



Operating instructions



V7 ALMEMO[®] D7 digital sensors

Measuring connector
D7 sensors for force, torque or weighing applications

V2.12
27.11.2015



ALMEMO® D7 digital sensors

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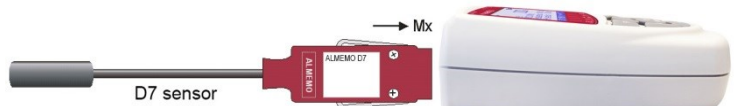


ALMEMO[®] D7 digital sensors

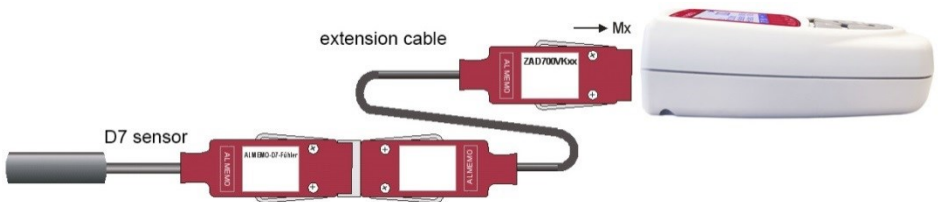
The latest ALMEMO[®] D7 digital sensors have been designed to overcome all the limitations experienced with earlier sensors regarding measurable variables, speed, range of measured values, and number of channels per sensor. It is also possible to perform efficient measuring operations simultaneously using high-speed and low-speed sensors with any range of measured values. It is even possible, via a menu stored in such sensors, to configure and use new measuring functions and quantities which ALMEMO[®] devices do not themselves support. All this makes the new ALMEMO[®] D7 system flexible and sustainable beyond compare. Communication between sensors and the measuring instrument is usually handled over a serial interface. D7 sensors can for this reason only be used in conjunction with new ALMEMO[®] V7 devices. A sliding average can be configured internally for up to four primary channels.

1. OPERATION AS SENSOR ON ALMEMO® V7 MEASURING INSTRUMENTS

ALMEMO® D7 sensors supply their definitive digital measured values from up to 10 measuring channels virtually simultaneously over the serial interface to the ALMEMO® V7 device where they are saved and / or output. Function channels can only be programmed and used by the device itself. If the user prefers that a particular measuring channel should not be displayed the measuring quantity and range can be switched off and deactivated as usual via the ALMEMO® device; it can be reactivated in the same way. The sensor is powered via the measuring instrument.



Extension



The operating radius of these sensors when connected to a measuring instrument can be extended by means of extension cable; measured values and connector programming can then be transmitted interference-free in serial form via an RS-422 driver. For electrical isolation adapter cable can be used.

1.1 Correction of measured values

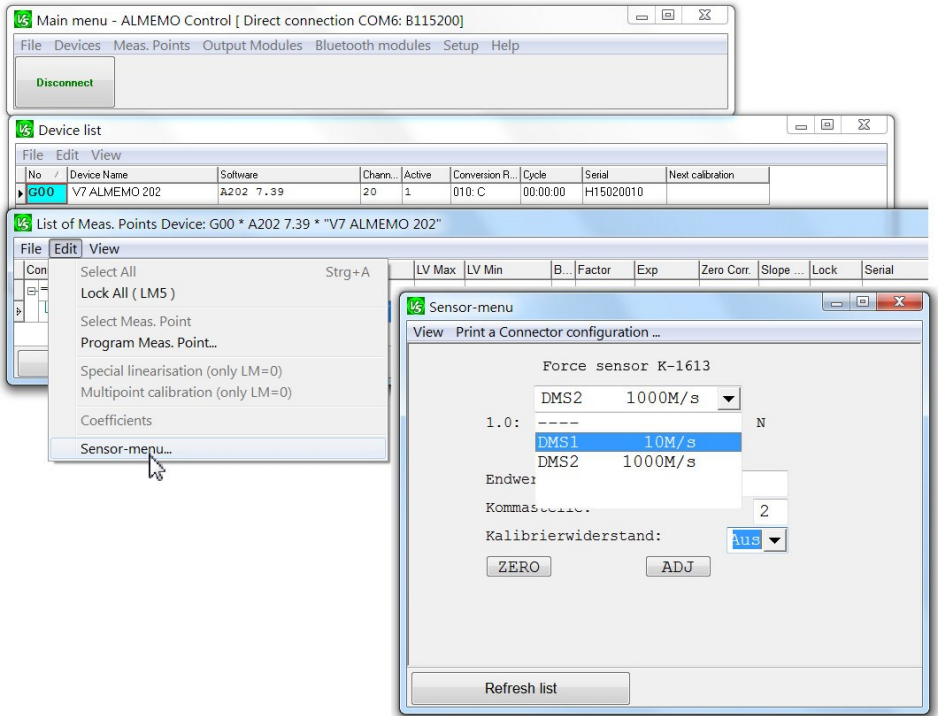
For the primary measuring channels adjustment values or multi-point adjustment can be stored in the D7 sensor (either at our factory or via a V7 measuring instrument using option KL). Correction values (zero-point, gain, base value, factor) are already processed in the sensor.

1.2 Sensor menu

To ensure the long-term future sustainability of the new ALMEMO® V7 measuring system without having to change the measuring instrument each D7 sensor incorporates an individual sensor menu which can be downloaded over the serial interface. It is possible in this way to configure measuring quantities and ranges, the averaging times for measured value smoothing, or other specific sensor functions. As operating device either a new ALMEMO® V7 measuring instrument or a PC can be used.



Function channels * are determined in the measuring instrument - either as parameters or the result of calculations. They can therefore only be programmed and used by the device itself. The following function channels are



available :

Batt, Mess, Alm, Diff, Max, Min, M(t), n(t), M(n), Flow, Time

However, if connected directly to the PC, these are not available. The advisory note '! unusable' will be displayed in the comments text.

Further parameters, depending on sensor type, can be set (e.g. setpoint adjustment, temperature / atmospheric pressure compensation).

Averaging period (smoothing)

All measured values on the primary channels are internally scanned all the time at the individual refresh rate. On most D7 sensors if measuring conditions make these values too unstable an averaging period can be entered in the menu for the primary channels; measured values will then be smoothed by a sliding average.

2. D7 SENSORS FOR FORCE, TORQUE OR WEIGHING APPLICATIONS

All mechanical sensors with a mV/V output signal of our manufacturing program are available as D7 sensors.

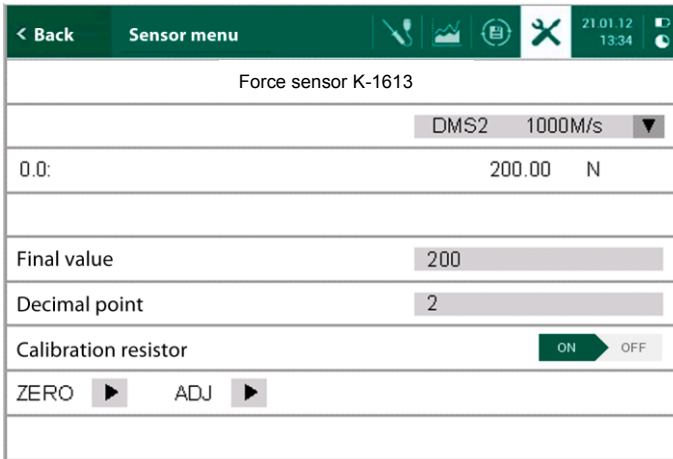
D7 sensors incorporate wire strain gauges in the form of a 4-wire full bridge; these are fed via the electronics in the plug (ZKD712FS) on connecting cable with a 5 V bridge supply and are evaluated via a high-speed 24-bit A/D converter. It is thus possible to record dynamic changes in force at two different conversion rates, namely 10 or 1000 measuring operations per second. To adjust the final value these sensors incorporate an internal adjustment resistor which can be activated as and when required via the sensor menu.

Measuring quantities and ranges - factory default settings

Designation	Quantity	Measuring range	Units	Resolution
1. Force 1000mops	B-02	DMS2	+	+

+ Measuring range, units, and resolution depending on type (see data sheet)

2.1 Configuration via the sensor menu



The following two measuring ranges can be configured (* factory default settings).

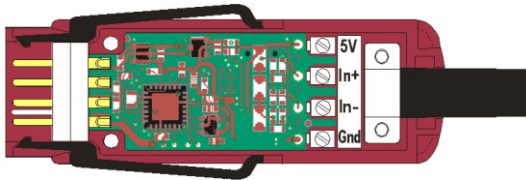
Designation	Quantity	Measuring range	Units	Resolution
1. Force 10 mops	B-01	DMS1	+	+
2. * Force 1000 mops	B-02	DMS2	+	+

+ Measuring range, units, and resolution depending on type (see data sheet)

2.2 Sensor functions

The user can set the sensor to zero at any time by pressing the 'ZERO' key. These two quantities are scaled by means of the factor according to the sensor's measuring range and at the conversion rate providing the highest resolution. Users wishing to scale the sensor themselves (e.g. to other units) can enter the required final value and the decimal points and then for the purposes of adjusting the gain activate the internal 'calibration resistor' corresponding to the final value and press the 'ADJ' key.

2.3 Pin assignment



Technical data

Power supply	from 6 V up, from the ALMEMO [®] device itself
Bridge voltage	5 V stabilized (terminals 5V and Gnd)
A/D converter	Delta-sigma, ratiometric (Bridge voltage = reference)
Common-mode range	0.25 to 4.75 V
Input	-29.600 to 29.600 mV (terminals In+ and In-)
Output	0 to ±200,000 (range DMS1 at 10 mops) 0 to ±50,000 (range DMS2 at 1000 mops)
Accuracy	0.02% ±2 digits
Temperature drift	maximum 30 ppm/K
Nominal temperature	22 °C ±2 K
Self-calibration	Each time the device is switched on or a sensor is connected
Refresh rate	DMS1 100 ms, DMS2 1 ms
Current consumption	approx. 15.5 mA
Connector colors	Housing ruby red, levers black

We take every possible care but the risk of inaccuracy can never be altogether excluded.

We reserve the right to make technical changes without advance notice!