High Precision Calibration Source
For voltage, current and thermocouples
DIGISTANT®

Model 4462

4462 EN

- **High precision current and voltage source ± 52 mA, ± 30 V Option: ± 22 mA, ± 60 V**
- **Precision simulation for all conventional thermocouples types (optional)**
- **Error limit 0.003 % Rdg.**
- **RS232/USB and optional IEEE488 interface**
- **Current "SINK"**

Application

The precision calibration unit combines high accuracy, low drift, low noise and superior long-term stability with multiple functionality and simple operation.
Ramps, Δ+/Δ-, and multiple setpoint storage make the operation of the device easier for the user.

For that reason the application possibilities are many:

- ► Calibration of current and DC-voltage meters
- ► Precise testing of thermocouple temperature measuring instruments
- ► Calibration of controllers, sensor, detection devices and other devices used in process control
- ► Open-loop process control with the aid of integrated ramp function

The DIGISTANT® model 4462 can be used both as a stand-alone table-top device, as well as in automatic, computer-assisted manufacturing and testing systems.

Description

It is possible to set current of ± 200 nA ... ± 52 mA, voltage of ± 1 µV ... ± 30 V and, optionally, temperature setpoint value of 14 thermocouples types.

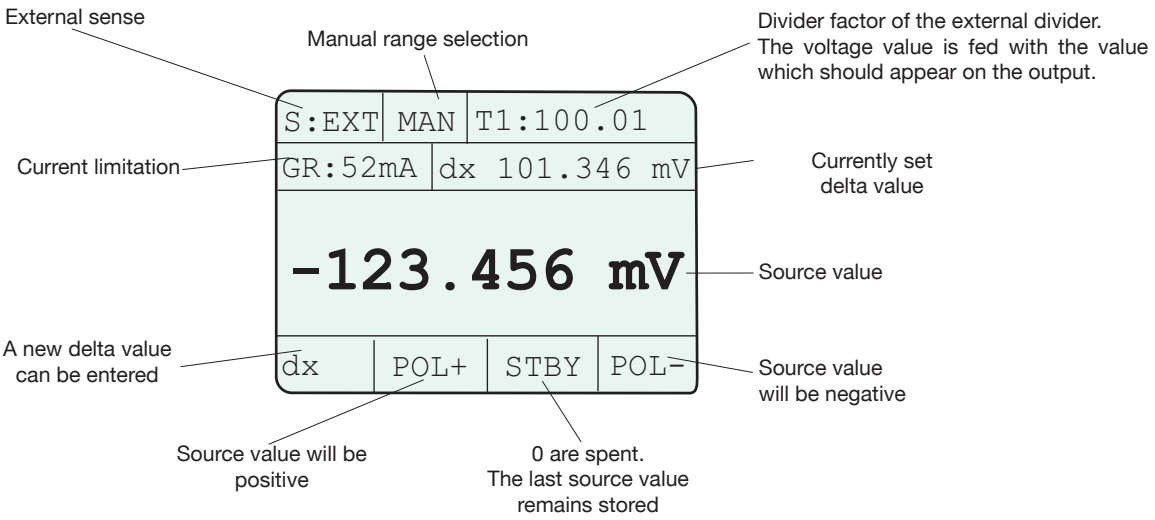
The output value is fed back via the sense line to eliminate voltage drops across the measuring leads.

The device has an adjustable current/voltage limitation. An external voltage divider of 1 up to 1:1000 can be considered internally.

With the thermovoltage sourcing option you can enter °C, °F and K, the temperature scales ITS 90 or IPTS 68 and the comparison point mode constant/external. Furthermore, when sourcing thermocouples a calibrated external comparison point can be used, whereby the data for calibration in the device can be taken into consideration.

Indication of the source value is carried out in large 12 mm figures on an illuminated graphics-LCD.
The device can be operated both via the keyboard as well as the interface.

Source main menu



Operating Examples

Ramp 1 Configuration menu

SEQUENZ: TRIANGEL
REPETITIONS: 17
START-VAL: 0.0mV
END-VAL: 250.0mV
DELTA-VAL: 25.0mV
DELTA-TIME.hh:mm:ss.s
RETU

Ramp function:

- ► Ramp 1 with constant delta values and delta time
- ► Ramp 2 with variable delta values and internal time.

The ramp function allows single or repeated outputs in sawtooth or triangular form. The number of steps can set from 0 to 99 (0 is continuos). The START, END and DELTA values can be entered in µV, mV, V, mA and temperature values. DELTA time is displayed as shown in the menu.

Current/voltage, limit setting

LIMITATION
U-LIMIT: 20 V
I-LIMIT: 10 mA
1 V >---< 32 V
HOME RETU

Current/voltage limit:

If a voltage or temperature value is given, the current limit is automatically active. If current is sourced the voltage limit is active. The voltage limit ranges from 1 V to 32 V and the current limit ranges from 1 mA to 55 mA.

TC/Temperature menu

TC-TYPE: K IPTS68
RJ-TYPE: EXTERN
RJ-TEMP: 300.00 K
TEMP.DIMENSION: K
SCALE:IPTS68
HOME RETU

Pt100 scale (measurement with external RJ)

A = 0.0039083
Ro = 100
B = -5.775E-07
C = -4.183E-12
DIN EN: 0.0039083
0.003 < -- > 0.006
Exp EN HOME RETU

Optionally the thermocouples types R, S, B, J ,T, E, K, U, L, N, M, C, D and G2 can be simulated. For the "manual" reference junction at 0 °C the accuracy depends on the thermocouples model starting at 0.1 K.
The connection occurs direct at the standard terminals or "externally" via an external, attachable reference junction model 4485-V001, at which the temperature is detected with a Pt100 sensor (see application 1)

724-004462EN-5072-111521

Technical Data

Voltage source

Range ±	Reso-lution	Error limits at 23°C ± of reading	TC with resp. to 23 °C
30 V	0.1 mV	0.003% (to ± 4.5 V) +200 µV (> ± 4.5 V) +1.1 mV	8 ppm/K+10 µV/K
3 V	10 µV	0.003% (to ± 450 mV) +20 µV (> ± 450 mV) +110 µV	8 ppm/K +1 µV/K
300mV	1 µV	0.003% (to ± 45 mV) +3 µV (>±45 mV) +11 µ	8 ppm/K+0,35µV/K

Option: 60 V (Range 30 V will be dropped)

Range ±	Reso-lution	Error limits at 23°C ± of reading	TC with resp, to 23 °C
60 V	0.2 mV	0.003% (to ± 9 V) +500 µV (>± 9 V) +2.2 mV	8 ppm/K +10 µV/K

Output current: max. 52 mA at 30 V, source resistance < 10 mΩ
(max. 22 mA at 60 V, model -VXX1)

Current source

Range ±	Reso-lution	Error limits at 23°C ± of reading	TC with resp. to 23 °C
52 mA (22 mA)	200 nA	0.007% (to ± 7.5 mA) +0.6 µA (>± 7.5 mA) +3 µA	10 ppm/K+10 nA/K

Burden voltage: max. 30 V at 52 mA, source resistance > 500 MΩ
Confidence coefficient for the specified errors: 95 % (K=2).
(Burden voltage: max. 60 V at 22 mA, model -VXX1)

Option: Thermocouples simulation

Model	Range	Error (K)*
R	- 50.0 °C ... 1768 °C	0.4 (+ 250 ... 1768 °C)
S	- 50.0 °C ... 1768 °C	0.4 (+ 350 ... 1768 °C)
B	0.0 °C ... 1820 °C	0.5 (+ 800 ... 1820 °C)
J	- 210 °C ... 1200 °C	0.2 (- 210 ... 900 °C)
T	- 270 °C ... 400 °C	0.2 (-170 ... 400 °C)
E	- 270 °C ... 1000 °C	0.2 (- 220 ... 1000 °C)
K	- 270 °C ... 1372 °C	0.1 (- 50 ... 800 °C)
U	- 200 C ... 600 °C	0.3 (- 100 ... 600 °C)
L	- 200 °C ... 900 °C	0.2 (- 100 ... 750 °C)
N	- 270 °C ... 1300 °C	0.2 (- 120 ... 1200 °C)
M	- 50 °C ... 1410 °C	0.1 (- 50 ... 900 °C)
C	0,0 °C ... 2315 °C	0.2 (+ 100 ... 900 °C)
D	0,0 °C ... 2315 °C	0.2 (300 ... 1100 °C)
G2	0,0 °C ... 2315 °C	0.3 (300 ... 2100 °C)

*The errors are defined at "manual" reference junction 0 °C.

Reference junction

EXTERNAL: The temperature are measured with an external Pt100 sensor.
MANUAL: The reference junction temperature is entered manually.

Temperature recording in an external reference junction or temperature measurement with Pt100

Range	Resolution	Current (mA)	Tolerance
- 200 ... 850 °C	0.01 °C	approx. 0.6 mA	0.00006*x °C + 0,045 °C

General Technical Data

Long-term stability: U-Drift < 20 ppm / year + 2 µV / year (300 mV)
U-Drift < 20 ppm / year + 6 µV / year (3 V)
U-Drift < 20 ppm / year +10 µV / year (30/60 V)
I-Drift < 70 ppm / year + 0.5 µA / year

Warm-up time: 30 minutes, until specified error limit

External divider: 1 to 1010

An external voltage divider can be connected. In this case the divider function is activated and the division factor of the external divider is entered. Then the source value is entered as the value that should be present at the divider's output.

Display: graphics LCD display with LED illumination

Visual field: 56.3 mm x 38 mm, resolution 128 x 64 dots

Sockets: + output, - output, + sensor, - sensor, ⏚, gold-plated 4 mm terminals and 6 pin LEMO socket 1B for the optional Pt100 connection.

Potential to ground: ≤ 50 V between analog ground and ground

Temperature range: 5 °C ... 23 °C ... 40 °C

Relative humidity: 80 % up to 31 °C above linear: decreasing that temperature to 50 % at T_{max}, no condensation

Storage temperature: - 10 °C ... 60 °C

Device construction: metal housing in protection class I in accordance with DIN EN 61010 part 1

Power supply: 230 V ± 10 %, 45 Hz ... 65 Hz, can be changed on device to 115 V

Power requirement: approx. 30 VA

Dimensions: (L x W x H) 237 x 285 x 151 [mm] (with handles u = 325 mm)

Weight: ca. 6 kg

Output: potential-free

Outputs and terminals on the rear side

Standard RS232C interface: 9 pin subminiatur D-socket
Baud rate 300 - 38 400
Protocoll ANSI X 3.28 1976
Subcategory 2.1, A3

Optional IEEE488 interface: 24 pin, open collector outputs (E1) SH1, AH1, T6, TE0, L4, LE0, SR1, RL1, PP0, DC1, DT1, C0

Instruction language: SCPI, version 1997.0

Order Information

DIGISTANT® **Model 4462 - V** [ ][ ][ ]

Standard with RS232 **1 0 0**

Additional with IEEE488 **2 0 0**

Option thermocouple simulation **1 0**

RJ temperature recording
(temperature measurement with Pt100)
subsequent installation is possible

Option 60 V/ 22 mA **1**

A test certificate with traceability verification is part of the delivery.

Accessories (Option)

4 measuring leads with low thermal voltage Cu/Te safety connectors, length 1 m **Model 9900-K342**

RS232 data cable
for PC connection **Model 9900-K333**
interface set consisting of USB/RS232 converter **Model 9900-K351**

External reference junction
for DIGISTANT® model 4462
for an accurate simulation of thermocouples,
Connection: Miniature thermo plug connection **Model 4485-V001**
(For description refer to page 4)

Assembly set suitable for 19" rack mounting **Model 2329-Z004**

DKD Certificates

DKD Calibration (basic system)
Each range (voltage, current) is calibrated at ±12,5 %, 25 %, 50 % and 90 % of full scale. **Model 44DKD-4462-V100**

DKD Calibration (extended system)
Each range (voltage, current) is calibrated at ±12,5 %, 25 %, 50 % and 90 % of full scale. With 2 points for 10 thermocouples, temperature of the reference junction 0 °C and two points for Pt100.
Model 44DKD-4462-V110

Calibration Certificate for the external reference junction
At 3 points (0 °C, + 23 °C and 40 °C). If the built-in Pt100 of the reference junction is calibrated (NAMAS, DKD or others) and you enter the probe calibration into the DIGISTANT® model 4462-VX1X the accuracy of the temperature measurement is ≤ 0.1 K (in the temperature range + 15 °C to + 35 °C). **Model 44DKD-4485**

External reference junction model 4485-V001 for thermocouples

- For an accurate simulation of thermocouples
- A built-in Pt100 for cold junction compensation
- Thermally stable and isolated construction
- Plug type: Miniature TC connector

Technical Data

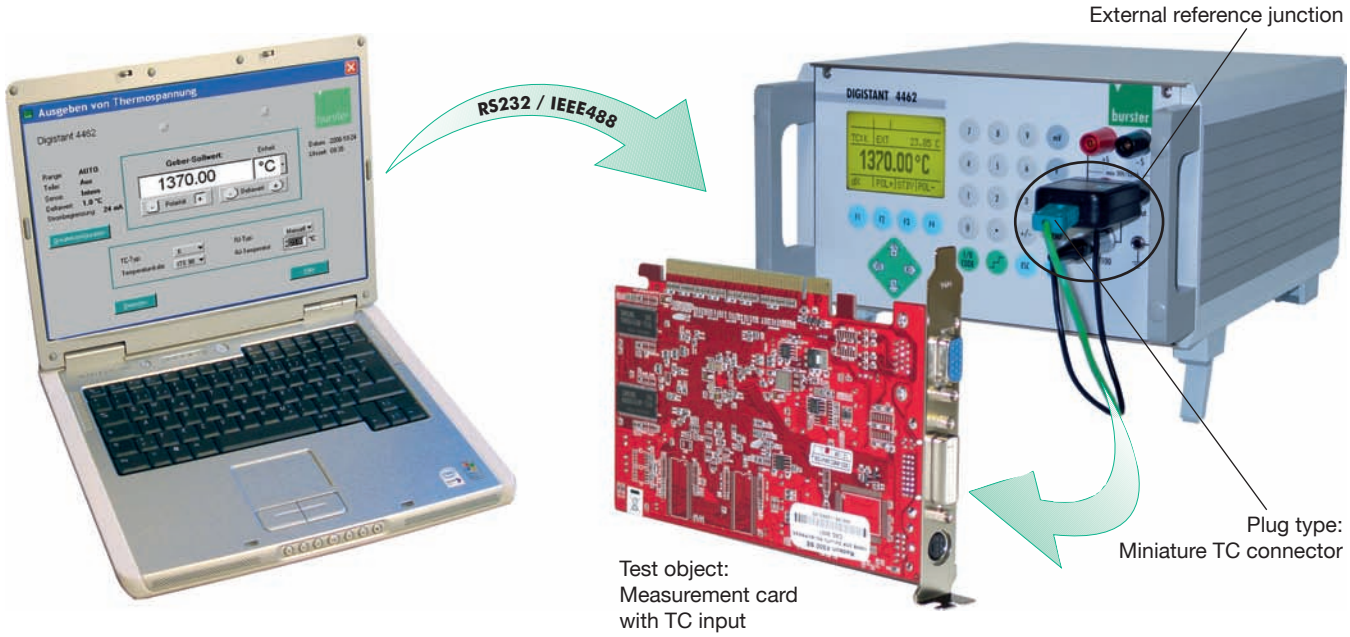
► Limits:	± 0.3 K
► Long term stability:	typical 0.05 K/year
► Insulation resistance between pin in disconnected status:	>= 20 MΩ
► Operating temperature range:	0 °C ... 23 °C ... 40 °C
► Storage temperature range:	- 10 °C ... 60 °C

Note: Thermo cable and connector cause an additional error.
We recommend to use the class 1.

Application Example

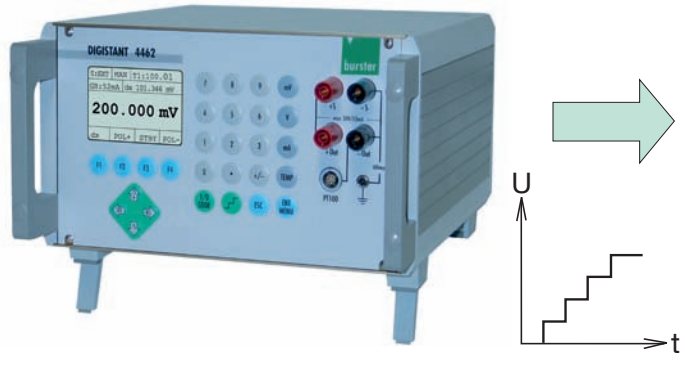
1. Calibration of a PC card with a thermocouple measurement input

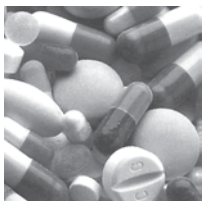
Instead of the thermocouple the calibration source DIGISTANT® model 4462 is connected. Using an external DKD-calibrated reference junction the PC card is retraceable calibrated with the optimum accuracy. Up to 14 thermocouples can be selected.



2. Calibration of measuring system in the medicine engineering

In the sweep function you set different current and voltage values with individual steps. The output happens once ore repetitioned in triangular or sawtooth wave.





Synthesis processes in the production of medicine require a careful check.
A highly secured production process is life saving.