BAYweb®

Application Programming Interface (API) v2

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Introduction

The BAYweb **A**pplication **P**rogramming **I**nterface (API) provides an interface to BAYweb devices from customer web sites and/or other systems.

The API provides the ability to acquire current and historical data and initiate control actions with your BAYweb Devices.

The BAYweb API is a a RESTful web service. Requests for data and commands are made using a HTTP GET or POST; responses are provided in JSON (JavaScript Object Notation) format.

About This Manual

This manual provides information for a web developer/programmer to interface to the BAYweb portal. The developer should be familiar with HTML, Javascript, and JSON programming standards and techniques before attempting to interface to the BAYweb system.

Bay is unable to provide support for customer web site development utilizing BAYweb devices, other than verifying that the API operates as documented.

This manual is updated periodically. You can download the latest version at http://www.bayweb.com.

Operation

To enable and configure the API for your devices, login to http://www.bayweb.com. Select the Settings item from the device's applet menu, then click the "API" tab. Each interface to a device is configured with an ID, key code and access level (read only or read/write).

You can only enable an interface for the devices you have registered. You can not enable the API for devices that another user has shared with you.

The interface ID is generated by the BAYweb system and the key code is specified by the device owner.

Using the API

The API is used by issuing a request to the API server using an HTTP GET or POST and decoding the JSON format response. The API request is either a request for device information or a command to write to the device.

Requests

An API request is made to either http://api.bayweb.com/v2/ or https://api.bayweb.com/v2/ as desired.

All requests must include the interface ID, key code, and desired action. The action parameter is further described under Device Interfaces in this manual.

For example, a request URL to obtain the current data from a device with an ID of 12345678 and key code of FEDCBA98 would be as follows:

> https://api.bayweb.com/v2/?id=12345678&key=FEDCBA98&action=data

Only one action may be performed per request. Note that any required parameters must be URL encoded.

Request Limits

Requests are rate-limited to prevent a script from making requests in a tight loop and causing unnecessary server load. The specifics of the limit may vary as the server load varies, but will generally be more than tens of requests per minute.

Responses

The API response is encoded as JSON data and differs depending on the action type and the device associated with the API ID. If an error occurs, "errno" and "error" objects are returned instead of the requested data.

ERROR RESPONSE		
Key	Description	Value
errno	Error number	Integer
error	Error description	Text

Example Response

An example response for the Web Thermostat "data" action is as follows:

```
{
"timestamp": 1318021866,"iat": 77,"iah": 0,"act": 2,"mode": 1,"sp": 60,"act_sp":
60,"hold": 0,"fan": 0,"oat": 80,"oah": 0,"wind": 6,"solar": 36,"door": 0,"relay_w2":
0,"relay_y2": 0,"in1": 0,"in2": 0,"in3": 0
}
```

Date and Time

All timestamps are Unix Timestamps, defined as the number of seconds since January 1, 1970 (UTC).

Actions that relate to daily data extract the day in the timezone of the device associated with the API ID. For example, 1306908000 refers to June 1, 2011 for devices in the Eastern timezone and May 31, 2011 for devices in the Pacific timezone. Any timestamp that falls within a day may be used to refer to that day.

Thermostat data that represents a daily average is averaged from midnight to midnight local time.

JSONP Support

Any API request may include a jsonp=XYZ parameter. If this parameter is specified and non-blank, the JSON response will be wrapped in a javascript function with the given name. This feature can be used to work around the "same-origin" policy enforced by most web browsers. Further JSONP discussion is beyond the scope of this document – a greal deal of documentation is freely available on the Internet.

Demonstration

A development demonstration is available at http://api.bayweb.com/v2/demo.php. This page allows you to make an API request in your browser and view the results in various formats.

Future Development

In the future, this API may be expanded to support additional requests, additional responses or additional data to existing responses. This additional data may be simply ignored. Changes to documented requests or documented response items will result in a new version of the API being released. Consider using the "currentver" action to develop a feature to notify you when a new API is released.

Obsolete API versions may be decommissioned.

Device Interfaces

The BAYweb API currently supports the BAYweb Thermostat (all models), the BAYweb Integrator, and the Winland Electronics EA800. The following sections provide detail on the API functions provided for each device. The specific results and validity of actions depends on the device associated with the API ID and Key.

Anonymous Actions

ACTION	
Action:	currentver
Description:	Requests the current API version. This action is not associated with a device and does not require an API ID or Key to be provided.

RESPONSE	
Key	**Description**
currentver	The version number of the latest available API. Developers should check this periodically to ensure that they are using a current API interface. If this value changes, you should consider porting your project to the new API before the old API is decommissioned.

Web Thermostat

ACTION	
Action:	data
Description:	Provides the most recent data, status, and set points received from the thermostat.

RESPONSE		
Key	**Description**	**Value**
timestamp	Time stamp of when the data was received from the device.	Unix Timestamp
iat	Inside air temperature	Deg F
iah	Inside air humidity	%
act	Current activity	0 = Home / Occupied 1 = Away 1 2 = Away 2 3 = Sleep / Away 3
mode	Current mode	0 = Off 1 = Heat 2 = Cool
sp	Current set point	Deg F
act_sp	Set point of current activity	Deg F
hold	Hold setting	0 = Off 1 = On
fan	Fan setting	0 = Auto 1 = On
oat	Outside air temperature	Deg F
oah	Outside air humidity	%
wind	Wind Speed (MPH)	MPH
solar	Solar Index	%
door	Door open status	0 = Closed or not sensed 1 = Open
relay_w2	Relay W2 status if not being used for HVAC.	

RESPONSE		
Key	**Description**	**Value**
timestamp	Time stamp of when the data was received from the device.	Unix Timestamp
relay_y2	Relay Y2 status if not being used for HVAC.	
in1	Input 1 value	Digital: 0 = Closed / 1 = Open Temperature: Deg F
in2	Input 2 value	Digital: 0 = Closed / 1 = Open Temperature: Deg F
in3	Input 3 value	Digital: 0 = Closed / 1 = Open Temperature: Deg F

Note: If no data is available for a selected key, null will be returned. For example, there is no active set point if the mode is off.

ACTION	
Action:	day
Description:	Provides the hourly data records for a day beginning at the specified time. Generally, 24 time periods will be returned, but it could fewer if there is missing data.
Parameter	**Description**	**Value**
timestamp	Start of requested data	Unix timestamp

RESPONSE		
Object:	**An array with values for each time period.**	
Key	**Description**	**Value**
timestamp	Time of the data being returned	Unix timestamp
heat1	1st stage heat run time	hours
heat2	2nd stage heat run time	hours
heat3	3rd stage heat run time	hours
cool1	1st stage cool run time	hours
cool2	2nd stage cool run time	hours

RESPONSE		
Object:	**An array with values for each time period.**	
Key	**Description**	**Value**
fan	Fan run time	hours
sp	Average set point	Deg F
iat	Average inside air temperature	Deg F
iah	Average inside air humidity	%
oat	Average outside air temperature	Deg F
oah	Average outside air humidity	%
wind	Average wind Speed (MPH)	MPH
solar	Average solar Index	%
in1	Input 1 average value. Digital values are averaged as well.	Digital: 0.0-1.0 Temperature: Deg F
in2	Input 2 average value. Digital values are averaged as well.	Digital: 0.0-1.0 Temperature: Deg F
in3	Input 3 average value. Digital values are averaged as well.	Digital: 0.0-1.0 Temperature: Deg F

ACTION		
Action:	days	
Description:	Provides the daily data records for a selected range of dates.	
Parameter	**Description**	**Value**
start	Start date of requested data	Unix Timestamp
end	End Date of requested data	Unix Timestamp

RESPONSE		
Object:	**An array with values for each time period.**	
Key	**Description**	**Value**
timestamp	Time of the data being returned	Unix timestamp
heat1	1st stage heat run time	hours
heat2	2nd stage heat run time	hours
heat3	3rd stage heat run time	hours

RESPONSE		
Object:	**An array with values for each time period.**	
Key	**Description**	**Value**
cool1	1st stage cool run time	hours
cool2	2nd stage cool run time	hours
fan	Fan run time	hours
sp	Average set point	Deg F
iat	Average inside air temperature	Deg F
iah	Average inside air humidity	%
oat	Average outside air temperature	Deg F
oah	Average outside air humidity	%
wind	Average wind Speed (MPH)	MPH
solar	Average solar Index	%
in1	Input 1 average value. Digital values are averaged as well.	Digital: 0.0-1.0 Temperature: Deg F
in2	Input 2 average value. Digital values are averaged as well.	Digital: 0.0-1.0 Temperature: Deg F
in3	Input 3 average value. Digital values are averaged as well.	Digital: 0.0-1.0 Temperature: Deg F

ACTION	
Action:	settings
Description:	Provides the device settings.

RESPONSE		
Key	**Description**	**Value**
deviceid	The type of device	1 = Thermostat
access	API access level	1=Read Only 2=Read/Write
location	The device's configured location	text
timezone	The device's configured timezone	text
wxids	An array of weather station IDs	Array of text

RESPONSE		
Key	Description	Value
deviceid	The type of device	1 = Thermostat
alert_mail	Email address that alerts are sent to	text

ACTION	
Action:	set
Description:	Provides the ability to modify a set point or make a control action. Multiple points may be set with a single request. Example: action=set&activity=3&heat_sp=64

Parameter	Description	Value
act	Change the current activity	0 = Home / Occupied 1 = Away 1 2 = Away 2 3 = Sleep / Away 3
heat_sp	Modify the heat set point	Deg F
cool_sp	Modify the cool set point	Deg F
mode	Change the mode	0 = Off 1 = Heat 2 = Cool
hold	Change the hold status	0 = Off 1 = On
fan	Change the fan mode	0 = Auto 1 = On

RESPONSE: Values as-set.

ACTION	
Action:	datarange
Description:	Provides the timestamps of the earliest and latest data available.

RESPONSE		
Key	Description	Value
mintime	Earliest data record	Unix Timestamp
maxtime	Latest data record	Unix Timestamp

Web Integrator

ACTION	
Action:	data
Description:	Provides the most recent monitoring and control point data.

RESPONSE		
Key	**Description**	**Value**
timestamp	Time stamp of when the data was received from the device.	Unix Timestamp
settingstimestamp	Time stamp of when the device's settings last changed. You may want to request the new settings when this changes.	Unix Timestamp
mp	An array of monitoring point data.	Refer to device settings.
cp	An array of control point data.	Refer to device settings.

ACTION		
Action:	day	
Description:	Provides the 10-minute average data records for a day beginning at the specified time. Generally, 24 time periods will be returned, but it could fewer if there is missing data.	
Parameter	**Description**	**Value**
timestamp	Time stamp of the day requested.	Unix Timestamp

RESPONSE		
Object:	**An array with values for each time period.**	
Key	**Description**	**Value**
timestamp	Time stamp of the data.	Unix Timestamp
mp	An array of monitoring point data.	Refer to device settings.
cp	An array of control point data.	Refer to device settings.

ACTION	
Action:	settings
Description:	Provides the device settings.

RESPONSE		
Key	**Description**	**Value**
deviceid	The type of device	3 = Integrator
access	API access level	1=Read Only 2=Read/Write
location	The device's configured location	text
timezone	The device's configured timezone	text
alert_mail	Email address that alerts are sent to	text

RESPONSE		
Object:	mp (an array with 1 element per point)	
Key	**Description**	**Value**
type	Monitoring point type.	0 = None / not used 1 = Analog 2 = Digital 3 = Totalizer
description	Point description.	text
precision	Point precision.	# of decimal places
units	Unit description.	text

RESPONSE		
Object:	cp (an array with 1 element per point)	
Key	**Description**	**Value**
type	Control point type.	0 = None / not used 1 = Analog 2 = Digital
description	Point description.	text
precision	Point precision.	# of decimal places
units	Unit description.	text

ACTION	
Action:	set
Description:	Provides the ability to write to a control point. Multiple points may be set with a single request. Example: action=set&cp1=100&cp2=200

Parameters	Description	Value
cp# (1-16)	Control point data.	Refer to device settings.

RESPONSE: Values as-set.

ACTION	
Action:	datarange
Description:	Provides the timestamps of the earliest and latest data available.

RESPONSE		
Key	**Description**	**Value**
mintime	Earliest data record	Unix Timestamp
maxtime	Latest data record	Unix Timestamp

ACTION	
Action:	deltas
Description:	Provides the data changes over specified intervals. This is useful for values that accumulate, such as kWh of electricity or gallons of water. This returns the amount of electricity or water that flowed between each time period. Lists should be a URL-encoded versions of comma-separated values. A comma is URL encoded as "%2C". See urlencode() in PHP or encodeURI() in JavaScript. Example: action=deltas&points=mp10%2Cmp11&times=1293854400%2C1296532800%2C1298952000

Parameter	Description	Value
points	A list of points to return data for.	URL-encoded comma-separated values
times	A list of times defining each period.	URL-encoded comma-separated values

RESPONSE	
Object:	An array with 1 element per timespan. Note that there is one fewer timespan than times given.

Key	Description	Value
timestamp	Start of the time period	Unix timestamp
mp	An array of values with 1 element for each mp requested.	Array of values

ACTION	
Action:	dump
Description:	Provides mp and cp values for a given month. See the "deltas" action for a description of how to provide the list of points.

Parameter	Description	Value
points	A list of points to return data for. These can be "mp" or "cp" points.	URL-encoded comma-separated values
timestamp	Time stamp of the month to return data for.	Unix timestamp

RESPONSE	
Object:	An array with 1 element per available record.

Key	Description	Value
timestamp	Time stamp of data	Unix timestamp
data	An array of with 1 element for each point requested.	Array of values

Winland Electronics EA800

ACTION	
Action:	data
Description:	Provides the most recent monitoring point data.

RESPONSE		
Key	**Description**	**Value**
timestamp	Time stamp of when the data was received from the device.	Unix Timestamp
settingstimestamp	Time stamp of when the device's settings last changed. You may want to request the new settings when this changes.	Unix Timestamp
pause	Whether the device is paused	value
alarm	An array of alarm statuses	value
mp	An array monitoring point data	value
sig	Signal strength	value
palm	Pending alarms	value

ACTION		
Action:	day	
Description:	Provides the data records for a day beginning at the specified time.	
Parameter	**Description**	**Value**
timestamp	Time stamp of the day requested.	Unix Timestamp

RESPONSE		
Object:	**An array with values for each time period.**	
Key	**Description**	**Value**
timestamp	Time stamp of the data.	Unix Timestamp
mp	An array of monitoring point data.	value
mo	An array of offset data for each MP	value
mt	An array of sensor types for each MP	value

RESPONSE		
Object:	**An array with values for each time period.**	
Key	**Description**	**Value**
mst	An array of sensor subtypes for each MP	value
mu	An array of sensor units for each MP	value
mr	An array of resolutions for each MP	value
sig	An array of signal strengths for each MP	value
palm	An array of pending alarms for each MP	value
alm	An array of alarms for each MP	value
warn	An array of warnings for each MP	value

ACTION	
Action:	settings
Description:	Provides the device settings.

RESPONSE		
Key	**Description**	**Value**
deviceid	The type of device	7=EA800
access	API access level	1=Read Only 2=Read/Write
location	The device's configured location	text
timezone	The device's configured timezone	text
alert_mail	Email address that alerts are sent to	text
collection_freq	Collection frequency	2=5 Minutes 3=15 Minutes 4=30 Minutes 5=1 Hour 7=2 Hours
buzzer	Buzzer enabled	0=Off, 1=On
rf_channel	Radio Frequency Channel	11-26

RESPONSE		
Object:	mp (an array with 1 element per point)	
Key	**Description**	**Value**
point	Monitoring point index	value
type	Sensor type (See "hardware" key)	Enumerated value
subtype	Sensor subtype (See "hardware" key)	Enumerated value
name	Sensor name	Text
unit	Measurement units	Text
resolution	Decimal places	value
high_limit	High alarm limit	value
low_limit	Low alarm limit	value
low_raw	Low raw reading	value

RESPONSE		
Object:	mp (an array with 1 element per point)	
Key	**Description**	**Value**
low_scaled	Low scaled reading	value
high_raw	High raw reading	value
high_scaled	High scaled reading	value
offset	Offset	value
low_short	ADC low short	value
low_ref	ADC low ref	value
low_open	ADC low open	value
high_short	ADC high short	value
high_ref	ADC high ref	value
high_open	ADC high open	value
hysteresis	Hysteresis	value
relay	Alarm relay number	value
alarm_delay	Alarm delay	value
cal_time	Calibration time	value
input	Sensor connection	Text
hardware	Sensor type description	Text

ACTION		
Action:	set	
Description:	Provides the ability to write to the unit. Multiple items may be set with a single request. Example: action=set&alert_reset=1&buzzer=0	
Parameters	**Description**	**Value**
alert_reset	Minimum alert frequency	0=Disabled, else time in minutes
alert_enable	Enable alerts	0=Disabled, 1=Enabled
collection_freq	Collection frequency	2=5 Minutes 3=15 Minutes 4=30 Minutes 5=1 Hour 7=2 Hours
buzzer	Enable buzzer	0=Disabled, 1=Enabled

ACTION	
Action:	set
Description:	Provides the ability to write to the unit. Multiple items may be set with a single request. Example: action=set&alert_reset=1&buzzer=0
rf_channel	Radio Frequency Channel	11-26

RESPONSE: Values as-set.

ACTION	
Action:	datarange
Description:	Provides the timestamps of the earliest and latest data available.

RESPONSE		
Key	**Description**	**Value**
mintime	Earliest data record	Unix Timestamp
maxtime	Latest data record	Unix Timestamp

ACTION	
Action:	dump
Description:	Provides values for a given month.

Parameter	**Description**	**Value**
points	A list of points to return data for. These can be "mp", "mo", "mt", "mst", "mu", "mr", "sig", "palm", "alm", "warn" followed by a point number or "pause". Lists should be a URL-encoded versions of comma-separated values.	URL-encoded comma-separated values
timestamp	Time stamp of the month to return data for.	Unix timestamp

RESPONSE		
Object:	An array with 1 element per available record.	
Key	**Description**	**Value**
timestamp	Time stamp of data	Unix timestamp

RESPONSE		
Object:	An array with 1 element per available record.	
Key	**Description**	**Value**
data	An array of with 1 element for each point requested.	Array of values

ACTION		
Action:	alarmlog	
Description:	Retrieve the alarm log entries	
Parameter	**Description**	**Value**
start	Return data at or after this time	Unix Timestamp
end	Return data before this time	Unix Timestamp

RESPONSE		
Description:	An array is returned that represents to log entries, from earliest to latest.	
Key	**Description**	**Value**
timestamp	Time alarm occurred	Unix Timestamp
type	Type code	value
typetext	Type text	text
code	Alarm code	value
codetext	Alarm code text	text
sensortype	Sensor type code	value
sensortypetext	Sensor type text	text
sensorsubtype	Sensor subtype code	value
sensorsubtypetext	Sensor type text	text
sensor	Sensor code	value
sensorname	Sensor name	text
unit	Measurement units	text
resolution	Digits	value
data	Measured data	value
highlimit	Alarm high limit	value
lowlimit	Alarm low limit	value
alarmflags	Alarm flags	value
warnflags	Warning flags	value

ACTION		
Action:	eventlog	
Description:	Retrieve the event log entries	
Parameter	**Description**	**Value**
start	Return data at or after this time	Unix Timestamp
end	Return data before this time	Unix Timestamp

RESPONSE		
Description:	An array is returned that represents log entries, from earliest to latest.	
Key	**Description**	**Value**
timestamp	Time event occurred	Unix Timestamp
type	Type code	value
param	Parameter	value
text	Text describing the event	text

Troubleshooting and Support

Support is limited to verifying the API is operating as documented. We are unable to provide any support for customer application development or web programming.

If you find that something is not operating correctly with the API, send an email to support@bayweb.com. Please include an example of how to duplicate the problem if possible.

Errors		
errno	**error**	**Meaning**
1	"Request limit"	Too many requests have been sent in a short period of time.
2	"Bad request"	Incorrect id specified, or Incorrect key specified
3	"Bad action"	Incorrect action specified
4	"Bad parameter"	Incorrect parameter
5	"Read only"	Cannot make changes to a device with read-only access
6	"Data unavailable"	Data unavailable
7	"Access denied"	Access denied. Is the request coming from a authorized IP address?
8	"MySQL error"	Internal error
9	"Unsupported device"	This device cannot perform this action