



USER'S MANUAL

AlarmBoxApp

Turnkey Instruments Ltd.

July, 2014



**User's Manual
Authorization Memorandum**

I have carefully assessed the User's Manual for AlarmBoxApp. This document has been completed in accordance with the requirements of the Turnkey Instruments Development Methodology.

MANAGEMENT CERTIFICATION - Please check the appropriate statement.

_____ The document is accepted.

_____ The document is accepted pending the changes noted.

_____ The document is not accepted.

We fully accept the changes as needed improvements and authorize initiation of work to proceed. Based on our authority and judgment, the continued operation of this system is authorized.

Mike Leck
Managing Director

DATE

Dave Brooks
General Manager

DATE

Alan Taylor
Director

DATE

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1.0 GENERAL INFORMATION

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1.1 AlarmBoxApp Overview

AlarmBoxApp is an Android application to configure the ‘AlarmBox’ manufactured by Turnkey Instruments, which is programmed via a 9600 Baud USB serial interface, 8 data bits, 1 stop bit, no parity. Readings for the alarm triggers or analogue outputs are obtained from an instrument connected via a second serial TTL or RS485 interface, again set for 9600 Baud 8 data, 1 stop, no parity.

AlarmBox polls the connected instrument for results using a fixed string loaded via the USB interface and at a chosen polling interval. For example, readings obtained from say, an Osiris, could consist of 8 channels (TSP, PM10, PM2.5, PM1, WS, WD, T, RH). Each channel also has an associated scale factor and offset to convert the polled data to the same engineering units shown on the instrument display.

1.2 Authorized Use Permission

Usage of this application is limited to its owner via the terms of its development. AlarmBoxApp is wholly owned by Turnkey Instruments Ltd. and may not be updated or amended without their express consent.

1.3 Points of Contact

For additional information and/or support Turnkey Instruments Ltd. can be contacted via email techsupport@turnkey-instruments.com or phone (+44) 1606 812 666.

1.4 Organization of the Manual

Section 2 describes the system architecture of the application including the data flow and the user access levels. Section 3 explains usage of this application in details with the help of screenshots.

2.0 SYSTEM SUMMARY

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AlarmBoxApp is an Android application to configure the 'AlarmBox' manufactured by Turnkey Instruments. This AlarmBox is programmed via a 9600 Baud USB serial interface, 8 data bits, 1 stop bit, no parity. The application allows you to configure the Alarm box to set off the physical alarms based on the data collected from the connected instrument. It can configure polling rate, flashing rate, hold time, clear time, etc. This application has 2 different modes, a Traffic Lights mode and an Advanced Settings mode. Each mode is explained in detail in the following chapter. AlarmBoxApp also allows you to communicate with the connected dust monitoring instrument. The application has a command prompt where you can manually send commands to the AlarmBox or to the connected instrument.

2.1 System Architecture

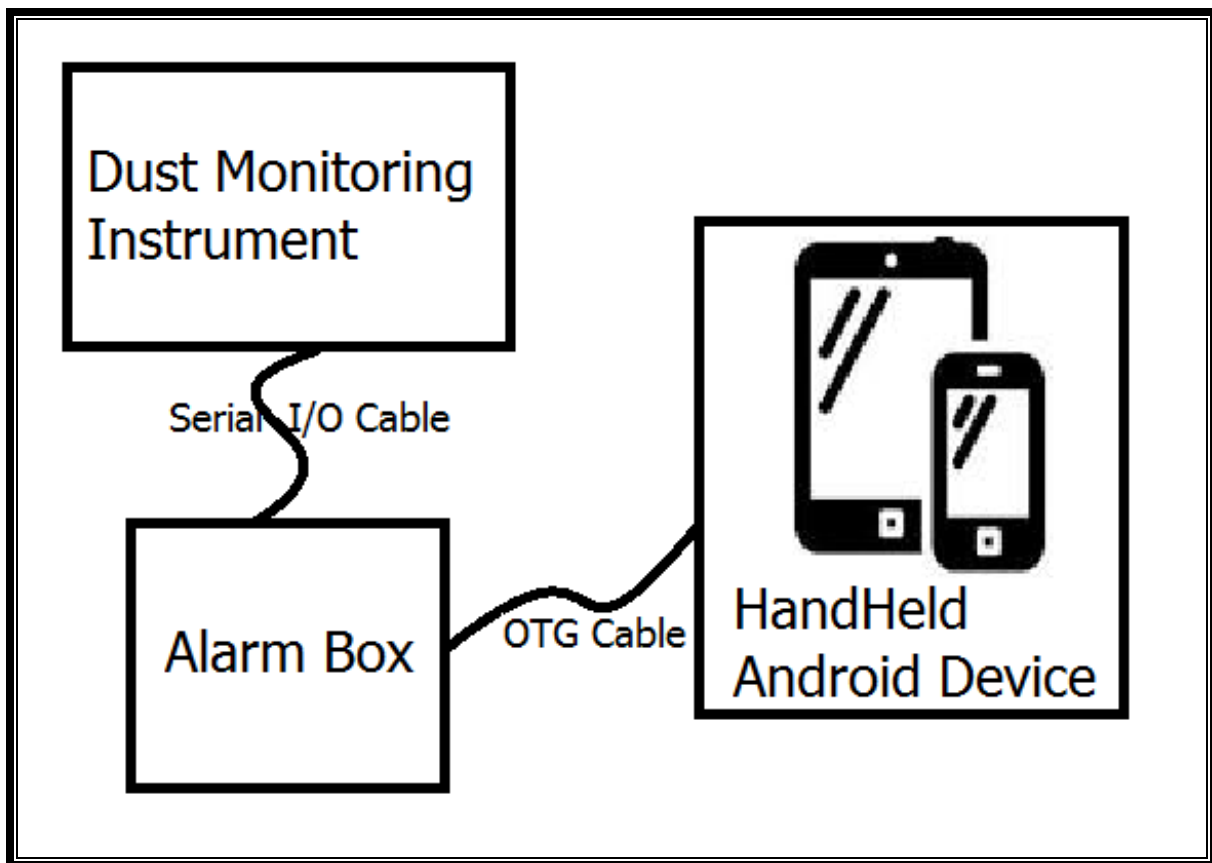


Figure 2.1

2.2 Data Flows

The above diagram shows a handheld device (having AlarmBoxApp installed in it) connects to the AlarmBox with OTG (On The Go) cable and the AlarmBox is connected to the instrument with a serial I/O cable. The handheld device must support OTG cable to make this application work with the AlarmBox (in some cases it needs rooted device).

2.3 Requirements

The requirements for this application are

- Android® handheld device that supports ‘On the Go (OTG)’ cable.
- On The Go (OTG) cable to connect to the AlarmBox.

2.4 Contingencies and Alternate Modes of Operation

If the AlarmBox has not been set up, the application will throw some exceptions. Press apply settings button to set the default values to the AlarmBox and reselect the option to set proper values.

3.0 USING ALARMBOXAPP

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AlarmBoxApp has been designed to work on multiple screen sizes. It has been tested on 4 – 7 inches screens. It consists of 6 options and a slider menu. To view the main menu tap on the menu button on the top left corner of the screen or slide the screen from left to right.

3.1 Main Menu

Main menu has options, Home, Basic Setup, Traffic Lights Mode, Advanced Settings, Configuration and Command Prompt. Each option is explained below.

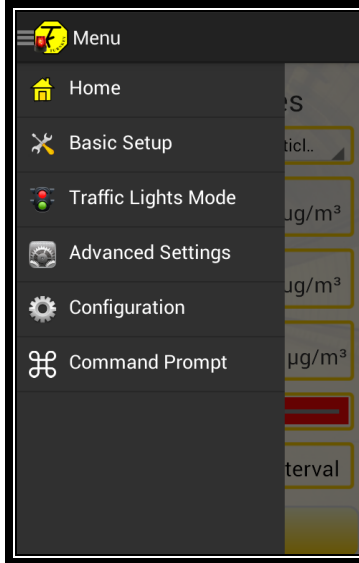


Figure 3.1

3.2 Home

Home screen only shows you the basic information from the AlarmBox for example the ID of the AlarmBox, ID of the instrument connected to it, version of the firmware, etc.

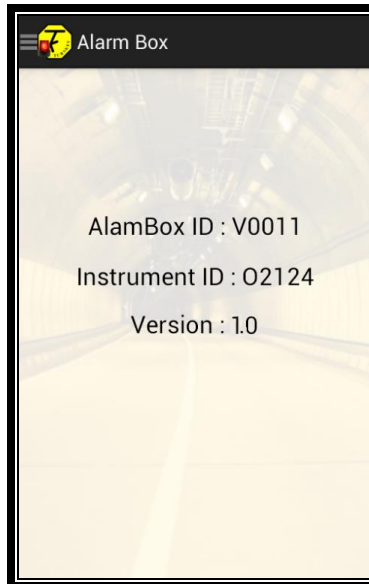


Figure 3.2

3.3 Basic Setup

Basic setup allows you to setup the instrument ID connected to the AlarmBox. When you select this option, it shows you the ID of the instrument that already has been setup, you can select the type of the instrument from the radio boxes and update the instrument ID here as shown in the figure below

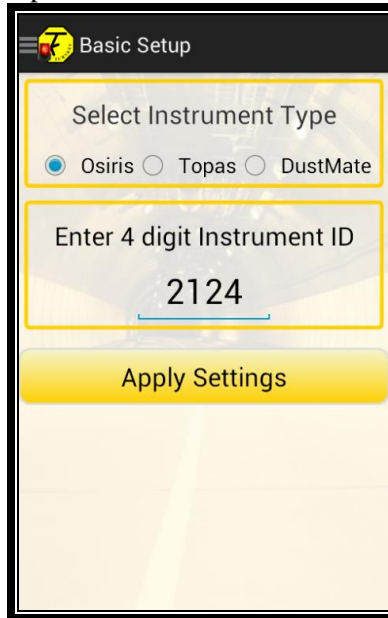


Figure 3.3

3.4 Traffic Lights Mode

Traffic Lights Mode allows you to setup the AlarmBox the way traffic lights work. A dropdown menu allows you to select the channel you want the conditions for and enter the values in the text boxes for Red, Amber and Green lights.

To make it user friendly, this application also allows you to select the values with an interactive slider bar as shown in the figure below

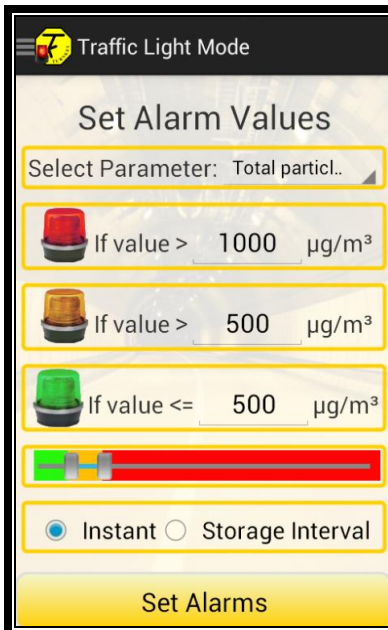


Figure 3.4

3.5 Advanced Settings

This option allows you to set multiple settings on one alarm. Plus (+) and Minus (-) buttons allow you to add or remove conditions and dropdown menus allow you to choose the channels and the conditions for them. For example you can have a condition like

“Set off Alarm 1 if TSP between 100 and 120 AND PM10 between 60 AND 80 OR PM2.5 between ...” as shown in the figure below. Similarly you can have multiple conditions for all 4 output alarms.

Advanced Settings

- Set off Alarm 1 if

Total particles between 100 & 120 $\mu\text{g}/\text{m}^3$

AND

PM10 particl.. between 60 & 80 $\mu\text{g}/\text{m}^3$

OR

PM2.5 particl.. between 40 & 60 $\mu\text{g}/\text{m}^3$

AND

PM1 particles between 5 & 10 $\mu\text{g}/\text{m}^3$

OR

Temperature between 20 & 40 Celsius

AND

Humidity less than 50 %RH

XOR

Wind Speed greater than 5 mtr/sec

AND

Wind Directio.. between 315 & 45 degrees **-**

+ Set off Alarm 2 if

Figure 3.5

3.6 Configuration

Configuration option allows you to change the configuration of the AlarmBox such as Alarm hold time, Alarm clear time, Alarm flashing rate and Alarm polling rate. It also allows you to change the Screen refresh time on the connected instrument as shown in the figure below

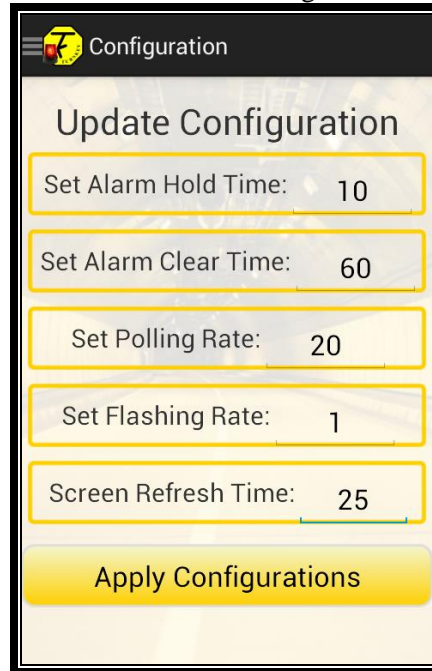


Figure 3.6

3.7 Command Prompt

Command prompt allows you to manually send commands to the AlarmBox or to the connected instrument and shows the reply on the screen as shown in the figure below

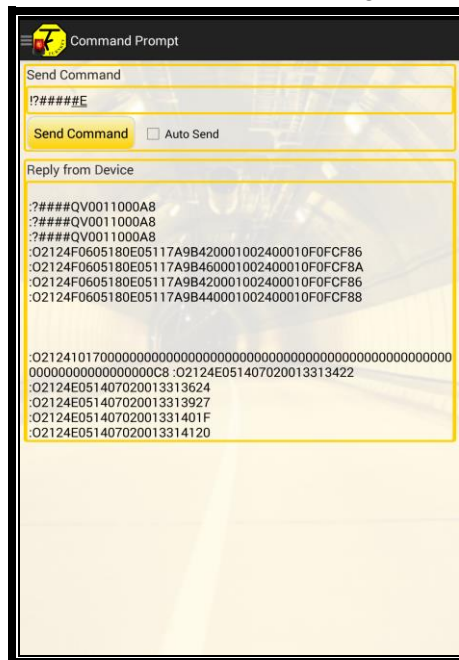


Figure 3.7

3.8 Special Instructions for Error Correction

Sometimes the application cannot collect the data from the device in this case please try again. Open the main menu and select the desired option again.

3.9 Caveats and Exceptions

If the application crashes or does not display the data please contact [support](#).