acquisition, monitoring and processing DATALOG 20, 90 and 140

- Universal Inputs/Outputs
- 1 to 2000 Inputs/Outputs
- 600,000 count converter
- Computations and statistics
- PCMCIA slot
- MODBUS/RTU networking
- PC software

The DATALOG series is intended to measure, handle, process, monitor and record analogue and digital signals from all common types of physical sensors. The systems can be supplied in various configurations with a choice of input and output boards as well as options such as built-in display and printer.

Whatever system chosen, and thanks to the measurement metrological quality, the programming power offered by the internal functions, the DATALOG systems are well adapted to numerous applications, such as:
• Stand-alone data acquisition system without PC.
• Sensor calibration system.
• Testing bench.
• Conditioning chamber and autoclave validation.
• PC input/output interface.
• Acquisition module for programmable controller or standard supervisor.

functions

Embedded software
The DATALOG series provides the user with a large amount of programming power.
This can be used or not depending upon the work to be carried out.

Channels
Each module can address 2 000 channels. These can be real channels (input or output) or virtual channels performing computations.

Monitoring
4 programmable thresholds per channel. A specific relay output or, if required, a conditional processing may be associated to each threshold.

Mathematical operations
Any mathematical, Boolean and statistical computations may be defined on or between channels. 100 linearization table with 40 couples of counts each may be accessed by the user (measured value associated with computed value), thus allowing corrections of sensors.

Conditional processing
IF, THEN, DO are accessible and authorise changes to constants, thresholds, tasks, i.e. condition scanning.

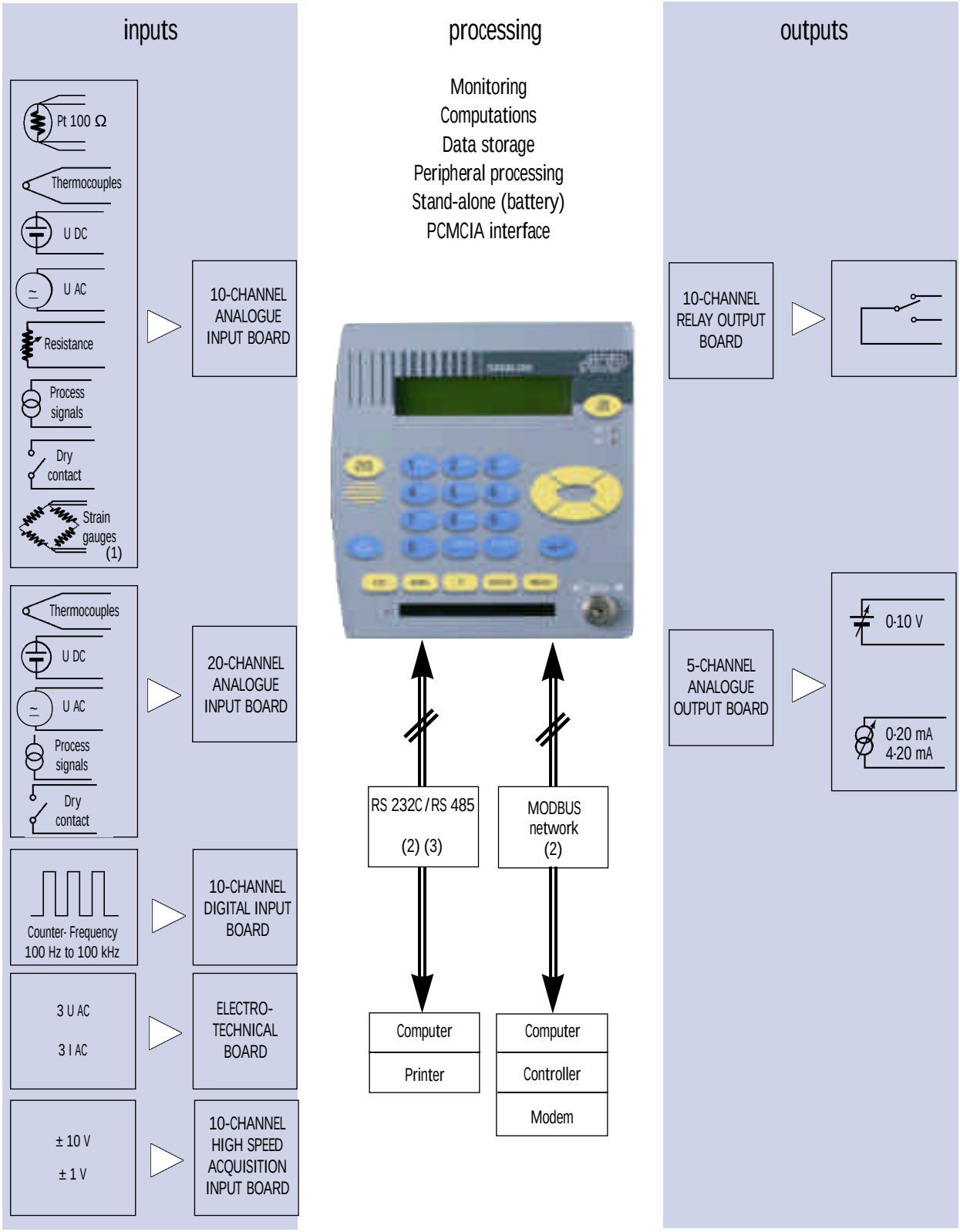
Channel scanning
The system is organised by "tasks" (up to 100) which define the inputs/outputs scanning and result output to peripherals.

Storage and PCMCIA
The DATALOG are equipped (as standard) with 6 storage memories of 8 000 measurements (1 per task over the first six tasks). All the DATALOG with the optional keypad are equipped with a PCMCIA slot authorising loading of various configurations and large capacity storage.

Configuration and processing
All the DATALOG can be configured using PC software which enables the operator to collect the data stored for PC processing (curves, delayed computations, export to spreadsheets).

Software
In addition to the configuration and processing software, a real time supervisory software is available for networking. Various utilities (automatic collecting of data via modem) a DLL library and a LABVIEW driver complete the range.

configuration



Each channel occupies 1 I/O slot except the high speed acquisition board which occupies 2 I/O slots.

(1)Full, half- or quarter- bridge gauges. Need a power supply board which occupies 1 I/O slot.
(2) RS 485 or RS 232C network interface. MODBUS/RTU (binary) protocol. Up to 32 modules can be linked. D ≤ 1 200 m.
(3)RS 232 C interface ASCII or MODBUS/RTU programmable.

functions

		D20	D90	D140	Specifications - Comments
MECHANICAL SPECIFICATIONS	Size	149 x 160	149 x 291	149 x 393	Front panel dimensions in mm Depth:410 mm, 470 mm with protection cover
	I/O board slots	2	9	14	Universal analogue inputs, digital inputs Electrotechnical board High speed acquisition board Strain gauge power supply Relay outputs, analogue outputs
INTERNAL FUNCTIONS	Computation function	✓	✓	✓	+, -, /, X, OR, AND, NOT, ≤, =, ≥, < >, square root, log, NL, absolute value, statistics: maximum, minimum, average, standard deviation, trigonometric function, time base in seconds
	Monitoring	✓	✓	✓	4 programmable thresholds per channel
	Bulk storage	✓	✓	✓	In standard system version, storage of 6 blocks of 8 000 measurements PCMCIA slot with keypad versions
	RS 232C interface	✓	✓	✓	ASCII/MODBUS RTU programmable interface
	Network interface	✓	✓	✓	MODBUS RTU (binary) protocol RS 485 support
	Alarm relays	✓	✓	✓	Dry relay contact alarms on first threshold
	Program backup	✓	✓	✓	Backup battery Life: approx. 1 month
	Keypad display	Optional	Optional	Optional	Liquid Crystal Display, 2 x 20 characters
	Internal printer	No	Optional	Optional	Thermal printer
	12 VDC supply	✓	✓	✓	Consumption: 10 W approx. according to configuration
	Rechargeable battery	No	Optional	Optional	Stand-alone operation. Typical life: 4 hours
I/O BOARDS Connection by removable screw connector	Analogue input boards	Optional	Optional	Optional	10 or 20 configurable inputs Scanning speed up to 100 meas/s: - DC voltage from 1 µV to 100 V (600 000 counts) - AC voltage from 10 µV to 100 V (600 000 counts) - Resistance from 1 mΩ to 300 kΩ - Pt 25, 50, 100 and 1 000 Ω, Ni 100, resolution 1/10°C or 1/100°C - K, T, J, S, B, N, C, R, E, Mo, L, U, PI thermocouples - Process 4-20 mA, 0-20 mA, 1-5 V, 0-10 V - Contacts - Full, half-, quarter- bridge strain gauges
	Digital input board	Optional	Optional	Optional	10 counter and frequency measurement inputs
	Electrotechnical input board	Optional	Optional	Optional	3 UAC inputs and 3 IAC inputs (with VT and CT) U, I, P, Q, R, F power and energy computation
	High speed input board	Optional	Optional	Optional	10 channels: ± 10 V, ± 1 V from 1 Hz to 50 kHz (occupies 2 slots)
	Relay output board	Option	Option	Optional	10 outputs to dry contacts
	Analogue output board	Optional	Optional	Optional	5-12 bits programmable outputs ± 10 V, 4-20 mA or 0-20mA
PC SOFTWARE	Programming	✓	✓	✓	Windows software
	Supervisory control	Optional	Optional	Optional	Windows software

analogue input boards AN 5885 – AN 5900 – AN 5905 – ATC 017

These boards are for universal inputs. Each channel is configurable depending on the quantity to be measured. The connection is performed over a removable screw connector for 0.5 to 2.5 mm^2 wires.

AN 5885.....
10 input channels authorising the following measurements:
DC voltages and currents.
AC voltages and currents.
Resistance using 3- or 4- wire configuration.
Platinum and Nickel RTDs.
Thermocouples
Dry contacts
Strain gauges (Need the AN 3700 board).

AN 5900.....
10 input channels authorising the same measurements as the AN 5885 board with the exception of strain gauges.

ATC 017.....
This board is to be used for energy source measurements. Resistors mounted in series on the inputs ensure the protection against accidental switching short-circuits. It has 10 input channels for measuring as follows:
DC voltages and currents,
AC voltages and currents.

AN 5905.....
20 input channels intended for measuring as follows:
DC voltages and currents,
AC voltages and currents,
Thermocouples,
Dry contact.

Switching.....
It is performed over the AN 5885, AN 5900 and ATC 017 boards by using 3-wire dry contact relay.
Differential resistance ≤ 40 mΩ.
Stray emf: ± 2.5 mV.
Life ≥ 10^8 operations.
For the AN 5905, the switching is static and performed by means of optomos and the voltage between channels is limited to 60 VDC or AC.
For the other boards, the voltage between channels is limited to 150 VDC or AC.

Scanning speeds.....

Three integration times are programmable channel per channel. This criterion acts on the conversion and settling time, the lowest speed gives the maximum resolution and accuracy.

Scanning speed	Integration time	Display capacity	Measurement counts	Representation unit (1)
7 meas/s	100 ms	690 000 cts	690 000 cts	1 RU
20 meas/s	20 ms	69 000 cts	69 000 cts	1 RU
50 meas/s	1 ms	6 900 cts	6 900 cts	1 RU
100 meas/s	(2)	6 144 cts	2 048 cts	3 RU

(1) RU = Representation Unit which corresponds to the minimum deviation between two displayed values. E.g.: for a decimal display changing 3 counts per 3 counts, RU = 3.
(2) Analogue-to-digital converter, 12 bits with successive approximations. This speed is not available for strain gauges.
For lower speeds, converter ± 690 000 counts.

DC voltage

Range	Resolution			Uncertainty at 7 meas/s over 90 days (1)		Uncertainty at 7 meas/s over 1 year (1)	
	7 meas/s	20 meas/s	100 meas/s	AN 5885	AN 5900 and 5905	AN 5885	AN 5900 and 5905
60 mV	1 µV	1 µV	30 µV	0.008 % + 3 µV	0.03 % + 5 µV	0.01 % + 7 µV	0.06 % + 7 µV
600 mV	1 µV	10 µV	300 µV	0.008 % + 3 µV	0.03 % + 5 µV	0.01 % + 7 µV	0.06 % + 7 µV
6 V	10 µV	100 µV	3 mV	0.008 % + 20 µV	0.03 % + 20 µV	0.01 % + 40 µV	0.06 % + 40 µV
60 V	100 µV	1 mV	30 mV	0.008 % + 200 µV	0.03 % + 200 µV	0.01 % +400 µV	0.06 % + 400 µV
100 V	1 mV	10 mV	300 mV	0.008 % + 2mV	0.03 % + 2 mV	0.01 % + 4 mV	0.06 % + 4 mV

(1) Expressed in ± (% rdg + C) at 23°C ± 5°C with rdg = reading and C = Constant.

The 20 channel board AN 5905 has the same uncertainties as the AN 5900 board and the maximum range is limited to 60 V.
At 20 meas/s, the uncertainty is slightly reduced with regard to 7 meas/s.
At 50 meas/s, the uncertainty over one year is ranging 4 RU (measurement resolution).
At 100 meas/s, the uncertainty over one year is ranging 12 RU (measurement resolution).
The "process current" ranges need an external 50 Ω - 0.1% shunt.
Rejection level at 50 Hz ± 1% over 60 mV range at 7 and 20 meas/s:
- Normal mode > 60 dB
- Common mode > 140 dB.
Input impedance:
> 100 MΩ over ranges ≤ 6 V
10 MΩ for upper ranges.
Temperature coefficient:
- From 0 to 35°C:
(0.0001% + 0.5 RU)/°C.
- From 35 to 50°C: (0.001% + 1 RU)°C.
Repeatability between two channels:
≤ Constant C.

AC voltage

T-RMS value measurement (AC + DC mode). The accuracies (uncertainties) are given for a sine wave voltage without DC component.

Measurement minimum scanning time: 2 seconds.
Measurement range: 4 to 110% of range from 40 to 400 Hz.
Crest factor influence (CF): 1% for CF = 3.
Repeatability between two channels: ≤ C.
Temperature coefficient: (0.05% + 0.5 RU)°C.

Range	Resolution	Uncertainty at 1 meas/s (1)	
		90 days	1 year
60 mV	10 µV	0.3 % + 100 µV	0.5 % + 100 µV
600 mV	100 µV	0.3 % + 1 mV	0.5 % + 1 mV
6 V	1 mV	0.3 % + 10 mV	0.5 % + 10 mV
60 V	10 mV	0.3 % + 100 mV	0.5 % + 100 mV
100 V	100 mV	0.3 % + 1 V	0.5 % + 1 V

(1) The uncertainty is given in ± (% rdg + C) at 23°C ± 5°C with rdg = reading and C = Constant.

Input impedance:
≤ 100 MΩ over ranges ≤ 6 V.
10 MΩ for upper ranges.

Note: The AN 5905 board is limited to 60 V range.

Resistance

Unavailable with the AN 5905 board.
Connection: 3- or 4- balanced wire.

Range	Resolution			Uncertainty at 7 meas/s over 90 days (1)		Uncertainty at 7 meas/s over 1 year (1)	
	7 meas/s	20 meas/s	100 meas/s	AN 5885	AN 5900	AN 5885	AN 5900
60 Ω	1 mΩ	1 mΩ	30 mΩ	0.01 % + 5 mΩ	0.03 % + 6 mΩ	0.02 % + 7 mΩ	0.06 % + 7 mΩ
600 Ω	1 mΩ	10 mΩ	300 mΩ	0.01 % + 5 mΩ	0.03 % + 6 mΩ	0.02 % + 7 mΩ	0.06 % + 7 mΩ
3 kΩ	10 mΩ	100 mΩ	3 Ω	0.01 % + 40 mΩ	0.03 % + 40 mΩ	0.02 % + 60 mΩ	0.06 % + 60 mΩ
30 kΩ	100 mΩ	1 Ω		0.01 % + 400 mΩ	0.03 % + 400 mΩ	0.02 % + 600 mΩ	0.06 % + 600 mΩ
300 kΩ	2 Ω	10 Ω		0.01 % + 4 Ω	0.03 % + 4 Ω	0.02 % + 6 Ω	0.06 % + 6 Ω

(1) Expressed in ± (% rdg + C) at 23°C ± 5°C with rdg = reading and C = Constant.

The uncertainties at 20 meas/s are the same as for 7 meas/s.
At 50 meas/s, the uncertainty over one year is ranging 4 RU.
At 100 meas/s, the uncertainty over one year is ranging 12 RU.

When measuring with 3- wire configuration, add 100 mΩ to the uncertainties above and, if required, the possible line unbalance.
Measurement current: 1 mA for ranges from 60 Ω to 3 kΩ and 10 µA for 30 kΩ and 300 kΩ ranges.
Permissible line resistance: ≤ 100 Ω per wire.
Repeatability between two channels:
3-wire ≤ (100 mΩ + 3 RU)
4-wire ≤ (10 mΩ + 3 RU).

RTDs

Unavailable with the AN 5905 board.
Connection: 3- or 4- balanced wire.
RTDs linearization according to IEC Publication 751.

Range	Measurement range	Resolution			Uncertainty at 7 meas/s over 90 days (1)		Uncertainty at 7 meas/s over 1 year (1)	
		7 meas/s	20 mea/s	100 mea/s	AN 5885	AN 5900	AN 5885	AN 5900
Pt 25	- 220 to + 1 200°C	0,01°C	0,1°C	1°C	0.01 % + 0.05°C	0.03 % + 0.05°C	0.02 % + 0.07°C	0.06 % + 0.07°C
Pt 50	- 220 to + 1 200°C				0.01 %+ 0.03°C	0.03 %+ 0.03°C	0.02 % + 0.04°C	0.06 % + 0.04°C
Pt 100	- 220 to + 1 200°C				0.01 % + 0.01°C	0.03 % + 0.01°C	0.02 % + 0.02°C	0.06 % + 0.02°C
Pt 1000	- 220 to + 600°C				0.01 % + 0.01°C	0.03 % + 0.01°C	0.02 % + 0.02°C	0.06 % + 0.02°C
Ni 100	- 60 to + 180°C				0.01 % + 0.01°C	0.03 % + 0.01°C	0.02 % + 0.01°C	0.06 % + 0.01°C

Expressed in ± (% rdg + C) at 23°C ± 5°C with rdg = reading and C = Constant.

The uncertainties at 20 meas/s are the same as for 7 meas/s.
At 50 meas/s, the uncertainty over one year is ranging 2 RU.
At 100 meas/s, the uncertainty over one year is ranging 3 RU.

When measuring with 3- wire configuration, add 0.25°C to the uncertainties above and the line unbalance value converted in °C.
Measurement current: 1 mA.
Permissible line resistance: ≤ 100 Ω per wire.
Temperature coefficient: (0.002% + 0.0025°C)/°C.
Repeatability between two channels:
≤ 0.05°C with 4-wire configuration and
≤ 0.2°C with 3-wire configuration.

Thermocouples

Three reference junction compensation modes are programmable: without RJC, with built-in RJC (1 Pt 100 per board), with remote RJC (1 Pt 100 per board).
Thermocouple linearization according to IEC Publication 584-1.

Sensor	Measurement range	Resolution			Uncertainty at 7 meas/s over 90 days (1)		Uncertainty at 7 meas/s over 1 year (1)	
		7 m/s	20 m/s	100 m/s	AN 5885	AN 5900/AN 5905	AN 5885	AN 5900/AN 5905
K	- 250 to - 200°C	0.5°C	0.5°C	1°C	0.008 % + 1.0°C	0.03 % + 1 °C	0.01 %+ 1.5°C	0.06 %+ 1.5°C
	- 200 to - 100°C	0.2°C	0.2°C	1°C	0.008 % + 0.4°C	0.03 % + 0.5°C	0.01 %+ 0.6°C	0.06 %+ 0.7°C
	- 100 to + 1 370°C	0.1°C	0.1°C	1°C	0.008 % + 0.2°C	0.03 % + 0.3°C	0.01 %+ 0.3°C	0.06 %+ 0.3°C
T	- 250 to - 200°C	0.5°C	0.5°C	1°C	0.008 % + 1 °C	0.03 % + 1 °C	0.01 %+ 1.5°C	0.06 %+ 2 °C
	- 200 to - 100°C	0.2°C	0.2°C	1°C	0.008 % + 0.4°C	0.03 % + 0.5°C	0.01 %+ 0.5°C	0.06 %+ 0.6°C
	- 100 to + 400°C	0.1°C	0.1°C	1°C	0.008 % + 0.2°C	0.03 % + 0.3°C	0.01 %+ 0.3°C	0.06 %+ 0.3°C
J	- 210 to - 120°C	0.2°C	0.2°C	1°C	0.008 % + 0.3°C	0.03 % + 0.4°C	0.01 %+ 0.4°C	0.06 %+ 0.5°C
	- 120 to + 1 100°C	0.1°C	0.1°C	1°C	0.008 % + 0.2°C	0.03 % + 0.2°C	0.01 %+ 0.3°C	0.06 %+ 0.3°C
S	- 50 to + 550°C	1°C	1°C	1°C	0.008 % + 1.5°C	0.03 % + 1.5°C	0.01 %+ 2 °C	0.06 %+ 2 °C
	+ 550 to + 1 768°C	0.5°C	0.5°C	1°C	0.008 % + 0.6°C	0.03 % + 1 °C	0.01 %+ 0.8°C	0.06 %+ 1 °C
B	- 400 to + 900°C	1°C	1°C	1°C	0.008 % + 1.5°C	0.03 % + 1.5°C	0.01 %+ 2 °C	0.06 %+ 2 °C
	+ 900 to + 1 820°C	0.5°C	0.5°C	1°C	0.008 % + 1 °C	0.03 % + 1 °C	0.01 %+ 1 °C	0.06 %+ 1 °C
N	- 250 to - 200°C	1°C	1°C	1°C	0.008 % + 1.5°C	0.03 % + 1.5°C	0.01 %+ 2 °C	0.06 %+ 2.5°C
	- 200 to - 100°C	0.5°C	0.5°C	1°C	0.008 % + 0.6°C	0.03 % + 0.7°C	0.01 %+ 0.8°C	0.06 %+ 1 °C
	- 100 to 0°C	0.2°C	0.2°C	1°C	0.008 % + 0.3°C	0.03 % + 0.3°C	0.01 %+ 0.4°C	0.06 %+ 0.4°C
	0 to + 1 300°C	0.1°C	0.1°C	1°C	0.008 % + 0.2°C	0.03 % + 0.2°C	0.01 %+ 0.3°C	0.06 %+ 0.3°C
E	- 250 to + 1 000°C	0.1°C	0.1°C	1°C	0.008 % + 0.8°C	0.03 % + 1 °C	0.01 %+ 1 °C	0.06 %+ 1.5°C
C	- 20 to+ 2 320°C	0.2°C	0.2°C	1°C	0.008 % + 0.4°C	0.03 % + 0.4°C	0.01 %+ 0.6°C	0.06 %+ 0.6°C
Mo	0 to + 1 375°C	0.1°C	0.1°C	1°C	0.008 % + 0.2°C	0.03 % + 0.2°C	0.01 %+ 0.2°C	0.06 %+ 0.2°C
R	- 50 to + 550°C	1°C	1°C	1°C	0.008 % + 1.5°C	0.03 % + 1.5°C	0.01 %+ 2 °C	0.06 %+ 2 °C
	- 550 to + 1 768°C	0,5°C	0,5°C	1°C	0.008 % + 0.5°C	0.03 % + 0.6°C	0.01 %+ 0.7°C	0.06 %+ 0.8°C
L	- 200 to + 900°C	0.1°C	0.1°C	1°C	0.008 % + 0.2°C	0.03 % + 0.3°C	0.01 %+ 0.3°C	0.06 %+ 0.4°C
U	- 200 to - 100°C	0.2°C	0.2°C	1°C	0.008 % + 0.3°C	0.03 %+ 0.4°C	0.01 %+ 0.4°C	0.06 %+ 0.5°C
	- 100 to + 600°C	0.1°C	0.1°C	1°C	0.008 % + 0.2°C	0.03 %+ 0.3°C	0.01 %+ 0.3°C	0.06 %+ 0.3°C
PI	- 100 to + 1 400°C	0.1°C	0.1°C	1°C	0.008 % + 0.3°C	0.03 %+ 0.3°C	0.01 %+ 0.4°C	0.06 %+ 0.4°C

Expressed in ± (% rdg + C) at 23°C ± 5°C with rdg = reading and C = Constant.

The uncertainties above are given for an RJC at 0°C.
Using the built-in RJC, add to the uncertainties above:
0.2°C for the AN 5885 board
0.5°C for the AN 5900 board
0.3°C for the AN 5905 board.

Repeatability between two channels:
- over a same board: 1 RU,
- between two different boards: 1 RU plus the RJC error.
Input resistance ≤ 100 MΩ.
Permissible line resistance: 1 kΩ per wire.

Strain gauges AN 3700 + AN 5885

Measurement by strain gauges or other resistive transducers.
This board operates only with the AN 5885, 10 input channels.

Sensor power .....
A specific power board common to all "gauge" channels occupies one standard slot in the system.
Available voltage: 2 V or 10 V switched to each bridge measured.
Measurement current: 1 mA or 8 mA switched to each half- or quarter- bridge measured.

Voltage and current are selected by switches located on the gauge power board.
Three compensation gauges can be connected to three quarter- bridge configurations.
Measured signals applied to the standard inputs of the analogue input boards as follows:
one channel per quarter- bridge,
two consecutive channels per half- or full bridge. Free channels can still be used for other purposes.
Sensors: minimum 120 Ω gauges or transducers, maximum voltage drop permissible in one gauge: 3.2 V.

Permissible unbalanced voltages compatible with the 30 mV and 300 mV ranges of the system voltmeter.
Measurement rate: 7 meas/s, 20 meas/s or 50 meas/s.

Note: The system can measure in full bridge configuration with externally supplied power, in this case, the gauge power board is not necessary.

Configuration	Range	Supply	Measurement range (2)	Resolution at 7 meas/s (2)	Uncertainty at 7 meas/s (1) 90 days	1 year
Full bridge	30 mV	10 V	± 6 000	0,2 με	0.05 % + 0.4 με	0.08 % + 0.6 με
	30 mV	2 V	± 30 000	1 με	0.05 % + 10 με	0.08 % + 12 με
	300 mV	10 V	± 60 000	0,2 με	0.04 % + 0.6 με	0.06 % + 1 με
	300 mV	2 V	± 300 000	1 με	0.04 % + 15 με	0.06 % + 20 με
Half-bridge	30 mV	8 mA	± 6 000	0,2 με	0.05 % + 2.4 με	0.08 % + 3.6 με
	30 mV	1 mA	± 40 000	1 με	0.05 % + 20 με	0.08 % + 27 με
	300 mV	8 mA	± 60 000	0,2 με	0.04 % + 2.6 με	0.06 % + 4 με
	300 mV	1 mA	± 400 000	2 με	0.04 % + 25 με	0.06 % + 40 με
Quarter-bridge	30 mV	8 mA	± 6 000	0,2 με	0.05 % + 2.6 με	0.08 % + 4 με
	30 mV	1 mA	± 40 000	1 με	0.05 % + 27 με	0.08 % + 37 με
	300 mV	8 mA	± 60 000	0,2 με	0.04 % + 2.8 με	0.06 % + 4.4 με
	300 mV	1 mA	± 400 000	2 με	0.04 % + 32 με	0.06 % + 50 με

(1) Expressed in ± (% rdg + n units) at 23 ± 5°C.
(2) Measurement range and resolution are given for 350 Ω gauges and a gauge factor NGF = 2.

Configuration: full bridge, half- bridge, and quarter- bridge.
Temperature coefficient for full bridge measurements:
(0.005% + 0.5 RU)/°C from 0 to 35°C.
(0.005% + 1 RU) from 35 to 50°C

Temperature coefficient for half- or quarter-bridge measurements:
(0.005% + 0.5 RU + 2 με)/°C from 0 to 35°C.
(0.005% + 1 RU + 2 με)/°C from 35 to 50°C.

Repeatability between channels
< 3 RU + 5 mV.
Other specifications: Those of the 30 mV and 300 mV ranges of the system.

digital input board AN 5886

This board counts pulses or measures frequencies of ten periodic signals. Each channel is coil-insulated from other channels of the data acquisition system.

Input voltage for any channel:
Level 1: CH1 > + 2.9 V.
Level 0: CH0 < + 1 V.
Maximum usable voltage: ± 50 VDC or AC peak.
Input current for level 1: 1.6 mA typical.

Input insulation: 100 VDC or AC RMS max. between each channel.

Counter inputs

Count positive transitions on the inputs.
User selectable bounce filtering time: 500 µs and 1 ms (typical) by a switch located on the digital input board. The filter on channels 1 and 2 can be eliminated to permit high-speed counting.

A jumper on the digital input board allows the use of channel input 10 as a trigger to validate or inhibit other counter inputs on the same board.

Channel numbers	1 - 2	1 to 10	
Filter in use	None	500 µs	1 ms
Maximum counter frequency	100 kHz	180 Hz	50 Hz
Minimum pulse duration	5 µs	2 ms	2 ms
Minimum duration between pulses	5 µs	2 ms	2 ms

Frequency inputs

Uncertainty: 0.02% + 2 RU.
Temperature coefficient: 0.0004%/°C.

NB: No filter is provided on frequency inputs. A cyclic ratio of approx. 50% (square signal) is advisable to obtain stable measurements but the pulse duration should always be above 5 µs.

Range	Resolution	Measurement range min. F (Integration time 1 second)	Measurement range min. F (Integration time 0.2 second)	Measurement range max .F
100 Hz	0.001 Hz	1 Hz	5 Hz	99.999 Hz
1 000 Hz	0.01 Hz	1 Hz	5 Hz	999.99 Hz
10 kHz	0.1 Hz	0.01 kHz	0.05 kHz	9.9999 kHz
100 kHz	1 Hz	0.1 kHz	0.5 kHz	99.999 kHz

electrotechnical input boards AN 6001 – AN 6002

They offer the following features:
- Measurements U, I, P, E, cosϕ, Hz in single or three-phase
- Continuous and triggered modes
- High scanning rate up to 16 kHz.

Two electrotechnical boards are available, with different inputs and functions.

For the connection of voltage and current transformers, use the AN 6001 board:
- 3 voltage inputs 100 VAC
- 3 voltage inputs 100 m VAC.

For the connection of Hall effect probes, (for example LEM type), use the AN6002 board:
- 6 voltage inputs 4 VAC.

The AN 6001 board is supplied with 3 shunts in order to convert the 1 A or 5 A transformer output into 100 mV, and to allow current measurement on 3 channels.

These boards measure voltages and currents on a single-phase or a three-phase network with or without neutral. The different programmed parameters are then computed.
Inputs are not insulated. The range selection can be programmed.
Both cards can function:
- in continuous mode.
- in triggered mode.
- in high scanning rate.

Board	Input	Continuous and triggered modes (3) signals from 10 to 440 Hz			
Reference	Un	Measurement range	Input impedance	Permanent overload	Crest factor
AN 6001	100 VAC 100 m VAC (1)	1 to 125 VAC (2) 0 to 125m VAC	250 kΩ 2.5 kΩ	200 V 15 V	1.8 2.5
AN 6002	4 VAC (1)	0 to 4 VAC (2)	100 kΩ	100 V	1.5

(1) The current input is performed by connection with a shunt placed on the measured element.
(2) On the voltage input 1 the minimum signal amplitude must be 10% of the rated voltage.
(3) The signals must cross 0 only once by period.

Continuous mode

In this mode, the board measures continuously, computes and retains for the system the last measurements processed.

Uncertainties
Uncertainties are expressed in ± (% rdg + % of scale) at 23 ± 5°C.
They are valid for measurements between 5% and 100% of the full scale

- Voltages and currents:
0.1% rdg + 0.2% s.
- Powers and Energies:
0.2% rdg + 0.3% if 0.8 < PF ≤ 1
0.4% rdg + 0.3% s if 0.5 < PF < 8
1% rdg + 0.3% s if 0.2 < PF < 0.5.
PF is the power factor.
- Frequency; 0.1% rdg.

Triggered mode

The acquisition is triggered:
- from the keypad,
- from an internal or external trigger.

The acquisition stops:
- from the keypad,
- when the signal disappears on the trigger board input,
- when the storage memory is full.

Storage memory
RAM not saved, capacity: 30 000 data.
This memory can be transferred into the bulk memory of the data acquisition system.

Uncertainties
Uncertainties are expressed in ± (% rdg+ % of scale) at 23 ± 5°C.
These uncertainties are valid for measurements between 5% and 100% of the full scale.

- Voltages and currents:
0.2% rdg + 0.2% s
- Powers and Energies:
0.4% rdg + 0.3% if 0.8 < PF < 1
0.6% rdg + 0.3% s if 0.5 < PF < 0.8 s
1.2% rdg + 0.3% s if 0.2 < PF < 0.5 s
- Frequency: 0.1% rdg.

High scanning rate

This mode allows the simultaneous acquisition of 1 to 6 channels per board, with choice by programming between the following frequencies: 100 Hz, 200 Hz, 500 Hz, 1 kHz, 2 kHz, 5 kHz, 10 kHz and 16 kHz.
The data are stored in the board memory (30 000 data).
The LS25 software (DOS) delivered with the board allows the system configuration as well as the stored data transfer to a PC. The file can be displayed as a graphic and exported to any usual spreadsheets.

Measurements and programmable parameters

- 3 RMS voltages phases/neutral (V1, V2, V3)
- 3 RMS voltages between phases (U12, U13, U23).
- 2 RMS currents (I1, I2, I3).
- 1 active power per phase + total active power (P1, P2, P3, P).
- 1 reactive power per phase + total reactive power (Q1, Q2, Q3, Q).
- 1 apparent power per phase + apparent global power (S1, S2, S3, S).
- 1 power factor per phase + the total power factor (PF1, PF2, PF3, PF).
- 1 active energy per phase + total active energy (EP1, EP2, EP3, EP).
- 1 reactive energy per phase + total reactive energy (EQ1, EQ2, EQ3, EQ).
- 1 apparent energy per phase + total apparent energy (ES1, ES2, ES3, ES)
- 1 frequency (F).

	Average acquisition rate		
Network frequency	10 Hz	50 Hz	400 Hz
Single phase configuration 2 measurements 10 parameters	5 meas/s	25 meas/s	39 meas/s
Three phase configuration + neutral 6 measurements 10 parameters	5 meas/s	14 meas/s	14 meas/s
Three phase configuration + neutral 6 measurements 10 parameters	5 meas/s	8 meas/s	8 meas/s

high speed acquisition input board ATC006

The ATC006 board is a high speed acquisition module for DATALOG 20, 90 and 140 systems. It takes two slots of input-output board.
This module is composed of an analogue board allowing a multiplexed acquisition of 1 to 10 measurements inputs at a programmable time between 10 µs and 10 s and by a logic board ensuring communication and storage. Two storage versions are available: 200 000 and 1 000 000 data.

Communication interface .....
The configuration and the processing of module can be performed via 3 interfaces:
- IEEE488 (National Instruments GPIB PC2 or PC2A compatible)
- system serial interface MODBUS-JBUS
- front keypad (optional).

Acquisition specifications .....
15 bit converter + sign.
Each input can be programmed as ± 1 V (0.1 mV resolution) or ± 10 V (1 mV resolution).
Permissible common mode voltage between channels: 30 V.
Acquisition time (time interval between two successive acquisitions) is programmable from 10 µs to 10 s.
The module storage memory is saved (> 1 month) and managed for memorising 32 bursts of data maximum (i.e. 32 different trigger actions). Two capacities are available: 200 000 and 1 000 000 data.

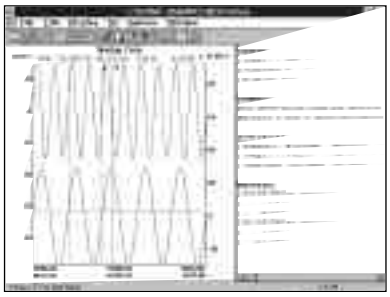
Trigger inputs .....
Two "ON/OFF" inputs are included in the board. One is a trigger function input with a trigger uncertainty of 2 µs. The second one can be linked with programmable thresholds on the 3 first channels by boolean equation in order to define event conditions.

Number of channels	1	2	3	4	5	6	7	8	9	10
Min. period (µs)	10	40	60	80	100	120	140	160	180	200
Max. frequency (kHz)	100	25	16.66	12.5	10	8.33	7.14	6.25	5.55	5

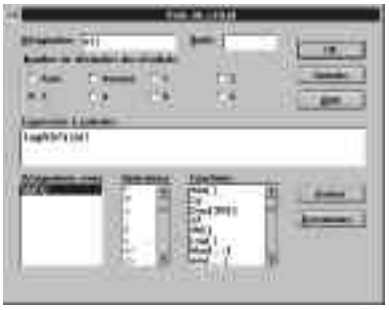
LACQR software.....
Delivered in standard with the ATC006 board.
This software is running under Windows and allows following functions:
- Communication with one or more modules via IEEE488 interface or via COM1 to COM4 port
- Creation or modification of configuration files
- Run and stop of data burst acquisition
- Measurement reading and data file creation
- Real time possible storage on PC (40 000 data/s maximum via IEEE488 interface)
- Result file processing in text mode and graphic
- Delayed computation on channels
- .TXT file creation, to be treated in spreadsheets.

Acquisition configuration
This dialog box allows to define acquisition parameters
- Channel to be first acquired
- Acquisition time
- Trigger (T1, T2 and T3 associated to the first three channels to be acquired)
- Definition of event following the 3 internal triggers and external input
- Number of cycles to be executed after event
- Number of cycles to memorise.

Channel configuration
This dialog box allows to define for each channel:
- Unit
- Range 1 or 10 V
- Scaling ax + b
- High and low limits



File processing as graphic.



Calculation channels
This dialog box allows to define all mathematical operations on or between channels (in the result file).

analogue output board AN 5888

The board is made up of 5 digital/analogue converters (12 bits) each providing two output quantities, a voltage - 10 to + 10 V and a current 0-20 mA or 4-20 mA.
As voltage and current quantities come from the same converter, they cannot be used simultaneously.
Voltage and current channels of the same board are coil-insulated and also are insulated from other system input/outputs.

Voltage output .....
Minimum permissible load resistance: 5 kΩ.

Current output.....
- Internal power:
Maximum permissible load resistance: 500 Ω.
Open circuit voltage: 12 V.

Range	Resolution	Uncertainty
± 10 V	5 mV	± 10 mV
0 - 20 mA	0.01 mA	± 0.02 mA
4 - 20 mA	0.01 mA	± 0.02 mA

- External power:
Supply voltage: 15 V ≤ V supply ≤ 50 V.
Max. permissible load resistance Rmax = (V supply - 2)/0.02.
Max. permissible common mode voltage between analogue channels and other system I/O channels: 150 VDC or VAC peak.
Average processing time: 20 ms.

Signal risetime to resistance load: 20 µs/V.

Maximum load capacity: 10 µF.

Temperature coefficient: 0.01% per °C.

dry relay output board AN 5887

Capacity: 10 bistable relays per board. Wired to removable screw terminal connector.

Contact resistance load: 48 V or 1 A or 30 W.

Number of operations: 5.10^5 in the following conditions.
Each contact is either common, on or off.
The relays are controlled according to system program, for example:
- on a specific alarm limit action;
- remote controlled from one of the communication interfaces;
- on a conditional processing.

communication interface

The DATALOG are equipped in standard with two communication interfaces, each configurable in RS 232 by means of a DB9 female connector or RS 485 using a 5-pin screw terminal block.
Data format: 8 bits, 1 stop bit, no parity.

Addresses are programmable from 1 to 15 and transmission rates from 9 600 to 56 000 bauds.

P1 interface .....
MODBUS RTU protocol either as master (for reading other instruments) or as slave.

P2 interface .....
Operation configurable in ASCII RS 232 (printer management for example) or MODBUS RTU (slave only).

internal printer

Option only available with DATALOG 90 and 140.
Thermal printer, 24 characters per line.

Printing speed: 1.5 line per second.
Paper roll: 80 mm wide, 50 m long, and diameter 65 mm.

PCMCIA interface

The DATALOG with keypad version, are equipped with a PCMCIA interface, type 2. This interface enables the operator to read and write on memory cards of RAM STATIC technology and FLASH card of ATA type. These cards allow to save and load configuration files as well as to create result files.

general specifications

Operating conditions .....
Reference range: 23°C ± 5°C.
Operating nominal range: 0°C to 50°C, 20% to 80% RH non-condensing.

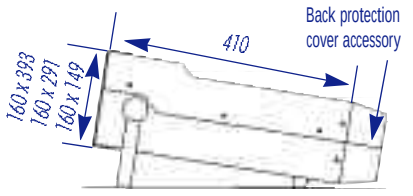
Power requirements .....
100 to 230 VAC ± 10%, 50 Hz to 60 Hz.
Consumption: 40 VA.
Input available for 11 V to 28 VDC supply.

Optional battery pack with built-in charger. Life: 3 hours approximately.
Unregulated output available for sensor supply. Rated voltage 24 V, current 100 mA.

Presentation.....
The systems are delivered with a carrying handle to be removed for panel mounting with optional accessories. A protective cover located at back of the system enables the operator to measure voltages above 60 V in accordance with the EMC and low voltage directives.
The systems can be delivered with various options (refer to the table).

Weight.....
From 3 kg to 9 kg depending on models and options.

dimensions in mm



software

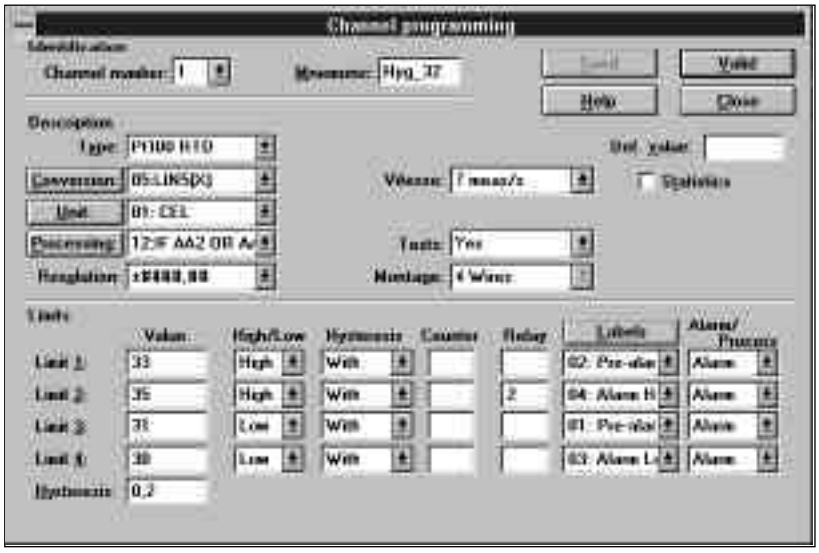
Various utilities for Windows from 3.1 to NT are available.

Logidat .....
Used to configure the DATALOG and process the values stored in memory from compatible PC. Easy to use thanks to menu-guided operation.
Processing the result files offers possible delayed computations, graphic form, sort and export to spreadsheets.
Connection to the systems can be performed by modems.

LTCMP .....
This utility is intended to read, at time intervals programmed by the operator, one or more systems connected to the PC or with automatic call of the different stations by Modem.

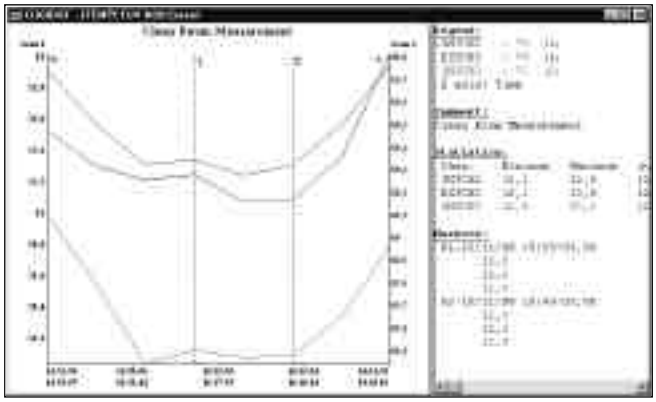
Visulog .....
Supervisory software for DATALOG which authorises the real time measurement representation in the form of graphic animations, curves, bargraphs and numerical tables, the recording of values and highest alarms in a logbook. Result files can be created on the PC hard disk and processed without stopping the acquisition.
A remote monitoring function is available for calling the duty operators and signalling the alarms on Minitel.

Utilities.....
In order to simplify all specific developments, a wide range of utilities is available:
Visulog DDE links with Windows environment.
DLL library, 16 and 32 bits.
Labview driver.



LOGIDAT programming screen
The menu-guided operation enables the operator to select his/her sensor type, program the conversion algorithms, the alarm thresholds together with their action on the output relays.

LOGIDAT file structure
Various data sort and collation functions are available such as: opening sub-files to extract data from certain channels, adding markers or recording only channels in alarm conditions, etc… These files can be directly converted to industry standard formats for export into common spreadsheet and database such as: Lotus 123, Excel, D-Base, etc…



LOGIDAT graphic display screen
The operator has access to graphic representation in the form of curves. Various functions are available as follows:
Programming of 2 different Y-axis
Choice of X-axis: time or correlation between channels.
Possibility to add comments and titles.
Zoom and marker functions.
Automatic statistics computation with LOGIDAT.

ordering instructions

System 2 I/O without keypad and display	D2AO
System 2 I/O with keypad and display	D2CO
System 2 I/O with keypad, display and Centronics interface (1) (2)	D2CC
System 9 I/O without keypad and display	D9AO
System 9 I/O without keypad and display but with rechargeable battery	D9AB
System 9 I/O with keypad and display (1)	D9CO
System 9 I/O with keypad, display and rechargeable battery (1)	D9CB
System 9 I/O with keypad, display and internal printer (1)	D9CI
System 9 I/O with keypad, display and Centronics interface (1) (2)	D9CC
System 9 I/O with keypad, rechargeable battery and Centronics (1) (2)	D9BC
System 14 I/O without keypad and display	D14AO
System 14 I/O without keypad and display but with rechargeable battery	D14AB
System 14 I/O with keypad and display (1)	D14CO
System 14 I/O with keypad, display and rechargeable battery (1)	D14CB
System 14 I/O with keypad, display and internal printer (1)	D14CI
System 14 I/O with keypad, display and Centronics interface (1) (2)	D14CC
System 14 I/O with keypad, rechargeable battery and Centronics (1) (2)	D14BC
10-channel analogue input board	AN 5885
10-channel simplified analogue input board	AN 5900
10-channel protected analogue input board	ATC 017
20-channel analogue input board, 2-wire	AN 5905
Strain gauge board	AN 3700
10-channel digital input board	AN 5886
10-channel high speed acquisition input board, 200 000 data	ATC 006-01
10-channel high speed acquisition input board, 1 000 000 data	ATC 006-02
Electrotechnical board, version 1 (100 V and 100 m VAC)	AN 6001
Electrotechnical board, version 2 (4 VAC)	AN 6002
Electrotechnical board, special version	AN 6003
10-channel relay output board	AN 5887
5-channel analogue output board	AN 5888

(1) All the models with display are equipped in standard with a PCMCIA interface.
(2) The optional Centronics interface occupies 2 slots.

Accessories

Removable terminal block for I/O boards, 10 channels	ER 48276-000
Removable terminal block for I/O boards, 20 channels	ER 48402-000
PCMCIA flash card, 2 Mb	ATC 013
PCMCIA flash card, 5 Mb	ATC 014
PCMCIA flash card, 10 Mb	ATC 015
Shunt for process current measurement	ER 44007-024
Set of 10 paper rolls for DATALOG	ATC 030
IEEE board	ATC 019
IEEE mechanical adapter for ATC 006	ATC 020
Voltmeter and CPU for DATALOG	ATC 031
Supply for DATALOG	ATC 032
Protection cover for DATALOG 20	ATC 023
Protection cover for DATALOG 90	ATC 024
Protection cover for DATALOG 140	ATC 025
Rack kit for DATALOG 20	ATC 026
Rack kit for DATALOG 90	ATC 027
Rack kit for DATALOG 140	ATC 028
12-thermocouple cone for autoclave	ATC 033
12-platinum probe cone for autoclave	ATC 034
Specific cone for autoclave	ATC 035

Software

Software protection key	ATC 007
DOS software for graphic tendency and remote monitoring	LS 23
Configuration software under Windows	LOGIDAT
Real time software, 16 bits under Windows	LW 1
Real time software, 32 bits under Windows	VISULOG
Multistation call software under Windows	LTCMP
Updating DOS to Windows real time	MAJDLW
Updating LS 20 to Windows	MAJLTC20
Processing licence LW 1	LICEW1
Updating LW 1	MAJLW1
DLL library, 16 and 32 bits	LTC 001
Labview driver	LTC 003

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