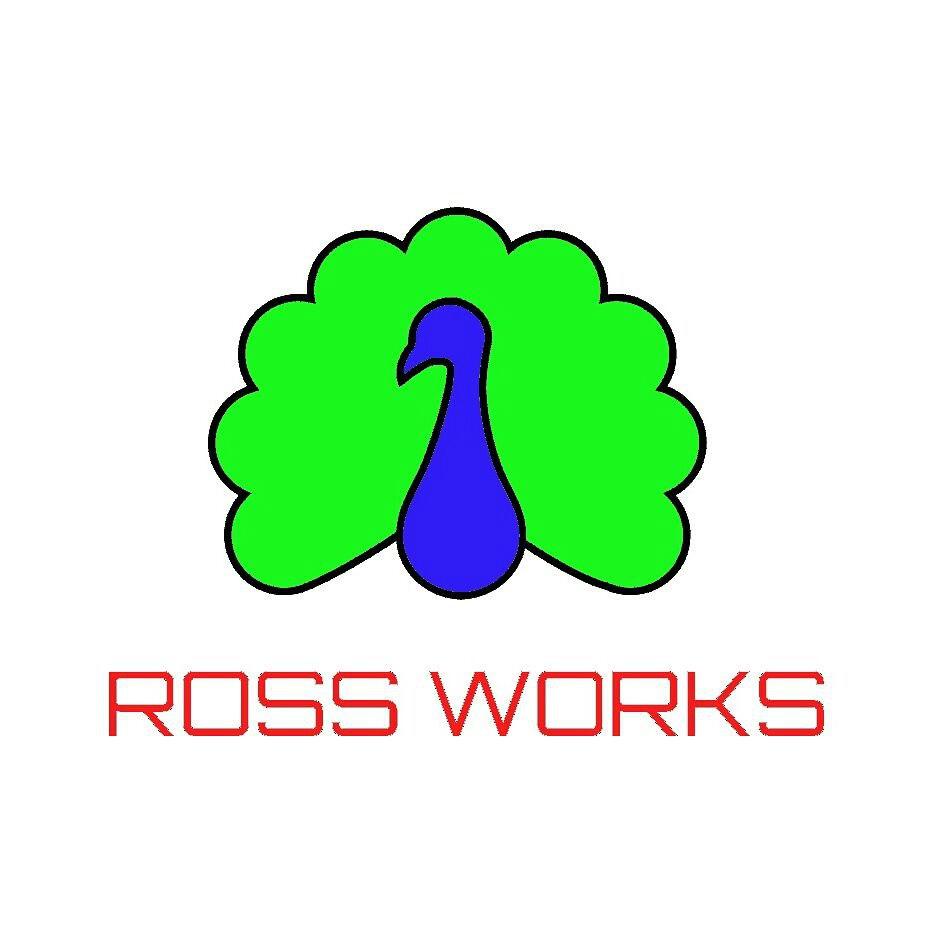
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| Ross Works Automatic Information Department |
| AUTOMATIC LIGHTHOUSE SYSTEM OWNER MANUAL |
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| Marco Rossetti  25/03/2021 |



# introduction

## composition

The Automatic Lighthouse System is an autonomous unit powered by an Arduino Mega2560. Along with this central micro controller, comes a variety of complementary hardware: a GPS module, for time syncing and geolocation, a Real Time Clock for keeping a precise track of current time, a Bluetooth module serving as a wireless interface, a SD card slot for storing information, an LCD to visually report relevant data, a temperature and pressure sensor (type BMP180), a temperature and humidity sensor (type DHT22) and a RGB Light Emitting Diode. Everything is powered via a DC-DC converter which ensure a stable 5 Volts energy supply.

## Wiring diagram

# Normal operations

Upon startup, the ALS starts with displaying a splash screen reporting the name of the current unit. It then proceeds in wainting for the GPS receiver to get a valid fix within 3 minutes. If the GPS succeds in acquiring a fix, the RTC module is synchronized with the UTC time supplied by the GPS module. In the event of the GPS failing to acquire a valid fix, the user will be notified whether the RTC has been already set in a previous startup or it has lost track of time due to power shortage via the LCD.

# Program mode

Program mode is entered when reading an initial char P, or 50 in Hexadecimal. Program mode then reads the subsequent bytes to execute various tasks. A typical program mode command is:

**PLNNEWFILE.LNT;**

**50 4C 4E 4E 45 57 46 49 4C 45 2E 4C 4E 54 3B**

In this example line the ALS is instructed to read a new lantern activation pattern from a new file called “NEWFILE.LNT”. A semicolon delimits the end of the file name.

When called upon, the program mode begins with reading the second byte in the Serial message. The second char can lead to different paths:

|  |  |  |
| --- | --- | --- |
| **Char** | **Hex** | **Effect** |
| **D** | **44** | Modify DST settings |
| **L** | **4C** | Modify Lantern Settings |

# Commands table

|  |  |  |
| --- | --- | --- |
| **Char** | **Hex** | **Effect** |
| **A** | **41** | Weather report |
| **D** | **44** | Date & Time report |
| **F** | **46** | GPS Fix report |
| **G** | **47** | Update GPS fix |
| **P** | **50** | Program mode; see Program mode chapter |
| **S** | **53** | Status report |
| **T** | **54** | reserved |
| **Z** | **5A** | Prepare unit for shutdown |