

COMPLETE SMART WATER NETWORK REMOTE MONITORING SOLUTION



I.

SUMMARY

SWIMM = Smart Water Infrastructure Monitoring Modeling and Management

The SWIMM-Pulse Next Generation 300 is a low-power, wireless, remote terminal unit (LPW-RTU) built for harsh water & wastewater network deployments: hydrants, manholes, or remote facilities. The NG-300 utilizes a high precision, reliable datalogger/controller by Campbell Scientific & industrial cellular gateway by Sierra Wireless to provide unparalleled performance - high rate pressure scanning, multi-parameter water quality, level, & flow monitoring, and remote control at your fingertips using SWIMM-Connect, our secure reliable and customizable data management website (SaaS) or integrate with the existing SCADA system via OPC server.

APPLICATIONS

- Pipeline pressure transient monitoring
- Pump station monitoring & optimization
- Water quality / intelligent hydrant flushing
- District metered area (DMA) monitoring
- Active leakage management
- Jurisdiction / master meter flow monitoring
- CSO / SSO level and overflow alarm
- Source water quality / level monitoring
- Regulatory compliance
- Customer complaint response
- Event notification system
- Network model calibration studies
- Real-time water / sewer network modeling

FEATURES

- 1-step magnetic swipe RTU activation
- Sensor agnostic (quality, level, flow, etc.)
- 160-2,000 Hz pressure scan rate
- Hydrant, manhole, vault installation
- Battery / solar powered
- 4G LTE cellular (Verizon)
- IP68 / NEMA 6P water proof
- Customizable website dashboards
- 2-way communication
- Local and remote website control
- GPS tracking / GIS mapping
- Event alarms (website, email, SMS text)
- Over-the-air RTU program updates

SPECIFICATIONS

A. Pressure Transient Analyzer

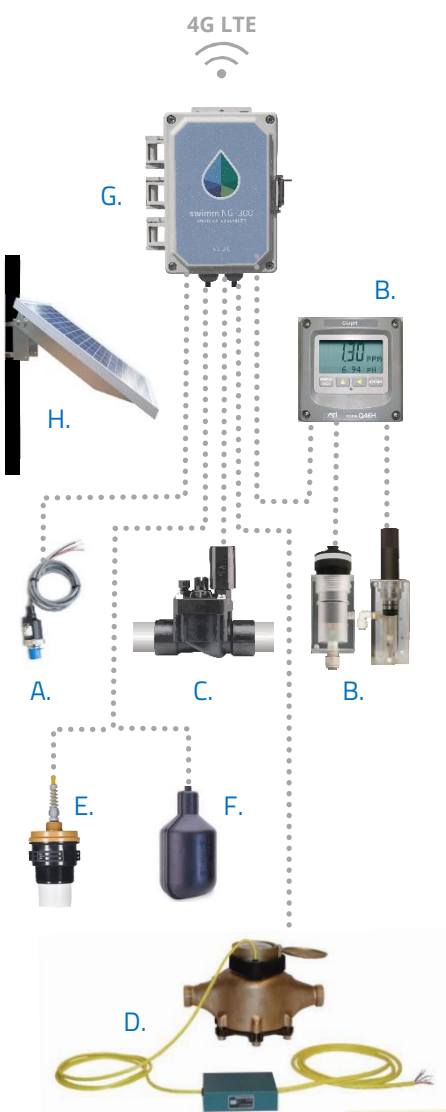
Scan Interval	<ul style="list-style-type: none"> ▪ Event mode: 60 second to 0.1 second (10 Hz) ▪ Burst mode (standard): 0.00625 seconds (160 Hz) ▪ Burst mode (optional): 0.0005 seconds (2000 Hz)
Data record	<ul style="list-style-type: none"> ▪ Normal and Event mode: maximum, minimum, and average ▪ Burst mode / edge analytics options: 1) waveform period max/min and 10 Hz down-sample (Patent Pending) or 2) upload all data to website or 3) record all data on datalogger only
Accuracy	0.5% of span (standard); 0.25% (optional)
Span	-14 to 300 psig (standard); 0-1,000 psi (optional)
Connection	1/4-inch male NPT (standard); stainless steel diaphragm (optional)

B. Water Quality Analyzer

Chlorine	Free or combined (0 - 2 ppm, 0 - 20 ppm)
Temperature	0°C to 50°C (32°F to 122°F)
pH/ORP	0 - 14 / -1000 to 2000 mv
Turbidity	0 - 5 NTU
Conductivity	50 - 1,000 µScm-1
Other/Custom	Call factory for additional options or custom sensor integration

C. Flushing Control Valve

Type	Globe style diaphragm (1" standard; 1.5" or 2" optional)
Solenoid	DC latching
Control	Smart sampling / flushing algorithm (Patent Pending)
Metering	Flow switch and flow meter integration (optional)
De-chlorination	De-chlorination tablet feed systems (optional)



D. Universal Flow Sensor

Meter Integration	Customer/master meters (mechanical - turbine; PD) (2 inputs standard)
Sensor Connection	Velcro strap-on magnetic sensor (does not interfere w/ AMR/I encoders)
Other Meter Options	Direct wired inputs (2 pulse counter) available for all other meter types

E. Non-Contact Level Sensor

Type	Ultrasonic, NEMA 6P, PC+PBT body
Certification	Class 1, Division 1, Intrinsically safe (suitable for sewer manholes)
Range	1.5-40 feet (contact factory for options)
Beam	9° off center

F. Cable Float Switch

Type	Cable suspended tilting ball float; polypropylene; 20-ft cable
Range	4-inch switching differential

G. Low Power Wireless RTU (Datalogger / Radio)

Memory	30 MB (local data storage)
I/O	6 analogue input, 2 analogue outputs, 4 digital inputs/outputs *
Serial	RS-232, SDI-12, RS-485 (optional add-on adapter)
Protocol	Campbell Scientific Pakbus/TCP, Modbus RTU, DNP3 (optional)
Temperature	-30°C to 70°C (-22°F to 158°F)
Cyber-Security	Pakbus AES-128 Encryption (serial and IP), Pakbus/TCP Password, Datalogger user security codes; Sierra Wireless Airlink security configurations
Communication	RV50 [4G LTE Verizon 700 MHz (standard), all N.A. carriers (optional)]; CR300-CELL210; Ethernet (optional CR310), unlicensed 2.4GHz or 900 MHz (optional CR300-Wifi/Rf407), and satellite (optional)

* Contact technical support to request alternative input configurations. See [Campbell Scientific CR300](#) specification sheet for more details.

H. Solar Power System

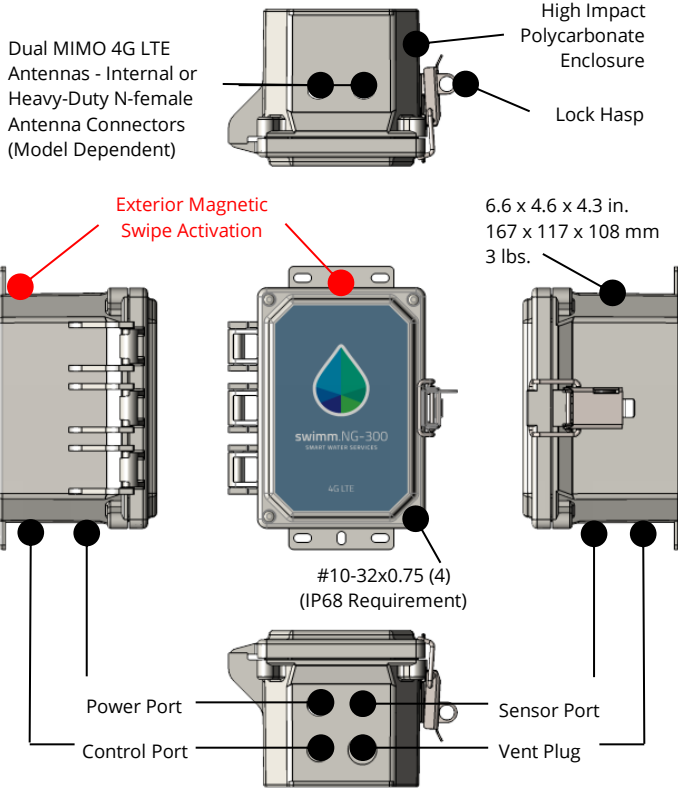
Batteries	12-VDC, 8.5-AH, lead acid deep cycle AGM battery, size 6.0"x2.6"x4.0", weight 6 lbs., quantity 1-2, Powersonic PDC-1285 or equal
Solar Panel	10-50W (per sales quotation based on customer system performance requirements and product model)
Optional Solar Charge Controllers (>20W Panels)	<ul style="list-style-type: none">Morningstar SunSaver SS-6-12V 2-step voltage charging with temperature compensation (standard)Campbell Scientific CH200 smart 12V charging regulator (optional) 2-step voltage charging with temperature compensation, battery reversal protection, simultaneous charging sources, real time SDI-12 measurement of input voltage, battery voltage/current, temperature and load current (sensor readings available on website dashboard)
System Performance	Pressure transient analyzer plus cellular data upload to website ** <ul style="list-style-type: none">2-10 minute interval (56 AH battery, 50W solar panel, CR300+RV50)10-60 minute interval (19 AH battery, 50W solar panel, CR300+RV50)12-24 hour interval (8 AH battery, 10W solar panel, CR300-CELL210)

** Solar power performance is based on high rate pressure transient scanning and local climate and site conditions; contact tech support for custom low power, battery-only product options

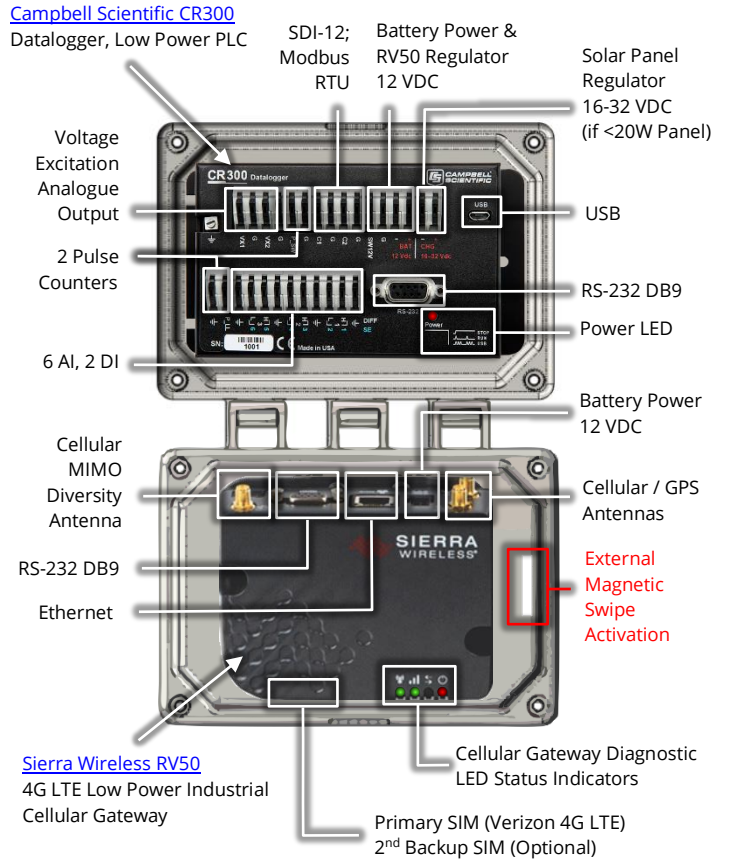
I. Cloud Data Storage and Website

Service	Software-as-a-Service (SaaS) includes: Amazon Web Service management, Mongo database management, Eagle.io website management, Verizon cellular data service, 24-7-365 technical support
Website	Eagle.io user-customizable dashboard environment (custom template configured by SWS)
Connection	TCP (website initiated), TCP Callback (device initiated), FTP, email
Data Download	Customer routine download to CSV file
Alarms	Any parameter, unlimited number of states, email notification, SMS
Documentation	Eagle.io Wiki
Alternative Integration	Eagle.io (HTTP API); SCADA (Campbell Scientific OPC Server)

NG-300.1 RTU: Front, Bottom, and Sides



NG-300.1 RTU: PLC/Datalogger & Cellular Gateway



NG-300.2 Portable RTU & Analyzers: Water Quality Monitoring + Intelligent Flushing + Pressure Transients

