

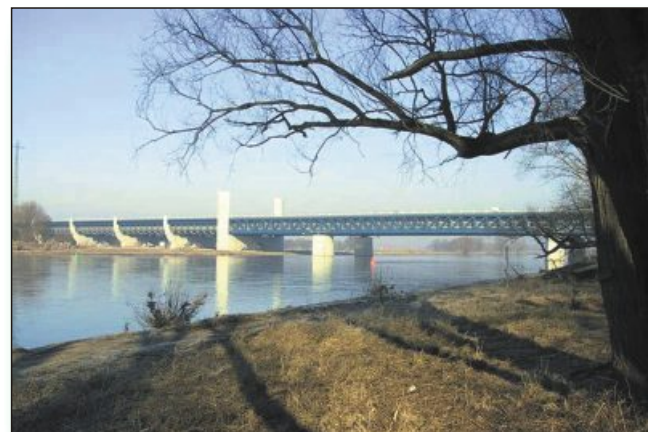
## Well-proven technology in all sorts of applications



Testing of fire-resistant clothing by means of a dummy equipped with a great number of thermo-couples



Straingauge systems for testing airplane structures



Continuous monitoring the structure of an aqueduct



Monitoring cracks in concrete structures



Testing for the maximum load in welded joints

### Peekel is represented in:

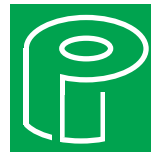
Materials research and testing departments, Aircraft and aerospace industry, Shipbuilding and offshore industry, Powerstations, Automotive and railway industry, Universities and Colleges.

### Some references:

Akzo B.V., Ameron International, Atlas Copco, BAM Berlin, Corus Staal, Electrobelt, Eurocopter, National Aerospace Laboratory NLR, Hella KG, IMA Dresden GmbH, IVECO, Kronprinz GmbH, Lemken, MAN Roland, MTU, Saab Bofors, Siemens,

Shell International Exploration and Production, SKF Engineering & Research, SMS Demag, TNO / NMI, University of Delft, Eindhoven, Enschede, Urenco, Vattenfall Europe Generation

## Specifications AUTOLOG 3000



### CA3460 measuring module:

For each of the 6 amplifiers and A/D converters at each card:

Typical accuracy:	< 0,1% @ 1 kHz 0,02% @ 10 Hz
Bandwidth (-3 dB):	200 Hz
Sample rate:	1000 Hz
A/D converter:	24 bits
Microprocessor:	16 bits with DSP functions
Calibration of amplifiers:	by software and A/D converter
Communication:	Localbus with 5 Mbit/s CAN-Bus with 1 Mbit/s
Data buffer:	50.000 measured values
Overall supply voltage:	9 ... 36 VDC / 12 W
Bridge / sensor supply:	2,5 V DC

### Sensor connections:

Straingauges, full bridge:	$\pm 16 \text{ mV/V}$ , $\pm 800 \text{ mV/V}$ @ 2,5 V
Voltage:	$\pm 40 \text{ mV}$ , $\pm 2 \text{ V}$ oder $\pm 10 \text{ V}$
Current:	$\pm 50 \text{ mA}$
Potentiometer:	0 ... 100 %
Resistance:	0 ... 4000 Ohm
PT100:	- 200 ... + 500 °C
PT1000:	- 200 ... + 500 °C
Thermocouples:	type B: + 250 ... + 1820 °C type E: - 200 ... + 1000 °C type J: - 200 ... + 1200 °C type K: - 200 ... + 1370 °C type N: - 200 ... + 1300 °C type R: - 50 ... + 1760 °C type S: - 50 ... + 1760 °C type T: - 50 ... + 390 °C

### Option 1 (for straingauge bridges)

3-channel-satellite module for CA3460	0,5 ... 5 VDC (in 0,5 V steps)
Sensor supply:	
Sense technology:	6-wire
Maximum load at supply voltage:	> 200 Ohm @ 5 V > 60 Ohm @ 2,5 V

Straingauge bridges:	1/1, 1/2 and 1/4 (4-wire technology) 120, 350 and 1000 Ohm
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Shunt-resistance:	for testing the external sensor-cabling
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### Option 2 (carrier-frequency (AC) bridges supply for inductive transducers (lvdt's)):

3-channel-satellite module for CA3460	2 V, 5 kHz
Supply voltage:	200 Hz (-3 dB)
Bandwidth:	

### CAN-Bus speed:

CAN bus speed	Maximum cable length	Maximum meas. values/s
1.000 kbit/s	30 m	7.000
800 kbit/s	50 m	5.600
500 kbit/s	100 m	3.500
250 kbit/s	250 m	1.750
125 kbit/s	500 m	875
50 kbit/s	1.000 m	350
20 kbit/s	2.500 m	140

Specification can be changed without prior notice. August 2005

### Specification of housings

<b>AUTOLOG 3000/3</b>	250 x 330 x 110 mm (W x D x H)
Dimensions:	9 – 36 VDC direct input
Power supply:	100 – 240 VAC / 50 – 60 Hz
External power supply:	(built-in power supply is optional)
Operation temperature:	0 – 50°C

### AUTOLOG 3000/8

Dimensions:	271 x 326 x 224 mm (W x D x H)
Power supply:	9 – 36 VDC direct input or 90 – 240 VAC / 50 – 60 Hz (100 W)
Operation temperature:	0 – 50°C

### AUTOLOG 3000/16

Dimensions:	500 x 326 x 224 mm (W x D x H)
Power supply:	9 – 36 VDC direct input or 90 – 240 VAC / 50 – 60 Hz (200 W)
Operation temperature:	0 – 50°C



ISO 9001 certificate was conferred to PEEKEL INSTRUMENTS of Bureau Veritas Quality International.



AUTOLOG 3000/16 for 16 slots

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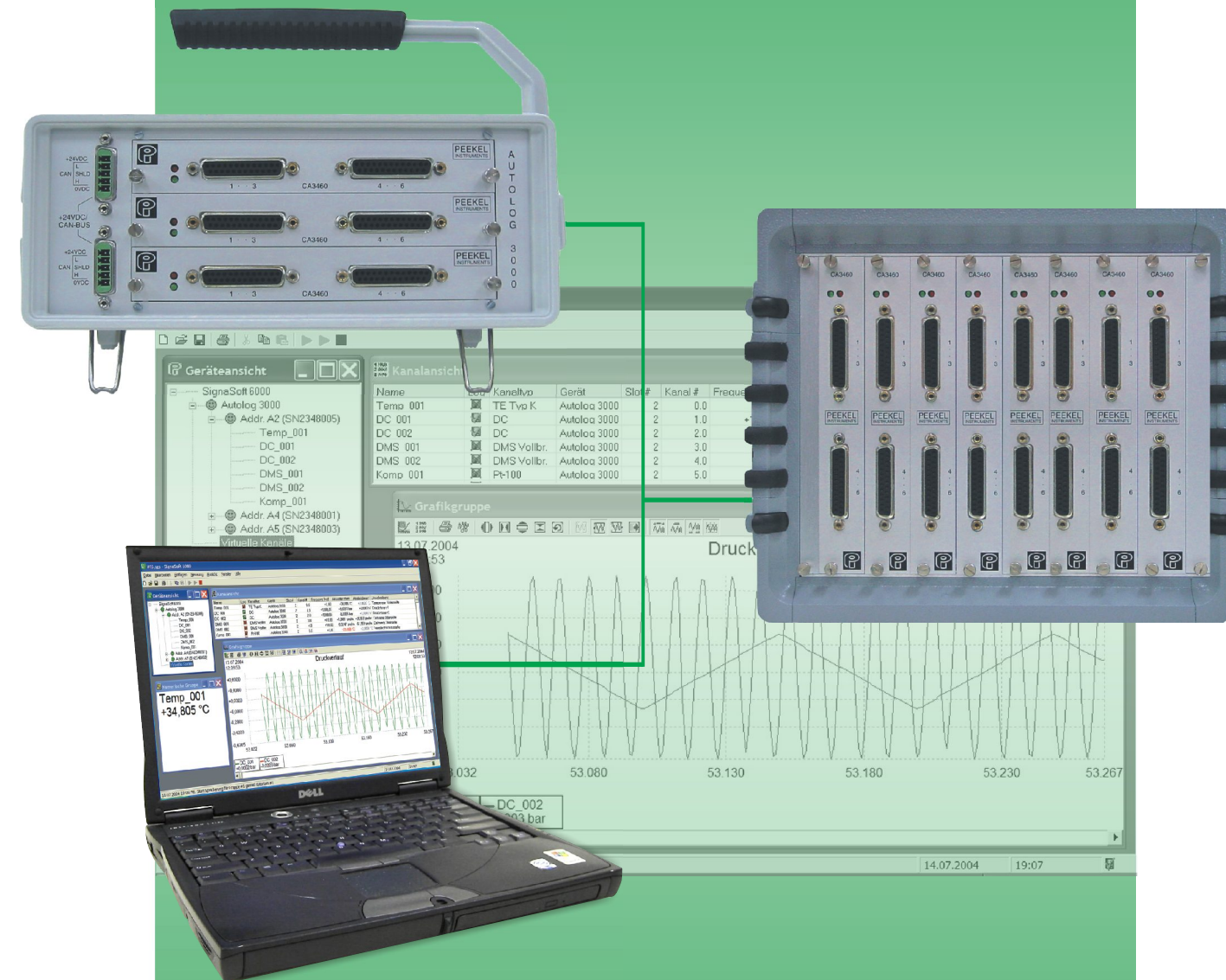
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**PEEKEL**  
INSTRUMENTS

## Data-acquisition

### AUTOLOG 3000



- Universal design for a wide variety of sensors

- Synchronous acquisition at 1 kHz / channel

- Small mobile versions or stationary multi-channel systems

## Data-acquisition system overview

The last decades showed a significant trend towards fewer sensors (measuring points) but with a much higher scanning frequency. This allows for a near simultaneous (synchronous) collection of all measuring data in any application. Following this trend and based on the company's over 30 years of experience with computer-based precision data-collection systems, Peekel developed the AUTOLOG 3000 concept.

Each channel of the AUTOLOG 3000 has a universal amplifier with 24-bit A/D converter. If scanning speed is less important, a multiplexer card is available.

### Efficient "packing": Small mobile tabletop system or 19" rack mounting

Although the input modules can be used as stand-alone units, three different types of housings are available. The smallest is a tabletop housing with 3 slots for input cards. Furthermore a half-19" and full-19" rack is available with 8 resp. 16 slots. The use of CAN bus allows a decentralized configuration of the systems (max. 5000 m).



AUTOLOG 3000/3  
– with 3 slots  
– as option with central USB interface

AUTOLOG 3000/16  
with 16 slots



PC controlled  
data-acquisition

### Convincing arguments

There are a number of very good reasons to choose for AUTOLOG 3000 from Peekel Instruments, e.g.:

- ✓ A choice of two types of cards for an optimal price / performance ratio
- ✓ Universal measuring inputs per card with individually adjustable channels (scanning speed, sensor type, voltage level, ...)
- ✓ High reproducibility through 100 % computer control
- ✓ Synchronous data collection with 1 kHz/channel
- ✓ For each application the right packing: mobile (table-top) or 19" rack
- ✓ Delivery incl. ActiveX-controls for linking to standard measuring software package
- ✓ Logging-(capturing-) software and visualization software "Signasoft 6000"





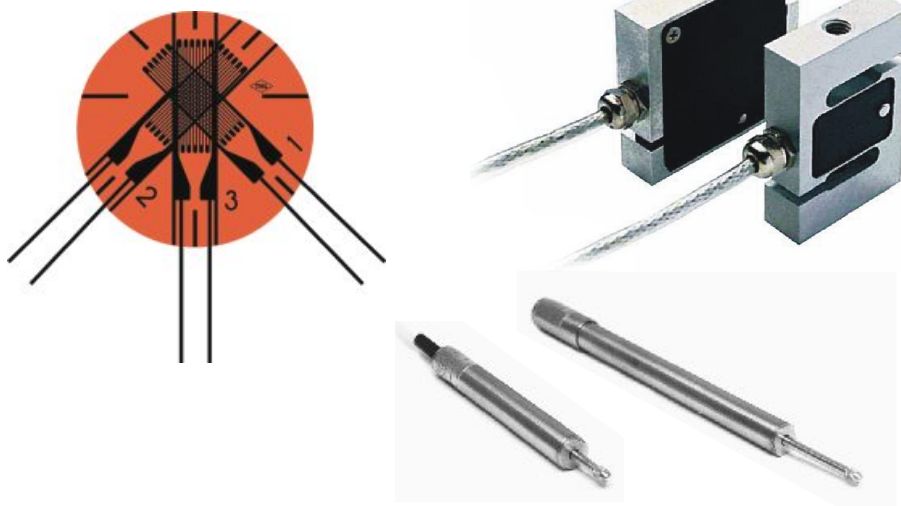


## Connecting all regular types of sensors

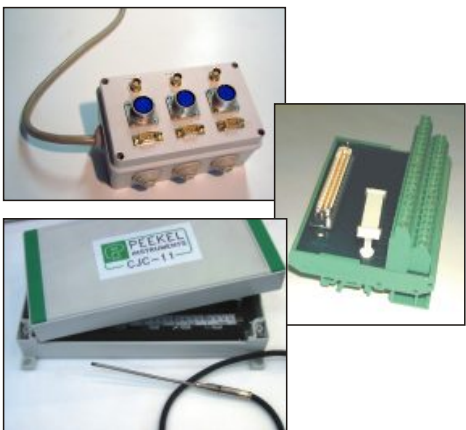
Very often different types of sensors and measuring principles have to be applied not only for different test jobs, but also within one particular application. With this in mind, AUTOLOG 3000 is designed to be a universal input device in order to offer the highest versatility. Full-bridge straingauges, thermocouples (of all types), resistance thermometers (Pt 100), potentiometric transducers, and a variety of DC input ranges.

Specifically for straingauge measuring technology (½- and ¼-bridges) as well as for inductive transducers, there are 2 satellite cards available, each enabling the optimization of 3 measuring channel inputs. Future use of TEDS (Transducer Electronic Data Sheet) is also prepared.

For connecting the wiring from the sensors to the 2 D-Sub input connectors, Peekel offers various standard solutions.

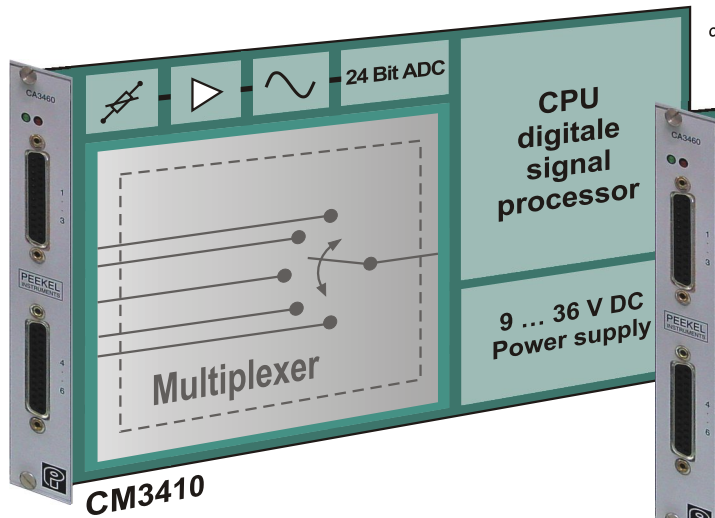


Examples of hardware connectivity



## Set-up of the input modules

The CA3460 is a 6-channel measuring card, of which each individual channel has its own analog amplifier and its own 24 bits A/D converter with a measuring speed of 1 kHz. The amplifier is of a highly universal concept, enabling the direct connection of nearly all popular sensors. A powerful microprocessor with a data buffer of 50.000 measured values, a CAN-Bus interface and a power supply unit, suitable for 9...36 VDC, complete each module into an autonomous unit.



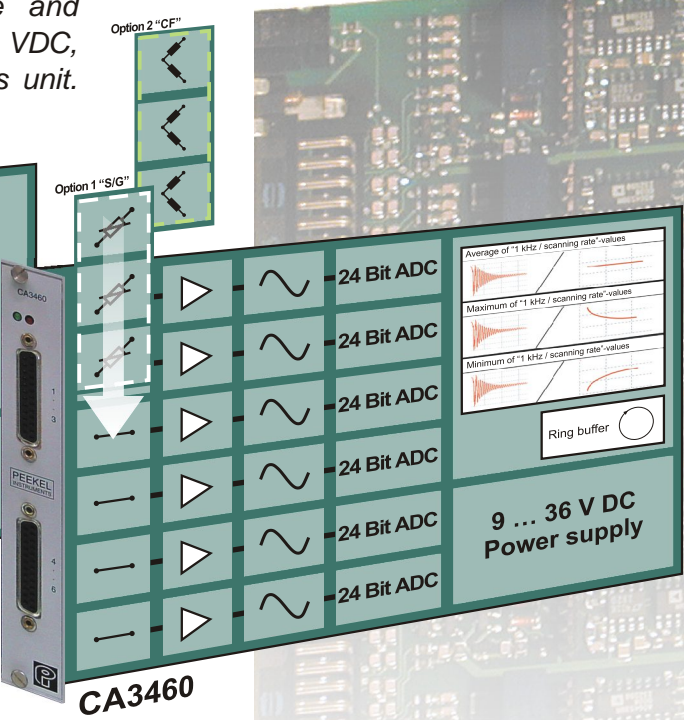
### Features of CA3460

- 6 separate measuring-amplifiers
- 6 A/D converters (working parallel) each 1 kHz, 24 Bit
- Resolution of 0,1  $\mu\text{V/V}$

### Option 1 (for straingauge):

- High-precision complementary resistors for:
  - ½ bridges
  - ¼ bridges (120, 350 and 1000 Ohms)
- Bridge supply adjustable between 0,5 bis 5 V
- Shunt measurement to check the sensor cables
- Resolution of 0,2  $\mu\text{m/m}$

A new member of the AUTOLOG family is a multiplexer card (CM3410) with a capacity of maximum 36 input channels. With the multiplexer, cost-effective larger systems can be configured if scanning speed is of lesser importance.



### Option 2 (CF for inductive transducers):

- 5 kHz carrier frequency
- 2  $V_{\text{eff}}$  supply voltage
- Bandwidth: 200 Hz (-3 dB)

### Features of CM3410

- 1 common measuring amplifier
- 1 analog-to-digital converter (24 bits @ 1 kHz)
- multiplexer with 72 input lines, for
  - 9 x 8-wire channel (incl. 2 for TEDS)
  - 12 x 6-wire (i. e. load cells)
  - 18 x 4-wire (i. e. Pt100)
  - 36 x 2-wire (i. e. thermocouples)

## Powerful signal conditioning

and the bus speed, a CAN-Bus can handle 32 measuring cards with each 6 channels = 192 channels. When configuring larger systems, one or more bus lines can be operated in parallel. Synchronization between the cards guarantees the measuring of all channels without any time loss.

### Through optional USB interface

If the decentralized features of the CAN-Bus are not required but a high speed data-transfer is necessary, it is possible to fit an optional USB interface in the AUTOLOG 3000. This interface communicates with the input cards and transfers the measured data directly to the connected PC.

### Data reduction and buffering

Because of their own microprocessor, the measuring cards maintain a high degree of independency. After A/D conversion, the measured values are processed internally (scaling, zero-adjustment, ...). After processing the following output modes are available:

- Transmission of single-, average-, minimum- or maximum values to the central computer.

- Transmission of measured values only if exceeding the preset trigger values.

- Writing a maximum of 50.000 values into the (ring-)buffer memory.

One of the facilities of the ring buffer is to enable the processing of pre-trigger measured values.

### Example of a fatigue test:

During a normal fatigue test run, a measuring rate of, say, 10 Hz might be sufficient. However, if the tested component fails, the trigger will automatically stop the measurement and the buffer (which has been filled with a speed of 1 kHz anyway) can be read and its values evaluated at ease.

## Data-aquisition and presentation software

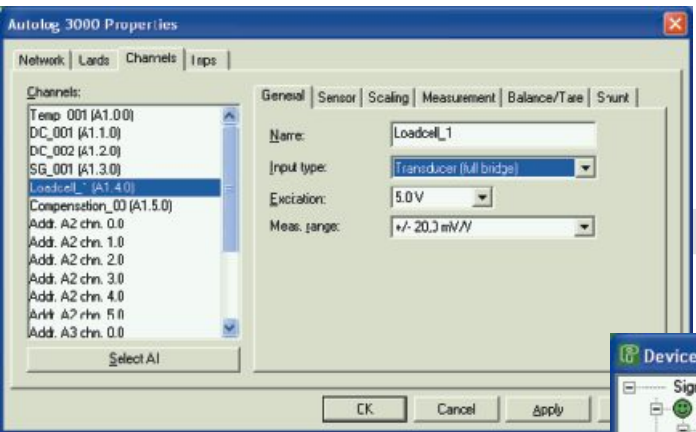
Peekel Instruments offers 2 possibilities of processing data to and from AUTOLOG 3000:

### ActiveX-Controls

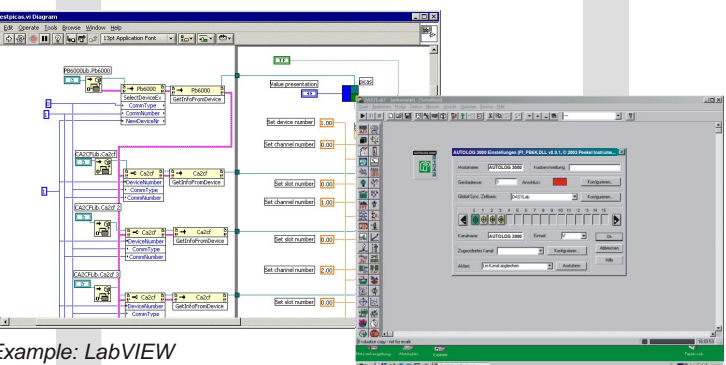
AUTOLOG 3000 includes ActiveX drivers, which enable communication with third-party programs that support this Windows™ standard, such as Microsoft EXCEL™, DIAdem™, LabVIEW™, DASYLab™, Matlab™, etc.

### SignaSoft 6000

This Peekel software product is a very complete data logging and visualization package. By maintaining Windows-conventions such as hardware in tree-structures, tables with all individual channel-data, Signasoft 6000 is easy-to-learn and safe-to-use. Trigger functions support data reduction when doing dynamic experiments.

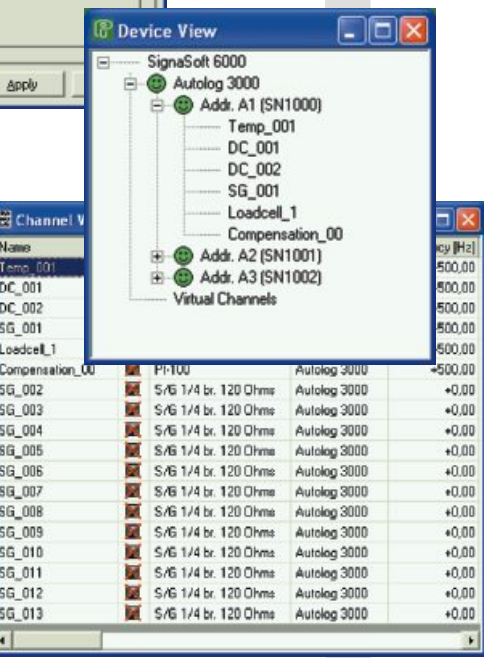


Choice by ActiveX-Controls

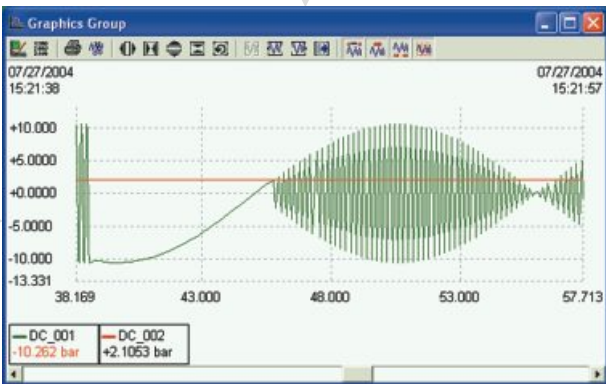


Example: LabVIEW

Example: DASYLab



Data-aquisition and presentation software SignaSoft 6000



Result:  
e. g. a frequency of oscillation

