



A-Scan ECHOMETER 1077 Portable, 19" Rack and Rack Module
Measurement Of Wall Thickness And Sound Velocity

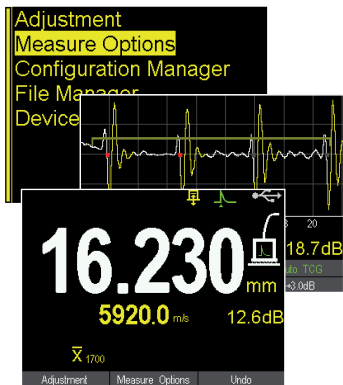
KARL DEUTSCH

A-Scan ECHOMETER 1077

High Precision Measurement with A-Scan Indication



Delivery in a handy carrying case with a foamed material inlay for optimum protection of the case contents



User interface on the display (top to bottom): menu structure, A-scan representation for observation of the signal response with measuring points and large numerical indication of readings with many additional information on evaluation



Selection of probes with and without delay line for different measuring demands



Option code for the module "Enhanced Data Communication" (example)

The sophisticated measurement technology of the new A-Scan ECHOMETER 1077 and a convenient user guidance bring high-quality measurement results together with simple operation. Several automatic modes optionally prepare the measurement signal and allow extremely accurate measurements even with demanding waveforms. In difficult measurement situations, the high-resolution A-scan display is available for an analysis of the echo signals, so the measurement parameters can be adjusted optimally. Since the measurement of wall thickness also can be executed by means of two backwall echoes, precise through-coating measurements are possible as well. Due to the high measurement rate of up to 100 Hz even small errors can be detected during a dynamic material scan.

Display and operating

- High-resolution graphic display of the ultrasonic signal for optimum observation of the signal curve (in particular, this is helpful with demanding applications regarding the sound response)
- Convenient operator guidance in many languages and comprehensible plain text
- Variable display modes for optimum adaptation to the measurement task. Optional display of the measured value with or without A-scan.
- Three programmable function keys
- Five different display modes selectable for the measured value: direct display, mean, minimum, difference, relative
- As under Windows®: storage of readings with easy data administration to files with alphanumeric designation
- Up to 25 data files with 999 readings each
- Statistical evaluation: minimum, maximum, mean, standard deviation
- Output of readings via the PC interface for customer's applications
- Powered with standard (rechargeable) batteries
- Rugged and durable: shock-absorbing protective rubber holster with stand
- Splash-proof housing compliant to IP54

Measurement technique

- Highest measuring precision: individual gate parameters and measurement at zero crossing
- Through coating measurement by evaluation of backwall echo sequences
- Various options selectable for echo evaluation: polarity, TP-BE, BE-BE
- Square wave transmitter with a pulse width individually adapted to the probe for high resolution and energy
- Selectable: automatic gain control AGC and – as the first instrument worldwide – compensation of material damping by means of automatic time-controlled gain ATCG*
- AutoMax function* for efficient suppression of interference echoes
- Very high measuring rate

Operator assistance

- Function for automated adjustment of the probe. Directly thereafter: ready-to-measure.
- During calibration: auto-detection of probe properties like centre frequency and frequency range, and automatic selection of the measuring range
- Automated adjustment of every suitable single-element probe
- Customized set-up can be stored with alphanumeric designation
- Configuration management for quick loading of stored settings for standard probes
- Limit monitoring
- Individual storage of calibration in the respective files
- B-scan*
- Matrix memory*

* see grey box

Special applications

- For special applications probes with high-temperature delay lines are available

Windows® software to connect a PC via the interface

- "EasyExport" for easy export of individual results or whole files to Windows® applications

Expansion modules (to be activated via a code at any time) permit individual adaptation of the instrument to the application:

Module "Enhanced Data Communication"

- Data output
- Variable pulse repetition frequency
- Selectable baud rate

Module "Matrix + B-Scan + Extended Storage"

- Matrix memory (2 to 19 lines, 2 to 19 columns, up to 225 matrix cells)
- B-scan to display the cross section of the scanned material area
- Expansion to 25 data files

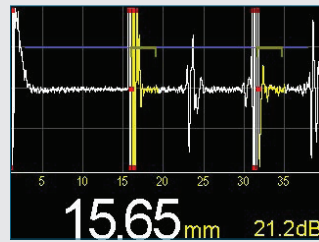
At a glance: Special properties of the A-Scan ECHOMETER 1077

Visual support



B-scan: While the probe is moved on the material surface (direction of arrow), the instrument is writing adjacent vertical lines whose lengths are proportional to the measured value. The result is a cross-sectional image of the scanned material region. The scaling of the display is automatic.

Blanking of interference echoes



AutoMax: Some applications come with interfering intermediate and noise echoes preventing proper evaluation of the ultrasonic signal. AutoMax divides the original gate range into two subregions determined by maximum amplitudes, thus no influence on the measurement from the outside of these echo ranges is possible.

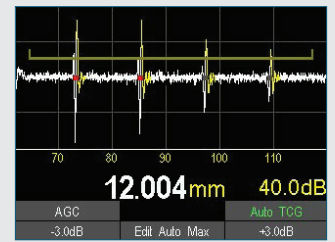
Variable memory structure

5.89	5.89	5.89	5.89	5.89	5.89	5.89
5.90	5.90	5.90	5.90	5.90	5.90	5.89
5.89	5.89	3.81	3.81	3.81	5.82	5.84
5.84	5.83	3.86	3.85	3.85	3.85	5.88
5.88	5.88	5.88	5.88	5.88	5.88	5.88
5.88	5.88	5.88	5.88	5.88	5.88	5.88

B4 5.89mm

Matrix memory: With the help of a memory organized in matrix form (columns and rows) it is possible to distribute the measured values to defined cells of the matrix. If the matrix form is based on the measurement points of the object to be measured, the geometric measuring point specifications are mapped to the data memory correspondingly.

Gain depending on transit time



Automatic time-controlled gain ATCG: Depending on the transit time the gain is controlled in such a way that the first four echoes are amplified to nearly the same height (approx. 95% of the vertical signal representation area).

A special 19" industry rack permits automatic system operation with up to six ECHOMETER 1077 modules.

The 19" rack is optimized for use in the field of industrial systems and has space for up to six ECHOMETER 1077 modules. Every module provides the proven metrological characteris-

tics of the portable wall thickness and sound velocity gauge ECHOMETER 1077, but is optimized for use in industrial rack environment regarding its shape and the mounting options. One module already comes with the basic version. Network and PC standard interfaces are provided to communicate with the host computer.



Example of a 19" rack with six ECHOMETER 1077 modules

All metrological and operational characteristics of the portable instrument are available in the rack module as well. Additionally, operation of modules in the 19" rack provides:

- Module "Enhanced Data Communication" included
- Distinct A-scan display for each channel
- Remote control, individually or altogether: Adjustment, set-up of sound velocity or opening of configuration files
- Special software for extended telegram evaluation
- The readings can be transferred alternatively via USB, LAN (Ethernet) or RS232.
- Depending on the application demands, up to five more modules can be added, thus making it possible to measure simultaneously in up to six channels.
- Option: 4 digital switching outputs for exceeding or dropping below limits, reading within limits and illegal reading / probe lifted



View of the rear of a 19" rack with the connectors for network integration (LAN), control via USB, up to six probes and the power supply (mains plug unit)

By the way...



There is also a module version of our coating thickness gauge LEPTO-SKOP 2042 (order number 2042.801), thus permitting automated wall and coating thickness measuring together in one 19" rack.

Technical Data and Order Numbers

Technical Data ECHOMETER 1077 - Portable, 16" Rack and Module

Display	TFT colour display, 320 px x 240 px, 50 mm x 37 mm approx., illuminated	
Measurands	Wall thickness, sound velocity, transit time	
Measurement uncertainty of gauge for wall thickness measurement (resolution)	0.1 mm, 0.01 mm, 0.001 mm, 0.0001 Inch, 0.001 µs (selectable)	
Measurement uncertainty of gauge for sound velocity measurement (resolution)	1 m/s, 0.1 m/s and 1 Inch/s (selectable)	
Ranges for wall thickness measurement	0.25 mm .. 450 mm (depending on probe and operating mode)	
Measurement uncertainty (gauge) in mm	0.001 mm (may be limited by application)	
Measurement uncertainty (gauge) in Inch	0.001 Inch (may be limited by application)	
Interfaces	Portable: RS232C for printer and PC (PC USB connection via adapter cable), 38400 Bauds	19" Rack: USB: per virtual COM port, PC drivers for FTDI-chip required (currently available for Windows, Linux and MAC-OS), TCP/IP, RS232C with 57600 Bauds
Measuring rate	100 Hz	
Storage	Arrangeable in 5 resp. 25 files with up to 999 readings each	
Power supply	Portable: 2 pcs Alkali Mangan batteries or 2 pcs Lithium batteries, type AA/IEC R6 each	19" Rack: power supply plug, 110 to 240 V, 50/60 Hz, current consumption < 0.5 A
Battery level indicator (only with portable gauge)	Symbol with additional acoustical and optical alarm signal when undervoltage occurs	
Channels and switching outputs (only with 19" rack)	1 channel per module, 1 module is included in the basic version of the rack. The rack may be expanded to 6 channels. Up to 4 galvanically isolated switching outputs (10 to 30 V) per channel.	
Size, weight	Portable: 135 mm x 82 mm x 32 mm approx., 237 g (with batteries and protective holster)	19" Rack: 3 RU; module: 12 HP

*stated measuring ranges in mm steel

Order numbers

Instruments		Probes for measurement of corrosion w/ TP-BE evaluation	
A-Scan ECHOMETER 1077 Data	1077.020	TR probe DSE 8.3/15 PB 5 C, incl. 1 m cable, Lemo 00	1465.771
Scope of delivery: Instrument incl. red protective holster, 100 ml ECHOTRACE couplant Lithium batteries, instruction manual and carrying case		TR probe DSE 4.2/4 PB 10, incl. 1 m cable, Lemo 00	1465.671
A-Scan ECHOMETER 1077 19" rack w/ 1 x 1077.801 (19" module)	1077.850	More accessories:	
A-Scan ECHOMETER 1077 (19" module)	1077.801	Probe cable, length 1 m, Lemo 00 / Lemo 00	1616.010
A-Scan ECHOMETER 1077 short case w/ external power supply	1077.090	Probe cable, length 1 m, Lemo 00 / Microdot	1618.010
Probes for BE-BE and TP-BE evaluation with delay line		Stepped reference block 2-4-8-12-16-25 mm (steel)	1713.001
Probe DS 6 PB 4-14 incl. 10 mm delay line, Microdot	1422.001	Stepped reference block 2-5-10 mm (steel)	1713.002
Special delay line for 6 mm element, 6 mm long	1932.003	Stepped reference block 4-7-15 mm (steel), cannot be certified	1713.003
Delay line (spare part) for 6 mm element, 10 mm long	1932.001	Protective bag for ECHOMETER 1075, 1076 TC, 1076 Data	1868.003
Probe SDS 3 PB 6-16 incl. 6 mm delay line, Microdot	1498.220	ECHOTRACE couplant (500 ml bottle)	9000.003
Delay line (spare part) for 3 mm element, 6 mm long	1932.002	ECHOFLUID couplant (1 l bottle)	9004.002
Probe S 12 PB 1-7 incl. 25 mm delay line, Lemo 00	1422.703	Screen protector foil for ECHOMETER 1077	1812.703
Delay line für 12 mm element, 10 mm long	1932.005	Space dust protection cap for interface socket ECHOMETER	1869.001
Delay line für 12 mm element, 25 mm long	1932.008	PC cable for ECHOMETER 1077 -> USB (incl. driver CD)	1657.314
HT delay line for 12 mm element, 25 mm long	1932.007	EasyExport, PC software for Windows XP/2000/Vista/7/8.1 (32/64)	2905.001
Probes for TP-BE evaluation without delay line		Software expansions	
Probe DS 6 HB 4-12 Microdot	1432.701	Module "Enhanced Data Communication" for ECHOMETER 1077	1910.001
Probe DS 6 HB 2-7 Microdot	1432.702	Module "Matrix + B-Scan + Extended Storage" for ECHOMETER 1077	1910.002
Probe DS 12 HB 0.8-3 Microdot	1433.703		
Probe DS 12 HB 2-7 Microdot	1433.705		

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