

ADS' Self-Contained Solutions for Power, Communication, Analog and Digital I/O and Modbus

The **TRITON+** COMM+EXT PWR port is used for external power via the ADS XIO, XBUS or ExPAC devices, delivery of Modbus output values as well as for on-site, direct monitor communication.

XIO Features

- Process variables measured by the **TRITON+** can be converted to two (2) 4-20mA loop output signals for SCADA systems or local display and control
- Logging capabilities of the **TRITON+** can be used for two (2) 4-20mA input process variables measured by other instrumentation
- Alarms produced by the **TRITON+** Monitor Level Intelligence (MLI) device can be output on the two (2) XIO relay contacts for process actuation
- Two (2) switch, solid state or dry contact digital inputs can be sampled and logged
- Design facilitates easy field wiring
- Supports easy plug and play configuration and start-up
- Associated Apparatus IECEx certification for use with approved equipment in Zone 0 (equivalent to Class I, Division 1, Groups C & D); ATEX Zone 0; and CSA Class I, Zone 0, IIB hazardous areas
- Rugged indoor/outdoor NEMA 4x case with hinged clear cover
- Accepts 85-264 VAC, 120-375 VDC; 47-62 Hz; 1.1A@110/0.59A @250 VAC
- Supplies 8 – 11.5 VDC, 500mA power to the **TRITON+** flow monitors



XBUS Features

- Supports Modbus RTU, ASCII and TCP communications
- Wireless Modbus via **TRITON+** internal modem communications
- Connects to wired networks via RS485 or RS232
- Supports easy plug and play configuration and start-up
- Associated Apparatus IECEx certification for use with approved equipment in Zone 0 (equivalent to Class I, Division 1, Groups C & D); ATEX Zone 0; and CSA Class I, Zone 0, IIB hazardous areas
- Rugged indoor/outdoor NEMA 4x case with hinged clear cover
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- Supplies 8 – 11.5 VDC, 500mA power to the **TRITON+** flow monitors

ExPAC Features

- Designed to be housed in another enclosure
- Associated Apparatus IECEx certification for use with approved equipment in Zone 0 (equivalent to Class I, Division 1, Groups C & D); ATEX Zone 0; and CSA Class I, Zone 0, IIB hazardous areas
- Requires DC power input between 9 and 36 volts and a minimum of 15 watts
- Supplies DC power of 8 to 11.5 volts, 500mA to the **TRITON+** flow monitors
- RS485 and RS232 Modbus output connections to SCADA systems
- Wireless Modbus via **TRITON+** internal modem communications
- Supports Modbus RTU, ASCII and TCP/IP communications



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HARDWARE

ADS TRITON+

The ADS TRITON+® is an intrinsically safe, "Fit-for-Purpose" open channel flow monitor for use in sanitary, combined, and storm sewers. It is designed to be the most versatile flow monitoring system available for wastewater collection applications. It supports single pipe or dual pipe flow measurement installations.

ADS TRITON+

This multiple technology flow monitor will power almost every available sensor technology that is used in wastewater applications today. It is the most versatile and cost-effective, multiple-technology flow monitor on the market. The **TRITON+** includes four multiple technology sensor options: a Long Range Depth Sensor, a Peak Combo Sensor, a Surface Combo Sensor, and an Ultrasonic Level Sensor (see inside for technology and specifications). This array of monitoring technologies provides for unmatched flexibility in a fully integrated, fit-for-purpose monitoring platform.

The **TRITON+** platform adapts to a wide range of customer applications and budgets. It can be configured as an economical single sensor monitor or dual sensor monitor. It offers a longer battery life and fewer parts for a more reliable system. This provides a lower purchase price and a lower ownership cost over the life of the monitor. The **TRITON+** has the lowest operational cost per data sample of any Intrinsically Safe flow monitor available.

TRITON+ Features

- Versatile performance that is easy to install and operate
- Two sensor ports supporting 4 interchangeable sensors providing up to 6 sensor readings at a time
- Single or dual pipe/monitoring point measurement capabilities
- Multi-carrier cellular 3G/4G UMTS/HSPA+ or Verizon® CDMA/EV-DO wireless communications; direct serial communications also available
- Industry-leading battery life with a wireless connection providing up to 15 months at the standard 15-minute sample rate (*varies with sensor configuration*)
- External power and Modbus network connectivity option available with an ADS External Power and Communications Unit (ExPAC™) and a 9-36 VDC power supply or an ADS XBUS™ which includes a power supply
- Analog and digital I/O expansion (4-20 mA and dry contacts) available with an ADS External I/O unit (XIO™)
- Modbus protocols enabling RTUs to help simplify SCADA system integration
- Supports the delivery of CSV files to an FTP site at user-defined intervals, and direct monitor SMS and e-mail messaging
- Supports actuation of a water quality sampler for flow proportional or level-based operation
- Monitor-Level Intelligence (MLI®) enables the **TRITON+** to effectively operate over a wide range of hydraulic conditions
- Superior noise reduction design for maximizing acoustic signal detection from depth and velocity sensors
- Five software packages for accessing flow information: Qstart™ (configuration and activation); FlowView Operations (web-based alarming); Slicer.com® (I/I analysis); FlowView Portal® (online data presentation and reporting); and Profile® (data collection, analysis, and reporting)
- Intrinsically-Safe (IS) certification by ATEX, IECEx and CSA for use in Zone 0 (equivalent to Class I, Division 1, Groups C & D) hazardous areas
- Thick, seamless, high-impact, ABS plastic canister with aluminum end cap (meets IP68 standard)
- Innovative circuit board dome-enclosure protects and limits exposure of electronics when opening the canister to change the battery



About ADS

A leading technology and service provider, ADS® LLC has established the industry standard for open channel flow monitoring and has the only ETV-verified flow monitoring technology for wastewater collection systems. These battery-powered monitors are specially designed to operate with reliability, durability, and accuracy in sewer environments.

To Learn more, visit www.adsenv.com/TRITON+



Multiple Technology Sensors

The **TRITON+** features three depths and two velocities with three sensor options. Each sensor provides multiple technologies for continuous running of comparisons.

Peak Combo Sensor



Dimensions: 6.76 inches (172 mm) long x 1.23 inches (31 mm) wide x 0.83 inches (21 mm) high

This versatile and economical sensor includes three measurement technologies in a single housing: ADS-patented continuous wave peak velocity, uplooking ultrasonic depth, and pressure depth.

Continuous Wave Velocity

Range: -30 feet per second (-9.1 m/s) to +30 ft/sec (9.1 m/s)

Resolution: 0.01 feet per second (0.003 m/s)

Accuracy: +/- 0.2 feet per second (0.06 m/s) or 4% of actual peak velocity (whichever is greater) in flow velocities between -5 and 20 ft/sec (-1.52 and 6.10 m/s)

Uplooking Ultrasonic Depth

Performs with rotation of up to 15 degrees from the center of the invert; up to 30 degrees rotation with Silt Mount Adapter

Operating Range: 1.0 inch (25 mm) to 5 feet (152 cm)

Resolution: 0.01 inches (0.254 mm)

Accuracy: 0.5% of reading or 0.125 inches (3.2 mm), whichever is greater

Pressure Depth

Range: 0-5 PSI up to 11.5 feet (3.5 m); 0-15 PSI up to 34.5 feet (10.5 m); or 0-30 PSI up to 69 feet (21.0 m)

Accuracy: +/-1.0% of full scale

Resolution: 0.01 inches (0.25 mm)

Long Range Depth Sensor



Dimensions: 9.15 inches (232.4 mm) long X 4.40 inches (111.8 mm) wide x 4.22 inches (107.2 mm) high (without bracket)

A narrow, powerful ultrasonic beam allows this depth sensor to perform well over long ranges. Integral Submersion Sensor provides detection of flooding at the point of interest.

Long Range Ultrasonic Depth

Minimum Dead Band: 0.0 inch (0.0 mm) from the bottom of sensor housing; Maximum Operating Air Range: 240 inches (6.1 m)

Beam Angle: +/- 3 degrees

Resolution: 0.01 inch (0.24 mm)

Accuracy: +/- 0.25% of sensor range measurement or 0.13 inches (3.2 mm) whichever is greater, in a homogeneous temperature air column

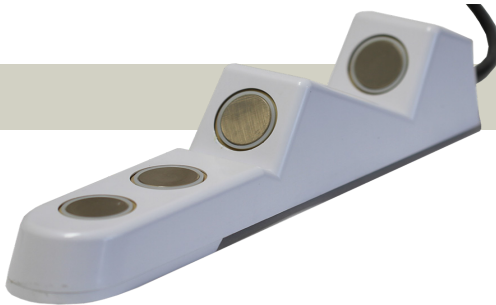
Drift: 0.0 inches (0.0 mm)

Temperature Compensation: Additional compensation for variable temperature air column supported

Submersion

Detects submersion when fully covered with liquid.

Surface Combo Sensor



Dimensions: 10.61 inches (269 mm) long x 2.03 inches (52 mm) wide x 2.45 inches (62 mm) high

This revolutionary new sensor features four technologies including surface velocity, ultrasonic depth, surcharge continuous wave velocity, and pressure depth.

Surface Velocity *

Minimum air range: 3 inches (76 mm) from the bottom of the rear, descended portion of the sensor

Maximum air range: 42 inches (107 cm)

Range: 1.00 to 15 feet per second (0.30 to 4.57 m/s)

Resolution: 0.01 feet per second (0.003 m/s)

Accuracy: +/-0.25 feet per second (0.08 m/s) or 5% of actual reading (whichever is greater) in flow velocities between 1.00 and 15 ft/sec (0.30 and 4.57 m/s)

* The flow conditions existing in some applications may prevent the surface velocity technology from being used.

Ultrasonic Depth

(Does not require electronic offsets)

Minimum dead band: 1.0 inches (25.4 mm) from the face of the sensor or 5% of the maximum range, whichever is greater

Maximum operating air range: 10 feet (3.05 m)

Resolution: 0.01 inches (0.25 mm)

Accuracy: +/- 0.125 inches (3.2 mm) with 0.0 inches (0 mm) drift, compensating for variations in air temperature

Surcharge Continuous Wave Velocity (Under submerged conditions, this technology provides the same accuracy and range as **Continuous Wave Velocity** for Peak Combo Sensors)

Surcharge Pressure Depth (Under submerged conditions, this technology provides the same accuracy and range as **Pressure Depth** for Peak Combo Sensors)

Ultrasonic Level Sensor

This non-intrusive, zero-drift sensing method results in a stable, accurate, and reliable flow depth calculation. Two independent ultrasonic transducers allow for independent cross-checking.

TRITON+ Specifications

Connectors

U.S. Military specification MIL-C 26482 series 1, for environmental sealing, with gold-plated contacts

Communications

- Domestic coverage, Verizon® 4G LTE-M modem, FCC ID: R17ME910C1NV

- Global coverage, commercial UMTS/HSPA+/GSM modem, FCC ID: R17HE910

- Domestic coverage, Verizon CDMA/EV-DO modem, FCC ID: R17DE910-DUAL

- Direct connection to PC using an ADS USB serial cable

Monitor Interfaces

- Supports simultaneous interfaces with up to two combo sensors

- Supports optional Analog and Digital I/O with ADS XIO: two 4-20 mA inputs and outputs, two switch inputs and two relay outputs

Power

Internal - Battery life with a cellular modem:

- Over 15 months at a 15-minute sample rate*

- Over 6 months at a 5-minute sample rate*

External - Optional external power available with ADS

External Power and Communications Unit (ExPAC) with an ADS- or customer-supplied 9-36 Volt DC power supply

* Rate based on collecting data once a day and varies according to sensor configuration and operating temperature

Operating and Storage Temperature

-4 degrees to 140 degrees F (-20 degrees to 60 degrees C)

Connectivity

- Modbus ASCII: Wireless; Wired using ADS ExPAC or XBUS

- Modbus RTU: Wireless; Wired using ADS ExPAC or XBUS

- Modbus TCP: Wireless only

Intrinsic Safety Certification

- Certified under the ATEX European Intrinsic Safety standards for Zone 0 rated hazardous areas

- Certified under IECEx (International Electrotechnical Commission) Intrinsic Safety Standards for use in Zone 0 rated hazardous areas (equivalent to Class I, Division 1, Groups C & D)

- CSA Certified to Class 225803 – Process Control Equipment, Intrinsically Safe and Non-Incendive Systems – For Zone 0 Hazardous Locations, Ex ia IIB T3 (152°C) in Canada

- CSA Certified to Class 225883 – Process Control Equipment, Intrinsically Safe and Non-Incendive Systems – For Class I Zone 0 Hazardous Locations, AEx ia IIB T3 (152°C) in the USA (equivalent to Class I, Division 1, Groups C & D)

Other Certifications/Compliances

- FCC Part 15 and Part 68 compliant

- Carries the EU CE mark

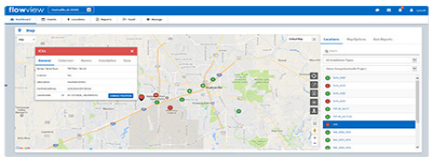
- ROHS (lead-free) compliant

- Canada IC CS-03 compliant



ADS Flow Monitoring Software

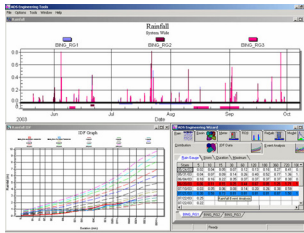
Qstart is desktop software providing field crews with a simple, easy-to-use tool for quickly configuring and activating ADS monitors. **Qstart** enables the user to collect and review the monitor's depth and velocity data in hydrograph and tabular views simultaneously.



FlowView is web-hosted software providing near real-time operational intelligence on the status of flow activity throughout the wastewater collection system. FlowView utilizes dynamic (or smart) alarming to inform clients about the occurrence of rain events, flow performance abnormalities, and data anomalies at the flow monitoring locations.

FlowView Portal is web-hosted software providing robust report delivery, enabling the user to manage data, customize reports, and select viewing parameters. FlowView Portal has a virtually unlimited database for storing and accessing historical data, using data for comparison and trend analysis purposes, and sharing information electronically.

Slicer.com is web-hosted software providing a powerful set of engineering tools designed for both the consulting and municipal engineer. Slicer.com's inflow and infiltration tools examine wastewater collection system dry and wet weather flow data and provide rigorous performance measurements in one-tenth the time of other analysis tools.



Profile is desktop software providing the industry's best data analysis tools, from basic flow monitoring data to complex hydraulic analysis. Profile is intuitive software that saves time and improves data quality by compiling project data into one location for analysis and reporting.

FLOW MONITORING APPLICATIONS

- Billing
- Combined Sewer Overflows (CSOs)
- Spill Notification
- Inflow/Infiltration
- Stormwater Monitoring
- Model Calibration
- Capacity Analysis