

Gelnorm® Geltimer – Touch-Control Type GTC-1

“ all in one”



GTC – 1 – the control unit for our GELNORM® Geltimer with integrated temperature regulator, Probe - temperature measuring channel, data store on USB and touch panel.

- With memory for 50 tests
- max 24 Hour per measuring test
- Data files in CSV format
- Data exchange via USB stick
- Illustrated spare parts list
- Connections retro compatible (compatible with earlier versions)
- Compact design, easy to operate
- Reasonable price / performance ratio



The GTC-1 is an interesting solution regarding data recording, the compact design and simple operation

The GELNORM® gel GTC-1 is a device for the determination of the gelation time of reaction resins in accordance with the standards DIN 16 945 Part 1, DIN 16 919, DIN EN ISO 9396 and DIN EN 14022 Method 5. The Determination of the gel time with GELNORM® Geltimer is automatic, simple and on a reproducible basis at any given reaction resin, under standard conditions with follow materials.

- Unsaturated polyester resins
- phenolic resins
- Epoxy resins
- Polyurethane resins
- Acrylic resins
- Silicone resins



Description of the Equipment

All the earlier auxiliary equipment such as the Gelnorm® Geltimer, the Heating Block GT and the Thermo Unit for the specimen temperature measurement can be connected and are fully compatible. Particular attention has been given to ensure that operating the equipment will be as simple as possible to use. Following customer feedback, the facilities for processing the measuring data are incorporated in the basic instrument. The test data is received by the GTC-1 and, if desired, the test measurements can be transferred to an USB stick for further processing using Microsoft Excel

All additional devices such as the Gelnorm® Geltimer, the heating block GT and the thermocouple for the sample temperature measurement can be connected. Because of the international application a lot of importance was placed on simple operation. On the versatile request of our long-standing customers, the measurement data acquisition is already integrated in the basic device. The test data are recorded in the GTC-1 and, if necessary, the selected test measurements can be transferred to the USB stick for further processing in Microsoft Excel

Starting point

The instrument is set up and operated using this screen display.





System setting

Temperature probe

This is used to measure the temperature in the probe using Thermocouple Type K. The measured temperature can be processed by alignment with a calibrated temperature reference system. The measurements are displayed in chart form and stored in file. If a gelation measurement is made without also measuring the temperature in the specimen, i.e., when the temperature probe is set to off the line drawn by the printer will be on 0 ° C.

Temperature controller

This feature can be activated if required. On the back panel of the GTC-1 there is a connection for the electric heater Art. No. 20.41 together with a connection for the Temperature Sensor. The intended value is set using SV. The temperature regulator can also be calibrated.

Display standby

At the end of a pre-set time the background lighting of the panel is switched off. This increases the working life of the background lighting and saves energy. The switch off feature for the background lighting is not operational whilst a measurement is being made.

Post record time

Presentation of data after passing the Gel point. In the case of exothermal measurements, the rate of temperature change can be very important or interesting.

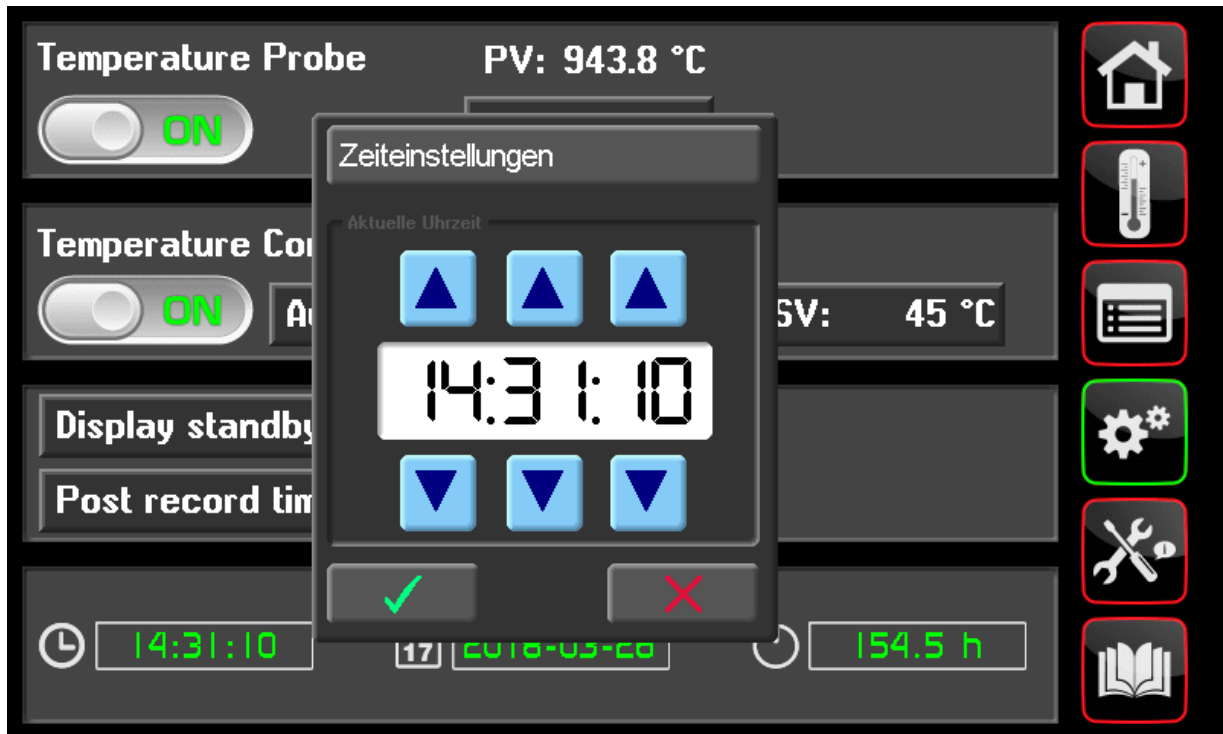
The screenshot displays the control panel interface for the GTC-1 instrument. It features several sections for system settings:

- Temperature Probe:** A toggle switch is set to **ON**. The current reading is **PV: 17.8 °C** and the calibration is **Cal.: 0.0 K**.
- Temperature Controller:** A toggle switch is set to **ON**. The current reading is **PV: 39.8 °C**. The setpoint is **SV: 40 °C** and the calibration is **Cal.: 1.0 K**. An **Autotune** button is also visible.
- Display standby:** Set to **15.0 min.**
- Post record time:** Set to **1 min.**
- System Status:** Shows a clock at **16:36:31**, a calendar icon with the date **17 2018-03-26**, and a power icon with **154.7 h**.

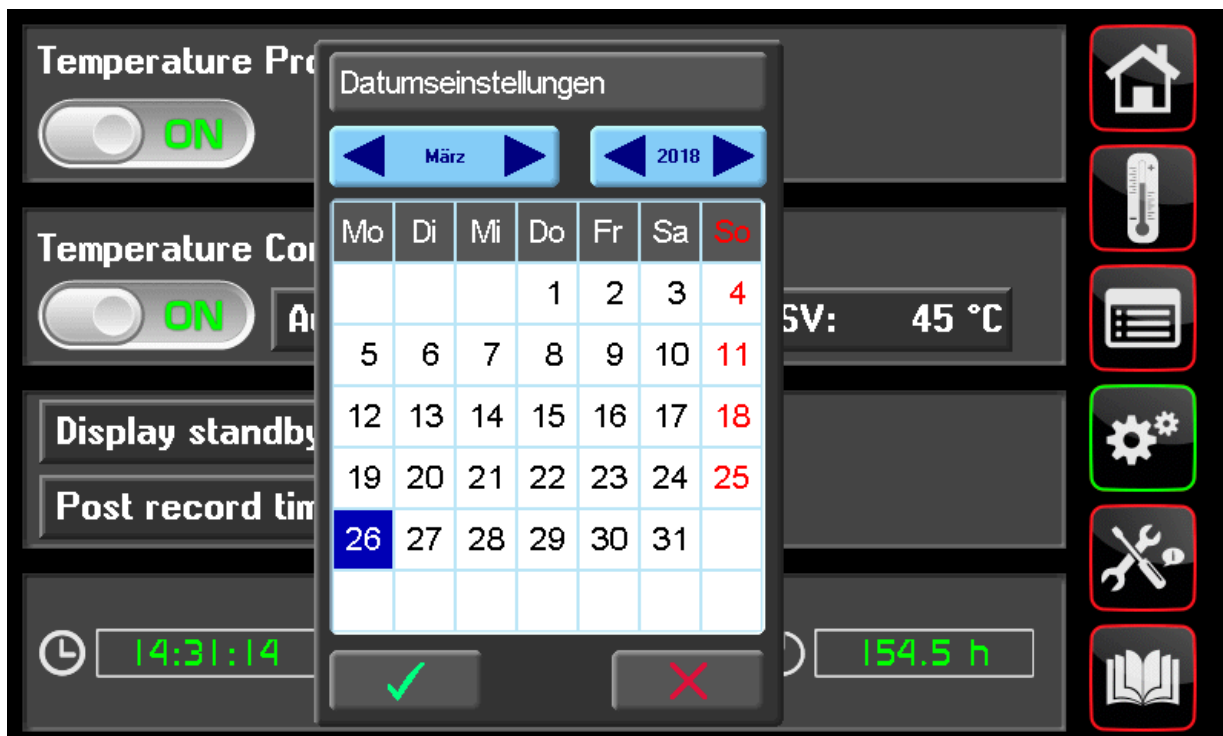
On the right side of the panel, there is a vertical column of six red-bordered icons: a home icon, a thermometer icon, a list icon, a gear icon, a wrench and screwdriver icon, and an open book icon.



Set time



Set date



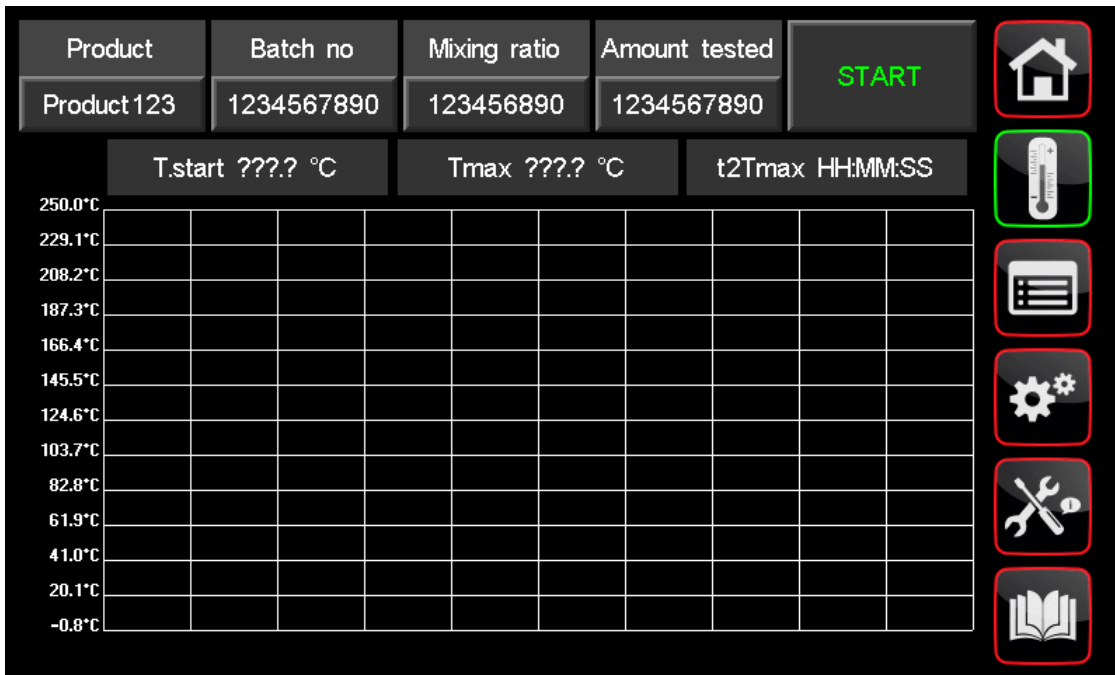


Measurement

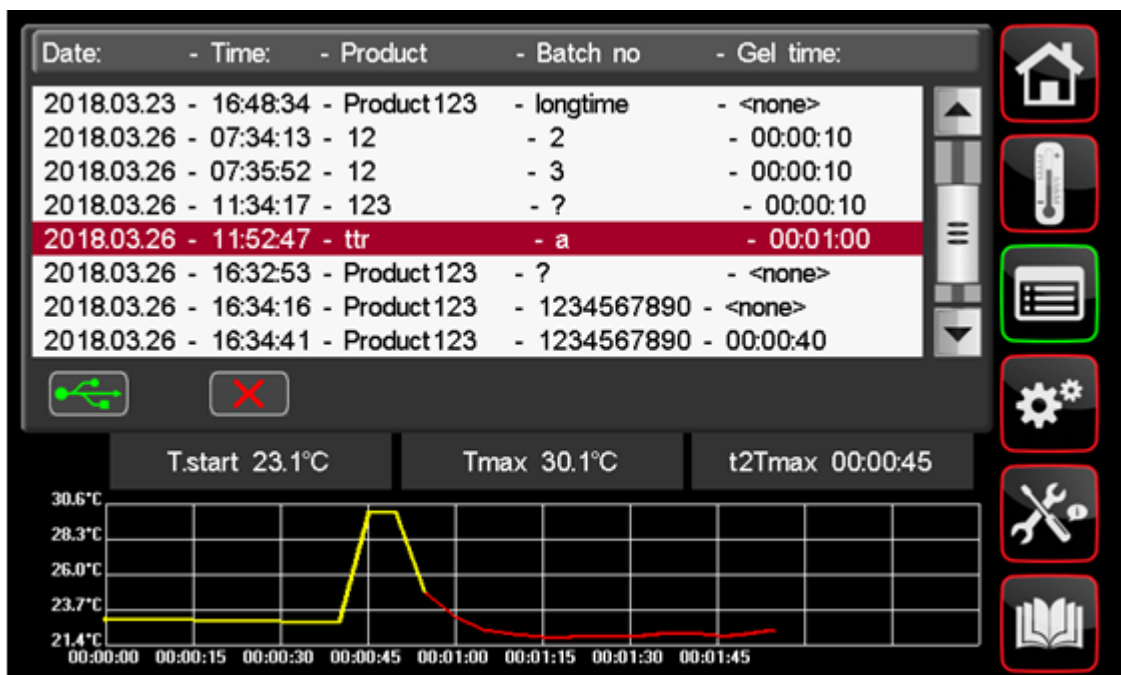
Entering test data for the specimen.

When initial heating has been completed the colour of the start button changes to green and the test can be performed. With no heating the test button is immediately ready to operate. When a Gelation point is reached the colour of the temperature line changes to red. The maximum measuring time per test is 24 Hours.

Online representation



Data transferred to USB stick

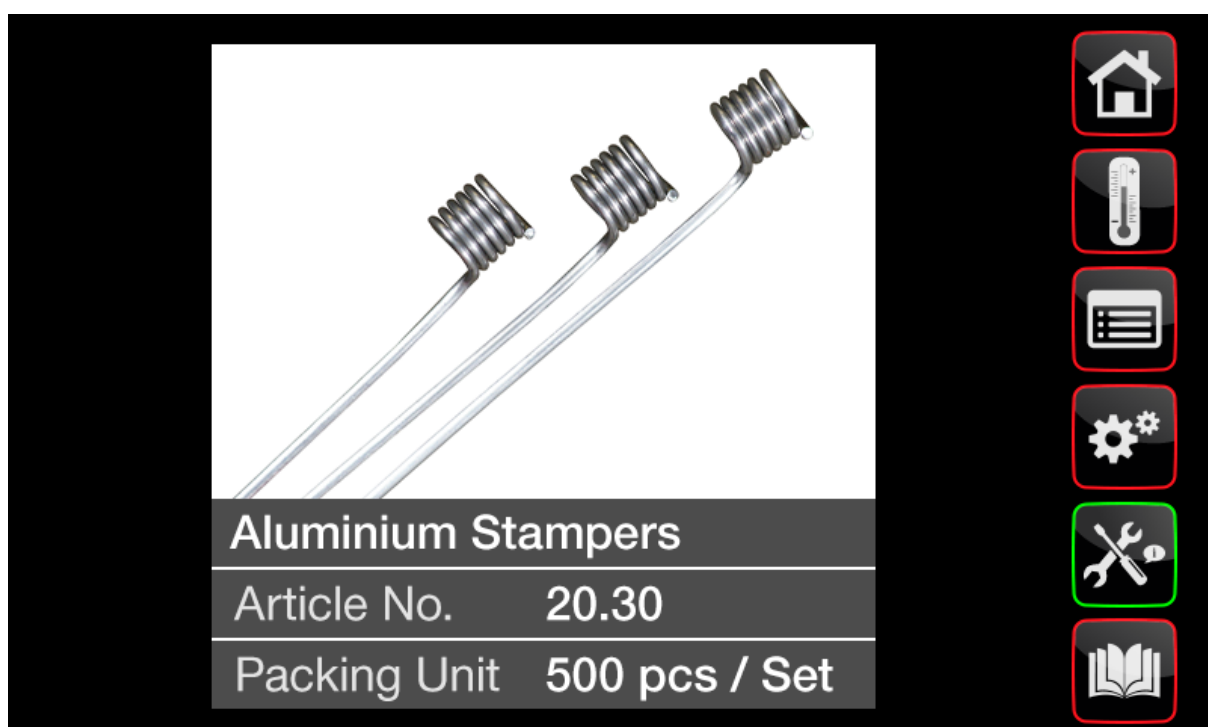




The most important spare parts are illustrated. In this way errors in ordering of spare parts are avoided.



Spare parts detailed presentation with ordering number and quantity input facility





Housing – the basic concept and the aim

The format of the very robust housing is designed to be operated either in a sitting or standing position. The 800 x 480 Pixel touch panel fitted provides optimum resolution and allows a wide angle of view. Touch screen can be operated with gloves and a pointer. Plastic foil is fitted on the touch panel for protection. The power input of the touch panel rated at 6 W can be reduced using the adjustable time setting for the background lighting switch off to 3 W.

Side panels: ground aluminium 3 mm thick
Top and base: 1.5 mm thick brush-finish stainless steel



TECHNICAL DATA

Power input: 115 VAC or 230 VAC, 50 / 60 Hz (internal switchable)
Energy consumption: 10 W without heating, 600 W with heating

Connections for compatible equipment supplied.

Geltimer (200.20.18)	7 pin M12 plug
Heat block GT (200.16.41)	7 Pin plug for power supply and sensor
Probe temperature (20.32)	Thermocouple type K with thermoplug in accordance with IEC 584
USB	Connection for USB stick for data transfer

Touch Panel

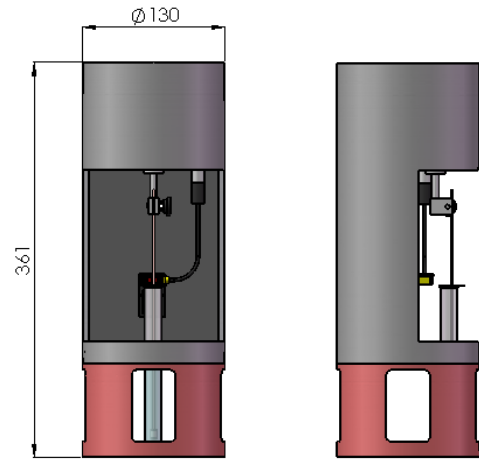
LCD Type TFT LCD, WVGA 800 x 480, Touchscreen 4 Wire, resistive, compact, easy to operate control unit with touchscreen. Computer panel touch screen and Software optimized to one another. Short boot time: only approx. 4 seconds. Low current consumption (6.0 Watt typical), quick response, concept optimized for long-term availability, clock / date: Hardware clock, battery supported, battery RTC clock Li-battery CR2032, 3 V, 235 mAh, 10 years Useful Life.



Technical Data

Test Unit with optical sensor 200.20.18

Time	99h 59min 59s
Cycle (on request other cycles are possible)	10 sec
Dimension	Ø 130 mm, H = 361 mm
Weight	~ 2.5 kg
Material	aluminium anodised
Environment temperature	-30 °C... 50 °C
Power	24 VAC
Connection cable	0.5 meters



Variants of Geltimer Test Units:

- 1 Test unit with electric heating block
- 2 Standard model
- 3 Test unit for Water- / Oil bath



1



2



3



Electric heating for the sample, heat block GT (Standard) Art. No 200.16.41

The integrated control system controls the temperature of the heating block temperature for the sample. The actual and set-point temperature is displayed digitally with a background lighted LCD. About the display colour of the control difference is optically very visible represented.

To ensure high reliability, the controller switches at a value exceeding from the power supply for the heater. In the heating block GT, an irreversible safety thermostat which switches off at 270 °C is installed. This heating block can be installed as an option later at any time on Geltimer.

Security:

- Exceeding controller alarm temperature set point +10 °C
- Safety temperature limiter at 270 °C
- Short circuit of the sensor
- Interruption of the sensor



Using the software, activate the heater and adjust the set point. The release for the measurement takes place only when the set point has been reached. The heater can be adjusted with an actual value offset.

Thermostatic control

Prerequisite for accurate and repeatable measurement is a precise temperature control of the sample. Using a water or oil bath, the buoyancy force of the immersed sample must be considered!

Thermostatic Bath with silicon-oil, 30 °C ... 150 °C

It is possible to perform tests at defined temperatures by submersing the portion of the test tube with the reaction resin into a thermostatic bath. The amount of the liquid in the bath should be adjusted such that its level is about 1 cm higher than the level of the reaction resin in the test tube. (Please note, that the volume excluded by the test tube influences the experiment and, hence, it has to be constant in order to reach an optimal reproducibility of the results.)

Note that the buoyancy forces distort the measurement!

A balancing weight on the test tube must be attached.

Note:

According to DIN EN ISO 9396 the use of the bath requires a coating weight of 10 g and 20 g for liquid resins for solid or powder resins.





Electrical data from the GTC-1

Electrical Specifications

Power supply	115VAC / 230 VAC, 50/ 60 Hz (internally switchable)
Power consumption	20 VA, 650 VA with heating
Connector	7 pole, N, P, PE and Pt100 2 wires, plug type Binder
Main switch	on the rear panel
Fuses	2 pieces, F 3.15A L 250 VAC
Electrical conformity	EMV 2014/30/EU, EN 61010-1:2010, EN 61010-2-010:2014, EN 61326-1:2013
USB Memory	USB Type B connector
Connection Geltimer	M12 8 pole, 24 VAC, 10 VA

Temperature control for the electrical heat block GT

Actual value (Pt100):	Range: 0.0 °C ... 250.0 °C, adjustable and calibrated
Accuracy:	± 0.3 % of full scale ± 1 digit
Set value:	Range: 0.0 °C ... 200.0 °C
Resolution:	0.1 K
Load output	power max. - Resistive load: maximum 600 W self-optimization

Temperature measurement for the sample

Sensor	Thermocouple Type K (Ni-CrNi), EN 60 584
Connector	Mini connector type K thermocouple, EN 60 584
Range	0.0 °C 400.0 °C ...
Accuracy	± 1.5 °C including cold-junction compensation Adjustable and calibratable
Time	
Uncertainty	up to 10 hours, ± 2 seconds Up to 24 hours, ± 3 seconds

Test Unit with optical Sensor

Motor	24 VAC, 50/ 60 Hz, 6 rpm
Switch	optical sensor, standard!
Sample temperature	Thermocouple Type K for installation in the test tube to the sample
Stroke	25mm, 10 seconds for an up and down motion



Order code, Article numbers

GELNORM® - Geltimer for 1 Measuring channel:

1 Stk.	Controller GTC-1 Power cable and USB Stick	200.80.01
1 Stk.	Test unit with optical sensor	200.20.18

Options

▪ Electric Heating		
	Heat block GT for Ø 16 mm glass tubes	200.16.41
	Heat block GT for Ø 20 mm glass tubes	200.20.41
	K-type thermocouple, 5 meters, ready for the Probe temperature	20.32
▪ Thermostatic bath		
	Thermostatic bath for 1 measuring head (without thermostatic oil)	20.50
	with holder and cover for the thermostat	20.50HC

Consumable materials

Stamper aluminum 1 x 235 mm, package with 500 pcs	20.30
Stamper steel (for aggressive specimen mixture), D = 1 mm x 235 mm, package with 500 pcs	20.36
Test tubes 16 x 160 mm, package with 100 pieces	20.55
PE Foam Rings, set with 10 pcs	80.50
Holder for stampers, 3 pieces	20.48

Our Gelnorm® Devices are supplied with a factory calibration certificate.

Our reference measuring instruments are provided with an internationally recognized Calibration.



Geltimer - measure



Temperature - measuring



Temperature - control



Geltimer