

WSDA-1000 Network Requirements

Introduction

The WSDA-1000 is a gateway that will collect sensor data from a wide range of MicroStrain's wireless nodes. The WSDA-1000 stores sensor data locally within onboard memory and can optionally send this data to **SensorCloud**. **SensorCloud** is an internet based data storage, visualization and analysis platform. **SensorCloud** also provides world-wide command and control access for enabled WSDA-1000s through the remote connectivity feature.

In order for the WSDA-1000 to properly communicate with **SensorCloud**, the following requirements must be met:

- WSDA-1000 **must** be on a DHCP network and be enabled to use DHCP.
- WSDA-1000 **must** be allowed to make outbound connections to the internet on port 443 (HTTPS) and 37 (time).
- WSDA-1000 **must** be in Data Aggregate mode to upload sensor data to **SensorCloud**.

Detailed Description of WSDA-1000 Operational Modes

WSDA-1000 Using DHCP

Boot Up Process

When the WSDA-1000 is in DHCP mode it assumes that there is access to the internet. On boot the WSDA-1000 will try to contact one of several time servers over port 37. Usually a WSDA-1000 will continuously attempt to communicate with a time server until it receives a valid time. Once it receives a valid time it will update the RTC time and continue to boot. If a WSDA-1000 is set up to timeout, it will then continue to boot once the timeout occurs and will retrieve a timestamp from the RTC, database, or log file, whichever has the latest time. This is illustrated in Figure 1.

Data Aggregator Mode

Ports Used: 37, 80, 443, 1900

In Data Aggregator mode the WSDA-1000 will begin collecting wireless traffic and storing it in its internal memory. The WSDA-1000 will announce its presence to other computers on the local network using UPnP over port 1900. If enabled, the WSDA-1000 will periodically upload data collected to **SensorCloud** via HTTPS (port 443) roughly every two minutes. The WSDA-1000 Control Panel is available locally over port 80 and if Remote Connectivity is enabled, over port 443. Time synchronization with a time server is done through port 37.

Live Connect Mode

Ports Used: 37, 80, 443, 1900, 5000

When a user is connected to a WSDA-1000 in Live Connect mode, the WSDA-1000 will forward wireless traffic to the user over port 5000. If Remote Connectivity is enabled, the WSDA-1000 will forward wireless traffic to the user over 443. It will also announce its presence to other computers on the local network via UPnP over port 1900. The WSDA-1000 Control Panel is available locally over port 80 and if

Remote Connectivity is enabled, over port 443. Time synchronization with a time server is done through port 37.

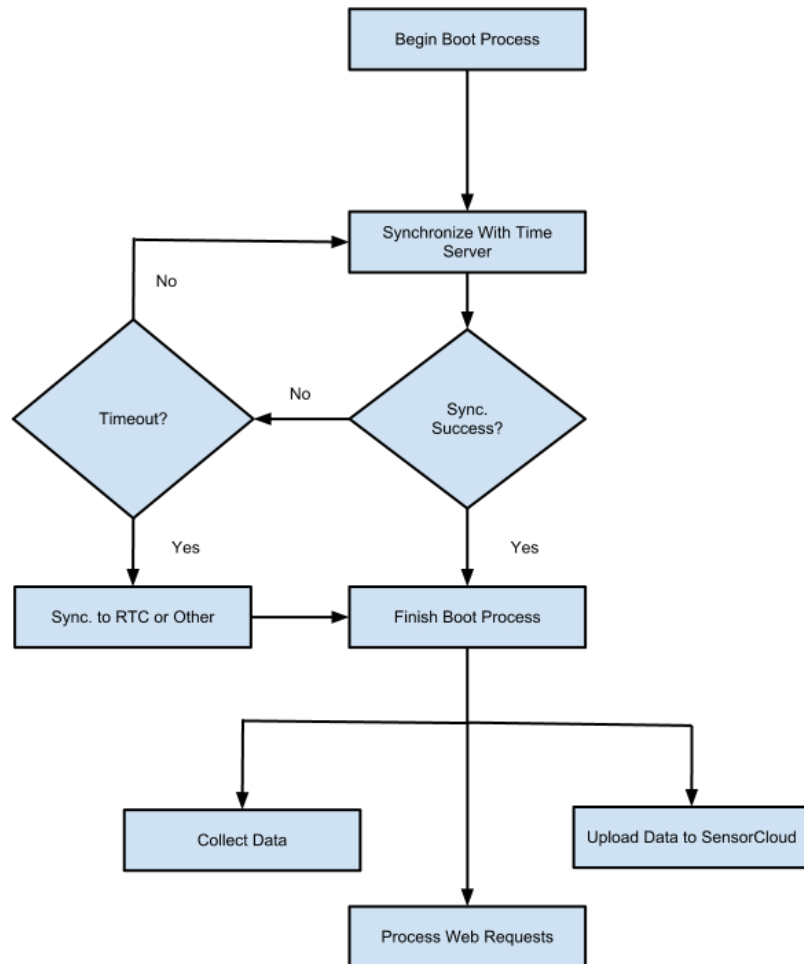


Figure 1 Simplified Flowchart for WSDA-1000 Using DHCP

WSDA-1000 Using Static IP

Boot Up Process

Static IP mode is meant for point-to-point communication in which only one computer can be physically connected to the WSDA-1000 at a time. When the WSDA-1000 is in Static IP mode it assumes that it cannot access the internet. On boot the WSDA-1000 will synchronize its system time to its onboard RTC. Once the time is set it will continue to boot. This is illustrated in Figure 2.

Data Aggregator Mode

Ports Used: 80

In this mode, the WSDA-1000 will simply collect data. It will not attempt to push data to any location. The user can download data from the WSDA-1000 using the Data Downloader program. This program uses HTTP requests over port 80.

Live Connect Mode

Ports Used: 80, 5000

When a user is connected to a WSDA-1000 in Live Connect mode, the WSDA-1000 will forward wireless traffic to the user over port 5000. UPnP does not work in this mode. The WSDA-1000 Control Panel is available over port 80.

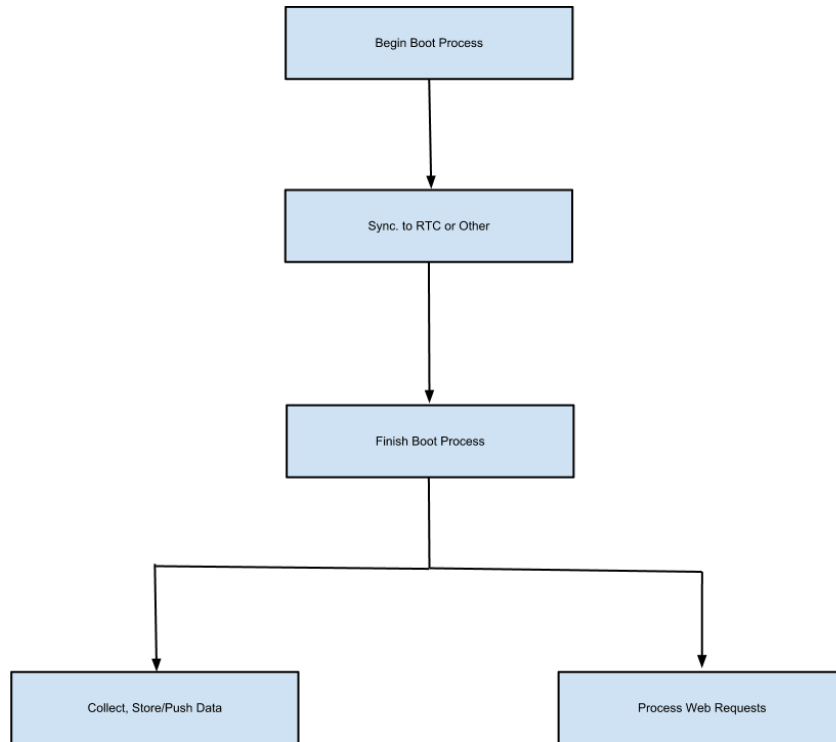


Figure 2 Simplified Flowchart for WSDA-1000 Using Static IP

Glossary and Network Summary

Remote	Remote denotes a feature which is available outside of the LAN.
Local	Local denotes a feature which is usually available only within the LAN.
UPnP	Universal Plug and Play is a network protocol used to discover network devices.
O.S. Version	The version number for the operating system running on the WSDA-1000.
Port	The Ethernet port number which data is communicated through.
External	External denotes a connection in which data usually travels outside of a local network.
Internal	Internal denotes a connection in which data usually travels within a local network.
Server	A WSDA-1000 is a server when it responds to a connection and processes user requests.
Client	A WSDA-1000 is a client when it initiates a connection and issues requests to a server.
DHCP	Dynamic Host Configuration Protocol is used to dynamically assign an IP address.
Static IP	The IP address is manually assigned and remains the same until changed.

Table 1 WSDA-1000 Feature and Associated Ethernet Port

WSDA-1000 Feature	O.S. Version	Port	Network Access	Server / Client
Time Server Synchronization	1.9.3+	37	External	Client
SensorCloud Communication	1.9.3+	443	External	Client
WSDA Control Panel (Local)	1.9.3+	80	Internal	Server
WSDA Control Panel (Remote)	2.2.0+	443	External	Client
Live Connect (UPnP)	2.0.14+	1900	Internal	Server
Live Connect (Local)	2.0.14+	5000	Internal	Server
Live Connect (Remote)	2.2.0+	443	External	Client