

This document covers the data communications and security aspects of the WellStat platform.

Components Overview

The WellStat platform consists of the following components:

- WellStat Air Quality Monitor (WAQ) devices continuously monitor the air in a specific space or in a duct such as a supply or return.
- A WellStat Communications Bridge (WBR) communicates with one or more WAQs via secure Radio Frequency (RF) packets in the ISM frequency range. A WBR also interacts with WellStat Cloud Servers.
- WellStat Cloud Configuration Servers are responsible for managing configuration information such as operating parameters, BMS integration settings, and code patches. WellStat Cloud Configuration Servers communicate exclusively with WBR devices.
- WellStat Cloud Data Collection Servers are a multi-tenant environment responsible for aggregating data from multiple devices for viewing by users as well as for automated analysis and alerting.
- WellStat Management servers permit remote access by WellStat support personnel for administrative and maintenance purposes.
- Optionally, a deployment may include a commercial cellular modem to provide Internet access to a WBR

Data Communications

Communications for the WellStat platform can be segregated into various categories:

- WellStat Local communications take place between WBR and WAQ devices. This local communication utilizes a 915MHz ISM Radio link. WellStat devices support up to 50 distinct frequencies. Communication packets are encrypted between devices via a mutually agreed-upon key.
- WellStat Cloud communications take place between a WBR and cloud-hosted servers. Communications include both configuration data and transmission of observed sensor data. Communication between WBR and WellStat cloud servers operate over HTTPS protocol on port 443.
- WellStat LAN communications expose WellStat capabilities to the local area network, including:
 - An embedded web server at port 80 (configurable)
 - Modbus TCP Server at port 502 (configurable)
 - BACNet IP Server at port 47808 (configurable)
- WellStat Serial communications permit connections to Building Management Systems (BMS) via an RS 485 connection. This is for Modbus RTU and BACNet MSTP traffic. Communications default to 19200 baud.
- WellStat Management Server connections take place via Secure Shell protocol at port 22223.

WellStat is the #1 Air Quality Monitoring System for Commercial Spaces

Data Communications (cont'd)

WBR devices communicate via an Ethernet connection via a DHCP-assigned IPV4 address. A static IP address is not required. This network connection must be provided by the host facility or the WBR must be provisioned with a cellular modem.

All WellStat Cloud and Management connections are initiated via the WBR, therefore no inbound firewall configuration is required.

Patch Management

From time -to-time, code changes may be required on either the WBR and/or WAQ devices. In these circum- stances, code changes are transmitted from the WellStat Cloud Configuration Server to a WBR. Each trans- action is encrypted and validated with a Cyclic Redundancy Check (CRC). When the integrity of the entire image has been verified, the code is applied to the target device.

Continuity of Operations

In the event of an Internet connection outage, the WBR accumulates time-stamped and encrypted snap- shots of the WAQ-collected data. When the Internet connection is restored, previously accumulated data is forwarded to the WellStat Cloud Data Collection Servers.

WellStat is the #1 Air Quality Monitoring System for Commercial Spaces