

MERTANI-AAWS

Automatic Agroclimate Weather Station



Regulasi :

- **Standard Operational Procedures (SOP)**
Nomor: SOP/26/KPNK/I/2019

GET YOUR BETTER SOLUTION

MERTANI-AAWS

PEMANTAUAN CUACA

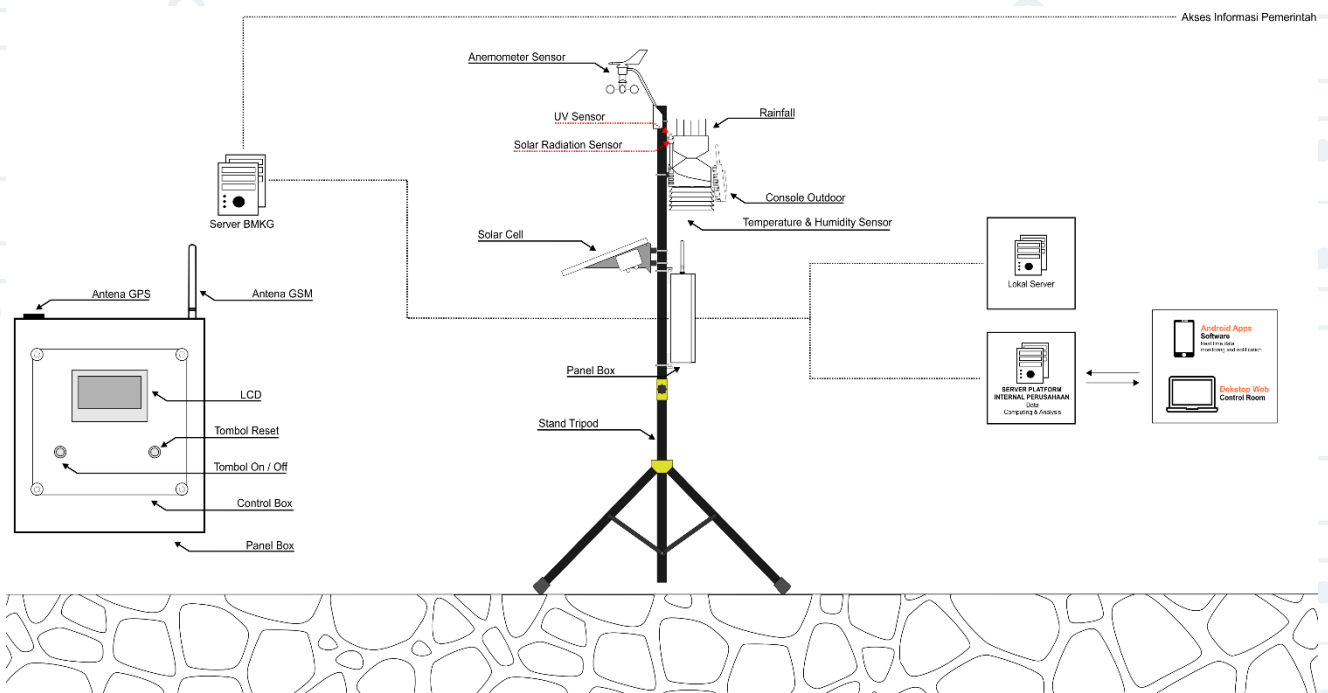
Merupakan alat untuk melakukan pemantauan terhadap cuaca secara online (dalam jaringan), realtime (terus-menerus), dan akurat. Garansi selama 1 tahun dan jaminan ketersediaan suku cadang selama 5 tahun.

AAWS terdiri dari Mertani Data Logger yang sudah berbasis Internet of Things (IoT) dan dapat terhubung dengan berbagai jenis sensor sekaligus. Kelengkapan sensor dari AAWS adalah sebagai berikut:

- Rainfall sensor
- Temperature / humidity sensor
- Solar radiation sensor,
- UV Index sensor
- Soil temperature & soil moisture
- Leaf wetness

Data akan terkirim secara otomatis ke sever BMKG untuk kemudian dilakukan pemantauan. Selain itu, data juga dikirim ke Dashboard PC and Android yang dapat digunakan untuk menampilkan data, melakukan analisis sederhana seperti mencari nilai maksimum, nilai minimum, mengurutkan berdasarkan waktu tertentu, menampilkan grafik visual, dan melakukan pengunduhan data.

Skematik



Penerapan

- Dapat diandalkan untuk melakukan pemantauan cuaca secara online dan terus-menerus, dimanapun, dan kapanpun
- Pemantauan cuaca sudah meliputi pengambilan data, pembacaan data, pengiriman data ke server secara otomatis, penampil data, dan fitur pengunduhan data

SPESIFIKASI

Data Logger

Data Logger

- Ultra-Low Power MCU based on Cortex M4+
- Input digital sensor RS485 (Modbus), I2C, RS232, Serial TTL, one wire. Under development: SDI12
- Main material ABS
- Operates from 2.7 V up to 5.5V
- Operational temperature 0°C to +85°C
- Weight 2 kg
- Internal memory 16 MB
- Extended industrial memory up to 256 MB
- Weather-resistant

Connectivity

- GSM (2G, 3G, and 4G)
- WiFi and Bluetooth Low Energy (BLE)
- LoRa 920-923 MHz
- GPS/ GLONASS/ GALILEO



Power

- Internal battery up to 49.500 mAh
- Solar panel 20-50 WP
- External power supply DC 4.1 V

Monitoring

- Realtime monitoring
- Data transmission interval (5 minutes, 10 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, and so on)

Numbers of Sensor Port

- 3 sensors (default)
- 10 sensors (extended)

LCD Touchscreen

- On site monitoring
- Interval and calibration setting
- Graphic or text display

Rainfall Sensor

Davis® 0.2 mm Rain Gauge Smart Sensor

- Measurement Range 0 to 10.2 cm (0 to 4 in.) per hour, maximum 4,000 tips per logging interval
- Accuracy $\pm 4.0\%$, ± 1 rainfall count between 0.2 and 50.0 mm (0.01 and 2.0 in.) per hour; $\pm 5.0\%$, ± 1 rainfall count between 50.0 and 100.0 mm (2.0 and 4.0 in.) per hour
- Resolution 0.01 in. (S-RGC-M002) or 0.2 mm (S-RGF-M002)
- Operating Temperature Range 0° to 50°C (32° to 122°F), survival -40° to 75°C (-40° to 167°F)
- Environmental Rating Weatherproof
- Housing UV-stabilized ABS plastic
- Mechanism Tipping spoon with magnetic reed switch pivots on metal shaft
- Dimensions 16.5 cm opening diameter (6.5 in.) x 24 cm (9.5 in.) high; 214 cm² (33.2 in.²) collection area
- Weight 1.2 kg (2.7 lbs)
- Bits per Sample 12
- Number of Data Channels* 1
- Measurement Averaging No
- Cable Length Available 2 m (6.6 ft)
- Length of Smart Sensor Network Cable* 0.5 m (1.6 ft)



SPESIFIKASI

TEMPERATURE/HUMIDITY SENSOR

- Operating Temperature -40° to +150° F (-40° to +65° C)
- Storage Temperature -40° to +158° F (-40° to +70° C)
- Sensor Type:
- Temperature PN junction silicone diode
- Relative Humidity Film capacitor element
- Cable Length 25 feet (7.6 meters)

Relative Humidity

- Range 1 to 100% RH
- Accuracy $\pm 2\%$
- Drift $< 0.25\%$ per year

Temperature (Air only)

- Range -40° to +150° F (-40° to +65° C)
- Sensor Accuracy $\pm 0.5^\circ\text{F}$



UV INDEX SENSOR

- Operating Temperature -40° to +150° F (-40° to +65° C)
- Storage Temperature -50° to +158°F (-45° to +70°C)
- Transducer Semiconductor photodiode
- Spectral Response 280 to 360 nm (Erythema Action Spectrum)
- Cosine Response $\pm 4\%$ FS (0° to 90° zenith angle)
- Supplied Cable Length 2' (0.6 m)
- Cable Type 4-conductor, 26 AWG
- Connector Modular RJ-11
- I/O Specs
- Green wire Output (0 to 2.5VDC); 150 mV per UV Index, 364 mV per MED/hour
- Black & Red wires Ground
- Yellow wire +3V $\pm 10\%$, 2.4 mA
- Housing Material UV-resistant ABS plastic
- Dimensions (length x width x height) 2" x 2.75" x 2.25" (51 mm x 70 mm x 57 mm)
- Weight 0.5 lbs. (226 g)
- Ultra Violet (UV) Radiation Dose
- Resolution and Units 0.1 MEDs to 19.9 MEDs; 1 MED above 19.9 MEDS
- Range 0 to 199 MEDs
- Accuracy $\pm 5\%$ of daily total
- Drift up to $\pm 2\%$ per year
- Update Interval 50 seconds to 1 minute (5 minutes when dark)
- Ultra Violet (UV) Radiation Index
- Resolution and Units 0.1 Index
- Range 0 to 16 Index
- Accuracy $\pm 5\%$ of full scale (Reference: Yankee UVB-1 at UV Index of 10 [extremely high]) plus 0.5 UV Index per 100' (30 m) of additional cable
- Cosine Response $\pm 4\%$ FS (0° to 90° zenith angle)



Soil Sensor

- Sensor Type Electrical resistance
- Attached Cable Length 15' (4.6 m)
- Cable Type Watermark standard, two-wire, wires stripped and tinned
- Maximum Cable Length 800' (243 m) (18 AWG UF recommended)
- Housing Dimensions 7/8" diameter x 3" (22 mm diameter x 76 mm)
- Weight 3.6 oz. (103 g)
- Resolution 1 cb
- Range 0 to 200 cb
- Update Interval 77 to 90 seconds



SPESIFIKASI

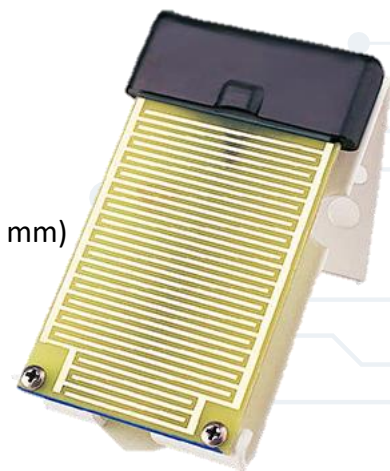
SOLAR RADIATION SENSOR

- Operating Temperature -40° to $+150^{\circ}$ F (-40° to $+65^{\circ}$ C)
- Storage Temperature -50° to $+158^{\circ}$ F (-45° to $+70^{\circ}$ C)
- Transducer Silicon photodiode
- Spectral Response (10% points) 400 to 1100 nanometers
- Cosine Response
- Percent of Reading $\pm 3\%$ (0° to $\pm 70^{\circ}$ incident angle); $\pm 10\%$ ($\pm 70^{\circ}$ to $\pm 85^{\circ}$ incident angle)
- Percent of Full Scale $\pm 2\%$ (0° to $\pm 90^{\circ}$)
- Supplied Cable Length 2' (0.6 m)
- Cable Type 4-conductor, 26 AWG
- Connector Modular RJ-11
- I/O Specifications
- Green wire Output (0 to +3VDC); 1.67 mV per W/m²
- Red & Black wires Ground
- Yellow wire +3 VDC $\pm 10\%$; 1mA (typical)
- Temperature Coefficient +0.067% per $^{\circ}$ F (+ 0.12% per $^{\circ}$ C)
- Reference temperature 77 $^{\circ}$ F (25 $^{\circ}$ C)
- Correction per degree above reference temp -0.067% of reading per $^{\circ}$ F (-0.12% per $^{\circ}$ C)
- Correction per degree below reference temp +0.067% of reading per $^{\circ}$ F (+0.12% per $^{\circ}$ C)
- Housing Material UV-resistant PVC plastic
- Dimensions (Length x Width x Height) 2.00" x 2.75" x 2.25" (51 mm x 70 mm x 57 mm)
- Weight 0.5 lbs. (226 g)
- Resolution and Units 1 W/m²
- Range 0 to 1800 W/m²
- Accuracy $\pm 5\%$ of full scale (Reference: Eppley PSP at 1000 W/m²) plus 45 W/m² per 100' (30 m) of additional cable
- Drift up to $\pm 2\%$ per year
- Update Interval 50 seconds to 1 minute



LEAF WETNESS

- Sensor Type Artificial leaf electrical resistance
- Excitation Bipolar (3V nominal) built-in
- Time Constant 2 seconds, Attached Cable Length 40' (12 m),
- Maximum Recommended Cable Extension 200' (61 m) using 4-conductor 26 AWG cable
- Cable Type 4-conductor, 26 AWG
- Connector Modular connector (RJ-11)
- Material Substrate Glass-reinforced, ceramic-filled laminate
- Grid 1 oz. copper, nickel, and 50 μ inch gold plate
- Mounting Bracket White powder-coated aluminum
- Dimensions (length x width x height)
- Leaf Wetness Sensor 4.00" x 2.25" x 2.25" (102 mm x 58 mm x 58 mm)
- Sensor Area 4.4 in² (28 cm²)
- Weight 13 oz. (.4 kg)
- Resolution 1, Range 0 to 15
- Dry/Wet Threshold User-selectable
- Accuracy ± 0.5 , Update Interval 46 to 54 seconds
- Supply Voltage and Current 100 μ A (typical) @ 3 VDC
- Output 2.5 to 3 VDC
- Connections, Yellow 3 VDC, Red Ground, Green Output



SPESIFIKASI

Solar Panel

- Solar panel 20 WP~50WP/ Maximum Power (Pmax) 20W, Current at Pmax (Imp) 1.11 A/sheet
- Type Cell Poly-crystalline/Mono-crystalline, Voltage at Pmax (Vmp) 18 V/sheet
- Short circuit current (Isc 1.24 A/sheet, Opencircuit voltage (Voc) 21.24 V/sheet, Solar cell mounting bracket included
- MPPT 600-kHz NMOS-NMOS Synchronous Buck Li-ion Chemistries 4.1V with Thermal Shutdown



Data Collection Method

