

**IMPACT**  
**IMPACT**  
**IMPACT**

**C104**  
**2005 version**

Impact Test Equipment Ltd  
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User Guide  
**User Guide**  
**User Guide**

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## Chapter 1 GENERAL INFORMATION

### 1.1 GENERAL FEATURES

- **THIS MANUAL IS ADDRESSED TO:** the carrier, the installer, the user, the maintenance operator, and the scrapping operator.
- Please read it carefully because it informs you about the operating of the machine in safety conditions.
- This manual has to be considered apart of the product and concerns only the machine it is delivered with.
- Keep the manual in order during the whole life of the appliance to consult it for any needs.
- In case of sale, the manual and its enclosures should be given together with the machine.
- The manufacturer assumes no liability for any damages caused by a misuse of the machine.
- The manufacturer has the right to modify this technical literature as well as the machines this refers to without any previous notice.
- Messages meaning:

#### ATTENTION

It shows the procedures that can damage seriously the machine if they are not followed carefully.

#### DANGER

It shows the procedures that can be dangerous to the operator if they are not followed carefully.

### 1.2 IDENTIFICATION

**MANUFACTURER IDENTIFICATION:**  
**MACHINE IDENTIFICATION:**

See the cover page.  
See the plate on the machine.

### 1.3 APPLICATIONS

The digital unit allows reading the load coming from the pressure transducers or from the load cells that are on the testing machine; it can make compression, flexure and split cylinder tests on concrete or mortar specimens. Its software can create a file containing the features of a quantity of specimens in order to be easily recalled before the text execution. The digital unit allows printing the tests results and exporting the read dates through the RS232 to a Pc for the saving.

The equipment is made for aim, which it has been conceived for. Any other uses are nor allowed.

#### ATTENTION

The instructions given in this manual are only made for the right use of the appliance.

### 1.4 MACHINE FEATURES

	<b>C104</b>
LENGTH	510 mm
WIDTH	580 mm
HEIGHT	1280 mm
<b>MASS</b>	80 kg
<b>ROM MEMORY</b>	128 kb
RAM MEMORY	128 kb
<b>FREQUENCY</b>	20 MHz

## Chapter 2 | INSTALLATION

### 2.1 | UNPACKING

After removing the package, check that any parts of the machine are not damaged. In case of doubt, **DO NOT USE THE MACHINE** and ask the manufacturer.

**DANGER**

The materials used for the package (plastic, polystyrene, screws, nails, wood etc.) have to be kept far from children. They must be thrown away in proper collection centre.

**ATTENTION**

Use the normal and logical cautions in order not to have any shock or damage on the appliance.

**ATTENTION**

Before throwing away the package, pay attention that any accessories, manuals, documents, spare parts are not inside it.

### 2.2 | HYDRAULIC CONNECTIONS

The hydraulic pump is connected to the machine by means of two connections:

1. Connection for the oil supply: this connection must be made to the hydraulic cylinder of the machine by means of a pipe having a capacity up to 650 bar. This connection allows the pressurised oil from the pump reaching the machine. The maximum pressure supplied by the system is 650 bars and the quantity of oil supplied is 5 litres.
2. Connection for the oil return to the pump: this connection must be connected to the hydraulic cylinder of the machine by means of a pipe having a diameter as big as possible and being as short as possible. This connection allows the oil returning from the hydraulic cylinder to the hydraulic pump in case the maximum allowed height has been reached.

### 2.3 | OIL LEVEL CHECK AND DRAIN

The machine is delivered with about 20 litres of oil in the tank.

The proper oil level is when the oil surface reaches the middle of the round window, with the piston in the low position.

Verify the level and eventually add oil **IP HYDRUS OIL HI46**.

**ATTENTION**

do not mix with different oils or with different trade marks. If you don't find the above-advised oil, replace it completely with a similar one.

Before using the machine for the first time or after a long time of setting aside, it is necessary to bleed, following the hereunder procedure:

- Read the whole operating manual and prepare the machine to be started.
- Unloose the stop nut connecting the transducer to the pipe.
- Start the control unit in order to let oil come out from the above-mentioned nut.
- Screw the stop nut when the oil coming out does not show any air bubble presence.

### 2.4 | CONNECTION OF THE SAFETY MICROSWITCH

The control unit foresees receiving a safety micro-switch signal installed on the safety guards of the machine. This safety micro-switch will allow stopping or starting the working of the motor.

The micro-switch has to be connected to the contacts 21 and 22 on the XT1 clamp of the electronic card IC1 (see enclosed electric diagrams). The card is supplied with the contacts 21 and 22 closed by a bridge: the opening of this contact doesn't allow the working of the motor and starts the alarm on the display.

## 2.5 TRANSDUCER CONNECTION

The control unit can receive both the signal coming from a pressure transducer or from a load cell. For a better use of the features of the analogical - digital converter present on the card, the transducers and the load cells have to be extensometer bridge type with a 3 mV/V accuracy. When transducers with accuracy between 2 and 3 mV/V are used the resolution won't be optimal. The connected transducer or load cell receives a feeding of 10 V d.c. The connection is made through a connector SUB-D tank type 9 poles male (for the connection drawing see electric lay out here enclosed).

## 2.6 CENTRONIC PRINTER CONNECTION

The PRINTER connector, placed on the back of the console allows the direct connection of an outside printer. The printer must follow the CENTRONIC standards with dimensions A4 Vertical. For a proper working of the connected printer, the manufacturer recommends to read with attention the instruction manual of the printer in order to foresee a proper setting.

## 2.7 ELECTRIC CONNECTION

<b>DANGER</b>	Skilled operators must arrange the electric connections.
---------------	--

<b>DANGER</b>	Before connecting, see the attached electric diagram and the plate on the machine for the information about the voltage, the frequency, etc.
---------------	--

<b>DANGER</b>	Connect the ground by the terminal PE (yellow-green) before making any other connections.
---------------	---

<b>DANGER</b>	Apply a knife switch at the top of the connecting cable of the machine to the power system. The knife switch must be combined with a safety device against the overload with a differential switch (safety switch). The technical features of the safety device must be in accordance with the standards in force in the country where the machine has been installed.
---------------	--

### ELECTRIC TOLERANCES:

- Real voltage  $\pm 10\%$  of the nominal one
- Frequency:  $\pm 1\%$  of the nominal one in a continuous way  $\pm 2\%$  of the nominal one for a short period
- The harmonic distortion of the sum from the second to the fifth harmonics not more than 10 % of the total voltage as a real value between the conductors. A further distortion of 2% is accepted for the sum from the sixth to the thirtieth harmonics of the real total value between the conductors.
- With reference to the tension unbalance of the three-phase voltage, the inverted sequence component and the zero sequence component must not be more than 2% of the direct sequence component of the voltage
- The voltage pulses must not last more than 1,5 ms with an up/down time between 500 ms e 500  $\mu$ s and a peak value not higher than 200 % of the real value of the nominal tension.
- The electric feeding must not be interrupted or zeroed for more than 3 ms. Between two interruptions it must not take more than 1 s.
- The interruptions must not overcome 20 % of the tension peak for more than one cycle. Between two interruptions it must not take more than 1 s.

### 3.1 CONTROLS AND MESSAGES

Description of the parts composing the enclosure A – COMPLETE VIEW OF THE APPLIANCE

	CONTROL	DESCRIPTION
A1	MAIN SWITCH	It allows switching on and off the unit.
A2	PLUG FOR OIL POURING	It allows to put oil into the tank
A3	OIL LEVEL INDICATOR	It allows the check of the proper oil level into the tank.
A4	PLUG FOR OIL DRAIN	It allows emptying the tank. WARNING: the drained oil must not be thrown away in the Environment, but must be delivered to a proper collection centre.
A5	OIL RETURN CONNECTION	It allows connecting the hydraulic pump to the cylinder of the testing frame: the connection by means of a pipe having a bigger diameter and as short as possible. This will allow the oil returning from the cylinder in case the maximum travel of the piston has been reached.
A6	OIL PUMPING CONNECTION	It allows connecting the hydraulic pump to the cylinder of the testing frame: the connection allows pressurized oil going form the unit to the frame. This happens by means of a pipe that can go up to a maximum pressure of 650 bars.
A7	DIGITAL UNIT	It allows reading the results of the tests and many other functions (see the charter describing this component).
A8	PRINTER (option)	It allows printing the results of the test. By means of the software of the digital unit the user can chose the values he wants to print.
A9	VALVE FOR THE SECOND READING RANGE (C097-01)	This valve is only on the machines having a second pressure transducer, for the reading of the loads on the low range scale. The valve is generally placed on the side of the frame of the Servotronic. When the high capacity channel is used, the valve must be properly closed, by turning it clockwise. When the low range channel is used, the valve must be opened, by turning it counter-clockwise. <b>ATTENTION: Before using the testing frame with higher loads than the MAXIMUM of he lower capacity range, censure that the valve has been properly closed.</b> <b>If this doesn't happen the low range transducer will be irreparably damaged.</b>
A10	HYDRAULIC THREE WAYS VALVE (C104-01 C104-02)	It allows controlling alternatively two different testing machine frames.
A11	OIL RETURN CONNECTION (C104-01 C104-02)	It allows connecting the hydraulic pump to the cylinder of the testing frame: the connection by means of a pipe having a bigger diameter and as short as possible. This will allow the oil returning from the cylinder in case the maximum travel of the piston has been reached.
A12	OIL PUMPING CONNECTION (C104-01 C104-02)	It allows connecting the hydraulic pump to the cylinder of the testing frame: the connections allow pressurized oil going form the unit to the frame. This happens by means of a pipe that can go up to a maximum pressure of 650 bars.

Description of the parts composing the enclosure B – DETAILS OF THE CONTROL PANEL

	COMMAND	DESCRIPTION
B1	MAIN SWITCH	Appliance can be switched on or off.
B2	PAPER ADVANCEMENT DIAGNOSIS BUTTON	Printing paper can be advanced.
B3	LED	When lit it signals the printer is in use.
B4	PAPER EXIT	Where the printed-paper exits.
B5	APS PAPER ROLL PRINT	Test results can be printed out. Using the digital unit software the values to be printed can be chosen.
B6	DISPLAY	Graphic display for the software of the digital unit
B7	MEMBRANE KEYS	Operator Interface consisting of five multifunctional keys. The five keys take on various functions according to the activated menu. An icon immediately appears on the display which indicates the function of every key.
B8	SELECTOR	Various data can be selected, modified and confirmed with this key. The command can be spun in both directions to increase or decrease the values.
B9	ELECTRIC SUPPLY CONNECTOR	The machine can be connected to the main electrical supply network.
B10	CH1 CONNECTOR	Channel that operates an appliance connected to it.
B11	CH2 CONNECTOR	Channel that operates an appliance connected to it.
B12	CH3 CONNECTOR	Channel that operates an appliance connected to it.
B13	RS232 CONNECTOR	The machine can be connected to the Personal Computer.
B14	PRINTER CONNECTOR	An external printer can be directly connected using the PRINTER connector positioned at the back of the junction box. The printer must be in the <b>CENTRONICS</b> standard in vertical A4 format. Refer carefully to the printer's user instructions so the correct setting can be established for it to function correctly.
B15	OLEODYNAMIC UNIT CABLE CONNECTOR SUPPLY	The digital box can be connected to the oleo dynamic motor unit. Consult the electrical diagrams enclosed in this manual for connection. Relè break: Nominal 5 A AC1 current. <b>N.B.:</b> this is only for resistant charges.
B16	PISTON EXCHANGE VALVE CONNECTOR (Only for machines with double charge chambers)	The digital unit can be connected to the piston exchange valve.

## 4.1 GENERAL INFORMATION

The appliance-operator interface consists of a graphic display (B6), five multifunction keys (B7) and a selector (B8).

The functions of every key vary according to the phase of the programme and are specified by the icon adjacent to the actual key. Activation of the indicated functions by the individual icons takes place by pressing the adjacent key.

Using the selector various data can be selected modified and confirmed. Turn the selector to the data to be set, press and turn to modify, and press once again to confirm the new setting.

## 4.2 MAIN MENU

When the junction box is switched on the following window will appear:

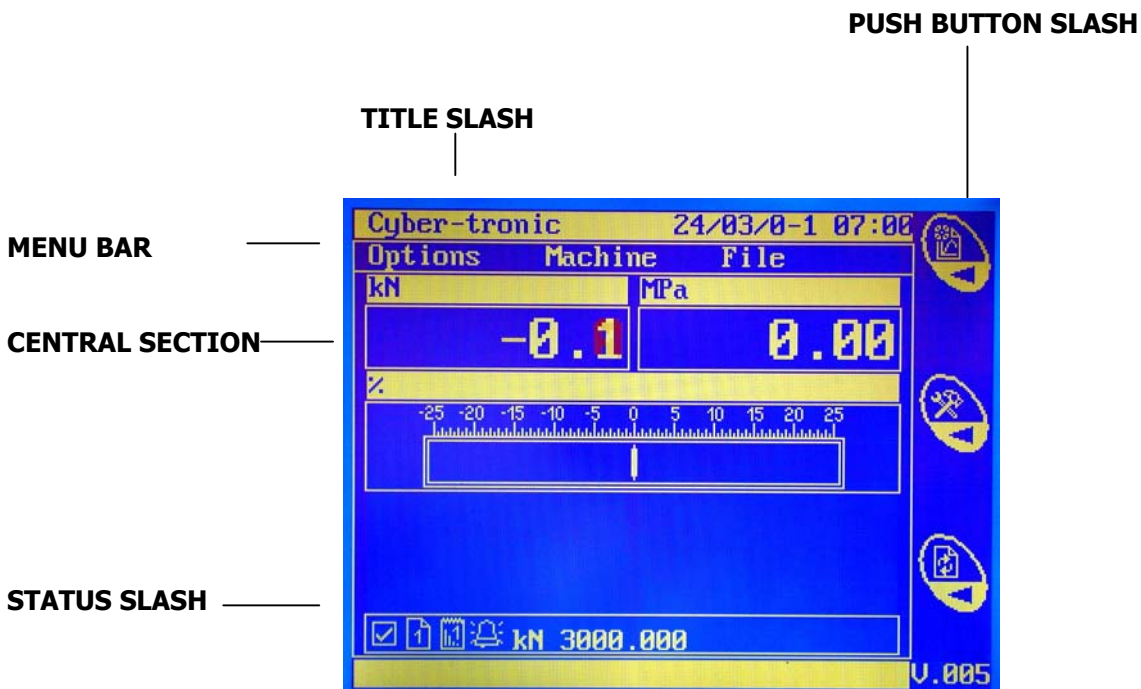





FIGURE 1

The main window is sub-divided into five sections:

1. **Title slash:** Displays the date and time.
2. **Central section:** displays the instantaneous load value and the unitary load after compression test.
3. **Status slash:** the following icons will appear:
  - : indicates the active channel has been calibrated
  - : indicates configuration 1 is active
  - : indicates the analogical channel 1 is active
  - : indicates the load alarm is active
  - : indicates the load alarm is inactive
  - **3000.000 KN** indicates the maximum limit of the channel.
4. **Push button slash:** the following keys are displayed which are necessary for the user to carry out the main functions of the machine:

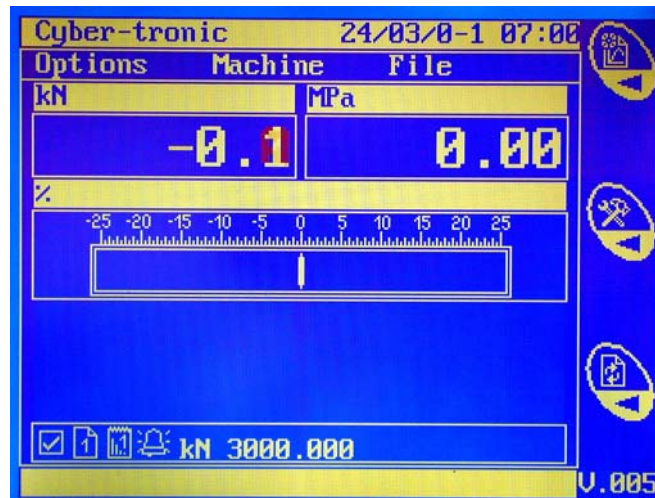
-  : Allows the access to the parameters of the test to be carried out
-  : Activates the pre-heating phase.
-  : Allows changing the configuration.

5. **Menu slash:** the menus that change the machine and test parameters are displayed here.


**4.3 SEMIAUTOMATIC TEST EXECUTION**


Proceed as follows to carry out a test:

1. Once the digital unit has been switched on the following figure will appear:



**FIGURE 2**

2. Select the desired configuration with this key  in order to carry out a test.

3. The dialogue window shown in this figure will appear when this key  is pressed:

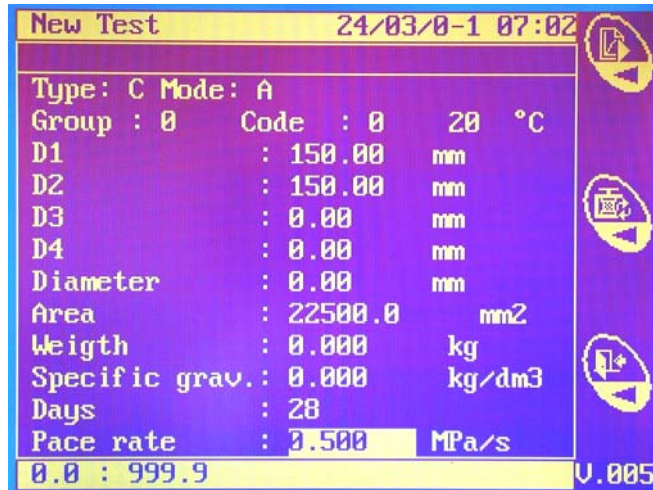


FIGURE 3

- Using the B8 selector, go to 'Type', then press and select the test type to be carried out (Compression 'C', Flexion 'F' e Splitting test 'B'). In order to select semiautomatic mode, position the selector on "mode" S.



Using this key the saved samples in the sample file can be scrolled through and selected.

**N.B.:** When selection is made from the samples archive always remember to insert at least the load gradient. This will remain saved along with the other settings, even for the following tests (if carried out correctly).

- Insert the relevant data for the test to be carried out using the B8 selector (turn to position, press and turn to modify, press to confirm).



- By pressing , the following dialogue window will appear:

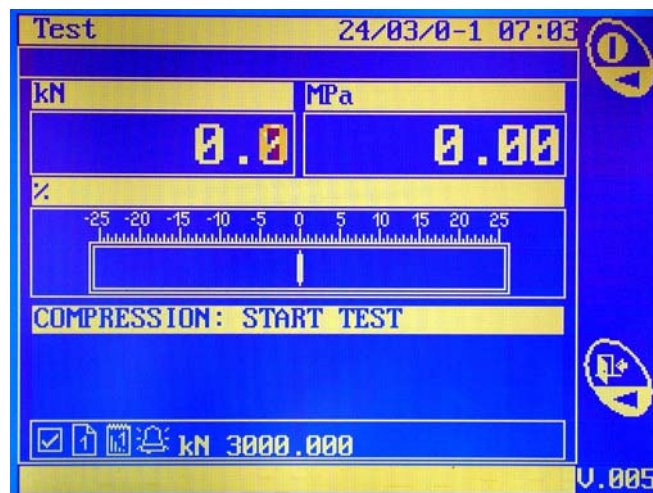



FIGURE 4

**N.B.:** In the central section the test type being carried out will be displayed.

7. Press this key  to switch on the motor. The piston will go up following the high speed until the specimen gets in touch with the upper compression plate. Just before the specimen touches the upper plate, the system makes the automatic tare.
8. The operator will have to act on the selector B8, in order to increase (turning it clockwise) or decrease (turning it counter-clockwise) the load application: The bar pace rate indicator, placed in the central part of the display, visualises in real time the % error of the load application.
9. The user can read the instant load on the display showing the applied load. Once the specimen has been broken the pressure of the oil is released and the display shows the maximum load reached during the test and the specific strength resulting from the ratio with the selected specimen surface (see the following figure):

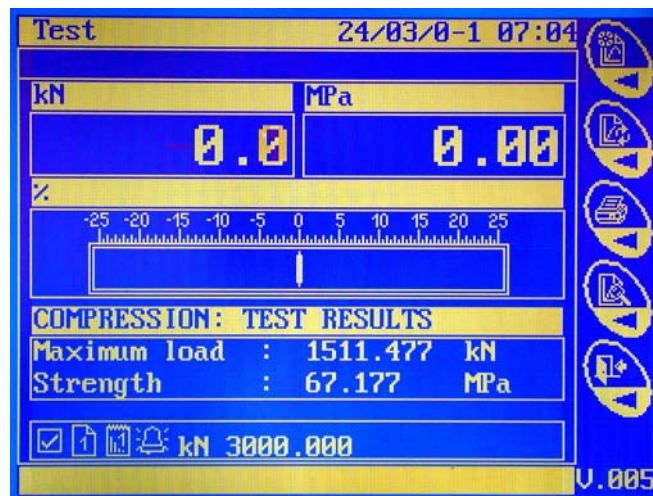






FIGURE 5

10. Press this key  to see the graph for the test carried out.
11. Press this key  to repeat the previously carried-out test without modifying the relative test data.
12. Press this key  to print the test results.
13. Press this key  to repeat the test and to possibly modify the data.

**N.B.**

Up to 300 tests can be saved in the junction box file.

**4.4 AUTOMATIC TEST EXECUTION**

Proceed as follows to carry out an automatic test:

1. Once the digital unit has been switched on the following figure will appear:

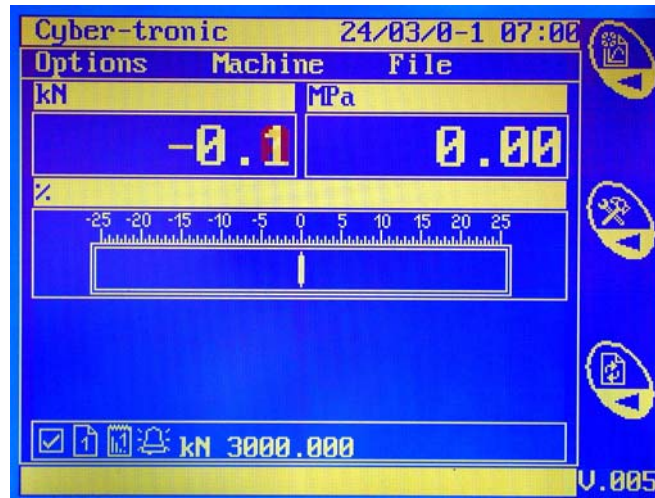




FIGURE 6

2. Select the desired configuration with this key  in order to carry out a test.

3. The dialogue window shown in this figure will appear when this key  is pressed:

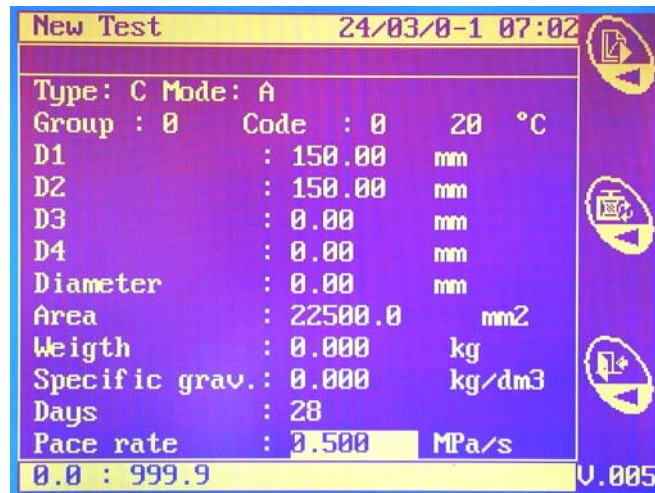




FIGURE 7

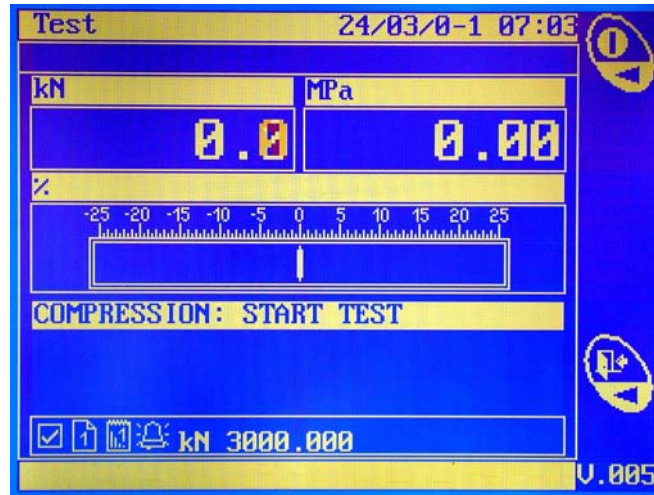
4. Using the B8 selector, go to 'Type', then press and select the test type to be carried out (Compression 'C', Flexion 'F' e Splitting test 'B'). In order to select automatic mode, position the selector on "mode" A.

Using this key  the saved samples in the sample file can be scrolled through and selected.

**N.B.:** When selection is made from the samples archive always remember to insert at least the load gradient. This will remain saved along with the other settings, even for the following tests (if carried out correctly).


5. Insert the relevant data for the test to be carried out using the B8 selector (turn to position, press and turn to modify, press to confirm).

6. By pressing , the following dialogue window will appear:



**FIGURE 8**

**N.B.:** In the central section the test type being carried out will be displayed.

7. To start the cycle or the automatic test, push on the button . The piston will go up following the high speed until the specimen gets in touch with the upper compression plate; starting from this point the system will keep the pace rate set by the user. The bar pace rate indicator, placed in the central part of the display, visualises in real time the % error of the load application.

8. Once the specimen has been broken the pressure of the oil is released and the display shows the maximum load reached during the test and the specific strength resulting from the ratio with the selected specimen surface (see following figure):

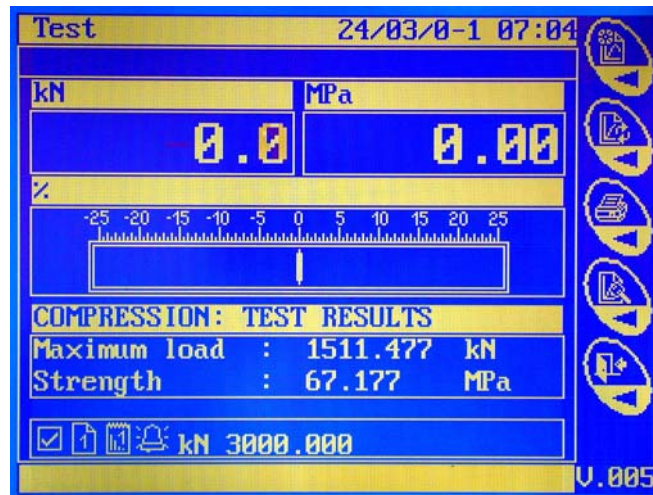






FIGURE 9

9. Press this key  to see the graph for the test carried out.
10. Press this key  to repeat the previously carried-out test without modifying the relative test data.
11. Press this key  to print the test results.
12. Press this key  to repeat the test and to possibly modify the data.

<b>N.B.</b>	Up to 300 tests can be saved in the junction box file.
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Proceed as follows to carry out a right calibration:

<b>N.B.</b>	The right device is necessary in order to carry out calibration.
-------------	--

1. In the dialogue window in the main menu, go to 'OPTIONS', select the desired calibration and press the B8 selector.
2. The following dialogue window will appear:

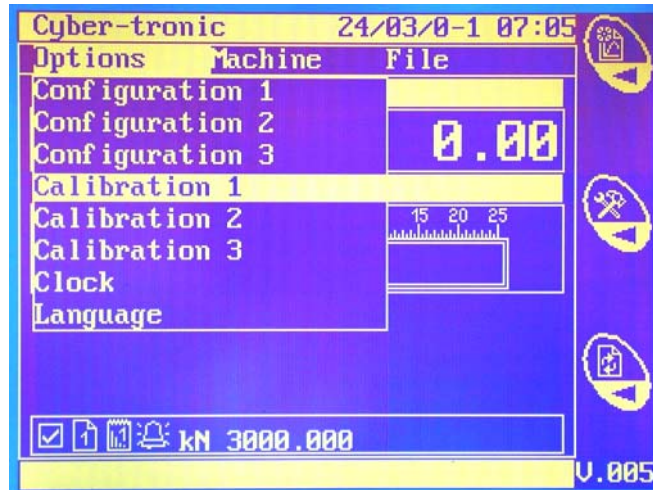
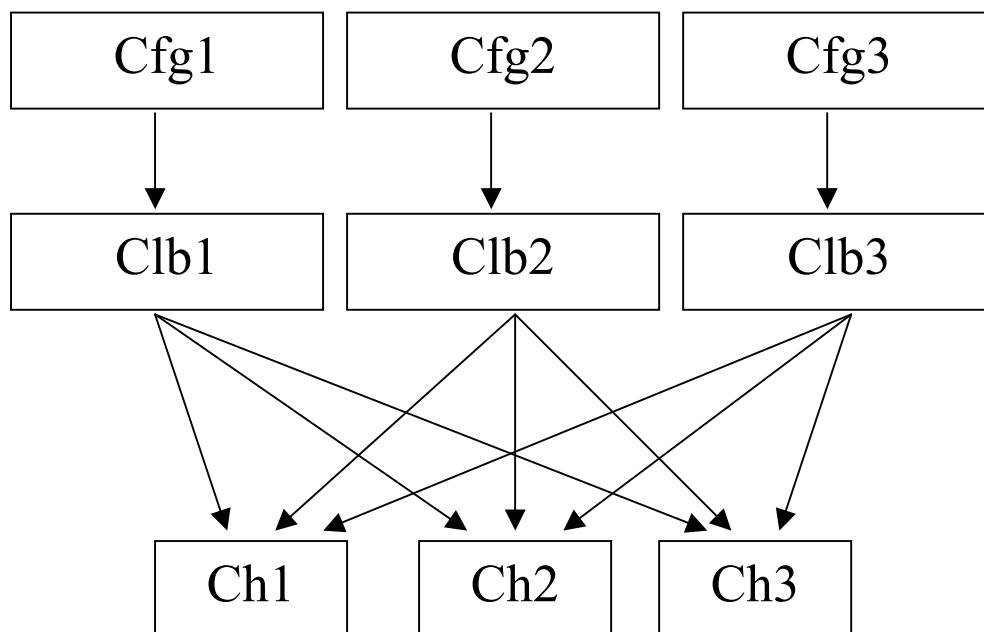


FIGURE 10

3. Turn the B8 selector and go to the channel to be calibrated (1, 2, 3). Channel choice is independent from the configuration and calibration type, or to be more precise any channel can be selected.  
The user can set up to a maximum of three configurations. For every configuration the user can decide upon which analogical channel to refer to:








4. Press the selector to confirm. The dialogue window will appear:

1. Enter the password ??? using the B8 selector. Go to 'OK' and confirm by pressing the C8 selector. The dialogue window will appear:



FIGURE 12

The following keys will be displayed in the dialogue window:

-  Print the calibration chart (incorporated printer).
-  Delete the calibration carried out (for calibration deletion enter the password 8671).
-  Verify the load of the calibrated channel.
-  Calibrates the channel.
-  Exit the calibration menu and confirms the settings.

Calibration can be carried out in two different ways:

- **Manual calibration A:**

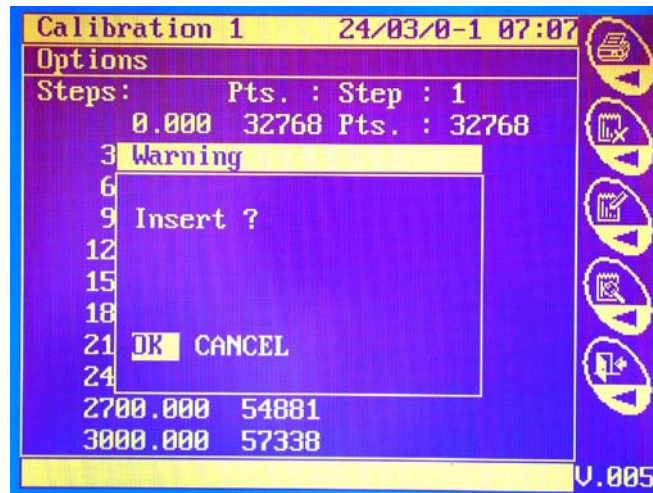
1. Using the B8 selector, got to 'OPTIONS'. Press and select 'STANDARD STEPS'. Press once again and the following will appear:



**FIGURE 13**

2. Confirm with OK. The calibration gaps (previously set in configuration) will then be automatically entered.
3. For repetition or selection of one calibration gap, using the C8 selector go to the number adjacent to the word 'STEP'. Press to modify and press again to confirm.

- Using the B8 selector go to 'OPTIONS'. Press and select 'STANDARD POINTS'. Press once again and the following will appear:





**FIGURE 14**



- Confirm with OK. The calibration points will be automatically entered in correspondence to the previously inserted steps.
- For repetition or selection of one calibration point go to the number adjacent to the word 'POINT' using the B8 selector. Press to modify then press again to confirm.

- **Manual calibration B:**

Manually insert the relevant points for the corresponding calibration steps (see the enclosed calibration certificate).




- **Automatic calibration:**

- Place a load cell between the compression platens.
- Press  to switch on the motor and start the calibration procedures. The piston will go up at the high speed until the load cell gets in touch with the upper compression plate. Before the load cell touches the upper plate, the system makes the automatic zeroing of the channel. Zero the instrument used to read the load cell loads.
- Act on the B8 switch (to increase turn the selector clockwise, to decrease turn the selector counter-clockwise) in order to have the load applied on the load cell on a value perfectly equal to the load indicated in the loads column (kN) relative to the first step. **ATTENTION:** to have a fine setting, turn the selector slowly; to have a speed setting turn the selector speedily.
- Once the value has been reached, act on the button  to store the points read by the transducer.
- Proceed in the same way for the following steps.

14. Press  to return to the previous window.
15. Press  and the following dialogue window will appear:



**FIGURE 15**

7. Push the button  to start the motor and start the checking procedure. The piston will go up at the high speed until the load cell gets in touch with the upper compression plate. Before the load cell touches the upper plate, the system makes the automatic zeroing of the channel. Zero the instrument used to read the load cell loads.
8. Act on the B3 switch (to increase turn the selector clockwise, to decrease turn the selector counter-clockwise). Proceed with the checking.
9. Press  to switch off the motor. Press the key  to confirm the channel check and return to the previous dialogue window.

#### 4.6 CALIBRATION 2

In order to carry out calibration 2 refer to the instructions for calibration 1.

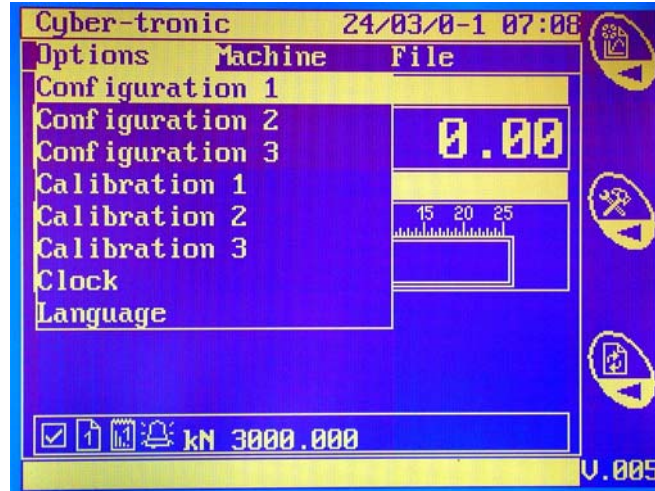
#### 4.7 CALIBRATION 3

In order to carry out calibration 3 refer to the instructions for calibration 1.

#### 4.8 CONFIGURATION

Proceed in the following way to carry out configurations:

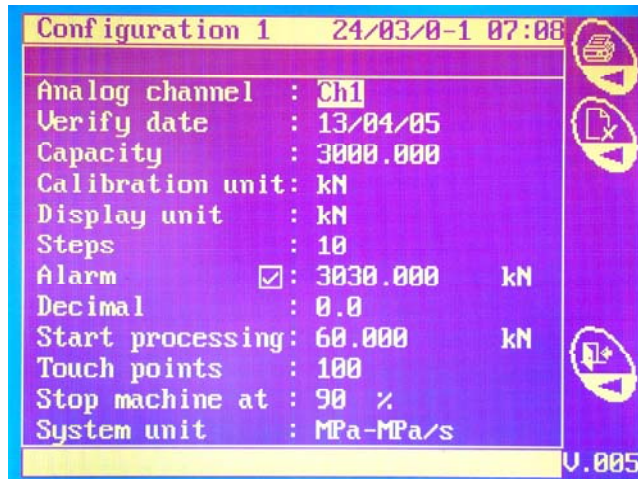
1. In the dialogue window of the main menu select 'OPTIONS' from the menu bar by turning and pressing the B8 selector.
2. The following dialogue window will appear:



**FIGURE 16**

3. By turning the C8 selector position it on the desired configuration (Conf. 1, conf. 2 or conf.3). Press the selector to confirm. The following dialogue window will appear:

4. Enter the password ??? with the C8 selector. Go to 'OK' and press the selector to confirm. The following dialogue window will appear:



**FIGURE 18**

5. In this window it is possible to:

- Select the analogical channel
- Set the test date
- Set the maximum limit
- Set the calibration measuring unit
- Set the system measuring unit
- Set the number of steps for calibration
- Activate or de-activate the maximum limit alarm with a relative value
- Set the number of decimals
- Set a value to be used as a threshold for the start of data processing
- Set a value which will be used as a threshold for the start of load gradient regulation
- Set the percentage of the end of the test. The percentage set will define a load value (calculated as a percentage of the maximum load reached during the test), which, when reached, the motor will halt thus avoiding sample crumbling.




**N.B.:** The set value influences the determination of the end of the test. Setting a low value (80% - 90%) guarantees the load fluctuations throughout test execution are not interpreted as possible sample breakage. Contrarily low values have as a consequence a greater sample chipping with the consequent inconvenience for the operator when removing the broken sample.

A value of around 100% will cause minimal sample chipping but as a consequence load fluctuations throughout the test can be interpreted as sample breakage with a resulting end of test!

The set default value allows correct test execution in normal conditions. In the case of testing certain samples where behaviour under load is such that correct results reading is not possible, the set value should be modified, temporarily searching for the optimum value.

- Set the test-measuring unit (unitary load and pace rate).

In the dialogue window the following keys are displayed:

-  Prints the parameters displayed in configuration
-  Deletes the parameters
-  Exits the configuration menu and confirms the settings.

**4.9 TEST ARCHIVE**

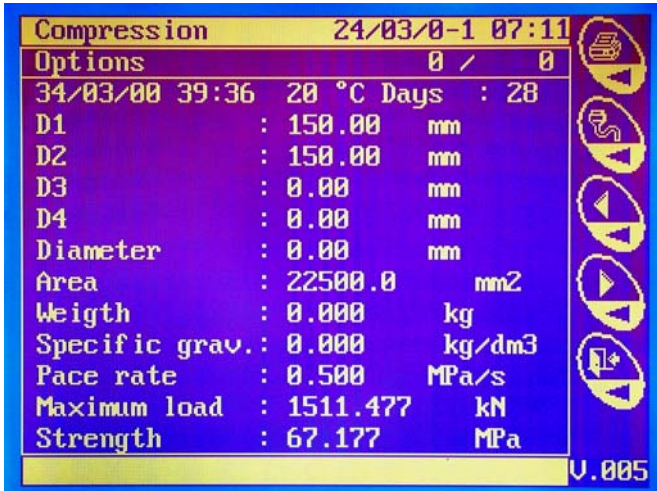
This function allows access to test data. Proceed in the following way to archive data:

1. From the dialogue window of the main menu, turn the B8 selector and select 'ARCHIVE' from the menu bar.
2. The following dialogue window will appear:






**FIGURE 19**



3. By turning the B8 selector position and click on the desired test archive (Compression "C", Flexion "F" and Brazilian "B"). Click to confirm. The following dialogue window will appear:



**FIGURE 20**

In the dialogue window the following keys will appear:

-  : Prints the shown test (incorporated printer).
-  : Displays the previous test.
-  : Displays the following test.

-  : Exits the archive and returns to the main screen.
-  : Captures data from the archive onto the PC.

4. To delete the test turn the B8 selector, go to 'OPTIONS' and click. The following dialogue window will appear:

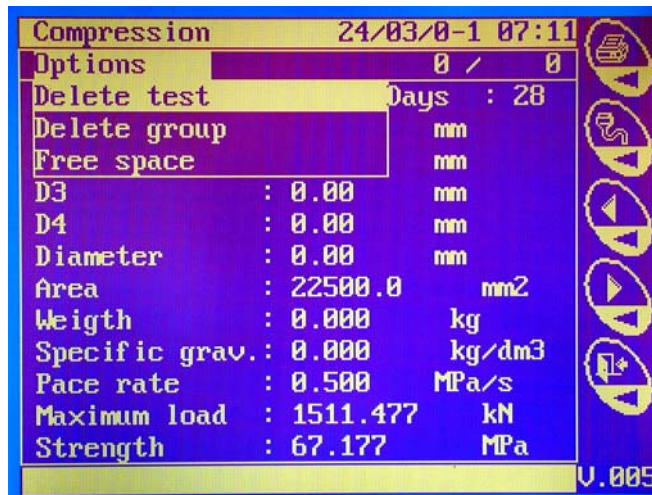


FIGURE 16

5. Using the B8 selector, select single test deletion or group test deletion. Selecting the third option can see the available space.

<b>4.9.1</b>	<b>TRANSMISSION PROTOCOL FOR THE TRANSFER OF TESTS FROM THE ARCHIVE TO THE PC</b>
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<b>BAUD</b>	9600
<b>PARITY</b>	NO
<b>BIT DATA</b>	8
<b>BIT STOP</b>	1

**COMPRESSION TEST**

“\$C group code data d1 d2 d3 d4 diameter area gradient maxload unitaryload”

“\$C gggg cccc ddddddddddddddd dddddddd dddddddd dddddddd dddddddd dddddddd aaaaaaaaaa  
gggggggg cccccccccc rrrrrrrrrr”

**FLEXURAL TEST**

“\$F group code data d1 d2 d3 d4 diameter area gradient maxload unitaryload ”

“\$F gggg cccc ddddddddddddddd dddddddd dddddddd dddddddd dddddddd dddddddd aaaaaaaaaa  
gggggggg cccccccccc rrrrrrrrrr”

**SPLITTING TEST**

“\$B group code data d1 d2 d3 d4 diameter area gradient maxload unitaryload”

“\$B gggg cccc ddddddddddddddd dddddddd dddddddd dddddddd dddddddd dddddddd aaaaaaaaaa  
gggggggg cccccccccc rrrrrrrrrr”

**COMPRESSION TEST (EN, UNI, ASTM, AASHTO, BS, NF, DIN, UNE)****EN 12390-3 / UNI 6132**

<b>CUBE SPECIMEN:</b> D1 = SIDE 1 D2 = SIDE 2 D3 = NOT AVAILABLE D4 = HEIGHT DIAMETER = NOT AVAILABLE AREA = SIDE 1*SIDE 2 (AUTOMATIC) UNITARY LOAD = Fm/AREA WEIGHT = AVAILABLE SPECIFIC WEIGHT = AVAIALABLE (automatically calculated after having inserted or modified the field WEIGHT)	<b>CYLINDER SPECIMEN :</b> D1 = NOT AVAILABLE D2 = NOT AVAILABLE D3 = NOT AVAILABLE D4 = HEIGHT DIAMETER = DIAMETER AREA = (DIAMETER/2) <sup>2</sup> *π UNITARY LOAD = Fm/AREA WEIGHT = AVAIALBLE SPECIFIC WEIGHT = AVAIALABLE (automatically calculated after having inserted or modified the field WEIGHT)
--	---

**FLEXURAL TEST (EN, UNI, ASTM, AASHTO, BS, NF, DIN, UNE)****EN 12390-5 / UNI 6133**

<b>PRISMATIC SPECIMEN:</b> D1 = A (WIDHTNESS) D2 = B (HEIGHT) D3 = C (DISTANCE BETWEEN LOWER ROLLERS) D4 = D (DISTANCE BETWEEN UPPER ROLLERS) (D3 has to be more than D4) DIAMETER = NOT AVAILABLE AREA = A*B (AUTOMATIC) UNITARY LOAD = 3/2*Fm*(C-D)/(A*B <sup>2</sup> ) WEIGHT = AVAILABLE SPECIFIC WEIGHT = AVAILABLE
---

**SPLITTING TEST (EN, UNI, ASTM, AASHTO, BS, NF, DIN, UNE)****EN 12390-6 / UNI 6135 / EN 1338**

<b>CUBE SPECIMEN:</b> D1 = LENGHT D2 = THICKNESS D3 = NOT AVAILABLE D4 = K (CORRECTION FACTOR = 1.3-30*(0.18-D2/1000) <sup>2</sup> ) DIAMETER = NOT AVAILABLE AREA = D1*D2 (AUTOMATIC) UNITARY LOAD = 0.637*K*Fm/AREA WEIGHT = AVAILABLE SPECIFIC WEIGHT = AVAILABLE	<b>CYLINDER SPECIMEN :</b> D1 = H (HEIGHT) D2 = NOT AVAILABLE D3 = NOT AVAILABLE D4 = NOT AVAILABLE DIAMETER = DIAMETER AREA = (DIAMETRO/2) <sup>2</sup> *π UNITARY LOAD = 2/π*Fm/(H*DIAMETER) WEIGHT = AVAILABLE SPECIFIC WEIGHT = AVAIALABLE (automatically calculated after having inserted or modified the field WEIGHT)
---	---

#### 4.10 SAMPLE ARCHIVE

Proceed as follows to access the sample archive:

1. Turn the B8 selector to 'ARCHIVE' and click to confirm. The following screen will appear:



FIGURE 22

2. Select the desired sample archive by pressing the B8 selector. The following screen will appear:

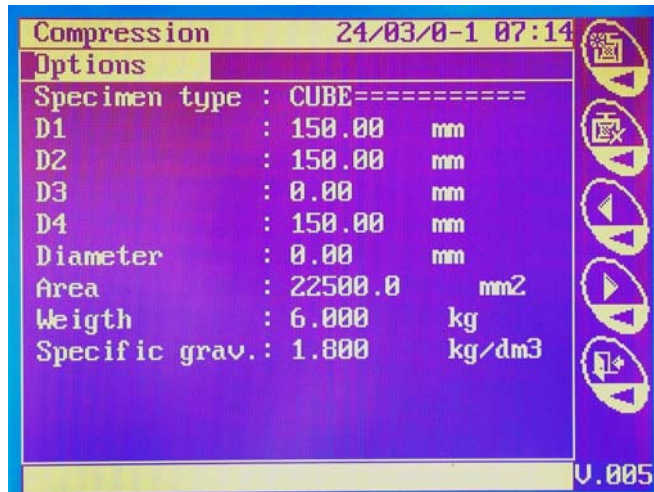








FIGURE 23

In the dialogue window the following keys will appear:

-  Creates a new sample
-  Deletes the sample
-  Scrolls through the previous samples
-  Scrolls through the following samples
-  Returns to the previous window

3. To create a sample click . Scroll and modify by turning and then pressing the C8 selector.
4. Go to 'OPTIONS' and press the B8 selector. The following window will appear where data for any sample can be printed, or see the available space in the sample archive:

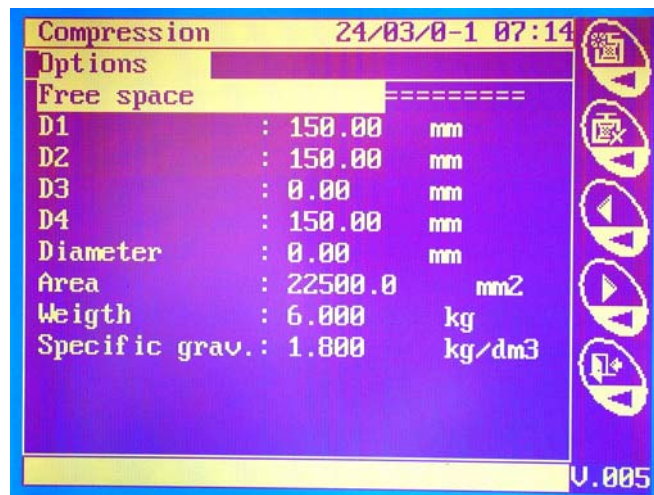


FIGURE 24

## 4.11 CLOCK SETUP

With this function the date and clock time of the junction box can be set. Proceed in the following way to configure the clock:

1. From the main dialogue window turn the B8 selector and select 'OPTIONS'.
2. The following dialogue window will appear:



FIGURE 25

3. Select 'DATE AND TIME'. The following dialogue window will appear:

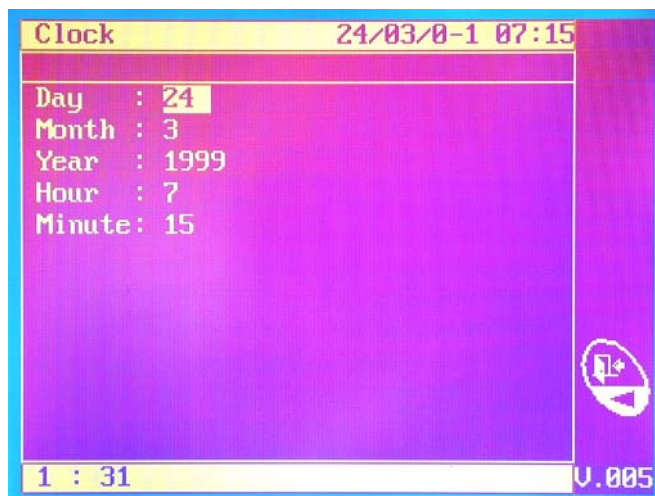



FIGURE 26

4. With the CB8 selector, select and insert the day, month, year, hour and minutes. Press  to return to the previous window and save the settings by clicking OK.

## 4.12 LANGUAGE SETUP

With this function the language can be set. Proceed as follows to select the desired language:

1. From the dialogue window of the main menu turn the B8 selector and select 'OPTIONS'.
2. The following dialogue window will appear:

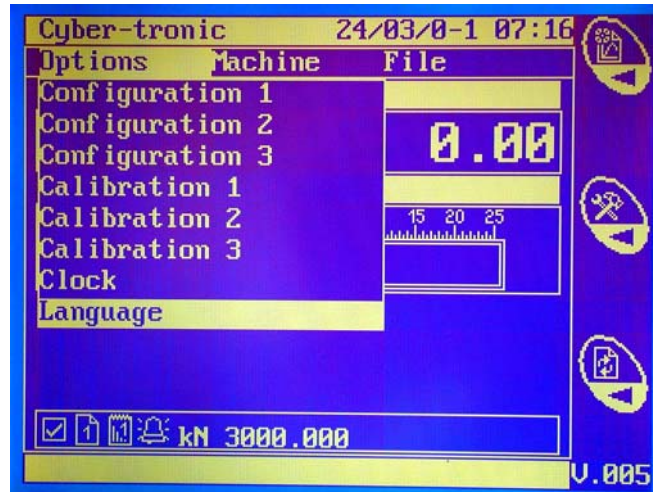


FIGURE 27

3. Select "LANGUAGE". The following dialogue window will appear:

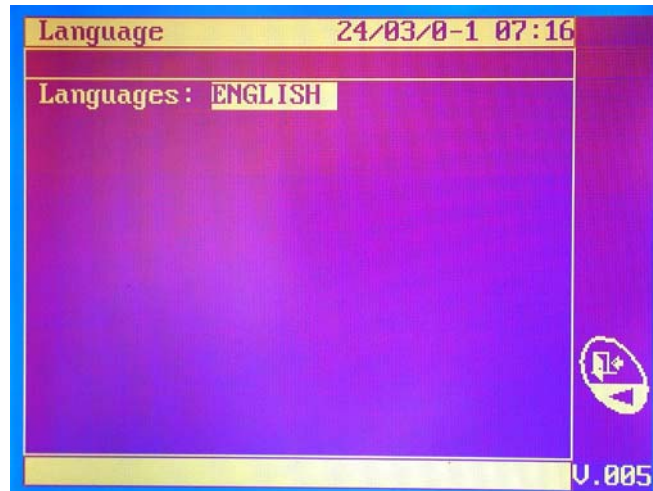



FIGURE 28

4. Using the B8 selector select and enter the desired language. Press  to return to the previous window and save the settings by clicking on OK.

#### 4.13 ALARMS DESCRIPTION

The alarms, which can appear on the junction box screen, are as follows:

- **"Invalid password!"** The required password has not been entered correctly. Re-enter the correct password.
- **"Alarm"** The threshold set in configuration has been exceeded. For the machine to be able to automatically check every overload a channel alarm must be enabled by ticking off the relative check in the screen configuration.
- **"Change the configuration?"** To change the current configuration and pass to the next one the question must be confirmed.
- **"Denied command"** Every time an unqualified command is carried out this message is displayed.
- **"Delete?"** Before deleting a configuration, a sample, a test or other machine settings confirmation is requested. Press OK to confirm deletion or press cancel.
- **"Save?"** When exiting the screens confirmation or cancellation of changes is requested.
- **"Enter?"** In the calibration phase the gaps and the transducer points of 3mv/V can be automatically entered. Confirm for insertion to be carried out.
- **"Invalid calibration!"** If the calibration table is incorrect (for example if it contains two steps equal to zero, etc) this message is displayed.
- **"Empty archive"**
- **"Full archive!"**
- **"Invalid date!"**
- **"Invalid test!"** Recheck the current test settings. For the test to be valid it must be compatible with the current configuration.
- **"Check the field type!"** An automatic test cannot be carried out on a manual machine and vice versa.
- **"Invalid flexural data"** Check the bending data and in particular the measurement of the knives.
- **"Invalid Brazilian data"** Check the Brazilian data.
- **"Invalid area!"** Enter the sample area; a test cannot be carried out without having first entered the sample area.
- **"Invalid gradient!"** Enter the gradient; a test cannot be carried out without having first entered the gradient.

#### 4.14 DATA ACQUISITION WITH PC

Using the RS232 connector, it is possible to connect the digital unit to a Personal Computer. Loading a Load/Deformation program it is possible to control following functions: remote control, real time visualisation of the load and deformation procedures with print out of graphic, test results, management of the specimen file and test profiles.

### Chapter 3 MAINTENANCE

<b>DANGER</b>	Consult " <b>DANGEROUS PARTS AND RESIDUAL RISKS</b> " before proceeding.
---------------	--

<b>DANGER</b>	All the maintenance operations must be carried out with the machine turned off and unplugged from the knife switch.
---------------	---

<b>DANGER</b>	Any kind of maintenance operations concerning the components of the machine, and on the electric components even those that may seem very simple, must be carried by skilled operators instructed about the purposes the machine is made for.
---------------	---

<b>DANGER</b>	Only original spare parts are allowed. The Manufacturer assumes no liability in the event that non-original parts are used.
---------------	---

#### 5.1 SPECIAL MAINTENANCE

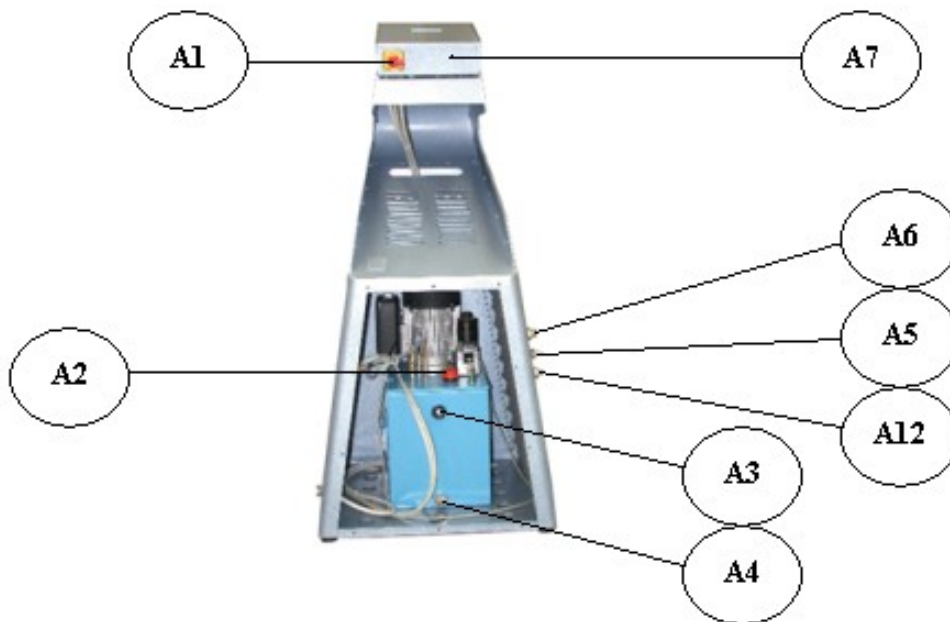
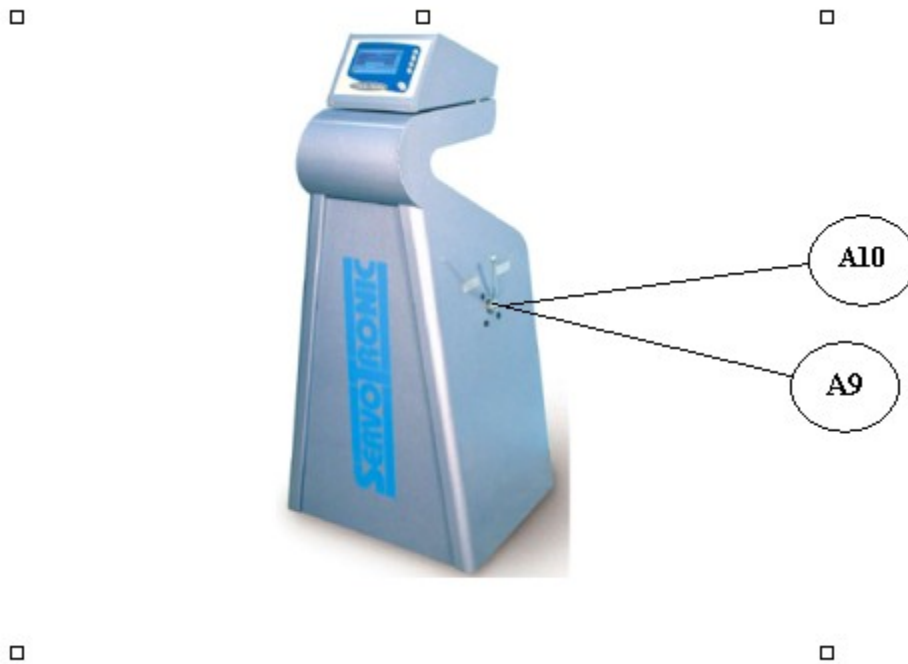
<b>DANGER</b>	The removal of the safety devices or any tampering of the machine could cause risks to the operator or to any other people.
---------------	---

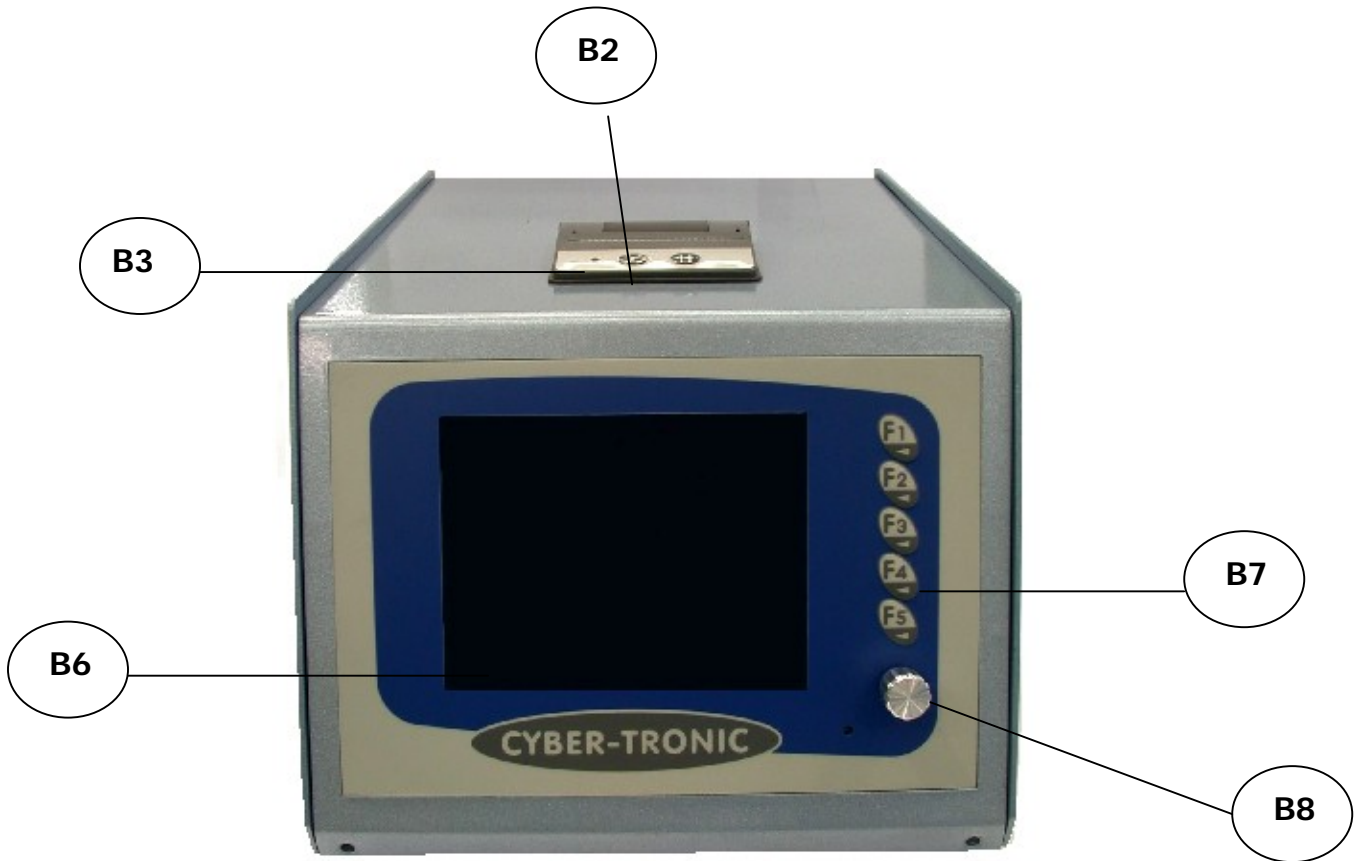
The manufacturer assumes no liability for any damages to people, things or animals due to the tampering of the safety devices.
--

The load-reading unit has an automatic motor safety switch. In case of intervention of such a device, to reset its working, follow the instructions given here below:

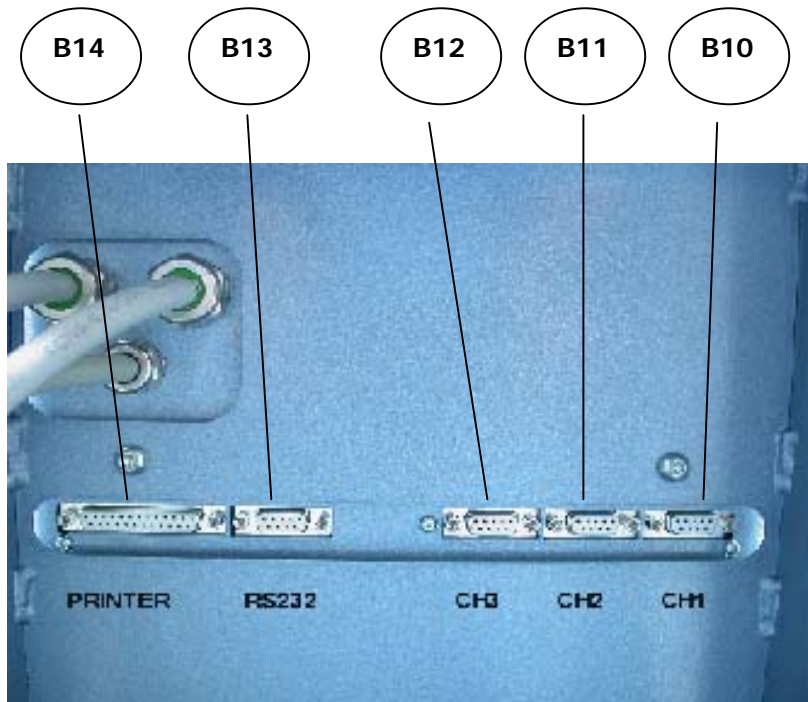
1. Turn off the appliance.
2. Insulate the appliance from the main supply disconnecting the main cable.
3. Open the digital unit (taking away the PVC cover) and pay attention to the inside cables connecting the components fixed on the cover with the main card,
4. Push the key on the automatic switch marked by "I".
5. Close again the digital unit, connect the main cable, turn on the appliance and check its proper working.
6. If the automatic switch interrupted again the working of the motor, check the good working of the motor or get in touch with the after sale service.

In case of special maintenance operations (repairs, replacement of parts and any other operation not described in this manual) ask directly o the manufacturer.





Here below you find the lower part of the digital unit

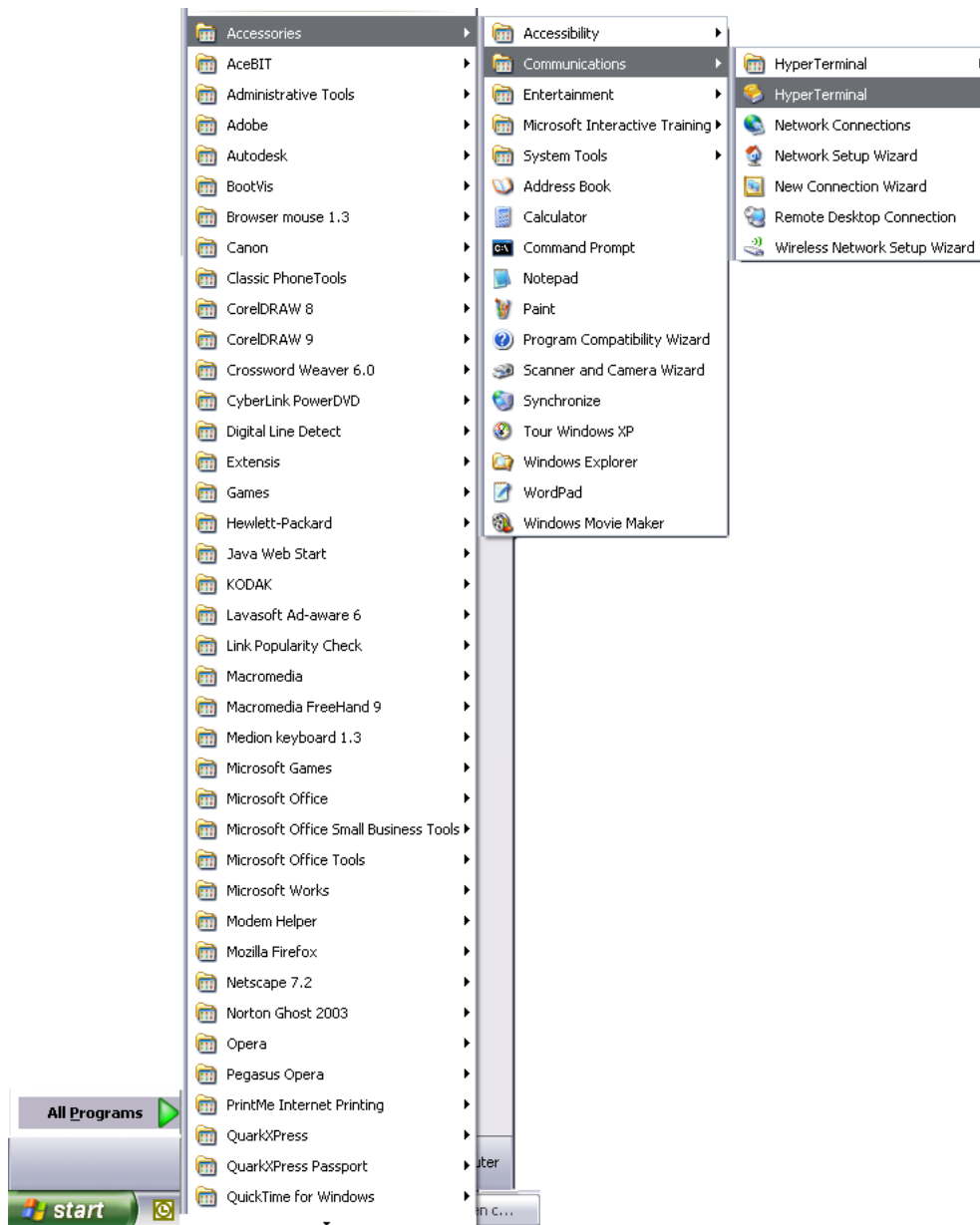


## HOW TO MANAGE THE CONTROL UNIT USING A PC

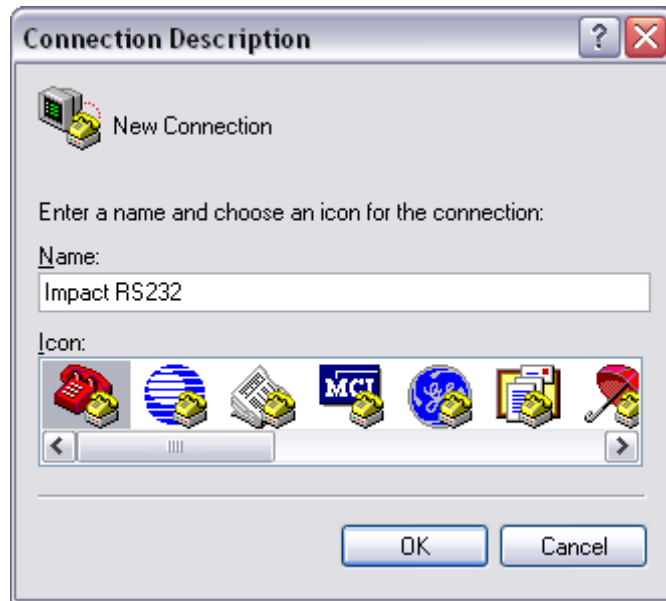
HyperTerminal, which comes with Windows95, 98, Me, NT, 2K & XP can be used to manage the control unit through a PC.

Follow these procedures to get a serial connection using HyperTerminal™:

1. Start the HyperTerminal .exe program (hyperterm.exe). Click on START, then ACCESSORIES, then COMMUNICATIONS, then HYPERTERMINAL, then chose the HyperTerminal entry that does not have an .ht extension.  
(Note: Some versions of Windows have Hyperterminal in Accessories.)



2. Start the program and create a new connection.

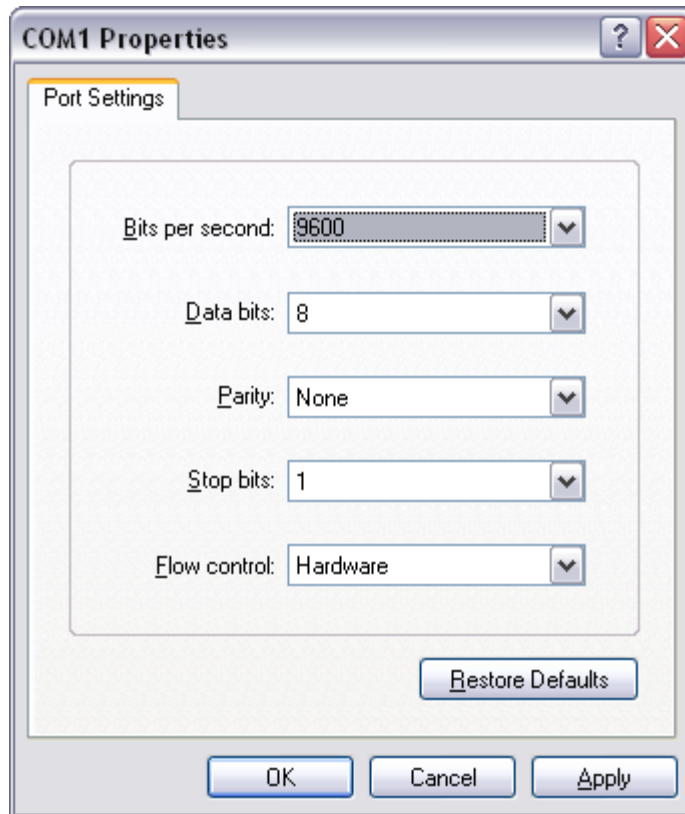


3. A dialogue window will appear where you select a connection; choose the serial port where the control unit is connected to the PC and click **OK**.

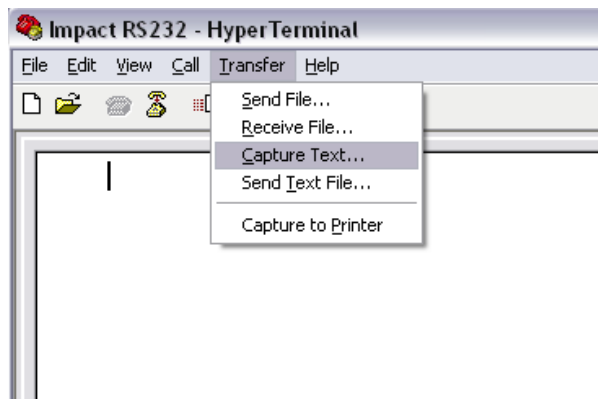
**NOTE:** in order to obtain correct data acquisition, select the serial port using the software and ensure that the control unit is physically connected to the selected serial port by a serial cable.



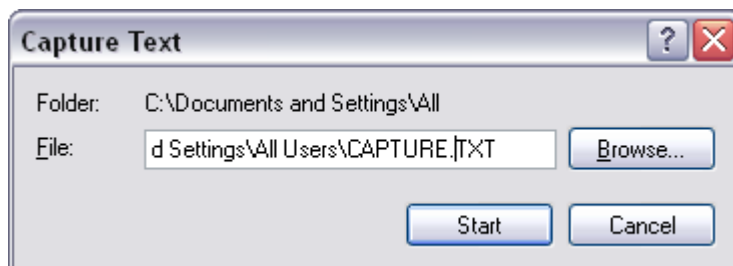
4. Once the serial port has been selected, a second dialogue window will appear to set up the transmission options for the selected port. Use the following configuration.



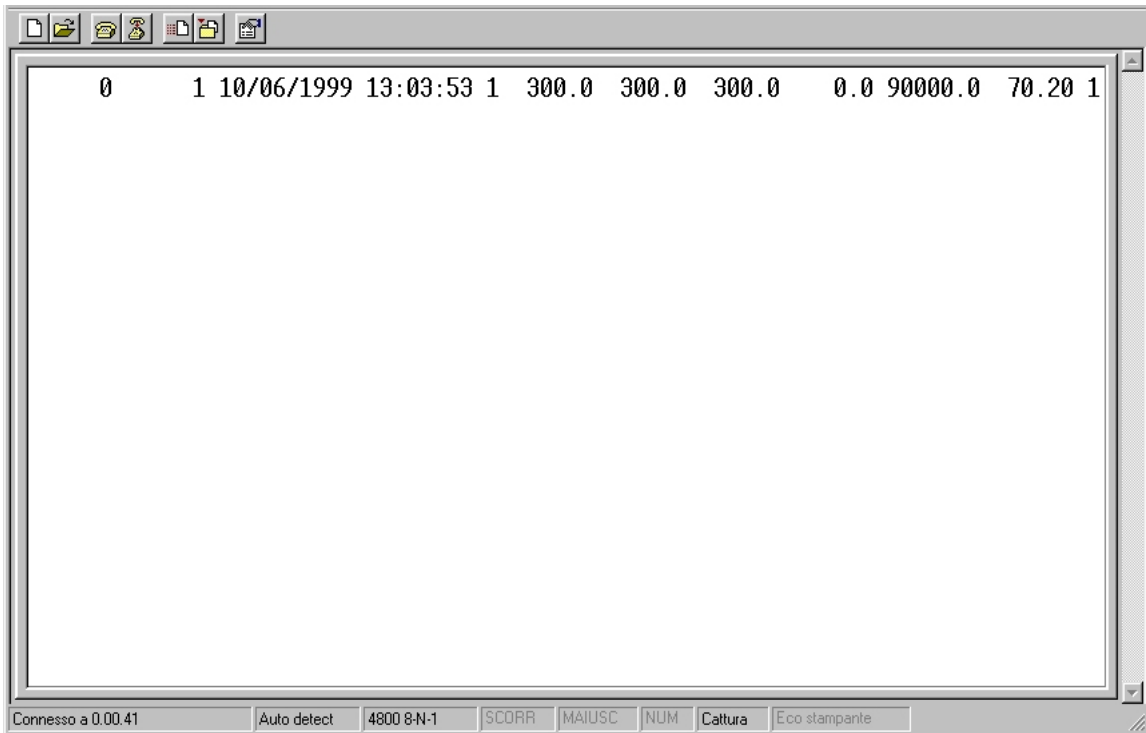
5. Now the program is ready to receive data from the selected serial port; select **"TEXT CAPTURE"** from the menu **"TRANSFER"**.



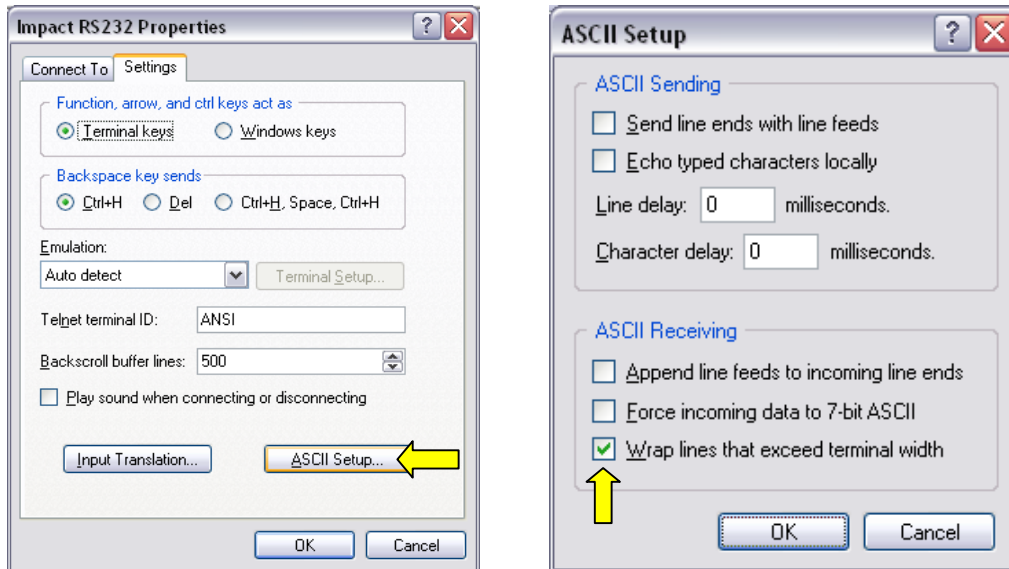
6. Select a file name and location to save the data received from the control unit to.



7. Start the data transmission function of the control unit.



**NOTE:** to be able to see the complete data values we recommend that you activate the Wrap lines Setting in "Properties", which can be selected from the "File" menu.



8. Once the data transmission has been completed, select "FINISH" from the menu "TEXT CAPTURE..." on "TRANSFER".

