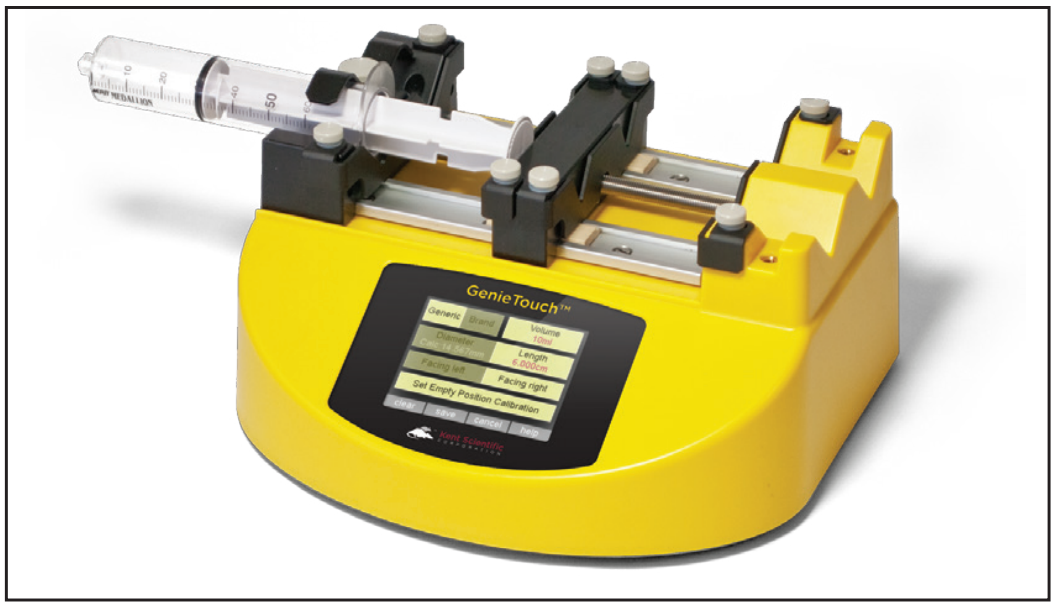
GenieTouch™

Infusion/Withdrawal Dual Syringe Pump



Owner's Manual

Kent Scientific
CORPORATION

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This product is not designed, intended or authorized for use in human applications.

About the GenieTouch

The GenieTouch™ is an infusion/withdrawal dual-syringe pump with multi-syringe capability and a series of user-configurable functions that allow it to meet a variety of needs. It supports optional audible alarms and optional force adjustment. **The GenieTouch is not designed, intended or authorized for use in human applications.**

Parts of the GenieTouch

It is useful to become familiar with the parts of the GenieTouch before you begin using it.

The GenieTouch supports use of two syringes at a time, both facing the same direction. The right syringe mount and the left syringe mount each accept two syringes of up to 60ml size.

Note: The left and right syringe plunger reversing clamps on the pusher block are used to grab the flange on the end of the syringe plunger. With the syringe plunger fixed to the pusher block, the plunger can be moved in both forward (infusing or emptying) and reverse (withdrawing or filling) directions. These clamps are also called anti-siphon clamps because they keep the syringe plunger from passively moving under large hydrostatic loads.

Figure 1a

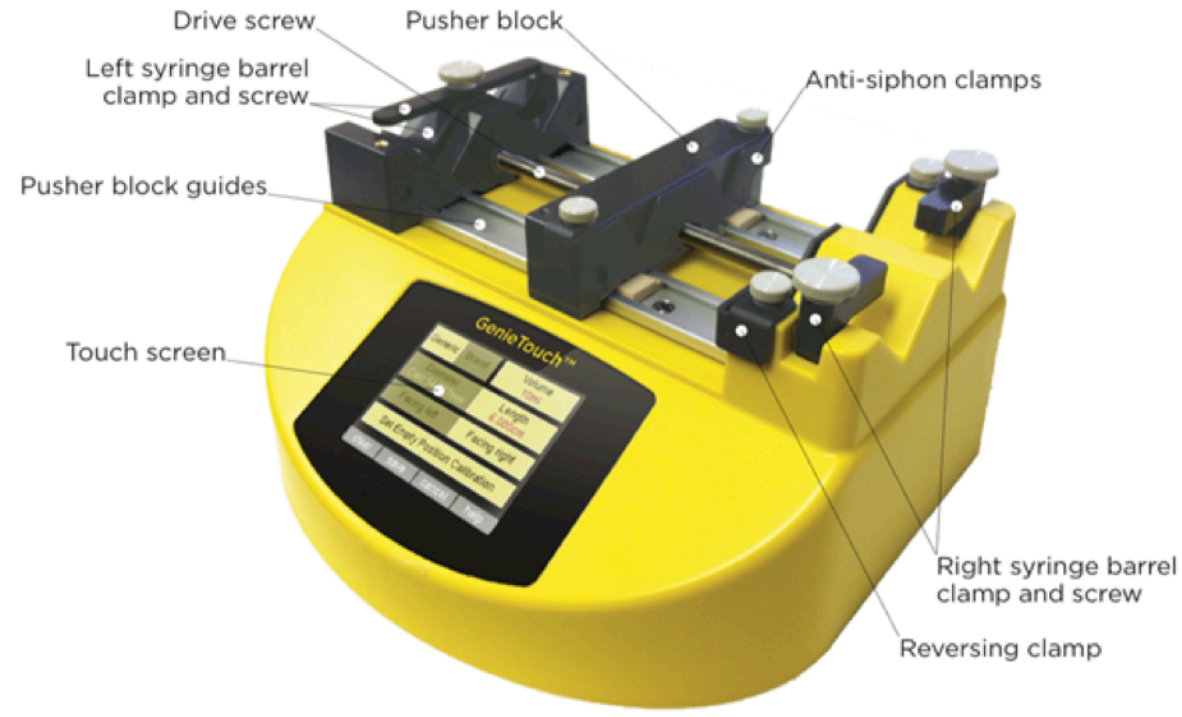
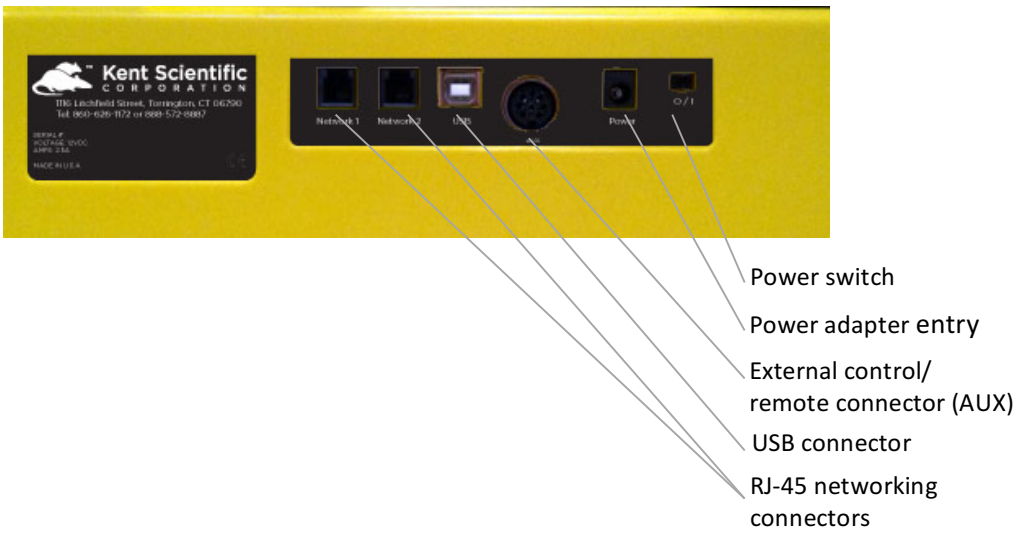


Figure 1b



Rear view

The RJ-45 networking connectors are for future GenieTouch models.

Figure 1c

This is the U.S. power supply. Yours may look different if we shipped your GenieTouch outside the U.S.

Setting Up the GenieTouch

The only physical setup the GenieTouch requires is that you plug it in and mount your syringes.

1. Connect the supplied 12VDC power adapter to the GenieTouch through the power entry connector on the rear of the chassis. (See Figures 1b and 1c.)
2. Plug the adapter into an appropriate power source.
3. Slide the power switch on. You will see the **Opening screen**, which contains two buttons—**Setup** and **Main**. Tapping **Setup** leads to a series of screens for configuring your GenieTouch to meet your specific needs. Tapping **Main** leads to the Main screen for controlling the GenieTouch while it is running.

Mounting Syringes

There are two syringe mounts on the right side of the GenieTouch chassis for the traditional industry-standard right-facing syringe placement. There are also two syringe mounts on the left side of the chassis if you prefer to use left-facing syringes.

The Right Side

To mount a syringe in one of the right-side mounts:

1. **Select the proper clamp orientation.**

   The syringe barrel clamps are **L**-shaped and work for both small and large syringes depending upon the orientation of the clamp:

   For smaller syringes

   - Place the screw in the hole in the bottom of the short leg of the **L**.
   - Place the spring over the protruding end of the screw.
   - Lay the longer leg of **L** in the notch in the side of the chassis.
   - Tighten the screw into the notch in the chassis.

   For larger syringes

   - Place the screw in the hole in the top of the short leg of the **L**.
   - Place the spring over the protruding end of the screw.
   - Insert the bottom of the shorter leg into the notch in the side of the chassis.
   - Tighten the screw into the notch in the chassis.

   The spring allows the clamp to rise automatically when you loosen it, making syringe removal more convenient.

2. **Loosen the screws on the two syringe barrel reversing clamps.**
   Both the right syringe mount and the pusher block have black reversing clamps with gray screws at the top. (See Figure 1a.) Loosen all four screws. If the reversing clamp of the pusher block is on the left face of the block, remove the gray screws and replace the clamp loosely on the right face of the block.

3. **Place the syringe.**
   Lay the syringe in the trough facing out of the chassis with the barrel flange between the chassis and its reversing clamp and the plunger flange between the pusher block and its reversing clamp.

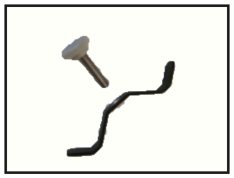
4. **Tighten the screws.**
   You may have to tighten all the screws part way down and then return to retighten them. Holding the syringe in place, screw the syringe barrel clamp down loosely. Tighten the screws part-way on the reversing clamps. When everything is loosely held in place, squeeze each reversing clamp against the flange it is holding and tighten to finger tight. Then squeeze the other side of each reversing clamp and tighten it. Finally, return to the syringe clamp and make it finger tight as well.

The Left Side

To mount a syringe in one of the left-side mounts:

1. **Select the proper clamp orientation.**
   There are two syringe barrel clamps, a straight clamp and an **M**-shaped clamp. Your choice of clamp will depend upon the size of your syringe:

   For the smallest syringes – Use the **M** clamp with the pointed sections
   facing down. Secure the clamp with the central screw.



   For mid-size syringes – Use the straight clamp. Secure the clamp with the central screw.

   For larger syringes – Use the **M** clamp with the pointed sections facing
   up. Secure the clamp with the central screw.

   Use the spring in the same way you use it for right-side mounts.

2. **Loosen the screws on the two syringe barrel reversing clamps.**
   Both the right syringe mount and the pusher block have black reversing clamps with gray screws at the top. (See Figure 1c.) Loosen all four screws. If the reversing clamp of the pusher block is on the left face of the block, remove the gray screws and replace the clamp loosely on the right face of the block.

3. **Place the syringe.**
   Lay the syringe in the trough facing out of the chassis, with the barrel flange between the chassis and its reversing clamp, and the plunger flange between the pusher block and its reversing clamp.

4. **Tighten the screws.**
   You may have to tighten all the screws part way down and then return to retighten them. Holding the syringe in place, screw the syringe barrel clamp down loosely. Tighten the screws part-way on the reversing clamps. When everything is loosely held in place, squeeze each reversing clamp against the flange it is holding and tighten to finger tight. Then squeeze the other side of each reversing clamp and tighten it. Finally, return to the syringe clamp and make it finger tight.

NOTE: The first time you use a new syringe size or brand model, you will need to:

- mount the syringe
- calibrate it
- remove it
- fill it
- mount it again

When you subsequently use the same syringe, you can simply select the syringe from the GenieTouch saved look-up table of syringes, and use the << or >> buttons to position the pusher block correctly before you mount the syringe. See page 18.

Controlling the GenieTouch

The Touch Screen

The GenieTouch menu screens are touch-sensitive. Here are some tips for using the screens:

A computer interface is also available for the GenieTouch. Visit the GenieTouch product page at our website or see page 19 to learn more about the ASCII commands and how to use them.

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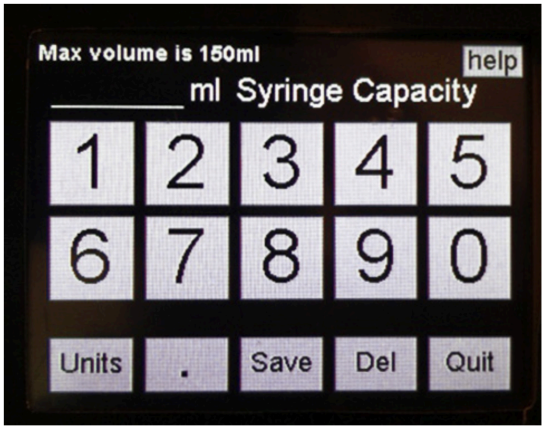
- When two choices appear side by side on the same button, only one or the other can be active at one time. The active choice will be yellow and the inactive choice will be grayed.

- If a screen contains a **Save** button, you must tap it if you want to save the settings you have made.

- Some screens contain a **Done** button which saves your settings to temporary memory and exits to the previous screen. In those cases, you will return to a screen with a **Save** button. Tap it to save the full configuration of settings on that screen to non-volatile memory.

- Some screens contain a **Cancel** button which exits to the previous screen without saving your settings.

- Numeric keypad screens, which allow you to set values for various parameters, all contain a bottom row with these buttons:
  - decimal point (•) where appropriate
  - **Save** to leave and retain your changes
  - **Del** to delete the last tapped number or decimal point
  - **Quit** to leave with no changes saved



- At numeric keypad screens, if you attempt to enter a numeric value larger than the allowed maximum, you will see an error message. Use the **Del** button to delete your last entry and try again. The allowed maximum value is always displayed in the upper left corner of the screen.

- Every screen contains a **Help** button for context sensitive help.

GenieTouch Help

When you tap **Help** at any screen, you will see context-sensitive help for that screen.

Tapping **TOC** (Table of Contents) at any context-sensitive help screen produces a list of Owner's Manual sections. The list items are not touch-sensitive. Highlight the section you want to view and tap **Select** to view it. Tap **Down** to move toward the end of the list and **Up** to move toward the top. At the help page, tap **Next** or **Prev** to page forward or backward through multi-page entries. Tap **Return** to go back to the most recent Table of Contents. Tap **TOC** to go back to the main Table of Contents.

The GenieTouch Menus

When you turn the GenieTouch on, the **Opening Screen** appears. It contains two buttons:

- **Setup:** Leads to the Setup screen for configuring the GenieTouch
- **Main:** Leads to the Main screen for controlling the GenieTouch while it is running

Setup

The Setup screen contains four main buttons: **Syringe**, **Operation**, **Auto Reverse** and **Advanced**. The function of each of these buttons is described below.

Setup > Syringe

The Syringe Selection screen

The top button of this screen shows the kind of syringe currently selected—**Generic** or **Brand**. The selected type appears in yellow, and the other buttons on the screen display the current settings, if any, for that type of syringe. To change between **Generic** and **Brand**, tap the blue choice. The other buttons on the screen will change to reflect the type of syringe you have selected.

Syringe > Generic

Use a Generic Syringe

If **Generic** is not already the chosen syringe type, tap **Generic**, then follow these steps, described in detail below:

1. Set the syringe **Volume**.

2. Set either the syringe **Diameter** or **Length**.
3. Choose the syringe orientation.
4. Calibrate the **Empty Position**.

When you are finished, press **Save**.

If you specify a **Diameter/Volume** combination that would cause a calculated **Length** to be outside the allowed range, or a **Length/Volume** combination that would cause a calculated **Diameter** to be outside the allowed range, the calculated value will display as **Out of range**.

Set the syringe Volume

Tap **Volume** to set the volume for your generic syringe. At the resulting numeric keypad, you may enter a value up to 150ml. Tap the **Units** button in the bottom row to switch between ml and ul.

Set either the syringe Diameter or Length

To set the diameter, tap **Diameter** and use the resulting numeric keypad to enter an exact inside diameter for your syringe in mm. To set the length instead, tap **Length** and follow the same process. Length is defined as the distance between the full and empty positions. When you specify one of these values, GenieTouch will calculate the other based on your **Volume** setting.

Syringe **Length** must be between 1cm and 12cm and syringe **Diameter** must be between 0.02mm and 3cm. If you try to input numbers outside these ranges, you will see an error message.

Choose the syringe orientation

Tap **Facing Left** or **Facing Right** to indicate how you plan to orient the syringe in the GenieTouch. Right and left refer to *your* right or left. Note this selection defines the physical direction for the **Infuse** and **Withdraw** functions.

(Re)Calibrate the Empty Position

The button for calibrating (or recalibrating) the **Empty Position** does not appear until you have specified all the other parameters for your syringe.

If you are using a new kind of syringe, the button will read **Calibrate Empty Position** and you must complete the process described below before your syringe is fully defined.

If you are using a syringe with identical dimensions to one you have used before, GenieTouch has saved its calibration data in the lookup table and will retrieve the data automatically. The button will read **Recalibrate Empty Position**. You should tap it only if you want to make a change. One of the changes you can make is pressing **Erase** to remove the current syringe from the GenieTouch lookup table. The table can hold 48

different **Generic** or **Brand** syringes. If you exceed that number, the oldest entry will be erased to make room for the new one.

To calibrate the empty position for your syringe:

1. Mount the syringe. See page 3 for directions.
2. Tap **Calibrate Empty Position**.
3. Move the pusher block until it is within about 0.2mm of the end of the syringe or lightly touching it. Use the **Fast <<** or **Fast >>** buttons to get close to the correct position and then switch to the **Slow Adjust** button to fine-tune the position. Note that **Slow Adjust** moves only toward what you have defined as empty for this syringe.

> **CAUTION**! Position the plunger to be lightly touching the end of the syringe barrel or to be about 0.2 mm from the end of the syringe. Do not force the plunger into the end of the syringe. That will cause the syringe and plunger to move and flex during use and result in inaccuracies in plunger movement. In addition, if you define the **Empty Position** to be too close to the end of the barrel and then select a **Maximum Force** of 100% (see page 16), the force could easily damage or break a delicate syringe.

4. Press **Save** to save your settings or **Cancel** to return to the previous screen with no changes.

Syringe > Brand

Use a Brand Syringe

If **Brand** is not already the chosen syringe type, tap **Brand**. Then follow these steps, described in detail below:

1. Choose the syringe brand.
2. Select the syringe volume.
3. Calibrate the **Empty Position**.

When you are finished, press **Save**.

Choose the syringe brand

Tap **Brand**. At the resulting screen, tap the name of the syringe manufacturer.

Select the syringe Volume

Tap **Select Volume**. At the resulting screen, choose from the volumes available for your selected manufacturer. You must select a syringe brand before you select the volume.

Calibrate the Empty Position

See directions and **CAUTION** note on page 7 under **Syringe > Generic**.

Syringe Abbreviations

AT: Air-Tite All Plastic HSW Norm-Ject
BD: Becton Dickinson Interm, WW, Plastipak
BDG: Becton Dickinson Glass—all types
CA: Cadence Science MICRO-MATE glass
HA Hamilton 1000-Series Gastight
ME: Medallion
SG: Scientific Glass Eng SGE
SH: Sherwood Monoject Plastic
TE: Terumo TE

Setup > Operation

The **Operation Screen**

The top button of this screen shows the type of syringe use currently selected—**Infuse** or **Withdraw**. The selected type appears in yellow. To change between **Infuse** and **Withdraw**, tap the grayed choice. The other buttons on the screen display the available choices of **Operation** mode with the current syringe use selection in yellow.

For either type of syringe use—**Infuse** or **Withdraw**—the four choices of **Operation** mode are the same:

- **Constant Flow**—drives the pusher block at a constant speed
- **Ramped Flow**—drives the pusher block at a linearly increasing or decreasing speed
- **Stepped Flow**—drives the pusher at an increasing or decreasing speed, with the total change divided into a number of equal steps
- **Pulsed Flow**—drives the pusher in a series of two alternating continuous flow pulses

If you plan to use **Auto Reverse** to enable infusion and/or withdrawal of a volume greater than the volume of the syringe, you must enable **Auto Reverse** before you specify the character-istics of your **Operation**. See page 14.

Each of the four choices leads to a screen that allows you to define the details for the mode. Each of the screens is discussed below.

Operation > Constant Flow

Tap **Constant Flow** for a screen that displays choices for defining your **Operation**. There are four ways to define a **Constant Flow Operation**, each of which requires you to specify two parameters. In all cases, the pusher block moves at a constant speed.

Specify Volume and Time

Tap **By Volume & Time** at the **Constant Flow** screen to specify the total volume of liquid to be moved and the length of time over which to move it. The calculated flow rate will then be displayed.

> When you tap any of the buttons at the **Constant Flow** screen, you will see the numeric keypad to allow you to enter your value. Enter your value using at most four digits and a decimal point.

Tap **Volume** and enter the volume of liquid to be moved. **Units** switches between ul (microliters) and ml (milliliters).

Tap **Time** and enter the time. **Units** cycles between seconds, minutes and hours. Use decimal format—1.5hr or 90min, for example, set the same **Time**.

Specify Flow and Volume

Tap **By Flow & Volume** at the **Constant Flow** screen to specify the flow rate and the total volume of liquid to be moved. The calculated time for full delivery will then be displayed.

Tap **Flow** and enter the volume of liquid to flow per unit time. **Units** cycles through ml/min, nl/min, ul/min and ml/hr.

Tap **Volume** and enter the total volume of liquid to be moved. **Units** cycles between ul (microliters) and ml (milliliters).

Specify Flow and Time

Tap **By Flow & Time** at the **Constant Flow** screen to specify the flow rate and the total time over which the flow is to be maintained. The calculated delivery volume will then be displayed.

Tap **Flow** and enter the volume of liquid to flow per unit time. **Units** cycles through ml/min, nl/min, ul/min and ml/hr.

Tap **Time** and enter the total duration of the **Operation**. **Units** cycles between seconds, minutes and hours. Use decimal format— 1.5hr or 90min, for example, set the same **Time**.

Specify Flow

Tap **By Flow** at the **Constant Flow** screen to specify a flow rate to be maintained until the syringe is empty for **Infuse** or full for **Withdraw**. Note that the second parameter you are specifying here is actually a time of "until full or empty." You can use this **Operation** method along with **Auto Reverse** for constant pumping. See page 14.

Operation > Ramped Flow

Tap **Ramped Flow** for a screen that displays choices for defining your **Operation**. You must specify three parameters—**Start Flow Rate**, **End Flow Rate** and either **Total Time** or **Total Volume**. The process—either **Infuse** or **Withdraw**, depending upon which you have chosen—begins at the **Start Flow Rate** and increases or decreases linearly to the **End Flow Rate** until the **Total Volume** is moved or the **Total Time** elapses.

When you tap any of the buttons at the **Ramped Flow** screen or the **Stepped Flow** screen, you will see the numeric keypad to allow you to enter your value. Enter your value using at most four digits and a decimal point.

Specify Start Flow Rate

Tap **Start Flow Rate** at the **Ramped Flow** screen to specify the flow rate at which the **Operation** is to begin. **Units** cycles through ml/min, nl/min, ul/min and ml/hr.

Specify End Flow Rate

Tap **End Flow Rate** at the **Ramped Flow** screen to specify the flow rate at which the **Operation** is to end. **Units** cycles through ml/min, nl/min, ul/min and ml/hr.

Specify Either Total Volume or Time

You must specify either the total volume of liquid to be moved during your operation or the total length of time over which liquid is to be moved. Either:

Note that 0 (zero) is an allowed value any time you are asked to enter a beginning or ending flow rate for **Ramped Flow** or **Pulsed Flow**.

Tap **Total Volume** at the **Ramped Flow** screen to enter the total volume of liquid to be moved. Genie-Touch will calculate the **Total Time** for your operation and display it at the **Ramped Flow** screen. **Units** switches between ul (microliters) and ml (milliliters).

or

Tap **Total Time** at the **Ramped Flow** screen to enter the length of time your operation is to continue. GenieTouch will calculate the **Total Volume** for your operation and display it at the **Ramped Flow** screen. **Units** switches between seconds, minutes and hours.

Operation > Stepped Flow

Tap **Stepped Flow** for a screen that displays choices for defining your **Operation**. You must specify four parameters—**Start Flow Rate**, **End Flow Rate, Number of Steps** and either **Total Time** or **Total Volume**. The process—either **Infuse** or **Withdraw** depending upon which you have chosen—begins at the **Start Flow Rate** and increases or decreases to the **End Flow Rate** in steps of equal duration until the **Total Volume** is moved or the **Total Time** elapses.

Specify Start Flow Rate

Tap **Start Flow Rate** at the **Stepped Flow** screen to specify the flow rate at which the **Operation** is to begin. **Units** cycles through ml/min, nl/min, ul/min and ml/hr.

Specify End Flow Rate

Tap **End Flow Rate** at the **Stepped Flow** screen to specify the flow rate at which the **Operation** is to end. **Units** cycles through ml/min, nl/min, ul/min and ml/hr.

Specify either Total Volume or Time

You must specify either the total volume of liquid to be moved during your operation or the total length of time over which liquid is to be moved. Either:

Tap **Total Volume** at the **Stepped Flow** screen to enter the volume to be moved. GenieTouch will calculate the **Total Time** for your operation and display it at the **Stepped Flow** screen. **Units** switches between ul (microliters) and ml (milliliters).

or

Tap **Total Time** at the **Stepped Flow** screen to enter the length of time your operation is to continue. GenieTouch will calculate the **Total Volume** for your operation and display it at the **Stepped Flow** screen. **Units** switches between seconds, minutes and hours.

Specify Number of Steps

Tap **Number of Steps** at the **Stepped Flow** screen to specify the number of steps into which the **Operation** will be divided.

Operation > Pulsed Flow

Tap **Pulsed Flow** for a screen that displays the choices for defining your **Operation**. Since **Pulsed Flow** is made up of a series of two-part **Constant Flow** pulses, you must specify two parameters for each of the pulse parts and you must specify the **Number of Pulses** to be carried out before the **Operation** ends.

Configure First Part of the Pulse

Tap **Pulse: 1st Part** at the **Pulsed Flow** screen to define the parameters for the first part of the pulse you want to use. The process is identical to configuring a **Constant Flow Operation** with one exception: the **By Flow** choice is not available. For complete directions, see **Constant Flow** on page 11.

Configure Second Part of the Pulse

Tap **Pulse: 2nd Part** at the **Pulsed Flow** screen to define the parameters for the second part of the pulse you want to use. The process is identical to configuring a **Constant Flow Operation** with one exception: the **By Flow** choice is not available. For complete directions, see **Constant Flow** on page 11.

Specify Number of Pulses

Tap **Number of Pulses** at the **Pulsed Flow** screen to specify how many pulses will make up the **Operation**. You may enter a number of pulses or you may choose **Continuous** which tells the GenieTouch to continue pulsing until the syringe is either empty or full, depending upon whether you have chosen **Infuse** or **Withdraw**.

You can use **Auto Reverse** together with the **Continuous** choice for **Number of Pulses** to achieve continuous operation beyond the volume of the syringe. See Auto Reverse below for more.

Setup > Auto Reverse

The Auto Reverse Screen

Auto Reverse alternates infusion and withdrawal. It allows the infusion or withdrawal of more fluid than a syringe can hold in a single filling. **Auto Reverse** maintains all the characteristics of your **Operation**, whether it is **Constant**, **Ramped**, **Stepped** or **Pulsed**.

Your setting for syringe use—**Infuse** or **Withdraw**—determines which of the two will occur first and will be the focus of the process. For example, if you have chosen **Infuse**, the process will begin with an infusion according to your **Operation** settings, followed by a

constant-speed withdraw to refill the syringe, and then another infusion. The pump will change direction each time the end of the syringe is reached until it reaches the end of your **Operation** as you have defined it. See **Operation** on page 10.

Note that if you begin your **Operation** with a partially filled syringe, the initial withdrawal or infusion stroke may be a partial one.

Important: To use **Auto Reverse**, your syringe must be equipped with check valves for unidirectional flow. Otherwise, **Auto Reverse** will simply push the same syringe contents into and out of the syringe which could have undesirable consequences.

The top button of this screen shows the status of **Auto Reverse**—**Enabled** or **Disabled**. The current status appears in yellow. To change the status, tap the grayed choice. To use **Auto Flow**, you must specify a **Volume** and either a **Reverse Flow** or **Reverse Speed**.

Specify a Flow or Speed

Tap **Reverse Flow** to enter your flow rate. Use at most four digits and a decimal point. **Units** cycles through ml/min, nl/min, ul/min and ml/hr.

Tap **Reverse Speed** to enter the % of full pump speed to be used. Enter at most three digits for a value between 1 and 100.

Specify Volume

Tap **Reverse Volume** to enter a volume per pump stroke. This volume must not exceed the volume of the syringe you plan to use.

Setup > Advanced

The Advanced Features Selection Screen

This screen contains three choices:

- **Audible Alarms**
- **Maximum Force**
- **External Trigger**

Each leads to another screen with choices for setting up the corresponding feature.

Advanced > Audible Alarms

Tap **Audible Alarms** at the **Advanced** screen to set one or more conditions that will trigger the beeper when you are running the GenieTouch. Buttons for currently enabled alarms will be yellow. Those for disabled alarms will be grayed. When all four **Alarms** are configured the way you want them to be, tap **Save**.

Turn Alarm On when Run Ends

Tap **Run Done** to cycle between enabling and disabling this alarm. When it is on, a one-second long beep sounds at the end of an **Operation**.

Turn Alarm On when Run is Partially Through

Tap **% Run Done** to enter the percentage of Run completion that will trigger three quarter-second long beeps. Enter a number between 1 and 99. To turn this alarm off, tap **Alarm Off** at the numeric keypad screen.

Turn Alarm On when Motor is Stalled

Tap **Motor Stalled** to cycle between enabling and disabling this alarm. When it is on, five one-second long beeps will sound to indicate that the motor is stalled and thus unable to move the pusher block.

Turn Alarm On when Motor Slips

Tap **Motor Slipping** to cycle between enabling and disabling this alarm. When it is on, four half-second long beeps will sound to indicate that the motor is under excessive load and cannot move the pusher block.

Advanced > Maximum Force

Tap **Maximum Force** at the **Advanced** screen to set the linear operating force of the pusher block. Enter your selection as a percentage of the maximum force, which is over 36kg (80lb). For typical operations, a setting of 50% should be satisfactory.

The minimum setting for **Maximum Force** is 25%. This should be used with caution to avoid stalling the GenieTouch motor.

Advanced > External Trigger

Tap **External Trigger** at the **Advanced** screen to configure the use of an optional external signal as an event trigger. You can apply the external signal through the **AUX** port (external control/remote connector in Fig 1b) on the back of the GenieTouch. That signal might be, for example, a foot pedal, an event switch or a computer interface.

The top button on the **External Trigger** screen shows the current state of the trigger—**Enabled** or **Disabled**. The current status appears in yellow. To change the status, tap the grayed choice. The three buttons below allow you to configure the GenieTouch behavior in response to the signal. You must define whether "off" is to be interpreted as a stop or a pause, set how GenieTouch will behave on a change in the signal and specify the nature of the electrical signal from your external trigger.

Set meaning of Off

Tap **Off = Stop** to define **Off** as a complete stop of your **Operation,** equivalent to tapping the **Stop** button on the **Run** screen. This resets the display of the moved and remaining volumes displayed there. Tap **Off = Pause** to define **Off** as a **Pause,** equivalent to tapping the **Pause** button on the **Run** screen.

Set behavior on change in signal

Tap **Hold for Off** to cause a held trigger to either **Stop** or **Pause** your **Operation**, depending on your setting at **Off =** above. Tap **Tap for Run/Off** to cause a tap to a switch or foot pedal to cycle between **Off** and **Run**, with **Off** defined at **Off =** above.

Specify nature of signal

Tap **Closed = Off** to define the closed or shorted-to-ground state of your signal as **Off**. Tap **Open = Off** to define the open or floating state of your signal as **Off**.

Main

The Main screen shows the kind of syringe in use and the details of the currently defined Operation. In addition, it contains five buttons: **RUN**, **Setup**, **<<** , **>>**, **Help**. The function of each of these buttons is described below.

Main > RUN

Tap **RUN** to begin your Operation. The **RUN** button changes to **Pause** and the **Operation** starts. Tapping **Pause** causes the **Operation** to stop temporarily. The **Pause** button changes to **Resume**, allowing you to pick up where the operation left off. While the GenieTouch is running or paused, the **<<** and **>>** buttons disappear and are replaced with **Stop**. Press **Stop** to end the **Operation** and reset the **Operation** parameters to their initial state.

Important
The **RUN** button does not appear if you have not completed the Setup process.

Main > Setup

Tap **Setup** for the **Setup** menus.

Main > << and >>

Tap **<<** to move the pusher block to the left and **>>** to move it to the right. The block begins moving very slowly and accelerates until it reaches a steady speed. To keep the block moving, keep your finger on the button. Let go to stop the block. You can also press and drag your finger slowly in the direction of the button arrows. When you lift your finger, the pusher will continue moving. Stop it by tapping either **<<** or **>>**.

Main > Help

Tap **Help** for help with the current topic. Tap **Next** or **Prev** to page forward or backward through multi-page entries. When you are finished, tap **Return**.

To see a list of available Owner's Manual sections to view on the GenieTouch screen, tap **TOC** (Table of Contents) at any context-sensitive help screen. Tap **Down** or **Up** to highlight the section you want to view and tap **Select** to view it. At the resulting help page(s), tap **Next** or **Prev** to page forward or backward through multi-page entries. Tap **Return** to go back to the Table of Contents.

GenieTouch PC Interface

You can download Computer Drivers for your GenieTouch at:
http://www.ftdichip.com/Drivers/VCP.htm.
These drivers will allow your computer to communicate with the GenieTouch via a virtual COM port (VCP) connection. For assistance in setting up your computer to communicate with the GenieTouch, please contact Kent Scientific.

COM Port Settings

Bits per second: 115200
Data Bits: 8
Parity: None
Stop bits: 1

Notes

- All commands are sent as ASCII characters.
- A one-time power up command prompt is supplied by the injector **Injector nnn**.
- All commands that produce errors are ignored and return an Error message.
- Commands and arguments are case insensitive.
- Only one command per line is permitted.
- Parts of commands in caps must be sent; lower case portions are optional.
- White space can be any number of spaces or tabs.
- All text on a line after '!' is ignored.
- Most commands that specify a value or a state have a request form of the command that is the same command preceded by **?**.

Unit Definitions

Length	
um	micrometer
mm	millimeter
cm	centimeter

Volume	
ul	microliter
ml	milliliter
cc	same as ml

Time	
s, sec	seconds
m, min	minutes
h, hr	hours
Time values can be combined as pairs, e.g. 3h20m.	

Flow	
vu/tu	volume unit per time unit
vu can be any of the above volume units and **tu** can be any of the above time units.	

Commands

AdHoc ASCII Commands

ASCII packet: Rec: ASCII chars, [CR | LF | CRLF]
: Xmit: '>', ASCII chars, CR, LF

BEEp No arg => 1 sec beep
BEEp Num **Num** = Number of 1 sec beeps
BEEp Num On ms Off ms

Num = Number of beeps of duration **On** mS and separation of **Off** mS
On and **Off** are truncated internally to a multiple of 10 ms.

Example: **bee 3 500 ms 1500ms** ➔ Three beeps, on 0.5 sec, off 1.5 sec

CONtrol

CONtrol [LOCK | UNLock]

LOCK: Enter locked state. Accept no commands except **UNLOCK**

UNLOCK: Release from locked state.

Example: **con lock** ➔ Prevent unintentional touch screen input

REPort [RESet] [OFF | ON] [MOVing] [POS] [PERc] [VOL] [EVEnt] [period]
?REPort [RESet] [MOVing] [POS] [PERc] [VOL] [EVEnt]
?REPort

- Report position, percentage, volume and/or events. Reporting can be periodic, by request or triggered by an event.
- The **?** forms request an immediate single report
  - If there are arguments the report contains the requested information. The arguments are not retained.
  - If there are no arguments the report contains the items that were last setup using the non-**? REPORT** form.
- The non-**?** form specifies items that are retained in EEPROM. If a non-zero **period** is specified reporting will be automatic and periodic.
- **POS** is the absolute carriage position in xxx.xx mm
- **PERC** is the percent completion as xx.xx% when in RUN mode
- **VOL** is the delivered volume when in RUN mode
- **EVENT** report significant change in status
  - **Stall** if movement stopped by stall
  - **Slipping** if motor is not able to move as fast as requested
  - **Limit** if movement stopped by limit before reaching target
  - **End** if movement stopped by reaching target

- M**OVING** restricts reporting to when unit's carriage is in motion. Has no effect on a **?** report.
- **ON** and **OFF** turns on/off periodic and event reporting, Has no effect on a **?** report.
- **period** can be in any of the forms of time but is rounded to integer seconds (that cannot exceed 65535). Has no effect for **?** reporting.
- If no argument is given a single report is generated using the last specified arguments.
- **RESET** clears all report settings. It must be the first argument given or else it will clear the arguments that precede it.
- All report settings are stored in EEPROM

Example: **rep on mov pos 1 sec** ➔ Report position every second while moving

RUN

Begin running using the current configuration

PAUse

Pause running. **RUN** will un-pause.

STOp

Stop running. **RUN** will start from beginning.

Example: **run** ➔ Begin running

CLEar arg

- **arg** = **ALL**: Clear Syr1, Syr2, Dispense, AutoRev
- **arg** = **SYRinge**: Clear Syringe
- **arg** = **OPEration**: Clear Dispense, AutoRev
- **arg** = **AUTorev**: Clear AutoRev
- All **CLEar** commands will force the motor to stop if it is running

Example: **cle syr** ➔ Clear syringe values

Direct Control

Notes about Direct Control Commands

For both **MOVe** and **SPEed** previous values are preserved unless explicitly changed by command.

To exit Direct Control issue a **STOP** command.

Default values for all DIRECT CONTROL cmds:

- **DAC** is set to 50%
- **DestArg** is set to **PHYSICAL**
- **Speed** is set to 0

ABSpos

- If motor not moving, update absolute motor position from calibration table and restart backlash correction.
- If motor moving, restart backlash correction

Example: **abs**

REFerence RefArg RefArg

- Where **LEFt** and **RIGht** are implied and both must be present
- **REFerence [LEFt RefArg] [RIGht RefArg]**
- **RefArg** = **PHYsical** | **SYRinge** | **FULl** | **EMPty** | **#cm** | **#mm**
- In the case of **FULl** and **EMPty** the **LEFt** and **RIGht** are ignored and the syringe facing direction governs usage .

Example: **ref 6 cm 4 cm** ➔ Set left reference to 6 cm and right reference to 4 cm

SPEed SpeedArgs

- **SpeedArgs** = **#%** | **#um/hr** | **stop** [**#F**]
- **#%**, **#um/hr** and **stop** specify speed
- **#F** specifies force, i.e. DAC value where 100 >= DAC >= MinDAC

Example: **spe 50% 100F** ➔ Set speed to 50% maximum and force to 100% maximum

MOVe LEFt | RIGht | ABS DestArg [SpeedArgs]

- If **LEFt** or **RIGht** is given then:
  - **DestArg** = **UNLimited** => no limit to motion
  - **DestArg** = **PHYsical** => physical end of allowed motion without hitting end stops
  - **DestArg** = **SYRinge** => syringe full or empty position based on syringe orientation
  - **DestArg** = **REFerence** => value specified by **REFerence** command
- If **ABS** is given then **DestArg** = **#mm** or **#cm** => absolute position relative to right End stop. Absolute position can be outside of syringe limits so care must be exercised not to damage the syringe

Example: **mov abs 5 cm** ➔ Move to location 5 cm (from right end stop)

Syringe Command

The following command specifies syringe selection parameters. All arguments that have associated units must be given with their units.

Numerical Values

For Length or Diameter

Form: xxxx, xxx.x, xx.xx or x.xxx

Units: **um**, **mm**, **cm**
Must be preceded by **LEN** or **DIA**

For Volume
Form: xxxx, xxx.x, xx.xx or x.xxx
Units: **ml**, **ul**
Is not preceded by text. Use only the value, eg, **40ml** not **VOL 40ml**

SYRinge Name Volume [RIGht | LEFt] [EmptyPos]

- This form is used to specify a brand named syringe.
- **Name** is an abbreviation of the manufacturer's name (see list at right).
- **Volume** must match one of the standard volumes provided by the specified manufacturer.

Syringe Abbreviations

AT:	Air-Tite All Plastic HSW Norm-Ject
BD:	Becton Dickinson Interm, WW, Plastipak
BDG:	Becton Dickinson Glass—all types
CA:	Cadence Science MICRO-MATE glass
HA	Hamilton 1000-Series Gastight
ME:	Medallion
SG:	Scientific Glass Eng SGE
SH:	Sherwood Monoject Plastic
TE:	Terumo TE

SYRinge DIAmeter dia | LENgth len Volume [RIGht | LEFt] [EMPty pos]

- This form is used to specify a generic syringe.
- Either **Diameter** or **Length**—not both—must be specified.
- **RIGht** or **LEFt** specifies the direction, i.e. **RIGht** facing or **LEFt** facing. If neither is given **RIGht** facing is assumed.
- **EMPty pos** specifies the absolute position that corresponds to the syringe being empty. It is specified without units and is assumed to be in 10 um units. It is for advanced use only. If it is absent the current stored value for **pos** will be used. To change **pos**, use **EMP** and the absolute carriage position in 10um increments. For example, **syr dia 15mm 8ml rig emp.**

Example: **syr bd 60ml right** ➔ Select BD 60 ml brand mounted facing right.

Operation Commands

The following commands specify dispensing parameters. All arguments that have associated units must be given with their units.

Numerical Values

For Time
Form: xxxx, xxx.x, xx.xx or x.xxx
Units: **s**, **m**, **h**, **sec**, **min**, **hr** or composite forms **#h#m** or **#m#s**
Limit: Minimum time is 100 mS and resolution is 10 mS

For Volume

Form: xxxx, xxx.x, xx.xx or x.xxx

Units: **ml**, **ul**

For Flow

Form: xxxx, xxx.x, xx.xx or x.xxx

Units: **ml/min**, **ml/hr**, **ul/min**, **ul/hr**

Definitions

- "**dir**" indicates one of the keywords: **INFuse** or **WIThdraw**.
- **GenVol** indicates a specific volume, **Vol**.

[WIThdraw | INFuse] Flow
[WIThdraw | INFuse] Flow GenVol
[WIThdraw | INFuse] Flow Time
[WIThdraw | INFuse] Time GenVol

- If **Flow** is the only argument then Continuous delivery is assumed.
- Any two of **Time**, **GenVol** or **Flow** will specify a specific delivery amount.
- Arguments can be specified in any order.
- All args must have associated units. The units are used to both specify the quantity of the value and to identify the type of the value.

Example: **inf in 10 ml/min 1 min** ➔ Infuse with a flow of 10ml/min for 1 min

[WIThdraw | INFuse] RAMp {Time or GenVol} FlowBeg FlowEnd

- Defines a linear ramp with starting flow of **FlowBeg** and ending flow of **FlowEnd**.
- Either **Time** or **GenVol** can be specified to set the total amount delivered.
- **FlowBeg** and **FlowEnd** must be given as a pair and in the stated order.
- **Time**, **GenVol** and the **Flow** pair can be in given in any order.
- One of the flows can be zero.

Example: **wit ram 50 sec 0ml/min 10ml/min** ➔ Withdraw for 50 sec with a linear ramp starting at a flow of 0 and ending with a flow of 10ml/min

[WIThdraw | INFuse] STEp #Steps {Time or GenVol} FlowBeg FlowEnd

- Defines a stepped ramp.
- The flow is uniformly divided into #steps starting at **FlowBeg** and ending with **FlowEnd**.
- The **#Steps** value is limited to a integer 2 to 9999 and it must be the 1st argument after **STEP**.
- In all other ways the syntax is the same as for **RAMP**.

Example: **wit ste 4 50 sec 10ml/min 5ml/min** ➔Withdraw for 50 sec with 4 steps starting at a flow of 10ml/min and ending with a flow of 5ml/min

[WIThdraw | INFuse] PULse #pulses Part1 Part2

- Defines a pulsed delivery.
- A pulse is divided into two parts: **Part1** and **Part2**.
- The specification of a Part must produce a flow rate for a non-zero period of time.
- The flow rate can be zero.
- A Part can be specified by any of pairs: {**Flow** & **Time**}, {**Flow** & **Volume**} or {**Time** & **Volume**}.
- The **#pulses** is limited to an integer of 1 to 9999.
- **#pulse** can be replaced by the keyword **FOREVER** in which case delivery will continue until manually stopped.
- The order of the arguments for the **PULSE** command is fixed.

Example: **wit pul 20 0ml/min 5 sec 10ml/min 5ml** ➔ Pulsed withdraw with 20 pulses. The first part of the pulse is zero flow for 5 sec. The second part of the pulse is 10 ml/min for a volume of 5ml.

Requests

?CONtrol

Returns: **Locked/Unlocked**

?SYRinge

- **volume** is volume of syringe with units
- **length** is length of syringe with units
- **diameter** is diameter of syringe with units
- Returns:
  - **Syringe volume Len|Dia length|diameter [Left]**
  - **Syringe volume name [Left]**
  - **Syringe No Empty Pos**
  - **Syringe Undefined**

?OPEration

- **dir** is **Infuse** or **Withdraw**
- **flow**, **beginFlow**, **endFlow**, **flow1** or **flow2** are flows with units
- **time** is time with units
- **genVol** is volume with units
- **num** is the number of steps in ramp or number of pulses
- Returns: ?
  - **dir Continuous flow**

    - **dir Constant flow time**
    - **dir Constant flow genVol**
    - **dir Constant time genVol**
    - **dir Ramp beginFlow endFlow time**
    - **dir Ramp beginFlow endFlow volConc**
    - **dir Steps:num beginFlow endFlow time**
    - **dir Steps:num beginFlow endFlow genVol**
    - **dir Pulses:num flow1 flow2 time**
    - **dir Pulses:num flow1 flow2 genVol**
- **dir Undefined**

?REPort [RESet] [MOVing] [POS] [PERc] [VOL] [EVEnt]
?REPort
See discussion under **REPort**

?RUN

- **perc** is percent complete. Sent as **nnn.nn%**. Omitted if continuous.
- Returns: **RunState**
- **RunState** = **Stopped**, **Paused [perc]**, Running **[perc]**, **Direct**, **Fast**, **Undefined**

?SN
Returns **SN: nnn.. Ver: v.vv** where **nnn..** is the serial number and **v.vv** is the version number

General Information

Specifications

GenieTouch	
Syringe number	Up to 2
Syringe size	0.5ul to 60ml
User Interface	Touchscreen
Max Linear force	>36kg (80lb)
Selectable Functions	Constant Rate Time Dispensing Volume Dispensing Ramp Pulsed Stepped
Programmable Fill/Empty	Yes
Pusher Block Stall Detection	Yes
Computer Interface	USB
Audible Alarm Indication	Yes
Pusher Block Position Detection	±0.2mm
Multi-Syringe Rack	Optional
Force Adjustment	Yes
Footswitch Interface	Yes
External Triggers	Yes
Warranty	2 years

Cleaning Instructions

Clean the surface of your GenieTouch using a soft lint-free cloth. If needed, clean with a cloth dampened with a solution of water and a mild detergent, or isopropyl alcohol mixed with water at a 3:1 ratio.

Warranty

Thank you for purchasing a GenieTouch. We truly appreciate your business. We strongly advise that you read and study this Owner's Manual to appreciate fully all the features, benefits, and capabilities of the GenieTouch.

Contact Information

Kent Scientific Corporation
1116 Litchfield Street
Torrington, Connecticut 06790
www.kentscientific.com

Email: sales@kentscientific.com
Phone: 860.626.1172
Fax: 860.626.1179

Disclaimer

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This product is not designed, intended or authorized for use in human applications.

Product Warranty

The GenieTouch has a two (2) year warranty including all parts and labor charges. This warranty does not cover damage by any cause including, but not limited to, any malfunction, defect or failure caused by or resulting from unauthorized service or parts, improper maintenance, operation contrary to furnished instructions, shipping or transit accidents, modifications or repair by the user, harsh environments, misuse, neglect, abuse, accident, incorrect line voltage, fire, flood, other natural disasters, or normal wear and tear. Changes or modifications not approved by Kent Scientific Corporation could void the warranty. The foregoing is in lieu of all other expressed warranties. Kent Scientific does not assume, or authorize any party to assume for it, any other obligation or liability.

Satisfaction Guarantee

Should you experience difficulty with the GenieTouch, our Technical Support Group will assist you in trouble-shooting and determining if the product needs to be returned to our facility. We will issue you a Return Manufacturer Authorization (RMA) number before the product is shipped back for repair. It is at the discretion of the manufacturer to replace or repair a defective part or product. Please call Customer Service at 888.572.8887 to obtain a Return Manufacturer Authorization number. Shipments without an RMA number will not be accepted. Please note that after our 30-day return policy period ends, we will be happy to assist you with your application, but cannot issue any credit or refund for a returned GenieTouch.

Prior to shipment, please clean and decontaminate the product of any chemical, biological, or isotopic contamination. Please include a completed Product Return Form with the shipment. The form can be found on page 29 of this Owner's Manual. Additional copies are available by calling Kent Scientific Customer Service at 888.572.8887.

⇨Product Return Form - Complete Steps 1 through 4

Kent Scientific
CORPORATION

860.626.1172 / toll-free: 888.572.8887 / fax: 860.626.1179
1116 Litchfield Street, Torrington, CT 06790 / www.kentscientific.com

1

Product Name: _____ Serial #: _____ RMA#: _____
(in subject line of email)

Product Name: _____ Serial #: _____

Product Name: _____ Serial #: _____

2

Prior to returning equipment that may be contaminated with biohazardous materials, potentially biohazardous materials, or radioactivity; the user must first decontaminate the equipment being returned. The decontamination procedure will include the following, as appropriate:

RETURNS WILL NOT BE ACCEPTED WITHOUT THIS INFORMATION

Place an "X" next to the appropriate box

☐ This equipment has not been used in an area which would result in any biohazard or radioactive exposure.

☐ This equipment was appropriately decontaminated* from any biohazardous materials with:_____

⇨ _____

*Example: Autoclave, 10% bleach, Ethylene Oxide, formalin, etc. (Please note that it is the user's responsibility to confirm that the method of decontamination used is appropriate). Instruments must be decontaminated externally and internally, if needed.

☐ This equipment was appropriately decontaminated and tested for radioactivity by:_____

*Example: Wipe test with results (^{3}H, ^{14}C, α-emitters), Geiger counts, etc.

3

If you are expecting a return or replacement shipped to you, please indicate the shipping address:

Institution: _____

Department: _____

Address Line 1: _____

Address Line 2: _____

City: _____ State: _____ Zip: _____

Country: _____ Telephone: _____

4

Name: (print) _____ Telephone: _____

Signature: _____ Date: _____

Return Product To: Kent Scientific Corporation 1116 Litchfield Street Torrington, CT 06790 USA Attn: Returns/RMA #	Returns using a Kent Scientific account should be sent "standard ground" service only. Written permission is required to use any service other than standard ground. Unless prior written authorization is obtained, the sender will be responsible for additional costs associated with the shipment if it is not sent by standard ground.

BEFORE SHIPPING THE PRODUCT: Fax or Email the completed form to 860-626-1179, sales@kentscientific.com

Kent Scientific
CORPORATION

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