XT Panel Records and Excel Spreadsheets
APP-026

General:

The XT-70 control panel up to 25 parameters to be chosen to use for records. Not only can the specific parameters to use be chosen, but so can the order of the records. The XT-70 will save 78,000 records and then will rollover when full by deleting the oldest record and replacing it with a new one. The records can be downloaded from a web browser or from the HMI. When downloaded with a web browser, they are loaded into a spreadsheet. It is also possible to access the data directly from a pre-setup template.

The XT-70 will also store refrigeration records for up to ten devices. The ten devices can be any combination of CR and ER cards. It will store up to 17000 records for each device. The records will also rollover when the slot is filled. They can be downloaded like the XT records.

The records are composed of both a historical averaged record and also an activity log. The time for the historical averaged record can be set. The activity log record will be generated any time there is a mode change. The activity record is not averaged and is an instantaneous record.

Records Setup:

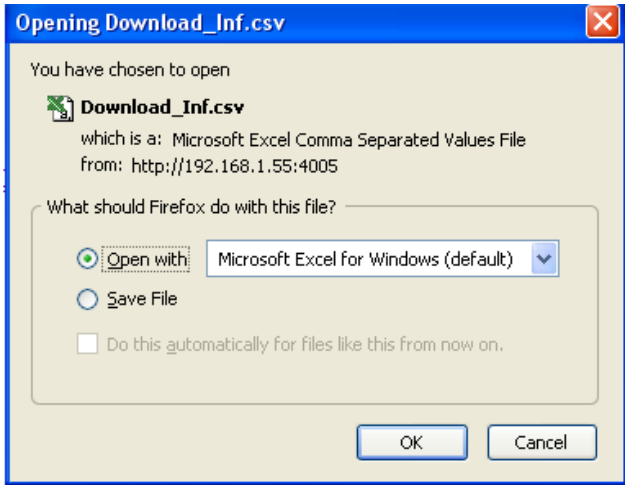
The format of the records is controlled by a CSV file that can be edited in Excel. This file will also allow the changing of the names of the pile sensors and the humidity and CO_2 sensors. There are numerous files already built that can be used and modified. These files are available on the BTU Tech website.

At any time, it is possible to download the existing file that the XT panel is using and make changes to it.

Access the panel via the webpage and click on 

On the Configuration page, click on Inf Manager

Now click on Download Current Card Configuration File



Click on OK and the file will open in Excel.

Click on File> Save As.. and use a name that will describe the panel. Changes can now be made. When done, save the file and upload it back into the panel.

The following shows the format of the CSV file. The sensors highlighted in yellow can be named. The record index refers to the order in which the values will appear in the records. All record index fields must have a value. If not being used, then insert a zero.

[XT_INF_01]		TERMINAL LABLE
[XT]		
<Plenum T - reference only>	<record index>	
<Start - reference only>	<record index>	
<Outside T - reference only>	<record index>	
<Return T - reference only>	<record index>	
<Pile 1 - **configurable**>	<record index>	AN5
<Pile 2 - **configurable**>	<record index>	AN6
<Pile 3 - **configurable**>	<record index>	AN7
<Pile 4 - **configurable**>	<record index>	AN8
<Pile 5 - **configurable**>	<record index>	AN9
<Pile 6 - **configurable**>	<record index>	AN10
<Pile 7 - **configurable**>	<record index>	AN11
<Pile 8 - **configurable**>	<record index>	AN12
<Outside H - **configurable**>	<record index>	H1
<Plenum H - **configurable**>	<record index>	H2
<CO2 level - **configurable**>	<record index>	H4
<Door Open - reference only>	<record index>	
<Operation Mode - reference only>	<record index>	
<Secondary Mode - reference only>	<record index>	
<Refrig Output - reference only>	<record index>	
<switch status 1 - reference only>	<record index>	
<switch status 2 - reference only>	<record index>	
<switch status 3 - reference only>	<record index>	
<output status - reference only>	<record index>	
<Return H - **configurable**>	<record index>	H3
<Freq Drive Current - reference only>	<record index>	
<Daily Run - reference only>	<record index>	
<CPH - reference only>	<record index>	
<Pile T - reference only>	<record index>	
<Pile H - reference only>	<record index>	
<setpoint - reference only>	<record index>	
<target - reference only>	<record index>	
<CO2 SP - reference only>	<record index>	
<humid sp - reference only>	<record index>	
<cooling sp - reference only>	<record index>	
<refrig sp - reference only>	<record index>	
<timed sp - reference only>	<record index>	

CSV Example:

Highlighted names can be changed to any name you want, with a ten character maximum.

[XT_INF_01]	
[XT]	
PLENUM T	4
START	5
OUTSIDE T	6
RETURN T	7
NE	8
NW	9
SE	10
SW	11
Middle E	12
Middle	13
Center	0
Unused	0
OSA H	14
PLEN H	15
CO2	17
DOOR OPEN	18
OPERATION MODE	1
SECONDARY MODE	2
REFRIG OUTPUT	19
SWITCH STATUS 1	20
SWITCH STATUS 2	0
SWITCH STATUS 3	0
OUTPUT STATUS	21
RTN H	16
FREQ DRIVE CURRENT	0
DAILY RUN	0
CPH	0
PILE T	0
PILE H	0
SETPOINT	3
TARGET	0
CO2 SP	0
HUMID SP	0
COOLING SP	0
REFRIG SP	0
TIMED SP	0

The numbers refer to the order of the records. In this example, the operation mode will be the first value, then the secondary mode, setpoint and so on.

Timestamp	OPERATION MODE	SECONDARY MODE	SETPOINT	PLENUM T	START	OUTSIDE T
4/2/2009 0:00	WARMING		39.7	40.2	60.1	91.9

Refrigeration records:

[CARD_1]	
	1
Discharge Pressure	1
Suction Pressure	2
Suction Super Heat	3
Amps	0
Output	4
Mode	5
Lead Compressor	6
Suction Temp	7
Discharge Temp	0
[CARD_2]	
	1
Discharge Pressure	1
Suction Pressure	2
Suction Super Heat	3
Amps	0
Output	4
Mode	5
Lead Compressor	6
Suction Temp	7
Discharge Temp	0
[CARD_3]	
	2
Suction Press A	5
Suction Temp A	6
Suction Press B	7
Suction Temp B	8
Super Heat SP	2
Super Heat A	3
Super Heat B	4
Valve pos A	9
Valve pos B	10
Mode	1

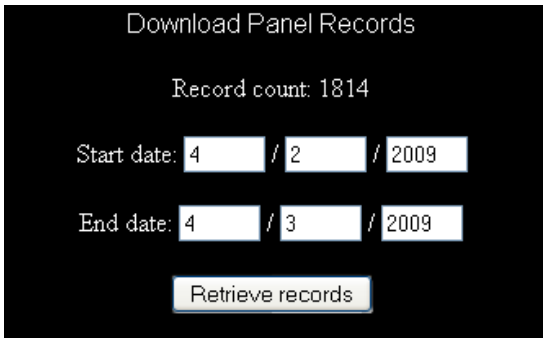
The refrigeration records are laid out in the same CSV file as the XT records. There can be up to ten devices and can be cut and paste to match up to the system. All cards must be in order, starting with Card 1. Below each card, identify the card type. 1 = CR-110 and 2 = ER-110 (required).

The numbers will set the order in which the values will appear.

Once the file is set as desired, then save it as a CSV file and use a name that references the given panel. Now upload the new file to the XT panel. Generally, when changes are made to this file, the records should be cleared.

Records Request:

There are a number of ways to retrieve the records from the XT. The first and easiest way it to use the web interface and select the desired date.



Any start date and ending date that has valid records can be entered. The start date begins at midnight. Thus, if today is the 4/2/09 and only today's records are wanted, use a start date of 4/2/09 and an end date of 4/3/09.

When Retrieve records is clicked on, a choice is given to save the records or to open them in a spreadsheet.

The next way to get records involves using a host of other applications to download the records. This could be a database, a spreadsheet or a custom program. Any records request involves the IP address of the panel.

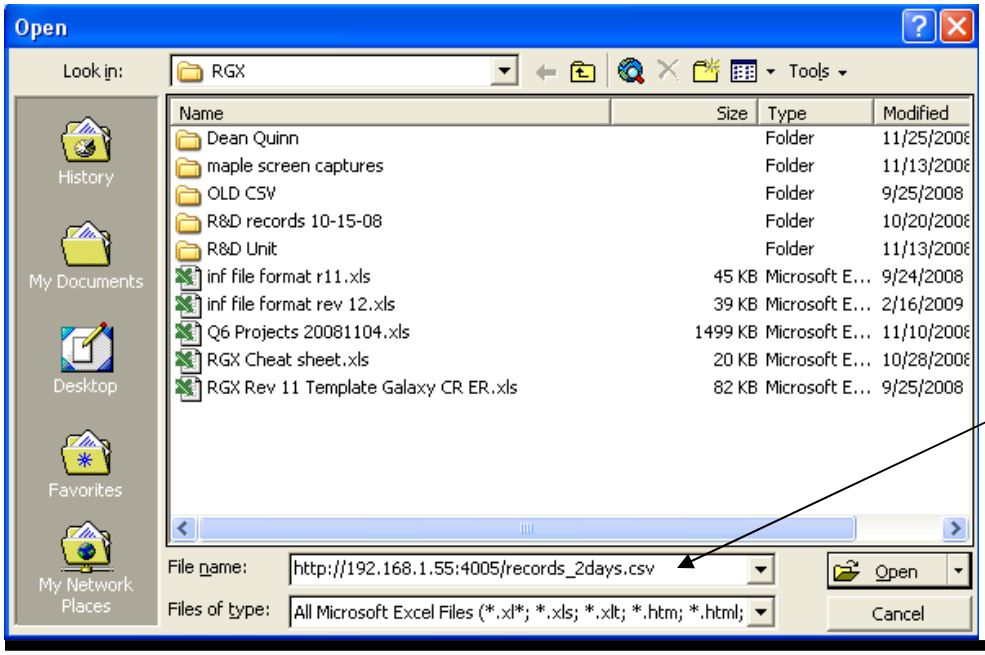
There is a variable format that would allow one to automatically pull records from any date and there is also a two day and a seven day fixed dump of records. The two day and seven day format are addressed here first.

The format for the last two days records is http://<ip address>/records_2days.csv

The format for the last seven days records is http://<ip address>/records_7days.csv

For example, to retrieve the last two days of records for an XT-70 panel at 192.168.1.55 at HTTP port 4005, the request would be: http://192.168.1.55:4005/records_2days.csv

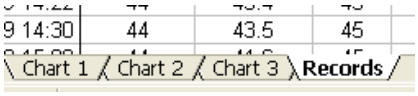
To load these records in an Excel spreadsheet, do a file open and use that address for the "File name:" field.



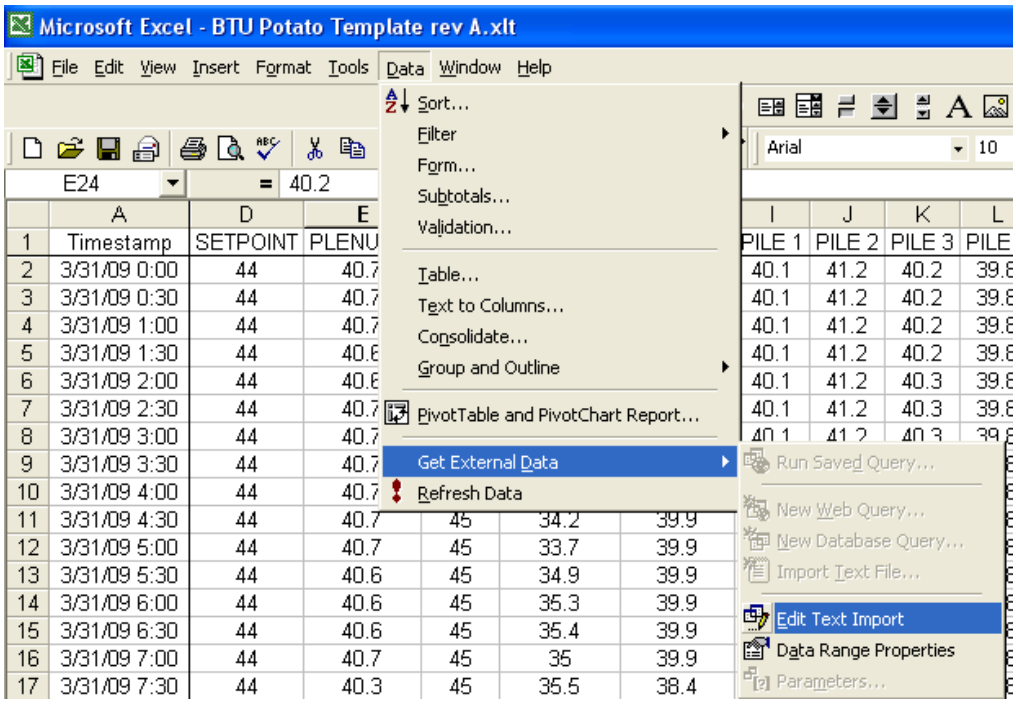
The XT panel acts much like a hard-drive. The difference is that the address or path is via the internet to gain access the XT.

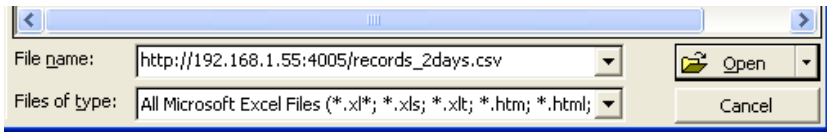
Two day and Seven day Templates:

The purpose of a template is to set up some predefined graphs and to be able to instantly download the data and apply it to the graphs. Excel allows one to build and save templates. Excel's normal file extension is xls. An Excel Template will have an extension of xlt. With a Template, one can set up graphs and different displays which will automatically load the data for the last two days or seven days when the spreadsheet is opened. The best way to start is with the BTU Potato Template.xlt file. Open this file (it may take a while to timeout if it is not pointed toward any data). The first thing to do is to point it toward the correct XT panel. To do this, click on the Record Tab at the bottom.



Click on any cell, then go Data> Get External Data> Edit Text Import.





Type in the IP address of the panel using the colon between the IP number and the HTTP port number. Records for either the last two days or seven days can be chosen here.

Click on Open and the file should load the new data for the last two or seven days.

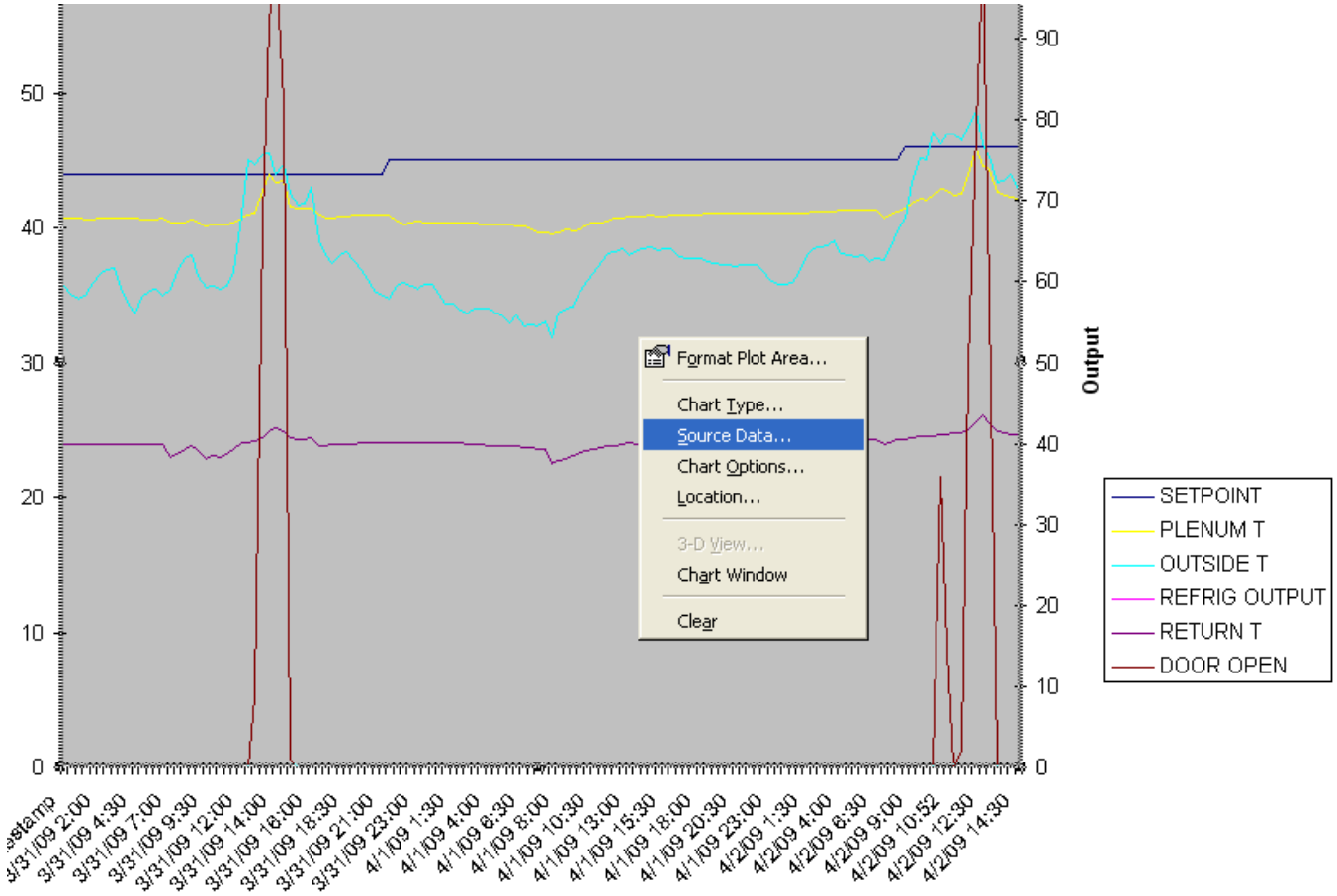
Do a Save As on this file and name it according to the panel name. Make sure that the file extension yis for a template (xlt) and not a worksheet (xls).

Now any time this file is opened, the last two days of data will automatically be loaded.

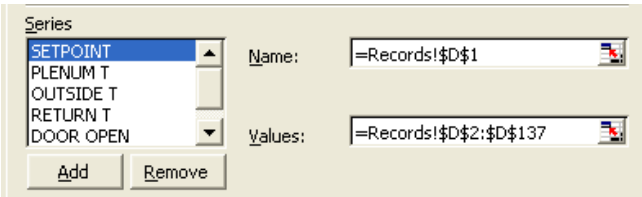
Excel Graphs & Templates:

The main part of the template is to get the data to load into the records page. The trick is that the exact number of records is unknown. Thus when the graphs are set up, they have to be inclusive of just the data. The BTU template can easily be modified it for a specific application.

Chart 1 is a dual axis graph and has temperatures on the left side and output percentage on the right side.



To make a change to the parameters being graphed, right click on the graph and select Source Data. Remove parameters by clicking on the parameter and then Remove. To change a parameter, select the parameter, determine which column the needed parameter is in and then change the alpha character in both the Name and Values boxes.



To add a button, click on Add. Then go to one of the other sensors and copy the Name string and paste it in to the new one and change the alpha character to match the desired value. Repeat for the Values field.

Getting Date Specific Data:

The second way to download data automatically is by using a date specific format. This will send a beginning date and ending date for the records. The request string would be as follows:

http://<ip address:port #>/records.csv?a=x&b=x&c=x&d=x&e=x&f=x&g=1&h=x

Where

a = record start month
b = record start day
c = record start year
d = record end month
e = record end day
f = record end year

x = value for corresponding variable

g = 1 this variable is only needed if the request is sent by an automated device, i.e. HMI, VPN, etc. It forces the formatting of the CSV to be strictly comma separated values with no other HTTP formatting.

h = 0 to 10 this variable indicates which device the request is for: 0 = XT, 1 to 10 = refrigeration cards

Example: to request records from a panel with an IP address of 192.168.1.55, HTTP port 4005, start date 4-3-09 and end date of 4-4-09, send the following request:

http://192.168.1.55:4005/records.csv?a=4&b=3&c=2009&d=4&e=4&f=2009&g=1&h=0