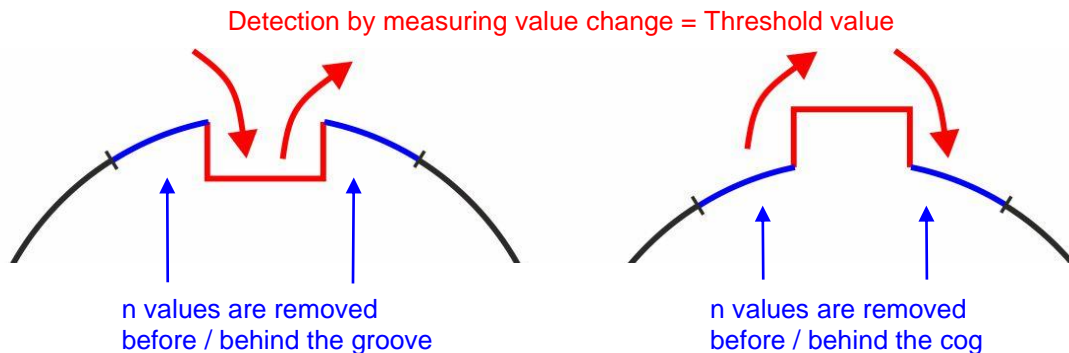


1. Introduction

By the ComGage special measurement mode *Dynamic measurement with groove removing (Type I)*, a dynamic measurement can be performed. For computing the measurement result, the measurement values e.g. inside a groove, on a cog, ... are not used. The detection is done by a programmable measurement value difference (hysteresis). It is possible to remove several grooves, cogs,



Important notes :

- In the following, only grooves are mentioned to shorten the text. But cogs, ... are always meant, too.
- The software license 72 (ComGage Special Modules) is required to use this special measurement mode,
- The measurement must not be started in a groove, except if the option *Start measurement after first detected groove* is enabled (see below).
- The usage of characteristics for diagnosis has a negative impact on the measurement rate.

Differences to the wgl022 (Dynamic measurement with groove removing (Type II))

During a *Dynamic measurement with groove removing (Type I)*, every measuring value is directly used to calculate the measuring result. The software evaluates if the value lies in a groove, if it is a value which is discarded or if the value is used to determine Min, Max, Because each value is directly evaluated, the measurement mode could run for an infinite time, independent from the number of turns.

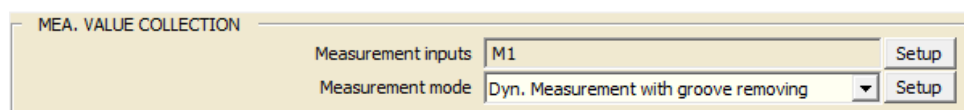
The *Dynamic measurement with groove removing (Type II)* saves all measuring values in a table during the dynamic measurement. After the dynamic measurement has been ended, the saved values are used for the calculations.

The advantage is that additional calculations, e.g. a Gaussian filter, can be used. But the disadvantage is, that this measurement mode can run only for a limited time, until the table is completely filled.

If possible, the measurement should run for one turn only and with constant rotation speed.

2. Configuration

For this special measurement mode, the formula for the measuring input has to be entered in the drawing data of a characteristic. The special measurement mode has to be selected as measurement mode.



By clicking the Setup button, the following configuration dialogue can be opened.



The setup dialog provides the following options :

- **Display Value**

Selects the displayed value (measurement result). The following options for *Display Value* are available :

- **Min**
Minimum of all collected measurement values without values inside the grooves.
- **Max**
Maximum of all collected measurement values without values on the cogs.
- **TIR (Max – Min)**
TIR of all collected measurement values without values inside the grooves / on the cogs.
- **MEAN ((Max + Min) / 2)**
Area means of all collected measurement values without values inside the grooves / on the cogs.
- **MEAN ((X1 + ... + Xn) / n)**
Arithmetic mean of all collected measurement values without values inside the grooves / on the cogs.
- **TIR (Xq1, ..., Xqn)**
Computes the arithmetic mean for each area between two grooves / cogs separately and returns the TIR of all arithmetic means.

- **Removing of the values on following mea. mode**

Defines the measurement type to determine the grooves / cogs. This allows not only to detect pits, but also rises :

Min – Each groove is detected as local minimum

Max – Each cog is detected as local maximum

- **Mea. Value Difference to detect the groove**

Defines the difference above which, based on the first recorded measured value, a groove / cog is detected.



- **Number of removed mea. values before & behind the groove**

So that the measured values at the beginning and end of the groove do not influence the measurement result, a specific number of measurement values before and after detection of a groove can be removed additionally. The exact number of removed values depends on the application.

- **Start measurement after first detected groove**

By default the hysteresis for groove detection depends on the first recorded measurement value when the dynamic measurement is started. This may lead to an incorrect measurement result if the dynamic measurement is not started outside a groove.

By enabling this option, all measurement values recorded at the beginning of the dynamic measurement are discarded until a groove was detected.

- **Register for number of detected grooves**

A Register can be selected to output the number of detected grooves during the measurement. With the help of this register value, the dynamic measurement can be stopped by an event formula, when the desired number of grooves has been detected.

- **Characteristic for saving the values with groove removing**

For diagnosis a characteristic to output all measurement values with removed grooves can be selected to visualise the measurement data used for measurement result computing.

- **Characteristic for saving all values**

For diagnosis a characteristic to output all measurement values can be selected. In combination with the *characteristic for saving analysis data*, the parameters for groove detection can be validated.

- **Characteristic for saving analysis data**

For diagnosis a characteristic to output analysis data can be selected. In the analysis data for each collected measurement value, the value is either 0 (outside a groove) or 1 (inside a groove). In combination with the *characteristic for saving analysis data*, the parameters for groove detection can be validated.

Note :

If run charts of the characteristic for saving all values and the characteristic for saving analysis data are placed one below the other, it can be easily seen where exactly the grooves are detected, i.e. which values are removed.

- **Output debug message**

If this option is enabled, a debug message will be displayed at the end of the measurement, containing the following information :

Min – Minimum value outside detected grooves

Max – Maximum value outside detected cogs

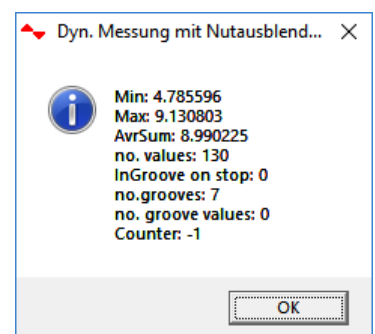
AvrSum – Arithmetic mean outside detected grooves / cogs

no. values – Number of all collected mea. values

InGroove – At end of measurement : (0) outside (1) in groove

no. Grooves – Number of detected grooves / cogs

no. Groove values – Number of mea. values of detected grooves / cogs



3. Usage of the special measurement mode

The special measurement mode needs to be configured for the desired characteristic. Begin / End of the measurement are controlled the same way as a ‘standard’ dynamic measurement in ComGage by the test step functions **Dynamic measurement on** / **Dynamic measurement off** or **Dynamic measurement on/off**.