

Instruction manual

Motorized torque bench

DRIVETWIST



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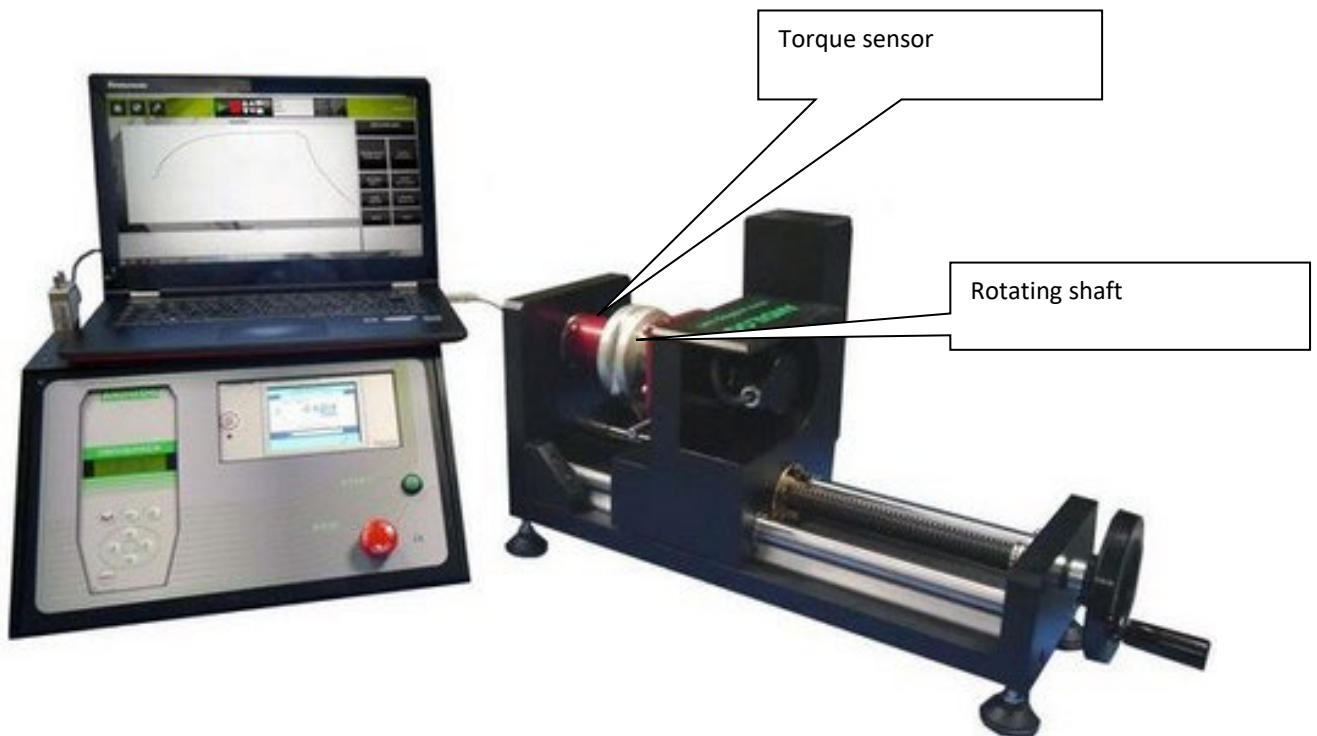
1. Introduction

1.1. Presentation

Thank you for choosing the DriveTwist torsionmeter manufactured by ANDILOG Technologies for your torque measurements.

This system is the result of over 30 years' experience in force and torque measurement. It incorporates the latest technologies available to offer you unrivalled performance and measurement quality.

Thanks to a completely redesigned graphical user interface, DriveTwist is intuitive and easy to use. This user's manual will guide you through the set-up and enable you to obtain your first measurements. It then goes on to cover the frame's advanced functions, enabling you to perform more complex tests and automate your results.



1.2. Documentation

This manual provides information on:

- System configuration and settings before starting tests
- Instructions for tests and their execution

Please refer to the CALIFORT software user manual for information on how to install and set up automated tests, and how to use the software. You should have received the operating manual by email or in Califort press the ? at the top right to open the manual.

1.3. Definitions

To make this manual easier to understand, here are some definitions of terms frequently used in this manual.

1.3.1. SPIP

SPIP is a technology developed by Andilog that enables our systems to automatically recognize external sensors. This technology stores capacity, serial number and calibration parameters inside the sensor.

1.3.2. Calibration

Systems are delivered calibrated by Andilog Technologies with a COFRAC calibration certificate. It is generally recommended to calibrate force measurement instruments once a year unless a different internal procedure is used. At each calibration, Andilog Technologies guarantees a complete verification of the instrument, as well as an adjustment of the calibration to guarantee perfect accuracy.

2. Installation and start-up

Refer to the [safety and installation instructions](#) - When opening the product. Check that the system has not been damaged in transit. If in doubt, contact Andilog Technologies to obtain further information and check that your measurement system is working properly.

2.1. Product opening

The DriveTwist system is supplied with:

- Torque transducer with calibration certificate
- A controller
- A torsion test stand
- Power cables and connection cables between components

2.2. Recommendations before use

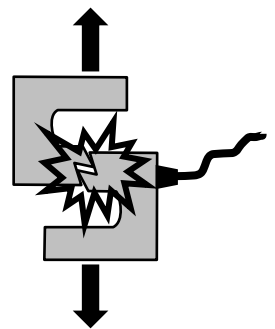
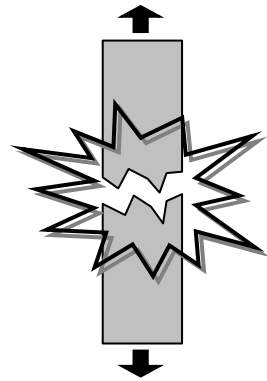
2.2.1. Sensor

Despite this instrument's overload protection, applying torque over the transducer's capacity can damage the system. The instrument will lock up if its capacity has been exceeded 10 times. You will then need to return your transducer to ANDILOG Technologies to check that it is working properly.

It is important that the measured values are generally less than 90% of the sensor's capacity. Constant use of the load cell above 90% of its capacity can lead to premature wear. When the transducer is used on a motorized frame, it is necessary to program a frame stop when the force approaches the transducer's maximum capacity. This limit must take into account the fact that, at high speeds, a frame will not stop immediately, and the risk of damage to the transducer is high due to the motor's inertia.

2.2.2. Precautions during testing

Most of the tests carried out with instruments from the Andilog Technologies range are destructive tests. The hazards associated with this type of testing require our instruments to be used by experienced and trained operators. Due to the nature and use of equipment sold by Andilog, the purchaser's acceptance of Andilog Technologies' products constitutes acceptance of the risks and damages that may result from the use of Andilog's instruments.



2.2.3. Ambient conditions

- Operating temperature: 0 to 35° C
- Storage temperature: -20 to 45° C
- Relative humidity: 5% to 95%, non-condensing
- Maximum operating altitude: 3,000 m

2.2.4. Warranty

Subject to the conditions below, Andilog Technologies warrants to the purchaser that it will repair or replace at no charge new instruments sold subject to normal use and maintenance. This warranty applies if the purchaser detects a defect in workmanship or materials within a period of two (2) years from the date of shipment.

The conditions of application are:

- ANDILOG Technologies has been notified in writing of the defect before the end of the warranty period.
- Products are shipped to Andilog Technologies with prior agreement from Andilog Technologies.
- All transport costs are paid by the buyer.
- The products have been used and maintained under normal conditions of use.

Any repair or replacement carried out by the seller without the agreement of Andilog Technologies voids the warranty.

In no event shall Andilog Technologies be liable for any damages, business interruption, or production stoppage resulting from the purchase, use, or non-operation of our products. Even if Andilog Technologies has been informed of the possibility of such damage.

The accuracy of our devices is guaranteed at the time of shipment at the value indicated in our documentation or offers.

If products are damaged during shipment, notify the carrier and Andilog Technologies immediately.

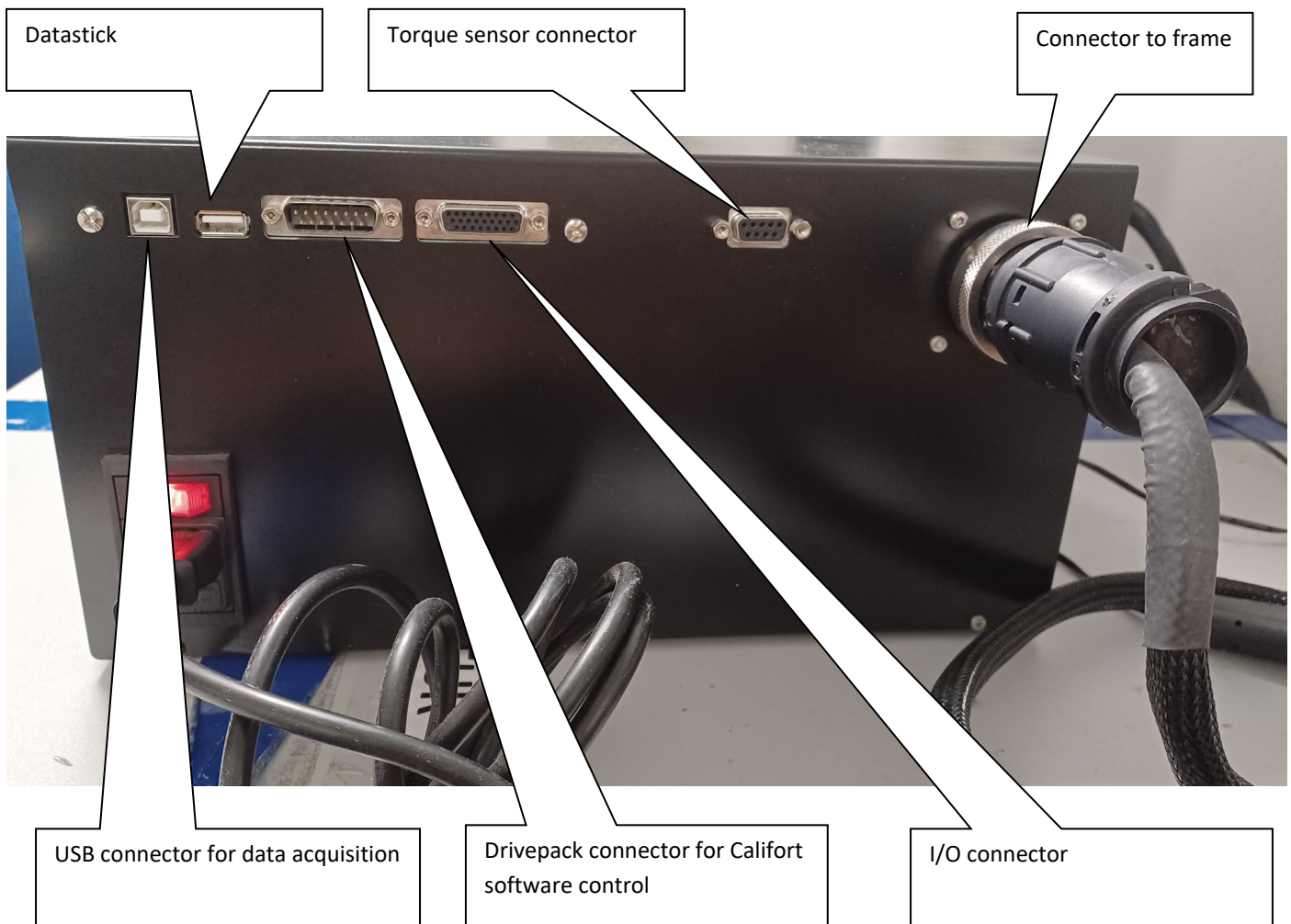
The warranty is void in the event of accident, misuse or abuse.

The warranty does not cover calibration, overloaded sensors or consumable parts such as batteries, unless the damage is due to a material or manufacturing defect.

2.3. Booting your system

2.3.1. Connect controller to frame

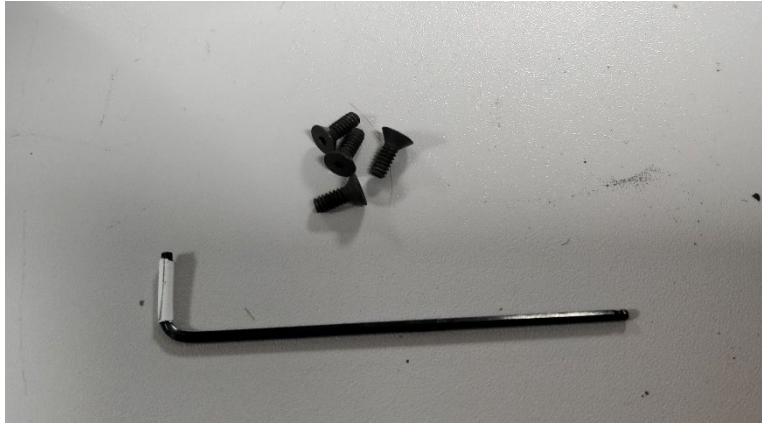
The controller Drivetouch should be placed on a stable, vibration-free table. It must be connected to the frame and to the computer using the cables supplied and the following connectors:



- Connect the frame to the controller using the round connector.
- Connect the torque sensor's 9-pin connector to the back of the Drivetouch.
- Connect the power chord to the Drivetouch.
- Turn on the Drivetouch

2.3.2. Mounting the sensor on the frame

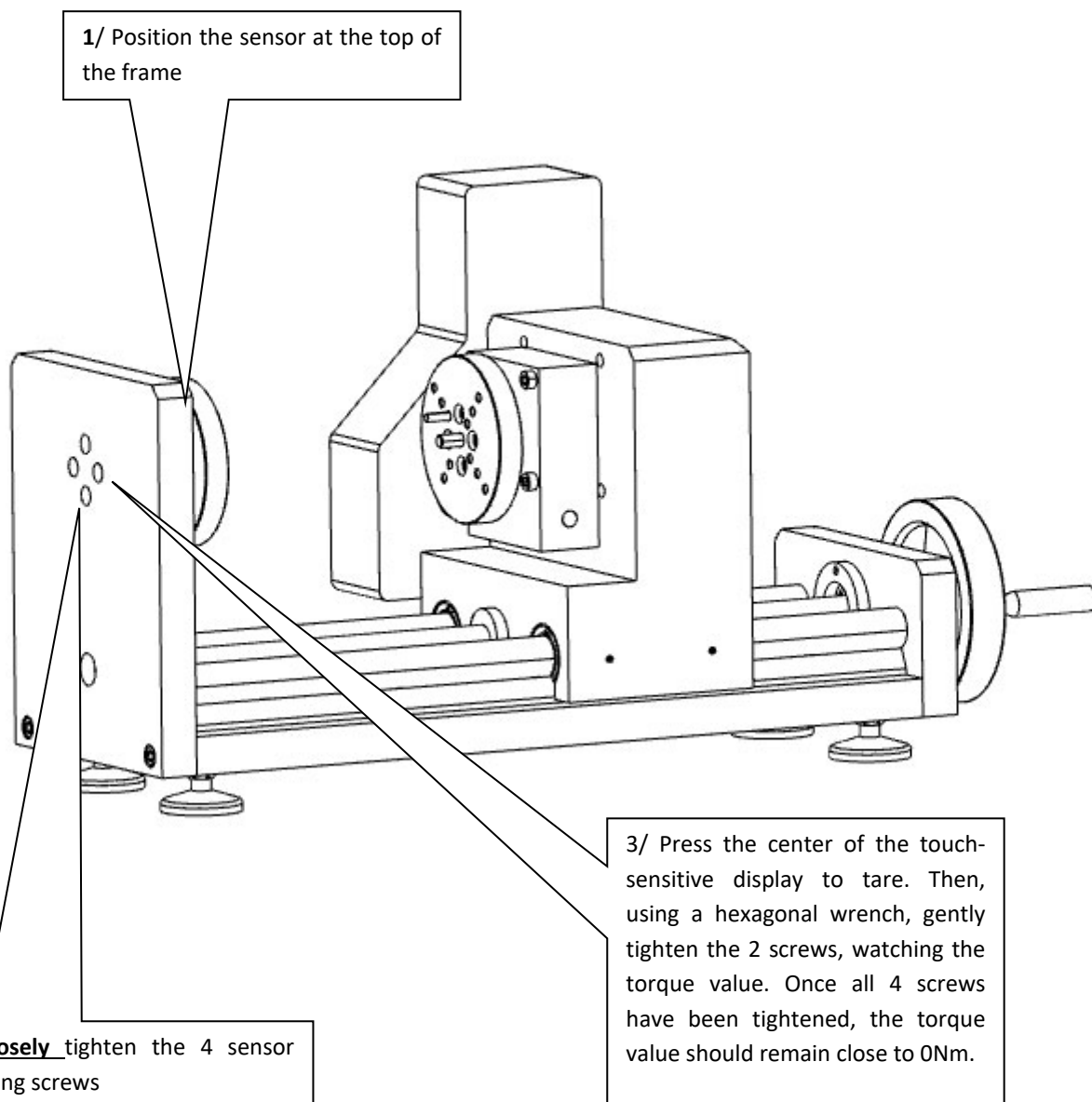
Switch on the controller using the switch next to the power cable. If necessary, release the emergency stop if the controller does not switch on.



Handle the sensor with care and ensure that it cannot be overloaded.

Torques to be measured must act precisely in the axis of the torque transducer. Torsional moments and eccentric loads may cause measurement errors and destroy the transducer. Tightening torques on mounting screws need not be very high.

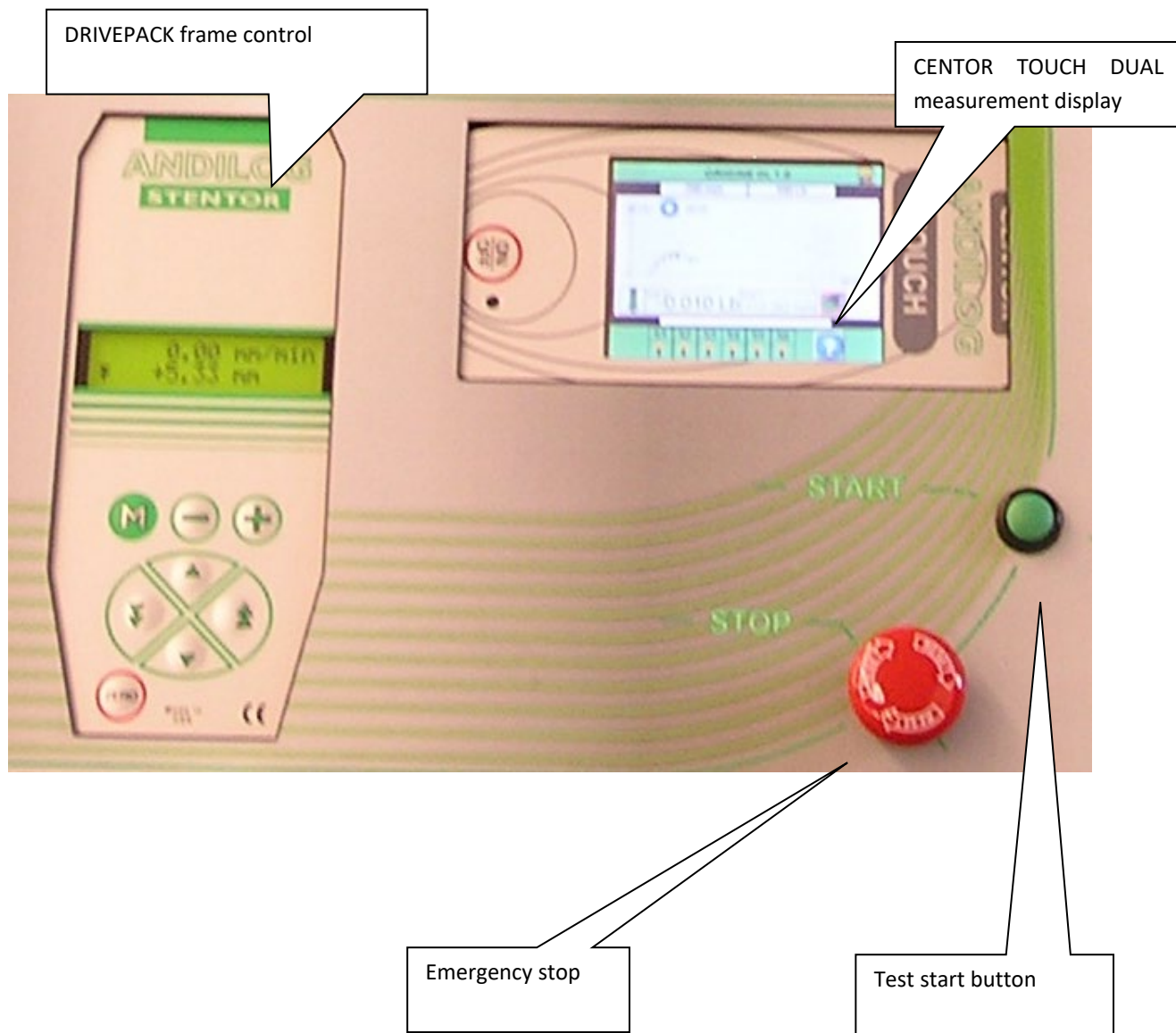
Use the 4 screws supplied to position the sensor on the frame.



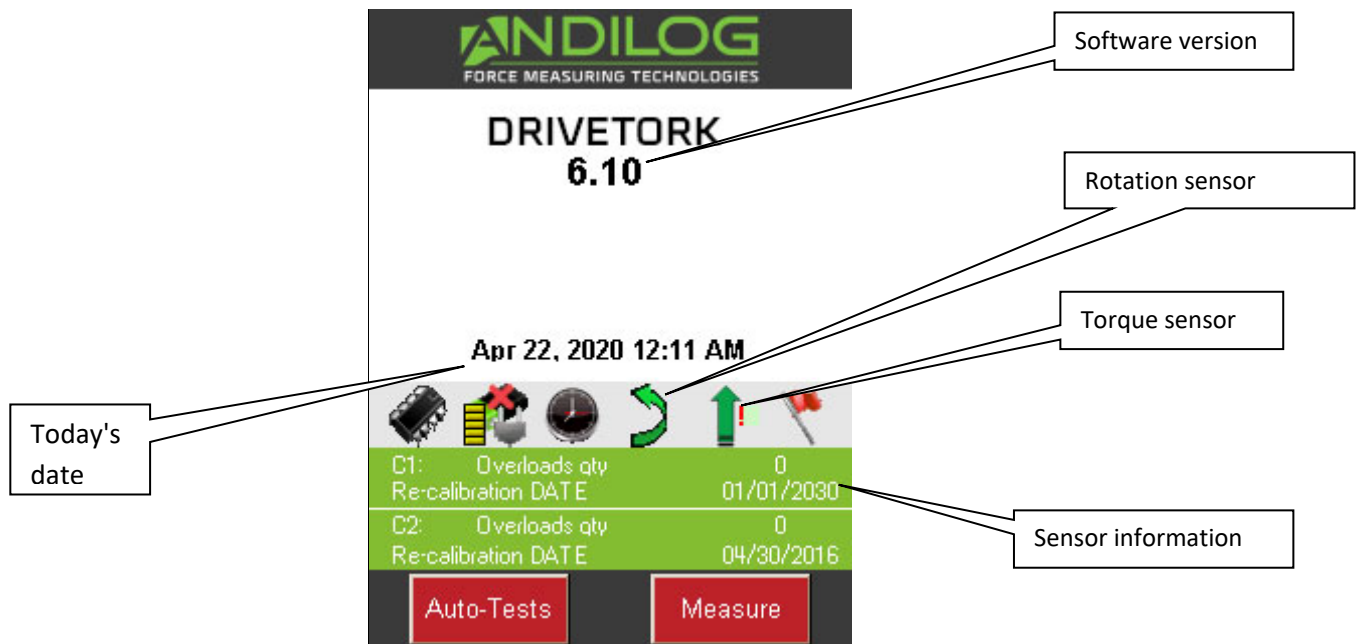
Start

The DriveTwist controller consists of two separate controls:

- DRIVEPACK frame motor control: controls the movement of the motorized column: displacement, speed, stop...
- CENTOR TOUCH DUAL: measurement of force as a function of displacement.



Start-up information screen :



Current date: Displayed in Europe: "DD / MM / YYYY" or US: "MM / DD / YYYY" format, can be set in the Maintenance menu (See chapter " Maintenance ")

Software version: This line indicates the embedded software version installed on the controller.

Internal and external sensor: Indicates the type of sensor connected (force, torque, displacement or angle) to your test machine and its operating status.

- A red "X" symbol indicates that the sensor is not recognized or has a serious problem. See chapter [Maintenance](#) for more information.
- Red exclamation mark! Indicates a minor warning on the sensor: an overload or an out-of-date calibration, for example.

Sensor information: At start-up, the CENTOR TOUCH display detects whether internal or external sensors are connected. External sensors are connected to the CENTOR TOUCH via a special connector, called SPIP.

Sensor information is displayed in the green rectangle at the center of the screen:

- Channel V1 for internal or V2 for external
- Date of next calibration
- Number of overloads

If the measurement window does not appear: While displaying the low battery indication, CENTOR TOUCH runs internal tests. If, during these tests, problems are detected, the **Autotest** icon is displayed at the bottom left of the screen. See chapter [Appendices](#) for the meaning of error messages.

If the error detected makes measurement impossible (major error such as a faulty sensor, for example), the device will remain stuck on this display and it will be impossible to carry out any other measurement. In this case, please contact the ANDILOG Technologies team to find out how to return the device.

If the error detected does not make measurement impossible (minor error such as low battery level or overload), you can go to the main screen by pressing the Measure button on the bottom right.

2.4. Operating principle DriveTwist

DriveTwist is designed around two independent interfaces: CENTOR TOUCH DUAL (for measurement acquisition) and DRIVEPACK (for motor commands).

- DRIVEPACK frame control: controls frame rotation: movement, speed, stop...
- CENTOR TOUCH DUAL measurement: force measurement as a function of displacement.

These two systems are configured separately, each with its own control command. However, they communicate with each other via digital inputs and outputs.

The general operating principle is as follows:

- Drivepack configuration of frame movement: rotation speed, maximum movement, stops, cycles, actions when frame meets a stop
- Use Centor Touch Dual to configure torque acquisition as a function of rotation, calculations (breakage, average...) and force limits.
- Configuring Centor Touch Dual outputs so that Drivepack performs specific actions (stop, return, etc.) at particular times during measurements. The most common configurations are described in [configuration examples DriveTwist](#) [DriveTwist](#), for example: frame stop on sensor overflow, stop on limit, return on ring break, etc.

This manual is therefore structured in the same way. First we look at the rotation configuration, then at the measurement acquisition configuration, and finally at communication between the two systems. In the final section, detailed examples of common configurations are presented.

NOTE: In addition, the optional CALIFORT control and command software lets you combine these 2 commands to configure and parameter your tests from a PC.

3. Travel controls

The motorized two-column test machine is moved using the DRIVEPACK control below. It is used to adjust the system's behavior during rotation.



3.1. Controls

The control buttons behave differently depending on the mode you're in. There are two modes:

- Normal mode
- Configuration mode

3.1.1. Functions in Normal mode

KEY #	NAME	DESCRIPTION
0	Display	Displays real-time information: displacement, speed, error, etc.
1	MENU button	Access to configuration mode
2	+ button	No function
3	Button -	No function
4	Up button	Clockwise start-up of frame at set speed
5	Down button	Counterclockwise start-up at set speed
6	Rapid ascent button	Clockwise frame start-up at maximum speed
7	Rapid descent button	Counterclockwise start-up at maximum speed
8	Reset button	Reset displacement value

PRESSING ANY CONTROL BUTTON WHILE THE FRAME IS MOVING CAUSES THE MOTOR TO STOP

A LONG PRESS (3 seconds) ON THE ZERO KEY RESETS THE CONSOLE

3.1.2. Functions in configuration mode

KEY #	NAME	DESCRIPTION
1	MENU button	Back to Normal mode
2	+ button	Go to next parameter
3	Button -	Go to previous parameter
4	Up button	Increment parameter
5	Down button	Decrements the parameter
6	Rapid ascent button	Increment parameter quickly
7	Rapid descent button	Decrements the parameter quickly
8	Reset button	No function

Note: The rotation value can be set to zero at any time when the motor is stopped. The origin of displacements is therefore 'relative'.

3.1.3. Emergency stop

The machine is equipped with a mechanically-locked emergency stop button on the front panel. The emergency stop button stops the machine when the power supply is completely cut off. To restart the machine, the emergency stop button must be unlocked.

Caution: if the machine is stopped by the emergency stop, the displacement value may be incorrect, so check the displacement value when restarting.







This does not apply when the machine is switched off at the end of operation, via the switch, with the motor stopped. In this case, the displacement value is stored and displayed when the machine is switched back on.

3.2. Travel configuration

Drivepack lets you configure clockwise and counterclockwise rotation of the motorized frame. Rotation settings are separate and have independent parameters. For each direction of movement, you can configure the following:

- Speed
- Rotation stop
- Stop action
- Travel time
- Action on end of travel time
- Cycles

Navigating menus, changing parameters or modifying a value is always done in the same way, whatever the parameter:

- To access the configuration menu, press the  key.
- Use the + and - keys to move from one menu to another.
- To exit the menu and confirm the configuration, press the  key.
- Change parameters or values using the buttons,   , .





3.2.1. Menu architecture

- Hourly speed
- Counterclockwise speed
- Hourly travel stop
- Type of stop (fast or precise)
- Counter-clockwise travel stop
- Type of stop (fast or precise)
- Hourly time stop
- Anti-clockwise time stop
- Climbing break
- Downhill break
- Cycles
- Pedal
- Input 1
- Input 2

- Output
- Units
- Language

The menu is dynamic, i.e. if one of the stops is inactive, then its setting menu is not proposed by Drivepack.

3.2.2. Speed settings

The first two menus allow separate clockwise and counterclockwise speed settings. Use the  and  keys to increase or decrease speed in steps of 0.01 rpm, and the  and  keys to increase speed in steps of 1 rpm. A long press on these keys increases the values more rapidly.

Caution: Frame speed is adjustable. During testing, too high a speed may prevent the sensor protection system from triggering in time if you exceed the maximum capacity.

3.2.3. Travel stops



A travel stop is a fixed point where the motorized frame's moving center crosspiece will stop during its travel. The upper travel stop corresponds to a travel limit when the frame is moving upwards, and the lower travel stop corresponds to a travel limit when the frame is moving downwards.


If several limits are configured in Drivepack, the first limit encountered by the frame will be executed and the other limits ignored.

Drivepack offers 3 different configurable limits: mechanical, displacement and temporal. For each limit, 4 actions can be configured for the frame:

- Inactive : the frame does not take into account the limit
- Stop the frame stops when it meets this stop
- Inverter the frame moves in the opposite direction at the set speed
- Inv temp : the frame starts moving again in the opposite direction at the defined speed after a pause of X seconds defined in the Pause menu.

Multiple stops can be configured for a single test. It is strongly recommended to use mechanical stops as safety limit switches to avoid destroying the sample, fixtures or sensor. Consequently, time or displacement stops are generally used to terminate tests.





Rotational stops: These are defined by displacement in revolutions or degrees. If they are active, an angle configuration menu appears in Drivepack and can be accessed by pressing the + key once. These limits can be configured in the "Stop pos  " menu for clockwise travel and the "Stop pos  " menu for counter-clockwise travel.

Note: The displacement value set for this limit is relative to frame position 0, which can be reset to 0 at any time using the  key. Clockwise displacement is positive, counter-clockwise negative.

Example configuration, if you enter the following parameters in Drivepack:

- Speed ↻ 2 rpm
- Speed ↻ 3 rpm
- Butee pos ↻ Arret
- Butee pos ↻ 1 tr
- Butee neg ↻ Inverseuse
- Butee neg ↻ -2 tr
- All other stops are inactive

If you return to Normal mode, there are several possibilities:

- If you press the  key to reset the frame movement to 0 and then press the  key, the DriveTwist will move counterclockwise at a speed of 3 rpm. When it reaches -2 revolutions, it will start moving in the opposite direction at a speed of 2 rpm until it reaches 1 revolution and then stop.
- If you press the  key to reset the frame movement to 0 and then press the  key, the DriveTwist will move clockwise at 2 rpm until it reaches the 1-turn position.

Note: These limits, if activated, **ARE NOT taken into** account when moving manually at high speed.

Time stops: Time stops are defined by a travel time in seconds. If they are active, a time configuration menu appears in Drivepack and can be accessed by pressing the + key once. These limits can be configured in the "Time stop ↻" menu for upward movement and the "Time stop ↻" menu for downward movement of the frame. Operation is identical to that of the position stops.

Note: These limits, if activated, **ARE NOT taken into** account when moving manually at high speed.



Pause: If at least one of the above stops is set to "Inv temp", then the "Pause ↻" and "Pause ↻" menus are available in Drivepack. These menus define the waiting times, in seconds, when the frame encounters a stop before it starts again in the opposite direction.

Note: The system may appear to be inactive when using the "Pause" function but will start to move without warning once the function is complete. Do not attempt to adjust accessories or remove samples until the test is complete.

Cycle: If at least two stops are set to "Inverse" or "Inv temp", then the "Cycle" menu is available in Drivepack. This menu is used to define the number of times the frame will cycle up/down between the reversing stops. The number of cycles can be set from 1 to 255.


3.3. Start-up configuration rotation

The DriveTwist can be started in two different ways:

- Press the  and  keys to start turning the frame.

- A long press on the green button on the front of the controller can start the DriveTwist moving. This button can be configured in a number of different ways, as follows.

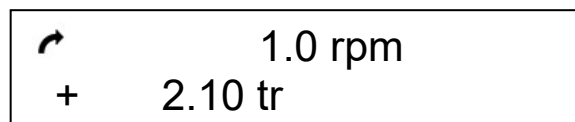
Configuring the green Start button on the front of the controller: To configure this button, go to the Drivepack menu, then to the "Action Pedal" menu. You then have several choices:

- Inactive No action
- Dem neg starts the frame clockwise
- Dem pos starts the frame counter-clockwise
- Stop Stopping the frame in its tracks
- RESET Reset position value to zero (equivalent to) 

Once the test has started, the Drivepack display shows :

- Travel speed
- Direction of travel
- Real-time frame position

Example:





In this example, the frame moves clockwise at a speed of 1 rpm and has covered 2.1 revolutions.

To stop the DriveTwist, press any key on the Drivepack control.


Note: If the DriveTwist reaches one of the stops while moving, it will execute the configured action (Stop, Return...).

3.4. High-speed travel



You can manually move the frame at high speed using the Drivepack command, for example, to position the frame at the test start point. To do this, use the  and  keys to move up or down. If the key is released, the rack stops.

Note: In fast travel mode, the stops are not taken into account by the frame. This mode should only be used to move to the original position. It must not be used for testing purposes.

3.5. Reset position to 0

To reset the Drivepack position to 0, press the  button when the engine is stopped.

3.6. Units

This menu allows you to select the unit for displaying speed and displacement. Use the  and  keys to toggle between rpm and °/s.

3.7. Change language

The last menu allows you to change the Drivepack language. The languages available are :


- French
- English
- German
- Spanish

3.8. Drivepack digital inputs

The Drivepack motion controller has 2 configurable digital inputs. These two inputs are accessible via the 15-pin connector on the rear of the controller (see "Appendix" for details of connector input numbers). They enable the Drivepack to perform actions on command from another device.

For example, they can be used to stop the frame when the controller detects a break or reaches a limit. For example, it is possible to perform a force threshold stop or a breakage stop.

The different actions possible on the activation of its inputs :

- Inactive no action
- Dem neg starts the frame clockwise
- Dem pos starts the frame counterclockwise
- Stop stops the frame in its tracks
- RESET resets the position value to zero (equivalent to the  key)
- Inverter the frame moves in the opposite direction at the set speed
- Inv temp : the frame starts moving again in the opposite direction at the set speed after a pause of X seconds defined in the Pause menu.
- RS232 The Drivepack sends the information 'TOR input' on its RS232 output to the Califort software. If you are not using Califort, this action has no effect.

When used with CALIFORT software, the software takes control of the digital inputs.

3.9. Drivepack's TOR output

The Drivepack motion controller features a configurable digital output. This output is accessible via the 15-pin connector on the rear of the controller (see appendix for details of the connector output number). It is used to inform another device of an event.

The various events that can trigger this output are :

- Inactive Output is disabled

- Butee Pos. one stop clockwise (position, time)
- Butee Neg. counter-clockwise stop (mechanical, position, time)
- Error : safety error, motor error, ...
- End of test This is the end of the last cycle.

When used with CALIFORT software, the software takes control of the digital output.

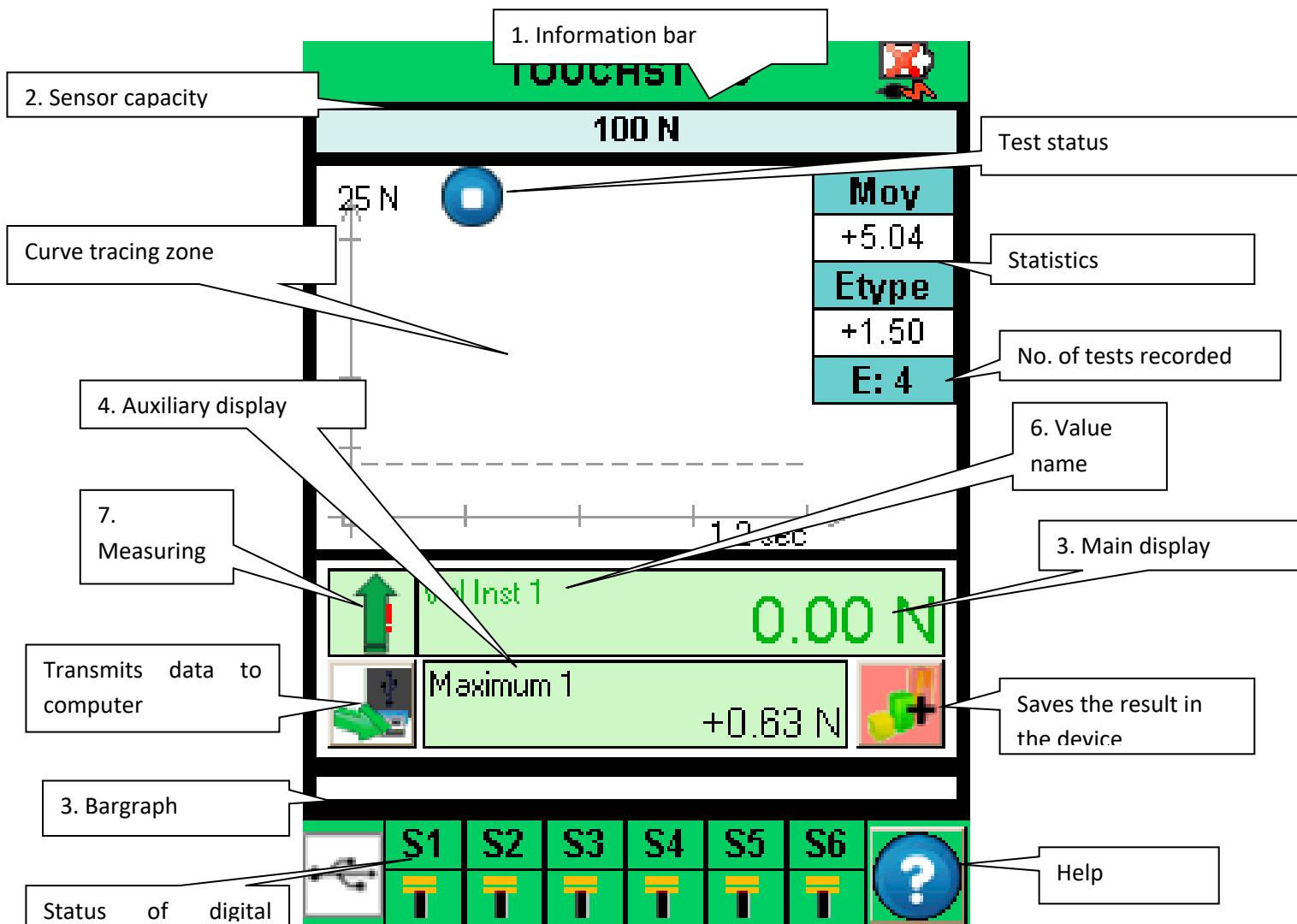
4. Measuring with DriveTwist

Once you've set up the movements you want to make with the DriveTwist, we'll move on to the operation of the Centor Touch Dual, enabling you to take your force measurements.

4.1. Main measurement screen

After the start-up screen, the main measurement screen appears as shown below. Depending on the options configured in DriveTwist, certain information may or may not appear on your system.

NOTE: the configurations and displays below depend on the current configuration of your machine.



1 - Information bar: the device name appears in this bar. Press this area to access the main menu.

2 - Sensor capacity: the maximum capacity of each sensor and its unit of measurement are displayed at all times.



3 - Bargraph: A moving black line represents the torque applied in real time. If the Bargraph is completely black, this means that the torque applied is close to full capacity, CAUTION there is a risk of overload! If the limits are activated, the Bargraph changes color according to the value read (see paragraph "Setting limits"). [Setting limits or thresholds](#) ")

4 - Main display : A wide range of information can be displayed in this window (current value, maximum, minimum, calculation...). See configuration screen for details.

5 - Auxiliary display area: a wide range of information can be displayed in this window (current value, maximum, minimum, calculation...). See configuration screen for details.

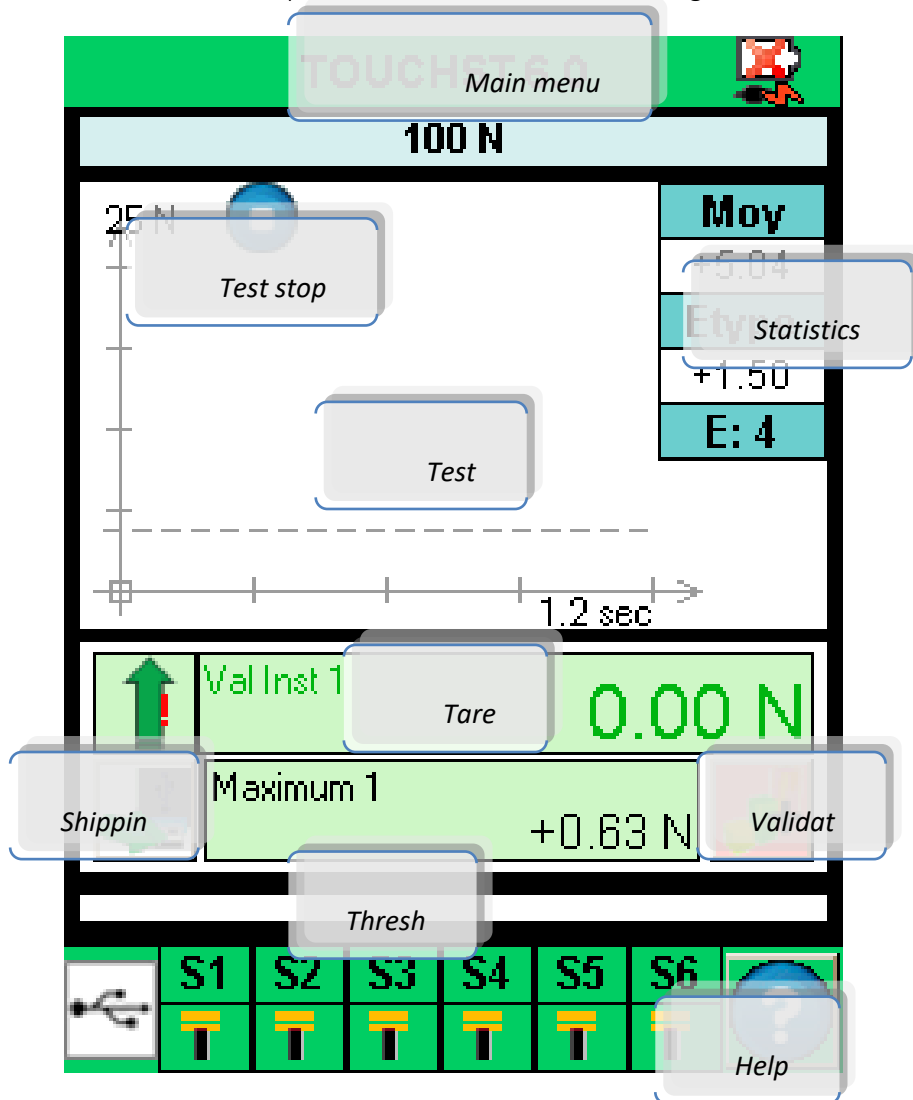
6 - The name of the data displayed in the main and auxiliary displays is indicated in the top left-hand corner of each screen. In [Modifying the measurement screen display](#) how to modify the displayed value.

7 - Sensor measurement direction: A small mnemonic symbol indicates the torque direction

exerted on the sensor  for clockwise and  for anti-clockwise

4.2. Measurement screen touch zones

Each area of the measurement screen provides access to controller configuration menus.



4.3. Main menu

To access the main menu, press the green bar at the top of the controller measurement screen. The main menu appears:



4.4. Zero or Tare

Before each measurement, it is important to tare or zero the transducer. By default, the green Start button on the front of the controller is configured to reset force and displacement to 0 and start a test. It is also possible to zero or tare before a test, by touching the main display area.

The controller will take into account the torque of the accessories (handle, hook, plate, etc.) attached to the load cell. The preload torque of the accessories on the load cell must not exceed 20% of the load cell's capacity before taring. Tare resets all stored values (maximum, calculations) and also resets the outputs.

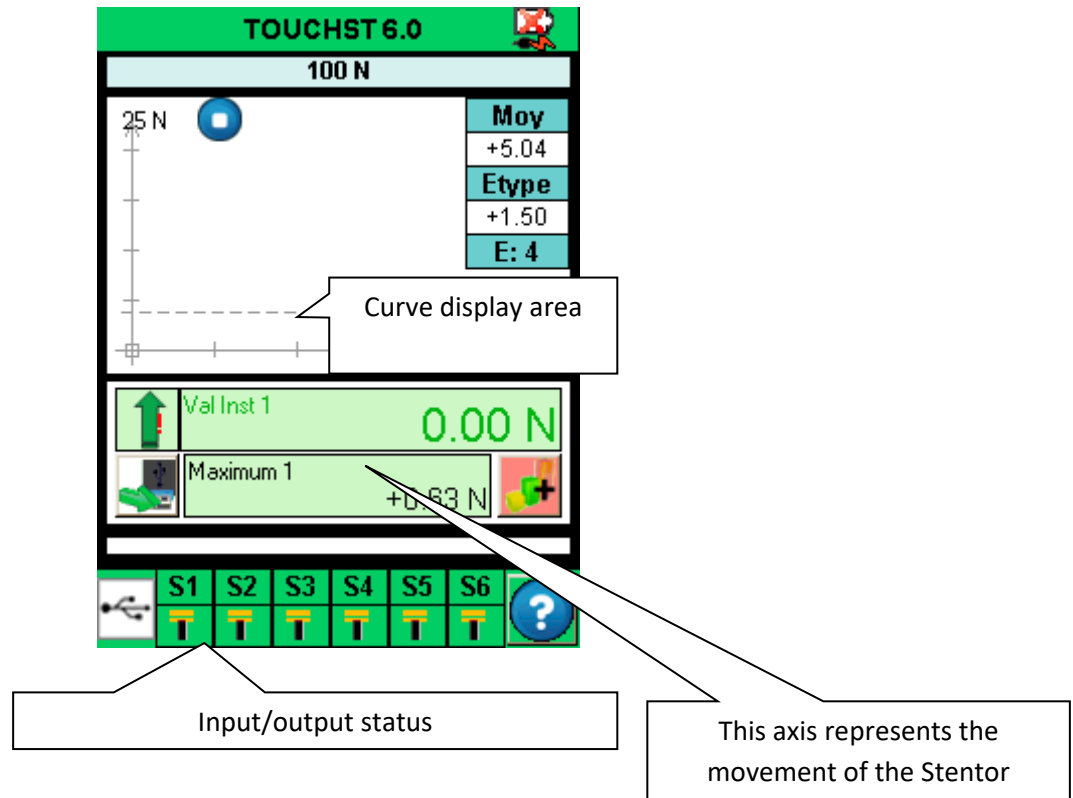
NOTE: at start-up, Centor Touch performs several self-tests to check the condition of the transducer. Tools may be left attached to the transducer, but the total torque must not exceed 5% of the transducer's maximum capacity.

4.5. Backlighting

When the controller is in use, the backlight switches off automatically after a preset time of inactivity - see the "Maintenance" chapter for settings.

5. Start measuring

After setting up the Test menu, DriveTwist allows you to plot your test curves. The following screen appears on start-up. See chapter "Configuring graphs and tests".



5.1. Start a measurement

By default, DriveTwist is configured to display the force vs. displacement curve. To start a measurement, simply press and hold the green Start button. The Centor Touch Dual will then reset the force and displacement to 0, and the frame will start moving in the direction configured in the Drivepack.



The torque vs. rotation curve will then start to appear on the display as torque increases.

The graph displayed self-adjusts during the test. There are 3 scale values: 25%, 50% and 100%. At the end of the test, the graph is automatically retraced to make efficient use of the available space. Measured values can be positive or negative.

5.2. Status indicator

At the top left of the graph, a Centor Touch Dual status indicator is displayed:



The system is waiting, the curve has not started, but the zero is done.



The system is in acquisition mode, tracing the curve.



The test is finished. To start another test, a zero must be entered.

If you wish to stop a test before the end of the test time, you can press this status indicator, which will then switch from acquisition mode to Stop mode. This will not, however, stop the frame moving, but only the acquisition.

5.3. Curve display area



There are 3 possibilities for axis position: positive measurement, negative measurement and positive and negative measurements.

To start plotting, first press the green Start button to zero. When the CENTOR TOUCH detects an increase in force on the sensor, it will start to plot the curve.


The curve represents the image of the force exerted on the sensor, with the current value displayed in the main area and the displacement displayed in the auxiliary display area. Depending on screen parameter settings.

The Centor Dual Touch has very fast electronics and an acquisition rate of 1000 Hz. However, for better readability, it stores a maximum of 1000 points of a graph.

Note: More precise graph acquisition via continuous communication with CALIFORT software and USB output is possible at 1000 values per second (adjustable parameter).

At the start of the curve, the indicator changes from  à 

To stop acquisition, touch the graphic area. However, acquisition stops automatically after the time selected in the configuration screen. See [Configure graph and tests](#).

At the end of this acquisition, the status indicator changes to : 

At this stage, you can:

- Read the chart
- Record the values calculated during the test by touching the statistics window.
- Download calculated values or graph to a PC via RS232 or USB output (send data using the "key")

- Enter configuration mode and modify configuration
- Clear the graph by touching the main display area

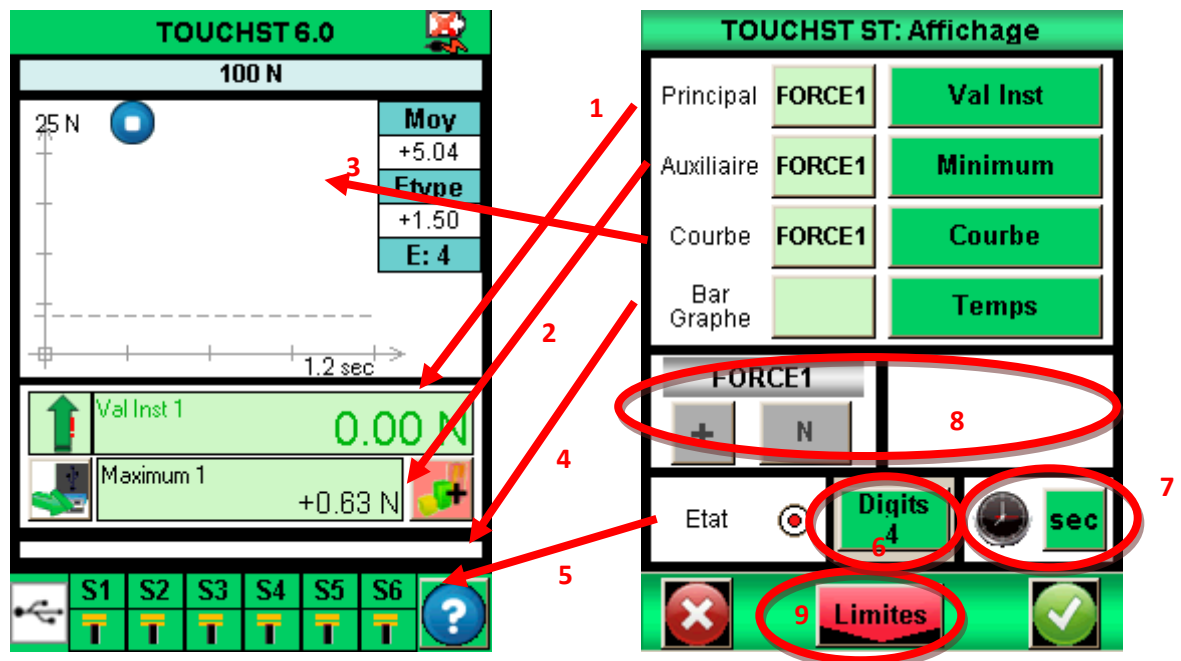
To repeat a test, use the green Start button to perform a tare.

To modify the configuration, touch the graph area.

6. Modify my screen display

Parameters can be modified via the setup menu by touching the green information bar at the top of the main screen. Then touch the "Display" icon at top left to change the measurement screen display.

The configuration screen appears as follows. Each parameter is used to configure the main measurement window. Each parameter is detailed below.



1. Main display window: The main display window can show all the values that appear in the list. Touch this value to display the list of available values. Select the sensor whose value you wish to display by touching the green window (ROTAT1: Angle or COUPLE2: Torque).
 - The data available are : Current value, Peak (maximum), Minimum and Calculation1 or Calculation2 (if enabled, see section : [Configuring calculations](#) for the different calculations).
2. Auxiliary window: same as main display window
3. Curve window: you have three options:
 - Display curve: select 'Curve' (as shown above).
 - Do not display curve: select 'None'.
 - Display a third value in place of the curve: select the value to be displayed.

When the curve is not displayed, the bargraph always represents time.
4. Bargraph: allows you to set the sensor and value on which the Bargraph varies. The parameters are the same as for the main display.

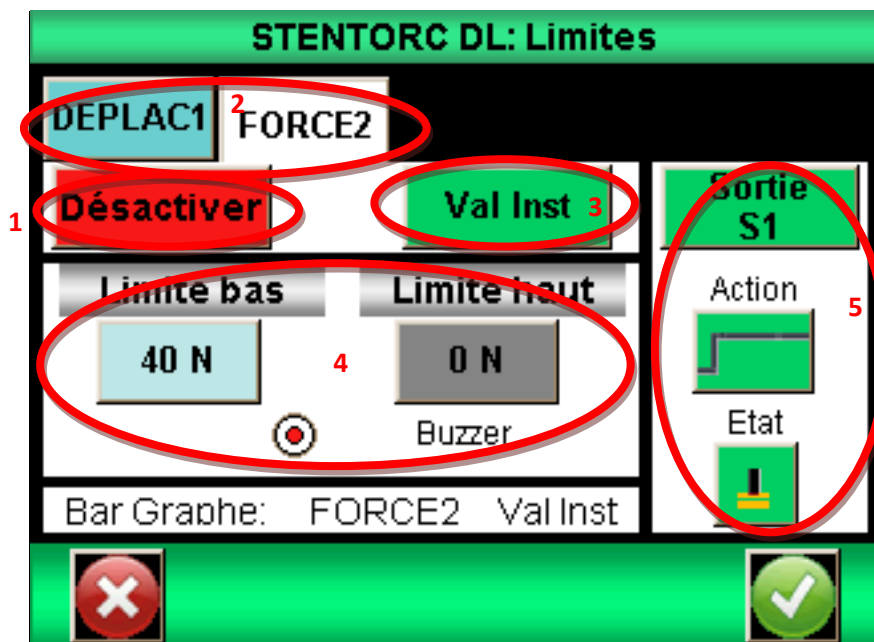
5. Status: shows or hides the status bar for Centor Touch digital outputs.
6. Digits: number of decimal places displayed during measurement. Adjustable from 0 to 4.
7. Allows you to change the Centor Touch and graph setting time unit by touching the green box. Available units are millisecond, second and minute.
8. Displacement or torque unit and sign: changes the sensor unit. The green button is used to change the sign of the displayed value: positive, negative or absolute value (the TESTS menu must be deactivated to change this parameter).
9. Accesses the "limits" setting menu, see chapter [Setting limits or thresholds](#).

7. Setting a limit or thresholds

You can access limit and force threshold settings by touching the Bargraph on the main measurement screen, or by touching the "Limits" button in the Display menu. The Centor Touch limit function allows you to perform an action depending on the conditions of the value read by the sensor. These actions can be: changing the screen color, activating a beep, stopping the frame, etc.

7.1. Activate / Deactivate

Touch the "Enable" or "Disable" area to activate or deactivate the limits.



7.2. Sensor tab

You have 2 tabs to display the configuration screen for each sensor (torque or rotation). You can set separate limits for each sensor. Select the tab for the desired sensor. Press the tab to activate or deactivate the limit function.

7.3. Choice of limit value

In Centor Touch, it is possible to define the type of value on which a limit is to be set. Generally, the instantaneous value is used. But it is also possible to set a limit on the maximum or on a calculation (average, derivative, break...see chapter : [Configuring calculations](#)).

Select the data you wish to limit by touching zone 3 to display the list of possible values.

7.4. Setting limit values

You can set a lower and upper limit for each sensor by touching the button, then enter the desired value using the keypad.

You can then define whether you wish to have a beep when the measured value exceeds the set limit.

Limit values are automatically displayed on the graph and Bargraph during measurement. During the test, the measured value changes color when a limit is passed. Values measured in the main and auxiliary zones also change color when limits are reached.

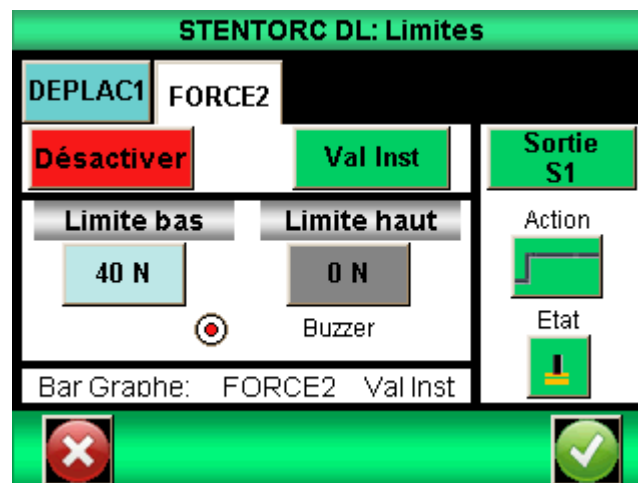
7.5. Stop the frame on a torque value

You can stop the frame when it reaches a torque limit, for example. Once the limit value has been entered. You need to activate a Centor Touch output (S1 or S2) to send a signal to the Drivepack motor control. You must then modify the Drivepack configuration to set Action Ext 1 or 2 corresponding to S1 or S2 to "Stop".

How it works :

- If only the low limit is configured, the output will change state when the measured value exceeds the limit value.
- If low and high limit are configured, the output will change state when the measured value falls between the limit values.

Example of a DriveTwist stop configuration with a force of 40N :

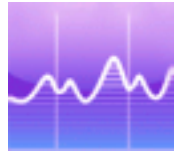


Drivepack order configuration :

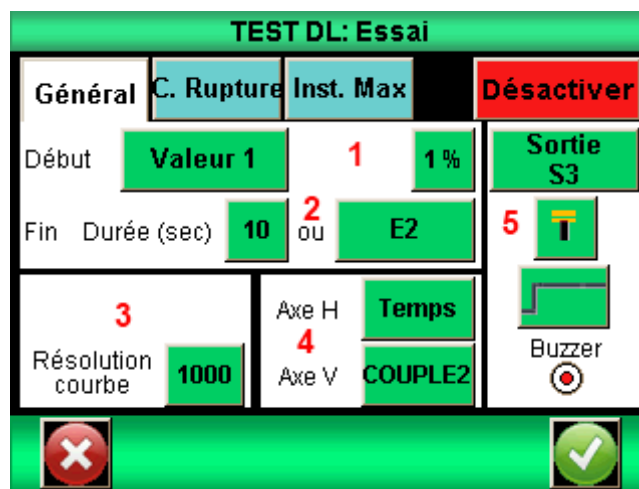
Action Ext. 1
Stop

8. Setting up graphics and tests

To configure the graph and test parameters, go to the main menu and touch the Test icon on the screen:



The graph configuration screen appears



8.1. Test tab

Touch the area at top right to activate or deactivate the graphic.

8.2. Configuration of test conditions

There are 2 parameters to take into account when configuring a trial:

- Test start condition
- Test duration

8.2.1. Start-up conditions of a test

Once the sensor has been tared, Centor Touch waits for an event to start acquisition. This event can be of two types:

- Variation in value on one of the connected sensors
- External action (controller START button, external foot pedal or command via CALIFORT software)

Select the test start condition by touching the green zone (Value 1 for rotation sensor, Value 2 for torque sensor). The "pedal" corresponds to the green button on the front of the DriveTwist controller.

If you have chosen Value 1 or Value 2, you must then define the percentage of the transducer capacity that triggers acquisition. For example, if the transducer has a capacity of 6Nm and the percentage is set to 1%, the test graph starts when the torque reaches 1% of 6 Nm, i.e. 0.06Nm.

Touch the % button, then set the desired value using the keypad displayed on the screen.




To start the curve as soon as you press the green button, choose Pedal in Start.

8.2.2. End of test

You need to define the maximum duration of a test to allow the controller to record values during your test. This maximum time has an influence on the resolution of your curve. For example, if you have set a duration of 10 seconds and the curve resolution is 1000 points, you will have one point recorded every 0.01 seconds.

Set the maximum test time by touching the green box next to Duration. Then enter the desired value using the keyboard.



Note: a test can be interrupted before the end of the set time by touching the  icon during the test, or by using one of the controller's discrete inputs. See chapter: [TOR and pedal inputs and outputs](#). The green button to the right of the time allows you to select a discrete input. However, stopping before the end of the test will not modify the resolution of the curve calculated at the start. On the other hand, fewer points will be recorded. For example, if we assume a duration of 10 seconds and a resolution of 1000 points, the controller will record one point every 10ms. If the test is interrupted after 5 seconds, the number of points on the curve will be 500 and the resolution will still be 10ms.

8.2.3. Curve resolution

Curve recording resolution can be modified. By default, it is set to the maximum: 1000 points.

The resolution of the curve indicates the number of points recorded over the duration of the test. However, this value is not simply a sampling frequency. In reality, the acquisition frequency on the internal sensor is 5000Hz, so the controller averages all the values read from the sensor and records this average as a function of the curve resolution.

Example: Curve resolution 1000 points, test duration 10 seconds. One point recorded every 10ms.

The controller will therefore average the values read by the sensor at 1000hz and record this average every 10ms. Consequently, the first value recorded will be the average force between 0 and 10ms, the second between 11ms and 20ms etc....

8.2.4. Display axes

You can choose what to display on the graph's horizontal and vertical axes: time, rotation, torque. Touch the green squares to change the values. This allows you to display force as a function of time, for example.

8.2.5. Perform an action at the end of the test

At the end of the test you can perform two types of action:

- Buzzer: activate or deactivate this function by touching the circle below "Buzzer".
- Activate one of the controller's digital outputs: select the output to be activated (from 1 to 6) and the operating mode: pulse or toggle, as well as the high or low state. More details on digital inputs/outputs in chapter: [Digital inputs, outputs and pedals](#).

9. Setting up calculations

Centor Touch offers the option of automatically calculating measured values. These calculations are set in the Test menu. It is possible to perform 2 calculations simultaneously, in addition to displaying the instantaneous, maximum and minimum values.

9.1. Choice of calculations

Centor Touch lets you select 2 calculations, performed from the graph. Access the configuration of each calculation by touching the calculation tabs. Trial mode must be activated to perform calculations.



The calculations available are :



1^{er} Peak: Calculates the first break detected by the sensor. You can define on which channel the calculation takes place and the percentage drop in force from the maximum that will trigger the calculation. Any other break after the first will be ignored.

C. Breaking: Calculates the value of the breaking torque during a test. Defined as a percentage of curve maximum.

Contact force: Calculation of torque when closing an electrical contact or switch connected to Centor Touch input E1.

Force at T: Calculation of torque at a defined time T relative to the start of the test.

Inst Max: Calculates how long it took for the maximum to occur during the test.

Max: Calculates the maximum between two defined times.

Moy Glissant : Calculation of the sliding average over a defined number of points.

Average: Calculates the average of values between two defined times.

Breaking level: Calculation of the value of one of the channels when the breaking force value has occurred. This calculation is only available as a second calculation, when the rupture calculation has been chosen as the first calculation. This calculation is performed in relative or absolute values.

Level N: Calculates the value of one of the channels when the other channel reaches a defined value. This calculation can be performed in relative or absolute values. For example, what is the angle value when the torque is 2Nm.

Stiffness: Calculation of the slope of the curve between two values.

Speed: Calculates the real-time speed of the selected lane.

9.2. Action following a calculation

Following each calculation, you can activate a controller output. Select the output to be activated (from 1 to 6) and the operating mode: pulse or flip-flop, as well as the high or low state. More details on digital inputs/outputs in chapter [Digital inputs, outputs and pedals](#).

This function can be used, for example, to stop the curve and return the frame to its initial position when it detects a break.

10. Storing results and statistics

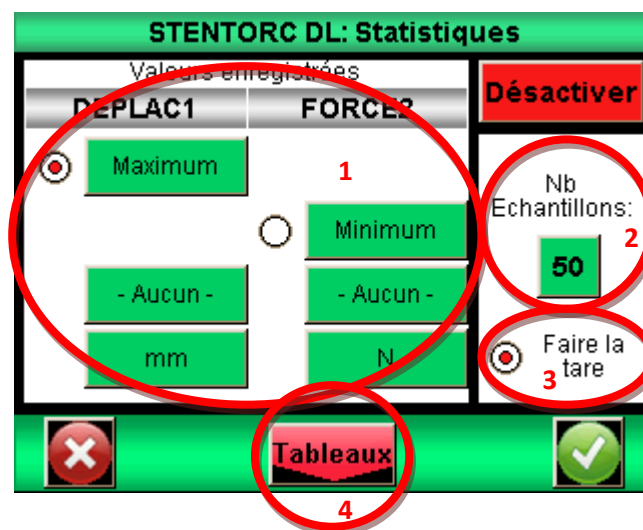
Centor Touch has a memory for 1,000 results and automatically calculates the mean, standard deviation and mean divided by the standard deviation of these results. It is possible to store 3 results simultaneously: maximum, minimum, calculation 1 and calculation 2.

Note: the controller cannot store curves. Only one curve is stored inside the controller. To save multiple curves, connect the controller to a computer or use our optional DATASTICK USB recorder.

To access the statistics configuration, touch the following icon from the main menu:



10.1. Statistics configuration



Use the buttons in zone 1 to select the 3 types of value you wish to save: minimum, maximum, calculation 1 or calculation 2 for each channel. Then select the desired unit of measurement.

You can then configure the number of samples available.

By default, tare is performed automatically after each save, but you can disable this automatic operation.

You can then view tables of values by clicking on the "Table" button, and calculations by clicking on the "Result" button.

10.2. Save values

When statistics mode is activated, the following icon appears in the main measurement window, to the right of the result windows.



To save data in memory, start a trial by taring. At the end of each trial, press the above icon to validate and save the trial. The stored values are added to the table of values and the average is recalculated and displayed in the statistics window at the top right of the screen.


Moy
+5.04
Etype
+1.50
E: 4

To view all calculations and values in memory, touch the window. These results can then be transferred to a computer. See [Communication with a computer](#).

TOUCHST ST: Résultats

Maximum
FORCE1

Moyenne	+5.04
Ecart Type	+1.50
Moyenne / Ecart Type	334.88
Nombre d'Echantillons	4



Retour **Tableau**

TOUCHST ST: Tableau

Maximum
FORCE1

N	Valeur (N)	Date/heure
1	+6.07	08/07/2014 11:28
2	+2.44	08/07/2014 11:28
3	+5.89	08/07/2014 11:29
4	+5.79	08/07/2014 11:30

Retour **Résultat**

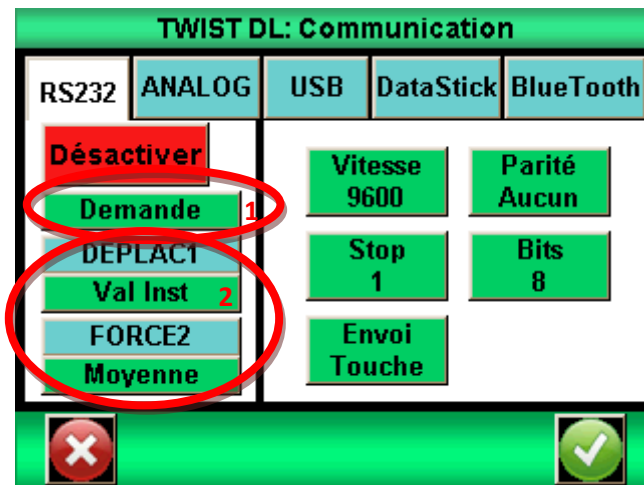
11. Communication with a computer

The controller can be connected to a computer or system with RS232, USB or analog input.

To access the communications configuration menu, from the main menu, touch the following icon :



The following window appears:



Note: One and only one of the five choices for data output is available at a time. Select the corresponding tab for RS232, analog or USB.

Centor Touch outputs have the following functions:

- RS232: send data continuously at 100Hz, send data on request via display, digital input or PC, send stored curve.
- USB: continuous data transmission up to 1000 Hz, data transmission on demand via display, digital input or PC, transmission of stored curve.
- Bluetooth: send data continuously at 100 Hz, send data on demand via display, digital input or PC, send stored curve.
- Analog: continuous data transmission at 100 Hz
- Data Stick: send data on demand via display to USB memory.

11.1. RS232 or Serial link

RS232 input/output can be set to two modes:

- Continuous: Sends measured data continuously via the serial link, at a frequency of around 100 Hz. (Configuration mode required to use Andilog Caligraph and Califort software)
- Request: The controller must be given a command to send data. This command can either be sent by a computer with ASCII characters via the serial link (see command list below), or by using a discrete input on the controller, or by using the icon below located on the measurement screen.



If you wish to send data on a screen or input command, choose the type of command by touching the green button in zone 1.

Note: The data proposed in zone 1 are dynamic. Therefore, if the two controller inputs are used for other operations, they will not appear in the menu. Only available inputs will appear. See chapter: [Digital and pedal output inputs](#) for more details.

Finally, choose the type of data to be sent:

- If you wish to send the command via the display or an input, use the green button in zone 2 to select the type of value you wish to send: instantaneous, maximum, minimum, calculation 1 or calculation 2, as well as the sensor.
- If you wish to send the command by computer, the value returned by the device will depend on the ASCII character sent by the computer.

Set the speed, parity, stop bits and number of bits corresponding to the connected computer. Default values are :

- Speed: 9600
- Parity: None
- Stop: 1
- Bits: 8

If you wish to send serial commands using a computer, you can either use our dedicated RSIC software or use the following ASCII characters:

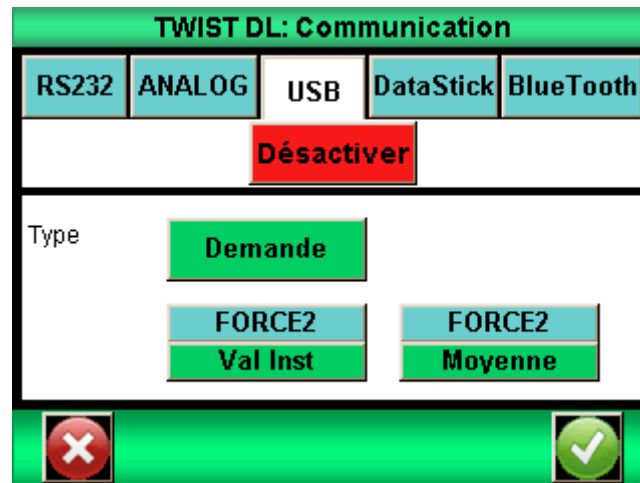
- F: current value of sensor 1
- I: current value of sensor 2
- P: maximum value of sensor 1
- M: maximum value of sensor 2
- V: minimum value of sensor 1
- B: minimum value of sensor 2
- C: calculation
- T: last 2,000 values calculated
- U: Sensor 1 unit
- N: sensor unit 2
- W: The last graph

- Z: Tare

The communication protocol follows the following rules in "Request" mode:

- The controller sends the RC character (13 decimal, 0D hexa) at the end of the string.
- The controller sends the +, - or nothing sign depending on the measured value and configuration.
- The number of characters sent varies according to the capacity of the sensor and the position of the decimal point.
- Force and displacement data are separated by a space
- The controller returns "?" if it does not understand the request.
- The controller returns "!" if the corresponding result is empty.

11.2. USB connection

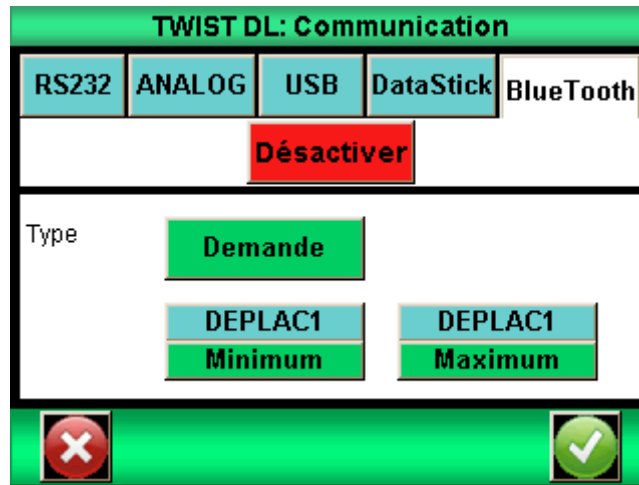


The USB connection creates a virtual communication port (COM) on the connected computer. It has the same functions as RS232: request and continuous mode. Controls also remain the same.

The differences with RS232 mode are :

- The frequency of continuous data transmission can be set if the "Eco" mode is activated in the "General" menu.
- Baud rate is fixed at 921600 bauds/s

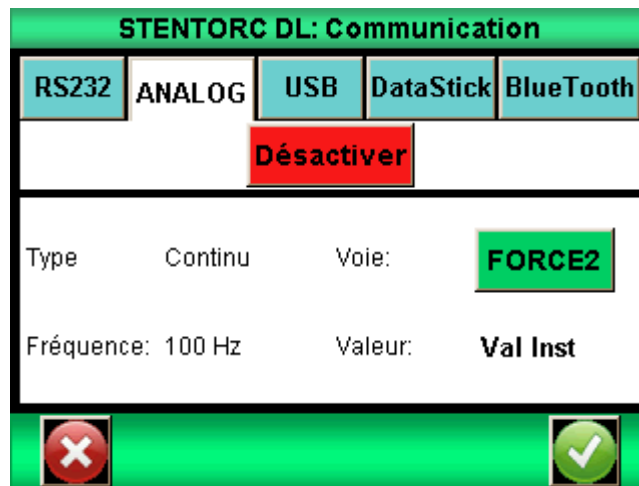
11.3. Bluetooth link



The Bluetooth link enables wireless communication with a computer. It replaces, for example, an RS232 or USB cable. It requires a module sold separately, which plugs into the connector on the side of the Centor Touch.

The Bluetooth link has the same functions as RS232: request and continuous mode. Controls also remain the same.

11.1. Analog link



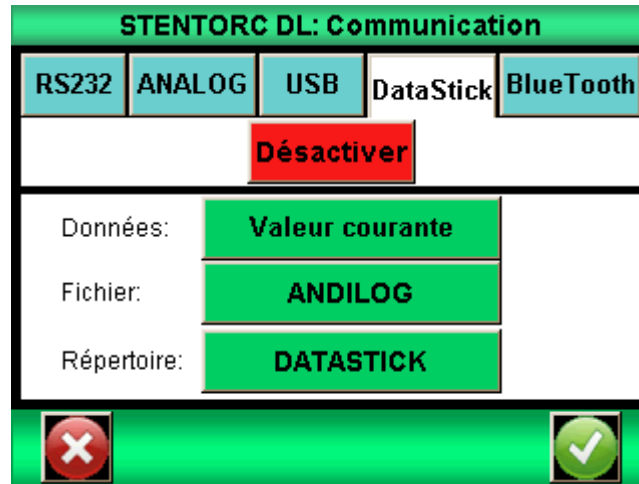
The Centor Touch can send analog data at a frequency of 100 hertz. The analog output is +/- 1V.

11.2. Data Stick (Option)

You can save results on a USB memory stick using the menu Datastick in communication. The USB connector is at the back of the Drivetouch/

11.2.1. Configuration

The data stick is activated and configured in the "Communication" menu.



Centor Touch can save various types of data on the USB stick. Choose the data to be saved from :

- Curve: Saves the curve displayed on screen
- Curve and calculations: Saves the curve displayed on screen + max and min + configured calculations
- Statistics: all values stored in the Centor Touch statistics memory
- Current value: the value measured on the sensor at the time of transfer
- Calculated values: max, min and calculations configured in the TEST menu

If you wish, you can change the name of the file in which unit data (statistics and values) will be saved. By default, the file will be called "ANDILOG". This name will be supplemented by the date of the day of saving. Example: ANDILOG_2013_01_17.txt. Each new record is added to the end of the file. Press the green button next to "File" to edit.

The directory is used to save curves. Its name can be modified. The default name is DATASTICK. This name is followed by the date and time the curve was drawn. Example: "DATASTICK_20130117_094026". The directory will contain two files:

- data.txt: curve data
- testSettings.txt: curve plot parameters

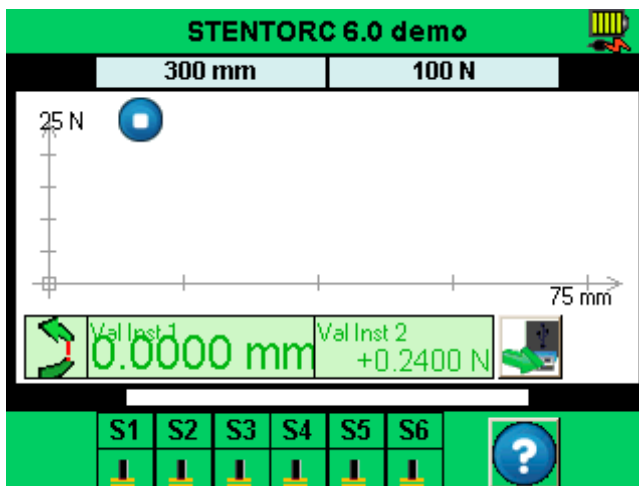
All these files are in text format and can be opened in a spreadsheet program such as Microsoft Excel to trace curves or exploit results.

To modify a name, press the corresponding button. This triggers the display of a virtual keyboard:



All these files are in text format, with data separated by the TAB character (09 decimal and hexadecimal) and lines separated by a carriage return (13 decimal, 0D hexadecimal).

11.2.2. Saving measurements



Once the Data stick option has been activated, a USB icon appears on the measurement screen:

To save, press the icon below on the measurement screen:



During data reading and writing, the icon changes to an hourglass, indicating that the data stick must not be unplugged, otherwise it may be damaged. When the hourglass is not visible, you can connect and disconnect the key.

11.2.3. Use several USB sticks

The USB key supplied by Andilog is associated with the Centor Touch serial number indicated at the time of ordering and cannot be used on another Centor Touch. However, it is possible to duplicate the Andilog key if you wish to have several keys for one Centor Touch.

To do this, simply copy the "Data Stick Config" file from the original key to another USB key. Centor Touch is compatible with USB 2.0 memory sticks.

12. Digital and pedal inputs and outputs

The Centor Touch has digital inputs and outputs which can be configured to allow the Centor Touch to communicate with Drivepack inputs.

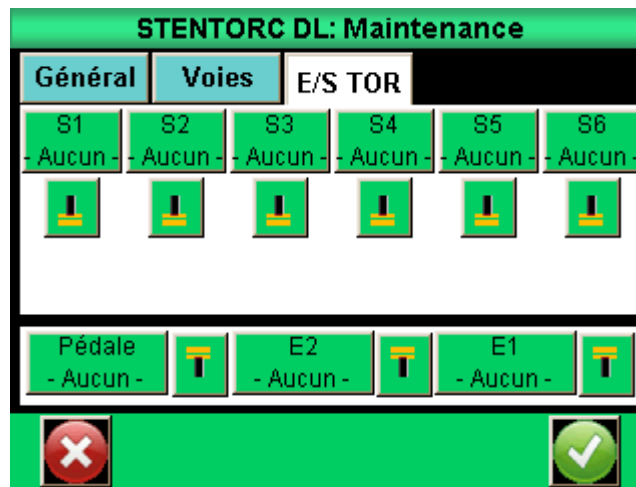
Centor Touch features:

- 3 inputs (named: Pedal, E1 and E2)
- 6 outputs (named: S1 to S6)

Drivepack features:

- 2 inputs
- 1 output

Each input/output can be configured separately via the various Centor Touch menus and functions (limits, calculations, communication, etc.). A menu allows you to view and configure the status and assignment of each input/output. This menu is located in the "Maintenance" menu of the main menu. Then the third tab, "Digital I/O", as shown below.



12.1. Centor Touch releases

Each output from 1 to 6 can be configured separately. These outputs can change state under different conditions, depending on controller parameters. The main state change functions are :

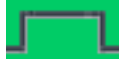
- None : no action
- Calculation 1 : changes state at end of calculation 1
- Calculation 2 : changes state at the end of calculation 2
- End of test : changes state at the end of a test.
- Limit : changes state when passing a limit (Channel 1 or Channel 2)
- DEP. 120% : changes state when the measured value exceeds the sensor's maximum capacity by 20%. Used to protect the sensor when mounted on a motorized frame.

Outputs 1 and 2 are connected to Drivepack inputs 1 and 2 respectively.

For each output, you can define whether the default value (at the start of the test) is high or low by touching the symbols below:



It is also possible to define how each output changes state:



- Toggle: the output changes state and remains in the new state until it is reset to its original state at the start of a test, or until the condition is true (in the case of limits).



- Pulse: the output changes state for 50 ms, then returns to its original state.

12.2. Inputs and pedals

Centor Touch's 3 digital inputs (Pedal, E1 and E2) can be configured separately. These inputs can be used to perform the following operations:

- ACTIVE TEST: launch a test
- STOP TEST: stop a test
- TARE VX: sets zero on channels 1 or 2
- F. CONTACT: used to calculate force measurement on contact closure.

The Pedal input is connected to the green button on the DriveTwist front panel. By default, this input starts a test.

For each input, you can define whether the default value (at the start of the test) is high or low by touching the symbols below:



13. General parameters

General settings for Centor Touch can be accessed from the "General" main menu. These settings allow you to adjust sounds, standby, language and screen orientation.



13.1. Sounds

Buzzer: Activates or deactivates buzzer for alarm conditions

Key Beep: Activates or deactivates the beep when the screen is touched.

13.2. Eco mode

Reduces energy consumption. Useful for long test times.

13.3. Feed management

Screen sleep and shutdown times can be set separately for battery and mains operation.

Standby / s: Sets the time of inactivity before the controller goes into standby. After a sleep mode, use the On / Off button to restart the device. Touch the button and use the keyboard to set the inactivity time in seconds.

Screen / s: Sets the time of inactivity before the screen is switched off. Pressing the screen turns it back on. Touch the button and keyboard to set the inactivity time in seconds.

13.4. Screen orientation

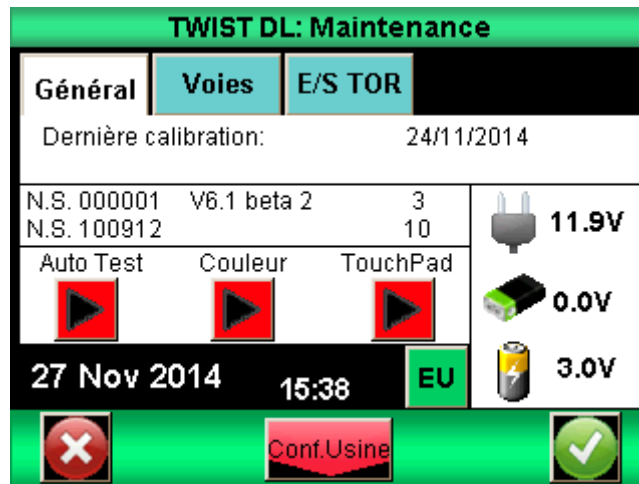
The touchscreen can be rotated in 90-degree increments. Touch the desired image to select the screen orientation.

13.5. Language

Touch the image and then the flag to select the desired language.

14. Maintenance

The maintenance screen provides access to basic parameters and status information. Select the maintenance symbol from the main menu screen.



14.1. General

The General tab provides information on the sensor, software version, battery status and time/date settings.

Auto test: launches a self-test and displays detailed information on the status of all connected sensors (offset, overload calibration) and battery conditions.

Color: displays basic colors to check screen status.

Touch Pad: Allows touch screen calibration.

14.2. Clock setting:

Date and time are set from the Maintenance tab. Touch the date format button below. This takes you to the date and time setting screen.





Change the date and time by touching the up or down arrows. You can also choose the date display format:

- EU = day - month - year
- US = month - day - year

14.3. Tracks

Displays detailed sensor data and current settings for all input and output signals.

14.4. Factory settings

This function returns your device to factory settings.

15. DriveTwist configuration examples

The aim of this chapter is to provide examples of typical DriveTwist test setups (without the need for CALIFORT software). It will enable you to set up your tests simply and to understand more easily how to set up other typical tests.



15.1. Overload protection

One of the most common problems encountered is configuring the system to shut down before damaging the sensor. Our sensors are protected up to 150% of their maximum capacity. However, DriveTwist has a function that allows you to stop at a pre-programmed limit, i.e. when you exceed 120% of the sensor's capacity.

Warning: stopping at 120% of capacity or at a limit close to maximum capacity does not guarantee sensor protection. It is necessary to take into account the fact that the frame has an inertia between the moment when the stop command is sent and the moment when the frame actually stops. This risk, and the margin to be taken into account, is highly dependent on the speed at which the frame is used.

15.1.1. Protection at 120% of capacity

Go to the "Maintenance" menu, then "Digital I/O". You must set the S1 or S2 output to "DEP.120%", depending on which is not in use.

Then, for this input, make sure the status indicator is set to  and the signal type to pulse. .

Then go to the Drivepack menu, to Entree 1 if you have configured Centor Touch output 1, or to Entree 2 if you have configured Centor Touch output 2, and change its status to Stop.

Input 1
Stop



15.1.2. Stop at a torque value

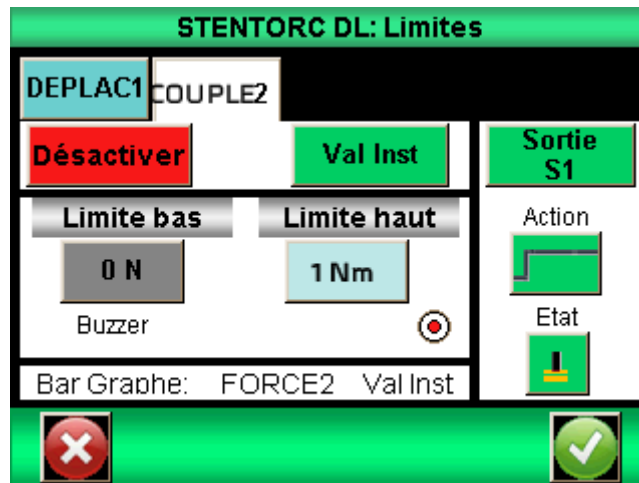
Go to the "Display" menu  then press "Limits" .

In this example, we assume that we want to stop when the force reaches 1Nm.

Touch the "COUPLE2" tab, then select "Val Inst".

Set "Low limit" to ON and "High limit" to 1Nm.

Select the "Output" to be activated S1 or S2. Then select the change of state icon  and finally state up. 



Then go to the Drivepack menu, to Entree 1 if you have configured Centor Touch output 1, or to Entree 2 if you have configured Centor Touch output 2, and change its status to Stop.

Input 1
Stop

Note: If neither S1 nor S2 are available in the proposed list, this indicates that they are already being used for other actions. It is then necessary to go to the Discrete I/O menu to reorganize your outputs.

15.2. Open plug + return to start position

There are several ways of performing these measurements, depending on the type of plug and the complexity of the tests to be carried out. For example:

1. Turn by ½ turn, then return to the initial position and read the maximum torque.
2. Turn until breakage is detected (broken opening ring), then return to the initial position and record the maximum torque and the breaking torque of the ring.

15.2.1. Turn half a turn and return to initial position

Drivepack configuration:

Speed ↻ 5.00	Speed ↻ 3.00
But. pos ↻ Stop	But. pos ↻ -0.00 mm
Privilegier ↻ Speed	But. pos ↻ Inverter
But. pos ↻ -0.50 mm	Privilegier ↻ Speed
Action Pedal Dem Neg.	Units rpm

With this configuration, if you press the ZERO button on the Drivepack and then the green button, the DriveTwist wil :

1. Turn at 3 rpm in unscrewing direction until -0.5 rpm is reached (½ turn).
2. Turn back when it reaches this position (But. Pos ↻ set to Reverse).
3. Return to starting position and stop (Goal pos ↻ on Stop and -0.00)

In this case, the Centor Touch is usually set to simply display the maximum torque.

15.2.2. Turn until break and return to start + trace curve

When breakage is detected (ring breaking), Centor Touch will send a signal (S2) to Drivepack to indicate that the test is complete and that it should start again in the other direction of rotation.

Drivepack configuration:

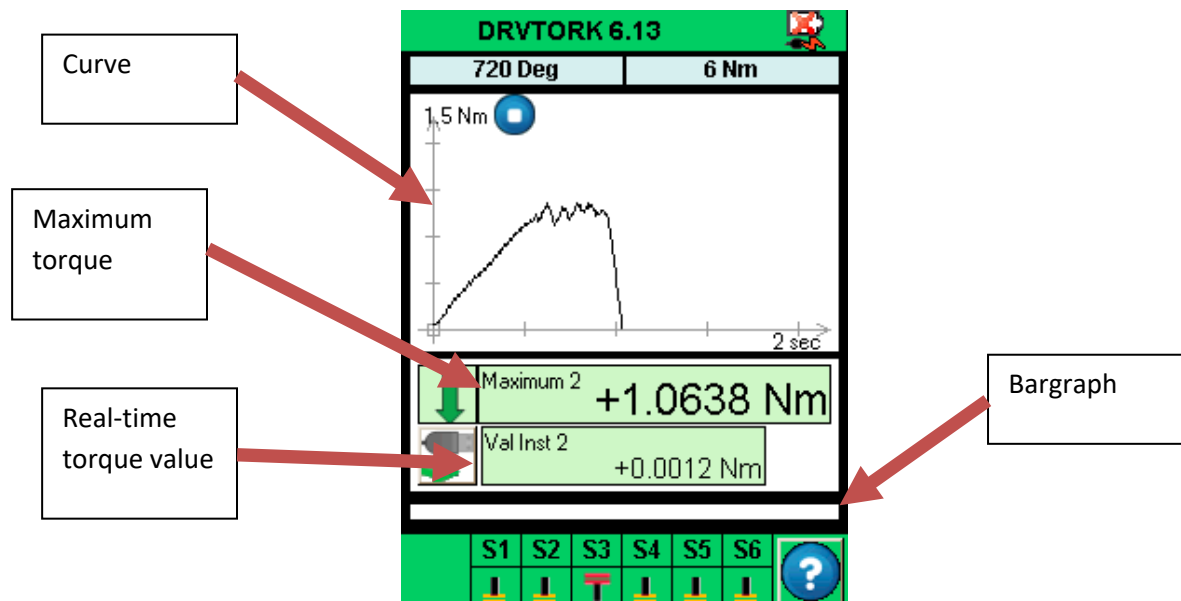
Speed ↻ 5.00	Speed ↻ 3.00
But. pos ↻ Stop	But. pos ↻ -0.00 mm
Privilegier ↻ Speed	But. pos ↻ Inactive
Action Pedal Dem Neg.	Action ext. 2 Inverter

Action ext 2 - Reverse: this is the information on which Drivepack will turn around.

Drivepack configuration :

What you want to set in Centor Touch:

1. Display torque versus time curve
2. Display maximum torque and torque in real time
3. Stop curve tracing when a break occurs
4. Return to initial position at end of trial

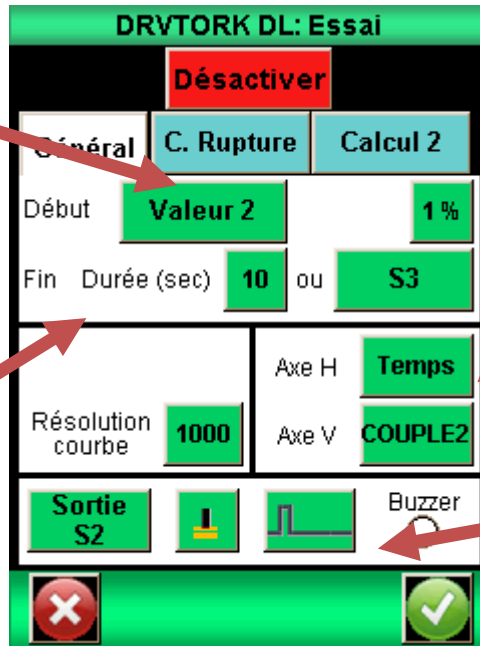


Test configuration:

Open the menu by touching the green bar at the top of the screen and go to Trial.

Measurement begins when 1% of Sensor 2 capacity is reached (torque)

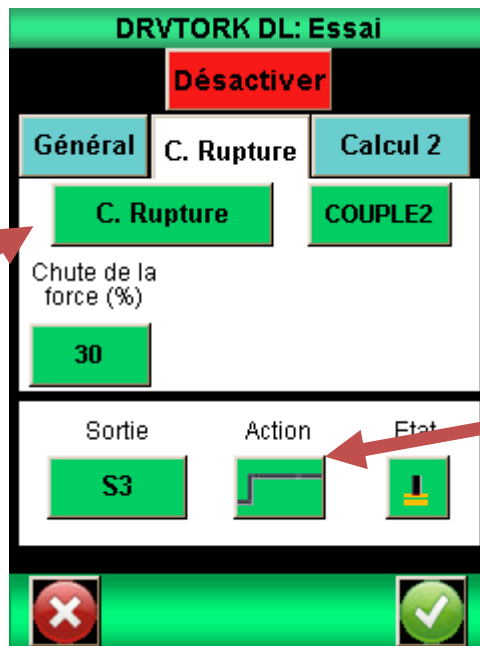
Stop test after 10 seconds or activate output S3 (break detection)



Display of torque versus time curve

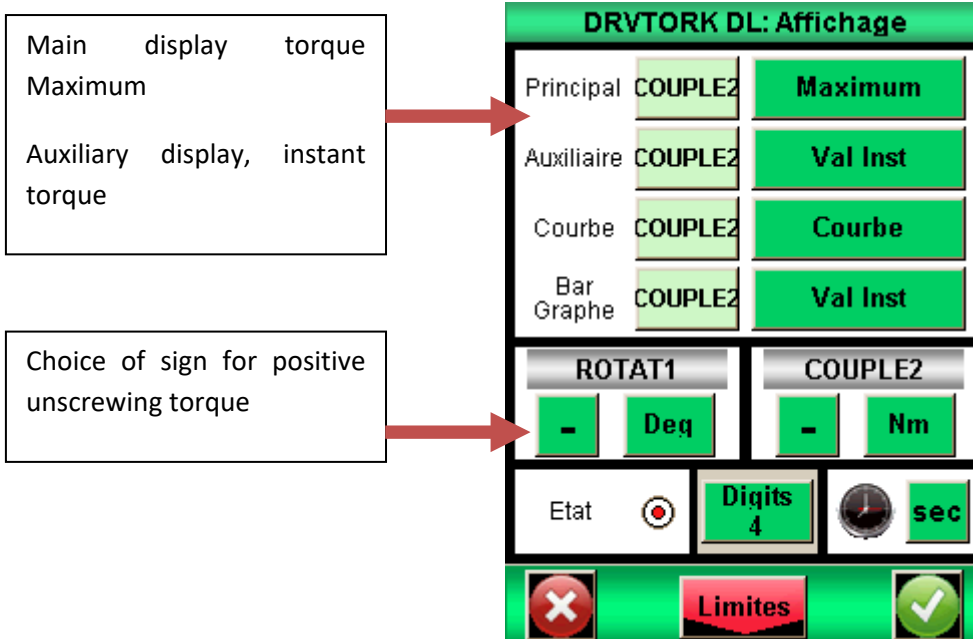
Activate S2 output at end of test to tell Drivepack to return to start position

Calculation of torque transducer failure when torque drop > 30% is detected





Activate output S3 to stop test in case of breakage

Display configuration:



15.2.3. Start test

Use the  key to move 0 on the DriveTwist.

Place your bottle on the DriveTwist. Press the Start button  until the Centor Touch tare is complete, then release. The DriveTwist will then rotate until the ring breaks. Stop, then return to its original position.

16. Appendices

16.1. Acquisition software

ANDILOG TECHNOLOGIES has developed several software packages to record and analyze the values of our measuring instruments. The CALIFORT software lets you control your DriveTwist torsion bench, set up various test configurations and acquire data (for analysis and test reports). See dedicated user manual.

16.2. Interface cables

Interface cables have been supplied to connect the DRIVETOUCH controller to your computer for use with CALIFORT software.

However, for use without software, you can use the following cables:

- External pedal: performs an action (starts a test, etc.) when the pedal is pressed.
- External contact cable: connects the controller to a switch for calculating contact closing/opening force.
- RS232 cable: connect your controller to a computer using the RS232 output.
- USB cable: connect your controller to a computer using the USB output.

16.3. Error messages

16.3.1. Centor Touch display error message



This screen appears when a minor fault is detected at instrument start-up. Minor faults can be:

- Overloads detected at less than 10
- Calibration date exceeded

Press the Measure button to continue.

If the Measure button does not appear: An error preventing the controller from operating has been detected.

The causes can be as follows:

- Damaged sensor
- Number of overloads > 10
- Internal error
- Sensor not connected

16.3.2. Drivepack command error message

Drivepack displays various error messages depending on the problem encountered.

If Drivepack detects excessive current consumption, the frame stops and the following message appears:

Dist+ 0.00 mm
CURRENT SAFETY

You must then shut down the system and restart it to cancel the error.

In addition, DriveTwist features internal travel stops to stop the frame before it reaches its travel limits. These travel stops cut motor power in the direction of travel. You can then manually move the frame in the opposite direction using the Drivepack control.

Note: After this type of stop, the displacement value may be incorrect. You must re-zero or check the displacement value before trying again.

If the Drivepack controller cannot communicate with the DriveTwist electronic board (e.g. if the cable is broken/damaged), both systems will stop the motor and initiate a restart process. You'll need to try switching the frame on and off to cancel this error. We strongly recommend that you consider a maintenance operation and contact the ANDILOG Technologies team for details.

! SAFETY!
ERROR CODE # 6

If the system detects that a command is not being carried out correctly, it displays the following error message:

! SAFETY!
Door / Surch / Pos

In this case, please check the following points:

- If you have a security door, check that it closes properly
- If you have exceeded the frame's capacity, remove the overload.
- If the frame has reached a travel stop, move the frame in the opposite direction.

If the system detects that a setpoint (e.g. travel speed) is not registering correctly, due to internal communication, it displays the following message:

**! SAFETY!
ERROR CODE # 2**

This may occur in the event of loss of communication or unstable communication due to a wiring problem or faulty component. You will need to try switching the rack on and off to clear this error. In this case, we strongly recommend that you consider a maintenance operation by contacting the ANDIOLOG Technologies team for details.

If the controller encounters communication problems with the Califort software, it displays the following error message:

**! SAFETY!
ERROR CODE # 5**

If the event is temporary, no action is required and manual control is activated (after operator assessment).

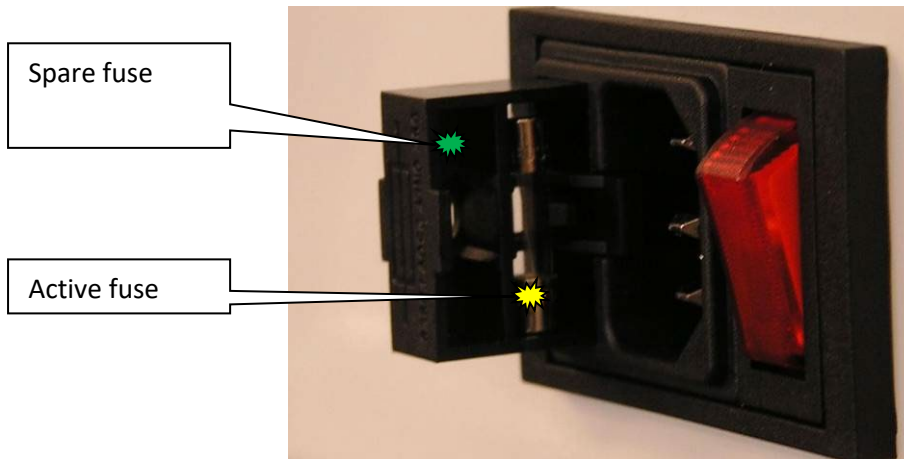
In this case, you should check the following points and restart Drivepack:

- The 2 connection cables are properly connected to your computer.
- The length of the cables may be questioned, so check that you are using the cables supplied by ANDIOLOG Technologies.
- Check cables for damage
- Reactivate communication from the maintenance interface

16.3.3. Fuses

If you can't switch on the DriveTwist, one of the 3 protective fuses may be out of order.

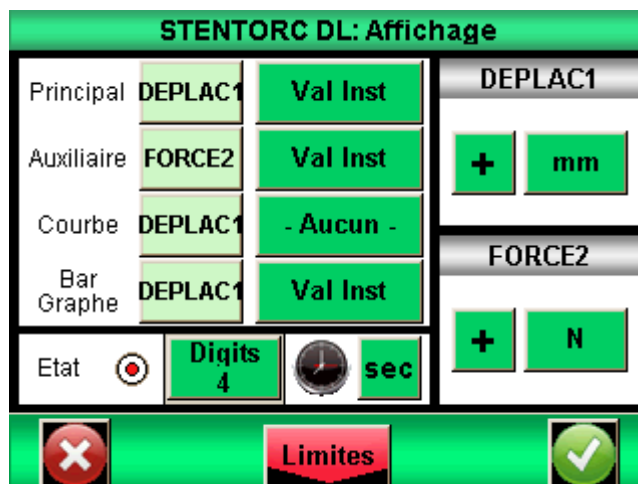
The first fuse is located on the side of the frame near the switch. It's a 5A, 5x20mm fuse.



16.4. Factory settings

Below are the configuration screens when the controller is delivered:

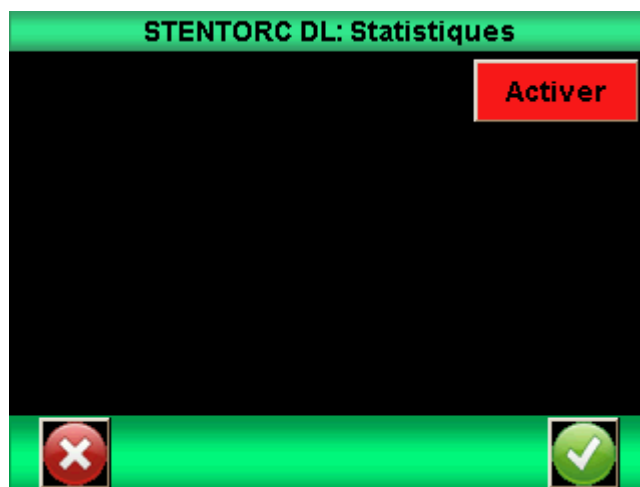
16.4.1. Display



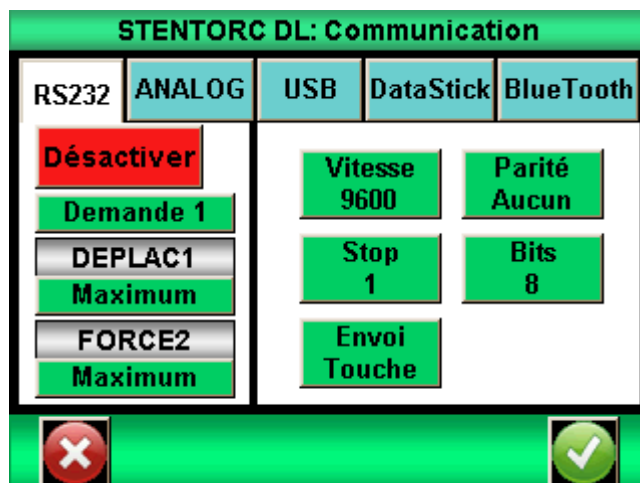
16.4.2. Test



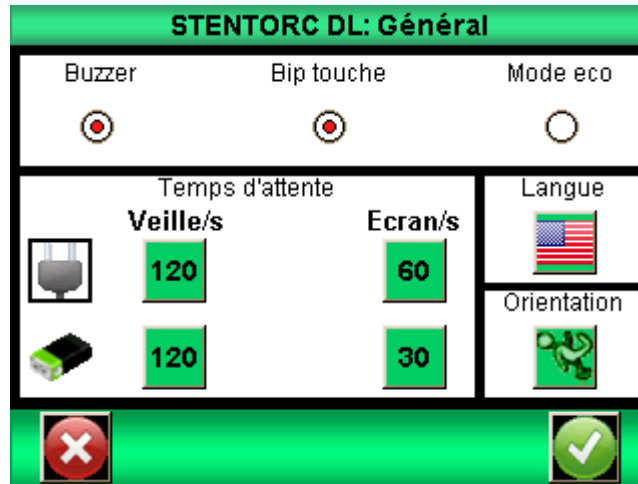
16.4.3. Statistics



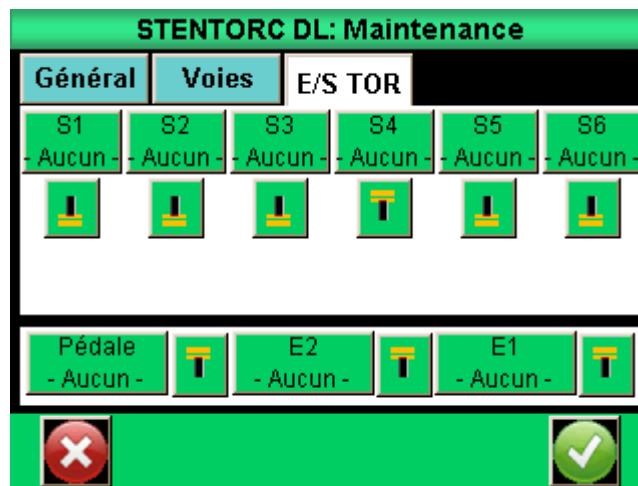
16.4.4. Communication



16.4.5. General



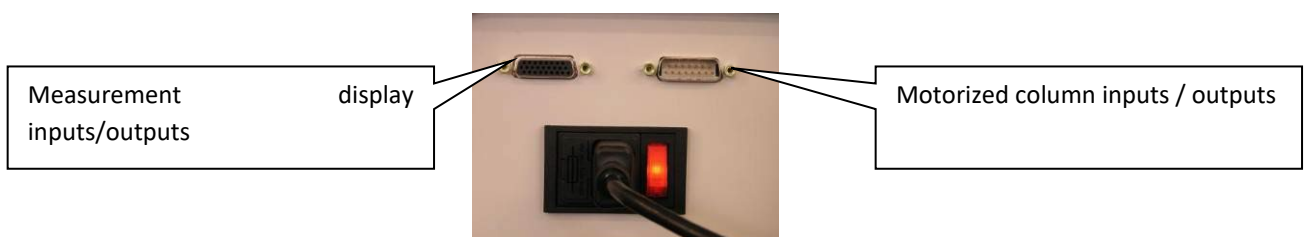
16.4.6. Maintenance



16.5. Connections

The DriveTwist controller has 2 connectors on the rear of the case. The 15-pin connector is connected to Drivepack, and the 26-pin connector to Centor Touch Dual.

Note that the pedal inputs on Drivepack and Centor Touch are wired together, and that output 1 and output 2 on Centor Touch are connected to inputs 1 and 2 on Drivepack.



16.5.1. Centor Touch Dual 26-pin connector

1	Mass
2	Input E1
4	RS232 readout
5	USB device data, negative
6	Negative USB host data
7	Output S3
8	Output S2
9	Reset
10	Analog output
11	Input E2
14	USB Device Power supply
15	USB Host Power supply
16	Output S4
17	Output S5
18	Mass
19	Earth
20	Pedal input
22	RS232 transmit
23	USB device data Positive
24	USB docking data Positive
25	Output S6
26	S1 output

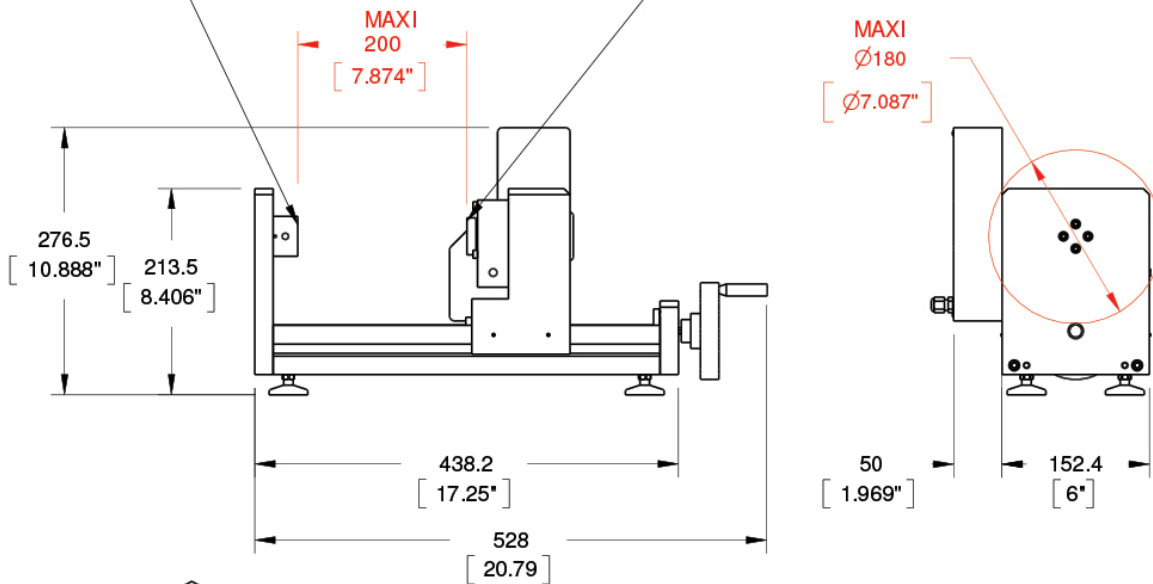
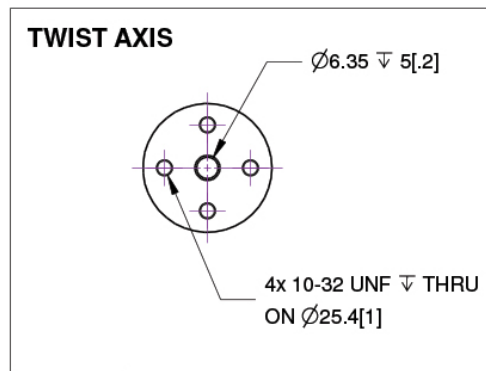
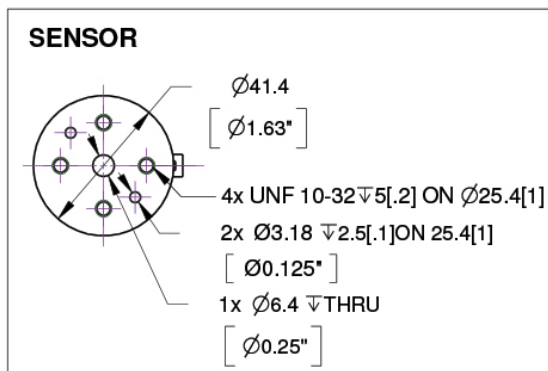
16.5.2. 15-pin Drivepack connector

1	Mass
2	Safety input
3	Input 1
5	Exit
9	Mass
10	Input 2

16.6. Dimensions

DRIVETWIST

CAPACITY:	0.35Nm to 40Nm
ANGLE RESOLUTION:	0.1°
SPEED:	0.1tr/min to 4.5tr/min (36°/MIN to 1620°/min)
MAXIMUM DIAMETER OF THE SAMPLE :	180mm[7.09 inch]
MAXIMUM LENGTH OF THE SAMPLE:	200mm[7.9 inch] with accessoires
WEIGHT :	16kg[36lbs] up to 12Nm 18kg[39.7lbs]ab
POWER SUPPLY:	110/220V



DRIVETOUCH

Boîtier de commande avec afficheur tactile de mesure pour système motorisé.
[Controller with touch screen for motorized test system]

POWER SUPPLY:

110V 8.1A/220V 3.9A

WEIGHT:

7kg [15.4lbs]

