

**XML History Format  
Specification and Documentation**

**Revision 0.2**

**November 2, 2009**

## Overview

This document describes an XML standard format for the exchange of historical data from water treatment controllers. This standard will allow easier interoperability between various water treatment controllers and software packages.

Along with this document there should be three files, controllerhistory.dtd, controllerhistory.xml, and sample.xml. The controllerhistory.dtd is the document type definition for the XML files. The DTD file will validate the generated XML file to ensure they contain the correct tags and data.

The controllerhistory.xml file describes in detail all of the tags presently used. Please note that this is not a correct controllerhistory.xml file do to certain items that cannot be in a single structure at once.

The sample.xml file contains historical data for a test controller and can be used to validate any parser programs that are developed.

## Structure

The basic structure of the XML history file will consist of the following items. A single Header structure containing the controller identification and basic information. Multiple Channel structures containing the information for each measurement and common information for the historical data. Multiple Historical Data structures containing the time stamp and data for the measurement.

The tags will be described in the order they appear in the file. The tags must be in the order shown or an error will occur when the file is verified against the DTD document.

All files are to start with the following tags

```
<?xml version="1.0"?>
<!DOCTYPE controller_history>
<controller_history>
```

Condensed version

```
<?xml version="1.0"?>
<!DOCTYPE controller_history>
<controller_history_cnd>
```

The xml version is set to 1.0

The Doctype must be controller\_history or controller\_history\_cnd the System and path has been deleted.

The controller\_history is the type of file we are generating.

## Header Structure

The Header structure contains the basic information used to identify the controller along with common information.

Full

<controller\_manufacturer\_name>

Condensed

<c\_m\_n>

This tag will indicate the manufacturer of the controller. This can be used by external programs correctly handle manufacturer specific items. This tag is required.

Full

<controller\_model>

Condensed

<c\_m>

This tag is used to indicate the controller model to the program. This will allow the program to correctly handle controller specific items. This tag is required.

Full

<controller\_name>

Condensed

<c\_n>

<controller\_id>

<c\_I>

These two tags are used to uniquely identify this controller. At least one of these tags must be present.

Full

<controller\_location>

Condensed

<c\_l>

<controller\_owners\_name>

<c\_o\_n>

These two tags are optional and can be used to indicate the location and owner of the controller.

Full

<time\_period>

Condensed

<t\_p>

This tag indicates the time period for the historical collection. This is used with averaged and totalized data points to find the period that they were processed over. The value is in seconds. This is an optional tag also this tag can be overridden in individual channels.

**Full**

`<download_date_time>`

This tag contains two elements indicating the local time and date of the download of this file. This tag is required. The elements are `<<date>>` and `<time>`. The `<date>` tag stores that date in a YYYY/MM/DD format. The `<time>` tag stores the time, based on a 24 hour clock, in a HH:MM:SS format. Note: The seconds are optional.

**Condensed**

`<dt>`

This tag containf the date time stamp in the following format  
YYYY/MM/DD HH:MM:SS

The year is always 4 digits. There is a space between the date and the time. The hours are based on a 24 hour clocked and the controllers local time zone.

**Channel Structure**

The channel structure contains the information used to identify the measurement data and for common information used with the measurement. There is one channel structure for each measurement or data channel in the controller.

**Full**

`<channel>`

The channel structure starts with the Channel tag. This tag is required.

**Condensed**

`<ch>`

**Full**

`<channel_id>`

`<channel_name>`

The Channel ID and or Channel Name are used to uniquely identify the measurement. At least one of these two tags must be present.

**Condensed**

`<chi>`

`<chn>`

**Full**

`<cht>`

The Channel Type is used to determine what type of I/O the channel is: Valid types are:

- M = Meter
- S = Sensor
- C = Contact Switch
- R = Relay
- F = Frequency Control
- I = Current Output

**Condensed**

`<cht>`

*Note: The Multiflex controller does not have this tag. However, when Trackster converts an Aegis data download to the Multiflex data format, Trackster will use the `<cht>` to specify the channel type. The reason for this is due to the fact that the Multiflex XML format does not make a distinction between a Contact and*

*Meter other than the fact that a water meter channel will include the <t> tag. The Aegis XML format does not use the <t> inference. Rather, the Aegis XML format explicitly specifies the channel type via the <t> tag where types are 'R'elay, 'F'requency, 'S'ensor, 'V'olume, 'C'ontact, 'I'Current Output*

Full

&lt;channel\_uom&gt;

Condensed

&lt;chu&gt;

This tag contains the Units Of Measurement for the data. This is an optional tag.

Full

&lt;channel\_control&gt;

Condensed

&lt;chc&gt;

This tag contains the control equation string. Applies to outputs only

This is an optional tag.

Added to MultiFlex controllers 10/10/06 with firmware M714\_0910\_06

**Full**

<channel\_upper\_alarm>  
 <channel\_upper\_setpoint>  
 <channel\_lower\_setpoint>  
 <channel\_lower\_alarm>

**Condensed**

<chua>  
 <chus>  
 <chls>  
 <chla>

These four tags are optional and used to indicate the channel control and alarm points.

**Full**

<time\_period>

**Condensed**

<t\_p>

This tag will indicate the time period for average and totalized data values. This value is in seconds. By entering a value within a channel you are overriding the <time\_period> tag in the header structure. This will allow you to have different time periods for different channels

**Historical Data Structure**

The historical data structure is embedded within the channel structure. There is an individual historical data structure for each data point.

**Full**

<historical\_data>

**Condensed**

<hd>

This tag indicates the start of a data point. This tag is required.

**Full**

<date\_time\_stamp>

This tag contains two elements indicating the local time that this data point was gathered. This tag is required. The elements are <date> and <time>. The <date> tag stores that date in a YYYY/MM/DD format. The <time> tag stores the time, based on a 24 hour clock, in a HH:MM:SS format. Note: The seconds are optional.

**Condensed**

<dt>

This tag containf the date time stamp in the following format  
 YYYY/MM/DD HH:MM:SS

The year is always 4 digits. There is a space between the date and the time. The hours are based on a 24 hour clocked and the controllers local time zone.

Full	Condensed
<value>	<v>
Used to indicate an instantaneous value	
<maximum_value>	<mv>
Used to indicate a maximum value over the time period	
<average_value>	<av>
Used to indicate a average value over the time period	
<minimum_value>	<lv>
Used to indicate a minimum value over the time period	
<total>	<t>
Used to indicate a running total outside of a specific time period	
<sum>	<s>
Used to indicate a total over the time period	

Only one of the above tags are used. Use the appropriate tag to indicate the meaning of the data point. If this is a raw data point use the value tag. Maximum value, average value, minimum value, and sum are assumed to operate over the header time period unless overridden by a channel time period. The total tag is used to indicate running totals outside of a specific time period, if you wish to indicate a total time for a time period, use the sum tag. Only one tag can be used and a tag is optional.

Full	Condensed
<note>	<n>
Used for textual data.	
The note tag is used to for textual data. The note tag can be combined with a value, maximum_value, average_value, minimum_value, total, or sum tag. Or the note tag could be used as a stand-alone tag. The note tag is optional.	

### Revision Log:

10/10/06 Format 10. Adds condensed **<chc>** field to MultiFlex controllers.

Full **<channel\_control>** field not implemented.