APPLICATION NOTE
AN-201301302
01/30/13

Information Technology Details

Network Media

BAYweb devices utilize a 10Base-T wired Ethernet connection operating at 10Mbit/s half-duplex. This interface is IEEE 802.3 compliant and compatible with 10/100/1000Base-T networks.

Network Services

BAYweb devices require DHCP and DNS services. The device will make a single DNS lookup request of uplink.bayweb.com on power up, and during certain error recovery modes.

The device MAC address consists of a unique three-octet OUI registered to Bay, followed by a unique device serial number. DHCP and/or firewalls can restrict traffic to the MAC OUI prefix if desired.

Internet Access

Users access the Cloud-EMS system via the Internet using standard web browser software and/or iOS or Android Apps. These front-end connections utilize the HTTPS protocol (HTTP over an SSL connection).

BAYweb devices utilize the Internet to communicate with the BAYweb servers. These back-end connections are initiated by the device upon power up and at a user configurable interval.

The TCP/IP outbound connection is exclusively to a server in Bay's class C network (38.157.74.0/24) on port 443. On power up the device initiates communication with the uplink.bayweb.com server (typically 38.157.74.110) and may be re-routed to other servers in the 38.157.74.0/24 network at any time. This internal re-routing may be done for performance and/or server fail over handling.

BAYweb devices do not accept any type of incoming connection including ICMP requests. They do not contain any network software other than that necessary to process the outbound connection. It is not possible to connect to a BAYweb device on a customer LAN, or to compromise a customers LAN utilizing a BAYweb device. The networking software is hard coded and can not be field updated.

Wireless Connectivity

Users will often use wireless connectivity to access the system when using standard web browsers or the iOS or Android Apps. This front end access is encrypted using SSL.

BAYweb devices do not use any wireless connectivity for device to local area network (back-end) communications.

Bandwidth Impact

BAYweb devices send a message:
- Upon power up
- User configurable interval
- Whenever an alert condition is detected, repeated at a user configurable interval.

Typical bandwidth impact of a single BAYweb thermostat is shown in the table below for each configurable interval. Since the normal message interval is significantly higher than occurrence of alerts and power cycles, and the thermostat message size is the largest of all BAYweb devices, the following table will provide a conservative estimate of bandwidth impact on the building WAN connection.

Message Interval	Bytes/Second	Bits/Second	Bytes/Day	Megabytes/Month
Fast	83.1	664.80	7,179,840	215.4
Normal (60 seconds)	13.9	110.80	1,196,640	35.9
5 Minutes	2.8	22.16	239,328	7.2
10 Minutes	1.4	11.08	119,664	3.6
15 Minutes	0.9	7.39	79,776	2.4
30 Minutes	0.5	3.69	39,888	1.2