# PROGRAM SPAS

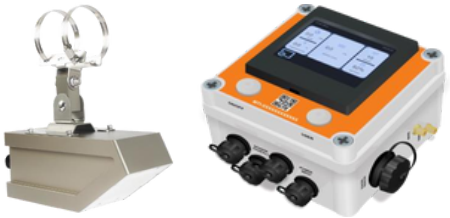
MERTANI Stasiun Pengamat Arus Sungai (SPAS) mampu melakukan monitoring secara real-time berbasis IoT didukung dengan monitoring data melalui web base maupun mobile app. Sehingga dapat menampilkan informasi secara real-time dan akurat guna melakukan tindakan preventif oleh user sebelum kondisi melampaui baku mutu yang ditentukan. Selain itu platform IoT yang digunakan oleh Mertani dapat menghasilkan laporan monitoring sesuai dengan format KLHK dan data ini memiliki keterbatasan akses sesuai dengan user level yang telah ditentukan.

## Penerapan

- Pemantauan Banjir
- Prediksi Cuaca
- Manajemen Sumber Daya Air
- Penelitian dan Pemahaman Ekologi
- Perencanaan Pembangunan dan Pengelolaan Risiko









## FItur Perangkat

- Data dikirimkan setiap interval waktu tertentu (dapat disesuaikan sesuai kebutuhan) ke server dan dapat dilakukan pemantuan secara online dan terus menerus.
- Data bisa diunduh secara online dan jarak jauh melalui dashboard dalam format file .xls maupun .csv. Data juga dapat diunduh secara manual melalui port user access yang ada pada data logger.
- Data logger dilengkapi dengan SD Card dan memiliki mekanisme penyimpanan data sementara pada hardware (data backup) apabila terjadi kegagalan pengiriman (misal saat terjadi hilang jaringan) maka data akan dikirimkan kembali saat koneksi internet tersedia secara bersamaan (sesuai dengan interval data) pada interval waktu pengiriman selanjutnya.

# SPESIFIKASI

## Data Logger

### Data Logger Sipora

- Industrial grade 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
- Dimension 15x14x9 cm
- 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

### Battery

- Internal battery up to 6.000 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

- Interval and calibration setting
- Graphic or text display
- HMI LCD Display Colored TFT Industrial with Touchscreen

# Flowmeter Sensor

## Velocity Measurement System

- Measuring principle planer microstrip array antenna CW+FMCW
- Operating mode manual, automatic, telemetry
- Operating temperature -30~80℃
- Operating voltage 7-32VDC;5.5-32VDC(Optional)
- Working current for 12VDC input, operating mode: <150mA Standby mode: <1mA
- Ambient temperature output temperature resolution 0.1℃; temperature measurement accuracy ±1℃
- IP rating IP68

## Radar Water Level Sensor

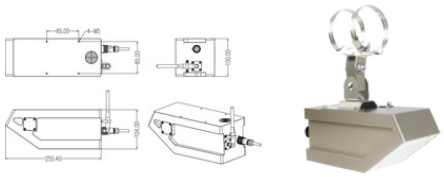
- Radar power 100mW
- Radar frequency 80Ghz (7~40m) 60Ghz (under 7m)
- Measuring range 40 meters
- Measurement accuracy ±3mm;±2mm
- Antenna angle 11°

## Radar Wave Velocity Meter

- Radar power 100mW
- Radar frequency 24GHz
- Max measuring range -30~80℃
- Velocity range accuracy 40 meters
- Working current ±0.01m/s;±1%FS
- Antenna angle 12°
- Measuring direction automatic recognition of water flow direction built in vertical angle correction

## Data Transmission System

- Data transmission S485 (default), RS232 (reserved), 4~20mA; 433MHz/4G /NB-IoT (optional)



# SPESIFIKASI

## Rainfall Sensor

- Material steel stainless body, aluminum alloy base
- Tips material white plastic
- Measuring range 0 ~ 8 mm/min
- Accuracy ±≤4% (≤240mm/hr);
- Resolution 0,2 mm
- Inner diameter 200mm/8inch ±0.3%
- Collection area 314cm2

## TSS/Turbidity Sensor

- Measuring technology nfrared scattering principle
- Measuring range turbidity: 0.01~1000NTU Suspended solids: 1~3000mg/L
- Resolution 0.01 NTU/1 mg/L
- Accuracy 5%
- Communication RS485 Modbus-RTU
- Related configuration humidity alarm
- Response time < 15s

## pH Sensor

- Measuring technology electrochemical glass electrode
- Measuring range pH: 0~14pH TEMP: 0~50℃
- Resolution 0.01pH / 0.1℃
- Accuracy 0.1% of the range or ±0.02pH, take the larger one; Temp: ± 0.5℃
- Communication RS485 Modbus-RTU
- Temp unit automatic temp compensation
- Response time < 10s

## Solar Panel

- Solar panel 50WP
- 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

## Battery

- Deep Cycle VLRA Battery 3.7 Volt minimum 17Ah