

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



**CONCRETE**

## TCM Graphic Display Data Acquisition and Control Unit



### PRODUCT MODEL

<b>C3050</b>	TCM Graphic Display Data Acquisition and Control Unit
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### STANDARDS

ASTM C39 | EN 12390-3, 12390-4 | BS 1881 | GOST 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

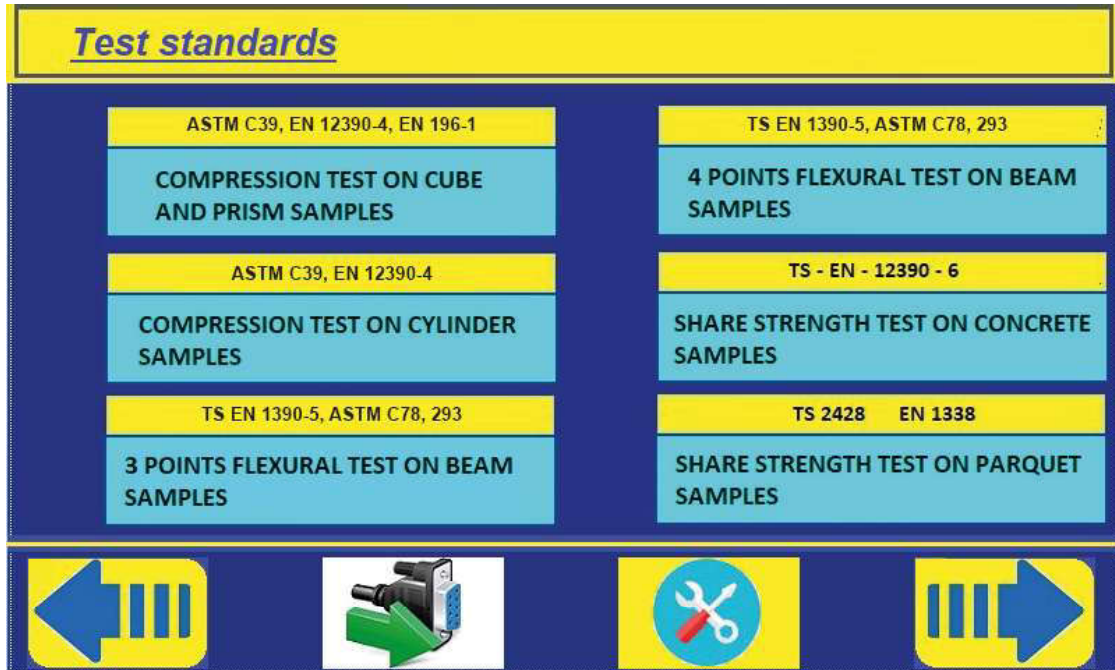
#### Technical Specifications

- 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 sağlanır
- 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.



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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

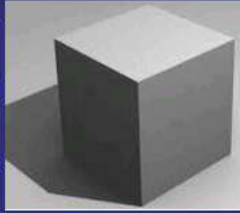
### Compression Strength in Cube / Prism Samples

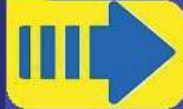



The compressive strength test in cube samples is a test method commonly used in the ASTM C39 | EN 12390-3, 12390-4 concrete tests standard. When this test method is selected, the sample size screen is displayed first.

**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. :**





<b>Channel / Unit nr. :</b>	<b>0.00</b>	7 Home	8 ↑	9 PgUp	Del
<b>Width (mm) :</b>	<b>0.00</b>	4 ←	5	6 →	
<b>Length (mm) :</b>	<b>0.00</b>	1 End	2 ↓	3 PgDn	
<b>Height (mm) :</b>	<b>0.00</b>	0 Ins		.	Enter

**Specimen dimensions**

**Cube / Prism sample dimen. :**

<b>Channel / Unit nr. :</b>	 <b>Sample dimensions loading..</b>				
<b>Width (mm) :</b>					
<b>Length (mm) :</b>					<b>0.00</b>
<b>Height (mm) :</b>					<b>0.00</b>

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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.


**Specimen dimensions**

<b>Cube / Prism sample dimen. :</b>																			
<b>Channel / Unit nr. :</b>	t2	0.00	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>7 Home</td> <td>8 ↑</td> <td>9 PgUp</td> <td rowspan="2">Del</td> </tr> <tr> <td>4 ←</td> <td>5</td> <td>6 →</td> </tr> <tr> <td>1 End</td> <td>2 ↓</td> <td>3 PgDn</td> <td rowspan="2">Enter</td> </tr> <tr> <td colspan="2">0 Ins</td> <td>.</td> </tr> </table>			7 Home	8 ↑	9 PgUp	Del	4 ←	5	6 →	1 End	2 ↓	3 PgDn	Enter	0 Ins		.
7 Home	8 ↑	9 PgUp				Del													
4 ←	5	6 →																	
1 End	2 ↓	3 PgDn				Enter													
0 Ins		.																	
<b>Width (mm) :</b>	t10	0.00																	
<b>Length (mm) :</b>	t11	0.00																	
<b>Height (mm) :</b>	t12	0.00																	


p3




p8

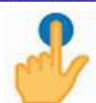



p5



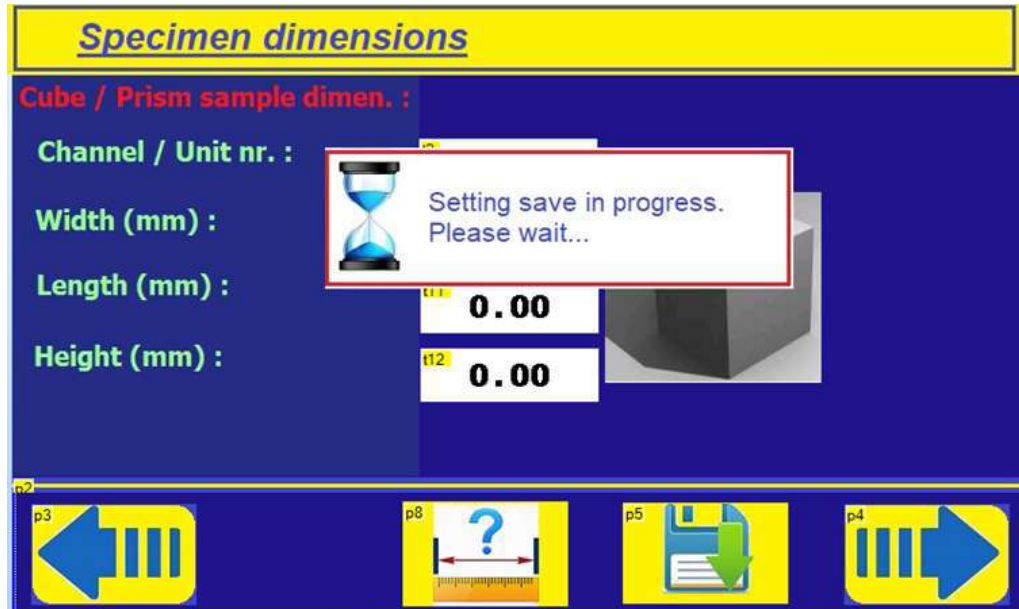
p4





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

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When saving data, the message "Saving settings ir 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 (mm<sup>2</sup>)

$$s = a^2$$

F: Maximum applied load (kN)

MP: Compressive strength (MPa)

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

## TCM Graphic Display Data Acquisition and Control Unit

Specimen dimensions


Cube / Prism sample dimen. :





Channel / Unit nr. : p2 **0.00**


Width (mm) : t10 **0.00**


Length (mm) : t11 **0.00**

Height (mm) : t12 **0.00**

p1 

p3  p8  p5  p4 



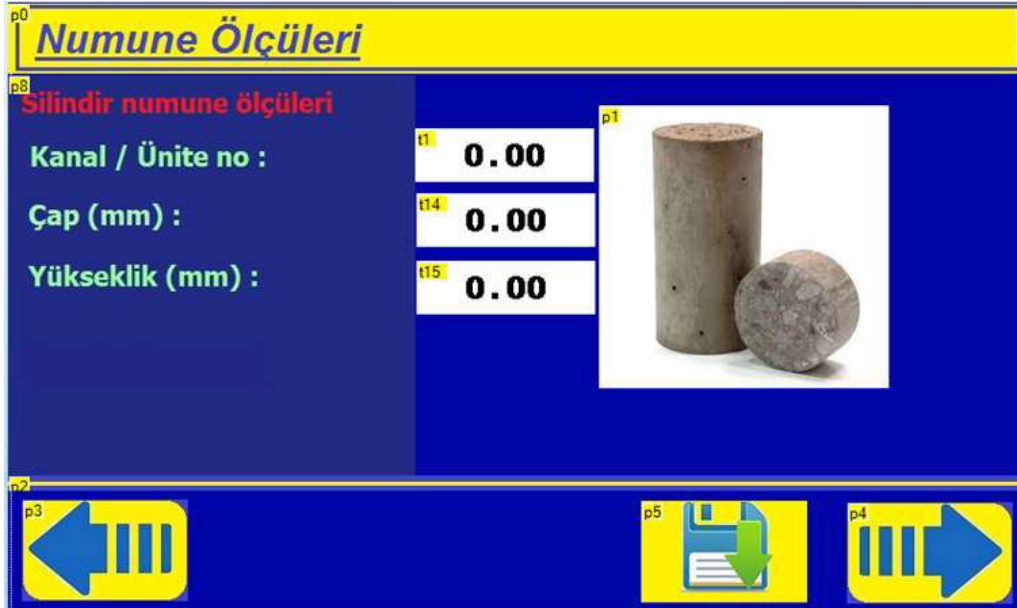
The  NEXT button is used to proceed to the next step.

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

## TCM Graphic Display Data Acquisition and Control Unit

### 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 (mm<sup>2</sup>)

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

F: Maximum applied load (kN)

MP: Compressive strength (MPa)

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

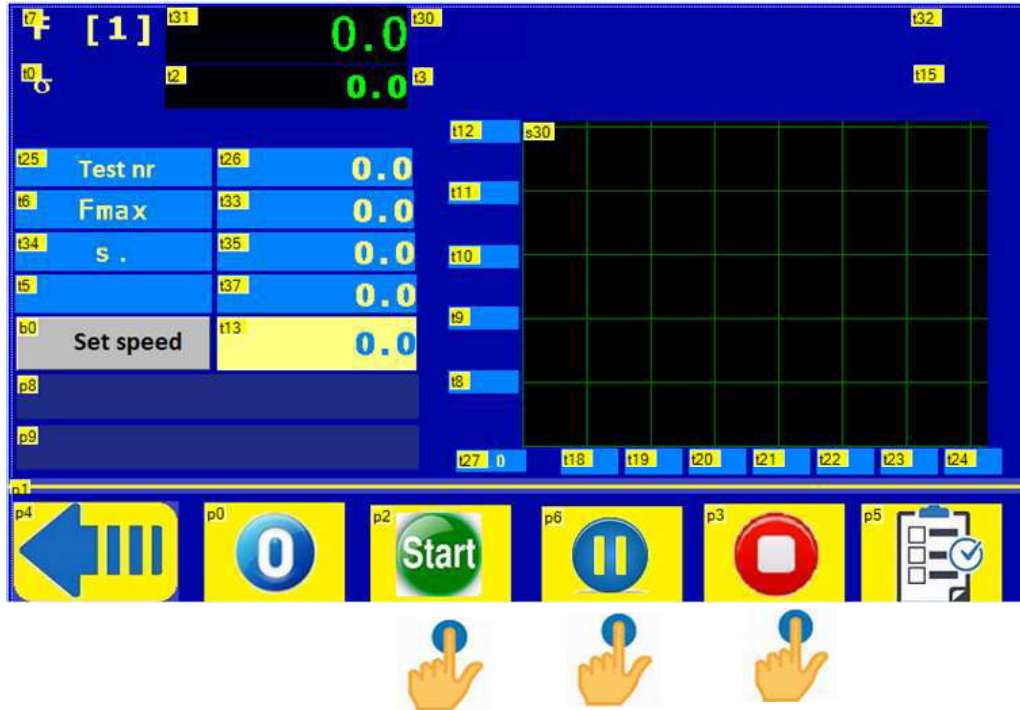
### Test Screen

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.

## TCM Graphic Display Data Acquisition and Control Unit

### 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

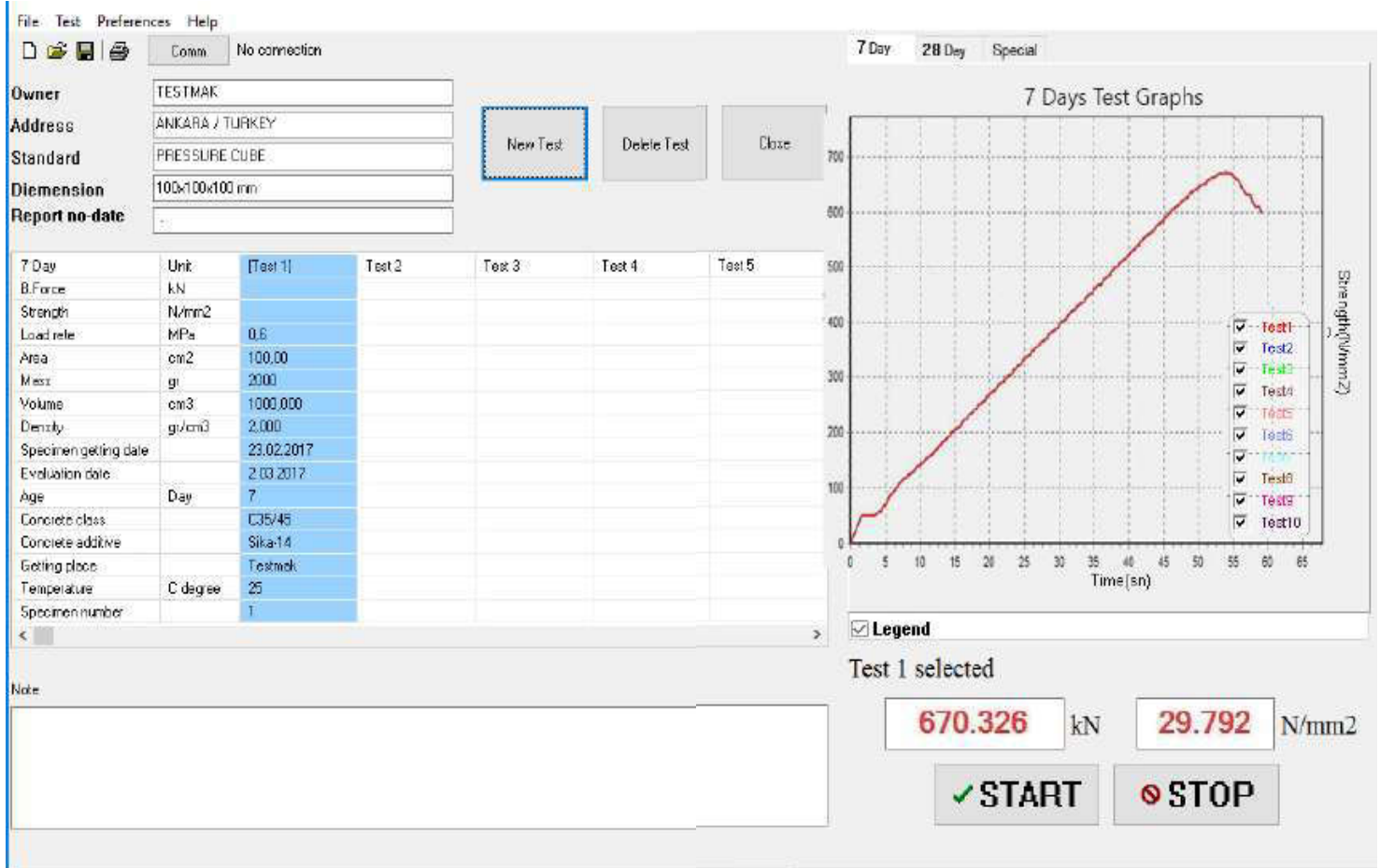
When the test results are displayed in a table, the test result is displayed on each page. Use the up / down arrow keys to scroll through the pages. This allows switching between 500 test results in the device memory.

Test Sonuçları				1		Ara	
No	Numune	Fmax	t1	σ (Mpa)	t0	(s.)	
t50	t51	t52	t53	t54	t55	t56	
t55	t56	t57	t58	t59	t60	t61	
t60	t61	t62	t63	t64	t65	t66	
t65	t66	t67	t68	t69	t70	t71	
t70	t71	t72	t73	t74	t75	t76	
t75	t76	t77	t78	t79	t80	t81	
t80	t81	t82	t83	t84	t85	t86	
t85	t86	t87	t88	t89	t90	t91	
t90	t91	t92	t93	t94	t95	t96	
t95	t96	t97	t98	t99	t100	t101	
t100	t101	t102	t103	t104	t105	t106	
t105	t106	t107	t108	t109	t110	t111	
t110	t111	t112	t113	t114	t115	t116	
t115	t116	t117	t118	t119	t120	t121	

## TCM Graphic Display Data Acquisition and Control Unit

### 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.





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