

OVERVIEW

xMet® is an advanced weather station gateway designed to integrate professional meteorological sensors into the Digitex Sentry System for comprehensive Structural Health Monitoring (SHM). By capturing and streaming real-time environmental parameters such as wind speed and direction, temperature, humidity, barometric pressure, precipitation, and solar radiation, xMet enables SHM systems to correlate structural responses with surrounding environmental conditions.

DESCRIPTION

xMet acts as a dedicated gateway for connecting weather sensors to the Sentry System. Supporting a wide range of Gill Instruments MaxiMet series weather stations (purchased separately), it enables reliable data integration over standard Modbus RS-485. The system is fully configurable through Voyager software, providing flexibility for deployment across multiple sites within a single SHM project.

Data is streamed in real time or stored locally using optional SD/eMMC storage. Synchronization is handled via GPS or proprietary DigiSync®, ensuring time-aligned correlation with structural data from xWave, xStrain, xGeo, and xInc units. Advanced Store&Forward® ensures no data is lost during communication outages, while Ethernet, Wi-Fi, DigiMESH®, or GSM/4G modules provide flexible connectivity options.

APPLICATIONS

- Wind loading assessment on bridges, towers, and high-rise buildings
- Environmental monitoring for dams, tunnels, and transport infrastructure
- Earthquake and extreme weather response studies
- Long-term monitoring of climate influence on structural integrity
- Integration into multi-parameter SHM systems with xWave, xGeo, xStrain, and xInc units

KEY FEATURES

- Wide Sensor Compatibility: Supports Gill Instruments MaxiMet and MetPak weather stations, plus other Modbus-capable devices.
- Environmental Data Acquisition: Captures wind speed/direction, temperature, humidity, barometric pressure, solar radiation, precipitation, and more.
- Reliable Data Integration: RS-485 Modbus interface for stable communication; user-configurable channels.
- Advanced Data Handling: Real-time streaming to Voyager; Store&Forward® buffering; optional MiniSEED or proprietary compression.
- Flexible Communication: Ethernet as standard; optional Wi-Fi, DigiMESH®, or GSM/4G modules for remote deployment.
- Time Synchronization: GPS or DigiSync® for precise alignment with structural data.
- Rugged Construction: Compact IP67 aluminum enclosure, operating from -40°C to +55°C.
- Low Power Consumption: supports PoE or 12-24VDC powering options.
- User Interface: Embedded web server for configuration and diagnostics; LED indicators for status.
- System Integration: Seamlessly integrates with xPloer central unit and all Sentry System modules.



SPECIFICATIONS

Sensor

Type: External interface for weather stations measuring multiple environmental parameters, including temperature, humidity, wind speed, wind direction, rainfall, barometric pressure and more

Supported Models : Compatible with any weather station transmitting data over RS-485 or Modbus RTU

Digitizer

Channels: Multiple channels available, depending on weather station configuration and connected sensor types

Models: Supports a wide range of Gill Instruments MaxiMet series weather stations (purchased separately)

Resolution: Defined by the digital output precision of the connected weather station

Sampling rates: User-selectable from 1 to 1000 samples per second (SPS)

Trigger

Modes: Above Max, Under Min, Over Relative, Over Absolute

Pre-/Post-Event: User configurable

Configuration: Voting logic with user-defined weighting per channel

Interface

Connectivity: Ethernet (10/100 Base-T), Wi-Fi, DigiMESH®, GSM/4G (model dependent)

Led Interface: Power, Streaming Type, State of Health, Battery Voltage, and Charging Status

Embedded Web server: Integrated HTTP interface for configuration, data retrieval, real-time visualization, and basic frequency analysis. Provides access to device logs, user actions (reboot, backup, restore, and configuration management), and sensor diagnostics

Synchronization

Time Base: GPS-disciplined oscillator or DigiSync® network synchronization protocol

Accuracy: Sub-microsecond (GPS mode) or sub-millisecond (DigiSync® mode) timing precision across distributed networks

Communications & Output

Data Modes: Continuous real-time streaming; user-configurable ON/OFF operation in standalone mode

Protocols: Embedded SeedLink protocol for data redundancy via Nexus application

Internal Storage: Optional 32 GB non-volatile SDHC card.

Operation Mode: Ring Buffer and Triggered Event modes; miniSEED format

Stream Compression DigiWLC®, miniSEED STEIM1 or Uncompressed

Data Reliability: Store&Forward® buffering - retains data during communication loss and automatically forwards upon link restoration, ensuring zero data loss

Power

Supply Voltage: 9 – 28 V DC (typ. 12 V) PoE compatible

Power Consumption: ~2.5 W (average)

Backup: Optional Li-Ion battery pack (~12 h autonomy)

Protection: Reverse voltage, over/under voltage, surge protection up to 2 kV DC (optional)

Physical

Dimensions: 130 × 120 × 65 mm (5.12 × 4.72 × 2.56 in)

Weight: 0.7 kg

Enclosure: Rugged coated aluminum housing, IP67 rated

Mounting: Horizontal or vertical using mounting plate; single anchor point, three leveling bolts, and integrated bubble level

Environmental

Operating Temp.: -20 °C to +60 °C

Humidity: 0 – 100 % RH (non-condensing)

Certification & Calibration

Standards: CE, RoHS, ISO9001, ISO14001

Calibration: Factory calibrated; individual calibration certificate included

Software Updates

Firmware: Over-the-air (OTA) updates via Voyager® or embedded HTTP server

AVAILABLE OPTIONS

SSWiFi: Wi-Fi Communication Module

SSGPS: GPS Module for time and data synchronization

SSGSM: 4G GSM module for streaming and/or SMS alarming

SSPW: Power protection module (2.25KV, 10-36V Input)

SSSDG: SD Memory Module (Non detachable 32GB SD card)

SSBAT: Battery option (12h autonomy)

SSDO: Digital Relay Outputs Module with ext. JB (4, NO/NC)

SSDSP: Informational display (2.8 Inch at the top)

SSPOE: Power Supply: 24VDC; 1A; 24W and POE Injector

BENEFITS

- Provides real-time environmental context for SHM systems
- Supports industry-leading Gill Instruments MaxiMet weather stations
- Enhances structural analysis by correlating vibration and strain data with weather conditions
- Ensures reliable operation in harsh climates with IP67 enclosure and wide temperature range
- Offers flexible deployment with multiple communication and power options
- Fully integrated with Voyager software and the Digitex Sentry System ecosystem