Data Monitor
KS 3005

TFT display 5,5"

Measurement data acquisition from 250 ms

3, 6, or 12 universal 16-bit inputs; Class 0,2 %

Channel visualization in groups

Storage medium: Compact Flash or 3.5-inch diskette

RS 232 or RS 485 interface for configuration and as Modbus master or Modbus slave

Ethernet interface

Mathematical functions in realtime

Front protection mode IP 65

GENERAL

The Data Monitor KS 3005 is a freely configurable, microprocessor-controlled device for measurement, storage, visualization, monitoring, documenting, and evaluating measurement data. Various versions are available, with 3, 6, or 12 universal inputs. Via a Modbus link, the unit can be expanded with 12 additional channels.

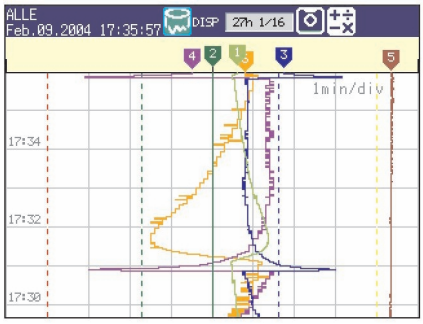
Measured data are buffered in the internal memory, from where they can be exported to a Compact Flash card or diskette. By means of a PC-based evaluation program, the measurement data can be archived for subsequent analysis.

The device has been designed for industrial use, and apart from numerous extra functions. It offers the latest communication possibilities. For example, via the Ethernet interface the KS 3005 can be configured completely, and the integrated web server permits convenient monitoring. E-mail messaging and FTP client and server functions put a finishing touch to the Ethernet communication concept.

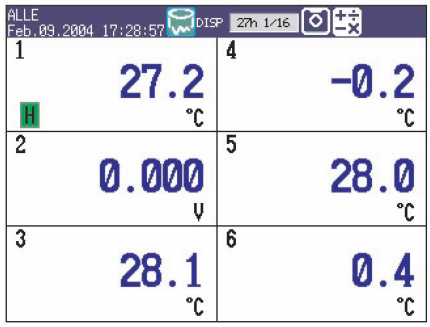
In its immediate automation environment, the KS 3005 is also very communicative: a serial interface with Modbus function can be used for slave or master operation.

Another highly important link to the process is the 5,5-inch (140 mm) TFT display with a resolution of 320 x 240 pixels. The display provides excellent readability even at wide angles.

Measurement values can be displayed either as trend curves or bargraphs in horizontal or vertical direction; a numeric display is also possible.



Trend display



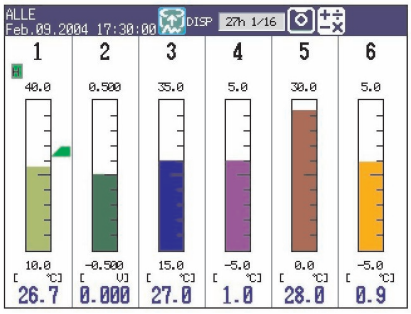
Digital display

The KS 3005 features a group manager, with which the different input signals can be assigned freely to a visualization group.

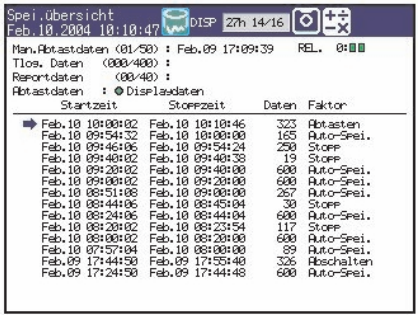
Any input signal can be assigned to several groups. Grouping the inputs helps to improve transparency, and also permits the use of different parameters for every signal within a group.

The KS 3005 offers 4 visualization groups, whereby every group can contain up to 6 channels.

Within a visualization group, different displays can be activated.



Bargraph display



Event list

From the vertical and horizontal displays, it is also possible to call a historic display of the data stored in the memory.

TECHNICAL DATA

ANALOG INPUTS

General

Programmable sensor type and measurement range.
Within a measurement range, span start and end can be configured freely.
Galvanic isolation between inputs up to 50 VDC

Scanning cycle

3 inputs from 250 ms upwards
6 or 12 inputs from 1 s upwards
Resolution: 16 bits

Thermocouples

Type	Measurement range
R	0 … 1760 °C
S	0 … 1760 °C
B	0 … 1820 °C
K	-200 … 1370 °C
E	-200 … 800 °C
J	-200 … 1100 °C
T	-200 … 400 °C
N	0 … 1300 °C
W	0 … 2315 °C
L	-200 … 900 °C
U	-200 … 400 °C
WRe	0 … 2400 °C

Resistance thermometers

Type	Measurement range
Pt 100	-200 … 600 °C
Jpt 100	-200 … 550 °C

For all thermocouples and resistance thermometers, the smallest display span is 0,1 °C.

Direct voltage

Voltages can be measured and displayed in the following ranges:

Measurement range	Resolution
-20 … 20 mV	10 µV
-60 … 60 mV	10 µV
-200 … 200 mV	100 µV
-2 … 2 V	1 mV
-6 … 6 V	1 mV
-20 … 20 V	10 mV
-50 … 50 V	10mV

Direct current

Currents are measured by means of an external shunt. Therefore, the ranges specified above for direct voltage are used.

Accuracy and display

The errors specified in the table are referred to the following conditions:
Humidity: 55% ± 10%
Temperature: 23 °C ± 2°C
Supply voltage: 180 to 250 V at 50 Hz ± 1%

The Data Monitor must have been in operation for at least 30 minutes (warm-up time)

Type	Error
R	± 3,7 °C with 0..100 °C ± 1,5 °C with 100..300 °C
S	± 3,7 °C with 0..100 °C ± 1,5 °C with 100..300 °C
B	± 2 °C with 400..600 °C
K	+ 1 °C with -200..-100 °C
E	+ 0,7 °C with -200..-100 °C
J	+ 0,7 °C with -200..-100 °C
T	+ 0,7 °C with -200..-100 °C
N	+ 0,7 °C
W	+ 1 °C
L	+ 0,5 °C
U	+ 0,7 °C with -200..-100 °C
WRe	+ 1 °C
Pt 100	+ 0,3 °C
Jpt 100	+ 0,3 °C

An error of +/- 0,1% + 2 digits applies for all voltage measurements (50V + 3 digits).

DISPLAY / OPERATION

TFT colour display
Screen diagonal: 5,5 inches
Resolution: 320 x 240 pixels
Automatic switch-off function
Selectable operating languages: German, English, French, Italy and Spain.

The KS 3005 is operated via softkeys in the front panel or via a network (Ethernet / RS 232 / RS 485 (Options))

Unit configuration is also done via the front panel keys, network (Option) or via the storage medium (Option).

DATA STORAGE

Internal data storage: 1,2 MB Flash
Optional external storage:

- Floppy disk, 1,44 MB, 3.5-inch
- Compact Flash, 32 MB up to 512 MB

Data storage can be initiated either manually via softkeys or external input (Option) or automatically.

POWER SUPPLY

Supply voltage: 100..240 VAC
Frequency: 50/60 Hz
(automatic detection)
Nominal power consumption:
14 VA at 100 VAC; 22 VA at 240 VAC
Max. power consumption
24 VA at 100 VAC; 35 VA at 240 VAC

Option. rated supply voltage: 24 V DC/AC
Op. supply voltage range:21.6 to 26.4 V DC/AC
Max.. power consumption
24 V DC 17 W 24 VAC(50/60Hz 30VA

ENVIRONMENTAL CONDITIONS

Normal operating conditions:
Temperature: 0 ..50 °C
(with floppy disk: 0..40 °C)
Humidity: 20...80% at 0...40°C
10...40% at 40...50°C
Vibration: 10...60 Hz; 0,2 m/s²
Warm-up time: 30 minutes

STORAGE CONDITIONS

Temperature: -25...60°C
Humidity: 5...95%, no condensation

CONFORMITY / SAFETY

CE marking

The device complies with the conformity regulations

Safety

CSA22.2 No. 1010-1, UL61010B-B (CSA NRTL/C)
EN 61010-1

EMC

EN 61326
EN 55011 Class A
EN 61000-3-2
EN 61000-3-3

OPTIONS

ALARM OUTPUTS

Depending on version, the unit has 2, 4 or 6 alarm outputs. The outputs are relay contacts rated for 250 VAC (50/60 Hz), 3 A.

SERIAL INTERFACES

Depending on version, the Data Monitor can be fitted with an RS 485/422-A or RS 232 interface.

The interface can be used for configuration by means of the recorder software, or as a Modbus interface.

With Modbus operation, the unit can be configured as Modbus master (this requires the 'Mathematics' option) or as Modbus slave.

When configured as Modbus master, up to twelve additional external channels can be read, whereby these channels only occupy one mathematics channel.

ETHERNET INTERFACE

The Ethernet interface offers the following protocols and functions:

- SMTP, HTTP1.0, FTP, TCP, UDP, IP, ARP, ICMP
- E-mail function for sending alarm messages and data.
- Web server function for displaying a standard operating interface on a conventional browser.
- FTP client function for automatic data transfer from the Data Monitor to an FTP server.
- FTP server function for data transfer via an FTP client.

MATHEMATICS FUNCTION

The 'Mathematics' function enables up to twelve additional channels to be defined.

The functions include general arithmetic calculations, logic operations, statistical functions, reporting functions, and triggering of automatic sequences.

REMOTE OPERATION

Depending on version, the Data Monitor can be fitted with 5 or 8 remote control inputs. These inputs are used to trigger different functions in the unit, e.g.:

- Start / Stop of recording
- Start / Stop of calculations
- Time synchronization
- Reset for mathematical functions
- Manual data recording
- Display of predefined texts
- Alarm acknowledgement
- Screen dump

PULSE INPUTS

The 'Pulse inputs' option comprises 3 pulse inputs, 5 remote control inputs (see Remote operation), as well as the 'Mathematics' function (see Mathematics function).
Specifications of the pulse inputs

- Max. pulse frequency: 100 Hz
- Min. pulse length: 5 ms
- Max. voltage: 30 VDC

Pulse counting can be done during a defined period or as a total sum.

BUFFER OVERFLOW

The 'buffer overflow' signal is available as a relay output rated at 250 VAC, 3 A. The signal is triggered at a specified time during manual recording, or automatically, when the storage medium reaches 90% of its capacity.

PT 1000

Expansion of the input channels with the linearization for Pt 1000 resistance thermometers.

Type	Measurement range
Pt 1000	-200 … 600 °C

Sensor current: 0,16 mA
Error: ± 0,2%

ISOLATED RTD

The signals A, B, and b are galvanically isolated. This option is standard in the 3-channel version.

APPLICATION SOFTWARE

A license for the application software is included with every unit that is supplied with an interface or storage medium.

The software runs under Windows 98/Me/NT4.0/2000/XP, and serves for the unit's configuration as well as the evaluation of the stored data.

Configuration is done via a storage medium or via a direct link (interface).
Primarily, the evaluating software supports the following functions:

- Display of the channels in groups as diagram, text display, and in reports
- Statistical evaluations
- Database function
- Data export as ASCII file
- Printout of the displayed data

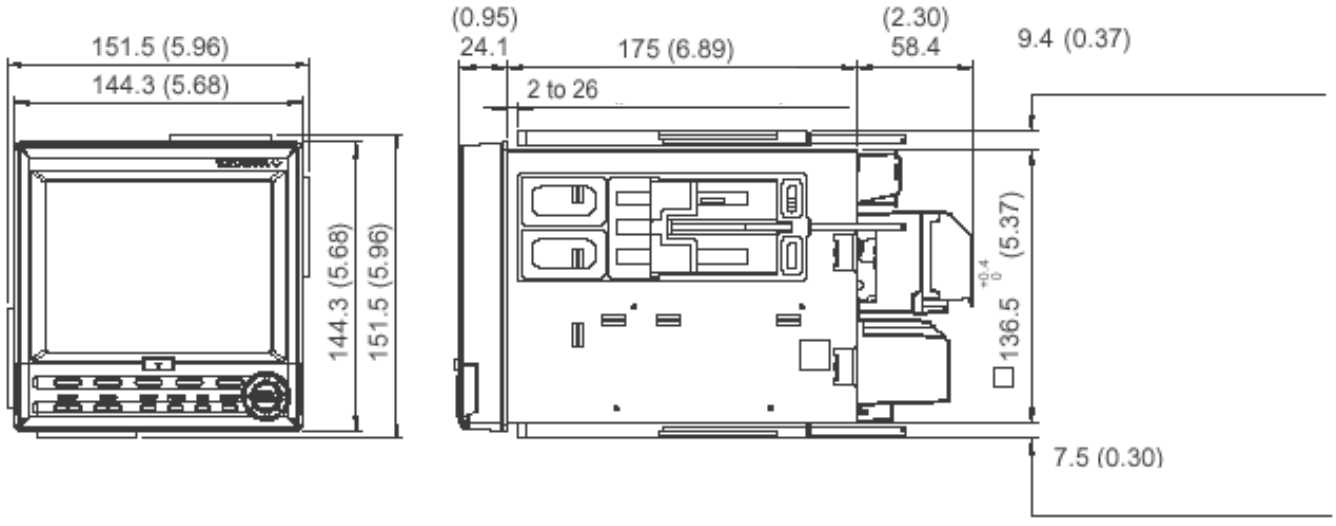
GENERAL

PROTECTION MODE

To EN 60529
Front IP 65, rear IP 20

HOUSING

Sheet steel housing for mounting in a panel cutout.
Panel fixing elements to DIN.
Weight: 2,5kg



Overall dimensions mm(inches):

Order no	9407-31 x	- x	x	x	x	x
Inputs and interface						
3 channels	1					
3 channels + RS 232 ***1**	2					
3 channels + RS 485/422-A ***1**	3					
6 channels	4					
6 channels + RS 232 ***1**	5					
6 channels + RS 485/422-A ***1**	6					
12 channels	7					
12 channels + RS 232 ***1**	8					
12 channels + RS 485/422-A ***1**	9					
Storage medium and Ethernet						
without storage medium and without Ethernet		0				
Diskette (FDD 1.44 MB, 3.5-inch)		1				
Compact Flash (32MB)		2				
Ethernet without storage medium		3				
Ethernet + diskette (FDD 1.44MB 3.5 inch)		4				
Ethernet + Compact Flash (32MB) *(recommended features)*		5				
Alarm outputs						
without alarms			0			
2 alarm outputs			1			
4 alarm outputs			2			
6 alarm outputs			3			
Output for buffer overflow signal			4			
2 alarm outputs + buffer overflow signal			5			
4 alarm outputs + buffer overflow signal			6			
Options 1						
without Options 1				0		
Mathematics ***1**				1		
8 remote control inputs				2		
Mathematics + 8 remote control inputs				3		
Mathematics + 3 pulse inputs + 5 remote control inputs ***2**				4		
Options 2						
without Options 2					0	
Pt 1000 connection					1	
Galv. isolation 3-pin RTD energization					2	
Galv. isolation 3-pin RTD energization + Pt 1000					3	
Options 3						
without Options 3						1
Portable Kit						2
Power supply 24 Volt						3
Portable Kit + Power supply 24 V						4

Remarks
*1 If the KS 3005 is to be operated as a Modbus master, the option 'Mathematics' must be selected.
*2 If the 3 pulse inputs are selected, only max. 4 alarm outputs are possible.

ACCESSORIES

SHUNT RESISTORS

Order no.	Type
9407-310-80011	250 ohms ± 0,1%
9407-310-80021	100 ohms ± 0,1%
4012-151-57322	50 ohms ± 0,1%
9407-310-80031	10 ohms ± 0,1%

APPLICATION SOFTWARE

A license for the application software is included with every unit that is supplied with an interface or storage medium.

Order no.	Type
9407-310-70011	REC standard

OPERATING INSTRUCTIONS

One operating manual is supplied with the unit.

Standard operating instructions

Order no.	Language
9499 040 75418	German
9499 040 75432	English

Interface description

Order no.	Language
9499 040 75618	German
9499 040 75611	English

Software operation

Order no.	Language
9499 040 75518	German
9499 040 75511	English

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