**AQP Version 1.2 - Release Notes**

# NEW RELEASE DESCRIPTION

**1.1 Software and Hardware Requirements**

The AQP application is available for the following computer platforms:

* + Raspberry Pi 3 Model B+, with a Raspbian Operative system

The Raspbian OS shall have the following distribution:

* + Distributor ID: Raspbian
  + Description: Raspbian GNU/Linux 9.11 (stretch)
  + Release: 9.11
  + Codename:stretch
  + Kernel: Linux raspberry pi 4.19.66-v7+

The AQP software requires:

* + MicroSD 16 Gb with last correct of NOOBS installed
  + 1 GB of hard disk space
  + 1 GB of RAM
  + Power supply 5.1V 2.5A (Raspberry official Power supply)

# Installation List of the software

The AQP distribution package consists of onefile **“*aqp-1.2.gz”*** valid for the supported computer platform: Raspberry PI 3 Model B+ with OS: Raspbian

|  |  |
| --- | --- |
|  | **32-bit** |
| **Raspbian** | aqp-1.2.gz |

The compressed package contains the following elements:

* AQP program modules
* Set-up files
* SW configuration files
* .ICO file
* Arduino SW

**The AQP program is composed by the following 20 python programs:**

aqiMax.py

Calibra.py

controllo.py

Correzione.py

dammi\_data\_ora\_gps.py

dammi\_grafico.py

dammi\_info\_gps.py

gpsok.py

killManager.py

leggi\_log.py

log.py

scrivi\_file.py

sendWebServer.py

StudentTest.py

tensioneArduino.py

testArduino2.py

testArduino3.py

testManager.py

testTemperatura.py

trovaArduino.py

**The following set-up file for the hardware components:**

AmplCO2.txt

AmplCO.txt

AmplNH3.txt

AmplNO2.txt

DECO2.txt

latitudeLast.txt

longitudeLast.txt

OffsetCO2.txt

OffsetCO.txt

OffsetNH3.txt

OffsetNO2.txt

PlatformID.txt

PortaArduino.txt

PortaParticolato.txt

tensione.txt

V0CO2.txt

V0CO.txt

V0NH3.txt

V0NO2.txt

ver.txt

**The following software configuration files:**

istituto.dat

passw.dat

valori.dat

wifi.dat

**The .ico file:**

AQPlatformcon.ico

**The Arduino file:**

“AnalogInOutSerialCO2.ino” which is the file of the C program for the Arduino

All the files above have been archived in the compressed file aqp-1.2.gz.

All the previous files (but the Arduino file) shall be copied in the following Raspberry folder (following the instructions specified in the next paragraph):

***/home/pi/AirPlatform/***

# Installation Hints

**Arduino Nano program**

The installation of the *AnalogInOutSerialCO2.ino* program on the Arduino Nano chip follows the Arduino procedures.

This file has to be loaded in the Arduino IDE, then specifying the device (Arduino Nano) on the IDE, has to be download with a proper cable on the Arduino Nano chip.

**Raspberry SW**

In order to install the AQP software (ver 1.2) it is sufficient to write (on the Raspberry PI in the folder where the aqp-1.2.gz file is located) the following two commands in sequence:

*> sudo mkdir /home/pi/AirPlatform/ (only if it is the first installation of the AQP software )*

*> sudo tar zxvf aqp-1.2.gz -C /home/pi/AirPlatform/*

this last command extracts all files of the AQP software in the /home/pi/AirPlatform/ folder.

# Constraints

In order to install the AQP software properly the following points must be respected:

1. Correct selection, configuration and installation of all hardware and electronics components of the AQP:

* Arduino and Raspberry
* Sensors (as indicated in Section 4.1)
* Connections
* Power supply

1. It is assumed that the Arduino Nano has been already programmed using the “AnalogInOutSerialCO2.ino” C-file using the Arduino IDE.
2. the following Third Parties drivers (software) must be properly installed on the Raspberry before the installation of the AQP software:

* **Adafruit\_Python\_DHT.git**  Adafruit\_DHT (Adafruit-DHT version:1.4.0 )(the driver for the Temperature sensor)
* **pynmea2** version 1.15.0 (driver for the GPS)
* **rc.local** file (present in the list of the files *aqp-1.2.gz*) for starting at the start up the main program of the AQP software has to be properly substituted.

1. The AQP has to be connected to internet to send the collected data to the Web Server, the “PlatformID.txt” file and to acquire the proper time.
2. The “PlatformID.txt” file shall be edited and set with the proper ID number of the AQP platform to communicate with the central platform

# FUNCTIONALITIES

The AQP measures different characteristics of the ambient air using commercial and cheap sensors.

To execute this functionality the AQP is composed by 3 subsystems:

1. Microprocessor subsystem
2. Sensors subsystem
3. Structure and Power

All AQP activities are controlled by the AQP software

The AQP measures local environmental parameters and send them periodically to a dedicated Web Server, where the data are geo-referenced on a World map.

# CLOSED SPRS

N.A.

# ADDITIONAL COMMENTS AND KNOWN PROBLEMS

* 1. **Mission Support**

The delivered code is effective for use with the following sensors:

* Particulate sensor (Nova PM Sensor SDS01)
* Temperature & Humidity Sensor (DHT22),
* Co&NH3&No2 sensor (Cjmcu-Mics-6814),
* Co2 Sensor (AihasdMG811 CO2 Carbon Dioxide),
* Gps receiver (XCSOURCE GPS NEO-6M),
* LED 2 colours (LED2Col that provides with 2 colours the status of the AQP)
* Arduino Nano (that is a Microcontroller)

# Known Issues

N/A

# REPORTING PROBLEMS

For any problems or questions please send an e-mail to the AQP HelpDesk:

[*AQP@eopp.esa.int*](mailto:eomer@eopp.esa.int)