# SCREEN RECORDER
# KD7 TYPE

European medal for KD7
granted in 2008

CE

## MAIN FEATURES:

- **LCD TFT 5.7" colour screen, 320 × 240 pixels, with touch screen,**
- **recording and data archiving on CompactFlash card with capacity up to 4 GB,**
- **IP65 protection class on the front panel,**
- **3, 6 or 12 galvanically isolated analog measuring channels,**
- **24 measuring channels for data transmitted through communication interfaces,**
- **16 or 32 alarms and 8 or 16 digital inputs,**
- **4 or 8 analog outputs,**
- **supervised access to the recorder through the user's name (login) and password,**
- **visualization of measurements in digital form, charts, bargraphs, analog indicators,**
- **RS-232, RS-485 serial interfaces and USB Device,**
- **ETHERNET communication, WWW server,**
- **user friendly graphical interface based on the MS Windows® layout**
- **MS Windows®CE operating system,**
- **complies with the regulation FDA CFR21 Part 11 - regulation for electronic records and signatures.**

## APPLICATION

The KD7 screen recorder is applied as a data acquisition station in measuring and control systems. It finds application to measure, visualise and supervise technical process parameters in various industrial branches, e.g. in pharmacy, food, chemical and papermaking industries.
It can be also used as an autonomous measuring and recording device.

## OPERATIONAL FUNCTION

- measuring inputs for the direct connection of thermocouples, voltage d.c., current d.c. and resistance,
- programmable current, voltage and resistance inputs,
- 6 MB internal memory with data support,
- exchangeable external memory up to 4 GB,
- access to recorded data via an internet browser,
- mathematical functions,
- counters and totalizers,
- visualization and archiving of 4 groups with 6 channels in each group (from 32 accessible channels), for which inputs are:
  - 1...12 analog measuring inputs,
  - 1...24 interface measuring inputs,
  - 1...16 mathematical functions
  - 1...16 binary inputs,
  - 1...32 logic channel totalizers,
  - 1...32 logic channel alarms,
  - 1...32 logic channel minimum, maximum, average,
- various language versions (Polish, English, Italian, French, Russian, Romanian, German),
- digital signature for archive data,
- „Just in place" help,
- programmable events.

## USER'S MESSAGES

User's messages enable to add information (Earlier prepared or written in any moment) to currently measured values in order to describe additional features or the measuring process state, They are displayed and archived together with the alarm log for the given group and visualized by means of KD Archive on the PC.

## DATA EXPOSURE

**The KD7 recorder enables the visualization of recorded data in following shapes:**
- linear and bargraphs,
- digital and analog indicators,
- each channel has the possibility to assign settings as: colour, name, range and presentation view.
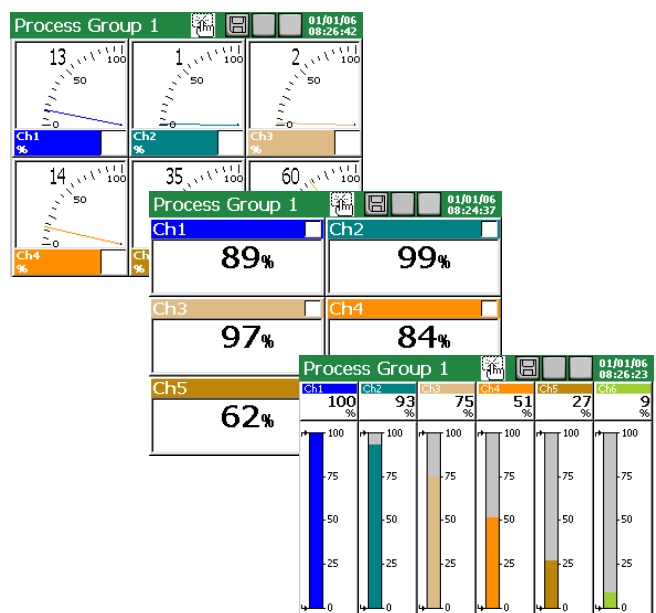
## DATA ARCHIVING

A CompactFlash card and the internal memory are destined for data archiving in the KD7 recorder. Depending on user's needs, the recorder is delivered with a memory card size up to 4 GB.

## SAFETY OF STORED DATA - ACCESS CHECK

The individual login and password for each user, configurable access right to recorder resources, are only several of numerous solutions applied in the KD7 recorder in order to ensure the recorder work safety in the network.

## PC SOFTWARE

**KD7 SETUP, KD ARCHIVE, KD CONNECT and KD CHECK programs are destined for KD7 recorder servicing.**

The **KD Connect** program is destined for the communication between the PC computer and the KD7 recorder by means of the USB interface. It enables the acquisition of archived data from the recorder, writing and erasing data on the CF card.

The **KD7 Setup** program enables to prepare a configuration file in the PC computer for the KD7 recorder. After recopying the configuration on the CF memory card, it can be used for reprogramming of settings in the given KD7 recorder.

The **KD Archive** program is destined for visualization. The KD Archive program is destined for visualization, verification of the digital signature and export to the CSV format, data stored in binary format with digital signature obtained from the recorder.

The **KD Check** program is destined for the verification of file correctness with measuring data saved in the CSV with digital signature format.
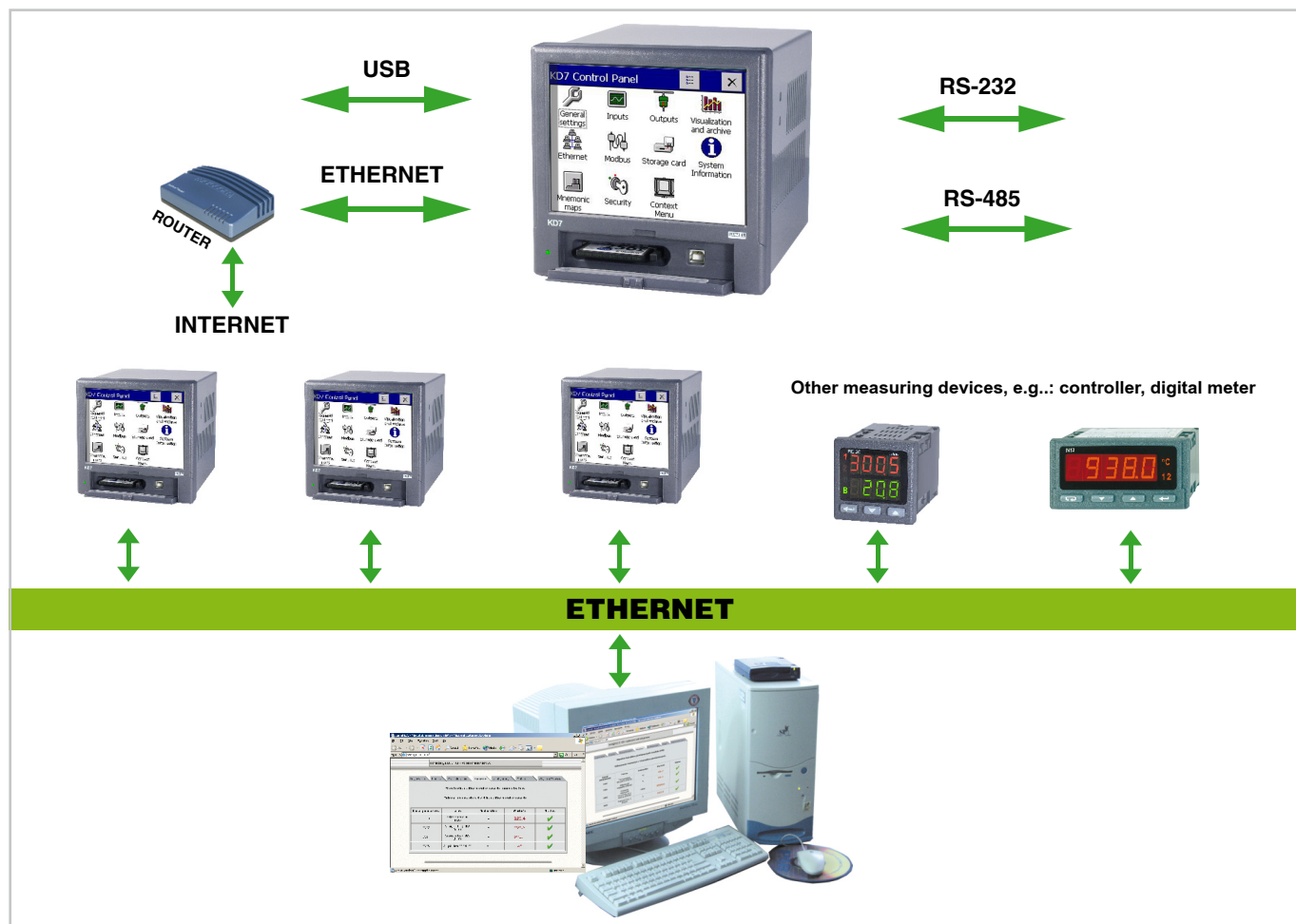
## RECORDER WORKING IN THE NETWORK

Depending on needs, the user has the choice of following communication interfaces:

- RS-232 (Modbus Slave)
- RS-485 (MODBUS Master and Slave)
- ETHERNET 10 Base-T (WWW Server, Modbus Slave)
- USB 1.1 Device

Recorder has a build-in HTTP server (WWW server).
A current state of a recorder may be observed from the web page archive data may be collected.

## TECHNICAL DATA

### Pogrammable measuring inputs:

| | |
|---|---|
| - number of measuring channel | 3, 6 or 12 |
| - input resistance | > 10 MΩ (U, TC); = 100 Ω (I) |
| - max. sampling rate | 350 ms (for 1 measuring place) |
| - measurement accuracy | acc. to the table 1 |
| - additional measuring error with the automatic temperature compensation of the thermo-couple reference cold junction | ≤ 1°C |
| - isolation between measuring places | 100 V d.c. |
| - isolation measuring place-housing | 500 V d.c. |

### Measuring ranges/accuracy class                Table 1

| Input signal | Measuring range/ Measuring accuracy (%) | | Minimal sub-range/ accuracy class (%) | |
|---|---|---|---|---|
| Voltage | 0... ± 9999 mV | 0.15 | 5 mV | 0.25 |
| Current | 0... ± 20 mA | 0.15 | 1 mA | 0.25 |
| Thermocouple (TC): | | | | |
| J (Fe - CuNi) | -200...1200°C | 0.1 | 100°C | 1 |
| K (NiCr - NiAl) | - 200...1370°C | 0.1 | 130°C | 0.7 |
| N (NiCrSi - NiSi) | - 200...1300°C | 0.1 | 200°C | 0.5 |
| E (NiCr - CuNi) | - 200...1000°C | 0.1 | 100°C | 1 |
| R (PtRh13 - Pt) | 0...1760°C | 0.2 | 540°C | 0.3 |
| S (PtRh10 - Pt) | 0...1760°C | 0.2 | 570°C | 0.3 |
| T (Cu - CuNi) | - 200...400°C | 0.1 | 110°C | 0.9 |
| B (PtRh30 - PtRh6) | 400...1820°C | 0.2 | 1000°C | 0.2 |
| L (GOST) | - 200...800°C | 0.1 | 90°C | 0.2 |
| K (GOST) | - 200...1370°C | 0.1 | 130°C | 0.7 |
| Resistance thermometer (RTD): | | | | |
| Pt 100 | - 200...850°C | 0.15 | | 0.25 |
| Pt 500 | - 200...850°C | 0.3 | | 0.5 |
| Pt 1000 | - 200...850°C | 0.3 | | 0.5 |
| Ni 100 | - 60...180°C | 0.15 | | 0.25 |
| Cu 100 | - 50...180°C | 0.15 | | 0.25 |
| GR.21 (GOST'78) | - 260...1100°C | 0.15 | | 0.25 |
| GR.21 (GOST'94) | - 260...1100°C | 0.15 | | 0.25 |
| 50P (GOST'78) | - 260...1100°C | 0.15 | 50°C | 0.25 |
| 50P (GOST'94) | - 260...1100°C | 0.15 | | 0.25 |
| 100P (GOST'78) | - 260...1100°C | 0.15 | | 0.25 |
| 100P (GOST'94) | - 200...200°C | 0.15 | | 0.25 |
| 50M (GOST'78) | - 200...200°C | 0.15 | | 0.25 |
| 50M (GOST'94) | - 200...200°C | 0.15 | | 0.25 |
| 100M (GOST'78) | - 200...200°C | 0.15 | | 0.25 |
| 100M (GOST'94) | - 200...200°C | 0.15 | | 0.25 |
| Potentiometric transmitter | 50...2000 Ω | 0.15 | 100 Ω | 0.25 |
| Resistance transmitter | 0...2000 Ω | 0.15 | 100 Ω | 0.25 |

### Standard measuring inputs (version acc. to the ordering code)

| | |
|---|---|
| - number of measuring channels | 6 (or 12) |
| - measuring ranges: | |
|   - voltage measurement | 0...10 V input resistance > 1MΩ |
|   - current measurement | 0...20 mA/4...20 mA input resistance < 10 Ω |
| - isolation between measuring channels | 500 V d.c. |

| | |
|---|---|
| - isolation between measuring channels and the housing | 500 V d.c. |
| - measurement accuracy | 0,25% of the measuring range |
| - measurement time of each input | minimum 100 ms |

### Admissible overload in the measuring system
acc. to EN 60051-8

### Logic inputs
8 (or 16), with a common mass

| | |
|---|---|
| - control signal | 0/5... 24 V d.c. |
| - switching frequency | up to 50 Hz (depending on equipment configuration) |
| - isolation to the housing | 500 V d.c. |

### Analog outputs:

**Current:** 4 (or 8) galvanically isolated

| | |
|---|---|
| - output signal | 0...5 mA, 0...20 mA or 4...20 mA |
| - additional error | 0.2% |
| - load resistance | < 500 Ω |
| - isolation to the housing | 500 V d.c. |

**Voltage:** 4 (or 8) galvanically isolated

| | |
|---|---|
| - output signal | 0...5 V, 1...5 V load resistance ≥ 250 Ω or 0..10 V, load resistance ≥ 500 Ω |
| - additional error | 0.2% |
| - isolation to the housing | 500 V d.c. |

### Alarms:

**Electromagnetic relays:** 8 (or 16), programmable

| | |
|---|---|
| - load capacity for resistance load | ≤ 250 V a.c./1 A ≤ 30 V d.c./1 A |

**OptoMOS relays:** 8 (or 16), programmable

| | |
|---|---|
| - load capacity for resistance load | ≤ 85 V d.c., 100 mA ≤ 60 V a.c., 70 mA |
| - current peak value | 300 mA/10 ms |
| - OptoMOS resistance | ca 8 Ω |
| - protection against a too excessive current | SMD type F 125 V/125 mA (SIBA) or BSMD-S0.125 A (TME) For the current accreation rate: ≤ 5 A/s - from the 0 mA value ≤ 1.5 A - from the 100 mA value |
| - protection against an excessive voltage when switching an inductive load | external system (varistor, transil, triac) |

### Interfaces:

| | |
|---|---|
| - RS-232 | transmission protocol: Modbus Slave baud rate: 300... 256000 bit/s transmission mode: ASCII/RTU D-Sub 9 connector (female) |
| - RS-485 (Modbus Master) and RS-485 (Modbus Slave) | baud rate: 300... 256000 bit/s transmission mode: ASCII/RTU złącze D-Sub 9 |
| - Ethernet | 10 Base-T, Socket RJ45, Server WWW, Modbus Slave |
| - USB | V.1.1 Device, Socket USBB-G |

### Supplying outputs for external object device supply
2 × 24 V d.c./30 mA

**General recorder parameters:**

| | |
|---|---|
| - frontal face dimensions | 144 × 144 mm |
| - length behind the panel | 155 mm |
| - panel cut-out dimensions | 138$^{+1}$ × 138$^{+1}$ mm |
| - colour graphical screen | LCD 5.7" of TFT type, 320 × 240 pixels, with a touch screen |
| - external data carrier | CompactFlash card up to 4 GB |
| - memory of the internal buffer (flash) | 6 MB |
| - working temperature | 0...23...50°C |
| - climatic conditions | < 75% relative humidity, without condensation |
| - supply voltage | 90...230...253 V a.c. or 18...24...30 V d.c. |
| - power consumption (max) | < 30 VA |
| - protection of the power pack supply | fuse RFS 1.6 A 250 V (a.c. supply) |

**Housing protection class:**

| | |
|---|---|
| - from frontal side | IP 65 acc. to EN 60529 |
| - from terminal side | IP 20 acc. to EN 60529 |

**Operational safety:** acc. to EN 61010-1
| | |
|---|---|
| - installation category | II |
| - pollution level | 2 |

**Electromagnetic compatibility:**

| | |
|---|---|
| - noise emission | acc. to EN 61000-6-4 |
| - noise immunity | acc. to EN 61000-6-2 |

**Weight** < 2 kg

## ORDER CODES

| KD7 SCREEN RECORDER | X | X | X | X | X | X | X | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Measuring inputs (slot 1)**
without measuring inputs ..................................0
6 programmable measuring inputs ...................1
6 standard measuring inputs: 0...10 V ...............2
6 standard measuring inputs: 0...20 mA...............3
6 standard measuring inputs: 4...20 mA.................4
6 standard measuring inputs: 3 × 0...10 V + 3 × 0...20 mA............5
6 standard measuring inputs: 3 × 0...10 V + 3 × 4...20 mA.............6
3 programmable measuring inputs ...................7

**Measuring inputs (slot 2)**
without measuring inputs ......................................... 0
6 programmable measuring inputs ......................... 1
6 standard measuring inputs [1] ........................ 2...6
3 programmable measuring inputs ......................... 7

**Interface measuring input:**
with RS-485 (1) interface measuring input ....................1

**Digital signals/analog outputs (slot 3):**
without digital signals and analog outputs ...........................0
8 alarms (NO relays) + 8 alarms (OptoMos) ........................1
8 alarms (NC relays) + 8 alarms (OptoMos) ........................2
8 digital inputs + 4 analog outputs: 0...5 mA .......................3
8 digital inputs + 4 analog outputs: 0...20 mA .....................4
8 digital inputs + 4 analog outputs: 4...20 mA .....................5
8 digital inputs + 4 analog outputs: 0...5 V .........................6
8 digital inputs + 4 analog outputs: 0...10 V .........................7

**Digital signals/analog outputs (slot 4):**
without digital signals and analog outputs ....................................0
8 alarms (NO relays)+ 8 alarms (OptoMos)................................1
8 alarms (NC relays)+ 8 alarms (OptoMos)................................2
8 digital inputs + 4 analog outputs [2] .................................. 3...7

**Interfaces:**
USB .......................................................................... 1
USB + Ethernet + RS-485 (2) .......................................... 2
USB + Ethernet + RS-232 ............................................. 3

**Memory for measuring data:**
with a 2 GB CF card [3] ......................................... 1
as per order [4] ...................................................... 2

**Supply:**
90...253 V a.c............................................................... 1
18...30 V d.c. ............................................................. 2

**Recorder firmware:**
without mathematical functions [5] ......................................... 0
with mathematical functions............................................... 1

**Softwares servicing the recorder from PC:**
KD Connect, KD Check ...................................................... 1
KD Connect, KD7 Setup, KD Check, KD Archive ...................................... 2

**Acceptance tests:**
without an extra quality inspection certificate ...................................... 8
with an extra quality inspection certificate .......................................... 7
according to user's agreements........................................................... X

[1] Write the range code from the item 2...6 as above: (Slot1)

[2] Write the range code from the item 3...7 as above: (Slot3)

[3] CF card with the lowest capacity from accessible currently on the market

[4] After agreeing with the manufacturer (it is recommanded to use 4 GB CompactFlash card from SanDisk® company)

[5] A key for the activation of mathematical functions can be ordered separately