

# ELITE SERIES DIRECT SHEAR



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Humboldt's Elite Series Direct Shear machines provide the materials testing lab with a choice of a pneumatic loading and several dead-weight machines for direct shear testing applications. The HM-5760 is a pneumatic loading machine, which with its touch-screen monitor provides test control and live test monitoring in either a stand-alone or computer-controlled configuration.

The HM-5750 machines are dead-weight loading machines, which come in an analog and a digital configuration. These machines also take advantage of our touch-screen monitor to provide test control and live test monitoring in either a stand-alone or computer-controlled configuration.

These machines provide four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configurations or accessed through a LAN-networked computer using Humboldt's Next Software.

Elite series direct shear machines are built with durable, high-quality components and feature the use of a stepper motor, precision gears and gear box to ensure smooth and reliable operation, as well as precise results.

In stand-alone mode, these direct shear machines provide a 7" (178mm) touch-screen controller, giving you finger-tip control of your testing processes, as well as providing real-time, visual views of your data in both tabular and graphic formats. These new waterproof, touch screens provide colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine while the test is running. Data can then be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced HM-5000SW Direct Shear software module.

When operated from a networked computer the NEXT software provides robust machine and test control, and report generation. It also allows the ability to control and monitor multiple machines from a single computer.



## HM-5760 DIRECT SHEAR

The Humboldt HM-5760 Direct/residual shear apparatus is a fully-automated system utilizing a pneumatic loading to apply vertical loads to a sample eliminating the need for loading weights used in dead weight-type systems.

The microprocessor-based system features a stepper-motor drive system and a 7" touch-screen display that allows the operator to control and monitor all test functions.

Like all elite series machines, the HM-5760 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the HM-5760 to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

The HM-5760 is supplied complete with a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, a 0.4" (10.2mm) vertical strain transducer and Humboldt's NEXT Direct Shear software module. Shear box assemblies and related accessories are not included and should be ordered separately.

Horizontal Movement	2" (50mm) Maximum
Horizontal Shear Force	2000 lbf (10kN)
Vertical Load	2000 lbf (10kN)
Data channels	4
Speed Range	0.00001 to 0.49999 in./min. 0.00001 to 12.9999 mm/min.
Data storage	1000 tests and up to 3000 readings per test
Dimensions (L x D x H)	30" x 15.5" x 22" (760 x 394 x 558mm)
Voltage	110/220V 50/60Hz - 6.5amps
Net weight	140 lbs (64kg)



## HM-5750A DIRECT SHEAR

The HM-5750A Direct Shear machine is an economical choice for performing direct/residual shear tests utilizing the dead-weight method and analog measuring devices. The microprocessor-based system features a stepper-motor drive system and a 7" touch-screen display that allows the operator to control and monitor all test functions.

Like all elite series machines, the HM-5750A is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the HM-5750A to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network. The carriage accepts shear box squares up to 4.0" (100mm) internal dimension. Forward and reverse measurements permit residual shear testing as standard. A built-in safety feature prevents the overloading of the load measuring system.

The HM-5750A is supplied complete with a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, and a 0.4" (10.2mm) vertical strain transducer. Shear box assemblies and related accessories are not included and should be ordered separately.

Horizontal Movement	2" (50mm) Maximum
Horizontal Shear Force	2000 lbf (10kN)
Vertical Load	2000 lbf (10kN)
Data channels	4
Speed Range	0.00001 to 0.49999 in./min. 0.00001 to 12.9999 mm/min.
Data storage	1000 tests and up to 3000 readings per test
Dimensions (L x D x H)	40" x 10" x 45" (1016 x 254 x 1143mm)
Voltage	110/220V 50/60Hz - 6.5amps
Net weight	288 lbs (131kg)



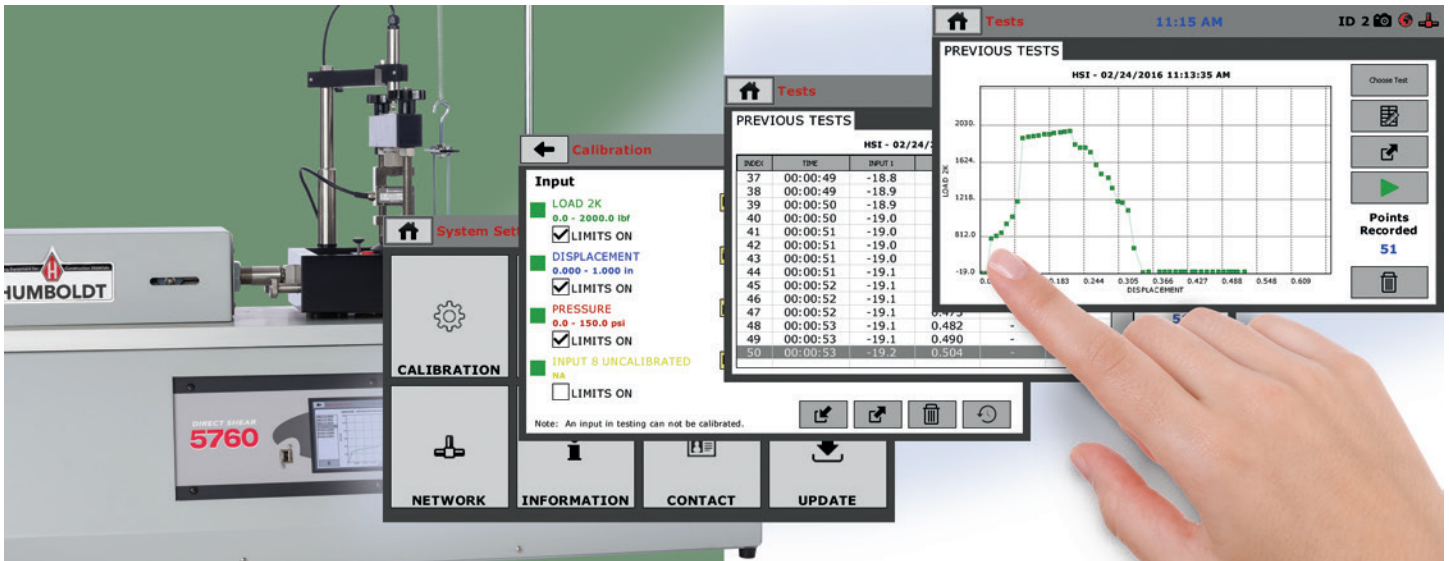
## HM-5750D DIRECT SHEAR

The HM-5750D Direct Shear machine is an economical choice for performing direct/residual shear tests utilizing the dead-weight method and digital measuring devices. The microprocessor-based system features a stepper-motor drive system and a 7" touch-screen display that allows the operator to control and monitor all test functions.

Like all elite series machines, the HM-5750D is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the HM-5750D to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network. The carriage accepts shear box squares up to 4.0" (100mm) internal dimension. Forward and reverse measurements permit residual shear testing as standard. A built-in safety feature prevents the overloading of the load measuring system.

The HM-5750D is supplied complete with a 2,200 lbf (10kN) capacity load ring and two 1.0" x 0.0001" (25.40 x 0.002mm) digital indicators. Shear box assemblies and related accessories are not included and should be ordered separately.

Horizontal Movement	2" (50mm) Maximum
Horizontal Shear Force	2000 lbf (10kN)
Vertical Load	2000 lbf (10kN)
Data channels	4
Speed Range	0.00001 to 0.49999 in./min. 0.00001 to 12.9999 mm/min.
Data storage	1000 tests and up to 3000 readings per test
Dimensions (L x D x H)	40" x 10" x 45" (1016 x 254 x 1143mm)
Voltage	110/220V 50/60Hz - 6.5amps
Net weight	288 lbs (131kg)



### Touch-Screen Controller provides:

- 4-channel data acquisition
- Hi-res, 7," waterproof, touch-screen provides total control and real-time graphical display of tests
- Machine /Test control and data acquisition via touch-screen
- Control up to 4 different tests at the same time
- Calibration of channels to load cells, transducers and other suitable instruments
- Real-time graphical chart and numerical display of tests via touch-screen display
- Effective sampling rate of 50 readings per second
- Stores up to 1000 tests with 3000 points per test
- 2 USB ports. One in front for data transfer and the rear port is for powering a wireless access point.

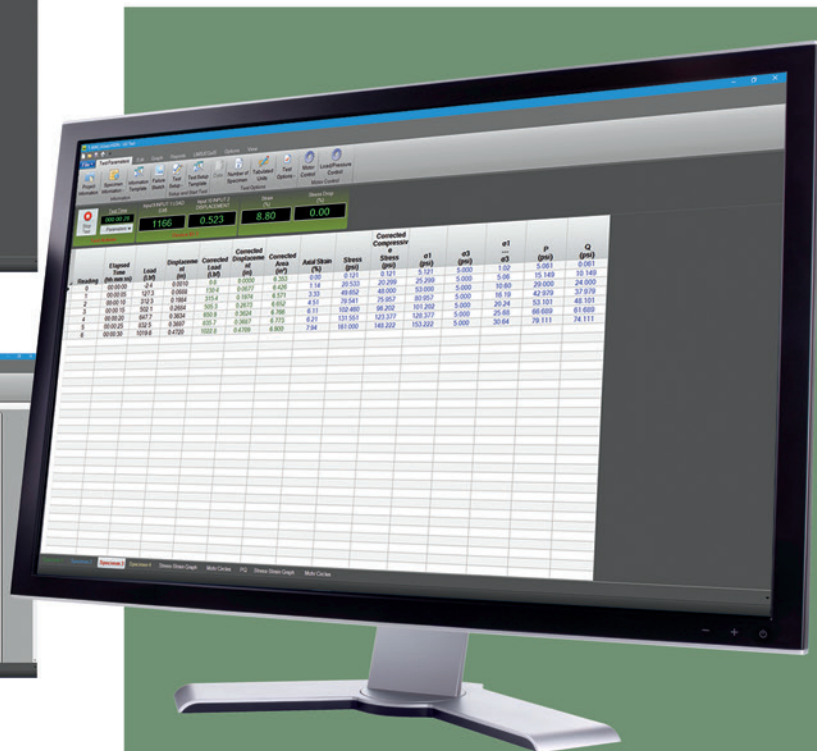
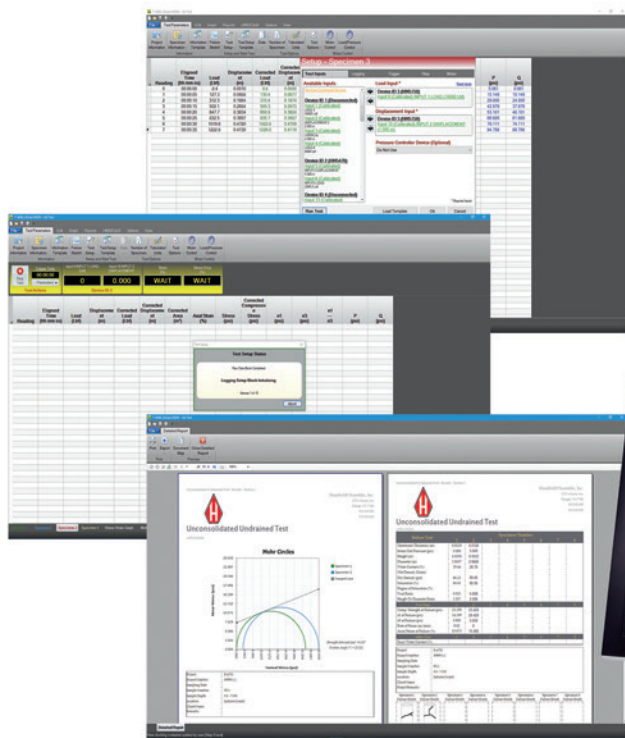
# Stand-Alone Control

Humboldt's touch-screen controller provides you with full, graphical monitoring of all testing functions in a stand-alone application, while maintaining full computer control when desired.

Now you can have full, finger-tip control and monitoring of all testing functions with Humboldt's touch-screen controller, found on these load frames. These seven-inch, waterproof screens provide at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer, building upon Humboldt's dedication to modular, stand-alone data acquisition.

Now, in a stand-alone application, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's FRONT USB port or the data can be transferred to a computer via the LAN port.

A second USB port located on the back of the machine can also be used to power a wireless access point, which can provide a wireless hook-up with a computer, if no LAN is available.



# Computer Control

Humboldt's Next software is included with all Elite Series Direct Shear machines. This software provides robust machine control, calibration, data acquisition and report generation for those using a computer to control load frame operations.

In addition, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, while also providing report generating capabilities using Humboldt's standard software or our enhanced test-specific modules.

So, whether you are controlling a single operation or controlling a complete geotechnical lab, Humboldt's NEXT software, in conjunction with Humboldt's Elite Series Direct shear machines, provides a complete solution for the calibration, acquisition, recording and presentation of testing data in data tabulation and graphic chart formats.

## Humboldt's, NEXT software provides:

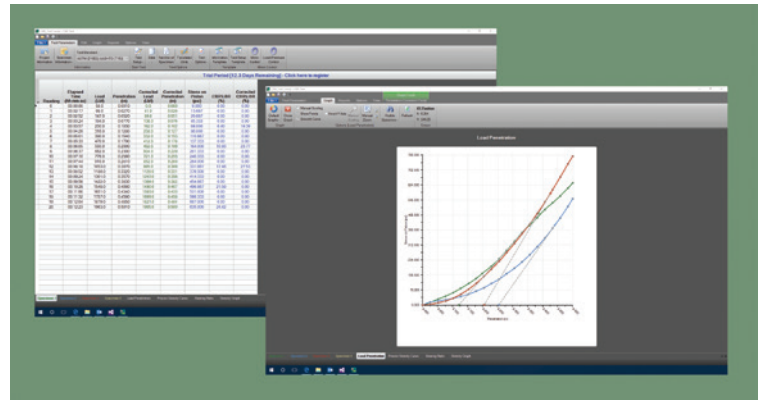
- Machine control, and data acquisition via networked computer
- Provides the ability to use Next Software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display
- Effective sampling rate of 50 readings per second
- Stores unlimited tests with up to 3000 points per test.
- Up to 255 individual tests can be run simultaneously from a single PC
- Advanced, test-specific modules are available, which provide all the calculations and graphs required per testing standards
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQUS, gINT, etc.

# NEXT Direct Shear Software Module

The HM-5760 Direct Shear machine includes Humboldt's NEXT Direct Shear software module. For the HM-5750A and HM-5750D machines Humboldt's NEXT software can be enhanced with the purchase of the Direct Shear module. This module provides you with the following capabilities beyond the standard software included with your ELITE Series Direct Shear machine.

- test-specific setup that guides you through the process, which includes selecting data collection parameters that best fit the specific test
- input specific project information for each test, such as project name, client information, etc
- all test-specific initial, intermediate, and final parameters required by ASTM and BS standards are dynamically calculated for you, based on your input of specimen information, such as size, weight, etc
- tabulated test data, graphs and all test-specific calculations are provided in real time, allowing you to monitor tests in process
- generate test-specific reports that include all graphs and data presented in a project
- simultaneously run multiple tests on one computer, involving any of the available HMTS modules and any compatible Humboldt equipment up to 255 device connections, which is up to 1020 inputs
- create and store test-specific test setup templates for rapid setup of future tests
- produce test-specific graphs, which allow you to draw construction lines to calculate angles and other test-specific parameters
- automatically recover from a PC shutdown without loss of data
- all unit parameters can be adjusted individually
- easily change between different test standards
- access free, downloadable software upgrades for purchased modules
- additional modules are available, please enquire

Direct Shear Module, HM-5700SW

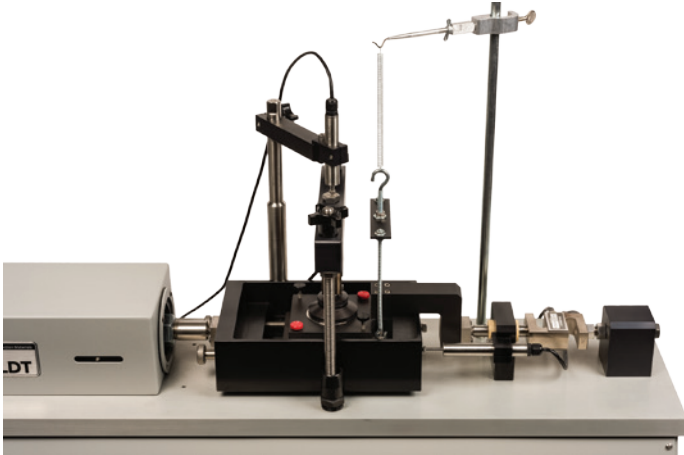


## Controller Specifications

Specifications for the touch-screen controller, instrumentation and data acquisition used with Humboldt Elite series Direct Shear machines.

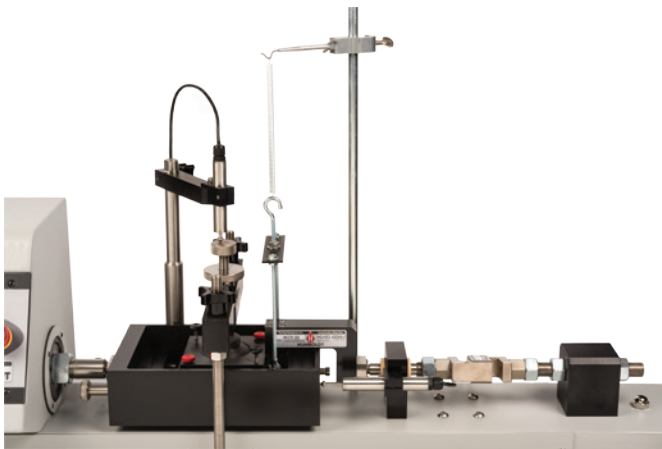
Display	7" (178mm) VGA (480 x 800) Resistive-touch screen
Real-time test data	Graphic and tabulation
Processor	Dual 32-bit ARM
RAM	64MB
Memory, non-volatile	4GB
Analog to digital converter	24 bit
Data acquisition	4 Channels
Logging speed	up to 50 readings per second
Multi-test storage	1000
Points per test	3000
USB port (front)	use to export data and import/export calibration data, also use to provide external power for optional WIFI adapter
USB port (back)	provides external power for powering a wireless access point at the back of the machine
Ethernet connection	for network connectivity
Emergency stop	Large button
24-bit differential analog to digital converter (21 bits @1000 samples/sec.	4
Ambient temperature sensor	1
Limit switches	2
Firmware Update	Ethernet or flash drive

# Typical Setups



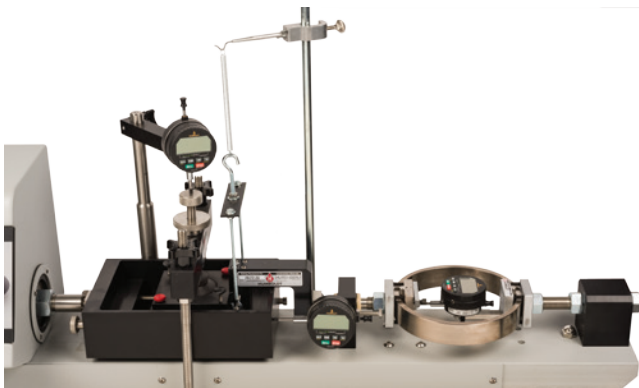
## Typical Test Setup for HM-5760

Part #	Description
HM-5760.3F	<b>Pneumatic Direct Shear with analog inputs</b> (includes a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, and a 0.4" (10.2mm) vertical strain transducer)
HM-5700SW	NEXT Direct Shear software module
HM-2751.XX(S/D)	Shear box assembly (specify size)
HM-2702.XX(S/D)	Shear box cutter (specify size)
HM-2703.XX(S/D)	Dolly/tamper (specify size)



## Typical Test Setup for HM-5750A

Part #	Description
HM-5750A.3F	<b>Dead-weight Direct Shear with analog inputs</b> (includes a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, and a 0.4" (10.2mm) vertical strain transducer)
HM-5700SW	NEXT Direct Shear software module
HM-1120*	16 TSF weight set
HM-2751.XX(S/D)	Shear box assembly
HM-2702.XX(S/D)	Shear box cutter
HM-2703.XX(S/D)	Dolly/tamper



## Typical Test Setup for HM-5750D

Part #	Description
HM-5750D.3F	<b>Dead-weight Direct Shear with digital inputs</b> (a 2,200 lbf (10kN) capacity load ring and two 1.0" x 0.0001" (25.40 x 0.002mm) digital indicators)
HM-5700SW	NEXT Direct Shear software module
HM-1120*	16 TSF weight set
HM-2751.XX(S/D)	Shear box assembly
HM-2702.XX(S/D)	Shear box cutter
HM-2703.XX(S/D)	Dolly/tamper

Part Numbers ending in .XX require a size code to be entered referring to the sample size to be tested.

For direct/residual shear samples, sizes are: .20 = 2.0"; .242 = 2.42"; .25 = 2.5"; .40 = 4.0"; .50 = 50mm; .60 = 60mm, and .100 = 100mm.

**NOTE:** use "S" for square and "D" for round samples.

\*For metric applications, use HM-1122, weight set, 32kg.

Shear box assemblies include: sample box, (2) porous plates, (1) loading pad, and (1) grid plate. All shear boxes feature mounting screws for use

with the HM-2560A.1 ASTM D3080-compliant counter-balance device. HM-5760 Pneumatic Direct Shear Machine requires a clean and dry continuous air supply. (air filter, water trap, minimum 100psi (700 kpa) 10CFM (0.3 m<sup>3</sup>/min).

**Installation and Spare Parts Kit HM-4168:** Direct Shear Installation and Spare Parts Kit Installation and spare parts kit provides tubing, fasteners and tools to complete an installation of pneumatic direct shear equipment.

## Applicable Standards

ASTM D3080; AASHTO T236; BS 1377: part 7

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