Web Server API
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Web Server/API Commands

The CR1000, CR3000, and CR800 dataloggers support an HTTP API interface for accessing data from the dataloggers. The CGI-style request syntax is designed to be flexible and easy to use.

Initial support for these commands was implemented in CR1000 OS 20, CR3000 OS 13, and CR800 OS 11. Additional commands were released in subsequent operating systems. If a command is not supported by the operating system in your datalogger, refer to our web site's download page for the most recent operating system release.

While the following information specifically addresses directly accessing the web server in the datalogger, this API can also be used with a PC-based web server where LoggerNet is used as the data source.

Enabling Security

The dataloggers employ a security scheme that includes three levels of security and is enabled by setting a field in the datalogger's Status table to a value in the range of 1 to 65534 (refer to the SetSecurity command in the CRBasic help file). This scheme can be used to limit access to a datalogger that is publicly available, but it is of limited value since the security code is plainly visible in the URI and the range of codes is relatively small. To provide a more robust means of security, Basic Access Authentication was implemented with the HTTP API interface in the form of an encrypted password file named .csipasswd.

When a file named .csipasswd is stored on the datalogger's CPU drive, basic access authentication is enabled in the datalogger. Four levels of access are available: all access denied (0), all access allowed (1), set variables allowed (2), and read-only access (3). These levels of access correspond to the levels of access as documented by the SetSecurity instruction in the CRBasic help file, with the addition of level 0, all access denied. Multiple user accounts/levels of access can be defined for one datalogger.

The encrypted password file is created (or an existing password file is modified) using DevConfig. Support for this file was added in DevConfig version 1.17. It is created from the Net Services tab, Edit HTTP Passwords button. After user accounts are defined and the Apply button is pressed, the .csipasswd file is automatically saved to the datalogger's CPU drive.

If the .csipasswd file is blank or does not exist, the default user name is "anonymous" with no password and a user level of read-only. To maintain backward compatibility with existing systems, this default to read-only affects only the web services API commands implemented in the OS versions as noted above, and not those commands as documented by the WebPageBegin/WebPageEnd instruction in the CRBasic help file (i.e., SetValue will work but SetValueEx will not). However, if a .csipasswd file sets one or more user names and passwords, security will be enforced regardless of which command is issued.

When access to the datalogger web server is attempted without the appropriate security level, the datalogger will return a 401 Authorization Required response, which will prompt the web client to display a user name/password request dialog. If an invalid username or password is entered, the datalogger web server will default to the level of access assigned to "anonymous". As noted above, anonymous is assigned a user level of read-only, though this can be changed using DevConfig.

Command Syntax

Syntax for the commands sent to the web server generally follows the form of:

    URL?command=*CommandName*&uri=*DataSource*&*arguments*

Arguments are appended to the command string using an ampersand (&). Some commands have optional arguments, where omitting the argument results in a default being used. When applicable, optional arguments and their defaults are noted in the descriptions below.

When specifying the data source for a command, the URI may be omitted in instances where a tablename or fieldname is not used (i.e., URI=dl:). This is because when querying the datalogger directly, the datalogger is the top level data source and the URI is assumed.

Some commands return a response code indicating the result of the command. These are described below where applicable.

Data Access Commands

DataQuery

DataQuery allows a web client to poll the datalogger for data. The command returns one or more fields, or one or more records, from a table in the datalogger. DataQuery has the following parts:

URI   The URI specifies the data source for the query. When querying the datalogger directly, the data source is specified as dl:tablename.fieldname. For example, the data source for the PTemp field in a datalogger's Public table would be:

Uri=dl:Public.PTemp

Note that fieldname is optional. If omitted, all values in the table will be returned.

Mode   The Mode specifies the timeframe for the data to be returned. Valid options are:

most-recent – Returns the data from the most recent number of records. The number of records is specified by P1.

since-time – Returns all the data since a certain time. The time is specified by P1.

since-record – Returns all the records since a certain record number. The record number is specified using P1

data-range – Returns the data in a certain date range. The date range is specified using P1 and P2.

Backfill – Returns all the data that has been stored since a certain time interval (for instance, all the data since 1 hour ago). The interval is specified using P1.

P1/P2   P1 and P2 are used to set the time parameters for Mode:

most-recent – The maximum number of records to return.

since-time – The start time for the data. Format = YYYY-MM-DD T:HH:MM:SS.MS. Time (T) is optional; if only the date is specified, Time is assumed as midnight. When specifying time, MS is optional.

since-record – The starting record number.

data-range – The start time (P1) and end time (P2) for the data. Format = YYYY-MM-DD THH:MM:SS.MS. Time (T) is optional. If only the date is specified, Time is assumed as midnight. When specifying time, MS is optional.

Backfill – The interval, in seconds, for the backfill (e.g., 3600 would be 1 hour).

Format   The Format is the format in which to return the data. Options are: html, json, toa5, tob1, xml.

As an example, to return the three most recent values from the PTemp variable in the Public table (i.e., most-recent) the command line would be:

http://192.168.4.14/?command=dataquery&uri=dl:public.ptemp&format=html&mode=most-recent&p1=3

For additional examples, [click here](#).

BrowseSymbols

The BrowseSymbols command is used to return all the tables in a datalogger, all the fields in a table, or all the elements of an array. It has the following parts:

URI   The URI specifies the name of the parent element for which to return the BrowseSymbol information. The format is dl:tablename.fieldname.

Format   The Format is the file format for the result of the command. Options are: html, json, or xml. The following information is returned:

Return	Description
URI	The URI of the child element.

Name	The name of the child element in the datalogger.
Type	The type of the element. 6 = Table, 7 = Array, 8 = Scalar
Is_enabled	Boolean value which indicates whether the element is enabled for scheduled data collection (relevant only to LoggerNet data sources).
Is_read_only	Boolean value which indicates whether the element is read only. If not read only, the element can be changed using SetValueEx.
Can_expand	Boolean value that indicates whether the element has child elements.

Follow this link for examples.

Control Commands

SetValueEx

The SetValueEx command is used to set a value in the datalogger. If a .csipasswd file has been sent to the datalogger, a user name and password must be entered (or previously entered in the same session) or the command will fail. SetValueEx has the following parts:

URI	The URI specifies the value that should be set in the format of dl:tablename.fieldname.
Value	The new value to which the URI should be set.
Format	The Format is the file format for the result of the command. Options are: html, json, or xml. A result code and description are returned:

Code	Description
0	An unrecognized failure occurred
1	Success
2	The data source connection failed (LoggerNet data sources only)
3	LoggerNet logon failed (LoggerNet data sources only)
4	Blocked by LoggerNet security (LoggerNet data sources only)
5	Read only
6	Invalid table name
7	Invalid fieldname
8	Invalid fieldname subscript
9	Invalid field data type
10	Datalogger communication failed
11	Datalogger communication disabled (LoggerNet data sources only)
12	Blocked by datalogger security
13	Invalid table definitions (LoggerNet data sources only)
14	Invalid device name (LoggerNet data sources only)
15	Invalid web client authorization

Results codes marked as (LoggerNet data sources only) are applicable only when the API is being used with a PC-based web server.

As an example, to set a Boolean variable called Flag(1) in a datalogger's Public table to True (-1), the command would be:

http://192.168.4.14/?command=setvalueex&uri=dl:public.flag(1)&value=-1&format=html

ClockCheck

Returns the current time of the datalogger clock.

URI The URI can be specified as URI=dl: or URI can be omitted.

Example:

http://192.168.4.14/?command=ClockCheck

ClockSet

Sets the time in the datalogger. ClockSet has the following parameters:

URI The URI can be specified as URI=dl: or URI can be omitted.

Time	The time to set the clock to, in the format of YYYY-MM-DD T:HH:MM:SS.MS. MS is optional.
Format	The Format is the file format for the result of the command. Options are: html, json, or xml.

A result code, time, and description are returned for ClockCheck and ClockSet. With ClockSet, the time returned is the time before the clock was set.

Code	Description
1	The clock was checked (successful)
2	The clock was set
3	The LoggerNet session failed (LoggerNet data sources only)
4	Invalid LoggerNet logon (LoggerNet data sources only)
5	Blocked by LoggerNet security (LoggerNet data sources only)
6	Communication with the station failed (LoggerNet data sources only)
7	Communication with the station disabled (LoggerNet data sources only)
8	Blocked by datalogger security
9	Invalid station name (LoggerNet data sources only)
10	LoggerNet device is busy (LoggerNet data sources only)
11	Specified URI does not reference a LoggerNet station (LoggerNet data sources only)

Results codes marked as (LoggerNet data sources only) are applicable only when the API is being used with a PC-based web server.

To set the clock to August 12, 2010, 15:13:10 the command would be:

http://192.168.4.14/?command=ClockSet&uri=dl:&format=html&time=2010-08-12T15:13:10.123

File Management Commands

NewestFile

The NewestFile command will return the most recent file that matches a given expression, as defined by the expr argument. This command can be used to display the most recent image stored to the datalogger by a camera. The command will return other files, as well, and the file will be processed based on the settings in the web client (for instance, if the specified file is a CR1 file and the command is entered into a browser, the browser may prompt for the file to be saved or for selection of the program to open the file).

URI The URI can be specified as URI=dl: or URI can be omitted.

Expr	Specifies the path and file pattern for the desired file to be returned. Path determines the drive on the datalogger; i.e., CPU:, USR:, or CRD:. The file pattern can incorporate the use of wildcards. If path is

omitted or invalid, or a file matching the pattern does not exist, an Unrecognized Request response will be returned.

NewestFile requires a minimum access level of Read/Write.

The following command can be used to return the most recent file on the datalogger's USR: drive with a JPG extension:

http://192.168.4.14/?command=NewestFile&expr=USR:*.jpg

The following command will retrieve the newest CR1 file on the datalogger's CPU, and assign a name to the file of Newest.CR1:

http://192.168.4.14/newest.cr1?command=NewestFile&expr=CPU:*.cr1

ListFiles

The ListFiles command returns a list of files stored in the specified directory of the datalogger. The ListFiles command requires at minimum security level of read only.

URI	The URI can be specified as URI=dl: or URI can be omitted.
Format	The Format is the format in which to return the list of files. Options are: html, json, and xml.

ListFiles returns the following, formatted in a table:

Path	The path of the file or directory, relative to the URL.
Is Directory	A boolean that indicates whether or not the returned object is a directory.
Size	An integer that provides the size of a file in bytes, or the number of bytes free in a directory.
Last Write	A string that specifies the date and time a file was last written (returned for files only).
Run Now	A boolean that indicates whether or not the file (a datalogger program) is marked by the datalogger file system as currently running.
Run On Power Up	A boolean that indicates whether or not the file (a datalogger program) is marked by the datalogger file system as run on power up.
Read Only	A boolean that indicates whether or not the file is marked by the datalogger file system as read only.
Paused	A boolean that indicates whether or not the file (a datalogger program) is marked by the datalogger file system as paused.

To return all files on the datalogger, the command would be:

http://192.168.4.14/?command=ListFiles&format=html