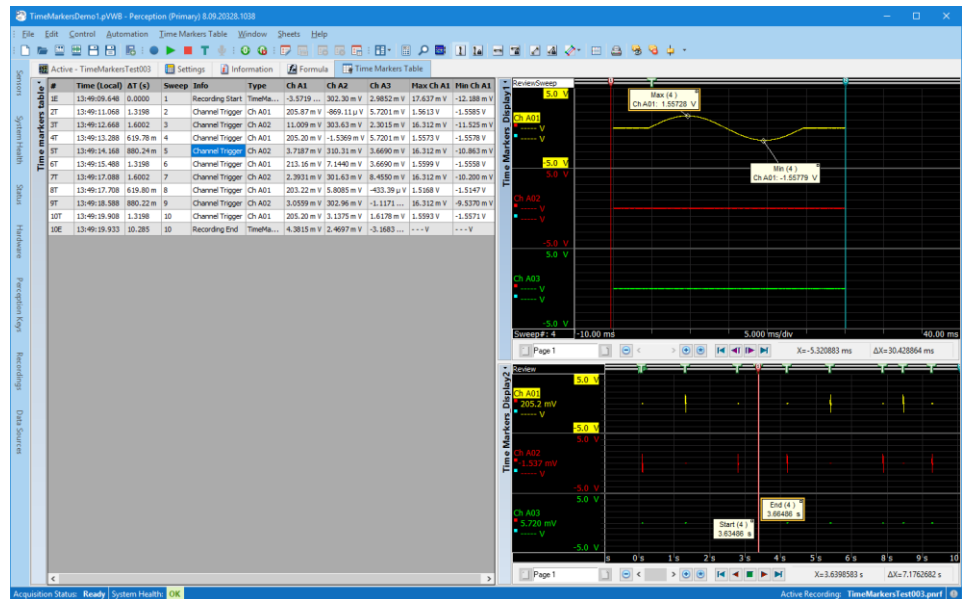


User manual

English



Perception CSI Extension Extended time markers table Version 1.0

Document version 1.0 – Nov 2020

For Perception 8.0 or higher

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1 Introduction

Welcome to the Time markers table software manual. This document describes how to use this software application.

The purpose of the new application is that it can show all or only specified time markers (including triggers) in a table. This table will be automatically updated during recording. It will also be filled when reopening an existing recording. The time markers table can be linked to a Perception display, when this is done the data shown in the display is controlled by the table; when double clicking on an individual time marker in the table the display time position will be automatically set to the position of the selected time marker.

Multiple time marker tables can be used in Perception.

The new Time marker sheet contains a table used to display the time markers; optionally one or two displays can be added to this sheet.

The application is an integrated part of the Perception software.

The application is based on the Perception Custom Software Interface (CSI).

This manual assumes you understand your Genesis High Speed Test and Measurement equipment, software and basic acquisition terminology. You may like to use the Perception User Manual as a reference.

2 Scope

This Perception software extension enables the use of Time markers table with any GEN DAQ hardware.

Via the extra sheet(s) the operator can do the following things:

- Browse through all or a selectable number of time markers of a recording
- Control one or two displays from the time markers table
- Print the time markers
- Show extra time marker related information in the time marker table, like the value of other channels at the time marked by the time marker
- Do sweep related calculations and store the result into the table, for example calculate the maximum of a sweep and save it into the time marker table
- Export the time markers to Word, Excel or copy it into the clipboard.

3 Getting Started

3.1 Installation

The Time markers table software is provided as an install file.

Perception CSI Extended Time marker Table 3.0.20332.1200.exe

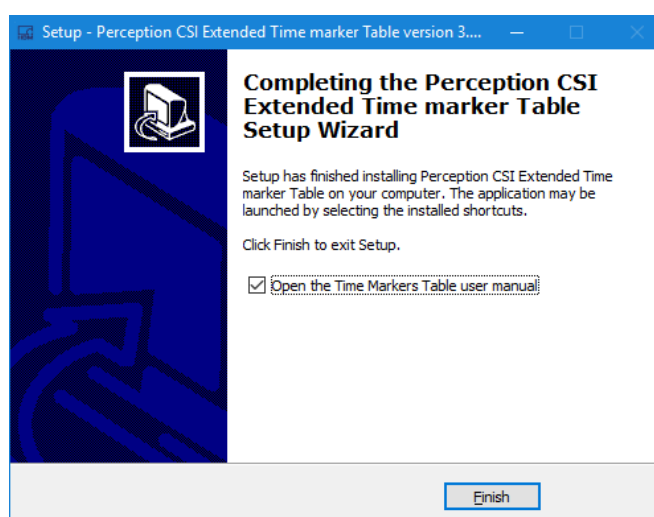
The name of the install file may be different when you have a newer version.

Run this file to install the software and the manual on your PC

The Time markers table software is **not** a stand-alone program which can be started from the Windows Start menu! It is an integrated part of the Perception software program. Once you start Perception you will see an extra sheet called: **Time Markers Sheet**

The manual has also been installed on your PC. It is a PDF file which can be opened via the windows Hottinger Brüel & Kjaer menu.

It is also possible to open the manual at the end of the installation:



If you cannot open this pdf file then you may have to install the Acrobat® Reader®.

3.2 Requirements

Time markers table software operates on any PC where Perception 8.0 or later is running.

The Time markers table application can only be used when the HASP® USB key CSI option has been enabled. You can check it has been enabled by going to the Help About dialog and click **More....**

The “More About Perception” dialog shows which options are enabled.

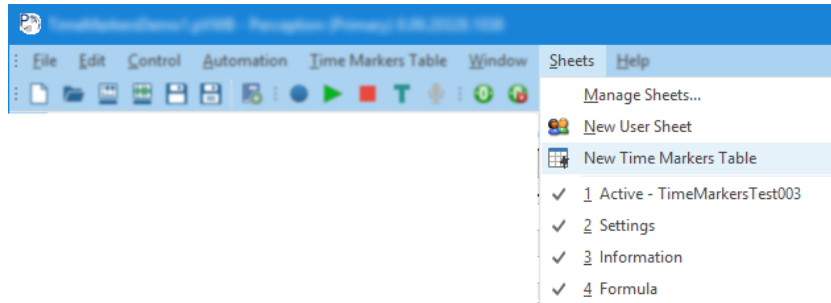
The CSI option icon looks like:



4 Application functionality

4.1 General

Perception has been extended with the option to add new time markers tables. A new time marker table can be added via the Perception Sheets menu. Select the option **New Time Markers Table**.



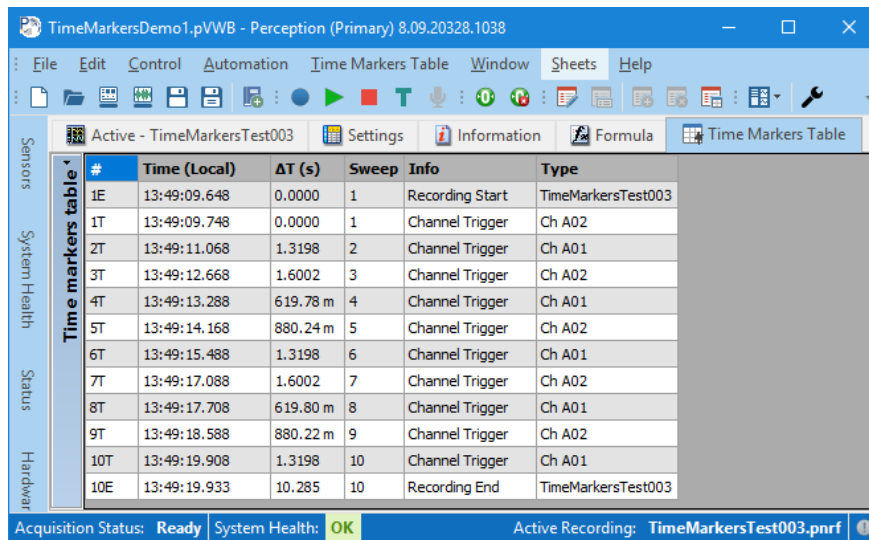
The new sheet contains a table which will be used to show the time markers of the open active recording.

It is possible to create as many Time Marker Tables as you want, each table will have a unique name, it is possible to change the name of a table via the properties dialog.

The following paragraphs will describe the application in more detail.

4.2 Time markers table contents

If you open an existing recording as active or make a new recording than the **Time Markers Table** will be filled automatically.



#	Time (Local)	ΔT (s)	Sweep	Info	Type
1E	13:49:09.648	0.0000	1	Recording Start	TimeMarkersTest003
1T	13:49:09.748	0.0000	1	Channel Trigger	Ch A02
2T	13:49:11.068	1.3198	2	Channel Trigger	Ch A01
3T	13:49:12.668	1.6002	3	Channel Trigger	Ch A02
4T	13:49:13.288	619.78 m	4	Channel Trigger	Ch A01
5T	13:49:14.168	880.24 m	5	Channel Trigger	Ch A02
6T	13:49:15.488	1.3198	6	Channel Trigger	Ch A01
7T	13:49:17.088	1.6002	7	Channel Trigger	Ch A02
8T	13:49:17.708	619.80 m	8	Channel Trigger	Ch A01
9T	13:49:18.588	880.22 m	9	Channel Trigger	Ch A02
10T	13:49:19.908	1.3198	10	Channel Trigger	Ch A01
10E	13:49:19.933	10.285	10	Recording End	TimeMarkersTest003

A time marker table shows per default the following information per time marker:

- A number followed by a character (**#** column)
- A **Time**
- The delta time (**ΔT**) with the previous time mark of the same type
- The **Sweep** number to which the time marker belongs
- The **Info** column gives information about the kind of time marker
- **Type** contains extra information

#

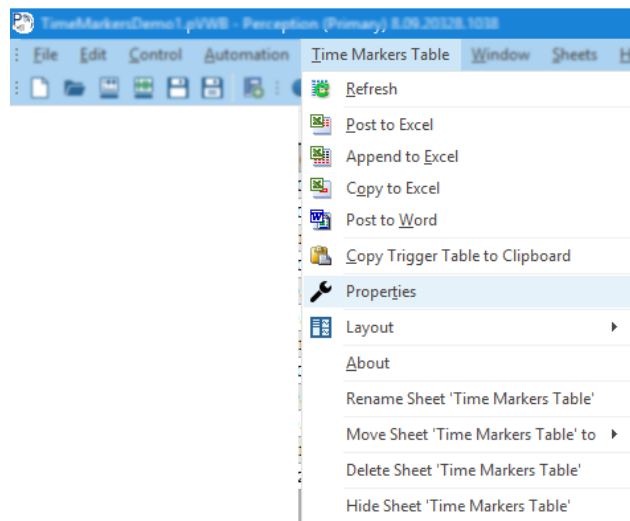
There are various kinds of time markers the two most frequently used time markers are the **Event Marker** (E in number column) and the **Trigger Marker** (T in number column)

Per time marker type a numbering sequence is used, e.g. **1T** means first trigger.

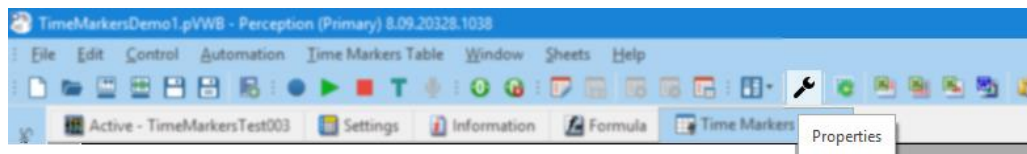
Via the properties dialog you can modify various properties. Use the right mouse click on the table to get access to this properties dialog.

80.24 m	5	Channel Trigger	Ch A02
.3198	6	Channel Trigger	Ch A01
.6002	7	Refresh	
19.80 m	8	Copy Calculator Table to Clipboard	
80.22 m	9	Properties	
.3198	10	Channel Trigger	Ch A01

Or use the **Time Markers Table** menu:



Or use the toolbar:



If you open the Time Markers Table Properties dialog you can select which time markers you want to see into the table, various time markers are: *Trigger* and *Event Markers*.

Misc Time format &T format Extra Columns

Table name:

Events to be shown:

Triggers

Event Markers

Link to time domain Display 1:

Link to time domain Display 2:

Filter on time markers Type:

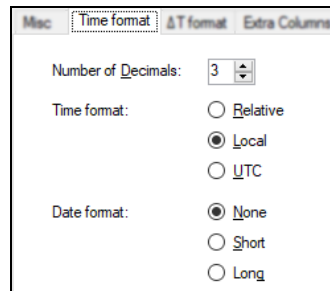
Filter enabled

Wildcards * and ? can be used, multiple filters can be entered using a semicolon as separator.
Examples: "ChA*" or "ChA1;ChA2"

Filter:

Time

This column shows the time of the time marker. Via the following configuration dialog you can select the format of the time presentation.

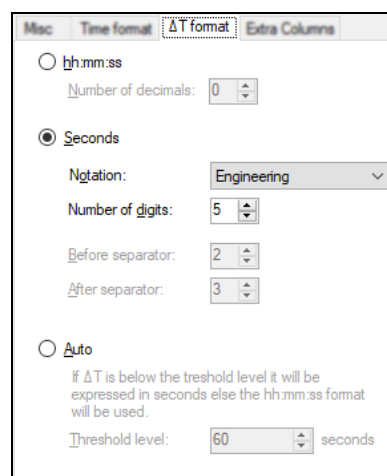


Configuration dialog for Time format:

- Number of Decimals: 3
- Time format:
 - Relative
 - Local
 - UTC
- Date format:
 - None
 - Short
 - Long

ΔT

The delta time with the previous time mark of the same type. Via the following configuration dialog you can select the format of the time span.



Configuration dialog for ΔT format:

- hh:mm:ss
 - Number of decimals: 0
- Seconds
 - Notation: Engineering
 - Number of digits: 5
 - Before separator: 2
 - After separator: 3
- Auto
 - If ΔT is below the threshold level it will be expressed in seconds else the hh:mm:ss format will be used.
 - Threshold level: 60 seconds

Sweep

The sweep number to which the time marker belongs

Info

The info gives information on what kind of time marker it is. Examples are **Recording Start**, **Recording End** and **Channel Trigger**. If working with a fiber it can also show when the synchronization has been lost or when the synchronization has been recovered.

Type

This column gives extra information depending on the type of trigger. If for example the time marker is indicating a *Recording Start*, then this column shows the name of the active recording. When dealing with a trigger the trigger source is shown.

It is also possible to filter on the Type of a time marker. You can use the **Filter on time marker Type**: in the picture below you can see how to do this.

Misc Time format ΔT format Extra Columns

Table name:

Events to be shown:

Triggers

Event Markers

Link to time domain Display 1:

Link to time domain Display 2:

Filter on time markers Type:

Filter enabled

Wildcards * and ? can be used, multiple filters can be entered using a semicolon as separator.
Examples: "ChA*" or "ChA1;ChA2"

Filter:

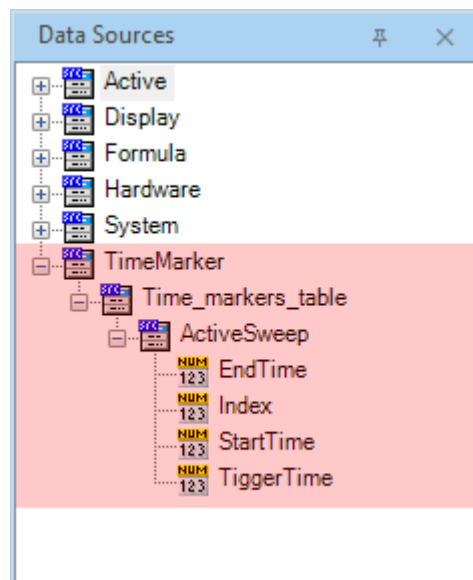
4.3 Time Markers Table Extra Columns

It is possible to add a maximum of 10 extra columns to the Time Markers Table.

#	Time (Local)	ΔT (s)	Sweep	Info	Type	Ch A1	Ch A2	Ch A3	Max Ch A1	Min Ch A1
1E	07:57:10.790	0.0000	1	Recording Start	TimeMarkersTest005	---	---	---	--- V	--- V
1T	07:57:18.326	0.0000	1	Channel Trigger	Ch A01	201.85 m V	9.5137 m V	7.1026 m V	1.5592 V	-1.5612 V
2T	07:57:19.206	880.23 m	2	Channel Trigger	Ch A02	10.965 m V	308.67 m V	5.0514 m V	16.267 m V	-10.244 m V
3T	07:57:20.526	1.3198	3	Channel Trigger	Ch A01	201.85 m V	1.5005 m V	4.3677 m V	1.5175 V	-1.5141 V
4T	07:57:22.126	1.6002	4	Channel Trigger	Ch A02	1.6857 m V	302.66 m V	3.0002 m V	17.592 m V	-11.570 m V
5T	07:57:22.746	619.79 m	5	Channel Trigger	Ch A01	203.17 m V	-502.78 μ V	4.3677 m V	1.5142 V	-1.5121 V
6T	07:57:23.626	880.21 m	6	Channel Trigger	Ch A02	1.6857 m V	303.33 m V	2.3165 m V	16.267 m V	-13.558 m V
7T	07:57:24.946	1.3198	7	Channel Trigger	Ch A01	201.18 m V	6.1749 m V	5.7352 m V	1.5135 V	-1.5108 V
8T	07:57:26.546	1.6003	8	Channel Trigger	Ch A02	1.0229 m V	308.00 m V	949.07 μ V	17.592 m V	-11.570 m V
9T	07:57:27.166	619.79 m	9	Channel Trigger	Ch A01	207.15 m V	4.8393 m V	6.4189 m V	1.5135 V	-1.5121 V
10T	07:57:28.046	880.18 m	10	Channel Trigger	Ch A02	-3.6166 m V	300.66 m V	4.3677 m V	15.604 m V	-9.5816 m V
10E	07:57:28.071	17.281	10	Recording End	TimeMarkersTest005	-2.2910 m V	4.8393 m V	4.3677 m V	--- V	--- V

Extra columns

Those columns can be used to show the value of other waveforms (e.g. other measured channels) at the time of the time marker. In the above display channels Ch A1, Ch A2 and Ch A3 are shown. It is however also possible to show any numerical or string data source as extra column. Before it is explained how to do this you should know that the Time Marker Table is creating dynamic data sources. These data sources will be changed when a new time marker comes in or when you select a row in the Time markers table. Per table four data sources are created as shown in the picture below.



The data sources are:

- **EndTime:** The end time of the active sweep
- **Index:** The sweep index of the active sweep
- **StartTime:** The start time of the active sweep
- **TriggerTime:** The trigger time of the active sweep

The full name of these data sources depend on the name of the time markers table which produces these data sources.

For example the StartTime produced by the table called **Time_markers_table** looks like:

TimeMarker.Time_markers_table.StartTime

These new data sources can be used by the formula sheet to do specific calculations. In the example below you can see how the **StartTime** and **EndTime** are used to find the sweep maximum, minimum and their positions using channel Ch_A01.

Num	Name	Formula
1	MaxSweepA1	@Max(Active.Group1.Recorder_A.Ch_A01; TimeMarker.Time_markers_table.ActiveSweep.StartTime; TimeMarker.Time_markers_table.ActiveSweep.EndTime)
2	MinSweepA1	@Min(Active.Group1.Recorder_A.Ch_A01; TimeMarker.Time_markers_table.ActiveSweep.StartTime; TimeMarker.Time_markers_table.ActiveSweep.EndTime)
3	MaxPosSweepA1	@MaxPos(Active.Group1.Recorder_A.Ch_A01; TimeMarker.Time_markers_table.ActiveSweep.StartTime; TimeMarker.Time_markers_table.ActiveSweep.EndTime)
4	MinPosSweepA1	@MinPos(Active.Group1.Recorder_A.Ch_A01; TimeMarker.Time_markers_table.ActiveSweep.StartTime; TimeMarker.Time_markers_table.ActiveSweep.EndTime)

Each time a new trigger comes in or you change the active row (by selecting a cell in the Time Markers Table) these data sources will be updated.

Now we know that we can do sweep specific calculations we can use this to add this new calculated information to the Time Markers Table via the extra columns.

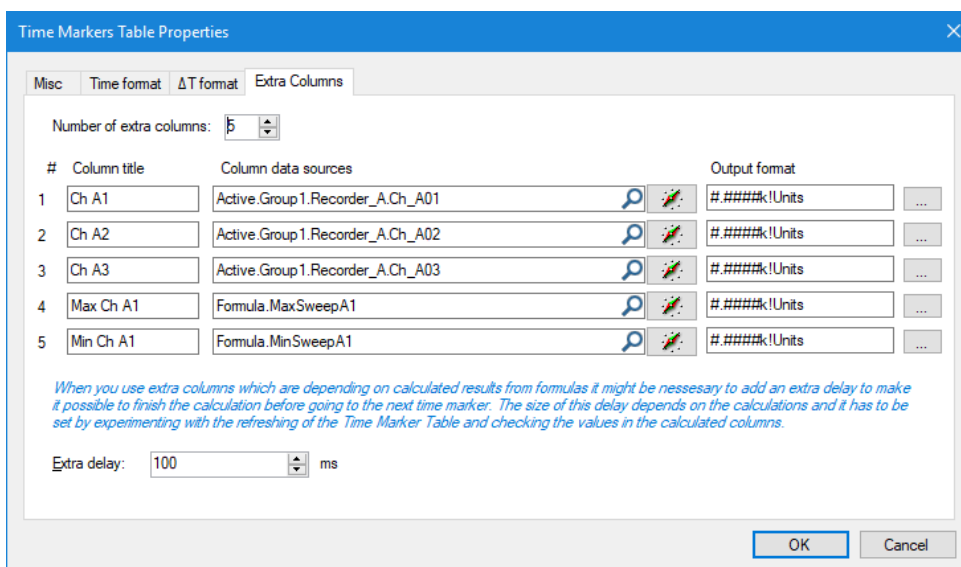
Open the Extra Columns tab in the Time Markers Table Properties dialog.

Select the number of extra columns you need (maximum is 10).

Per extra column you have to define:

- **Column title**
- **Column data sources**
- **Output format**

You can find those items back in the following dialog:

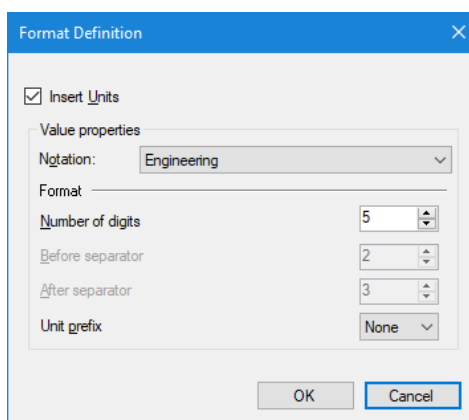


When you select a new data source and the **Column title** was empty then the **Column title** will be filled in automatically depending on the selected data source.

When the selected data source is a waveform then the current time marker time (= TriggerTime data source, see above) is used to get the value of the chosen waveform at that specific time.

If the selected data source is not a waveform then its value will be shown, most of the time this will be a numerical value but it can also be a string value, below you can find an example on this.

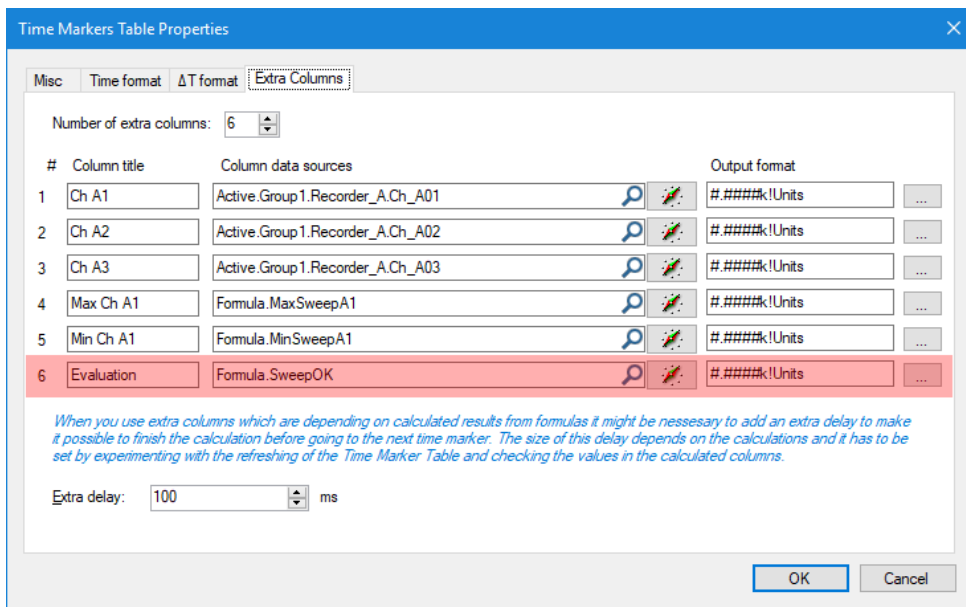
If the output is a numerical value you can use the Output format to select the wanted format for showing the numerical value in the table.



Here you can find an example using a string result in one of the extra columns. A sweep is correct (passed) when the maximum value of channel A01 is equal or above 1V. The extra column will show if a sweep has passed or failed. To make this possible we use the following formulas:

Num	Name	Formula
1	MaxSweepA1	@Max(Active.Group1.Recorder_A.Ch_A01; TimeMarker.Time_markers_table.ActiveSweep.StartTime; TimeMarker.Time_markers_table.ActiveSweep.EndTime)
2	MinSweepA1	@Min(Active.Group1.Recorder_A.Ch_A01; TimeMarker.Time_markers_table.ActiveSweep.StartTime; TimeMarker.Time_markers_table.ActiveSweep.EndTime)
3	MaxPosSweepA1	@MaxPos(Active.Group1.Recorder_A.Ch_A01; TimeMarker.Time_markers_table.ActiveSweep.StartTime; TimeMarker.Time_markers_table.ActiveSweep.EndTime)
4	MinPosSweepA1	@MinPos(Active.Group1.Recorder_A.Ch_A01; TimeMarker.Time_markers_table.ActiveSweep.StartTime; TimeMarker.Time_markers_table.ActiveSweep.EndTime)
5		
6		Check if maximum is less than 1, this is too low
7	MaxTooLow	@LessThan(Formula.MaxSweepA1; 1)
8		Use the MaxTooLow to make the new formula SweepResult1 either "FAILED" or "PASSED"
9	SweepResult1	@IIF(Formula.MaxTooLow; "FAILED"; "PASSED")
10		We need an extra check because it might happen that there is no calculated maximum value
11	SweepResult2	@IsNaN(Formula.MaxSweepA1)
12		Now we combine the above checks in a final formula which can return the following strings: "--", "FAILED" or "PASSED"
13	SweepOK	@IIF(Formula.SweepResult2; "--"; Formula.SweepResult1)

Now we add an extra column to the Time Marker sheet:




The resulting table now looks like:

#	Time (Local)	ΔT (s)	Sweep	Info	Type	Ch A1	Ch A2	Ch A3	Max Ch A1	Min Ch A1	Evaluation
1E	10:06:08.468	0.0000	1	Recording Start	TimeMa...	4.3523 m V	6.4065 m V	7.7030 m V	--- V	--- V	---
1T	10:06:08.473	0.0000	1	Channel Trigger	Ch A02	5.0151 m V	310.91 m V	-2.5529 ...	15.620 m V	-10.229 m V	FAILED
2T	10:06:09.093	619.82 m	2	Channel Trigger	Ch A01	204.51 m V	8.4098 m V	8.3867 m V	1.5606 V	-1.5585 V	PASSED
3T	10:06:09.973	880.20 m	3	Channel Trigger	Ch A02	-949.95 ...	303.56 m V	6.3355 m V	16.282 m V	-10.229 m V	FAILED
4T	10:06:11.293	1.3198	4	Channel Trigger	Ch A01	210.48 m V	6.4065 m V	4.2844 m V	1.5599 V	-1.5591 V	PASSED
5T	10:06:12.893	1.6002	5	Channel Trigger	Ch A02	375.61 μ V	302.23 m V	4.2844 m V	18.271 m V	-10.892 m V	FAILED
6T	10:06:13.513	619.83 m	6	Channel Trigger	Ch A01	206.50 m V	2.3999 m V	11.122 m V	1.5142 V	-1.5141 V	PASSED
7T	10:06:14.393	880.20 m	7	Channel Trigger	Ch A02	3.6895 m V	300.22 m V	4.9681 m V	15.620 m V	-9.5661 m V	FAILED
8T	10:06:15.713	1.3198	8	Channel Trigger	Ch A01	201.86 m V	6.4065 m V	2.2332 m V	1.5599 V	-1.5578 V	PASSED
9T	10:06:17.313	1.6002	9	Channel Trigger	Ch A02	3.0267 m V	301.56 m V	3.6006 m V	16.945 m V	-10.892 m V	FAILED
10T	10:06:17.933	619.83 m	10	Channel Trigger	Ch A01	204.51 m V	6.4065 m V	-1.1854 ...	1.5162 V	-1.5121 V	PASSED
10E	10:06:17.958	9.4900	10	Recording End	TimeMa...	375.61 μ V	396.65 μ V	4.2844 m V	--- V	--- V	---

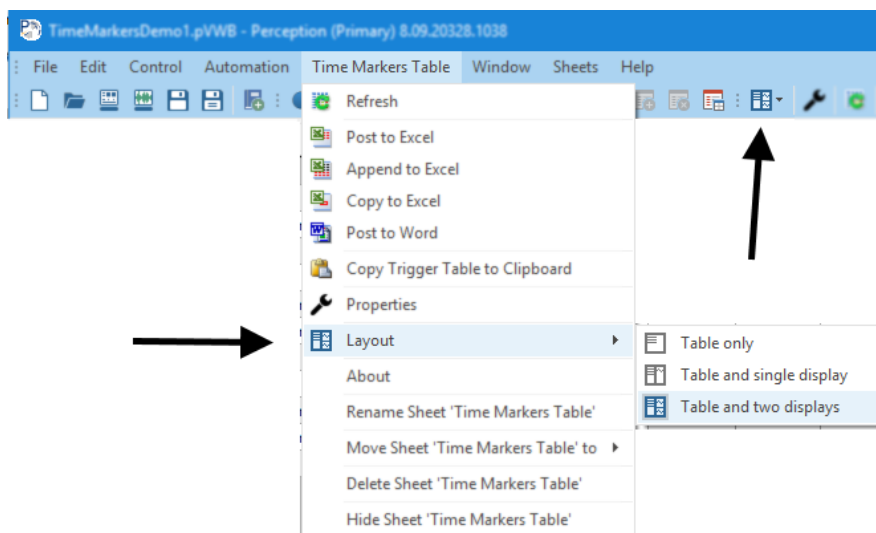
Extra delay

The **Extra delay** entry can be used when you are using the results of formulas as the content of the extra columns. Depending on the calculations behind a formula it can happen that a short delay (or waiting time) is needed, otherwise the program already modifies the published data sources like **StartTime** and **EndTime** before the calculations are ready, if this happens the result can be wrong. To prevent this you should do a measurement and check if the calculated results are correct, if not try to make the delay a little bit longer. You also can check if the results are OK by pressing the refresh

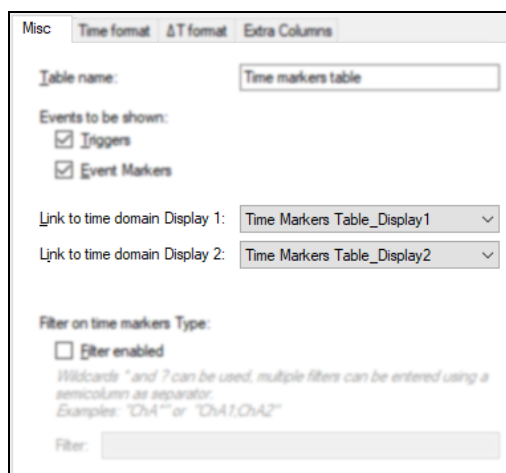
button  several times the calculated results should not change. Modify the delay smaller or larger and repeat the refresh several times to find the best delay time.

4.4 Time Markers Table and Displays

You can link one or two displays to the time markers table. Those displays can be any display in Perception; however it is also possible to add new displays to the **Time Markers Table** sheet. Adding new displays can be done by changing the Layout of the sheet as you can see in the picture below.

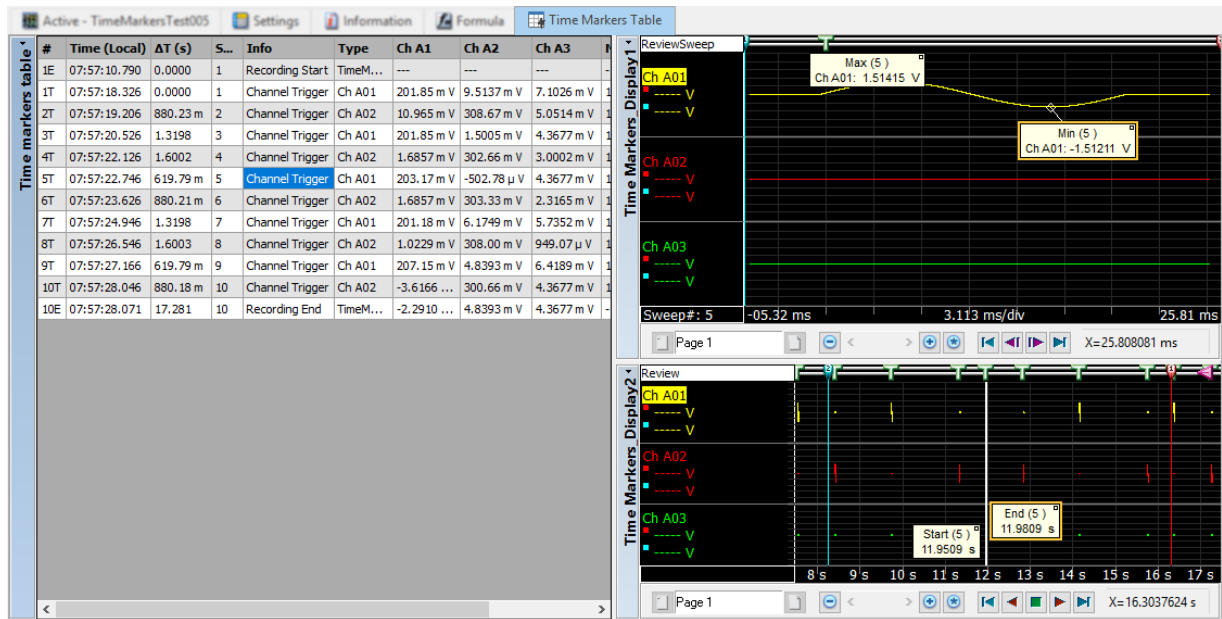


In the properties dialog you can see to which displays the table is linked:



The time position of the linked display will change when you double click on a time marker in the time markers table.

Using two displays gives you the possibility to use the first display in **ReviewSweep** mode to show a specific sweep and use the second display in **Review** mode to see the complete recording (see picture below).



4.5 Time Markers Table toolbar

The time marker table has its own toolbar. The toolbar looks like:




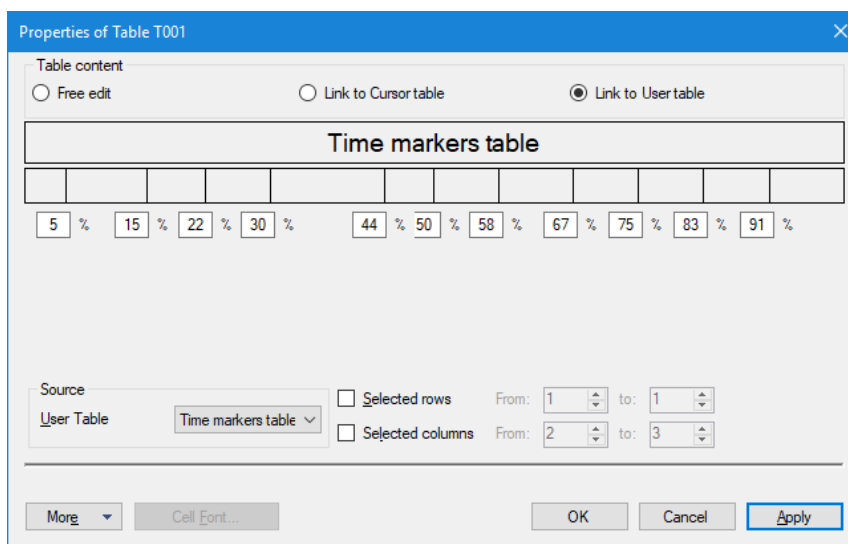
- A. Change the sheet Layout
- B. Edit properties of the time markers table
- C. Refresh time markers table, all data will be read again and also recalculated
- D. Post to Excel
- E. Append to Excel
- F. Copy to Excel
- G. Post to Word
- H. Copy to Clipboard

The items of the toolbar are also accessible via the **Time Markers Sheet** main menu.

4.6 Time Markers Table printing and reporting

The Time Markers Table can be used by the Perception Report page just like a normal user table. The following steps show you how to do this.

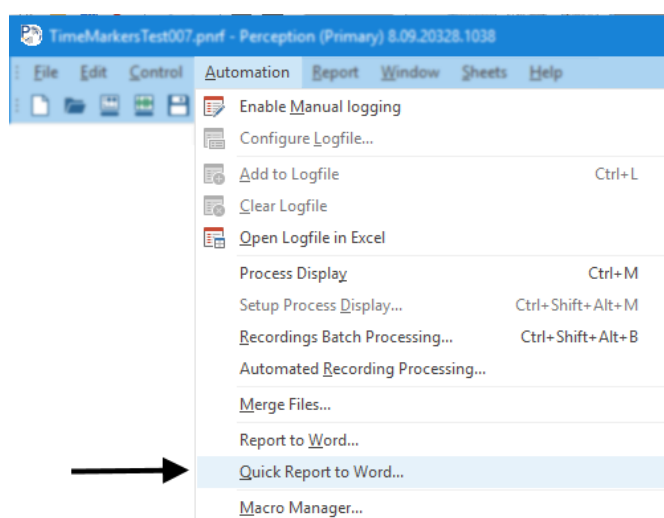
- Go to the Report sheet
- Add a table to the report sheet, use the tools button with icon 
- Select Link to User Table in the properties window of the table
- Select as *User Table Source* the **Time Markers Table**

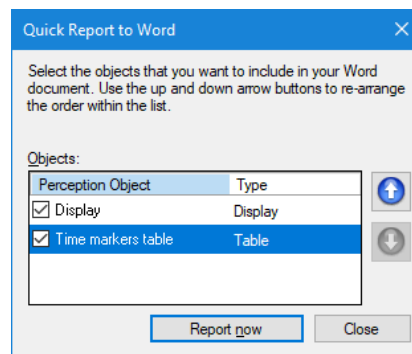


- The table at you report will now be filled with the data from the Time Markers Table

Time markers table											
#	Time	ΔT (s)	Sweep	Info	Type	Ch A1	Ch A2	Ch A3	Max Ch	Min Ch	Evaluation
1E	10:06:08.46	0.0000	1	Recording Start	TimeMa	4.3523 m	6.4065 m V	7.7030 m	--- V	--- V	---
1T	10:06:08.47	0.0000	1	Channel Trigger	Ch A02	5.0151 m	310.91 m V	-2.5529 m	15,620 m	-10.229 m	FAI L E D
2T	10:06:09.09	619.82 m	2	Channel Trigger	Ch A01	204.51 m	8.4098 m V	8.3867 m	1.5606 V	-1.5585 V	P A S S E D
3T	10:06:09.97	880.20 m	3	Channel Trigger	Ch A02	-949.95 μ	303.56 m V	6.3355 m	16,282 m	-10.229 m	FAI L E D
4T	10:06:11.29	1.3198	4	Channel Trigger	Ch A01	210.48 m	6.4065 m V	4.2844 m	1.5599 V	-1.5591 V	P A S S E D
5T	10:06:12.89	1.6002	5	Channel Trigger	Ch A02	375.61 μ	302.23 m V	4.2844 m	18,271 m	-10.892 m	FAI L E D
6T	10:06:13.51	619.83 m	6	Channel Trigger	Ch A01	206.50 m	2.3999 m V	11.122 m	1.5142 V	-1.5141 V	P A S S E D
7T	10:06:14.39	880.20 m	7	Channel Trigger	Ch A02	3.6895 m	300.22 m V	4.9681 m	15,620 m	-9.5661 m	FAI L E D
8T	10:06:15.71	1.3198	8	Channel Trigger	Ch A01	201.86 m	6.4065 m V	2.2332 m	1.5599 V	-1.5578 V	P A S S E D
9T	10:06:17.31	1.6002	9	Channel Trigger	Ch A02	3.0267 m	301.56 m V	3.6006 m	16,945 m	-10.892 m	FAI L E D
10T	10:06:17.93	619.83 m	10	Channel Trigger	Ch A01	204.51 m	6.4065 m V	-1.1854 m	1.5162 V	-1.5121 V	P A S S E D
10E	10:06:17.95	9.4900	10	Recording End	TimeMa	375.61 μ	396.65 μ V	4.2844 m	--- V	--- V	---

The time marker table can also be used by the Perception Automation for posting to MS-Word. If you e.g. go to the **Quick Report to Word** menu, you will see that the Time Markers Table is available.

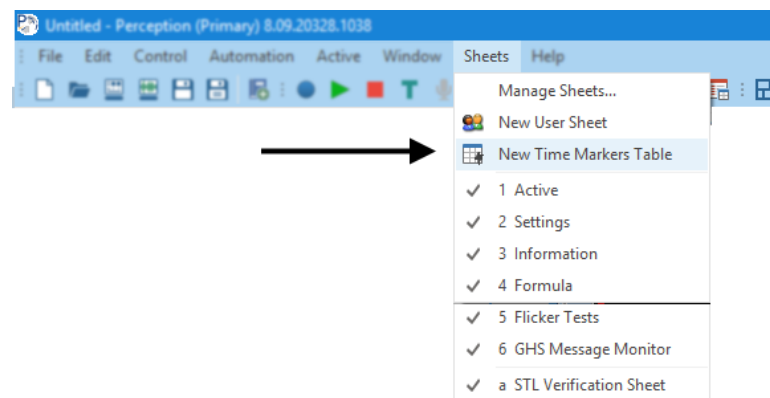




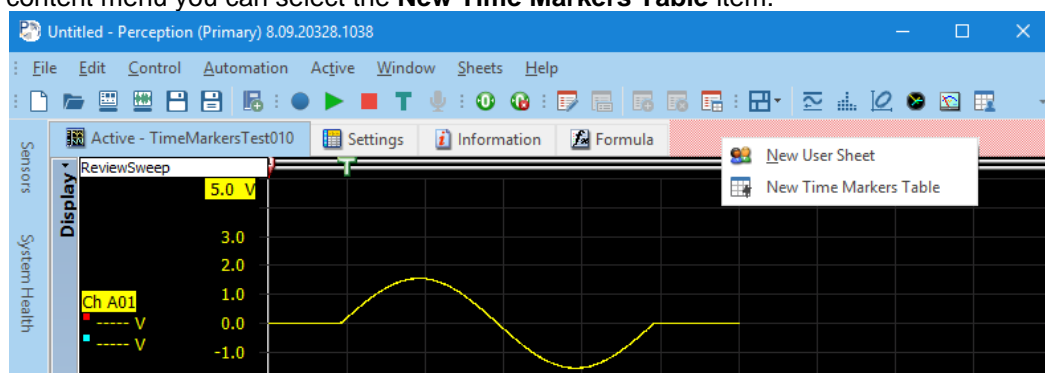
4.7 Creating, Deleting and Renaming a Time marker Table

4.7.1 Creating

New Time Marker Tables can be created via the Sheets menu New Time Markers Table.



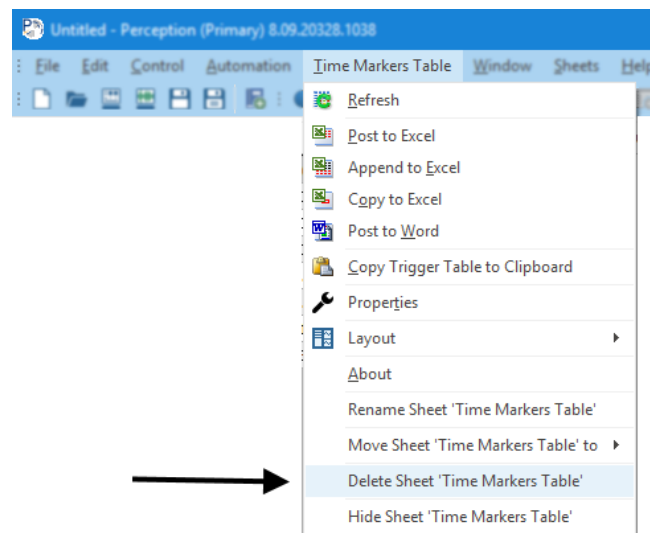
You can also do a right mouse click in the not used tab area (the area with red color below), from the shown content menu you can select the **New Time Markers Table** item.



You can create as many Time Marker Tables as you want.

4.7.2 Deleting

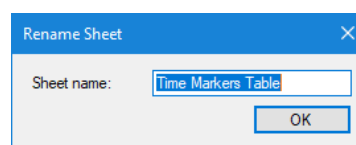
Via its own main menu called **Time Markers Table** you can select the Delete Sheet 'Time Markers Table'. You can get the same menu when you right mouse click at the tab



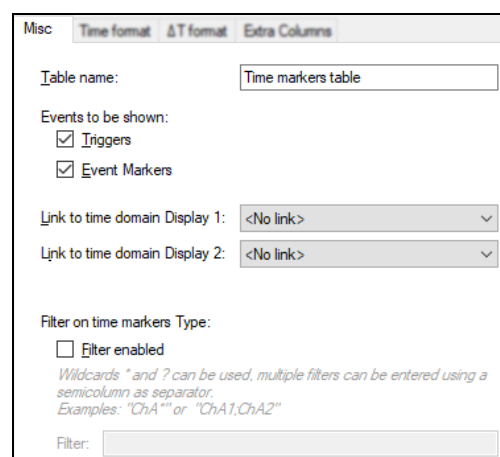
4.7.3 Renaming

The renaming can be confusing because in Perception terms we are dealing with a so called Sheet and the sheet contains a special user table called Time marker Table, both the sheet and the Time marker table have a name. By default the name of the sheet is **Time Markers Table** and is shown at the Tab of the sheet. The default name for the table is **Time markers table** you can find this name at the left side of the table.

Renaming the sheet works like all other Perception sheets, use the menu item **Rename Sheet 'Time Markers Table'** as shown in the above menu. The following dialog comes up:



For renaming the table you have to go to the properties dialog of the table, there you can change its name, see picture below.



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