

D-2/4 - Mobile mini DAT recorder

A small device for extremely hard applications

Smallest 4 channel DAT recorder of the world for record and playback of analog signals up to 16 kHz per channel



- Record and reproduce of 4 analog data channels, voice, date, time and digital signals
- Extremely small and rugged design for multiple application areas
- Usable in each position and therefore especially suitable for extreme mobile applications
- Very resistant against shock and vibrations
- Extremely adaptable to various measuring requests due to switchable number of channels and signal bandwidth
- Robust remote control box with bar graph display
- Computer interface for online data visualization, hard disk transfer and analysis
- Telemetry connection to computer interface for online data monitoring during mobile use
- Event-driven record commands by trigger signals or via remote control
- Automatic title number recording with fast search run in play mode
- Power supply 10 ... 18 or 18 ... 32 V DC, optional battery and mains 220V or 110V AC

The D-2/4 DAT Recorder is a small and powerful data logger. The physical size and shock resistance is his major advantage against other data acquisition devices. This becomes apparent, whenever space or critical positioning is the issue. Well-tried examples are cars, trucks, trains, planes and heavy machines. The surveillance's and analysis takes place online.

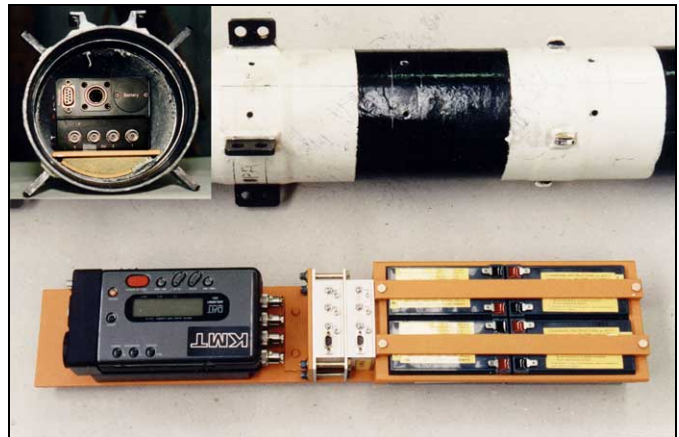
Over a serial PCM output, optionally also by our RF telemetry TS/TE 2.5, the data will transmit to a computer. Our Windows 95/NT based MLAB and MGRAPH Software control the whole data transfer, hard disk storing, numerical and graphical online visualization, mathematical transformations, trigger monitoring and event-driven tasks. The last-mentioned feature includes the possibility of signal level controlled data record. This have an especially meaning for long term measurements, where continuous recording is impractical. In this case, for example, a periodic signal impulse can start an one-minute record of analog data, current time and title number.

The D-2/4 DAT can convert data from analog to digital and feed them direct to an PC without recording using the "Tape Bypass" function. Just as in recording mode the analog data will filtered and digitized and the DAT recorder works as an PCM encoder for serial or telemetry data transmission.

An additional feature is the digital pulse channel for simultaneous recording of bit streams with clock rates from 0 to 40 kBit/s. This input is very suitable for PCM signals transmitted via telemetry from extern

encoders, input pulses from revolution or speed sensors and simple digital signals. With an optional encoder this bit stream can also used for recording 4 or 8 additional low frequency analog channels independent from the selected channel mode.

D-2/4 - Application e.g. in a missile:



References D-2/4 and D-2/16

Aprilia motorcycle Italy
 Daewoo Corp. Korea
 Renault Sport France
 Hyundai Korea
 VW Brazil

Benetton Formula 1 England
 Ferrari Formula 1 Italy
 SAGEM France
 Military test departments
 NASA

CNES France - MIR space station
 Fiat Italy
 Samsung Heavy Industry Korea
 Railway Germany
 and many more

Application MIR space station



Application Formula 1



Application recording data's in a missile



Application motorcycle



Technical data:

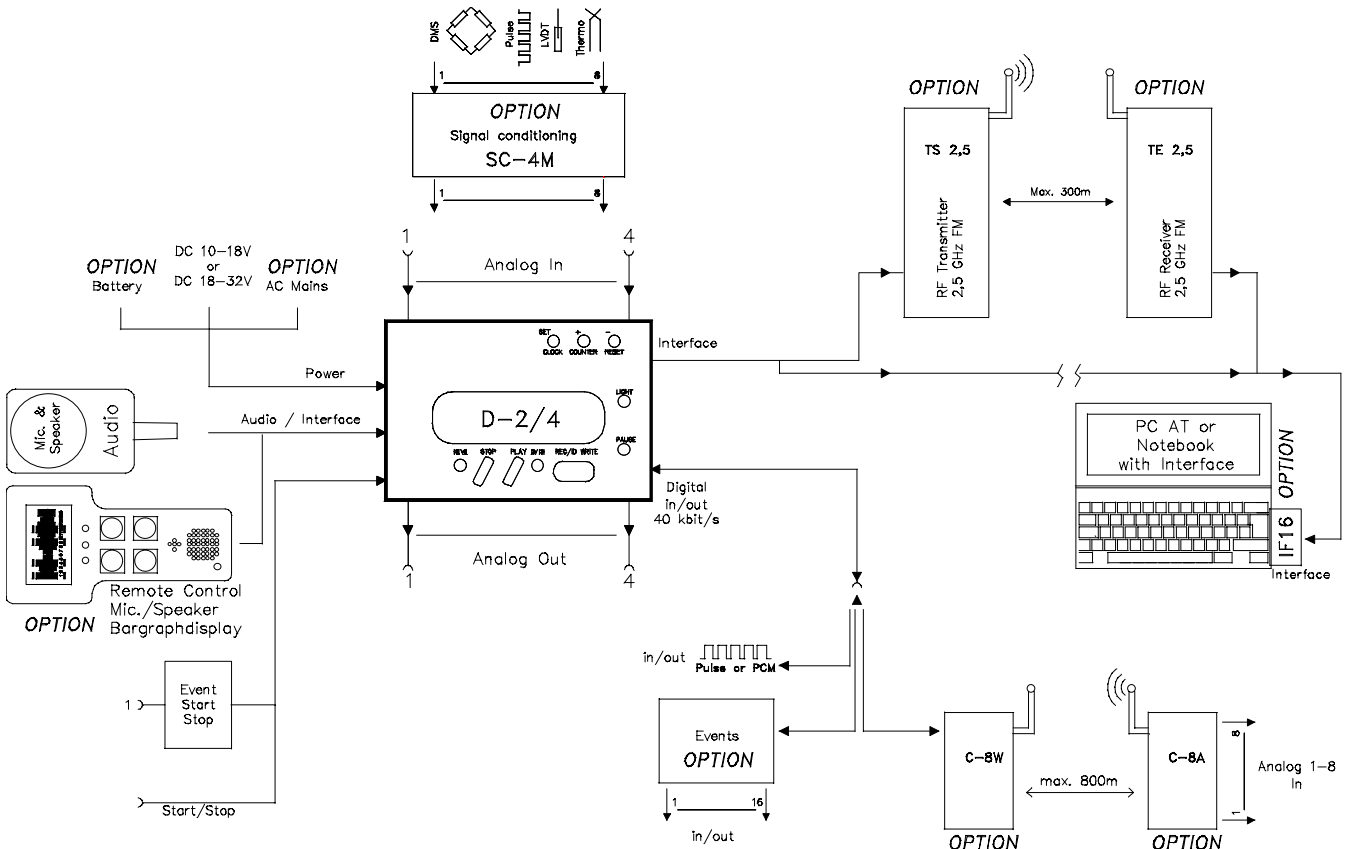
- 4 analog channels; input and output can be connected via adapter cable to BNC connectors
- Measuring range $\pm 5V$ with overload indication for each channel
- Resolution 12 bit, SNR 72dB
- Simultaneous sampling of all channels
- Max. signal bandwidth 16kHz (2-channel mode, -3dB)
- Total sampling rate 96kHz, distributed to selected number of channels (see table)
- Input impedance 100k Ω
- Input voltage protection up to 40V
- 8-pole low pass Butterworth filter for avoiding Aliasing effects (stop band attenuation 48dB at 2f cutoff)
- Analog output impedance 2 Ω , 10mA, $\pm 5V$
- Selectable 2 - 4 channel mode
- Serial Interface, suitable for direct transmission over long cables or RF transmission
- PC Interface plug-in board for all IBM comp. PCs (Option)
- Digital pulse channel for TTL signals from 0 to 40kBit/s
- Date and time recording (year - month - day - hour - minute - second)
- Tape length counter for absolute time, programming time and remaining record time.
- Automatic or manual setting of title numbers with fast title search for playback
- Remote control unit with voice channel and bar graph display with overload indication (Option)
- Voice channel with external microphone and built-in loudspeaker, signal bandwidth 2800Hz.
- Recording time 3 hours with a DT180 cassette
- Storing capacity approximate, 2.4 Giga Byte with a DT180 cassette, reproduce accuracy $\pm 0,1\%$ at 0Hz

- Phase error between channels at same frequency $< 1^\circ$.
- Error correction by Double Encoded Reed Solomon Code.
- Bit error rate better 10^{-10}
- Recording format Helical Scan R-DAT
- Illuminated display with following indications: date/time - program i.e. test number - tape length counter for absolute time - program time - remaining record time - indications for functions like record -forward - reverse - tape loaded etc.
- Additional indications like battery level - error condensing water
- Functional buttons on tape deck: FORWARD - REVERSE - PLAY - RECORD -STOP - PAUSE - HOLD
- Remote controllable with TTL-level signals for START/REC - STOP or/and event controllable with 1 event for blocks of 1 min.
- Power supply 10 ... 18 or 18 ... 32 V DC, optional battery, mains 220 V or 110V AC ($\pm 10\%$)
- Power dissipation 10W
- Environmental conditions:
 Operating temperature range $-5^\circ C$ to $+45^\circ C$
 Storage temperature range $-20^\circ C$ to $+60^\circ C$
 Relative humidity 20 ... 80 % non condensing
 Vibration 5g Mil. Standard 810 C, Curve C
 Shock 10g in all directions
 Size 157 x 90 x 65 mm without shock absorber
 Weight 1.3 kg without shock absorber

Analog signal bandwidths and scanning rates

Analog bandwidth -3 dB	0-16 kHz	0-8 kHz
Scanning rate	48 kHz	24 kHz
Channel Mux	2 CH	4 CH

Technical specifications are subject to change without notice!



Options:



REMOTE

Robust remote control with Bar graph LCD display, built-in microphone and loud-speaker, remote control keys ("Record", "Play" and "Stop"), overload indicator and reset key



IF-16

Digital interface for desktop PC ISA bus interface card and transfer cable for digital data acquisition, on-line visualization, hard disk storage, data analysis and administration. (MLab* software required, MGraph* recommended)



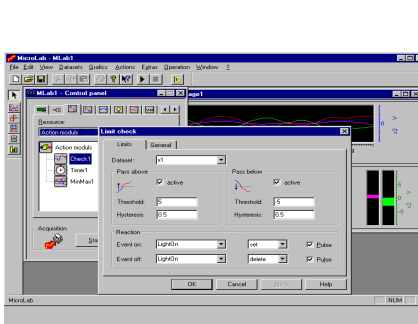
ECIA100

Digital interface for notebook PCMCIA interface card and transfer cable for digital data acquisition, on-line visualization, hard disk storage, data analysis and administration. (MLab* software required, MGraph* recommended)



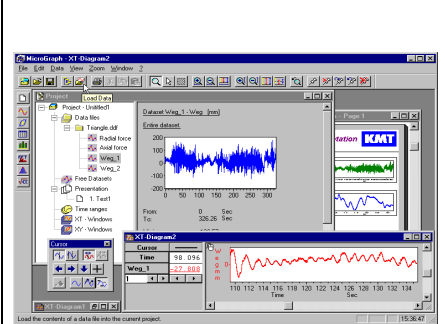
ACCU-BOX

Extern accumulator box Voltage output 12V, capacity 7Ah (4h operating time), AC charger, charging adapter cable to cigarette lighter in cars



MLab

32bit data acquisition and on-line processing software for Win95/98/NT. Real-time recording of all 4/8/16 analog channel data on hard disk, on-line visualization (xt-, xy- diagrams, bar graphs, numerics, switches), ergonomical handling (drag&drop functions, tool bars and tips), user-defined channel properties (linear/non-linear scaling, smoothing), action modules (limit control, timer, data reduction, trigger functions) English*/German* versions, see also software price list for more information, OBE* and other options* (digital interface IF16* or ECIA100* required)



MGraph

32bit data analysis software for Win95/98/NT, Data management (evaluation, network access, project administration, quick-look, ASCII, RMS, DAT, DIF, dBase data import, report generation), interactive display (xt-, xy-diagrams, bar graphs, time history, table, free zoom, auto-scaling, cursor, bookmarks, legends, channel correlations), presentation (individual layouts, graphical objects, WYSIWYG display), printing, arithmetics (formula editor, numerical and boolean operations), statistics (min., max., mean, difference, deviation, linear regression), ergonomical handling (drag & drop functions, tool bars and tips), English*/German* versions



CASE

Transport case for DAT recorder and accessories, robust design, dust and water proof.