data logging on Windows

A comparison of metrological program packages

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Doubts who, not so long ago, believed that Windows
not prevail as a graphical programming interface in measurement technology
can, are now taught better. The "windows train" is
There are interesting program packages on wheels and in the field of
measurement technology, which are to be presented in this article.

Graphically programmable measuring systems
PC base enjoy the simple operation and the associated
Productivity gains increasing
Popularity. Accordingly diverse,
but this also makes the selection difficult
the appropriate software. The article provides
a range of products (BEAM, DASYLab,
DIAdem, IC.ONNECT, LabVIEW) and tries to
search through an extensive table
Comparison of different criteria in the
Help you choose the right product
be.

Graphic Module

Regarding the type of operation and
Application creation, the program packages can
be divided into two large groups. Measurement,
control and simulation tasks
can be opened up with the software packages
DASY Lab, DIAdem, ICONNECT and LabVIEW
solve it in a simple way using the modular
principle directly on the screen. For this
Function blocks are placed on a worksheet

(schematic) according to the task
placed and connected to each other by signal
flow lines. Each function block
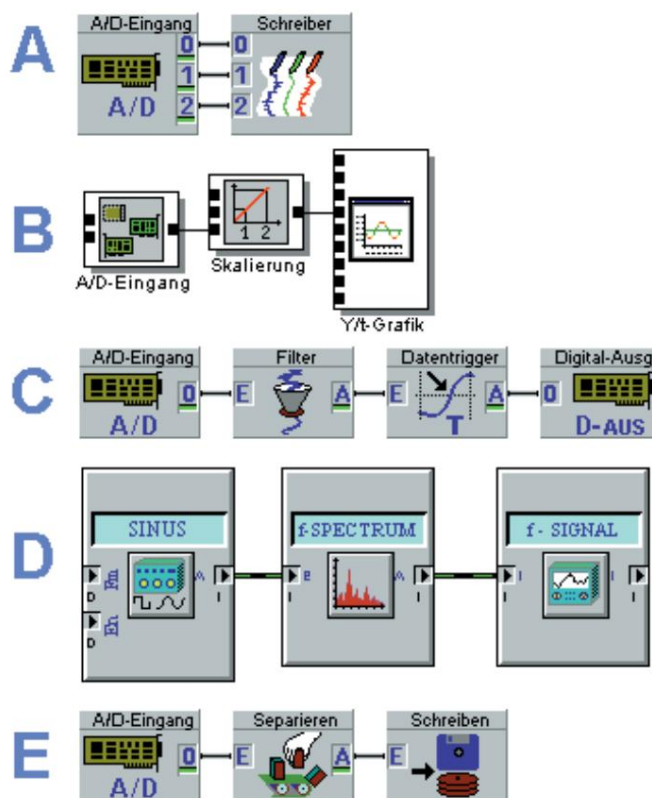can use a separate one for documentation purposes

Figure 1. Application in symbols: examples of data acquisition and processing. (A, C, E: DASYLab, B: ICONNECT, D: DIAdem)

be assigned names. The advantage of this method lies in the

graphical representation of the logic of measurement process. Due to the strong Ver relation to technical block

diagrams, this type of task definition is different for the user

by product more or less easy to learn. The single ones

blocks, also known as modules, contain data processing functions

recording, measurement data analysis, process control and for visualization.

In addition, there is the possibility of exchanging data with others

ren Windows programs via

Measurement data files created in different formats

can become.

The combination of the functional

Modules enable concrete task definition. For example

requires a visualization of analog input signals in the simplest form

Case as in **Figure 1a** only a two-stage

fig module chain. The scaling at the recording of sizes over Sen

sensors can be done using fewer modules be implemented **(Figure** 1b).

Additional editing modules

behind the acquisition modules

enable the compensation of problems in the relevant measurement

construction. Examples would be something like this Eliminate the 50 Hz noise content

of a network-connected analog signal by several consecutive fol

ing filter elements. **Picture 1c** shows

a signal graph that after the

Noise elimination with a low-pass filter on the

measurement signal

Exceeding the threshold checks and an external device switches.

It is just as easy to implement a frequency

analyzer with three modules, for example **(Fig**

1d) or save the measured values with data reduction in a file on the hard disk **(Fig.** 1e).

Also a software package (BEAM), that without cumbersome, graphic Programming gets along, have we included in the comparison. A very clear, menu-driven operation with this software makes it possible to

already after a few mouse clicks measurement curves on the screen

can look at. Also here there is

Setting dialogs for the properties of the different modules. The
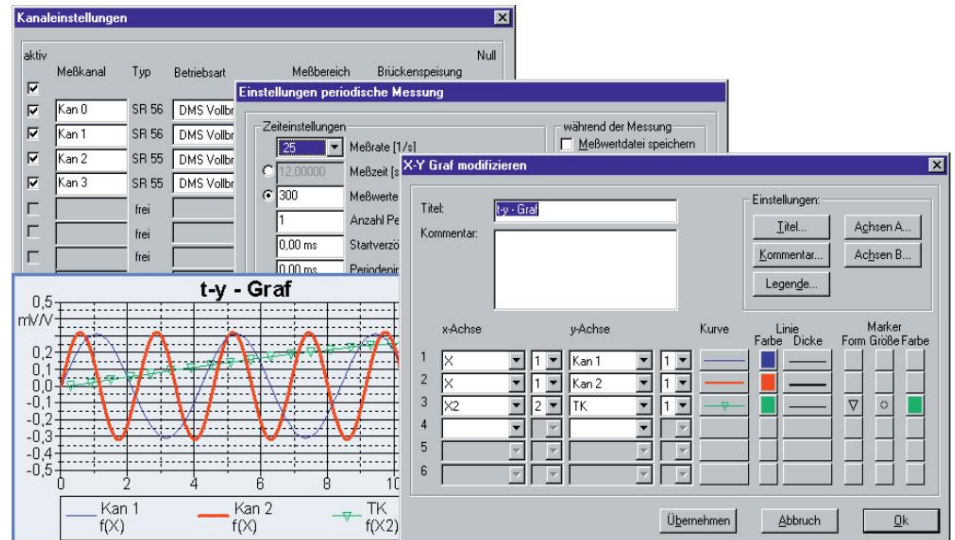
difference is that the

Figure 2. Implementation of the example application under BEAM.

Linking the modules in the settings dialog by selecting the

input happens. Through this

eliminates a user level what to

a clearer and faster

operation.

All program packages come with briefly presented their distinctive key themes.

Furthermore

will implement a small

Application example - a function generator

generates a sine signal, this signal is over time

represented graphically - shown with the respective product presentation.

BEAM

The metrological standard soft ware

BEAM, a product of the AMS Society for Applied Measurement and

System technology was developed with the aim of measuring technicians

to provide a tool that, despite its complexity and

performance, does not require programming

is easy and clear to use. Special software versions

support hardware functions

demanding measuring devices very much

clear and compact. The individual operating steps for the through

of a measurement are the

based on the practical work of the measuring

technician. Over 500

mathematical functions are available

available for analysis of the measurement data.

Three freely configurable graphic windows allow

an optimal

Visualization of the measured values. The current Measurement data is displayed as a real-time graphic on the shown on screen. Graphics and images can be imported for process visualization

become. The measured variables determined can automatically in a freely designable

Measurement protocol can be output. One

tabular representation of the measured values

as well as all defined calculations including their parameters

ensures a large

clarity. BEAM has one

simulation mode. All settings as well

the preparation and follow-up of the measurement

(Evaluation) can therefore also convenient

be done at the desk.

Since spring 1999 AMS offers with jBEAM -
Measurement technology uses the Internet another

interesting product on the market. The

Internet or a company intranet

enable global access as a transport medium. Whether a connection within

of a room or across the Atlantic

is built makes no difference.

Global use, however, requires a universal software solution that is neither processor nor operating system dependent. Java

makes this possible. On the user side

(Frontend) Windows computers, Apple

Macintosh, UNIX systems or Java consoles can be used.

With jBEAM, AMS

a metrological software that this

meets criteria. The functionality will

both as a Java applet and as a local one

Java program (application) implemented. The

The applet's Java code is located on the

central server and is for use only

downloaded. This procedure avoids

also version conflicts on the client side. The

Java applet is in a normal HTML page

integrated and is called up with a mouse click.

As a Java program, jBEAM works on the
local computer like a normal program. The installation is automatic
on computers with the operating systems Windows 95/98/NT/2000, Mac or UNIX. Out of
the user can perform the required calculations
based on a large number of measurement methods
Select analysis functions. The calculations are performed locally, no further downloads are required. The execution speed is therefore very high

high. With locally generated graphic elements
the data can be visualized and printed out. A layout editor allows
the user, his ideas simply
and quick to implement. In addition to online data acquisition
and database connection
there is the option of importing local measured value files.

DASYLab

Die EASY-to-USE-Software

DASYLab, a product of Datalog-Systeme
for data acquisition, is a measurement technology software under Windows, which outgoing
was developed from the requirements for online
measurement data evaluations. Special emphasis was placed on simple and
clear operation and a wide
Hardware support added. measurement,
Control and simulation tasks can be
in a simple way directly on the picture
release screen.

For the integration of DASYLab in complex
Testing systems it is possible that actions
also automatically by DDE command from
triggered by other Windows applications
are, among other things, the loading of a
Circuit diagram as well as start and stop of a
Measurement. As a result, this measured value acquisition program can also be used as a
measured data server for your own evaluation programs
become. For process connection there is one
Series of popular data acquisition boards for
Disposal. To use these cards metrics
under Windows even at high sampling rates
to be able to comprehend it completely is the
Control via virtual device drivers
and a data buffer that can be freely adapted to the
measurement task
Data acquisition rates up to several hundred kHz and online
displays up to 100
kHz reached.

DIAdem

The PC workshop

DIAdem, a product of Gfs Systemtechnik,
is a graphical user interface under
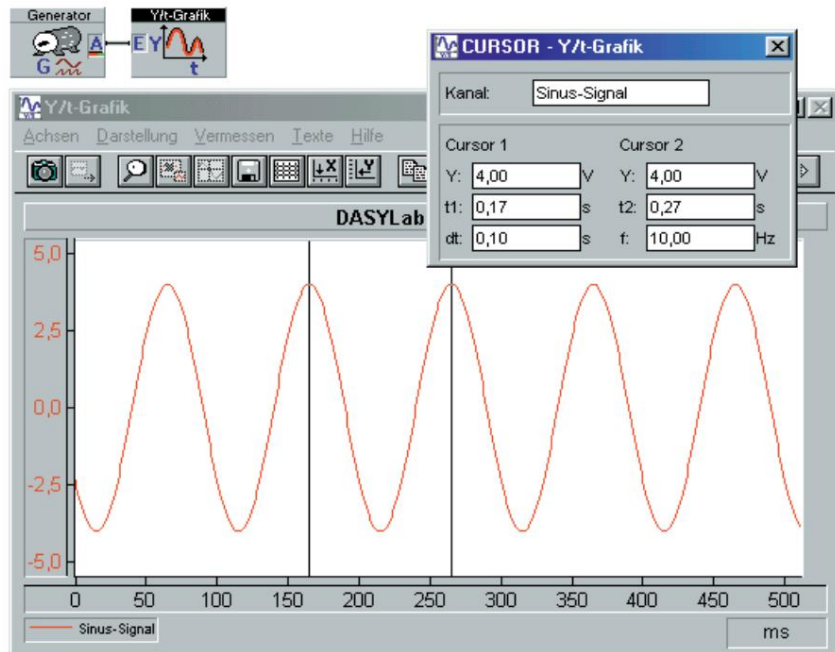Windows. It grants the user
quick access to all program functions

Figure 3. Implementation of the sample application under DASYLab.

to. To at the comprehensive radio
functionality greatest possible overview
to achieve were the functions
broken down by task and in
Software devices combined.
In the PC workshop, the user has exactly the
functions in view that he needs for tasks such
as "Define measurement", "Mathematical

Analysis" or "Presenting results" is required.
This modular
Construction of the PC workshop made possible
it is the user, the workshop

to meet your needs. One of the great strengths
of
DIAdem is the possibility that
Tailoring standard software so precisely to
special applications
that the special software looks
like she's inherently accurate
programmed for this purpose. Through
this cropping can be done
prepare solutions for operators,
which neither with the task
are still familiar with DIAdem.

The address

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Measurement and system technology
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Fax: 0 37 26 / 78 33 - 40
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Internet: www.AMSonline.de

DATALOG systems for data acquisition

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Tel.: 0 21 66 / 95 20 - 0
Fax: 0 21 66 / 95 20 - 20
Email: info@datalog-kg.de
Internet: www.datalog-kg.de

Gfs system technology
Pascalstraße 17
52076 Aachen
Tel.:0 24 08 / 60 11
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Email: info@gfs-ac.de
Internet: www.gfs-ac.de

Micro-Epsilon measurement technology
PO Box 1254
94493 Ortenburg
Tel.: 0 85 42 / 1 68 - 0
Fax: 0 85 42 / 1 68 - 90
Email: info@micro-epsilon.de
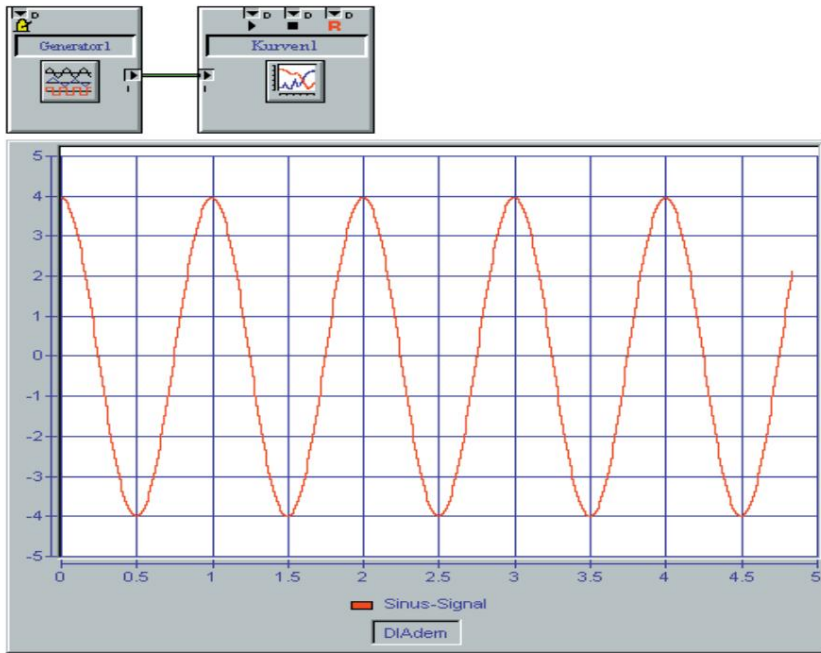Internet: www.micro-epsilon.de

Figure 4. Implementation of the sample application under DIAdem.

ICONNECT

Die Software-Toolbox

ICONNECT, a product of Micro Epsilon-Messtechnik, represents a graphical development environment
moving towards object-oriented
design of data processing algorithms. By simple

Combination of basic algorithms
A variety of applications from the fields of
automation, measurement and testing technology as well as

Realize process monitoring. A
essential advantage of ICONNECT
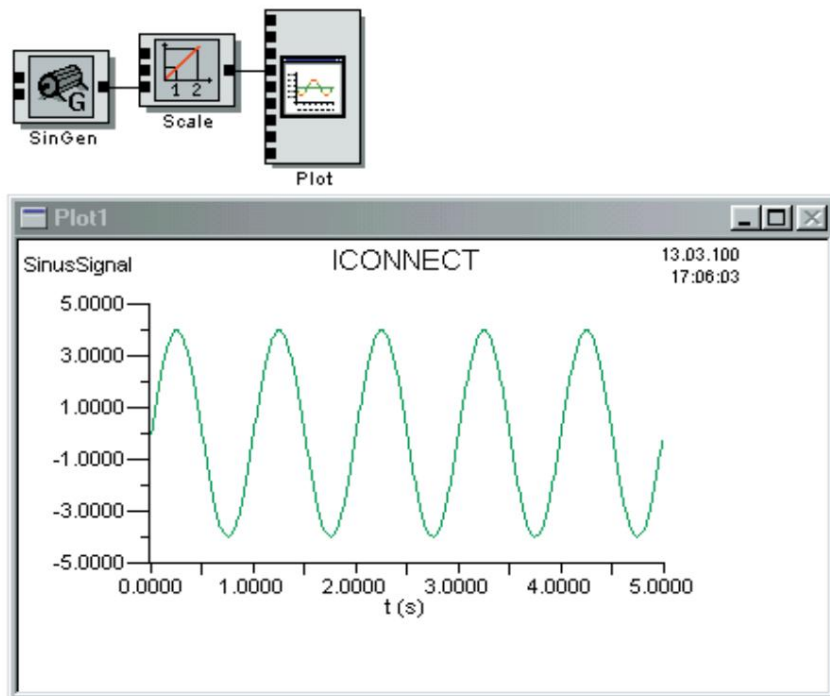is *Lean Optimized Data Mana*

Figure 5. Implementation of the example application under ICONNECT.

gement, in other words: processing in blocks
hierarchically structured data. It enables the correct processing of data
asynchronously from different sources with
produced at different sampling rates
become. ICONNECT only recognizes the
really relevant data. This proves to be particularly useful in time-critical applications
Optimization in which accruing amounts of data are already available at the earliest possible point in time
be reduced as very efficient.

LabVIEW

The most popular program

LabVIEW, a product of National Instruments Corporation, is based on the graphical programming language G

development environment. LabVIEW is on the
Communication with hardware such as GPIB, VXI,
Matched PXI, RS-232, RS485 and data acquisition cards.
LabVIEW also has implemented libraries to use

of software standards such as TCP/IP network
works and ActiveX. With LabVIEW you can
compiled 32-bit programs can be created that have the
necessary execution speed for traditional data acquisition,

give test and measurement applications. Lab VIEW programs range from very simple
up to applications, the highest
requirements. The software includes
comprehensive libraries for data acquisition
information, analysis, presentation and storage. LabVIEW also includes traditional
development tools. You can set breakpoints and see the program flow
to be displayed graphically. You can go further
the program is in single step mode
view to enable debugging and the
simplify program development. Lab VIEW also provides numerous mechanisms
for interfacing with external code or software using shared libraries (DLLs), ActiveX and more.

Additionally, there are numerous add-on toolkits
for a wide variety of applications
available.

The table tries you through the comparison
different criteria when choosing the rich
to support the current product. All prices are given in DM (status
January 2000). Inquire if you are interested in
a product please the latest price lists and
Further information is available from the respective manufacturer under the information given in the box Address.

(00098)rg

	BEAM	DASYLab	DIAdem	ICONNECT	LabVIEW
Generally					
Quality of the supplied documentation Expenses for	Very good and practical	Very good	Gut	Gut	Very good
familiarization Operation	Minimal	Minimal	Middle	Very high	Very high
	Very good	Very good	Gut	Difficult	Difficult
How long has the product been on the market?	11 years	7 years	Unknown	4 years	> 11 years
Supported Operating Systems	95, 98, NT, 2000, Mac, (Java)	3.1, 95, 98, NT, 2000	3.1, 95, 98, NT, 2000	95, 98, NT, 2000	3.1, 95, 98, NT, 2000, Mac, Sun, HP
Minimum requirement for computer equipment	Pentium 166 MHz 64 MB of memory	Pentium 166 MHz 64 Mbytes of memory	Pentium 166 MHz 64 MB of memory	Pentium II 300 MHz, 64 Mbytes of memory	Pentium 233-MMX, 64 MB of memory
language versions	German English French	German English, Japanese	German, English, Italian	German English, French	German English, further
demo version	I1)	And	And	I1)	And
Opportunity to download the latest program components from the Internet to download	No	No	And	No	And
Functional version + hardware available under DM 300? 249,- 3)	No	199,- 9)			
	No	99,- 2)	No		
university version3)	780,-	Unknown	Unknown	Unknown	Unknown
Lite-Version3)	ab 780,- ab	1495,-	2250,-	1295,-	Unknown
full version3)	4,450,-	3190,-	3580,-	7073,-	Unknown
bundle package3)	ab 1.895,-	ab 3250,-	No offers	No offers	Unknown
In principle, supported data acquisition hardware, other inputs / outputs					
ISA, PCI, Compact- PCI, PCMCIA, USB, Parallel- Port	And	And	And	And	And
Measuring cards with onboard processor	No	Yes, very versatile	And	No	And
Temperature / DMS transducer	Yes, very versatile	And	And	No	And
Maps for optical distance measurement	No	No	No	And	No
RS 232 / 485	And	And	And	Ja5)	And
IEEE 488	And	And	And	Ja5)	And
DDE	And	And	And	No	And
OPC	No	And	And	No	And
BETWEEN	No	And	And	No	And
CAN-BUS	And	And	And	Ja5)	And
PROFIBUS	No	And	And	Ja5)	And
Hardware from different manufacturers can be mixed	No	No	No	And	And
Trigger					
Various software triggers	And	Yes, very versatile	And	And	And
signal processing					
Filter	And	And	And	And	And
correlation	And	And	And	And	And
data window	And	And	And	And	And
FFT	And	And	And	And	And
transfer function	And	And	And	No	And
convolution	And	And	And	And	And
statistics					
Statistical Values	And	And	Yes, very versatile	And	And
counter	And	And	And	And	And
Monitoring of complex target curves	And	And	And	No	And
histogram	And	And	And	And	And
taxes / rules					
Generator for simple test purposes	And	Yes, very versatile	And	And	And
setpoint generator6)	And	Yes, very versatile	And	No	And
PID Rules	And	And	And	And	And
Zweipunkt - Rules	No	Yes, very versatile	And	No	Unknown
Dreipunkt- Rules	No	No	And	No	Unknown
Fuzzy Rules	No	And	And	And	And
Timer7)	And	And	And	And	And
Switch	And	And	And	And	And
Hand rules	And	And	And	And	And

	BEAM	DASYLab	DIAdem	ICONNECT	LabVIEW
data reduction					
Various reductions	And	And	And	And	And
files					
Different data reading / writing possibilities	I1)	And	And	I1)	And
visualization					
Y/t diagram with cursor measurement	And	And	And	No	And
X/Y diagram with cursor measurement	And	And	And	No	And
data lists	And	And	And	No	And
analog display	And	And	And	And	And
digital display	And	And	And	And	And
status display	And	And	And	And	And
bargraf	And	And	And	And	And
3-D Graphic	And	No	And	And	And
4-D Graphic	No	No	And	No	Unknown
5-D Graphic	And	No	No	No	Unknown
6-D Graphic	No	No	And	No	Unknown
polar display	And	And	Yes, offline only	No	Unknown
color sonogram	And	And	And	And	And
waterfall display	And	And	And	No	And
mathematics					
Formula interpreter	And	And	And	Ja5)	And
derivative / integral	And	And	And	No	And
Logical links	And	And	And	And	And
curve approximation	And	And	And	And	And
Splines	And	No	And	And	And
Other special features					
circular regression	No	No	And	No	And
K value analysis	No	No	And	No	Unknown
order analysis	No	No	And	No	Unknown
Crash- Analyse	No	No	And	No	No
stress analysis	And	No	Unknown	No	No
GPS- Satellitennavigation	And	No	And	No	Unknown
classification process	And	And	And	No	And
Sending e-mails, SMS messages, faxes	And	And	And	And	And
ODBC (Oracle, Microsoft SQL- Server, ACCESS, dBase)	And	And	And	And	And

Remarks:

1) XXX

2) In the free demo version, ASCII data can already be imported into the program for various evaluation options (statistics, FFT, ...). A data export eg for Excel is also permitted.

3) The StarterKit includes the largely functional demo version together with a COM port interface for recording measured values. The measurement hardware offers 6 analog input channels with different measurement ranges
with a resolution of 10 bits. A voltage of +5 V is also provided, for example for sensor supply. The driver implements sampling frequencies in the range from 1 Hz to 1 kHz.

4) The program package does NOT contain any data acquisition hardware at the stated price.

5) Manufacturers often offer packages consisting of software and data acquisition hardware.

6) The interface is addressed in a "C"-like scripting language. After a longer training period, this results in very extensive programming options.

7) The setpoint generator is used to generate time-dependent, definable analog setpoints and time-synchronous digital switching commands for test bench control, process automation, simulation.

8) It is possible to generate TTL signals with separately adjustable times and duty cycles.

9) The package offers a parallel port interface for digital I/Os and uses an existing sound card in the computer.

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