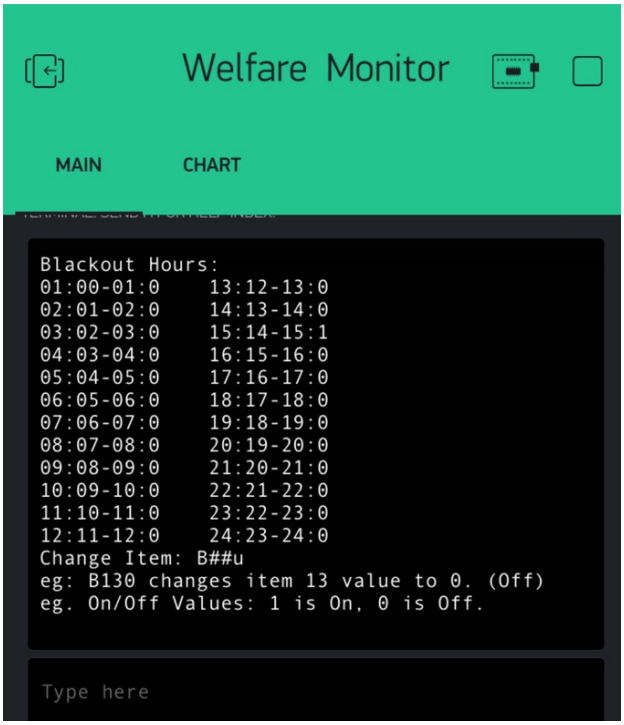
This is a 3 Digit Setting. 0 to 960 Range (up to 40 Days) Default =0.
This is the number of hours for which Notifications are temporarily suspended.

4.5 The Blackout Screen

In addition to being able to set the Start and End Notification Hours, you can also select individual Hours of the day when Notifications will not be sent, called Blackout Hours. For example, the senior might have a nap most afternoons or watch TV in which case there will be few or no movement events during that time and a Notification would be sent.

As Events are totalled through an Hour, the Alarm is sent at the end of the Hour so if you want to Blackout 1pm to 2pm, then set Hour 14 as Blackout On.

Use the command B##U, eg B161 sets the Notifications Off for the Hour before 1600 (3 - 4pm). If Blackout is on for the Hour, Notifications for that Hour are Blacked out and not sent.



4.6 The Log Screen

The Log screen lists the hourly events for the current day. Logs from earlier days can be shown using the command Ld/m/yyyy. Eg for 3rd March 2020 use L3/3/2020 then press send. You can also use the short cut command Ld/m

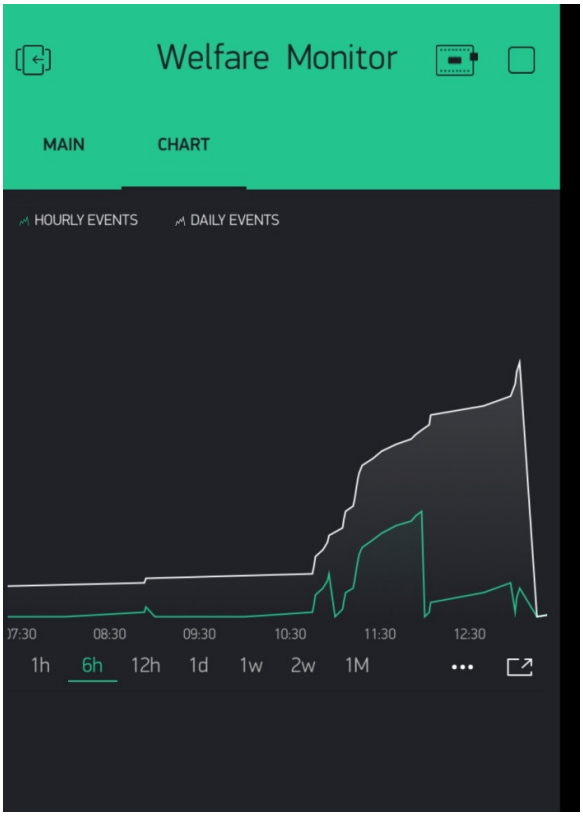
4.7 The Graph Screen

The Graph screen shows a simple view of the Daily Hourly events.

Events from earlier days can be Graphed using the command Gd/m/yyyy. Eg for 3rd March 2020 use G3/3/2020 then press send.

4.8 The Chart Screen

The Chart screen provides a detailed graph of the hourly and daily total events only if Limited Data Plan is Off.



Tap on the CHART Tab to display the Chart screen. Scroll left and right for earlier and later values.
Select the time frame (Live, 1h, 3hr etc)
Hold your finger on the graph line to see the value at that time.
Tap on the … to Erase the Data or export to CSV format (Sent to your Blynk email address)

Tap on the arrow in the window icon (bottom Right corner) to make the graph full screen with full range of X and Y axis values. Tap it again to return to normal size.

Tap on the MAIN Tab to return to the Main screens

4.9 The Full Chart Screen

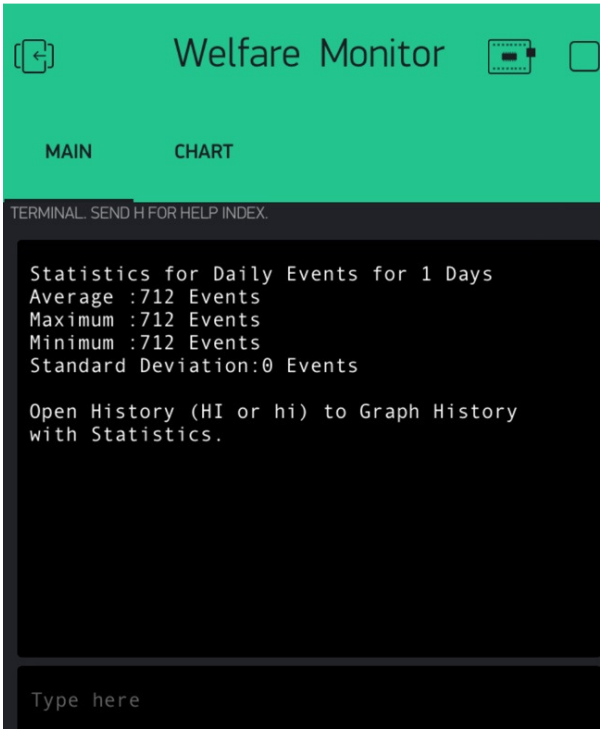
4.10 The Statistics Screen

The Statistics screen shows the following Statistics for Daily Events for the previous 100 days (or fewer days if less data is available):

Average Daily Events.
Maximum Daily Events.
Minimum Daily Events.
Standard Deviation (SD).

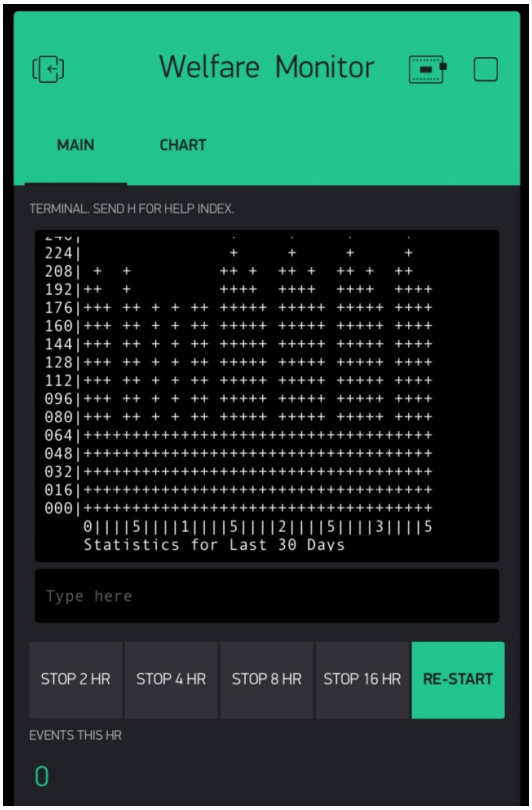
This data can be used to analyse changes in movement activity patterns.

If you now change to the History Screen, by typing HI or hi and send, the Average line is plotted on the History Graph so that you can see the relativity to the most recent Daily Events. The graph is low resolution due to character graphics.



4.11 The History Screen

The History screen shows the daily cumulative event hours for the prior 35 days (or fewer days if less data is available). This screen can be used to identify normal activity patterns and changes over time that may be of concern. A useful practice may be to run the statistics screen at the end of each month and take a screen shot photo on your smart device. This would keep a record of the monthly events and allow month to month comparison. Data shown is test data only.



5. SD Card Information

I have used a 16GB micro SD card.

The Welfare Monitor creates two files as follows:

“WELFLOG.TXT”

This is the Hourly Event data for each day.

File format is:

D/M/YYYY Hr XX - ####
D/M/YYYY Hr XX - ####
etc.

And:

“WELFSTAT.TXT”

This is the Total Event data for each day.

File format is:

D/M/YYYY ####
D/M/YYYY ####
Etc.

Allow the software to create both files. If you create them yourself on your computer, you may find that they cannot be opened by the sketch. I created a test file in Notepad that resulted in read errors when run in the sketch. Later I discovered that there were two seemingly identical “WELFLOG.TXT” files on the SD card (both filename and extension). I deleted both and allowed the sketch to create and modify the files and then all worked correctly. It may have something to do with the encoding system use for SD cards by Arduino.

6. PIR Information

The PIR module uses the BIS0001 chip.

There are four settings:

1. Output pulse high time duration set by a potentiometer. Anti-clockwise for shorter durations. I set mine to about 10 seconds.
2. A short duration pause period at the end of the output pulse before movement will set the output high again. This setting is fixed with resistors on the circuit board.
3. Distance Sensitivity set by a potentiometer. Clockwise for higher distance sensitivity.
4. Retriggerable and Non Retriggerable mode set by jumpers (H or L) or solder pads and connected to Pin 1 of the BIS0001.

   Pin 1 set to supply voltage (High or H) sets Retriggerable mode and means that if movement continues to be detected after triggering, the output stays high for as long as movement continues to be detected (Retriggering).

   Pin 1 set to ground (Low or L) sets Non Retriggerable and means that the output when triggered will stay high only for the time duration of the output pulse, irrespective of movement detected during the output high pulse. (Not Retriggering)

I set the Trigger mode to Retriggerable (H) that gives only one event count until movement stops. Setting to Non Retriggerable may result in many event counts for effectively one movement event.

6. Project Settings in Blynk Design Mode

In the event that you cannot get the QR code to work, the Blynk setup is:

Widget Type	Location	Pin	Label(s)	Comment
Tabs	Main Page	Nil	Tab 1: Main Tab 2: Chart	Tap on + Add Tab to add tab.
Terminal	Main Tab	V0	Terminal. Send H for Help Index	
Segmented Switch	Main Tab	V1	Options(1) Stop 2Hr Options(2) Stop 4Hr Options(3) Stop 8Hr Options(4) Stop 16Hr Options(5) Re-Start	Tap on + Add Option to add Switch Options
Labelled Value	Main Tab	V2	Events this Hr	
Labelled Value	Main Tab	V3	Daily Events	
Notification	Main Tab	Nil		
RTC	Main Tab	Nil	Tap on RTC Icon when in Run Mode to set your Time Zone	
Super Chart	Chart Tab	V2 V3	Data Stream1 : Hourly Events Data Stream2: Daily Events	Tap on + Add DataStream to add a data stream. Give it a label and then tap on the Slider Icon to the Right to Add the Pin number

7. Files

Description	File Names	Comments
Project Description	Welfare_Monitor_Description.pdf	
User Manual	Welfare_Monitor_Manual_Ver1.pdf	This document
Arduino sketch	Welfare_Monitor_Sketch.Zip	
QR Code	Welfare_Monitor_QR_Code.jpg	
Schematic	Welfare_Monitor_Schematic.jpg	

8. Schematic Diagram