

**TCM Graphic Display
Data Acquisition and
Control Unit**



CONCRETE

TCM Graphic Display Data Acquisition and Control Unit



PRODUCT MODEL

C3050 TCM Graphic Display Data Acquisition and Control Unit

STANDARDS

ASTM C39 | EN 12390-3, 12390-4 | BS 1881 | GOCT 10180-2012

INFORMATION

Manufacturer TESTMAK INS.LAB.MAK.SAN.VE TIC. PAZ. ITH. IHR. LTD. STI

Country of Origin TURKEY

Product Name TCM Graphic Display Data Acquisition and Control Unit

TCM Graphic Display Data Acquisition and Control Unit

LCD DATA ACQUISITION CONTROL SYSTEM

The Data Acquisition Control provides real-time graphical indication. Automatically determines the load rate in accordance with the international standards upon sample type. With the STOP and START buttons, the test will automatically stop or start.

LCD Data Acquisition Control System has different units are available (kN / kgf / lbf). Can do Automatic Load Rate upon Sample Type. Total load and also per area are given. and has real time graph indication. Stops Automatically, when Test is completed. Test results can be send printer to with software or from the thermal printer. Can do calibration easily from 5 points. Manual Control is available. Computer and printer are not included in the price.

Data Acquisition Control

Technical Specifications

- 3 universal analog input sockets (ADC)
- Each analog input with 18 bit precision (1/256000)
- 1 replacement analog input
- A total of 4 analog high-precision measuring capacities
- 2 analog output sockets (DAC)
- Analog outputs generate a 0-10V DC output signal
- Motor speed control devices, servo valves with this output signal, proportional valves, etc. reference signal is produced.
- PULSE / DIR outputs (PULSE / DIR / ENA) to control the servo and stepper motor drives
- 5 digital outputs for general purpose (can pull relays and control different electrical units)
- 5 digital inputs for general purpose (receives and evaluates input signals like limit contacts from the environment)
- Potentiometer input (reference signal input for calibration and remote control)
- 2 RS232 serial communication signal outputs (communicates with computers)
- It also connects to motor drives via serial communication via MODBUS connection
- USB communication signal output (communicates with computers)
- Connects to local networks and the Internet with Ethernet 10/100 network connection output (optional)
- Connects to portable devices via Bluetooth wireless connection (optional)
- 500 test results can be stored in internal memory
- Due to the SD (memory) card connection, a large number of test results can be stored in the device memory (40,000 test results).
- In addition, the results can be taken from the device memory and transferred to the computer as an Excel table. (Optional)
- Color TFT display supports 16 lar and 7 800 screen sizes, supports 16M colors and supports 800x480 pixel screen resolution

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- Resistive touch screen allows easy operation of device functions by touching the screen
- Access to frequently used functions with 6 membrane keypads
- The industrial standard operates with 24V DC supply voltage. Built-in voltage filter and regulator protects against input signal fluctuations
- Sensor modules are compatible with loadcell (load cell), pressure sensor (4-20 / 0-20 mA), potentiometric distance sensors, strain washers, thermocouples and all kinds of mV output sensors.
- Provides precise calibration with multi-point calibration (up to 10 points)
- Setting and calibration menus are password protected and prevent unauthorized use
- Allows testing with a computer or device
- There are many test sample information screens and test methods in the device memory and tests can be performed easily
- Different menu languages can be selected via the device via language support
- Speed control algorithm is closed loop PID control and all parameters can be adjusted on user side.
- The device can switch between one-touch load and deformation control modes Cihaz farklı makinelere kolayca adapte edilebilir ve en uygun kontrol sağlar
- The graphical field that visualizes the test results on the screen has the ability to change the scale automatically and automatically adjusts the optimal scale as the values change
- Firmware updates can be made via USB input. In addition, via the computer allows remote or internet update.

When energized to the device, on the digital indicator display will show the following information.

<u>Test standards</u>	
<p>ASTM C39, EN 12390-4, EN 196-1</p> <p>COMPRESSION TEST ON CUBE AND PRISM SAMPLES</p>	<p>TS EN 1390-5, ASTM C78, 293</p> <p>4 POINTS FLEXURAL TEST ON BEAM SAMPLES</p>
<p>ASTM C39, EN 12390-4</p> <p>COMPRESSION TEST ON CYLINDER SAMPLES</p>	<p>TS - EN - 12390 - 6</p> <p>SHARE STRENGTH TEST ON CONCRETE SAMPLES</p>
<p>TS EN 1390-5, ASTM C78, 293</p> <p>3 POINTS FLEXURAL TEST ON BEAM SAMPLES</p>	<p>TS 2428 EN 1338</p> <p>SHARE STRENGTH TEST ON PARQUET SAMPLES</p>
	
	

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Test standards and methods

There are already 18 commonly used test methods in the device memory. With updates, this number is increasing.

The input is displayed by touching the area of the test standard you want to test.

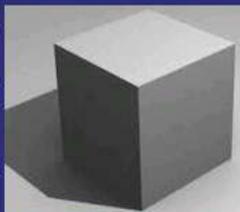
Toggle left / right arrow keys between test standard screens. In addition, the test standards screen is one of the most frequently used home screens, so you can switch from here to the computer connection screen and the settings menu

Compression Strength in Cube / Prism Samples

The compressive strength test in cube samples is a test method commonly used in the ASTM C39 | EN 12390-3, 12390-4 concrete tests standard. When this test method is selected, the sample size screen is displayed first.

Specimen dimensions

Cube / Prism sample dimen. :

Channel / Unit nr. :	0.00	
Width (mm) :	0.00	
Length (mm) :	0.00	
Height (mm) :	0.00	



After a short period of time numune Receiving sample information lanmış message is displayed, the predefined sample sizes of this test method are loaded from memory. Thus, the loss of time from entering the same information is prevented.

It is important to note that with the sample information, the unit number to be tested and the sensor input channel to which the test unit is connected are entered into the device.

The selection of the sample dimensions and the selection of the test unit are performed in this screen. The device makes the necessary calculations according to the entered dimensions and determines the values of the cross-sectional area, etc. and makes the strength calculation accordingly.

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Specimen dimensions

Cube / Prism sample dimen. :

Channel / Unit nr. : **0.00**

Width (mm) : **0.00**

Length (mm) : **0.00**

Height (mm) : **0.00**

7 Home	8 ↑	9 PgUp	Del
4 ←	5	6 →	
1 End	2 ↓	3 PgDn	Enter
0 Ins			






Specimen dimensions

Cube / Prism sample dimen. :

Channel / Unit nr. :

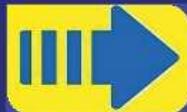
Width (mm) :

Length (mm) : **0.00**

Height (mm) : **0.00**


Sample dimensions loading..



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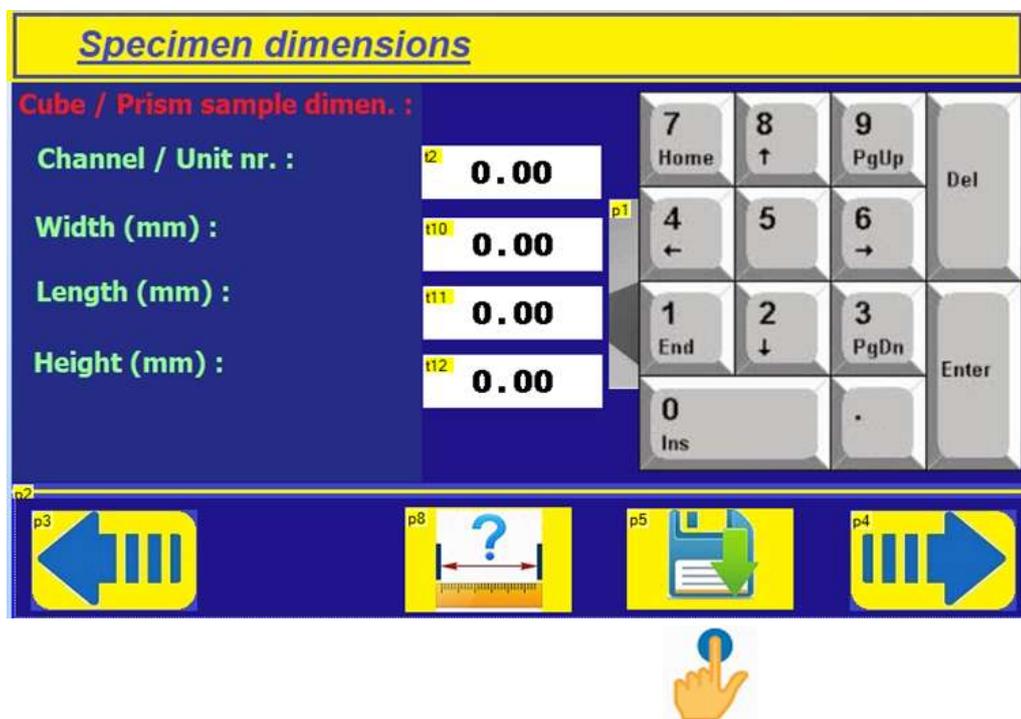
Thus, in which test method the device will receive the data from which sensor, the calibration values, the unit, the unit to be controlled and the required parameters will be automatically loaded.

To change any value displayed on the screen, touch the corresponding data field to open the on-screen keyboard.

Use the on-screen keyboard to enter the desired value and press ENTER.

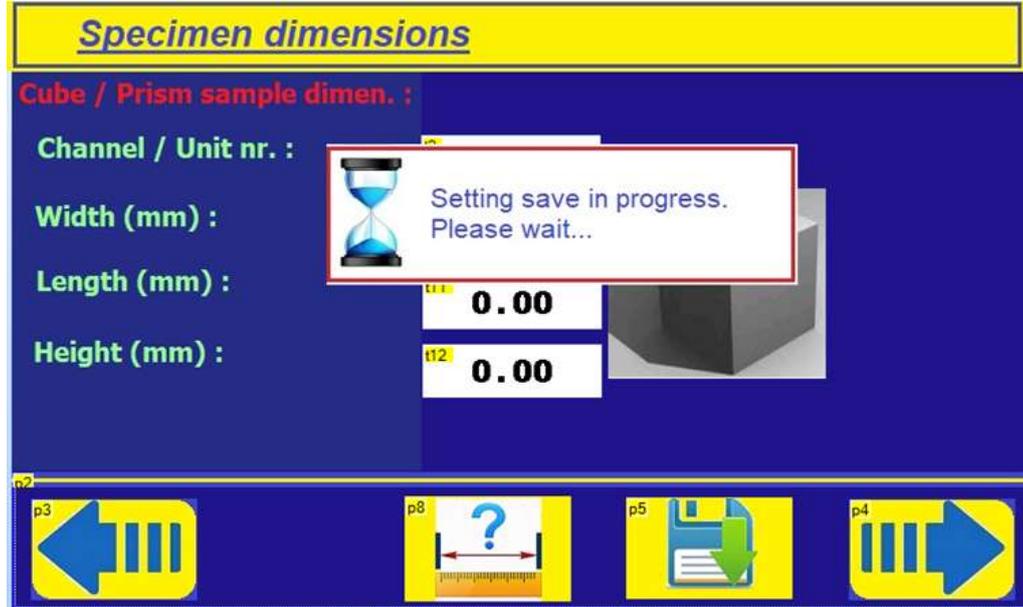
The DEL (Delete) key is used to delete the incorrect data.

The on-screen keyboard disappears when the enter key is pressed.



The  (SAVE) button is used to store data in the device memory.

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When saving data, the message "Saving settings" is displayed.

The method and screen layout described in this chapter are generally valid for all test methods and can be easily entered and saved by following the same process steps.

a: edge length (mm)

s: cross-sectional area (mm²)

$s = a^2$

F: Maximum applied load (kN)

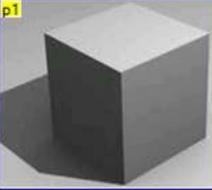
MP: Compressive strength (MPa)

$$\sigma = F/s \text{ (Mpa)}$$

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Specimen dimensions

Cube / Prism sample dimen. :

Channel / Unit nr. :	t2	0.00	
Width (mm) :	t10	0.00	
Length (mm) :	t11	0.00	
Height (mm) :	t12	0.00	

p3

p8

p5

p4



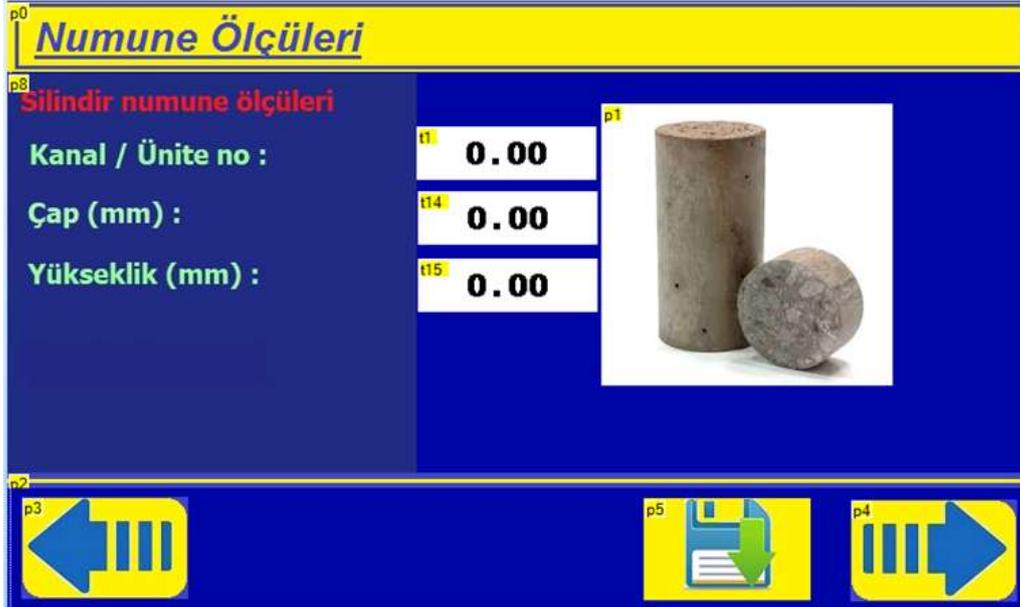
The  NEXT button is used to proceed to the next step.

The next step will be to determine the test parameters related to the selected test method.

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Compression Strength in Cylinder Samples

When this test method is selected, the sample size screen is displayed first.



d: diameter (mm)

s: cross-sectional area (mm²)

$$s = 3.14 \cdot (d/2)^2$$

F: Maximum applied load (kN)

MP: Compressive strength (MPa)

$$\sigma = F/s \text{ (Mpa)}$$

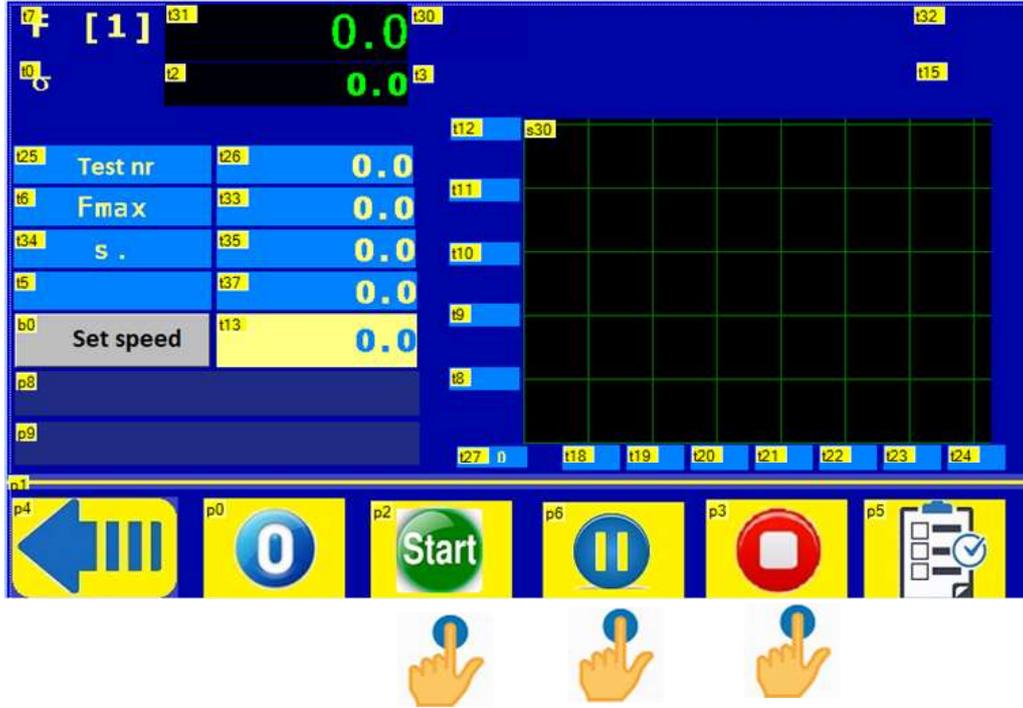
Test Screen

The screen test screen where the tests are performed in accordance with the test method.

At the top of the test screen, the channel, unit and the active value are displayed. In some tests, more than one active measuring channel is shown on the display.

In addition, the test number, the highest measured load value (Fmax), the time elapsed during the test, in seconds, and the set test speed are displayed.

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Start the Test Pause on Load End of test

Start the Test

Press (START) to start the test. First, the device performs a bit of fast loading up to the boot value. When the boot value is reached, the speed is automatically set to the test speed level and kept constant at this level until the end of the test.

Pause on Load

If you want to stabilize the load at any load level during the test (PAUSE), press the hold button. In this case, the load is fixed at the load value level when the hold button is pressed and the device starts to wait. If this button is pressed again, the load will resume.

Pause on Load

The device automatically terminates the test when the condition specified for the end of the test occurs.

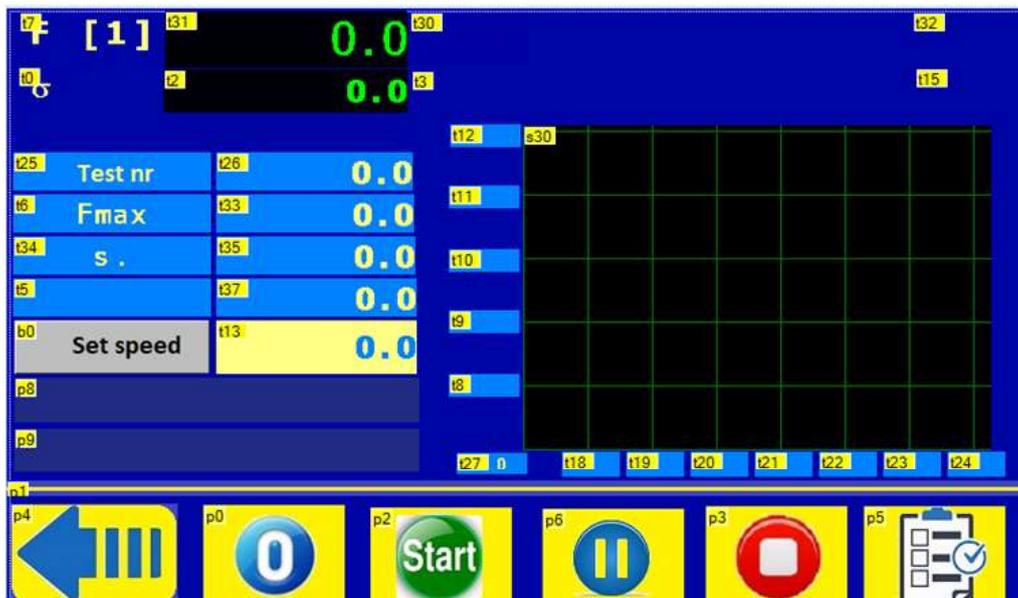
This condition is usually a decrease in the load as a result of the breakage of the test specimen, but sometimes the test can be completed when a certain load or deformation value is reached.

The user can also end the test at any time by pressing the STOP key at any time  (STOP). The unit automatically terminates the test to protect the machine and the sensors when the device detects that the specified loading capacity has been reached.

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Test Results

The test results are saved as a table in the device memory. To access this table, press the test button on the test screen. In this case, the test results are displayed.



Test Results

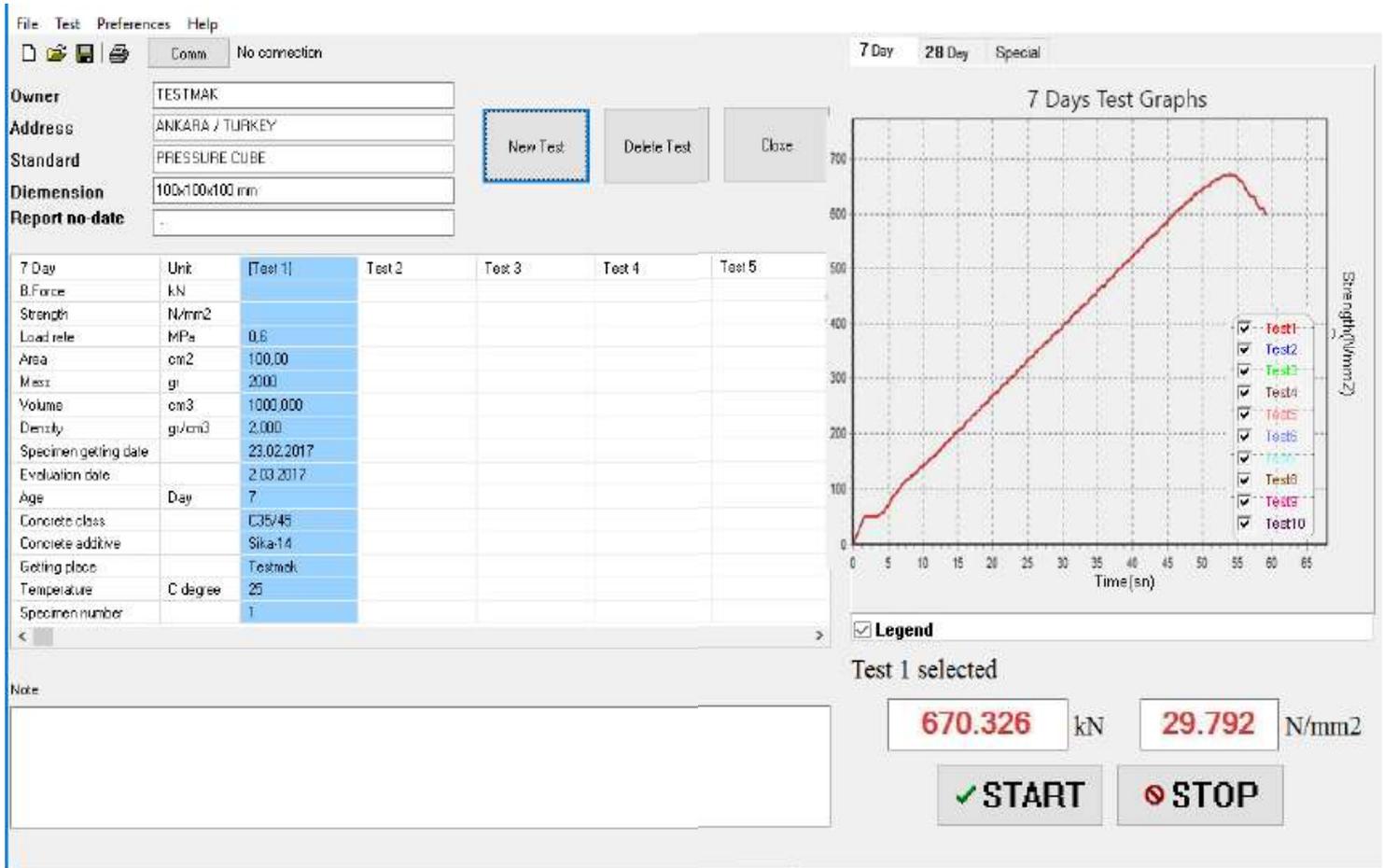
When the test results are displayed in a table, the test result is displayed on each page. Use the up / down arrow keys to scroll through the pages. This allows switching between 500 test results in the device memory.

Test Sonuclari				t22	1	b0	Ara
t48	t47	Numune	t46	t1	t45	t0	t44
No			Fmax		σ (Mpa)		(s.)
t50	t51		t52		t53		t54
t55	t56		t57		t58		t59
t60	t61		t62		t63		t64
t65	t66		t67		t68		t69
t70	t71		t72		t73		t74
t75	t76		t77		t78		t79
t2	t3		t4		t5		t6
t7	t8		t9		t10		t11
t12	t13		t14		t15		t16
t17	t18		t19		t20		t21

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SOFTWARE

The tests and calibration can be done and monitored with a computer by connecting it to the machine. LCD Control unit can connecting with RS232 or USB port to the machine. Using the state-of-the-art software provided by TESTMAK with the machine will help performing and managing the tests in a very easy and fast way. By performing the tests via computer, the results can be saved and recalled when required. Reports can be generated automatically by the software and sent to printer.



The screenshot displays the TESTMAK software interface. On the left, there are input fields for test parameters and a table for test data. On the right, there is a graph titled '7 Days Test Graphs' showing Strength (N/mm²) vs Time (sn). Below the graph, there are control buttons for 'START' and 'STOP'.

Test Parameters:

- Owner: TESTMAK
- Address: ANKARA / TURKEY
- Standard: PRESSURE CUBE
- Dimension: 100x100x100 mm
- Report no-date: -

Test Data Table:

7 Day	Unit	Test 1	Test 2	Test 3	Test 4	Test 5
B.Force	kN					
Strength	N/mm ²					
Load rate	MPa	0.6				
Area	cm ²	100.00				
Mass	gr	2000				
Volume	cm ³	1000.000				
Density	gr/cm ³	2.000				
Specimen getting date		23.02.2017				
Evolution date		2.03.2017				
Age	Day	7				
Concrete class		C35/45				
Concrete additive		Sika-14				
Getting place		Testmak				
Temperature	C degree	25				
Specimen number		1				

7 Days Test Graphs:

The graph shows Strength (N/mm²) on the Y-axis (0 to 700) and Time (sn) on the X-axis (0 to 65). A red curve represents the test results, showing a peak strength of approximately 670 N/mm² at around 55 seconds.

Legend:

- Test1 (Selected)
- Test2
- Test3
- Test4
- Test5
- Test6
- Test7
- Test8
- Test9
- Test10

Test 1 selected results:

- 670.326 kN
- 29.792 N/mm²

Control Buttons:

- START (Green checkmark)
- STOP (Red stop sign)



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MATERIAL TEST EQUIPMENTS

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