

# HOTnote

## Perception CSI: Cylinder Pressure Analysis

### The Customer

A German manufacturer of pistons for combustion engines.

### The Application

Analyzing cylinder pressure measurements using Perception with Genesis HighSpeed.

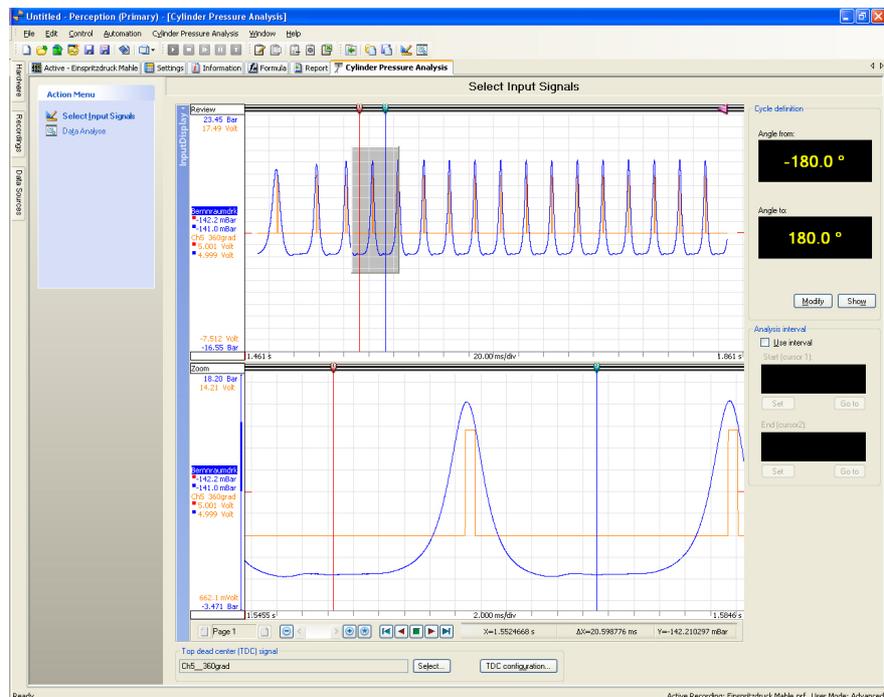


### The Problem

The customer is using two GEN DAQ systems to do cylinder pressure measurements. During a continuous recording he measures pressure signals. The pressure signal is measured in the time domain. The signal can be split in cycles, those cycles are related to one or two rotations of the piston.

The customer likes to know which cycle has the highest maximum, which cycle has the lowest maximum and wants to generate an "average pressure cycle".

The customer wants all results shown as function of the angle position of the piston, and only wants to save the result data from the analysis, not the raw data.



*The initial screen shows the cylinder pressure traces still displayed over time and allows selection of analysis criteria*

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## The "General" Solution

The general solution is based on a Genesis with 1MS/s acquisition boards

## The Missing Link

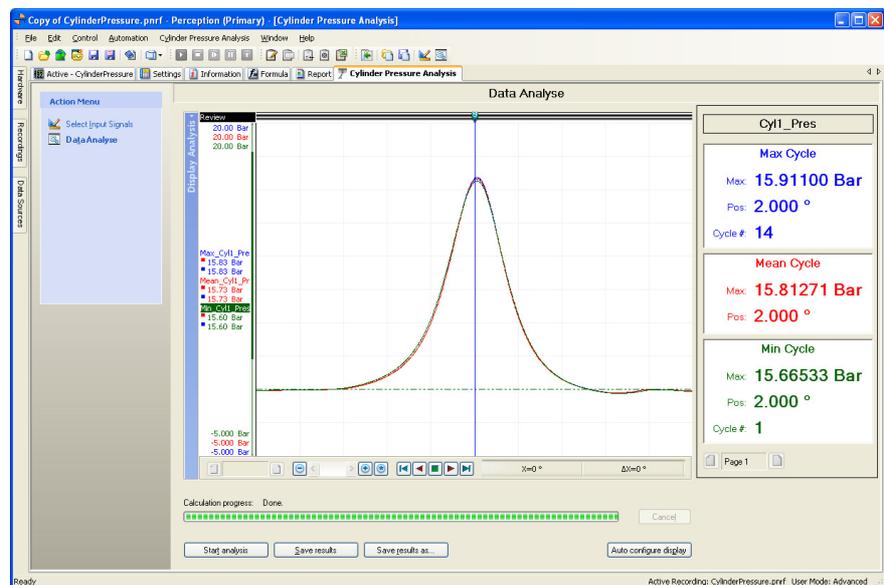
Standard software cannot convert the signal from time to angle domain. It also cannot split the original signals into individual cycles and the standard software always saves all measured data and can not save results separately.

## The CSI Solution

With CSI it is possible to add the specific dedicated analysis routines to the standard Perception program.

The CSI sheet called Cylinder Pressure Analysis, which was created for this application, enables the user to set up his desired analysis. Then the data is automatically cut in blocks of DIFFERENT length in time, but EQUAL length with respect to degree crankshaft. After resampling the blocks to "external clock" (interpolated from the time between TDC pulses), the software searches for the pressure injection cycles with the maximum peak pressure and the minimum peak pressure. It also computes a mean pressure trace. Then these three traces are displayed with their peak pressure value and the cycle count, and can be saved as the real results of this test.

Raw data is discarded afterwards.



*The result screen shows the traces with the maximum max pressure, the minimum max pressure and a calculated mean pressure trace – all displayed over degree crank angle now*

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