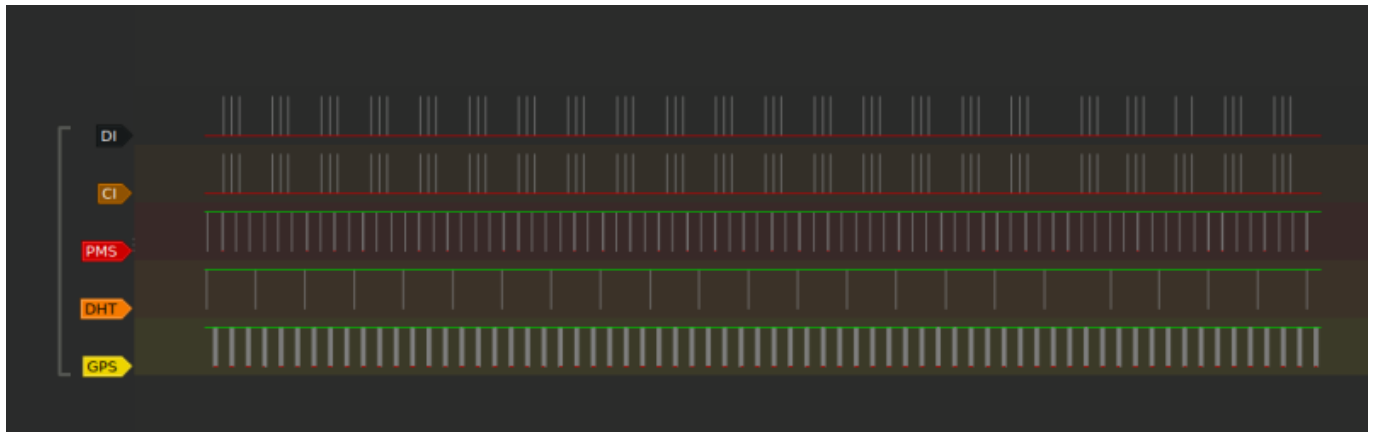


# Debugging de la trama de datos del sensor PMS5003

- Logic analyzer →

<http://vdwaa.nl/logic%20analyzer/pulseview/arch/linux/5-euro-usb-logic-analyzer/>



# Communication protocol

Serial port baudrate: 9600; Parity: None; Stop Bits: 1; packet length is fixed at 32 bytes.

|                                 |                                                                         |
|---------------------------------|-------------------------------------------------------------------------|
| Start Character 1               | 0x42(fixed bit)                                                         |
| Start Character 2               | 0x4d(fixed bit)                                                         |
| Frame Length 16-byte            | Frame Length = 2*9+2 (data+check bit)                                   |
| Data 1, 16-byte                 | concentration of PM1.0, ug/m3                                           |
| Data 2, 16-byte                 | concentration of PM2.5, ug/m3                                           |
| Data 3, 16-byte                 | concentration of PM10.0, ug/m3                                          |
| Data 4, 16-byte                 | Internal test data                                                      |
| Data 5, 16-byte                 | Internal test data                                                      |
| Data 6, 16-byte                 | Internal test data                                                      |
| Data 7, 16-byte                 | the number of particulate of diameter above 0.3um in 0.1 liters of air  |
| Data 8, 16-byte                 | the number of particulate of diameter above 0.5um in 0.1 liters of air  |
| Data 9, 16-byte                 | the number of particulate of diameter above 1.0um in 0.1 liters of air  |
| Data 10, 16-byte                | the number of particulate of diameter above 2.5um in 0.1 liters of air  |
| Data 11, 16-byte                | the number of particulate of diameter above 5.0um in 0.1 liters of air  |
| Data 12, 16-byte                | the number of particulate of diameter above 10.0um in 0.1 liters of air |
| Data 13, 16-byte                | Internal test data                                                      |
| Check Bit for Data Sum, 16-byte | Check Bit = Start Character 1 + Start Character 2 + ...all data         |

- [https://www.dfrobot.com/wiki/index.php/Air\\_Quality\\_Monitor\\_\(PM\\_2.5,\\_Formaldehyde,\\_Temperature\\_%26\\_Humidity\\_Sensor\)\\_SKU:\\_SEN0233#Board\\_Overview](https://www.dfrobot.com/wiki/index.php/Air_Quality_Monitor_(PM_2.5,_Formaldehyde,_Temperature_%26_Humidity_Sensor)_SKU:_SEN0233#Board_Overview)
- [https://www.dfrobot.com/wiki/index.php/PM2.5\\_laser\\_dust\\_sensor\\_SKU:SEN0177](https://www.dfrobot.com/wiki/index.php/PM2.5_laser_dust_sensor_SKU:SEN0177)

## Output result

Mainly output as the quality and number of each particles with different size per unit volume, the unit volume of particle number is 0.1L and the unit of mass concentration is  $\mu\text{g}/\text{m}^3$ .

There are two options for digital output: passive and active. Default mode is active after power up. In this mode sensor would send serial data to the host automatically. The active mode is divided into two sub-modes: stable mode and fast mode. If the concentration change is small the sensor would run at stable mode with the real interval of 2.3s. And if the change is big the sensor would be changed to fast mode automatically with the interval of 200~800ms, the higher of the concentration, the shorter of the interval.

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- Leer con detalle → [http://www.aqmd.gov/docs/default-source/aq-spec/resources-page/plantower-pms5003-manual\\_v2-3.pdf?sfvrsn=2](http://www.aqmd.gov/docs/default-source/aq-spec/resources-page/plantower-pms5003-manual_v2-3.pdf?sfvrsn=2)
- <http://www.aqmd.gov/home/library/public-information/publications/aire-sucio>

## Sensor Accuracy

- <http://www.aqmd.gov/docs/default-source/aq-spec/field-evaluations/purpleair---field-evaluation.pdf?sfvrsn=2>
- <http://www.aqmd.gov/docs/default-source/aq-spec/laboratory-evaluations/purple-air-pa-i---lab-evaluation.pdf?sfvrsn=2>
- (Grimm vale EU\$15K) Particle Distribution Dependent Inaccuracy of the Plantower PMS5003 low-cost PM-sensor - [https://www.researchgate.net/publication/320555036\\_Particle\\_Distribution\\_Dependent\\_Inaccuracy\\_of\\_the\\_Plantower\\_PMS5003\\_low-cost\\_PM-sensor](https://www.researchgate.net/publication/320555036_Particle_Distribution_Dependent_Inaccuracy_of_the_Plantower_PMS5003_low-cost_PM-sensor) | <http://wiki.grimm-aerosol.de/index.php?title=IAQ-11-R>
- [https://www.researchgate.net/publication/6754812\\_Comparison\\_of\\_the\\_GRIMM\\_1108\\_and\\_1109\\_Portable\\_Aerosol\\_Spectrometer\\_to\\_the\\_TSI\\_3321\\_Aerodynamic\\_Particle\\_Sizer\\_for\\_Dry\\_Particles](https://www.researchgate.net/publication/6754812_Comparison_of_the_GRIMM_1108_and_1109_Portable_Aerosol_Spectrometer_to_the_TSI_3321_Aerodynamic_Particle_Sizer_for_Dry_Particles) → Pillar el diagrama del experimento
- Kit similar al nuestro <https://airu.coe.utah.edu/sensors/>

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