

# HOTnote

## Perception CSI: Statistical Calculator Table

### The Customer

A research institute in China doing some earthquake safety studies.

### The Application

Testing large equipment and structures in an earthquake simulator. Vibration and stress data is recorded and some automatic calculation of statistical parameters needs to be performed on all channels.

### The Problem

The customer needs a software function which calculates and displays statistical information of recorded data on all channels automatically. It should be possible to post the results to Microsoft Word. Setting up and using this feature should be as easy as possible. Using standard Perception functions like Formula database and Meters was too complex for the huge amount of different parameters.

Channel	RMS	Mean	Max	Max Pos	Min	Min Pos	pk-pk	Std Dev
Ch1	3.532 Volt	289.4 mVolt	5.000 Volt	624.0 ms	-5.000 Volt	1.249 s	10.00 Volt	3.520 Volt
Ch2	3.539 Volt	278.7 mVolt	5.000 Volt	311.5 ms	-5.000 Volt	936.5 ms	9.999 Volt	3.529 Volt
Ch3	3.432 Volt	400.5 mVolt	5.000 Volt	2.499 s	-5.000 Volt	1.249 s	10.00 Volt	3.409 Volt
Ch4	3.502 Volt	63.76 mVolt	5.000 Volt	1.874 s	-5.000 Volt	624.0 ms	10.00 Volt	3.502 Volt
Ch5	3.535 Volt	221.9 μVolt	4.990 Volt	13.00 ms	-4.990 Volt	10.00 ms	9.980 Volt	3.536 Volt
Ch6	1.378 Volt	99.20 mVolt	4.905 Volt	55.00 ms	-3.937 Volt	153.0 ms	8.842 Volt	1.375 Volt
Ch7	3.532 Volt	289.4 mVolt	5.000 Volt	624.0 ms	-5.000 Volt	1.249 s	10.00 Volt	3.520 Volt
Ch8	1.276 Volt	-101.5 mVolt	2.612 Volt	473.0 ms	-2.717 Volt	1.060 s	5.329 Volt	1.272 Volt
Ch9	2.762 Volt	-151.1 mVolt	4.035 Volt	892.0 ms	-3.959 Volt	1.148 s	7.994 Volt	2.758 Volt
Ch10	556.4 mVolt	-28.27 mVolt	3.719 Volt	57.00 ms	-3.346 Volt	69.00 ms	7.065 Volt	555.8 mVolt
Ch11	2.084 Volt	-46.90 mVolt	3.908 Volt	2.213 s	-3.993 Volt	1.173 s	7.901 Volt	2.084 Volt
Ch12	2.435 Volt	-9.017 mVolt	3.880 Volt	1.458 s	-3.967 Volt	280.0 ms	7.847 Volt	2.435 Volt
Ch13	3.636 Volt	993.2 mVolt	5.000 Volt	624.0 ms	-5.000 Volt	1.874 s	10.00 Volt	3.498 Volt
Ch14	3.539 Volt	278.7 mVolt	5.000 Volt	311.5 ms	-5.000 Volt	936.5 ms	9.999 Volt	3.529 Volt
Ch15	3.432 Volt	400.5 mVolt	5.000 Volt	2.499 s	-5.000 Volt	1.249 s	10.00 Volt	3.409 Volt
Ch16	350.2 mVolt	6.376 mVolt	500.0 mVolt	1.874 s	-500.0 mVolt	624.0 ms	1.000 Volt	350.2 mVolt
Ch17	353.5 mVolt	22.19 μVolt	499.0 mVolt	13.00 ms	-499.0 mVolt	10.00 ms	998.0 mVolt	353.6 mVolt
Ch18	137.8 mVolt	9.920 mVolt	490.5 mVolt	55.00 ms	-393.7 mVolt	153.0 ms	884.2 mVolt	137.5 mVolt
Ch19	3.532 Volt	-289.4 mVolt	5.000 Volt	1.249 s	-5.000 Volt	624.0 ms	10.00 Volt	3.520 Volt
Ch20	1.276 Volt	-101.5 mVolt	2.612 Volt	473.0 ms	-2.717 Volt	1.060 s	5.329 Volt	1.272 Volt
Ch21	2.761 Volt	-151.0 mVolt	4.033 Volt	892.0 ms	-3.957 Volt	1.144 s	7.990 Volt	2.757 Volt
Ch22	555.6 mVolt	-27.61 mVolt	3.717 Volt	57.00 ms	-3.343 Volt	69.00 ms	7.060 Volt	555.0 mVolt
Ch23	2.083 Volt	-46.23 mVolt	3.907 Volt	2.213 s	-3.990 Volt	1.173 s	7.897 Volt	2.083 Volt
Ch24	2.434 Volt	-9.026 mVolt	3.880 Volt	1.458 s	-3.967 Volt	280.0 ms	7.847 Volt	2.434 Volt

The Calculator table shows several statistical parameters for multiple channels and can display alarm conditions per cell ...

### The "General" Solution

A LIBERTY with a total of 64 channels of strain gage and accelerometer channels for signal conditioning and data acquisition. Perception for control and display of the data.

### The Missing Link

Standard software does not support a calculator table. The calculation itself could be done with the formula database, but the problem is the way the results are presented.

The new calculation table shows the calculated statistical results in a synoptic way, it is optimized for performance and has also the ability to modify the time interval of the calculations.

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## The CSI Solution

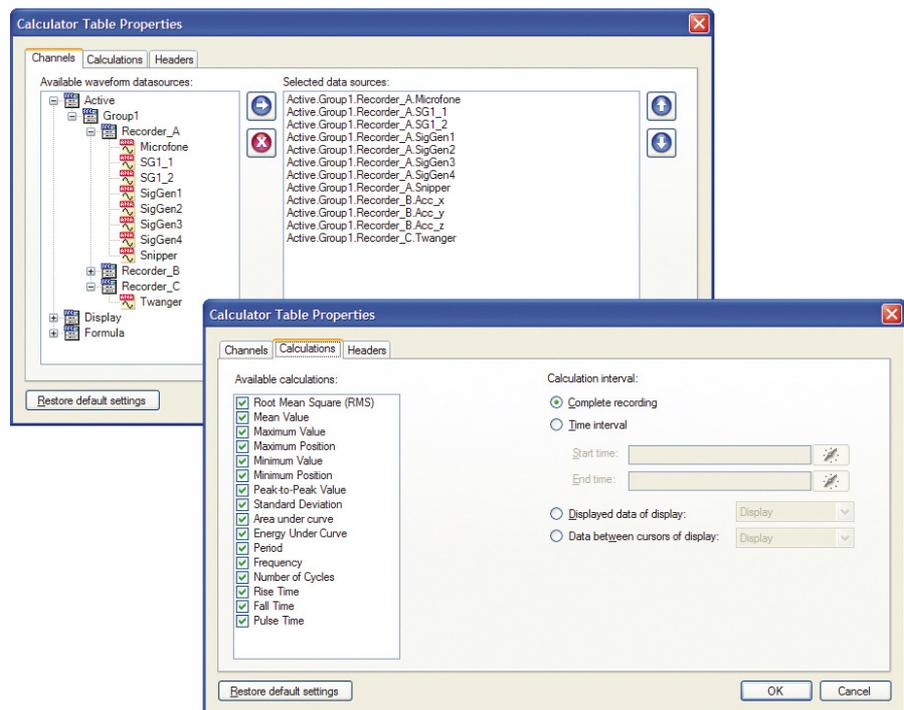
With CSI it is possible to add specific dedicated software to the standard Perception program. A new sheet has been added, this sheet is an integrated part of Perception and contains the new calculator table which enables the customer to do the specific statistical calculations.

The customer can select which channels to use and which calculations to be performed.

It is also possible to enable alarm level checking. Per calculation per channel an upper and lower level can be set, and depending on the calculation result the text color and background color of a table cell can be changed.

The calculation table can be linked to the cursors of a display and calculations will be done automatically whenever the cursors are moved.

The customer can make its own reports by using the Perception Report Sheet or he can post the results to Word or Excel. He can save the analysis results together with other setup data like instrument settings into a separate prnf data file.



*In the Properties dialog boxes the user can select the channels to include, the analysis to be done and the time interval to be used.*

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