Portable Data Recorder
HMG 3010

Description:

The HMG 3010 is an attractive, high-performance portable measuring and data-logging device. With automated setting procedures, simple, self-explanatory operator guidance, and many comprehensive functions, it enables the user to carry out a wide range of measurement tasks in a short amount of time, saving both time and money.

The HMG 3010 thus quickly becomes a reliable and helpful companion in the areas of service, maintenance, development, test bench technology, quality assurance, or commissioning of plants and machines. The HMG 3010 is designed primarily for recording measured values of the variables of pressure, temperature, and flow rate, which are common in hydraulics and pneumatics. For this purpose, special sensors are available, with which the measured variable, measurement range, and unit are automatically detected by the HMG 3010. The device also offers measurement inputs for standard sensors with current and voltage signals. In addition to the analog inputs, the HMG 3010 has two digital inputs (e.g., for frequency or rpm measurements).

The ability to connect the HMG 3010 to a CAN bus and thus to display messages from the CAN bus expands the range of applications.

The breadth of functions and the simple handling make the HMG 3010 equally suitable for users who take measurements only occasionally and for professionals for whom measuring and documentation is routine.

The update capability of the HMG 3010 via the integral USB port ensures that future developments of the device software can be used.


Special features:

- Simple, user-friendly operation
- Practical, robust design
- Large, full-graphics colour display
- Quick and independent basic setting of the instrument through the use of automatic sensor recognition
- Up to 10 sensors can be connected simultaneously
- Up to 32 measurement channels can be displayed at a time
- Measuring rates up to 0.1 ms
- Extended voltage measurement
  -10 .. +10 V und 0 .. 50 V
- Can be connected to a CAN bus

- Very large data memory for archiving measurement curves
- Various measurement modes:
  – Normal measuring
  – Fast curve recording
  – Long term measuring
- 4 independent triggers, can be logically linked
- PC connection
  – USB
  – RS 232
- Convenient visualisation, archiving and data processing using the HMGWIN 3000 and CMWIN software supplied

Function:

- Clear and graphical selection menus guide the operator very simply to all the instrument functions available. A navigation pad on the keypad ensures rapid operation.

- The HMG 3010 can monitor signals from up to **ten sensors simultaneously**. For this there are 5 robust standard input sockets. By using Y adapters the number of inputs can be doubled individually to make a total of between 6 and 10.

- Up to 8 sensors can be connected to 4 of these input sockets:
  - 8 sensors (e.g., for pressure, temperature, and flow rate) with special digital HSI interface (HYDAC Sensor Interface); the basic device settings (measured variable, measurement range, and unit) are made automatically
  - 8 standard analog sensors with current and voltage signals
  - 4 Condition Monitoring sensors*) (SMART sensors); again, the basic device settings are made automatically

- Frequency measurements, counter functions, or triggers for data logging can be implemented via the fifth input socket with 2 digital inputs.

- For extended voltage measurement, the HMG 3010 offers the possibility of recording signals of 0 .. 50 V on two inputs and a signal of -10 .. +10 V on one input (e.g. proportional valve control).

- The connection to a **CAN bus** in conjunction with the CAN adapter ZBE 3010 makes it possible to record CAN messages (e.g., motor speed, motor oil pressure) in combination with measurement data from the hydraulic system.

- HYDAC CAN bus sensors connected directly to the CAN adapter can be parameterized using the HMG 3010 (node ID and baud rate)

- All input channels can operate simultaneously at a **measurement rate** of 0.5 ms (1.0 ms for SMART sensors). To record highly dynamic processes, 2 analog inputs are capable of recording measured values of 0.1 ms.

- The most impressive function of the HMG 3010 is its ability to record dynamic processes "online", i.e., in real-time, as a **measurement curve** and render them as graphs in the field.
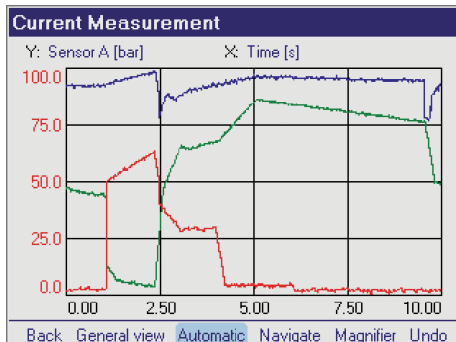

- The **data memory** for recording curves or logs can hold up to 500,000 measured values. At least 100 such full length data records can be stored in an additional archive memory.

- For specific, **event-driven curves or logs,** the HMG 3010 has four independent triggers, which can be linked together logically.

- It is also possible to **determine differential values** between different input signals from sensors. Particularly when measuring flow rate by means of differential pressure measurement across a measuring orifice, the accuracy can be significantly improved by using a stored calibration curve. To generate such calibration curves, the HMG 3010 has an easy-to-use recording function.

- User-specific instrument settings can be stored and re-loaded at any time as required. This means that repeat measurements can be carried out on a machine again and again using the same instrument settings.
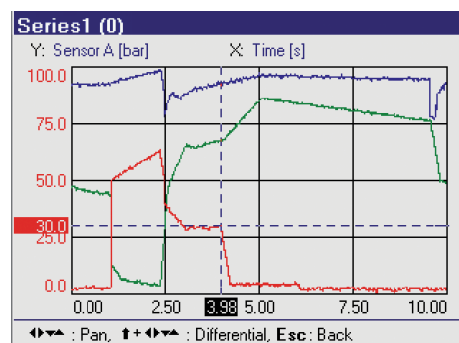

- Measured values, curves, or texts are visualized on a **full-graphics color display** in different selectable formats and display forms.
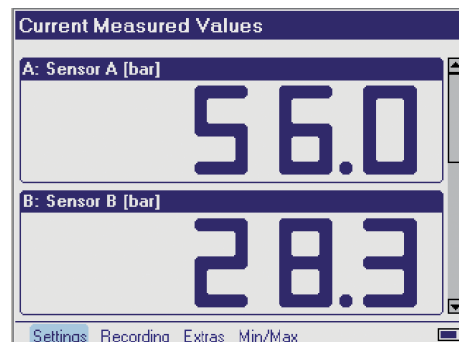
- Numerous useful and easy-to-use **auxiliary functions** are available, e.g., zoom, ruler tool, creating differential value graphs, and individual scaling, particularly for use when analyzing the recorded measurement curves.

- The HMG 3010 communicates with a PC via the built-in USB port or RS 232 port.

HMGWIN 3000:

The HYDAC PC software HMGWIN 3000 is also supplied with the instrument. This software is a convenient and simple package for analysing and archiving curves and logs which have been recorded using the HMG 3010, or for exporting the data for integration into other PC programs, if required. In addition it is also possible to operate the HMG 3010 directly from the computer. Basic settings can be made, and measurements can be started online and displayed directly on the PC screen in real-time as measurement curves progress.

CMWIN:

The HYDAC software CMWIN is also supplied with the instrument.
This software enables you to communicate directly with SMART sensors *) connected to the HMG 3010 from your PC.

Both programs can be run on PCs with Windows Vista / XP / 2000 and Windows 7 operating systems.

Some examples of the numerous useful additional functions:

- **Transfer and archiving** of measurements recorded using the HMG 3010
- Display of the measurements in graph form or as a table
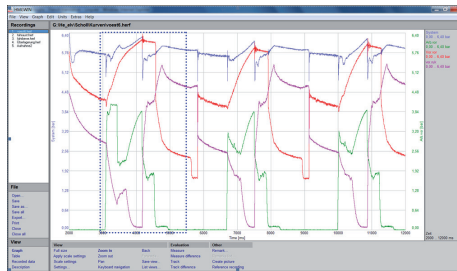
- **Zoom function:**
Using the mouse, a frame is drawn around an interesting section of a measurement curve, which is then enlarged and displayed.
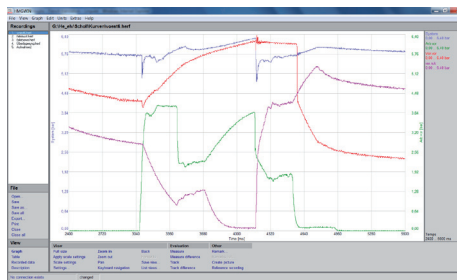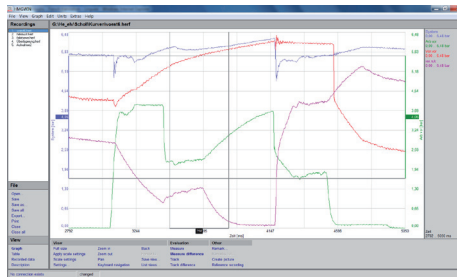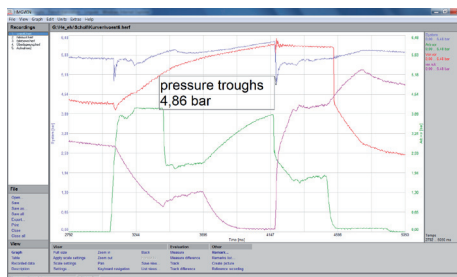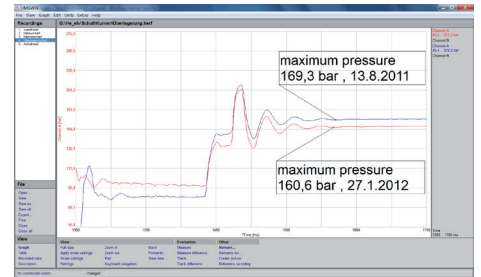

Fig.: Zoomed section of measurement curve

- **Accurate measurement** of the curves using the ruler tool (time values, amplitude values, and differentials)


- Individual **comments** and measurement information can be added to the graph

- **Overlay** of curves, for example to document the wear of a machine (new condition/current condition)

- Using mathematical operations (calculation functions, filter functions) new curves can be added.
- Snap-shot function:
comparable to the function of a digital camera, a picture can be taken immediately of any graph and saved as a jpg file.
- A **professional measurement report** can be produced at the click of a mouse: HMGWIN 3000 has an automatic layout function.
Starting with a table of contents, all recorded data, descriptions, and graphics and/or tables are combined into a professional report and saved as a pdf file.
- **Online function:**
Start, record, and display measurements in real-time (similar to the function of an oscilloscope)
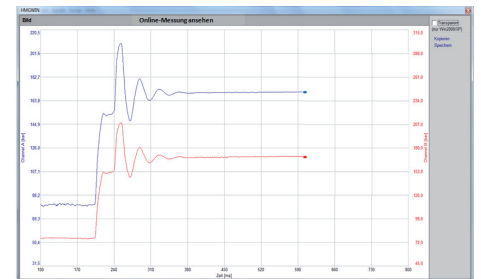
- Change of axis assignment of the recorded measurement parameters in graph mode (e.g. to produce a p-Q graph)

*) SMART sensors (Condition Monitoring Sensors) are a generation of sensors from HYDAC, which can provide a variety of different measured values.

Technical specifications:

Meas. inputs	● 4 input sockets (channels A-H) for connecting up to 8 analogue sensors or up to 4 SMART sensors. ● 1 input socket with 2 digital inputs (channel I-J) and one voltage input of -10 V to + 10 V (shown on channel H) Sensors are connected using standard M12x1 connectors (5 pole)

Channel A, B, E, F, G

(Accuracy)		
	HSI	(≤ ± 0.1 % FS max.)
	4 .. 20 mA	(≤ ± 0.1 % FS max.)
	0 .. 20 mA	(≤ ± 0.1 % FS max.)
	0 .. 4.5 V	(≤ ± 0.1 % FS max.)
	0 .. 5 V	(≤ ± 0.2 % FS max.)
	0 .. 10 V	(≤ ± 0.1 % FS max.)
	0.5 .. 4.5 V	(≤ ± 0.1 % FS max.)
	0.5 .. 5.5 V	(≤ ± 0.2 % FS max.)
	1 .. 5 V	(≤ ± 0.2 % FS max.)
	1 .. 6 V	(≤ ± 0.2 % FS max.)

Channel C and D (Accuracy)		
	HSI	(≤ ± 0.1 % FS max.)
	4 .. 20 mA	(≤ ± 0.1 % FS max.)
	0 .. 20 mA	(≤ ± 0.1 % FS max.)
	0 .. 4.5 V	(≤ ± 0.1 % FS max.)
	0 .. 5 V	(≤ ± 1.0 % FS max.)
	0 .. 10 V	(≤ ± 0.5 % FS max.)
	0 .. 50 V	(≤ ± 0.1 % FS max.)
	0.5 .. 4.5 V	(≤ ± 0.1 % FS max.)
	0.5 .. 5.5 V	(≤ ± 1.0 % FS max.)
	1 .. 5 V	(≤ ± 1.0 % FS max.)
	1 .. 6 V	(≤ ± 1.0 % FS max.)

Channel H (Accuracy)		
	HSI	(≤ ± 0.1 % FS max.)
	4 .. 20 mA	(≤ ± 0.1 % FS max.)
	0 .. 20 mA	(≤ ± 0.1 % FS max.)
	0 .. 4.5 V	(≤ ± 0.1 % FS max.)
	0 .. 5 V	(≤ ± 0.2 % FS max.)
	0 .. 10 V	(≤ ± 0.1 % FS max.)
	0.5 .. 4.5 V	(≤ ± 0.1 % FS max.)
	0.5 .. 5.5 V	(≤ ± 0.2 % FS max.)
	1 .. 5 V	(≤ ± 0.2 % FS max.)
	1 .. 6 V	(≤ ± 0.2 % FS max.)
	-10 .. +10 V	(≤ ± 0.5 % FS max.)

Channel I and J (Accuracy)	Frequency range: 1 .. 30 000 Hz (≤ ± 0.1 % FS max.) Switch / switch-back threshold: 2 V / 1 V max. input voltage: 50 V
Differential channels	A - B C - D Differential channel for flow rate measurement orifice (shown on channel B)
Measuring rate (dependent on the number of active channels)	0.1 ms, max. 2 analogue input channels 0.2 ms, max. 4 analogue input channels 0.5 ms, all 10 input channels 1.0 ms, for SMART sensors
Resolution	12 bit
Memory	At least 100 measurement curves, each with up to 500,000 measured values
Display	3.5" colour display, 7 segment display
Interfaces	1 USB, 1 serial port
CE mark	EN 61000-1/2/3/4
Safety	EN 61010
Safety type	IP 40
Environmental- conditions	Operating temperature: 0 .. +50 °C Storage temperature: - 20 .. +60 °C Rel. humidity: 0 .. 70 %
Weight	1100 g

Note:
FS (Full Scale) = relative to the full measuring range

Order details:

HMG 3010 - 000 - X

Operating manual and documentation
D = German
E = English
F = French

Items supplied
● HMG 3010
● Charger for 90 .. 230 V AC
● Operating manual
● CD-ROM containing USB drivers, HMGWIN 3000 and CMWIN software
● USB connection cable

Accessories:

● CAN adapter, required for CAN bus operation (ordered separately)
ZBE 3010 CAN adapter for HMG 3010
Material no. 921238

● Additional accessories, such as electrical and mechanical connection adapters, power supplies, etc. can be found in the "Accessories - Service devices" catalog section

Dimensions:

shown with protective cover open
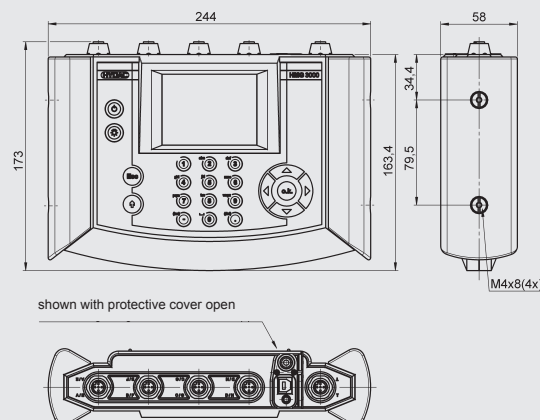
Notice:

The information in this brochure relates to the operating conditions and applications described.
For applications and operating conditions not described, please contact the relevant HYDAC department.
Subject to technical modifications.