AWARE Flood

Advance Warning Equipment IoT Flood Inundation Sensor

The Remote Autonomous, Networkable Flood Sensor

Key Features

- Integrated Data Logger
- Integrated Solar Power
- Integrated Processor
- Internet of Things (IoT) Operations
- Two-Way Cellular or Iridium Satellite Connectivity
- 900 MHz Wireless Mesh Radio (Coming Soon)
- SDI-12 Expansion Port
- Rugged and Lockable
- Optional Color Imaging Camera
- Automatically Detects Flash Floods

Data Collected

- GPS Location
- Water Depth
- Barometric Pressure
- Battery Voltage
- Air & Water Temperature

AWARE

Monitoring Systems

Can be anywhere, should be everywhere.

SAFEWARE®

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The **Advance Warning Equipment (AWARE) Flood System** is a simple, rugged, and low-cost flood sensor that detects and automatically alerts users to flooding. This lightweight, portable solution is designed to withstand the harshest weather conditions and autonomously monitor water levels and other environmental conditions used to help determine risk of flooding. The system supports user configurable reporting periods and thresholds which can automatically send warnings in almost real time.

The AWARE Flood System reports water levels continuously using a self-sustaining battery and passive solar energy harvesting system. It is built on proven Intellisense technology to ensure a robust power capability for at least seven days without solar recharge. Additionally, the proprietary battery pack is field replaceable and can be recharged through the serial port.
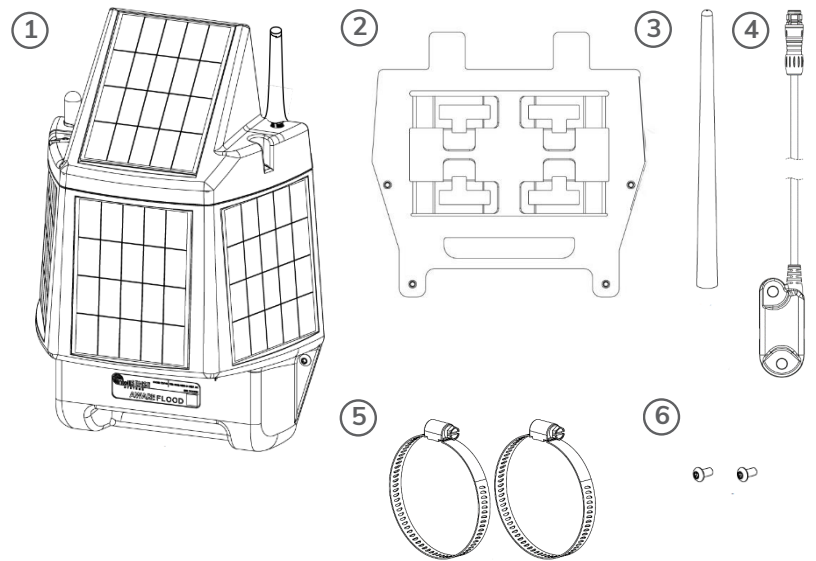
The AWARE Flood System is comprised of a network of sensor nodes, each consisting of an IoT sensor node that is connected to a submersible water level sensor through a 49-foot cable to independently monitor waterway conditions. Data from the wireless network can be sent via either a direct cellular Internet of Things (IoT) communications link or an Iridium satellite connection for reliable data transmission around the world.

Every AWARE Flood Node with IoT Module includes automatic calibration and connects with a variety of existing networks. The design is completely modular with easily replaceable sensor components for quick and easy maintenance. Customers can also order a tipping bucket rain gauge, water-level radar, water-resistant camera sensor, or an extension cable to gain access to more remote sensor sites.

The AWARE Flood Package:

1. AWARE Flood Node with IoT Module with Removable Cellular Antenna
2. Stainless Steel Universal Mounting Plate
3. Removable Radio Antenna
4. Water Level Pressure (WLP) Module (50 ft. Length)
5. Stainless Steel Hose Clamps (2)
6. Torx Head Mounting Screws (2)
7. Water Level Pressure Module Mounting Plate (not pictured)

Weight	1.59 kg (3.5 lb)
Dimensions	H: 16.5 cm (6.5 in) W: 8.9 cm (3.5 in) D: 24.1 cm (9.5 in)
Operating Temperature	Minimum: -30° C (-22° F) Maximum: +60° C (+140° F)
Mounting Hardware	Removable and adaptive 316 stainless-steel mounting plate for easy installation
Power Management	**Solar Cell Array and Onboard Nickel-Cadmium Batteries** Self-sustaining battery and passive energy harvesting system based on proven Intellisense technology to ensure completely robust power capability for long endurance.
Communications	**Integrated Two-Way Iridium Satellite Transmitter and Receiver or Pre-Activated Cellular LTE-M Modem** Communications units can be optioned with either a pre-activated cellular LTE-M modem or Iridium satellite connectivity to ensure reliable data transmission regardless of location.
Cell Carrier Approvals	**End Device Certified:** ▪AT&T (LTE-M) ▪Verizon (LTE-M) ▪Bell (LTE-M) ▪Tellus (LTE-M) ▪Compatible with other carriers using LTE-M and NB-IoT services
Expansion Port	**IP67-rated Serial Ports** Allows new capabilities to be added and easy integration of other fielded sensors, including laptop connectivity, external power, non-contact water level radar, camera, redundant communications, precipitation gauge, and an SDI-12 port for third-party sensor additions.
Compliance	**Manufactured under ISO 9001**

ACESSORIES AVAILABLE

The AWARE Flood System can attach up to 4 peripherals to deliver a complete overview of the environment and any potential flood risks. A water level pressure sensor is included with the purchase of every AWARE Flood System, but every sensor can connect to a water level radar, water level camera sensor, external soil moisture sensor, and tipping bucket rain gauge.

WATER LEVEL PRESSURE SENSOR The Water Level Pressure Sensor connects to the AWARE Flood Node via a 15-meter (50-foot) cable to allow for the ideal placement on any site. The sensor automatically calibrates within 30 seconds of start-up.

SENSOR SPECIFICATIONS		
Weight	.45 kg (1 lb)
Dimensions	3.3 cm x 1.2 cm x 7.6 cm (1.3 in x 0.5 in x 3 in) Cable length: 15.2 m (50 ft)
Operating Temperature	Minimum: - 30° C (-22° F) Maximum: + 60° C (+140° F)
Ambient Temperature	Minimum: - 30° C (-22° F) Maximum: + 60° C (+140° F) Accuracy: ±3° C
Water Level Measurement	Range: 0-9.8 m (0-32 ft.) Accuracy: ± 15 cm (0.5 in.) or ± 0.5%
Design	Modular, easily replaceable, low-cost, and auto-calibrated
Installation	Two ¼-in. holes located on either side of the sensor for rugged mounting in a waterproof over-molded sensor design
Communication Protocol	RS-232

WATER-RESISTANT CAMERA SENSOR The Water-Resistant Camera Sensor delivers images with up to 640 x 480 ppi resolution of the sensor's site in real time. Its over-molded design includes two ¼-in. holes for zip tips along with a screw-in plug, so it will never be disconnected by flood water or debris.

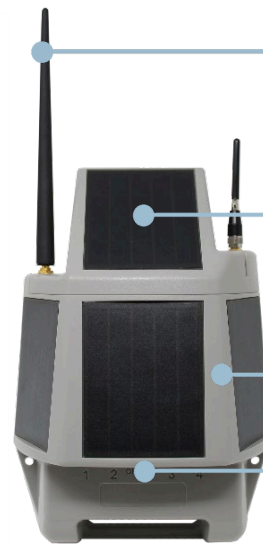| CAMERA SPECIFICATIONS		
Weight	.22 kg (0.5 lb)
Dimensions	7.9 cm x 1.5 cm x 4.8 cm (3.1 in x 0.6 in x 1.9 in) Cable length: 2 m (6.5 ft)
Camera Design	Modular adjustable camera with 60-degree field of view (FOV)
Installation	Water-resistant over-molded design with two ¼-in. holes for ruggedized installation
Camera Images	**Base Resolution:** 320 x 240 ppi, 8-bit color, and JPEG compression down to approximately 5kB-35kB per image **Enhanced Version:** 640 x 480 ppi, 8-bit color, and JPEG compression down to approximately 90kB-200kB per image

TIPPING BUCKET RAIN GAUGE The optional Tipping Bucket Rain Gauge is the robust and highly accurate solution for measuring rainfall. This sensor consists of a powder-coated aluminum enclosure, a UV-resistant ASA polymer base, and stainless-steel fasteners and finger filter, ensuring that it is the long-term solution in even the harshest environments.

TIPPING BUCKET SPECIFICATIONS		
Weight	2.1 kg (4.6 lb)
Height	33 cm (13 in)
Range	700 mm per hour
Material	Enclosure: powder-coated aluminum Base: UV-resistant ASA Bucket: chrome plated ASA
Operating Temperature	Minimum: +4° C (+39° F) Maximum: +70° C (+158° F)
Pivots	Sapphire tipped
Accuracy	0-50 mm per hour: better than ±1% 100-150 mm per hour: better than -5% 200-300 mm per hour: better than -10% 50-100 mm per hour: better than -3% 150-200 mm per hour: better than -7%

AWARE
Monitoring Systems

Two-way cellular or Iridium satellite communications for reliable data transmission

Four-panel solar array for dependable power

Battery supplies 7 days of power without solar energy

Four waterproof serial ports for easy integration with other devices

SOFTWARE COMPATIBILITY

The hardware for the AWARE Flood System was designed to be open and flexible. It can be integrated into existing networks or used by communities without any infrastructure and support framework. The network utilizes a direct to IP approach with a TCP/IP socket protocol that is an open standard utilized by almost any internet-based data servers. In addition, the code and packet structure can be integrated into almost any existing server network.

The hardware comes preconfigured with the cellular modem that sends data directly to a flashflood.info website. This service, along with one user account, is completely free. The ability to configure software notifications based on alarms and rules is also available and charged on a per sensor, per year basis. The AWARE Flood System is also capable of being directly pointed to any server IP address and port destination, including the following platforms with more coming soon:

1. Contrail
2. DataWise
3. OpenSensorHub (pending)

STANDARDS AND CERTIFICATIONS

MIL-STD-810G
    Test Method Standard for Environmental Engineering Considerations and Laboratory Tests
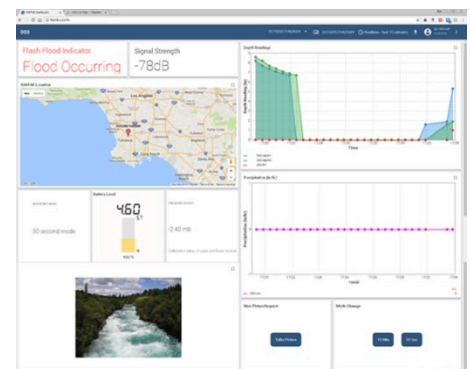
MIL-STD-464
    Standard for electromagnetic environmental effects (E3) interface requirements and verification criteria for airborne, sea, space and ground systems

EN61000
    UK EMC Directive

DASHBOARD

AWARE provides a web-based user dashboard with customizable data panels for observing the data collected. The AWARE Flood System data is also compatible with many third-party visualization software suites.

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