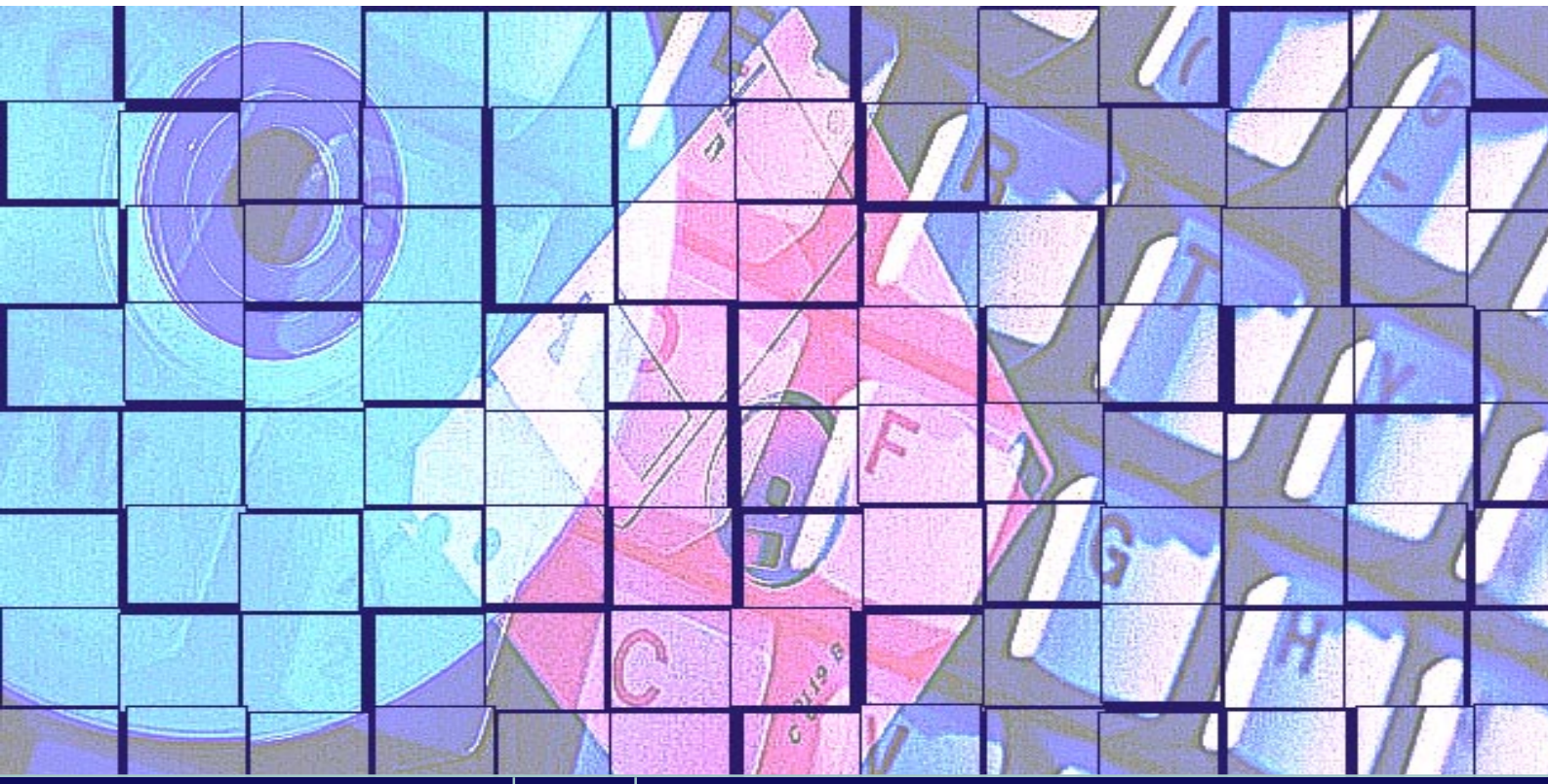


QMSOFT®

QMSOFT®

QMSOFT - 1500 Installations

QMSOFT - 30 Countries

QMSOFT - 10 Languages

L & W does offer for you a CD-ROM with all QMSOFT modules free-of-charge and unlimited time to test any QMSOFT functionality.

So you have the possibility to test the whole system to see its ability without any pressure of time.

Please test, how easy you can connect the different measuring devices of different manufacturers - creating a unique system to perform your complete gauge inspection process.

QMSOFT is a modular „building block“ system - where you purchase only the components you really need.
If your requirements are growing you add new components at your individual wishes.

Much success when testing QMSOFT !

QMSOFT - the Gauge Inspection Software maked to measure

The systematic inspection of all measuring tools and gauges in your company is essential for your quality assurance system. This is also one of the fundamental requirements of an **ISO 9000** .. certified system.

If that means for you:

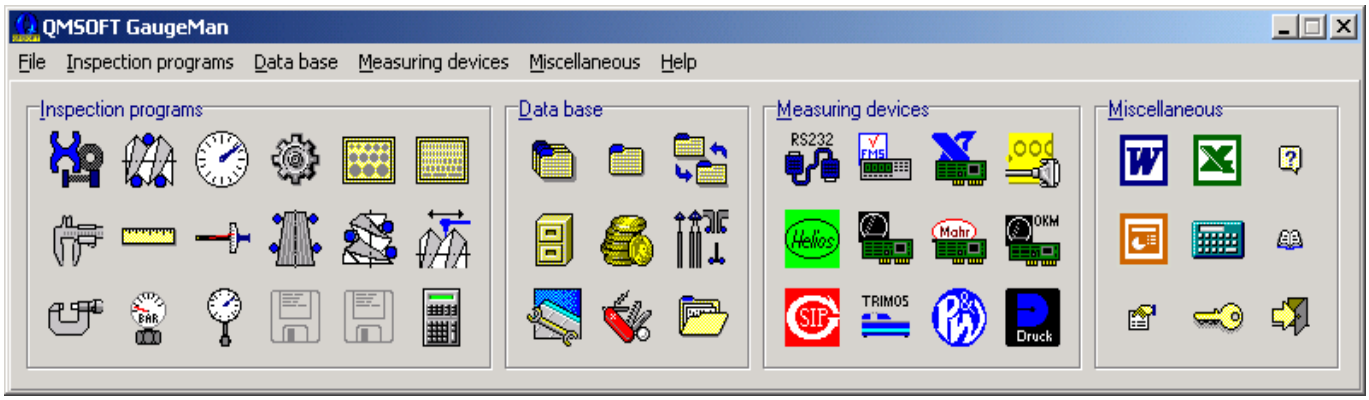
- the Gauge Stock including all related information about stock-taking, gauge locations and calibration records has to be managed.
- the usage of Gauges has to be controlled and the keeping of recalibration periods should be guarantied .
- the Calibration process has to be carried out in a correct, repeatable and provable way.

This will produce constantly growing mountains of paper, tedious routine work and constant struggle with many standards.

We have the solution:

QMSOFT (**Q**uality **M**anagement **Soft**ware) connects our practical experiences in gauge inspection with the advantages of state of the art computer technology. Furthermore, it is a powerful tool for managing all gauge data and checking measuring tools, all via one uniform user interface.

Simply jump in and start using QMSOFT!

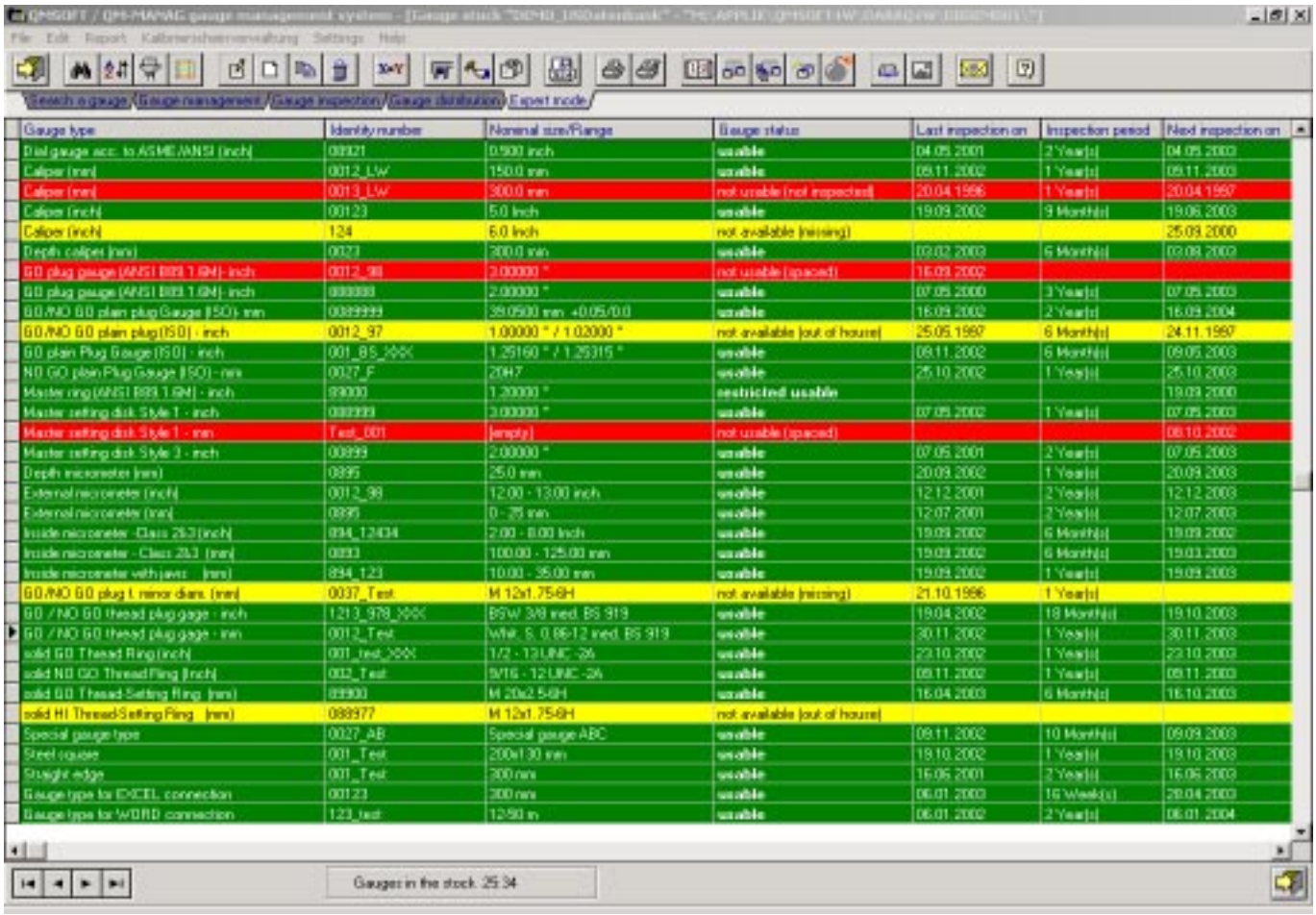


That's the features of QMSOFT:

- All nominal sizes and tolerances for all related DIN or ISO standards as well as for ANSI standards, British standards and partly for Japanese, French or Korean standards are calculated by the program system.
- Gauge inspections will be started directly from the gauge management system and will be performed with inspection programs specially designed for the gauge type selected.
- Predefined inspection procedures does following exactly the given rules and standards. So you do not need any preparation before starting a measurement.
- All inspection programs does support the directly connection to measuring instruments for the online taking over of measuring values.
- Inspection certificates may be customised for individual presentation.
- A XML - file interface does opening the QMSOFT system to link any other application.

QMSOFT uses a variety of special modules to provide you with optimal support for inspecting various kinds of tools and gauges. Each of these modules allows you to effectively carry out and record a inspection. Thus you are able to build a system according to your individual wishes.

The program **QM-MANAG** provides all the functions you need to manage your complete stock of measuring tools and gauges. It also allows you to create identification cards, search and reminder lists, as well as histories of your measuring tools and gauges. A user defined data structure can be created for each type of gauge. Also the system provides a flexible interface for database querys. The process of calibration is directly controlled by the system.



Important **functions** are:

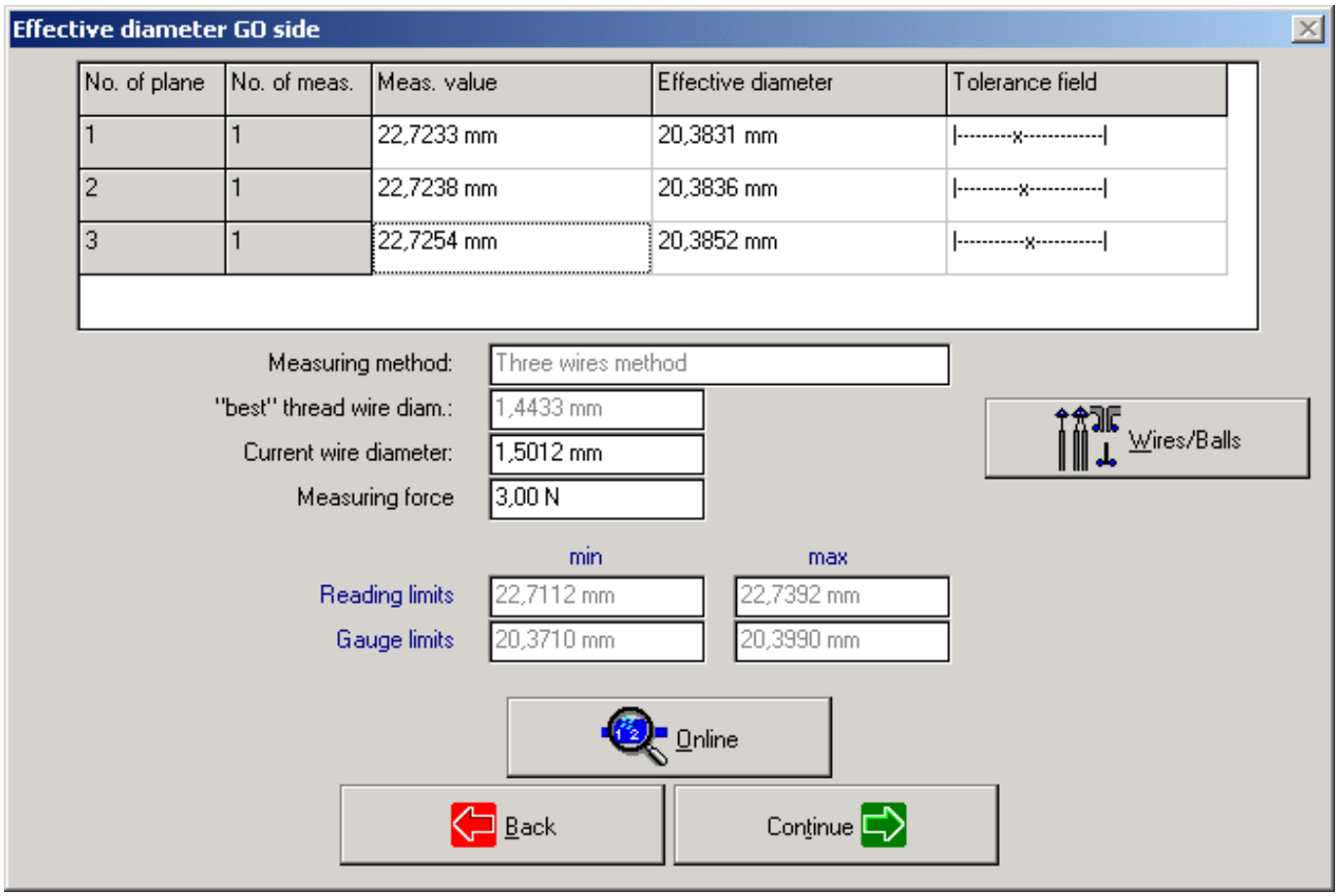
- field independent gauge management caused by the free definition of data structures and the possibility to create new types of gauges.
- free definition of database calling up operations to create various „recalling“ lists or gauge cards.
- inclusion of nominal value generation and calculation of tolerances for all common gauges for length inspection.
- inclusion of online measurements through integration of separate measurement modules of any type of gauge.
- the capability of parallel administration of different stocks of gauge data.
- network and multi-user capability for all common network platforms.

If you do not have a special „calibration program“ for a gauge, QM-MANAG does provide an interface to MS-WORD or MS-EXCEL to create a certificate on a very simple way.

QM-THREAD - the calculation and inspection of Screw Threads Gauges

QM-THREAD is an effective tool for the measurement and calculation of all kinds of cylindrical thread gauges. The program calculates the expected measures over wires or balls and the pitch diameter depending on the measurement method. This calculations can also be done in accordance to the ANSI standard specifications. *International surveys have established that QM-THREAD has the highest precision for the different screw anatomies.*

The automatic selection of measuring wires or balls from predefined or user defined size tables, including the calculation of the best wire size provides an easy and comfortable work environment, as well as helping to minimise of sources of errors.
The program supports the calculation of nominal sizes and tolerances for varied international thread standards. The implemented standards will be constantly extended and updated.



Currently the following standards are implemented:

- ISO Metric Threads acc. to DIN ISO 1502
- Unified Threads (UNC, UNF..) acc. to ANSI/ ASME B1.1/1.2 as well as acc. to BS919, Part 1
- ISO Metric Trapezoidal Threads acc. to DIN 103
- Pipe threads according to DIN ISO 228
- Whitworth Threads acc. to BS84 / BS919 P.2
- ISO Metric Threads acc. to ANSI/ASME B1.16.M
- Buttress Threads acc. to ANSI B1.9 or DIN 513
- Gauges for wire thread inserts (HeliCoil) acc. to DIN 8140 or Böllhoff
- NPSM pipe threads acc. to ANSI/ASME 1.20.1
- Threads for valves and tyres acc. to DIN 7756 respective ETRTO V.7
- Steel conduit threads acc. to DIN 40431
- ACME and Stub ACME thread ANSI B1.5 and ANSI B1.8

QM-PLAIN - Inspection of Plain Gauges

The program supports the inspection of master rings and ring gauges, plaug gauges and snap gauges, master plugs or master disks. Using the gauge type selected and the nonimal value provided (e.g. 20H9 or 1.002/1.005 inch) the program calculates the gauge allowances and tolerances.

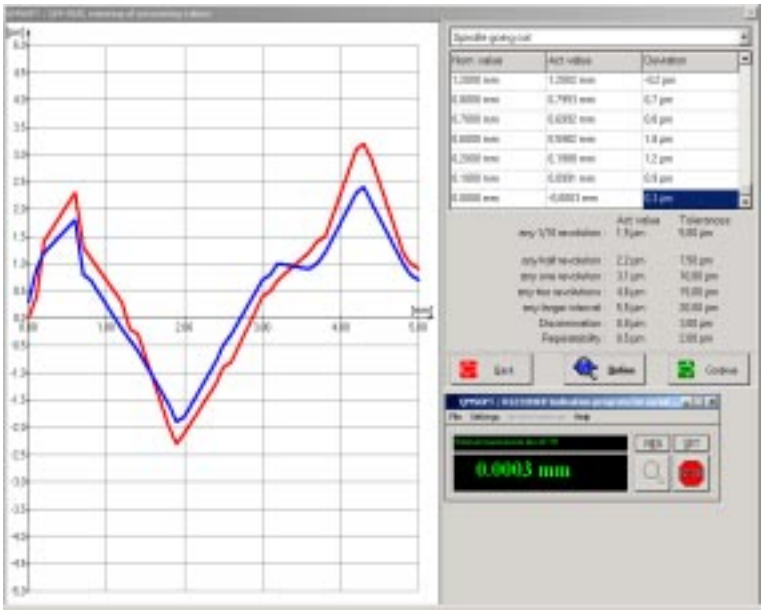
The tolerances may be calculated according to:

- DIN ISO 286,
- British Standard 969:1982,
- ASME/ANSI B89.1.6M or
- NF E 02-202 (french standard).

QM-DIAL - inspection of Dial Gauges and Indicators

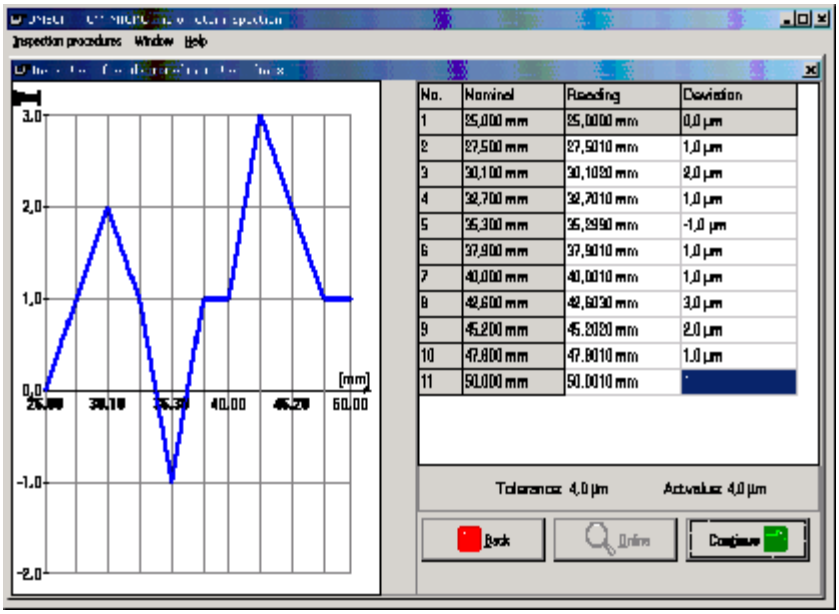
QM-DIAL supports the inspection of dial gauges, dial indicators and dial testing indicators with the usage of dial gauge testing instruments or horizontal measuring machines. The inspection may be done in accordance to various international standards (ANSI, DIN, British standard, Japanese or Korean standards).

The results can be displayed in a graphical and numerical form.



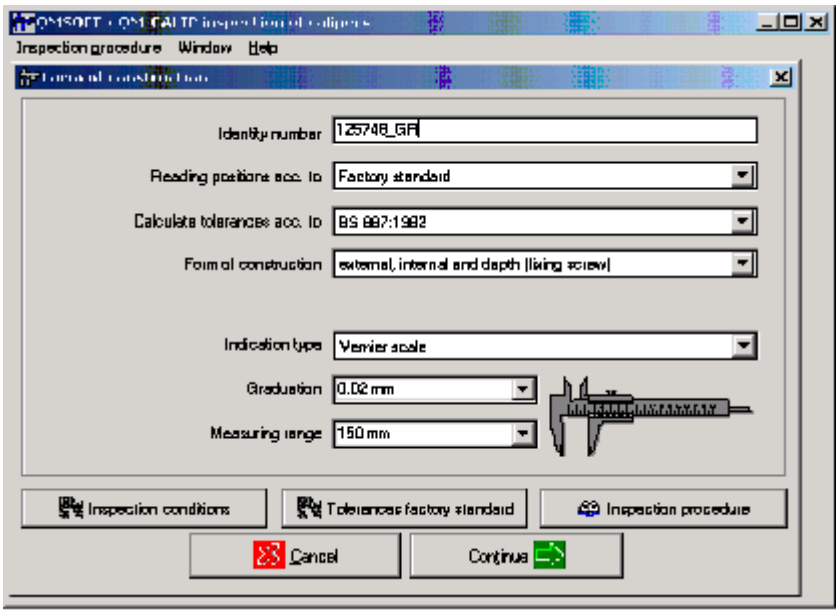
QM-MICRO - inspection of Micrometers

QM-MICRO does support the inspection of micrometers according to various standards. Micrometer inspection may be done according to DIN 863-1999 (Part 1-4), BS 870, BS 959, BS 6468, BS 1734 and the Federal specification GGG-C-105C respective according to customised factory standards. Depending on the micrometer type and the evaluation mode selected the program determines the maximum error in indicated measurement, the error of the micrometer screw, the error in alignment or the zero deviation. Also the inspection of masters and inspection rods can be made.



QM-CALIP - inspection of Calipers

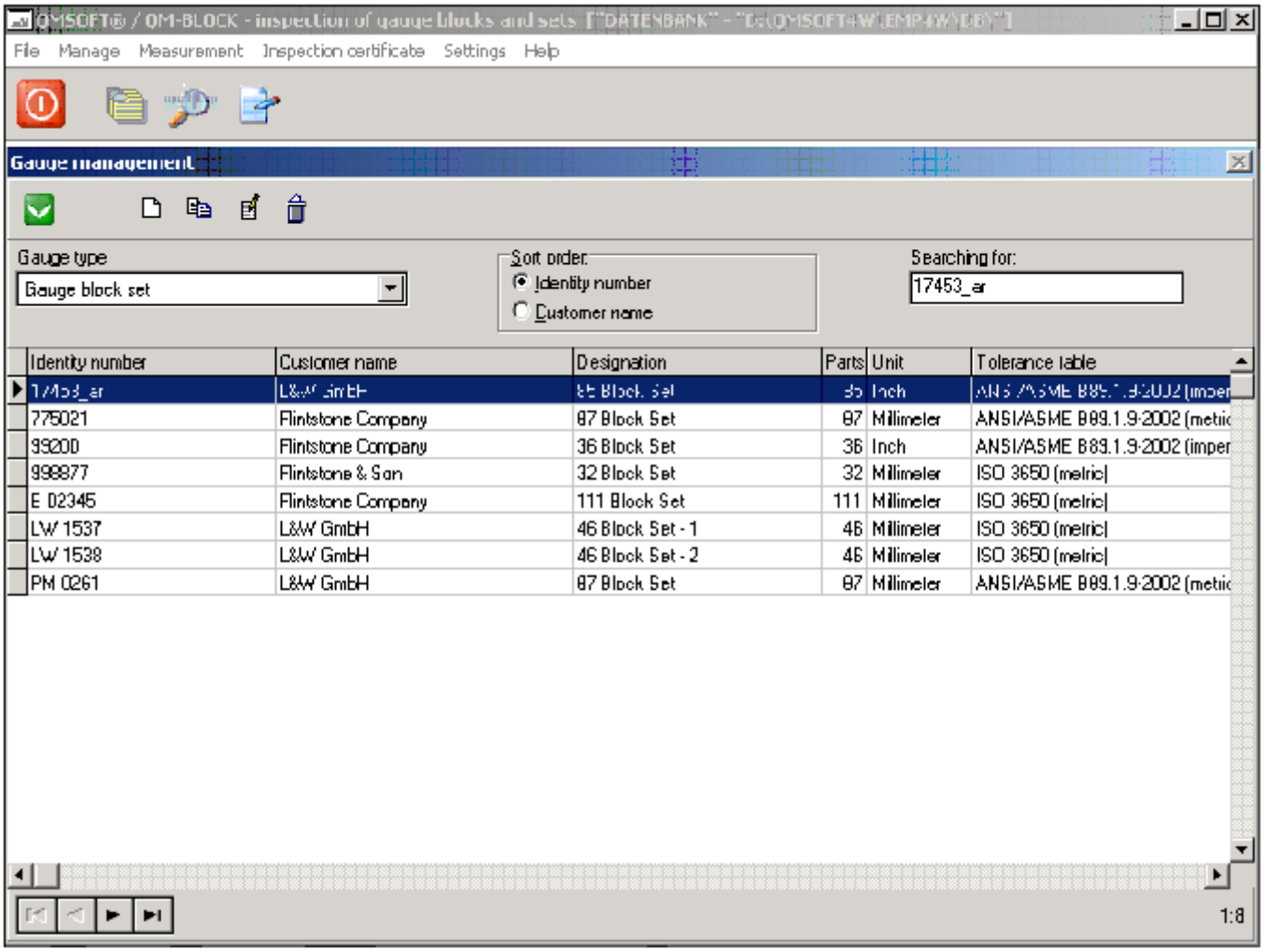
This program does support the inspection of calipers according to various standards. Measurement data can be entered directly from the caliper, if the caliper has an digital interface. The program does determine the errors of external, internal and depth measurement. The evaluation results can be reproduced on the screen and/or the printer. Tolerance excesses will be shown.



QM-BLOCK - inspection of Gauge Blocks

The program QM-BLOCK is designed to the computer supported inspection of gauge blocks used as single gauge blocks or as gauge block sets. The program includes a database to manage all entered nominal sizes of gauge blocks and sets and to save all inspection results of this gauges.

The inspection itself may be done according different evaluation methods. Basically the evaluation and the used tolerances are related to the ISO 3650 standard, the ANSI/ASME B89.1.9. or the BS 4311, but you can also define your own tolerance tables and classes of accuracy.



Usually a gauge block inspection instrument does work with the method of „difference measurement". This means that you use a reference gauge block with a well known actual size and compare it with the size of the gauge block which should be inspected.

The nominal sizes and the centre length deviation of your reference gauge blocks you will get from the calibration certificate of this reference set.

To inspect a gauge block it is usual to set 5 measuring points on the gauge blocks face. The order of the measuring points is related to the standard selected. The program supports also to define your own „Measuring point pattern". Measurement data can be taken over through an online measuring instrument or entered on the keyboard.
The results can be produced on the screen, printer and/or in a file. It is possible to customise the record listings using a user defined certificate layout file.

QMSOFT - other inspection programs available

QM-PRESS

Program to inspect Pressure gauges, Process pressure gauges and Pressure switches according to DIN EN 837. The gauges may be designed for different measuring principles (Bourdon tube gauges, Diaphragm and capsule gauges), for different working and inspection mediums (Air, Water, Oxygen, Fuel oil and others) and also for the different types of construction (without pointer stop, pointer stop at zero position, ..) .

QM-SCALE

Program to inspect graduated steel rules according to DIN 865, DIN 866 or according to British Standard BS 4372. The program is also usable to inspect measuring tapes according to DIN 6403 and EG 73362. The program offers the possibility to inspect a tape in sections. So you can also inspect tapes with a long range on a shorter inspection device.
You will get the calibration results in a graphical and tabular form.

QM-TORQ

This program does support the inspection of different types of indicating and settting torque tools. The valuation is based on the international standard ISO 6789 or can be made according to factory standards. Using the possibility to take over the measuring values directly from an torque testing instrument (Rahsol, Norba or others) the inspection can be made in a save a efficient way.

QM-SPLINE

Program to support the inspection of gauges for involute splines according to DIN 5480 and DIN 5482 and also for gauges for serrated splines according to DIN 5482 (more standards are in preparation).
There is also an option to enter your spline parameters according to a factory standard and calculate the measure over or between pins in relation to this parameters.

QM-PIN

Management and inspection of pin gauges, pin gauge sets, thread wire sets and thickness gauge sets. The program is able to create and manage all nominal sizes of a pin set and also the results of an unlimited number of measurings including all measuring values for each pin or wire. Measurement data can be entered through an online measuring machine or on the keyboard. The output of the results are in a tabular form - either on the screen or printer.

In addition to those, we offer **other modules for the inspection** of different types of gauges.

Additional standards or inspection programs will be implemented at cost and **customer requests**!

QMSOFT can be run as a **stand-alone** system or in a **client-server** environment.

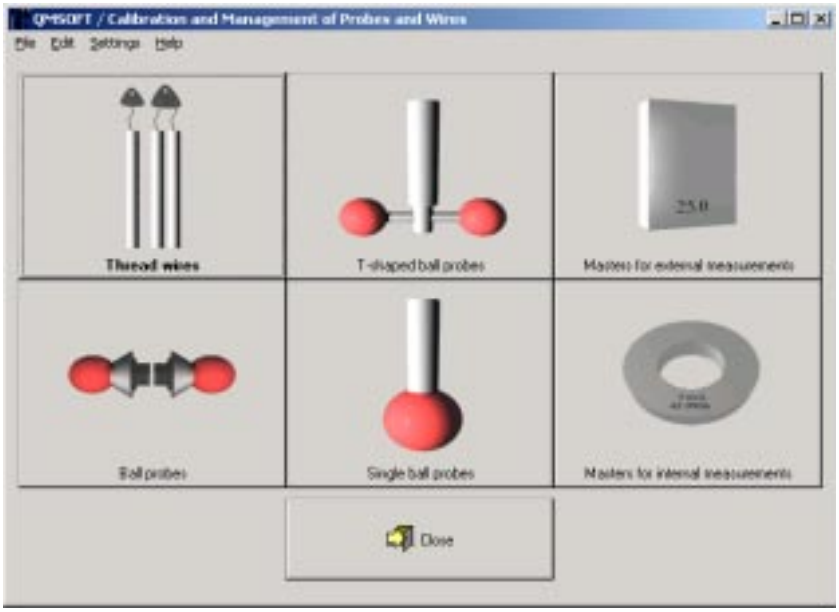
Supported platforms are Windows 98 and Windows NT, 2000 or Windows XP. The system is implemented in a modular and portable fashion.

QMSOFT - Tools and Additional programs

There does exist a series of tools and additional programs as a part of the QMSOFT software system, which does help you to carry out calibrations more efficient and comfortable.

QM-PROBE

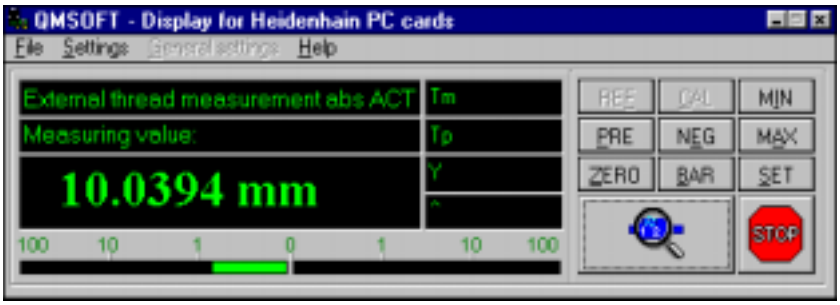
Doing gauge calibrations you will need constantly masters, setting parts, thread wires or other measuring accessories. The program QM-PROBE is a powerful tool to **manage** all this **probes and masters**.
Especially for thread measurements, the automatic selection of thread wires or balls from the related libraries does increase the efficiency of your calibration process.



QMSOFT - Indicating programs

Efficient and convienent measurement does mean the Online taking-over of measurements from a connected measuring device.

The system QMSOFT includes different program modules, which does perform the **Online communication** with all **common measuring instruments**. This may be done via a serial cable or with special PC interface cards.



Program QM-THREAD (Inspection of thread gauges)

- ISO Metric threads, DIN ISO 1502 (DIN 13)
- ISO Metric threads, ANSI B1.16M
- Metric ISO Trapezoidal threads, DIN 103
- Unified threads and thread gauges, ANSI/ASME B1.1 u. B1.2
- Thread gauges for Unified threads, BS 919 (Part 1)
- Gauges for pipe threads, DIN ISO 228
- Steel conduit threads, DIN 40430, 40431
- Knuckle threads, DIN 405
- Buttress threads and gauges, DIN 513 /Factory standard
- Gauges for wire thread inserts for metric threads, DIN 8140
- Gauges for screw threads of Whitworth form, British standard BS 84 / BS 919 (Part 2)
- NPSM pipe threads, ANSI/ASME 1.20.1
- Aerospace MJ threads, DIN ISO 5855
- Gauges for Metric and Unified thread inserts, Böllhoff factory standard
- Threads for valves and tyres, DIN 7756 and ETRTO V.7
- Metric threads, NF E 03-152/153 (GE40-010N)
- Unified threads, CNOMO GE40-008N (PSA, Renault)
- ACME threads, ANSI B1.5 - 1988
- Stub-ACME threads, ANSI B1.8 - 1988
- Buttress threads 7°/45°, ANSI B1.9 - 1973
- Hot-dip galvanized threads, DIN ISO 965:2002

Program QM-PLAIN
(Inspection of plain rings, plug and snap gauges)

- DIN-ISO 286 – 1
- DIN-ISO 286 – 2
- British Standard BS 969
- ANSI/ASME B89.1.6M-1984
- French Standard NF E 02-202 (GE40-001N)
- Master rings, BS 4064 : 1966 and BS 4065 : 1966
- Master rings, French Standard NF E 11-011

Program QM-DIAL
(Inspection of Dial gauges and indicators)

- Dial gauges, DIN 878 - 1983
- Dial indicators, DIN 879 - 1999
- Dial test indicators, DIN 2270 - 1985
- Dial gauges, ASME/ANSI B89.1.10M
- Dial gauges, French Standard NF E 011-50
- Dial test indicators, French Standard XP E 11-053 : 2000
- Dial gauges, Japanese Standard JIS B 7503-1992
- Dial gauges, British Standard BS 907-1965
- Dial test indicators, British Standard BS 2795-1981
- Dial gauges and Test indicators, Australian Standard AS 2103
- Dial gauges (0.01 mm Graduation), Korean Standard KS B 5206-1984
- Dial gauges (0.001 mm Grad.), Korean Standard KS B 5207-1984
- Dial test indicators, Korean Standard KS B 5238-1976

Program QM-CALIP (Inspection of Calipers)

- DIN 862 - 1988
- British Standard BS 887
- French Standard NF E 11-091

Programm QM-MICRO (Inspection of Micrometers)

- Micrometers (any type), DIN 863 – 1999 (Part 1-4)
- External micrometers, British Standard BS 870-1950
- Internal micrometers, British Standard BS 959-1950
- Depth micrometers, British Standard BS 6468 : 1984
- Micrometer heads, British Standard BS 1734 : 1951
- Micrometers (any type), Federal Specification (USA) GGG-C105 C–1987
- External micrometers, Australian Standard AS 2102
- Internal micrometers, Australian Standard AS 2101 : 1978

Today there are a lot of industrial users and commercial service calibration laboratories using our QMSOFT technology. Even more than 30 DKD (the German accreditation body) accredited laboratories make use of QMSOFT programs.

QMSOFT modules are also employed as „Third-Party-Components“ to extend the functionality of other software products, for example to calculate thread tolerances in a CAQ system.

Several universities and technical colleges make a practical education of their students in the field of gauge management and gauge calibration with the usage of the QMSOFT system.

Countries in which QMSOFT has already been installed:

Argentina, Australia, Austria, Belgium, Brazil, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, India, Indonesia, Iran, Israel, Italy, Luxembourg, Malaysia, Mexiko, Netherlands, Norway, Poland, Sweden, Switzerland, Singapur, Slovenia, Slovakia, Spain, South Africa, South Korea, Taiwan, Turkey, USA

QMSOFT®

Calibration Certificate

Measurement Laboratory
< customize here your name and logo >

QM-DIAL

Inspection of Dial gauge acc. to BS 907 : 1965

Customer:	L&W
Identity number:	**2871 KB-511**
Standard:	BS 907 : 1965
Measuring range:	5,00 mm
Graduation:	0,01 mm
Start of inspection:	0,00 mm
End of inspection:	5,00 mm
Inspection step:	0,10 mm
Position for inspection of repeatability:	0,20 mm

Inspection results

Parameter	Nominal value [µm]	Actual value [µm]	Out of tolerance [µm]
Deviation – adjacent readings	5,00	1,50	-
Deviation over ½ revolution	7,50	2,20	-
Deviation over 1 revolution	10,00	3,10	-
Deviation over 2 revolutions	15,00	4,60	-
Deviation at any larger interval	20,00	5,50	-
Discrimination error	3,00	0,80	-
Repeatability	2,00	1,20	-

Valuation: **Gauge in tolerance**

Inspection device: Dial gauge testing instrument - No. 178164
Gauge block set 314826 (Cal. report no. 0125454-2002)

Inspection date: 01 October 2002

Operator: .....
(Mr. Smith)

Calibration curve

QMSOFT®

Calibration Certificate

Measurement Laboratory

< customize here your name and logo >

QM-THREAD

Periodical inspection of GO / NO GO thread plug gauge

Customer:	L&W
Identity number:	**6386-B012**
Thread designation:	M 20x2.5-6H
Standard:	ISO metric threads according to DIN ISO 1502 (DIN 13)
1. Flank angle:	30,00°
2. Flank angle:	30,00°
Pitch:	2,5000 mm
Thread starts:	1,0
Used wire diameter:	1,3500 mm
Measuring force:	3,0 N
Method of measurement:	Three wires method

Gauge nominal values	*GO side*	NO GO *side*
Major diameter (max):	20,0300 mm	19,1210 mm
Major diameter (min):	20,0020 mm	19,0930 mm
Effective diameter (max):	18,3990 mm	18,6140 mm
Effective diameter (min):	18,3850 mm	18,6000 mm
Effective diameter - Wear limit :	18,3710 mm	18,5920 mm
Minor diameter - maximum value:	16,9331 mm	16,9331 mm

Measuring values of Effective diameter - GO Side

Meas. plane No.	*Meas. value No.*	*Measure [mm]*	*Effective diameter [mm]*	*Out of tolerance [µm]*
1	1	20,2574	18,3717	-
2	1	20,2582	18,3725	-
1	2	20,2565	18,3708	-0,20
2	2	20,2569	18,3712	-

Measuring values of Effective diameter - NO GO side

Meas. plane No.	*Meas. value No.*	*Measure [mm]*	*Effective diameter [mm]*	*Out of tolerance [µm]*
1	1	20,4823	18,5967	-
2	1	20,4831	18,5975	-

Valuation:	**Gauge out of tolerances**
Inspection procedure:	VDI/VDE/DGQ 2618 (Page 23)
Measuring uncertainty:	U = 1,5 µm + 0,9 µm * L (Length L in m)
Inspection device and traceability:	Measuring device no. B181289 Gauge block set no. 531826 (Calibr.-Certificate-No. 02/25454-A)
Inspection date:	16 March 2003
Operator:	..... (Mr. Smith)

QMSOFT®

Calibration Certificate

Measurement Laboratory

< customize here your name and logo >

QM-PLAIN

Periodical inspection of GO / NO GO plug gauge

Customer:	L&W	
Identy number:	**817241**	
Standard:	DIN-ISO 286	
Nominal size:	30H7	
Upper deviation Es:	21,00 µm	30,02100 mm
Lower deviation Ei:	0,00 µm	30,00000 mm

Gauge nominal sizes

Upper deviation GO side:	5,00 µm	30,00500 mm
Lower deviation GO side:	1,00 µm	30,00100 mm
Wear limit GO side:	-3,00 µm	29,99700 mm
Upper deviation NO GO side:	23,00 µm	30,02300 mm
Lower deviation NO GO side:	19,00 µm	30,01900 mm

Actual values – GO side

Meas. plane no.	Meas. value no.	Measure [mm]	Out of tolerance [µm]	Tolerance graphic
1	1	30,0021	-	|----------x--------|
1	2	30,0027	-	|----------x------|
2	1	30,0015	-	|----------x--------|
2	2	30,0018	-	|----------x--------|
3	1	30,0024	-	|----------x-------|
3	2	30,0022	-	|----------x-------|

Actual values – NO GO side

Meas. plane no.	Meas. value no..	Measure [mm]	Out of tolerance [µm]	Tolerance graphic
1	1	30,0213	-	|----------x--------|
1	2	30,0208	-	|---------x----------|
2	1	30,0218	-	|----------x------|
2	2	30,0214	-	|----------x--------|

Valuation: **Gauge in tolerances**

Inspection procedure:	VDI/VDE/DGQ 2618 (Page 2)
Measuring uncertainty:	U = 0,6 µm + 0,9 µm * L (Length L in m)
Inspection device:	Measuring device no. 98374; (Certificate no. 030217-12) Gauge block set No. 549231 (Calibration cert. no. 3504-17)
Inspection date:	01 October 2002
Operator:	..... (Mr. Smith)

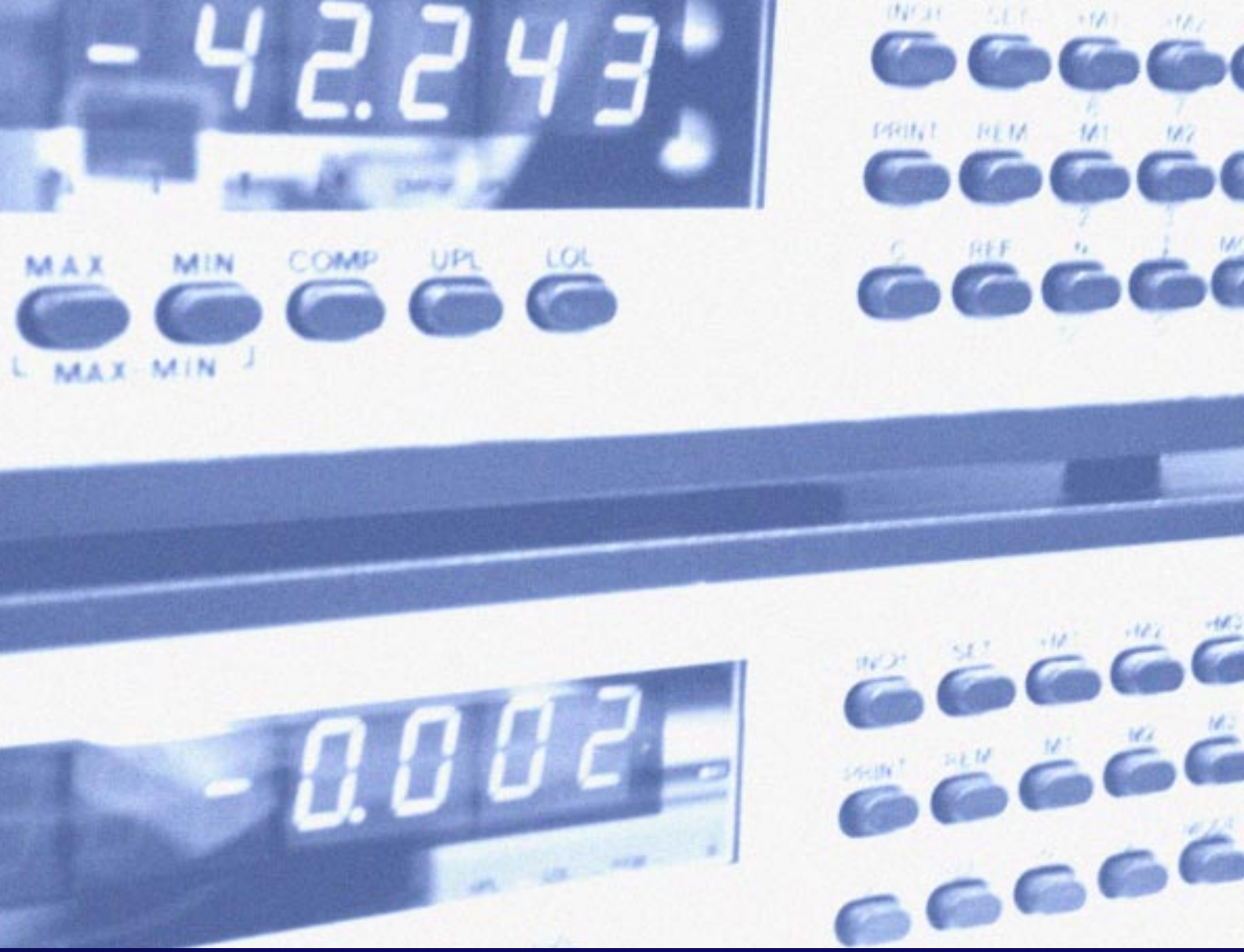
Each QMSOFT program does include an interface named „QmLink“. This interface was designed to create an universal tool to exchange gauge data as well as between the single QMSOFT components itself and also for the data exchange between a QMSOFT program and a „Third-Party“ system (e.g. a CAQ system).

QmLink was implemented as a file interface based on the XML format. This format is becoming more and more usual and does support a well structured description of gauge data on a simple way.

The L&W company does offer a detailed description of this interface to allow the developers of other software components a simple access to the complete functionality of the **QMSOFT®** program system.

```
<?xml version="1.0" encoding="ISO-8859-1"?>

<QmLink>

<!-- Beispiel Meßauftrag: Grenzlehrdorn 20H7 nach DIN-ISO 286 -->

  <Version>2.00</Version>
  <Date>24.12.2002</Date>
  <Time>11:14:31</Time>
  <Creator>LEHRM32.EXE</Creator>
  <User>Mustermann</User>

<Global>
  <Done>false</Done>
  <ErrorCode>0</ErrorCode>
  <ErrorText></ErrorText>
  <NumberOfGauges>1</NumberOfGauges>
</Global>

<Gauge>

  <NominalData>

    <sIDENTNUMBER>0815</sIDENTNUMBER>
    <sNOMSIZE>20H7</sNOMSIZE>
    <sSTANDARD>DIN-ISO 286</sSTANDARD>
    <sUNIT>mm</sUNIT>
    <iGAUGETYPE>6</iGAUGETYPE>
    <sGAUGETYPE>Grenzlehrdorn</sGAUGETYPE>

<!-- Abmaß vom Nennmaß -->

<rUPPERDEVIATION>21,0 µm</rUPPERDEVIATION>
<rLOWERDEVIATION>0,0 µm</rLOWERDEVIATION>
```

Example for a QmLink file, representing the program call to inspect an plain GO/NO GO plug gauge.



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