



**When product integrity counts...**  
Manufacturers of laboratory calibrated temperature and humidity data loggers,  
real-time monitoring and cold chain solutions

# TTV Statistics

## Quick Start Guide

# Total Temperature Value (TTV)

(This information is extracted from the **Help** section of the TRW software.)

In many applications there is a need to evaluate thermal performance - how well was a certain temperature band maintained over time. In some applications the ideal ambient temperature changes over time. At any given time there is an optimum temperature range for best results.

This optimum temperature profile - sometimes called the **zone of thermal neutrality** - can be modelled as a single or a series of equal length time periods, where each period has a lower an upper temperature. An index can be calculated for that period based on the distance the actual temperature strays outside the two limits. The total temperature value (TTV) for that period is calculated as the sum of the number of degrees outside the limits for each temperature sample in the period. Samples that are within the limits are not counted - only samples where the temperature is outside the limits are counted, and the further outside the limits the sample is, the higher its contribution for the TTV value for that period. The TTV value is thus a temperature-time integral of the deviation from the ideal range.

Temprecord for Windows allows you to specify up to 20 TTV periods of any duration, and then specify a lower and upper temperature limit for each period. The TTV value is calculated separately for the lower and upper limits for each time period, and total TTV results are also calculated.

- **If the number of samples corresponding to the TTV periods specified exceeds the number of samples between the start sample and the last sample, the number of periods actually shown may be less than the number specified. Also, this may mean that the number of samples used to calculate the TTV value for the last shown TTV period is less than a full TTV period's worth. In this case the TTV value for the final period will have less relevance.**
- **The units of the TTV values are degree-samples, because the method of calculation involves summing the temperature deviation for each sample. This means that the displayed value depends on both the sample rate and the selected units (degrees F or degrees C). When comparing TTV values from different data records, the sample rate, selected units, and TTV period should be the same for both files.**

The TTV statistics are shown in the [statistics view](#). The TTV statistics can also be printed and exported.

**See also:**

[Changing the view mode](#)

[Statistics view](#)

[Statistics View Options](#)

[Printing Options](#)

[Export Options](#)

[Process Hygiene Index](#)

# TTV (Total Temperature Value)

## TTV (Total Temperature Value) Statistics

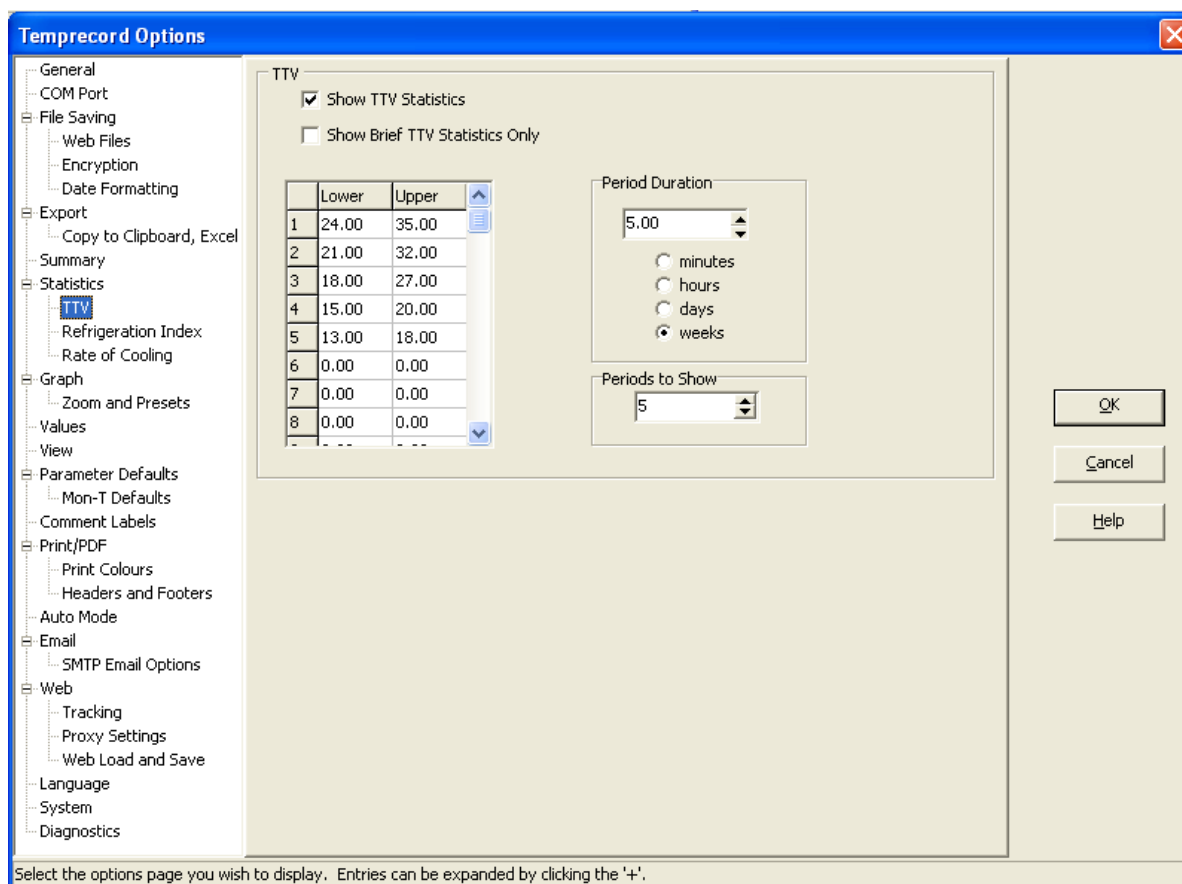
Temprecord for Windows can also calculate and display TTV (Total Temperature Value) statistics. To enable this facility, click on Options/Statistics, and make sure Show TTV Statistics is checked. The TTV statistics are displayed after the statistics for all samples and statistics for samples between the start and samples are displayed. The TTV statistics are calculated for one or more periods starting from the start sample. The temperature limits, duration and number of TTV periods are set using the statistics view options

For more information on the derivation and application of TTV statistics, see the topic Total Temperature Value. There are also options that control whether the TTV statistical data is shown, printed or exported. See Graph View Options, Printing Options, and Export Options for more details.

An example of the use of TTV would be for chicken farms during the production of newly hatched chickens growing to full size. Their ambient temperature requirement changes as they grow, and if not optimised it will affect production levels plus feed & heating consumed, therefore affecting resulting profits.

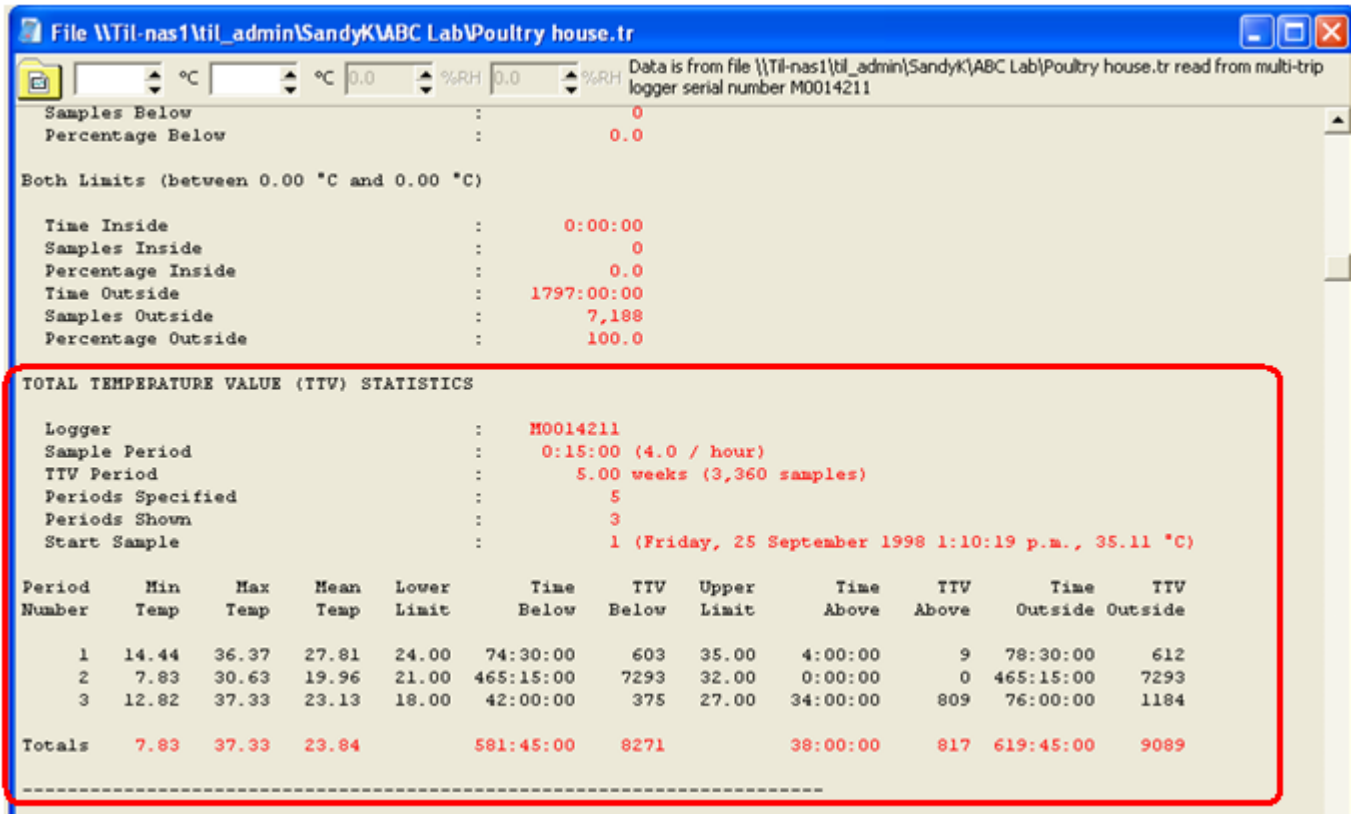
**To select TTV statistics, go to Options/Statistics/TTV tab and select “Show TTV Statistics”.**

1. Set the upper and lower limits for each time period. (Only 5 have been selected here. Up to 20 can be viewed).
2. Set the period duration.
3. Set the periods to show.
4. Click “ok”



# TTV (Total Temperature Value)

The following statistics arrangement will appear at the foot of the Statistics page:



File \\Til-nas1\til\_admin\SandyK\ABC Lab\Poultry house.tr

Data is from file \\Til-nas1\til\_admin\SandyK\ABC Lab\Poultry house.tr read from multi-trip logger serial number M0014211

Samples Below : 0  
Percentage Below : 0.0

Both Limits (between 0.00 °C and 0.00 °C)

Time Inside : 0:00:00  
Samples Inside : 0  
Percentage Inside : 0.0  
Time Outside : 1797:00:00  
Samples Outside : 7,188  
Percentage Outside : 100.0

**TOTAL TEMPERATURE VALUE (TTV) STATISTICS**

Logger : M0014211  
Sample Period : 0:15:00 (4.0 / hour)  
TTV Period : 5.00 weeks (3,360 samples)  
Periods Specified : 5  
Periods Shown : 3  
Start Sample : 1 (Friday, 25 September 1998 1:10:19 p.m., 35.11 °C)

Period Number	Min Temp	Max Temp	Mean Temp	Lower Limit	Time Below	TTV Below	Upper Limit	Time Above	TTV Above	Time Outside	TTV Outside
1	14.44	36.37	27.81	24.00	74:30:00	603	35.00	4:00:00	9	78:30:00	612
2	7.83	30.63	19.96	21.00	465:15:00	7293	32.00	0:00:00	0	465:15:00	7293
3	12.82	37.33	23.13	18.00	42:00:00	375	27.00	34:00:00	809	76:00:00	1184
<b>Totals</b>	<b>7.83</b>	<b>37.33</b>	<b>23.84</b>		<b>581:45:00</b>	<b>8271</b>		<b>38:00:00</b>	<b>817</b>	<b>619:45:00</b>	<b>9089</b>

This data can be exported to an excel spreadsheet to be tabulated with statistics from other data loggers that are being used in different areas of the same room.