High Precision Calibration Source for Voltage, Current and Thermocouple DIGISTANT®

Model 4462

Code:	4462 E
Manufacturer:	burster
Delivery:	upon request
Warranty:	12 months

4462-E

- **High precision current and voltage source ± 52 mA, ± 30 V**
  Option: ± 22 mA, ± 60 V
- **Precision simulation for all conventional thermocouple types (optional)**
- **Basic error 0.003 % of reading**
- **RS232/USB- and optional IEEE488 interface**

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:

- Testing current and voltage meters
- Precise testing of thermocouple temperature measuring instruments
- Calibration of controllers, sensors, detection devices and other devices used in process control
- Open-loop process control with the aid of integrated ramp functions.

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 currents of ± 200 nA ... ± 52 mA, voltages of ± 1 µV ... ± 30 V and, optionally, temperature setpoint values of 14 thermocouple types.

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

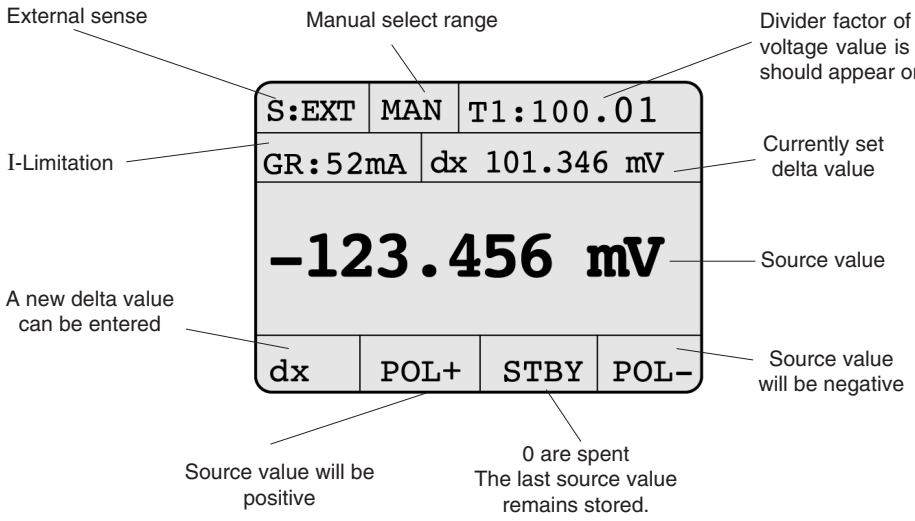
The device has an adjustable current/voltage limitation. An external voltage divider of 1 up to 1:1000 can be considered internally.

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



Operation 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 interval 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 continous). 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. At the current source the voltage limit is active. The U-limit ranges from 1V to 32V and the I-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

Pt 100 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 thermocouple model starting at 0.1K.
The connection ensues "manually" directly at the standard terminals and "externally" via an external, attachable reference junction type 4485-V001, at which the temperature is detected with a Pt 100 sensor (see application).

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	8ppm/K +10µV/K
3 V	10 µV	0.003%	(to ± 450 mV) +20 µV (>± 450 mV) +110 µV	8ppm/K +1µV/K
300mV	1 µV	0.003%	(to ± 45 mV) +3 µV (>±45 mV) +11 µV	8ppm/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	8ppm/K +10µV/K

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

Current source

Range ±	Reso-lution	Error limits at 23°C ± of reading		TC with resp. to 23 °C
52 mA (22mA)	200 nA	0.007%	(to ± 7.5 mA) +0.6 µA (> ± 7.5 mA) +3 µA	10ppm/K +10nA/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: Thermocouple 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:
EXTERN: The temperatures are measured with an external Pt100 sensor.
MANUEL: The reference junction temperature is entered manually.

Temperature recording in an external reference junction or Temperature measurement with Pt 100

Range	Resolution	Current (mA)	TC with resp.
- 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
Current limitation: for U up to 30 V 1 mA ... 50 mA
Voltage limitation: for I up to 50 mA 1 V ... 30 V
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 a 6-pin LEMO socket 1B for the optional Pt 100 connection
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 W = 325 mm)
Weight: approx. 6 kg
Output: Floating

Outputs and Terminals on the Rear Side

Standard RS232C interface: 9-pin subminiature D-socket
Baud rate 300 - 38 400
Protocol 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

Bestellbezeichnung

DIGISTANT® **Model 4462 - V** □□□

Standard with RS232 **1 0 0**
Additional with IEEE488 **2 0 0**
Option thermocouple simulation RJ-Temp. recording (temperature measurement with Pt 100) Subsequent mounting possible **1 0**
Option 60 V/ 22 mA **1**

A test certificate with traceability is part of the delivery

Accessories

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**
Assembly set for 19" rack mounting	**model 2329-Z004**
External reference junction for DIGISTANT® model 4462	**model 4485-V001**

Calibration Certificates for Type 4462

DKD Calibration (Basic system)
Each range (voltage, current) is calibrated at ± 12,5%, 25%, 50% and 90% of full scale.
Order code 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 Pt 100.
Order code 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 data 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).
Order code 44DKD-4485

External reference junction type 4485-V001 for thermocouple

- for accuracy simulation of thermocouple
- a built-in Pt 100 for cold junction compensation
- thermally stable and isolated construction
- Plug type: Miniature TC connector

Technical data

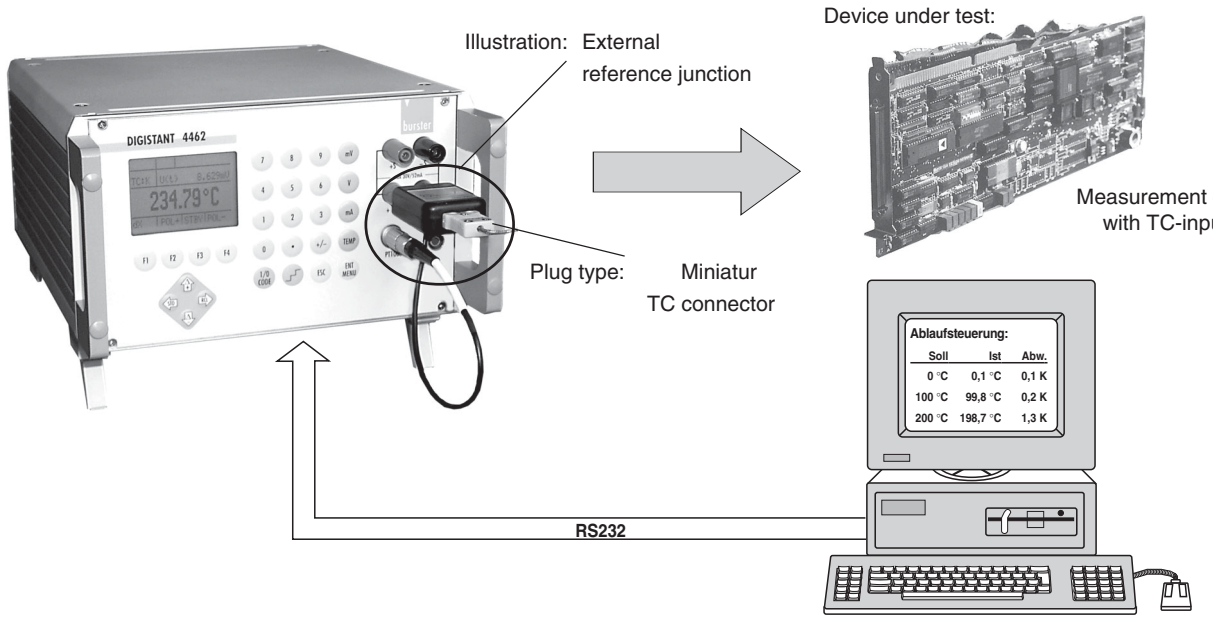
- Limits:	± 0,3 K
- Long term stability:	typical 0,05 K/year
- Insulation resistance:	>= 20 MOhm
- Operating temperature range:	0 °C ... 23 °C ... 40 °C
- Storage temperature range:	- 10 °C ... 60 °C

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

Application Examples

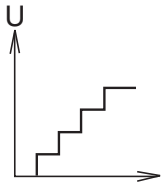
1. Calibration of a PC card with a thermocouple measurement input

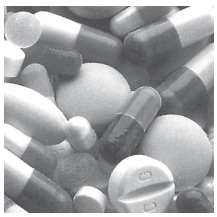
Instead of the thermocouple the calibration source DIGISTANT® type 4462 is connected. Using an external DKD-calibrated reference junction the PC card is retraceably calibrated with the optimum accuracy. Up to 14 thermocouples can be selected.



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 for production of medicine required a careful check.
A highly secured production process is life saving.