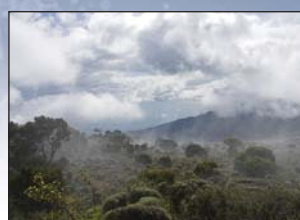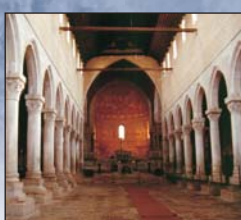**Driesen + Kern GmbH**

Am Hasselt 25
D-24576 Bad Bramstedt

Tel.: +49 (0)4192 8170-0
Fax: +49 (0)4192 8170-99

info@driesen-kern.de
www.driesen-kern.de

**DK650-DK660 "rugged Visual" data logger -
Entering a new dimension of data logging!**

Data logger series
„rugged Visual"

humidity · CO_2· temperature · condensation
barometric pressure · light · differential pressure
analogue signals (voltage · current · pulse)

DK650-DK660 "rugged Visual" data logger -
Entering a new dimension of data logging!

Made in Germany

Integrated sensors	3 flexible inputs
Humidity	Voltage
CO_2	Current
Temperature	Resistance
Barometric pressure	Strain gauge
Differential pressure	Pulse
Light	Humidty & temperature (uses only 1 slot/input)
Acceleration	Thermocouple probes
	Soil moisture
	Condensation
	Water detection

Modern data recording -
fast, safe, versatile

The "rugged-Visual" series by Driesen+Kern GmbH sets standards for customizable data acquisition.

In addition to ist six integrated sensors for humidity, temperature, barometric pressure, light, and differential pressure the device offers three input slots for external probes or analogue signals.

All three slots can be completely configured by the user - hence you don't need to tie yourself down beforehand, but rather you can customize the "rugged-Visual" according to your measuring task.

The robust logger stores up to 4 million readings and its freely selectable sampling interval reaches from 32 Hz to 24 hours.

Using modern low power technologies the device can perform continuous operation for up to 4 years with only one standard lithium battery. An internal back up system provides several days of continued logging in case the battery is completely drained.
Of course, you can always replace the battery.

Simply start the "rugged Visutal" logger with its button or set up a delayed start time with a computer, and see the values on the digital display!
If the LCD is always supposed to be on connect the logger to the external power supply (e.g. over USB).

Originally "rugged"!

It offers IP65 protection - against splash water - by default and is outmost resistant thanks to its shock-proof materials.

Synchronized Readings

The internal RTC always ensures a correct time-reference, allowing you to synchronize several loggers.

Logging goes wireless

By default the sensors are connected by a cable to the "rugged Visual" logger. Optionally you can have a radio module installed, enabling you to also use one wireless sensor.

This helps you to collect data even from measuring sites which are difficult to access.

Overview

- LCD display
- Fast power-on up by the push of a button
- Up to 12 channels in one baby-sized device
  6 integrated sensors
  3 configurable sensor slots s
- Optional wirelss sensor
- Robust logger
  Shock-proof, IP65 protected housing
- High accuracy (24 bit A/D!)
- Memory modes "Continuous" and "stop-when-full" for up to 4 million readings
- Battery level monitoring
- Battery life for 4 years
- Dual alarm function
  LED and switching output
- Standard software InfraLog -*basic*- included in delivery or -*light/enhanced*- with comprehensive gfraphic features as an option

Rugged-Visual models

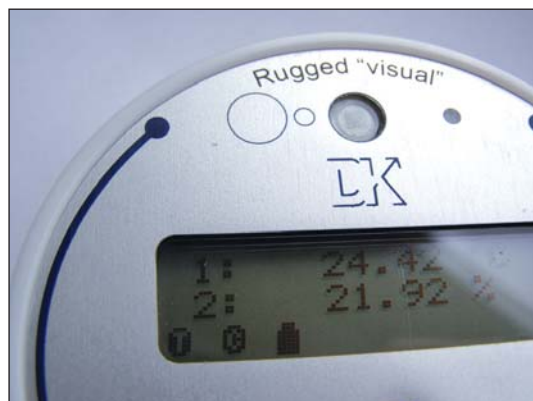|	Humidity/ Temperature	Barometric Pressure	Differential Pressure	Light	CO$_2$
DK650	No internal sensors - order option 3S				
DK651	●				
DK652				●	
DK653		●			
DK654			●		
DK655	●	●			
DK656	●		●		
DK657	●	●		●	
DK658	●		●	●	
DK659	●	●	●	●	
DK660	●				●

Order Code: DK6xx- A -B -C -D

A: 0 = integrated sensor only
3S[1] = 3 additional inputs for external sensors or analogue signals
(Option not available for DK660)
3DMS= 3 additional slots for precise measurement of strain gauges, bridges

B: 0 = LCD-display and immediate start button

C: 0 = Alarm LED, only
AL = switching output

D: 0 = no wireless functionality

E: STD = Standard Range
If any special range for differential pressure or CO2 is needed, please state range here (ranges available see page 9)

1 All three slots are user-configurable. Humidity/Temperature probes use obnly one slot.
Thermocouple sensors can only be connected to modells Dk651, 655-659.

Humidity and Temperature

The internal humidity sensor is a precise sensor based on a capacitive measuring principle.

The sensor is protected by special semipermable membrane and can be used even in rogh environments.
It is insensitive to many chemical substances and has a state-of-the art long-term-stability of better than +/-1%per year.
With its accuracy of up to +/-1,8% RH and 0,3°C it may well be used in applications with a high level of technical requirements.
Iit may be used in a range of -20...+80°C and 0..100%RH except that prolonged wettening shall be avoided as with all humidity sensors.
All instruments containing a humidity and temperature sensor are delivered with a certificate of conformity. Other options include calibration certificates according to ISO or DAkkS.

Der Feuchte/Temperatur-Sensor ist in den Modellen DK651, DK655-660 integriert

CO$_2$

The modell DK660 comes with one of the most modern CO2-sensors based on a patented NDIR (non-dispersive infrared) sensor.
This sensor gives accurate and reliable readings in a range of 0...2000ppm (optional 0...5000ppm or 0...10.000ppm) and has an outstanding long-term stability.
This is particularily achieved by the sensor´s autocalibration using the fact that in naturally as well as forced ventilated buildings the lowest measured value is calibrated to 400ppm one a week. This technology has proven itself since many years and can be used inside as well as outside for example in climate outdoor studies in a range of -25...+55°C.

Due to the low power consumption of the sensor and the datalogger, unattended campaigns of several months can be conducted.

The logger can furthermore be used as a fresh air indicator.
It has three LEDs indicating the air quality in green (<1500ppm) as good, yellow (1500...2500ppm) as medium and red (>2500ppm) as poor. It will furthermore give the exact value in ist when turned on.

Der CO2-Sensor ist nur in dem Modell DK660 integriert

Differential pressure

The models DK654, 656, 658 and 659 are fitted with a differential pressure sensor. Many ranges can be selected to achieve utmost accuracy for the requested application. The piezo-electric sensor is available in several ranges, starting from a 1.000 Pa to a 5 bar range.

Barometric pressure

Some of the rugged visual loggers have an integrated barometric pressure sensor, which measures within a wide dynamic range of 600 to 1100hPa.
The models DK653, 655, 657, 659 can therefore be used for measuring barometric pressure combined with other climatic parameters.

Light sensor (lux)

Four models of the RuggedVisual-series measure light by an integrated lux-sensor. These are DK652, 657, 658 and 659.
The response curve of this sensor has been optimised for the human eye response to light and measures in lux units. This is preferred for human and animal studies. Optionally we offer scientific sensors for UV, pyranomter, PAR etc. Which may be connected to the analogue inputs (-3S required).

Option 3S and 3DMS

If the -3S option is ordered, the logger obtains three additional sensor slots. These are user-configurable and may be used for analogue signals. Furthermore they can be used for many of the special sensors that we offer (i.e. temperature, bedewing, water ingress and combined humidity/temperature).
Option -3DMS needs to be ordered, if strain gauges or very low signals are going to be measured.

Sensors, probes for DK65X-3S/3DMS

Temperature sensors for DK65X-3S

Driesen+Kern GmbH manufactures several standard temperature sensors for the DK65X-3S.
Furthermore a large selection of sensors is available (see separate spec seet)

DS-325 standard probe
D=4mm, L=100mm

CM-325 standard probe
D=4mm, L=50mm

CO-325 Air temperature probe
D=4mm, L=17mm
mit extrem schneller Ansprechzeit

EU-325 standard probe
L=20mm, W=10mm

EUM-325 Surface temperature
with magnet L=25mm, W=14mm

MT-315 Thermocouple probe
D=3mm, L=200mm
for high temperatures (1200°C)
(other probe see separate
datasheet)

Combined humidity-/temperatureprobes for DK65X-3S

RFT-325 - Measures humidity and temperature. Operating range: -20 and +80°C, or -40 to +120°C with cable type G. Dimensions: d=8x35mm
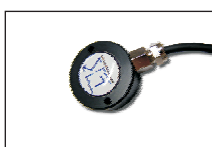
DKRF300-325 - Measures humidity and temperature. Operating range: -20 and +80°C, Dimensions: d=8x101mm

RFTXS-325 - miniaturised sensor for measuring for example in screed.
max . +80°C
D=4,6mm, L=200mm,

RFTXXS-325 - Especially small probe with dimensions d=4mm and l=20mm.
Sensor cable: 2m

RFTO-325 - Probe for humidity and temperature at walls and boundary layers.
D=30mm x H=10mm

RFTW-325 - Special probe for measuring humidity/temperature in confined spaces or wall surfaces. Dimensions: l=45mm, W=20mm

DKRF370-325 Humidity-/temperature snesor for pressure applications max. 100bar, G3/8" thread, Range -20/+80°C L=100mm, D=13mm

TR351 Radiation screen
for RFT-325 and DKRF300-325. Minimises influence from solar raditation and protects againts rain. (D=77mm/H=108mm)

SHS-325 - Detects incipient bedewing. Signal "1" if condensation occurs, "0" if not Operating range: 0...50°C Dimensions: 43 x 10mm

SHSW-325 - Detects water ingress. (Pipe burst, flooding) Signal "1" if moistened "0" if not. Operating range: 0...50°C Dimensions: 60 x 10mm

Cable specifications

The standard probes come with a PVC cable type V and can be used under operating conditions -20...+80°C.
If desired, special cables made of Teflon® (type G) can be used which allow operation from -75...+250°C.
The RFT and RFT-XXS probes can operate within the range of -40...+120°C with a Teflon®cable.
Example: DS-325-V-2000 for the DS-probe with a 2m PVC cable or DS-325-G-2000 with 2m Teflon®cable.

Sensors, probes for DK65X-3S/3DMS

Current clamps, displacement, force, weather sensors

Driesen+Kern GmbH offers a wide range of probes to connect to the DK65X logger.
A small number of probes are listed below. If you do not find a suitable sensor here, you may be able to connect others as well. Feel free to contact us if you need any assistance to select your sensors.

Current clamp MN-89
Range: 0,5..240A
Opening: D=20mm

Electrical transducer
For measuring high voltage/current
Model Uw : Umax= 650V (AC)
Model UgT : Umax=600V (DC)
Model IgT : Imax = 5A (DC)

LP-50F Wegsensor (-3DMS only)
zur Erfassung z.B. von Längen-
änderungen
Gesamtlänge: L=129mm
Messbare Dehnung bis 50mm

K25 Force sensors (-3DMS only)
Torque, force, load sensors
0,02 to 50 KN
Accuracy class: 0,1%/0,2%

Radiation sensors
Wwe offer a wide range of radiation
i.e. LUX, UV, PAR, Pyranometer

EC5 -Soil Moisture probe Special
sensor to measure moisture in soil by
volumetric water content

ARG100 Rain gauge
affordable tipping bucket
raingauge.
area: 506,7cm²
sensitivity: 0,2mm

Young 52202/52203 Rain gauge
With heating option, tipping bucket
according WMO recommendation
area: 200cm²
sensitivity: 0,1mm

**WG3400 low-cost wind speed
sensor 0,5..35m/s**
Accuracy 0,5m/s / 5%
(connects directly to "-3S", no
additional power supply needed)

**WR3124 low cost wind direction
sensor** with potentiometer
Reoslution: 0,5°
(connects directly to "-3S", no
additional power supply needed)

Accessories for "Rugged Visual" datalogger

Wallmount including one wire and
seal for easy mounting and
securing the logger on a wall.
Set of wires and numerised seals
(50pcs each) Wandhalterung zur
einfachen available as well.

Optionally, a traceable calibration
certificate can be ordered with the
logger.

Carrying case
For three logger DK65X/660 as well
as cable, USB stick and probes

Connection cables
voltage: up to 1VwithDKC-S, otherwise DKC-U
current: DKC-I
pulses: Use DKC-S for potential-free pulses
            Also for pulses with a "low" signal <0,5VDC
            and "high"signal between 2 and 3V
            For "high" signals >3 and <24V use DKC-P

Included in delivery:
datalogger, 1 battery, software InfraLog -basic-,
USB-cable, manual, certificate of conformity
If option -3S or -3DMS is ordered: 3 connection cables
type DKC-S

Software *InfraLog* for Windows V5

InfraLog V5

Basic-Version
Light-Version
Enhanced-Version

For Windows XP/Win7

InfraLog V5.0 offers a multitude of features for all Driesen+Kern data loggers. Three versions are available: basic, light and enhanced version with different functionality.

Features of the "basic"-Version

· Automatic logger identification

· Displays loggerstate (logging/alarm/low battery)

· Start/stop/download just by simple
  push-the-button operation

· Input configuration incl. engineering units
  (for transducers with analogue outputs)

· Download while logging

· Online-Measurement (metermode)

· Fast! export to spreadsheet

· Calculates absolute humidity/dewpoint

· USB 2.0 Support for fast download (500 kbps)
  (25 seconds for 100.000 readings)

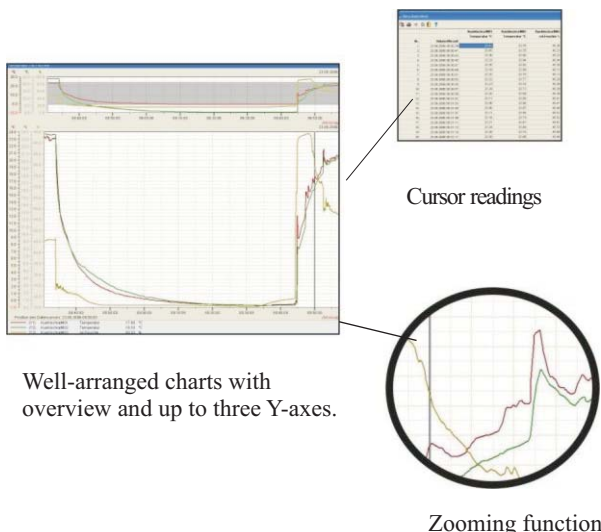· languages: german, english

· compatible with WinXP/7/8

Features of the Light version

Graphical analysis of measured values with the following functions:

· formular editor (calculated channels)

· y/t-charts (values over time)

· Three scaleable Y-axes

· Zooming function

· Displays readings at the cursor

· Displays spreadsheets

· Combining a series of measurements in one chart

· Definition of thresholds

· Statistics (min, max, mean)

Advanced features of the Enhanced version

· y/x- charts (values over values)

· Allocation of up to 12 channels

· Generating daily, weekly, monthly,and annual reports

· Input of start and stop for the analysis period

· Input of analysis interval

· Print settings

Cursor readings

Well-arranged charts with
overview and up to three Y-axes.

Zooming function

Specifications

General

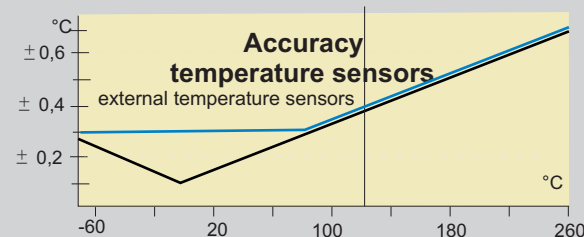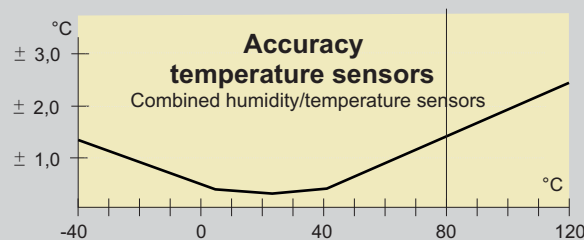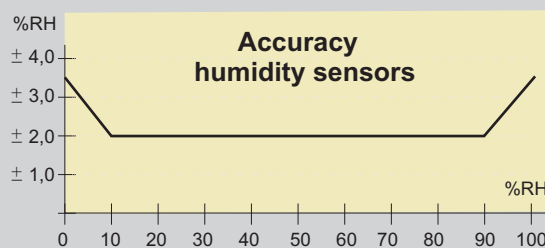|	
Operating temperature:	-30...+70°C
Dimensions:	
DK650-DK659:	d=80mm, h=40mm
DK660:	d=80mm, h=65mm
Battery life:	
DK650-DK659:	4 years @ 1 minute 230 days @ 10 seconds 25 days @ 1 second
DK660:	**2** years @ 10 minutes 1/2 year @ 1 minute
Interval:	1 sec...24 hours
FastMode:	32Hz (only on analogue inputs)
Housing material:	Robust, shock-proof POM composed synthetic material,IP65
Memory Capacity:	4 million readings

Sensors and inputs

	Range	Resolution	Accuracy
Temperature (internal):	-40...+90°C	0,01 K	see diagram
Temperature (external): (Pt100 or Pt1000	-70...+250°C	0,01 K	see diagram
Temperature (Thermocouple Type K,T,J,B,E,N,R,S)	-100...+1300°C	0,05 K	Kl.I/II
Humidity: (Internal/external)	0...100%rF	0,01%rF	s. graph
CO_2: (optional 5000ppm, or 10.000ppm)	0...2000ppm	1ppm	+/-50ppm +3% of rdg.
Barometric pressure:	600...1100hPa	0,1 hPa	+/-1,5 hPa[1] +/- 0,5 hPa[2]
Differential pressure: **Standardrange**	+/-1000 Pa	0,1Pa	+/-15Pa
Further optional ranges: +/-2000Pa, +/-5000Pa, +/100mbar, +/-200mbar, +/-500mbar, +/-1bar 0...2bar, 0...5bar		0,025% of range	+/-0,5% of range
Light:	0...40.000 Lux	1 Lux	+/- 10% of rdg

Included in delivery:
Data logger, 1 battery, Software InfraLog -*basic*-,
USB cable, user's guide, Certificate of conformity

Optionally available:
Software *InfraLog -light or enhanced,* calibration certificate,
wall holder, carry case, lead seal set

Accuracy humidity sensors

Accuracy temperature sensors
Combined humidity/temperature sensors

Accuracy temperature sensors
external temperature sensors

-- external probes without calibration

--external probes EU,DS,CO
with physical calibration

Specifications

The logger will be supplied with three additional, flexible inputs if the option „-3S" has been ordered. These can be used for measureing analogue signals (voltage, current, pulses) as well as signals from a large number of sensors such as temperature, humidity, light, wind, pressure and many more (see page 7/8 for available sensors).

If the option "-3DMS" is ordered, the DK65X can be supplied with three special inputs which can be used for very low signals, strain gauge measurement or other wheatstone bridges.
The logger supplies a stabilised output current for these type of measurements.

High impedance mode for voltages

Range (mV):	+/- 5	+/-10	+/-20	+/- 50	+/-100	+/-1000
Resolution (µV)[2]:	0,15	0,3	0,6	0,8	1,5	15
Input impedance (GOhm):	1					
Accuracy:	0,1% of chosen range					

[2] The maximum sampling rate in high impedance mode is 1Hz.

Strain gauge (bridge circuits)
(for full bridges of 60...700Ohm)

Range (mV):	+/- 5	+/-10	+/-20	+/- 50	+/-100
Resolution (µV)[1]:	0,15	0,3	0,6	0,8	1,5
Input impedance MOhm	2,5				
Accuracy	0,1% of chosen range				

[1] When logging at 32Hz, the resolution is then 10x of the above values.

Single ended voltage signals

Range (mV):	0-10	0-20	0-50	0-100	0-1V	0-2,5	0-5V	0-10V
Resolution (µV)[3]:	0,58	0,58	0,76	1,54	15,4	38,9	76,9	154
Input impedance (MOhm):	2,5	2,5	2,5	2,5	2,5	0,1	0,1	0,1
Accuracy:	0,1% of chosen range							

[3] Single ended signals can be sampled at a maximum rate of 32 Hz.
The maximum resolution is 10x of the values specified above.

Current

Range (mA):	0 - 24mA
Resolution (µA):	0,36 µA
Input impedance (Ohm):	10
Accuracy:	0,1% of chosen range

Pulsecount (potential-free)

Range	0...65.000 pulses per interval	0...100 Hertz
Resolution	1Pulse / 1 Hz	1Pulse / 1 Hz
Accuracy	1Pulse / 1 Hz	1Pulse / 1 Hz

Pulsecount (voltage pulses, max 24V)

Range	0...65.000 pulses per interval	0...1300 Hertz
Resolution	1Pulse / 1 Hz	1Pulse / 1 Hz
Accuracy	1Pulse / 1 Hz	1Pulse / 1 Hz

Connecting analogue inputs
Voltage/current:
Signals within a range of 0...1V can be can be connected with the standard cable DKC-S.
Signals with higher voltage (max. 24V) need to be connected with the voltage divider cable DKC-U.
When measuring current signals the DKC-I cable is required.

Pulse count

:Potential-free signals or pulses with a low level of <0.5 VDC and a high level between 2 and 3 VDC can be connected with the standard cable DKC-S (included in delivery).
Higher levels up to 24V need to be routed through the DKC-P cable.

Driesen + Kern GmbH

Driesen + Kern GmbH

Am Hasselt 25
D-24576 Bad Bramstedt

Tel.: 04192 8170-0
Fax: 04192 8170-99

info@driesen-kern.de
www.driesen-kern.de

„rugged visual" series 04/13 subject to technical change

CE

Driesen+Kern GmbH
Am Hasselt 25
D-24576 Bad Bramstedt

www.driesen-kern.de
www.driesen-kern.com

Tel. +49 (0) 4192 8170-0
Fax +49 (0) 4192 8170-99
info@driesen-kern.de
TÜV NORD
DIN EN ISO 9001