VISION® G2 AUTOPLUS™ AUTOSAMPLER AND AUTOFILL™ COLLECTOR USER GUIDE

About Teledyne Hanson Research

Teledyne Hanson Research, a division of Teledyne Instruments, Inc., is a global technology company specializing in analytical test instruments for the pharmaceutical industry. Founded by the innovator of modern dissolution test technology, Teledyne Hanson Research (THR) helps ensure the world's pharmaceuticals are pure, safe, and effective by manufacturing equipment that sets the global standard for quality, innovation, and long-term value. Teledyne Hanson Research instruments are used by scientists in over 75 countries worldwide and are supported by the industry's top customer service team. For more information, visit teledynehanson.com.

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Congratulations on your purchase of the Teledyne Hanson Research Vision® G2 AutoPlus™ autosampler and AutoFill™ collector. While we are certain you will enjoy this new product, we also understand from time to time you may have a question or technical issue requiring our assistance. Please feel free to contact us at any time by any of the methods below.

Website: teledynehanson.com

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Revision History

Document Revision History

REVISION	DATE	DESCRIPTION
A	12 Dec 2011	Initial release.
B	28 Aug 2012	References to SR8-Plus added; appendix added.
C	14 Jan 2013	Added section defining the differences between the DissoScan and Maximizer. Clarified retrieval reservoir installation instructions. Added appendices B and C. Updated transfer event for added features in section 5.7. Added flowchart for wash function in section 8.2. Added connection diagram to section 4.9.
D	19 May 2014	Updated various sections with new commands and options to use Vision AutoFilter. Added appendix for improved reports. Updated system configuration with new printing options. Corrected error regarding Maximizer in wetted materials table. Corrected wash flow chart. Updated new features.
E	14 Aug 2014	Added Event Library appendix (E) and information.
F	6 Nov 2014	Added rack zoning option. Added indefinite pause option.
G	12 June 2019	Added three-tier security. Updated document to Teledyne format.

To confirm that you have received the latest version of this user guide, contact Teledyne Hanson Research Technical Support.

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Figures and Diagrams

Introduction

The Vision® AutoPlus™ is a programmable precision syringe-pump sampling instrument that handles a wide variety of dissolution applications and requirements. The basic instrument consists of a choice of 6 or 8 precision glass sampling syringes driven by a stepper motor, with internal valve interfacing, in one compact ergonomic instrument package. PTFE tubing harnesses connect up to 3 dissolution testers, automated filter changers, along with multi-cell changers for on-line UV/VIS sample analysis, as well as collection trays for sample archive.

The Vision G2 AutoPlus can be directed to withdraw an aliquot from a dissolution tester at a pre-programmed time. The sample is measured and dispensed through a UV flow cell and/or further into a collection rack that contains vials or test tubes. The Vision G2 AutoPlus can be programmed to repeat this process multiple times.

Most other commercial dissolution sampling systems use peristaltic pump movement of samples into a collector or through a UV flow cell. Vision G2 AutoPlus avoids the volumetric inconsistency and high maintenance of the peristaltic pump and provides an inert environment to minimize drug absorption.

The Vision® AutoFill™ is an automated sample collector designed for seamless integration with the Vision G2 AutoPlus. The AutoFill includes sample collection capability from eight sources, home port arrays for wash and waste, all-inert tubing and dispense probes, and reduced tubing lengths to minimize rinse volume and save time. Collection racks include 16 x 100 mm test tubes for UV, 13 x 100 test tubes for UV, 12 x 32 vials for HPLC, and 12 x 32 vials for UPLC (the UPLC rack holds three trays for Waters Acquity UPLC).

Definitions

AutoFill™

The redesigned sample collection instrument placed on to the top of the Vision G2 AutoPlus.

AutoMag™

An automated mechanism that can be installed on the Vision Elite 8 dissolution tester to automate raising and lowering of the sample probes and Digital Temperature Probes (DTPs).

Classic 6™

A rugged compact six-position dissolution test station with a unique two-across, three-deep design. The workhorse unit ideal for manual test routines, space-limited laboratories, and budget-minded programs.

Detect

Determine a sample's absorbance.

Dilute

To collect a solute and a solvent in the same container with the purpose of reducing its concentration.

Dispense

The pushing out of material from the syringe by the syringe plunger.

DissoScan™

The autosampler with one 3-way solenoid valve per syringe to direct fluid flow. The DissoScan provides 2 fluid lines (A and D). Only 1 tester can be connected to a DissoScan.

Elite 8™

An eight-position high-performance machine built for automation and extended applications.

Fixed Probe

A stationary vessel mount sampling probe mounted to the vessel cover for connection to an automated sampler.

Generic

A dissolution tester that is not an SR8-Plus, Vision G2 Classic 6 or Elite 8.

Load

The drawing of material into the syringe by the syringe plunger.

Maximizer™

The autosampler with four 4-way solenoid valves per syringe to direct fluid flow. The Maximizer provides 4 fluid lines (A, B, C, and D). Up to 3 testers, or 2 testers with media replace, can be connected to a Maximizer.

Occurrence

The dictated time at which a function is performed.

Prime

To fill sample lines with media.

Protocol

The parameters that are entered into the instrument that determine the operation and steps that are to be accomplished for a given test.

Rack

The vial/test tube holder that fits on the AutoFill.

Recurrence

The dictated time at which a function repeats.

Retrieval Reservoir

The retrieval reservoir is an optional accessory placed on the AutoFill. This accessory enables the AutoPlus to return rinse volume back to vessel(s) in multiple tester applications. This method will accommodate one or two testers with media replace or three testers without media replace.

Rinse

The clearing out of old media from tubing with the target media.

Sample Return

This configuration requires routing the lines of the home ports (1 and/or 2) back to the dissolution testers. This is done using return port fittings or sample return probes installed into the AutoMag.

Solenoid Valve

The device that controls flow direction.

SR8-Plus™

An eight-position high-performance dissolution tester; predecessor to the Vision instruments.

SuperMag™

An automated mechanism capable of accommodating 1-liter, Small Volume (SV), and Chinese Small Volume (CSV) vessels that can be installed on the Vision Elite 8 dissolution tester to automate raising and lowering of the sample probes and Digital Temperature Probes (DTPs).

Transfer

The moving of liquid from a source to a destination.

Vision® AutoFilter™

A programmable filter changing instrument which uses 25 mm in-line syringe filters.

Vision® AutoPlus™

The redesigned Teledyne Hanson Research autosampler series (either Maximizer or DissoScan) with stepper motor driven syringes.

Vision® G2

Teledyne Hanson Research Vision® "G2" dissolution instruments represent a significant upgrade from the original Vision Testers introduced in 2008. Our new G2 operating platform includes full-color touchscreens for instrument programming, extensive programming menus, up to 100 operating protocols, 21CFR11-compliant security configuration, a convenient flash drive for instrument uploads and downloads, and 32-bit digital technology.

Wash

The clearing out of old media from tubing with blank or wash media.

Features

The new Vision G2 dissolution testers take the next step in dissolution testing with a streamlined new design and increased functionality. Here are some of the new features

- Precision syringe pump autosampling system

- All-inert 5 mL syringes, valves, tubing and fluidics

- Choice of DissoScan (1 tester) or Maximizer (multiple testers)

- Choice of 6 or 8 sampling syringes (for 6 or 8 vessels)

- Volume accuracy and repeatability ± 1%

- Seamless integration with G2 Classic 6 and Elite 8

- Automatic media replace standard with Maximizer

- Convenient "Auto-Start" feature

- Sample dilutions with AutoFill collector

- In-line filter block kit (easy tubing and filter connections)

- Handles problem drugs, surfactants and buffers

- Trouble-free maintenance, no peri-pumps or check valves

- Full color touchscreen with intuitive menus and programming

- Up to 100 protocols (create, manage and save routines)

- Upload & download programs with flash drive

- Electronics and firmware include 32-bit digital technology

- Print to both serial and PostScript-capable network printers

- Alarms for sampling, maintenance and calibration

- ISO 9001 quality certified

- Supports 21 CFR Part 11 compliance

- USP / FDA / ASTM / EP / JP compliant

- Precision X-Y-Z dissolution test sample collector

- AutoFill features seamless integration with Vision AutoPlus

- Choice of easy install collection racks with rack detection

- Collect in test tubes for UV or vials for HPLC & UPLC

- New wash port with end of test wash routine

- Sample retrieval return to vessel accessory

- AutoFill is designed and manufactured with CETAC Technologies USA

- CE / CSA / RoHS compliant, includes earth-friendly packing

AutoFill & AutoPlus Identification

Fig. A-1 Identification: Vision G2 AutoFill/AutoPlus

Vision AutoFill collector

Dispense head

Interchangeable rack

Tray handle

Logo lens

Touchscreen

Vision AutoPlus Autosampler

Power switch

Autosampler handle

Syringes
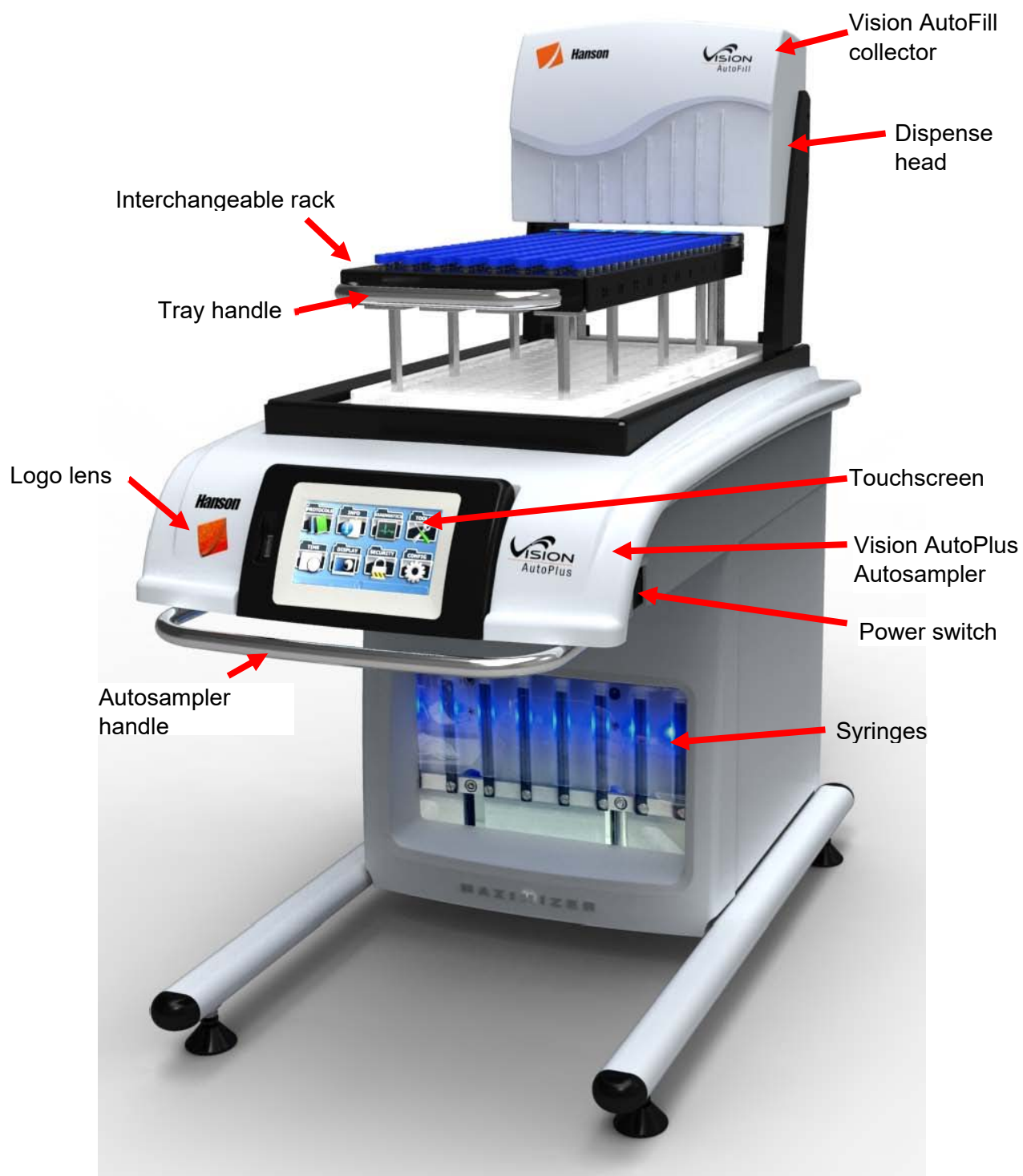
Learning the Interface

The Vision G2 AutoPlus software was designed to be intuitive and easy to use. A user is able to interact and program the unit using the touchscreen interface. The touchscreen can be used with fingers or with a stylus. The interface has the following forms of input:

Buttons: In order to use a button, touch it with your finger or a stylus. Buttons may appear as having text or as icons.

Sliders: In order to use a slider, place a finger on the slider button and slide the finger right or left to place the slider in the desired position. Sliders are found for display and audio settings on the unit.
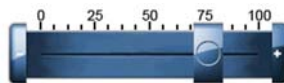
Text Keypad: Text keypads are used for text entry into the unit.

Text fields are typically restricted to 25 characters.

To enter a letter, touch the button for the letter. To delete a letter, use the del button.

To finish entering text, touch the OK button.

To cancel out of the screen, touch the ESC button.

NOTE: Touching the (X) in the input line clears in the whole line.

Numeric Keypad: The numeric keypads are used for numeric entry into the unit.
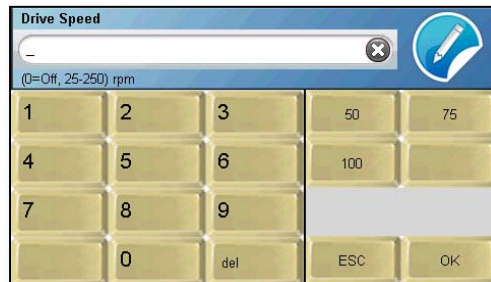
Unlike the text keypads, numeric keypads often have limits or specific formats which must be observed when entering information. These limits and formats are stated in the upper left corner of the screen below the field name. For example, the IP address of the Vision G2 AutoPlus must be entered in a numerical format as follows: xxx.xxx.xxx.xxx. If the wrong format is entered, the Vision G2 AutoPlus will produce an error sound and reset the field so the correct value can be entered.

NOTE: Some numeric keypads have preset entry buttons for commonly used values, such as the instrument's speed and temperature.

Calendar

When setting dates, a calendar screen will be displayed. Touch the arrows located at the bottom of the calendar screen to select the month. Touch the day of the date displayed to select that date.

Tabs

The tabs are located on the left side of the screen and allow access to different parts of a section of the software. For example, the Edit Alarms screen has 3 tabs that allow the editing of Sampling Alarms, User Alarms, and Calibration Alarms.

Fields

When touched, these will allow the user to edit the settings for that field. Depending on the field, the values will be toggled, or a data entry screen (text keypad, numeric keypad, calendar) will appear, allowing the user to edit the data accordingly.

Send button

The Send button allows the user to print the displayed logs to the printer or upload them to a USB flash drive. This is a common button on many of the screens of the Vision G2 AutoPlus.

Exit button

The Exit button allows the user to return to the main menu. This button is typically located in the lower right corner of the screen.

Home screen

After the initialization sequence completes, the unit remains at the home screen. The home screen displays the syringe position, elapsed test time, and a countdown until the next event. If no test is running, the times will be listed as 0:0000.

The Start button is located on the bottom right of the screen and is used for starting tests. The time and date of the system are displayed next to the start button.

The menu is accessed by touching the Menu button located in the bottom left corner of the screen. If the Vision G2 AutoPlus is pumping, the status report of the instrument will be displayed adjacent to the menu button. If the Vision G2 AutoPlus is not pumping the status report will not be displayed.

If a protocol is already loaded, the protocol name will appear in the upper left corner of the screen, and when touched it will be opened for editing. If no protocol is loaded, Select Protocol will appear in the corner; when touched, the Vision G2 AutoPlus will allow the user to select a protocol for testing.
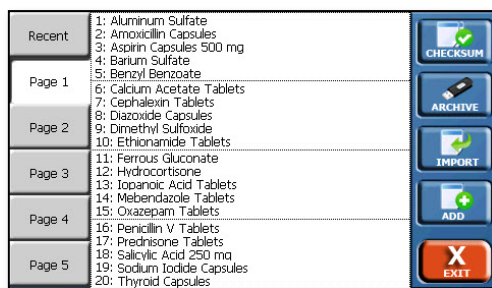
If security features are enabled, the current user is displayed in the upper right corner of the screen. If no user is logged on, and security features are enabled, Please Log In appears in the corner. If security features are not enabled, a user can log on by touching the same corner of the screen. Security Off appears in the corner of the screen and when the corner is touched, the Security Configuration screen appears.
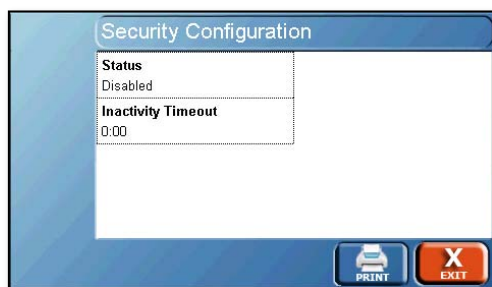
Main Menu screen

The main menu provides access to all the functions of the Vision G2 AutoPlus. To return to the home screen, touch the bar at the bottom of the menu with the house icon.

DissoScan and Maximizer

The Vision G2 AutoPlus DissoScan has 2 liquid lines: A and D. The DissoScan is best suited for single bath configurations where the sample rinse volumes can be returned to the tester or to waste.

The Vision G2 AutoPlus Maximizer has 4 liquid lines: A, B, C, and D. The Maximizer is best suited to applications needing multiple dissolution testers, or media replace.

	DissoScan	Maximizer
Sources	A	A, B, C
Testers supported	1	Up to 3
Media replace supported	Yes (Home port 2)	Yes
Dilution supported	No	Yes with 2 testers
Wash sources	Home port 2	Home port 2, B or C

Fig. A-2 DissoScan versus Maximizer

Regulatory and Safety

General Safety Considerations

The installation category (overvoltage category) for this instrument is Level II. The Level II category pertains to equipment that receives its electrical power from a local level, such as an electrical wall outlet.

This instrument must be connected to a grounded electrical outlet. If condensation forms on or inside the AutoFill collector, allow it to dry thoroughly before connecting to a power source.

Warning: Never work on the electrical components in the system while there is power to the unit. DISCONNECT POWER BEFORE SERVICING THE INSTRUMENT.

Review all safety and environmental precautions pertaining to any chemicals that are to be used in conjunction with this equipment.

CSA Safety Considerations

For indoor use only

Maximum altitude up to 2,000 meters

Environmental operating temperature 5 °C to 40 °C

Operating relative humidity 80% for temperatures up to 31 °C, decreasing linearly to 50% relative humidity at 40 °C

Mains supply ratings 100 - 240 V~, 50 - 60 Hz, 1.5 A

Mains supply voltage fluctuations not to exceed ±10% of the nominal voltage

Installation Category II (overvoltage categories)

Pollution Degree 2

See "Moving and Storage" in the maintenance section before moving the equipment

Please note potential pinch hazards per the diagram below.

Additional hazards may exist if the equipment is not used correctly per the user guide.

Between cap and vials/tubes

Under removable drip tray

Base of moving dispense head

Fig. B-1 Pinch Hazards

Regulatory and Safety

Canadian Emissions Notice

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set forth in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans les réglements sur le brouillage radioélectrique édictés par le Ministère des Communications du Canada.

The following safety symbols are used throughout this manual.

Symbol	Definition
	General warning of potential damage or danger from a variety of sources.
	Electrical grounding connection.
	Pinch hazard; keep hands and fingers clear.

Installation

Location

This section provides information on determining if a location is suited to a Vision G2 AutoPlus and AutoFill.

Environmental Requirements

The Vision G2 AutoPlus should be placed to the left of the first dissolution tester and between the first and second dissolution tester. The Teledyne Hanson Research AutoFill should be placed on top of the Vision G2 AutoPlus.

The location should be clean and free of any issues which may influence dissolution testing. Issues that may affect dissolution results include vibration, significant heat, or significant cold.

Space Requirements

The bench should be at least 60 cm (24 in.) deep and clearance above the unit of at least 82cm (32 in.).

The bench should be level and flat.

The bench should be capable of supporting weight given in specifications section.

For additional pieces of equipment (e.g., dissolution testers, UV/Vis spectrophotometers, etc.), see the user guides for the respective pieces of equipment.

Electrical Requirements

The Vision G2 AutoPlus requires a single grounded outlet within 1 meter (3 ft.) of the location of the system.

The AutoFill requires a single grounded outlet within 1 meter (3 ft.) of the location of the system.

The Vision G2 AutoPlus and AutoFill are available in one configuration, 100 V through 240 V. The voltage is automatically set when the voltage is supplied to the external power supply.

Unpacking and Inspection

This section provides instructions on unpacking and setting up the Vision G2 AutoPlus and AutoFill.

1. Unpack the Vision G2 AutoPlus from the shipping container.

    a. Note any damage to the shipping container. If container is damaged, contact Teledyne Hanson Research immediately.

    b. Place shipping container near installation location.

    c. Remove straps from the container.

    d. Open container and remove any accessory boxes.

    e. Carefully remove the Vision G2 AutoPlus and AutoFill from the shipping container

2. Place the Vision G2 AutoPlus on the bench.

    a. The Vision G2 AutoPlus should be placed in a manner to allow access to the back of the Vision G2 AutoPlus until the installation is completed. Once the installation is complete, the Vision G2 AutoPlus can be placed in its final position.

    b. If applicable, place the AutoFill on top of the Vision G2 AutoPlus with the tray for the rack toward the front of the unit.

    c. Place a collection rack on the tray of the AutoFill. The rack should sit flat on the bottom of the tray.

Electrical Connections

NOTE: The Vision G2 AutoPlus and AutoFill have ports located on the underside of the silkscreen panel, which illustrates port placement; see photos in Figures C-1 and C-2.
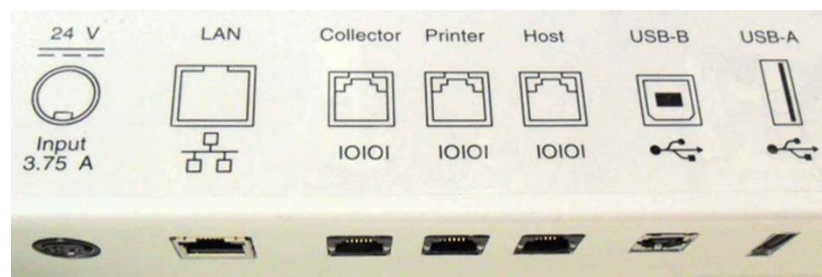
Fig. C-1 Photo of Vision G2 AutoPlus Back Panel and Ports

Fig. C-2 Photo of Vision AutoFill Back Panel and Ports

This section provides instructions on making the power connections to the Vision G2 AutoPlus and AutoFill.

1. Ensure the power switch located on the right side of the Vision G2 AutoPlus is in the off (O) position.

2. Connect the power supply to the port labeled 24 V Input 3.75 A on the lower left corner of the back panel of the Vision G2 AutoPlus, flat side facing the unit (the connector is keyed so it will only fit one way). Then connect the power supply to the wall outlet.

3. Ensure the power switch located on the back of the AutoFill is in the off (O) position.

4. Connect the power supply to the port labeled 24 V Input 3.75 A on the back of the AutoFill, flat side facing the user (the connector is keyed so it will only fit one way). Then connect the power supply to the wall outlet.

5. Do not turn on the Vision G2 AutoPlus or AutoFill at this time.

Vision G2 AutoPlus to AutoFill Communication Connections

This section provides instructions on how to make the communication connections between the Vision G2 AutoPlus and AutoFill so that the Vision G2 AutoPlus is able to control the AutoFill.
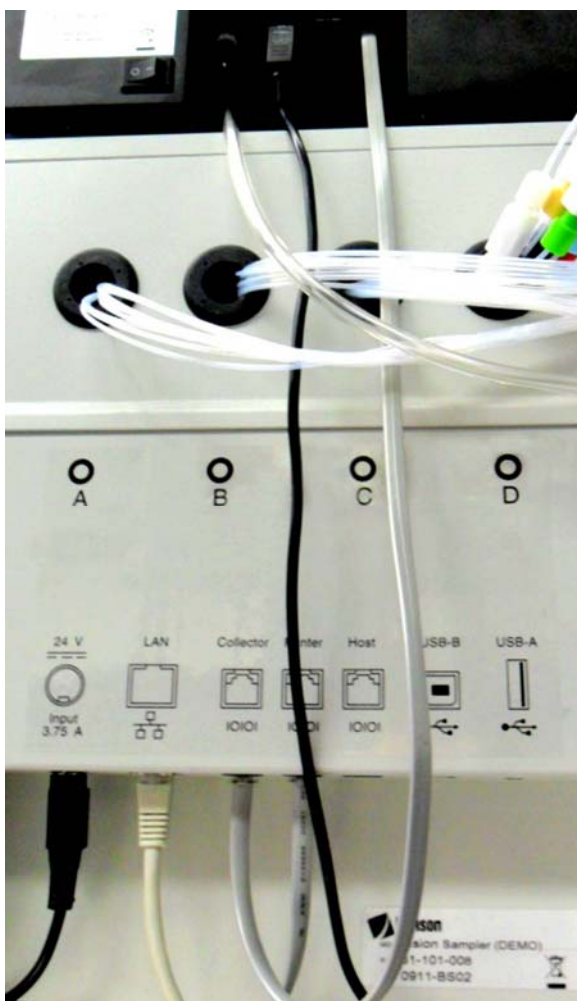
Fig. C-3 Vision G2 AutoPlus-AutoFill Connections

1. Connect one end of the RS-232 cable to the port labeled Collector on the back of the Vision G2 AutoPlus.

2. Connect the other end of the RS-232 cable to the RS-232 port labeled Sampler on the back of the AutoFill.

3. Turn on (I) the AutoFill. The dispense head should move to the home position and blue lights will illuminate under the dispense head. If the AutoFill does not power on consult the troubleshooting appendix of this user guide.

4. Turn on (I) the Vision G2 AutoPlus. The syringes should move to the home position and the display will be illuminated. The unit may take as long as 30 seconds to reach the home screen. If the Vision G2 AutoPlus does not power on, consult the Troubleshooting appendix of this user guide.

   NOTE: If the AutoPlus is turned on before the AutoFill, an error will be generated, and the user will be forced to power up the instruments in the correct order before any syringe or collector operations will work.

5. With the Vision G2 AutoPlus powered on, the home screen will appear. Touch the Menu button located in the bottom left of the screen.
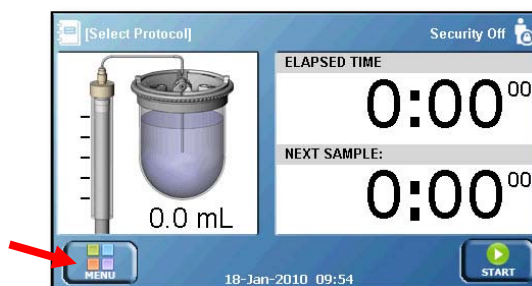
6. The menu will appear. Touch the Time button located to the lower left.

7. The Edit Alarms screen will appear. Touch the Time/Date button at the bottom of the screen.

8. The Edit Time/Date screen will appear. Touch the System Date field to set the current date. Enter the date in the DD-MM-YYYY format, and touch OK when done.
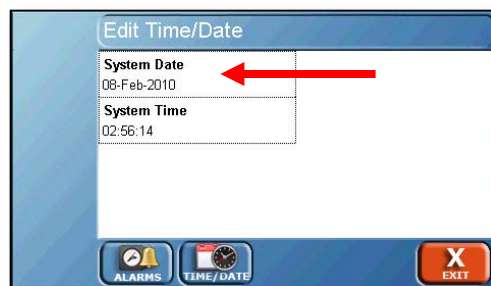
9. The Edit Time/Date screen will reappear. Touch the System Time field to enter the current time. Enter the time in 24-hour format. For example, if it is 2:30 pm, enter 14:30. Touch OK to return to the Edit Time/Date screen.
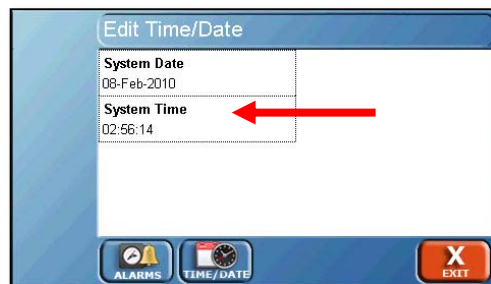
10. Touch the Exit button at the bottom right corner of the screen to return to the main menu.

11. The menu will appear. Touch the Config button located to the lower right.

12. The Device Setup screen will appear. Touch the Ports tab on the left side.

13. Touch the Collector (D) field until AutoFill appears.

Installation

14. Select the appropriate setting for Home Port 2.
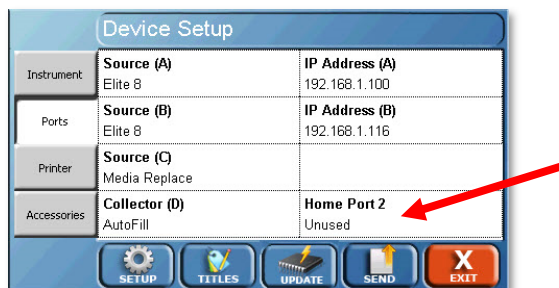
15. Touch the Exit button located in the lower right of the screen to return to the menu.

Verifying Syringe Functions

This section provides instructions on how to verify that the syringe drive is functioning properly.

1. Touch the Tools button located on the upper right of the menu. The Automatic Syringe Control screen will appear.

2. Touch the Manual (syringe) button located at the bottom of the screen. The Manual Syringe Control screen will appear.

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3. Touch the Volume field to bring up the numeric keypad.

4. On the numeric keypad, touch 5 and then OK to enter a volume of 5.0.

    The Manual Syringe Control screen will reappear.

5. Touch the green arrow button ( ) located in the center of the display to perform a transfer. Ensure that the syringes go down and then return to the home position.

Verifying Collector Functions

This section provides instructions on how to verify that the collector is working properly.

1. Starting from the screen in the previous step 3 of "Verifying Syringe Functions", touch the Collector button located at the bottom of the screen. The Collector Controller Menu will appear.

Note the type of rack installed, which appears next to the word Rack: on the screen. Touch the Go to Row button.
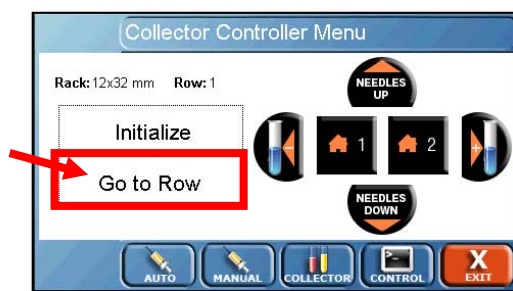
2. If a 12 x 32 rack is installed, enter "21" and touch the OK button. If a 13 x 100 or 16 x 100 rack is installed, enter "18" and touch the OK button. The dispense head should move to the last row of the installed rack.

3. Touch the Needles Down button. Ensure that the needles lower properly and align with the rack.

4. Touch the Initialize button to return the dispense head to the home position.

5. Touch the Exit button to return to the menu.
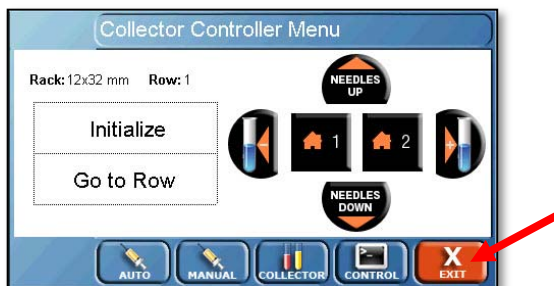
Vision (G2) Dissolution Testers

This section provides instructions on how to make the communication connections between the Vision G2 AutoPlus and Vision G2 dissolution testers.

NOTE: For more information on TCP/IP communications, refer to appendix B. For connecting to an SR8-Plus dissolution tester, refer to appendix C.

Fig. C-4 Vision G2 Dissolution Testers

1. Obtain the IP addresses of the Vision dissolution testers the Vision G2 AutoPlus will be connected to.

2. Obtain an appropriate IP address, gateway, and subnet mask for the Vision G2 AutoPlus.

3. Connect the Vision G2 AutoPlus to the network switch or directly to the network as appropriate using a network patch cable. The network patch cable must be plugged into the port labeled LAN on the back of the Vision G2 AutoPlus.

4. Touch the Config button on the menu of the Vision G2 AutoPlus screen.

5. The Device Setup screen will appear. Touch the Instrument button on the left.

6. Touch the Instrument ID field to enter ID for the instrument. This ID will appear on printouts.

7.   Touch the IP Address field to enter the IP address assigned to the Vision G2 AutoPlus.
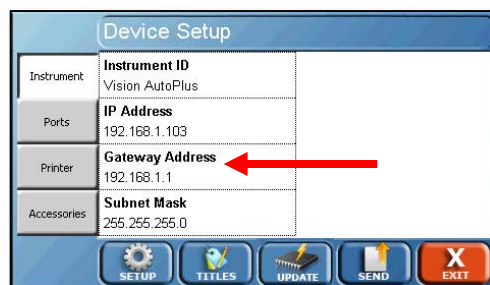
A numeric keypad window will appear. Use it to type in the IP address. Touch OK to return to the Device Setup menu.

8.   Touch the Gateway Address field to enter the gateway address assigned to the Vision G2 AutoPlus. A numeric keypad screen will again appear; use it to enter the gateway address. Touch OK to return to the Device Setup menu.

9.   Touch the Subnet Mask field to enter the subnet mask assigned to the Vision G2 AutoPlus. A numeric keypad screen will again appear; use it to enter the subnet mask.

10. Touch the Ports tab to load the ports menu.

11. Touch the Source (A) field until the appropriate Vision tester appears (Classic 6, Elite 8). Touching the field repeatedly will cycle through all the available options.

12. Touch the IP Address (A) button to enter the IP address of the Vision tester.

13. Repeat steps 11 and 12 for Source B and Source C, if applicable. To return to the menu, touch Exit.

    NOTE: If media replace is desired, set Source B or Home Port 2 to Media Replace. An IP address is not required for media replace.

14. Proceed to liquid connections section for liquid connections.

Other Dissolution Testers (or Original Vision Testers)

1. Touch the Config button on the menu of the Vision G2 AutoPlus screen. The Device Setup screen will appear.

2. Touch the Instrument tab on the left.

3. Touch the Instrument ID field to enter ID for the instrument (Vision G2 AutoPlus). This ID will appear on printouts.

4. Touch the Ports tab to load the ports menu. The Ports menu will appear.

5. If connecting an SR8-Plus tester to the Vision G2 AutoPlus, touch the Source (A) field until "SR8-Plus" appears. Otherwise, select "Generic" for any other tester (including an original Vision [G1] unit). Touching the field repeatedly will cycle through all the available options.

6. For instructions on installing an interfacing with a Teledyne Hanson SR8-Plus tester, please refer to appendix C at the end of this manual. For any other tester, consult the tester's user guide for installation and operation instructions.

7. Repeat step 5 for Source B and Source C if applicable. To return to the menu, touch Exit.

   NOTE: If media replace is desired, set Source C to Media Replace. An IP address is not required for media replace.

Liquid Connections

Except for the drain hose, liquid line connections are done by connecting the six or eight liquid tubes from the Vision G2 AutoPlus, AutoFill, spectrophotometer, and sample probe harness from the dissolution tester. These are numbered and color-coded for easy identification, and they can be connected with nuts, unions, and ferrules. See Figure C-5 below:
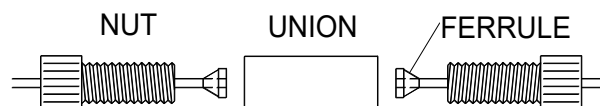
Position	Fitting Color
1	Black
2	Red
3	White
4	Yellow
5	Green
6	Blue
7	Clear
8	Purple

Fig. C-5 Liquid Line Connections

Use the illustrations below for reference when following the liquid line installation steps.

NOTE: Refer to the Vision AutoFilter User Guide when setting up systems that include a Vision AutoFilter.
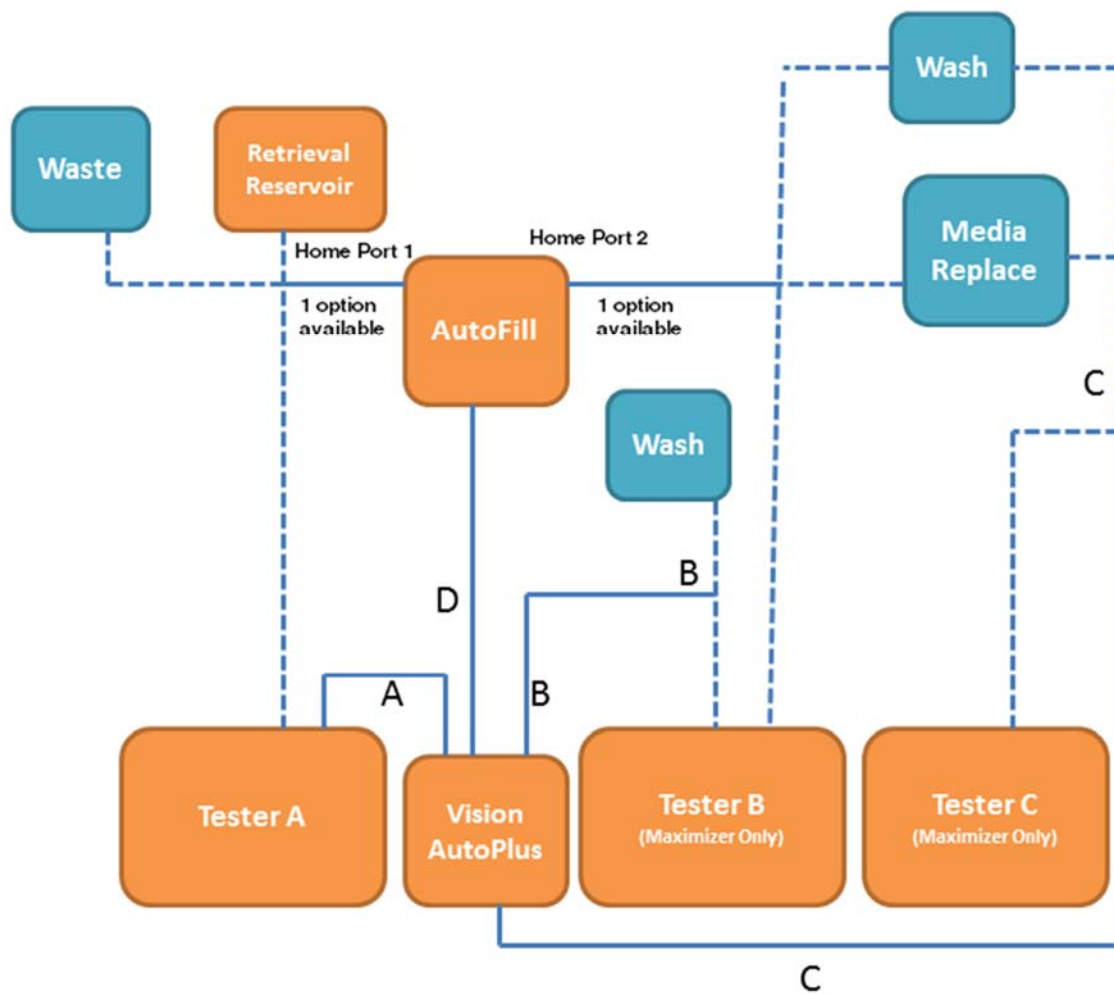
Fig. C-6 Recommended Liquid Connection Diagram

1. AutoFill Overflow Tube: Insert the overflow tube into a waste container.

2. Retrieval Reservoir Installation:

    a. Using Vision G2 AutoPlus controls, move the dispense head of the AutoFill forward to the last row (closest to the operator):

        i. From main menu, select Tools.

        ii. Select Collector.

        iii. Touch Goto Row, then enter the last row (18).

b. Use a 9/64 in. Allen key to remove the two screws holding the home port in place.

Fig. C-7 Home Port Screw Removal

c. Remove the waste lines from Home Port 1.

NOTE: The waste lines are the lines closest to the back of the AutoFill.

Fig. C-8 Removal of Waste Lines

d. Install the short tubing (6 in.) into the bottom of the retrieval reservoir assembly. Connect to the home port in the same positions the waste lines were removed from.

NOTE: To ensure proper alignment, make sure the colored fittings are matched up.

Fig. C-9 Connect Retrieval Reservoir Lines to the Home Port

NOTE: Retrieval reservoir is upside-down in this photo.

e. Slide the retrieval reservoir assembly onto the posts at the back of the AutoFill and replace the home port on the posts. When the retrieval reservoir is properly installed, the rinse media will fill it from the bottom.
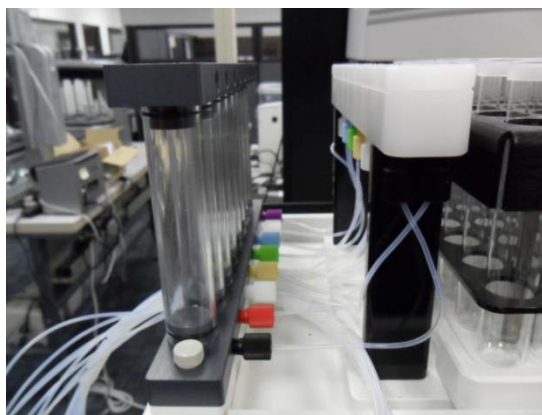
Fig. C-10 Retrieval Reservoir and Home Port Installed

f. Connect the waste lines to the top of the retrieval reservoir assembly.

Fig. C-11 Waste Lines Attached to Retrieval Reservoir

g. Return the dispense head to the home position.

3. Waste Lines:

a. Connect the waste probes to the waste line of the AutoFill or retrieval reservoir as appropriate.

b. Install the waste probes on the waste container.

4. Dissolution Testers

Connect each of the lines for the appropriate source (A, B, C) to the appropriate tester.

5. Media Replace (if applicable):

    a. Connect a 3 ft. tubing harness to the liquid lines for source C.

    b. Connect the source probes to the other end of the tubing harness.

    c. Wash (if applicable).

        i. Connect a 3 ft. tubing harness to the Home Port 2 on the AutoFill.

        ii. Connect the other end of the 3 ft. tubing harness to source probes.

        iii. Install the source probes in the wash bottle.

Security

The Vision G2 AutoPlus can be configured to require users to log in and allows for tracking of any changes made to the protocol. The security system allows for 25 users when using firmware versions below 2.50 and 50 users for versions 2.50 and above.

Firmware versions below 2.70 offer two levels of users (managers and operators) with *fixed* permissions:

- Managers are given full access to the unit and allowed to make any changes to the system as required, with all these changes being tracked by the software. All users can be configured as managers for full control of the Vision G2 AutoPlus. The default password for the Hanson manager is 0000.

- Operators are permitted to run tests but are not allowed to make changes to protocols or other system settings. Not all users can be configured as operators; the software requires at least one user be configured as a manager.

Firmware versions 2.70 and above offer Enhanced Security with three levels of users (administrators, managers and operators) with *configurable* permissions.

To configure security settings, begin by selecting the Security button from the main menu and the Security Configuration screen will appear. Enhanced Security screens are shown.
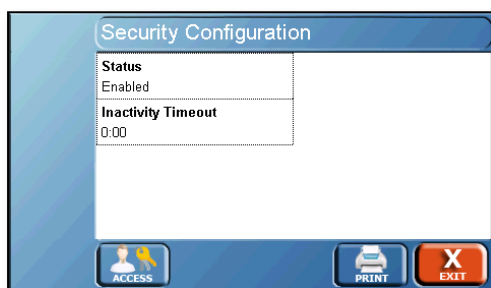
Status: Enables or disables the security feature.

Inactivity Timeout: The amount of time without user input before the system requires a user to log in. The range is 0 to 1:00 (hh:mm). Entering 0:00 disables the timeout function.

Enhanced security adds an "Access" button which allows the configuration of user permissions.

Access: Allows the configuration of the different user levels (administrators, managers and operators) as dictated by the lab requirements. By default only manager and operator are enabled. The following settings are recommended for an operator:
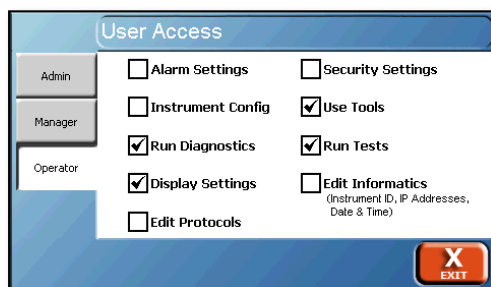
The following settings are recommended for a manager.
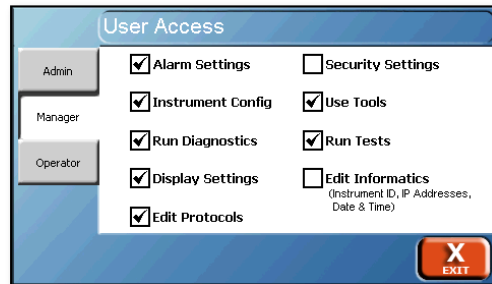
The following settings are recommended for an administrator.
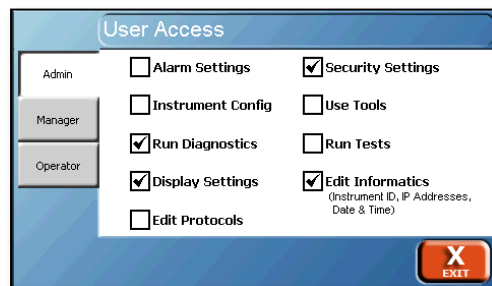
- Alarm Settings: Allows the configuration and resetting of the alarms for the instrument.

- Instrument Config: Allows adjusting the instrument configuration settings such as whether a printer is connected to the instrument.

- Run Diagnostics: Allows users in that level to run the diagnostics routine on the instrument.

- Display Settings: Allows the ability to adjust the display brightness, volume, and recalibrate the screen.

- Edit Protocols: Allows the ability to edit and create protocols. Protocols can still be run depending on the permissions provided.

- Security Settings: Allows the configuration of security settings, adding/removing users, and adjusting access levels. At least one group must have this permission.

NOTE: A user is not able to toggle the security settings of a group they belong to. For example, a manager is not able to toggle the security settings on and off for managers.

- Use Tools: Allows access to the tools menu of the instrument.

- Run Tests: Allows the ability to run a protocol. Protocols can still be viewed or edited depending on the permissions provided.

- Edit Informatics: Allows the editing of the system time, date, Instrument ID, and network configuration settings.

Only users with permission to edit security settings can display the User List. The users are listed alphabetically and displayed in groups of 5 per page (4 groups of 5) over 2 pages within the interface. Maximum 50 users.

To select a user, first select the group the user is in.
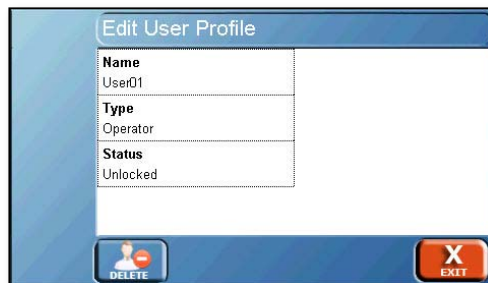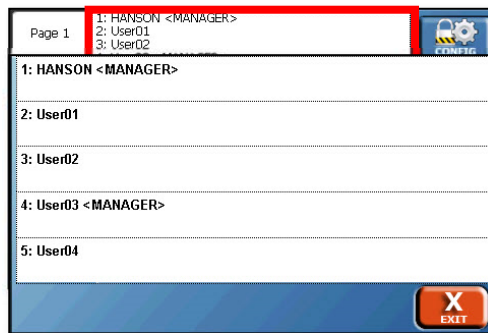
Select the user from the list that appears.

When the user is selected, the following can be changed:

- Name: The name of the user.

- Type: Toggles the type of user. The options are operator, manager and administrator (enhanced security); the default is operator.

- Status: The user's status. The options are locked or unlocked. An unlocked user has access to the system, a locked user does not and must be unlocked by a manager.

On the Security screen the following options are available:
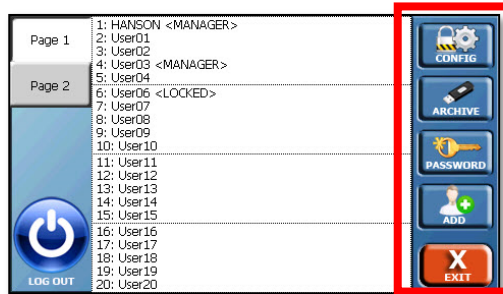
- Config: Allows access to the Security Configuration screen

- Archive: Allows the manager to use backup or restore functions as follows:

  o Backup: Allows a manager to create and send a backup of the instrument's security configuration (including the users and corresponding profiles) to a flash drive in the USB port. The security configuration is in a single file under the filename security.bak.

  NOTE: The backup function will overwrite all users previously saved on the flash drive.

  o Restore: Allows a manager to restore the instrument's security configuration (including users and corresponding profiles) from a flash drive in the USB port from the security.bak file.

  NOTE: The Restore function restores only user profiles from the backup file but clears all users' passwords. All other users (not in the backup file) will be erased.

- Password: Allows the user who is currently logged in to change their password.

- Add: Allows a manager to create a new user. The screen that appears is identical to the Edit User Profile screen.

- Log Out: Logs out the current user

With security enabled, a user can log on either by touching the upper right of the home screen where Please Log In or the name of the user who is logged in is displayed. Additionally, if any other input is attempted, the Vision G2 AutoPlus will prompt the user to log in.

Installation complete

Operation

How the Vision AutoPlus Works

Before beginning operation of the Vision AutoPlus, the operator should have a thorough understanding of how sampling is performed and how this may affect method development. Sampling is not an instantaneous process, and it is important to balance the amount of pumping required against the desired sample times within a protocol.

1. The AutoMag lowers on the dissolution tester to prepare for sample collection 15 to 30 seconds prior to the sample point, depending on the system configuration.

2. The sample rinse is performed. Depending on the configuration, the sample rinse is pumped to waste, returned to vessel, or stored in the retrieval reservoir. The sample rinse is split evenly into at least 2 strokes. If the rinse volume requires more than 2 strokes of the syringe, it is split into the smallest number of strokes. For example:

Programmed Sample Rinse	AutoPlus Actions
5.0 mL	2 strokes of 2.5 mL
9.0 mL	2 strokes of 4.5 mL
12.0 mL	3 strokes of 4.0 mL

Fig. D-1 Sample Rinse Volume Strokes

3. The dispense head of the AutoFill moves and the sample is collected into a test tube or vial. If the sample volume is less than 5 mL, the sampling will be performed in a single syringe stroke. If it is greater than 5 mL, it will be split evenly into the fewest number of strokes.

   If a detect volume is specified, the collect volume less the detect volume will be pumped first (collect volume minus detect volume), then the detect volume will be pumped into the vial after the read delay, completing the total collect volume.

   For example, if a user specified a collect volume of 6 mL, and a detect volume of 2 mL, 4 mL will be pumped into the test tube, then the system will wait for the read delay. After the read delay, the AutoPlus will pump the remaining 2 mL.

4. The AutoMag rises on the dissolution tester.

5. Replacement media is pumped in from the port configured for media replace back through the sample probes of the dissolution tester.

6. If a retrieval reservoir is used, the AutoPlus will empty it back to the dissolution tester through the sample probes.

   NOTE: It may take 1.5 to 2.0 times the amount of sample rinse to empty the retrieval reservoir. The final stroke on retrieval return should be air.

Diagnostics

The Diagnostics button on the home screen launches the Vision G2 AutoPlus diagnostic procedure. This procedure performs a self-test to check functionality and test the connections of the configured equipment. Failures are shown in red text on the screen.

This procedure performs a self-test to check functionality and test the connections of the configured equipment. Failures are shown in red text on the screen. The failures of the diagnostics tests are also stored in the error log located in the Info screen (from main menu).
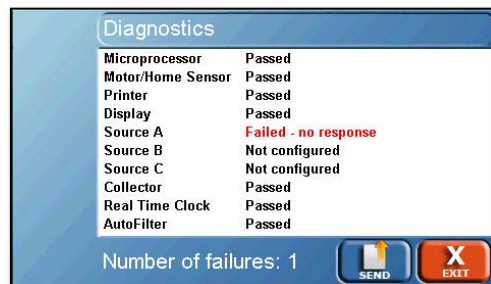
NOTE: For a list of errors, refer to appendix A of this user guide.

Information

Information menu

The Information menu allows access to various system logs and other basic information about the Vision G2 AutoPlus. To access it, touch the Info button from the menu screen. By default, the Versions screen is shown.

Versions screen

The Versions screen (also accessed by touching the About button at the bottom of the screen) provides information on the software installed on the Vision G2 AutoPlus.

Sampler Firmware: Version number of the sampler firmware.

Bootloader Firmware: Version number of the bootloader firmware used to upgrade the sampler firmware.

Collector Firmware: Version number of the AutoFill firmware.

Touchscreen Firmware: Indicates the firmware revision of the touchscreen.

PCB Revision: Indicates the revision of the PCB main board hardware.

PCB Identifier: Unique PCB identifier.

Instrument Logs screen
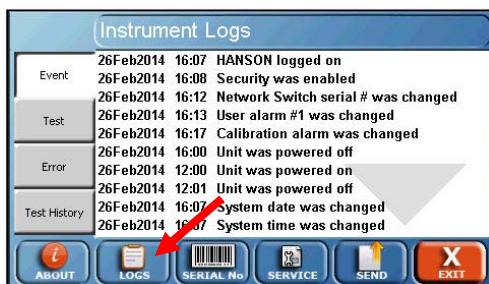
The Instrument Logs screen can be accessed by touching the Logs button at the bottom of the Info screen, and provides access to the Event, Test, and Error logs by touching the respective tabs at the left side of the screen. All log screens have large up and down arrows which allow the user to scroll up and down.

Event Log: This log provides information on what was done on the unit. This includes but is not limited to, powering on, powering off, running diagnostics, changing settings, or editing protocols. The log will store the last 543 events.

Test Log: This log lists all the actions that occurred during the last test. It is overwritten when a new test is started.

NOTE: This function is equivalent to "Print Last Test" on legacy testers.

NOTE: Any exported log will overwrite an existing log on the USB drive.

Error Log: This log lists system errors that occur on the unit. This can include communication issues, diagnostic failures, or other errors. The log will store the last 331 errors. Tolerance errors and other test specific errors are located in the test log.

Test History Log: This tab provides access to the last 8 tests run on the AutoPlus. It allows the user to select the test based on protocol name, time, and date, and to reprint the test.

Serial Numbers screen
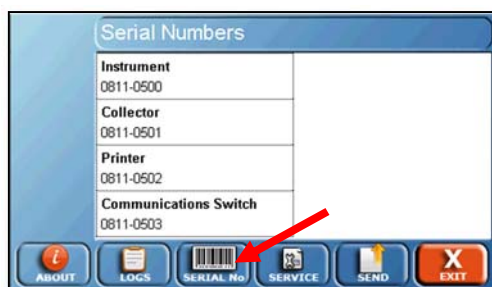
The Serial Numbers screen allows the user to enter the serial numbers of the components connected to the Vision G2 AutoPlus. To change the serial number, touch the appropriate field and enter the serial number. All serial numbers are limited to 9 characters. If security features are enabled these items may only be edited by a manager.

Instrument: This is the serial number of the Vision G2 AutoPlus itself.

Collector: This is the serial number of the AutoFill collector installed on the Vision G2 AutoPlus.

Printer: This is the serial number of the printer connected to the Vision G2 AutoPlus. This is generally reserved for RS-232 printers that are directly connected to the Vision G2 AutoPlus.

Network Switch: This is the serial number of the communication switch used for future expansion.

Service Log screen

The Service Log screen is accessed by the Service button at the bottom of the screen. It provides access to the instrument service log (Instrument tab) and syringe service log (Syringes tab), which are accessed by touching their respective tabs on the left side of the updated and the current date will be entered and the cycles reset to 0. When resetting any of the counters, a confirmation will be requested.

NOTE: Service logs can be updated only by a manager if security is enabled.

The date refers to the date the action last occurred. The cycles refer to the number of individual cycles the syringes and/or drive have made since the action last occurred.

Instrument menu

Instrument menu: This provides a log for the Vision G2 AutoPlus. The following items are listed:

- Last Calibrated: The date of, and cycles since the last calibration of the unit.

- Last Lubrication: The date of, and cycles since the last lubrication of the drive screw within the unit.

- Tests Completed: The number of tests completed since the counter was last reset.

- Drive Train: The number of cycles completed on the drive train. This should only be reset if the drive train is reassembled or replaced.

Syringes menu

Syringes menu: Each of the syringes is listed. If a syringe is replaced touch on the appropriate field to reset the cycles and date. Syringes should be replaced every 100,000 cycles.

Display

The Display button allows the user to access the Touchscreen Settings screen.
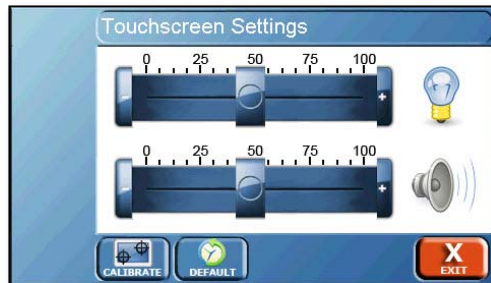
Brightness : This item allows the user to adjust the brightness of the screen by using the slider located to the left of the brightness symbol.

Volume : The volume slider located to the left of the speaker symbol allows the user to increase or decrease the volume of the feedback sounds.

Calibrate button : Touching this button begins the screen calibration procedure. It is recommended that a stylus be used for this to ensure the proper precision.
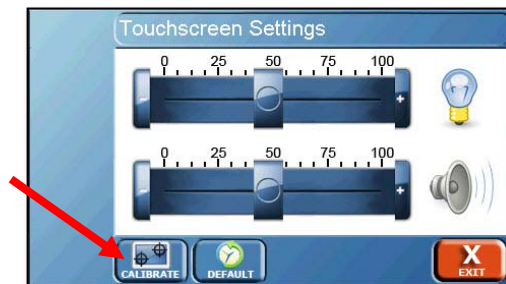
NOTE: Do not use sharp objects for the calibration procedure as the screen can be seriously damaged.
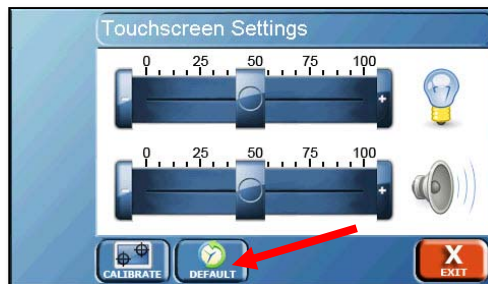
Default : Touching this button returns the touchscreen back to the factory default settings.

Configuration

Touch the Config button on the menu to bring up the Device Setup menu.

The Device Setup menu allows the user to configure the Vision G2 AutoPlus for communication and use with accessories. This menu can also be accessed by touching the Setup button at the bottom of the screen.

Instrument tab

The Instrument tab allows options for the configuration of the instrument ID and network communication settings.

Instrument ID: The ID of the instrument which will be displayed on printouts and applicable software packages. The system ID is limited to 25 characters.

IP Address: The internet protocol address is a numerical label assigned to each instrument (sampler, tester, PostScript-capable network printer) participating in a computer network that uses the Internet Protocol for communication.

NOTE: For more information on configuring networks, refer to appendix B.

Gateway Address: The gateway address of the unit when connecting to a network.

Subnet Mask: The subnet mask of the unit when connecting to a network.

Ports tab

The Ports tab allows the user to configure the Vision G2 AutoPlus to communicate with other instruments.

Source (A, B, or C): Allows the user to set the type of instrument attached to the respective port. The options are:

- None – When no dissolution tester is connected.

- Classic 6 – When a Teledyne Hanson Vision G2 Classic 6 tester is connected.

- Elite 8 – When a Teledyne Hanson Vision G2 Elite 8 tester is connected.

- SR8-Plus – When a Teledyne Hanson SR8-Plus tester is connected. See appendix C for more information.

- Generic – When a tester is to be sampled from, but it is not directly supported.

    NOTE: When testing, the user will need to start the test on both the Vision G2 AutoPlus and the tester at the same time to ensure proper sampling.

    NOTE: Use Generic for non-Hanson testers or original Vision (G1) testers.

- Media Replace – This option is available for source C only. It configures the Vision G2 AutoPlus to treat source C as a source of clean media for media replace.

- Wash – This option is available for source B and C only. It configures the Vision G2 AutoPlus to treat source B or C as a source for the wash routine.

- Wash & Media Replace – This option is available for source C only. It configures the Vision G2 AutoPlus to

treat source C as a source of clean media for media replace and use the same media for washing the system.

Port	Tester	AutoFill	Media replace	Wash	Return to tester	Retrieval reservoir	Plug for AutoFilter
A	X						
B	X			X			
C	X		X	X			
D		X					
AutoFill home port 1					Tester A	X	
AutoFill home port 2			X	X	Tester B		X

Fig. D-2 Port Option Table for Vision AutoPlus

NOTE: It is not recommended to use a buffer solution as a wash solution. If the buffer is allowed to dry in the lines, it will form a salt, which can clog the lines and prevent proper operation of the Vision AutoPlus.

IP Address (A, B, or C): This option only applies to Vision dissolution testers. This allows the user to set the IP Address of the tester installed on that particular source. For example, if a Vision Elite 8 tester was installed on port A and had the IP address 192.168.10.5 then for IP Address A, the user would enter 192.168.10.5 so that the Vision G2 AutoPlus can communicate with the tester.

Collector (D): Collector type connected to the Vision G2 AutoPlus. If no collector is installed set this to None. If an AutoFill is installed, it should be set to AutoFill.

Home Port 2: Configures the AutoPlus to use Home Port 2 of the AutoFill. The options are:

- Unused - Home Port 2 is not used for anything.
- Wash - Home Port 2 is used for the wash media.
- Media Replace - Home Port 2 is used as a media replace source.

NOTE: To ensure accurate volumes, the syringe will prime the tubing by performing a transfer from Home Port 2, then back to Home Port 2 to expel any air from the lines. This may require additional time between sample points to avoid late or missed samples.

- Plug for AutoFilter - Used when the system is set up with a Vision AutoFilter in the push-through configuration.

- Return to Tester B - Will return the rinse media to tester B.

WARNING: If a transfer event from D to X (current tester) is not used between sample points when returning to two different testers, cross contamination will occur.

Printer tab

The Printer tab allows the user to configure the printer the Vision G2 AutoPlus will use.

Printer Type: When touched, toggles the type of printer connected to the instrument.

- Network: Used when the printer is connected via a TCP/IP network and supports PostScript.

NOTE: Network printers must support PostScript in their firmware. Printers that support PostScript through software drivers or do not support PostScript will not work.

- RS-232: Used when an RS-232 printer is connected.

- None: Used when no printer is installed.

Page Format: Toggles the paper size between Letter and A4 when using a PostScript-capable network printer.

NOTE: Selecting the wrong size may omit lines from printout.

IP Address: For use when printing to PostScript-capable network printers. Allows the user to enter the IP address of the target printer.

Printer Port: For use when printing to PostScript-capable network printers. Allows the user to enter the appropriate port of the target printer (0-65535).

Add Signature Line to Footer: This adds a line for a signature and date to the bottom of printed reports (Yes or No).

Use Duplex (if available): This allows for printing on both sides of a page if a network printer supports this option. Network printers which do not support duplex printing will print normally even if this is set to Yes (Yes or No).

Use Color (if available): This allows for color printing if a network printer supports this option. Network printers which do not support color printing will print normally in black and white even if this is set to Yes (Yes or No).

Accessories tab

The Accessories tab allows the user to define the accessories installed on the Vision G2 AutoPlus and on dissolution testers connected to the system.

Sampling Probe: Toggles which type of sampling probe is connected to a system when touched. Options are Magazine (for use with the Vision Elite 8 AutoMag or SuperMag, or with an SR8-Plus equipped with E-Probes), or Fixed (when no magazine is installed).

AutoFilter: This setting allows for the configuration of a Vision AutoFilter changer.

- No: A Vision AutoFilter is not installed.

- Push-Through: An AutoFilter is installed and connected between the D port of the AutoPlus and the input connection to the AutoFill.

- Pull-Through: An AutoFilter is installed and connected between the tester sampling lines and port A of the AutoPlus.

  NOTE: Pull-Through will not appear if more than 1 tester is configured.

Retrieval: Indicates whether or not a retrieval reservoir is installed on the AutoFill.

Lighting: Toggles the decorative LEDs on the Vision G2 AutoPlus on or off below the display and behind the syringes. Also toggles the decorative LEDs on the dispense head of the AutoFill if installed.

Automatic Dosage Delivery: Toggles whether or not the system makes use of Automatic Dosage Delivery (ADD) vessel covers. If so, the Vision G2 AutoPlus will instruct the tester to lower the AutoMag and trigger the ADD covers to drop the dosage at the start of the test. This option is only available if the AutoMag is selected as the sampling probe.

AutoFilter IP Address: This allows the user to set the IP address of the AutoFilter. This only appears when the AutoFilter option is set to Push-Through or Pull-Through.

Collection Rack Zoning: This allows the user to enable zones within the collection rack for individual testers. When set to Disabled, the AutoPlus will fill the rack sequentially (row 1 is tester A sample 1, row 2 is tester B sample 1). When set to Enabled, the AutoPlus will fill tester A samples in one zone, and tester B samples in a separate zone.

2-Tester Configuration

	Starting Row	
Rack type	Bath A	Bath B
16 x 100 test tube	1	10
13 x 100 test tube	1	10
12 x 32 HPLC	1	12
12 x 32 UPLC	Tray 1, row 1	Tray 2, row 1

NOTE: The 3rd tray in the 12 x 32 UPLC rack is not used when using only 2 testers with Collection Rack Zoning enabled.

3-Tester Configuration

	Starting Row		
Rack type	Bath A	Bath B	Bath C
16 x 100 test tube	1	7	13
13 x 100 test tube	1	7	13
12 x 32 HPLC	1	8	15
12 x 32 UPLC	Tray 1, row 1	Tray 2, row 1	Tray 3, row 1

Titles button

The Titles configuration is accessed by touching the Titles button at the bottom of the Device Setup screen.

Edit Titles screen

The Edit Titles screen allows the user to set the desired titles for the company information, test headers, and protocol names. To edit any of the information, touch the field and enter the new title of the desired field. Titles are limited to 25 characters in length.

Company tab

Touching the Company tab allows editing of the company information. The labels for these fields cannot be changed.

Company: This is the name of the company that owns the Vision G2 AutoPlus.

Department: The department that controls the Vision G2 AutoPlus.

Logo: Touch this field to load a custom logo that will appear at the top of the report.

How to Load a Custom Logo

1. Prepare a jpeg image that meets the following requirements:

    a. No more than 100 pixels wide by 50 pixels high

    b. 96 dpi

    c. File size 15 KB or less.

    d. Named logo.jpg

2. Load the image into the root directory of a USB flash drive.

3. Insert the USB flash drive into the USB port of the Vision instrument.

4. Touch the Logo field to load the logo into the Vision instrument.

   NOTE: The previous logo will be overwritten by the new logo. Only one logo can be present in the instrument at a time.

Header tab

The Header tab identifies each individual test run (rather than a protocol). Touching the Header tab allows for editing the header field names. Up to 8 header fields are available, each having a maximum length of 25 characters. The default values for headers 1, 2, 3, and 8, respectively, are:

User Name: Allows the user to enter their name or if security is enabled the name of the user logged in is automatically displayed. This label cannot be changed.

Test Number: A test number, if applicable.

Lot Number: The lot number of the item being tested.

Comments: Allows the user to add any comments which should be noted related to this test run.

Operation

Protocol tab

Touching the Protocol tab allows for editing the field of the protocol labels section. Up to 8 label fields are available, each having a maximum length of 25 characters. The default values are:

Drug Name: The name of the drug the protocol is designated to test (e.g. prednisone).

Dosage: The dosage size of the drug to be tested (e.g. 300 mg).

Protocol ID: A secondary ID for the protocol, this does not need to be unique.

Apparatus: lists the apparatus used for the testing (i.e. Paddles, Baskets, Paddle over Disk).

Media Type: Lists the media type used for the dissolution test (i.e. Water, pH 7.4 Phosphate Buffer).

Media Volume: Lists the media volume used for the dissolution test (i.e. 900 mL).

Update button

The Firmware Update feature is accessed by touching the Update button at the bottom of the screen. The firmware update feature allows an operator to update the firmware of the Vision AutoPlus.

The firmware update feature uploads the file simage.hru from the root of the USB flash drive. This process is automated and takes up to 5 minutes to complete. Protocols, system settings, security settings, and users are not overwritten when a firmware update is performed.

Time

The time and alarm settings are accessed by touching the Time button on the menu.

The Edit Alarms screen will load by default. There is a tab available for each alarm. The function of each alarm is listed below. The Reset button will clear the selected alarm.

Sampling Alarm tab

Touching the Sampling Alarm tab provides the user with the ability to enable a sampling alarm. The sampling alarm is meant to notify the user when a sample point is imminent.

Sampling Alarm: Toggles the alarm between enabled or disabled.

Prenotification Time: The amount of time before a sample point when the alarm sounds (0 - 9:59 in hh:mm). For example, if the user set the alarm to 0:01, the alarm would begin 1 minute before each sample point.

User Alarms tab

User Alarms are customizable alarms which the user can set up to display a specific message. The alarms can be used to notify users when service should be scheduled on the unit, when to change the tester water on the attached testers, or any other routine task. The user alarms can be set for a specific time and date, and also can be set to reoccur.

Alarm Number: Toggles between the 3 user alarms available.

Alarm Time: The time the alarm will begin.

Alarm Date: The date the alarm will begin

Recurrence: Toggles between the following values:

- Disabled: The alarm will occur only once at the time and date set and will not recur.

- Every day: The alarm occurs every day.

- Every 0 days: This option brings up an Edit button, which allows the user to enter the number of days between when the alarm occurs. For example, if the user entered 30 days, the alarm would occur every 30 days. The range is 2 - 1827 days.

- Mon -> Fri: The alarm will occur every Monday through Friday.

- Mon -> Sat: The alarm will occur every Monday through Saturday.

Reminder: The text that is displayed when the alarm goes off. For example, if the operator set this to "Change Tester Bath Water," the text "Change Tester Bath Water" would be displayed when the alarm goes off.

Calibration Alarm tab

The Calibration Alarm can be set for a specific time and date to notify the user that the calibration on the instrument is due.

Alarm Type: Determines the Calibration or Preventive Maintenance alarm. This changes what is displayed when the alarm goes off.

Alarm Time: The time the alarm will begin.

Alarm Date: The date the alarm will begin.

Recurrence: Toggles between the following values:

- Disabled: The alarm will occur only once at the time and date set and will not recur.

- Every day: The alarm occurs every day.

- Every 0 days: This option brings up an Edit button, which allows the user to enter the number of days between when the alarm occurs. For example, if the user entered 30 days, the alarm would occur every 30 days. The range is 2 - 1827 days.

- Mon -> Fri: The alarm will occur every Monday through Friday.

- Mon -> Sat: The alarm will occur every Monday through Saturday.

Time/Date button
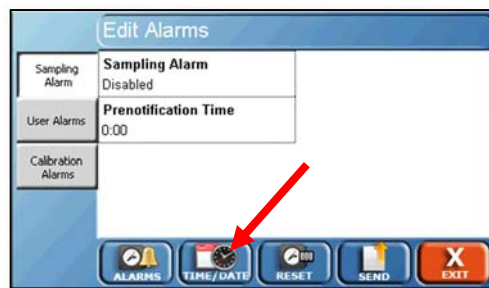
The system time and date can be entered by touching the Time/Date button. The System Time format is 24-hour time (military time) as hh:mm:ss where hh is the current hour (00 - 24), mm is the current minute (00 - 59), and ss is the current second (00 - 59).

The System Date is entered on the numeric keypad, using the format DD-MM-YYYY, where DD is the day (01 - 31), MM is the month (01 - 12), and YYYY is the year in the long format (2009 - 2999). This date is displayed as DD-Mmm-YYYY, where Mmm is the month abbreviation (Jan – Dec).

NOTE: The system clock is powered by a capacitor. If the system is left unplugged for 2 weeks, then the time and date will have to be reset. The system must be plugged in for at least 5 minutes for the capacitor to reach sufficient charge to maintain the time and date when the system is powered off.

Tools

Tools button

Touching the Tools button opens the Automatic Syringe Control menu. Other options include: Manual Syringe Control menu, Collector menu, and Remote Command screen Control menu.

Automatic Syringe Control screen

The Automatic Syringe Control screen allows the user to execute procedures with a moderate level of automation and is accessed by touching the Auto button at the bottom of the screen.
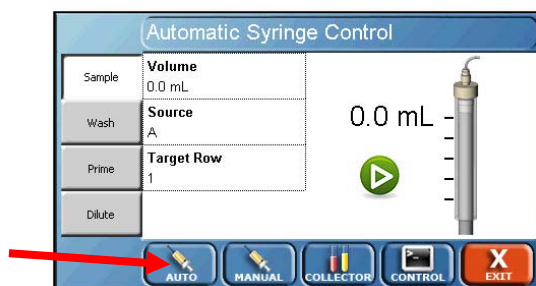
If a tester or media is not configured to a particular port then it will not be possible to utilize it using the Automatic Syringe Controls. If material must be transferred to an unconfigured port, refer to the Transfer command under Manual controls. The following tabs are available for Automatic Syringe Control.

Sample tab

The sample tab allows the user to sample the specified volume from the specified source.

Volume: The sample volume to transfer (0.0 - 99.9 mL). It is recommended that the sample volume not exceed 15 mL for 16x100 test tubes, or 1.5 mL for 12 x 32 HPLC vials.

Source: The port from which the sample is pulled. This can be set to A, B, or C.

Target Row: The collector row to which the sample is delivered. This is a numeric value that depends on the type of collector rack used.

Wash tab

The wash tab allows the user to run a wash routine without the need for running a test. For a detailed explanation of the wash routine see the "Wash Routine" explanation in the maintenance section of this user guide.

Operation
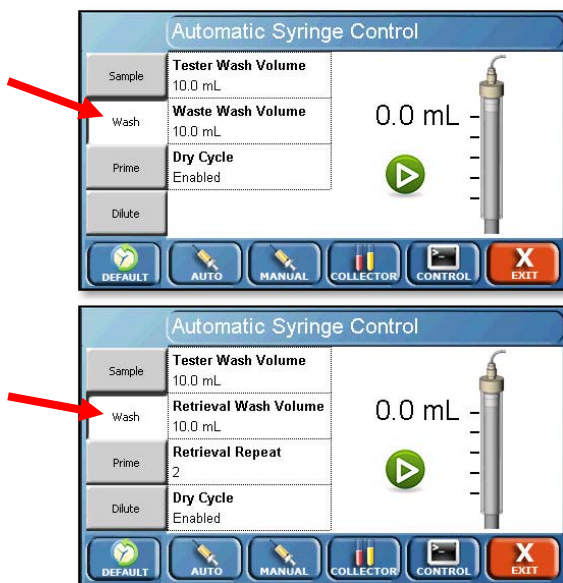
Tester Wash Volume: The amount of media used to wash the lines leading to a dissolution tester. When touched it brings up a screen with a plus (+) and minus (-) sign. The plus and minus signs are used to increase or decrease the specified quantity by 5 mL.

Retrieval Wash Volume: The amount of media used to wash the lines leading to the waste lines or retrieval reservoir. When touched it brings up a screen with a plus (+) and minus (-) sign. The plus and minus signs are used to increase or decrease the specified quantity by 1 mL. The maximum value for this field is 15 mL.

Retrieval Repeat: When touched allows the user to enter the number of times the washing of the retrieval reservoir is repeated. The allowable range is 2 to 9.

Dry Cycle: Toggles a dry cycle being enabled or disabled. The dry cycle pushes air through the lines to dry them.

Default button

Default is located in the lower left corner of the screen. When touched, this button resets the values for the wash routine to the following default values:

Tester Wash Volume: 10 mL

Retrieval Wash Volume: 10 mL

Retrieval Repeat: 2

Dry Cycle: Enabled

Select Tester screen

After touching the green arrow (▶), the Select Tester(s) screen will appear. Select the testers to perform the wash protocol by touching the fields they appear in. Touch the next button at the bottom of the screen to execute the wash.
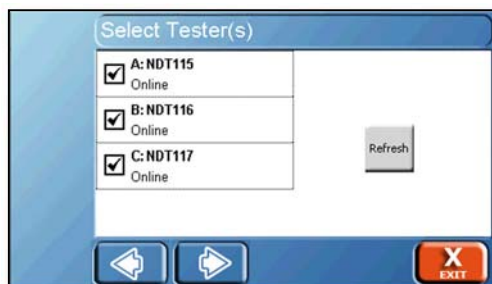
NOTE: Once communications are established, the tester's instrument ID will be displayed next to the bath's corresponding letter for Teledyne Hanson testers.

Prime tab

The Prime tab allows the user to prime the lines before starting a test. It is recommended that this be performed before the vessels are filled with media.

Dilute tab

The Dilute tab allows the user to use the Vision G2 AutoPlus as a means of diluting the collected samples or pre-fill vials or test tubes with a solvent prior to starting the dissolution test. The only target for this function is D and an AutoFill must be installed. The Dilute function has a number of unique fields.
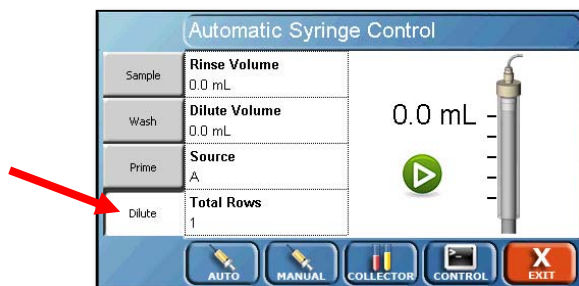
Rinse Volume: A rinse performed prior to dispensing the dilute volume. The purpose of this function is to ensure that clean solvent is used for dilution of samples.

Dilute Volume: The volume which will be delivered to the test tube or vial.

Source: Toggles the port from which the media is pulled. This can be set to A, B, or C.

Total Rows: The number of rows that will receive the dilute volume. The system starts with the row 1 unless the dispense head is located over another row.

For example, if the user specified a rinse volume of 10 mL, a dilution volume of 7 mL, the source as C, and the total rows as 5, the Vision G2 AutoPlus would first rinse the lines from port C to port D using 10 mL of solvent. Then 7 mL of solvent would be dispensed into rows 1 through 5.

Manual Syringe Control screen

The Manual Syringe Control screen is accessed by touching the Manual button at the bottom of the screen. The Manual Syringe Control screen allows the user to execute basic controls over the Vision G2 AutoPlus syringes. These functions are primarily used for maintenance and troubleshooting of the system.

Transfer tab

The Transfer tab allows the user to transfer a programmed volume of media from a source port to a destination port regardless of whether the port has been configured.

Volume: The amount of volume to be transferred. This can typically be set from 0 mL to 99.9 mL using the numeric keypad.

Source: Toggles the port from which the material is pulled. This can typically be set to A, B, or C.

Target: Toggles the port to which the media is delivered. This is typically set to D.

Repeat: Allows the user to enter the number of additional times to implement the transfer. This can be set from 1 to 9999. For example, if a volume of 10 mL from Source A to Target D with a Repeat of 2 was selected, the Vision G2 AutoPlus will transfer 10 mL from A to D twice, for a total of 20 mL.

Load tab

The Load tab allows the user to load the specified volume from the specified source. After this is executed, the Vision G2 AutoPlus will stop and await the next command. Volume for the load command is restricted to the maximum amount the syringe can hold, 5 mL.

Dispense tab

The dispense tab allows the user to dispense the material in the syringe to the selected target. If dispensing to Target D, the needles of the AutoFill are automatically lowered, but the user must ensure that the needles are located over the proper row in order to avoid spillage.

Valves tab

The Valves tab allows the user to open and close the valves located within the unit. Touching the red button located next to each port letter will open the valve for that port.
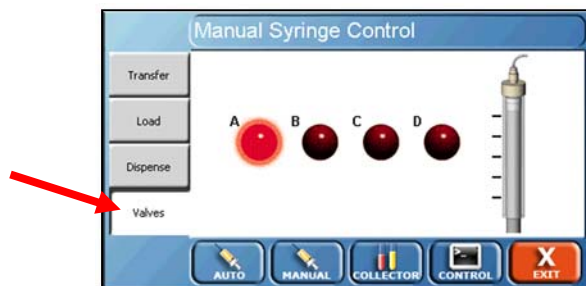
Collector button

Touch Collector at the bottom of the screen to pull up the Collector Controller Menu, which controls the AutoFill.

This menu displays the following positions:

Rack: Displays the rack that is currently installed in the AutoFill.

Row: Displays the current row where the dispense head is located.

NOTE: The Home Port 1 (last row in back) is also the Waste position. The next row (toward the user) is the Home Port 2. The next row forward is row 1, where the rack begins.

The following functions are available in the cross-shaped menu:

Needles Up (top): Moves the needles up while keeping the dispense head in the same position.

Needles Down (bottom): Moves the needles down while keeping the dispense head in the same position.

Left Arrow: Moves the dispense head 1 row closer to the home position, toward the back of the AutoFill.

Right Arrow: Moves the dispense head 1 row forward from the home position, toward the front of the AutoFill.

Home 1: This moves the dispense head to Home Port 1 on the AutoFill.

Home 2: This moves the dispense head to Home Port 2 on the AutoFill.

Other options, to the left of the cross-shaped menu:

Initialize: Performs an initialization of the collector by executing a soft reset on the AutoFill. This also returns the dispense head to the home position.

Goto Row: Directs the AutoFill to move the dispense head to the specified row.

Service Position: Appears only when no rack is installed. It moves the dispense head forward on the AutoFill in order to allow for servicing of the collector.

Control button

The Remote Command screen is accessed by touching the Control button at the bottom of the screen. The Remote Command screen provides access to the Vision G2 AutoPlus and AutoFill service and support functions. The button for this screen does not appear to operators if security features are enabled.

NOTE: The Remote Command screen should only be used when instructed by THR Technical Support.

Protocols

Protocols can be accessed by touching the Protocols button on the main menu.

It can also be accessed from the home screen by touching [Select Protocol] (or protocol name) displayed in the upper left corner of the screen.

Protocols are a list of parameters and events that are required to perform a dissolution test. These parameters can be modified to accommodate the user needs. Up to 100 different protocols can be stored.

NOTE: Some of the enhanced capabilities of the Vision instruments are not available on the SR8-Plus; please consult appendix C for details. The Vision G2 AutoPlus samples from, but does not control or communicate with, testers designated as "Generic."

The Recent tab displays the protocols which were used most recently.
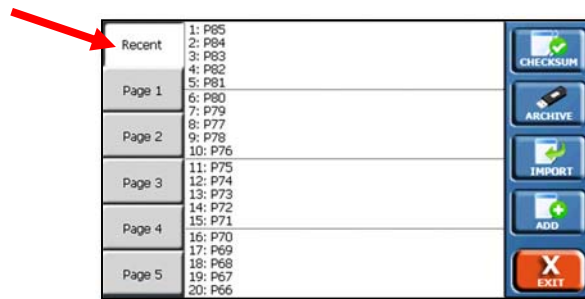
The Page # tabs display the protocols in alphabetical order based on protocol name.

The protocols are listed alphanumerically by protocol name in groups of 5 (4 groups per page) over 5 pages within the interface.

Buttons on the right of the Protocol screen are as follows.

Checksum button

Checksum: This button generates a unique checksum for the protocols. This can be used to ensure a restored set of protocols is identical to the original set. When touched, the Protocols check pop-up is displayed, which first informs the user the value is being calculated, then displays the calculated value.

For example, an operator touches the Checksum button and obtains a value of 0EA4. The operator then changes a protocol label by 1 character. When the operator touches the Checksum button again, it will generate a different value.

This feature can be used to ensure that backups and restorations of protocols are identical to the originals. The feature can also be used by managers to ensure that protocols have not been changed without authorization.

Archive button

The archive button allows Backup and Restore functions.
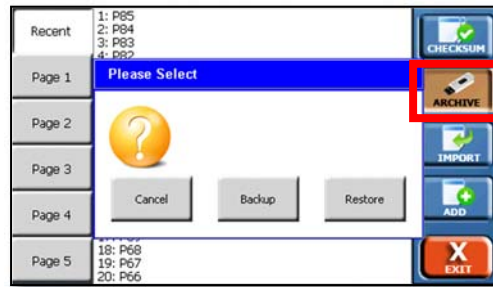
Backup: This button allows all existing protocols to be saved on the flash drive which must be inserted into the USB port at the left of the touchscreen. When this button is touched the Protocol Backup pop-up is displayed, which prompts the user to insert a flash drive into the USB slot if it is not inserted. If the flash drive is already inserted, it writes the protocols to the drive and disappears. All protocols will be saved to a file named dproto.bak.

Restore: This button allows protocols to be restored from the flash drive inserted into the USB port. All protocols will be restored from the dproto.bak file.

NOTE: The restore function will produce an exact copy of the protocols on the flash drive. All existing protocols will be overwritten.

If the dproto.bak file does not exist, then a pop-up error message is displayed and the message is also written to the error log. The message asks the user to confirm protocol restoration. If the user touches No, then the protocols will not be restored. If the user touches Yes, all the protocols will be overwritten.

Import button

The import button allows the user to import all previously exported protocols from a flash drive inserted into the USB port. Protocols must have been previously exported to the flash drive in order to import them. Only protocols with differing protocol names will be added. Existing protocols may be overwritten if the user confirms an overwrite; otherwise, the existing protocol will remain.

NOTE: With firmware changes in version 2.20, protocols cannot be imported or restored back into Vision AutoPlus instruments with version 2.14 or earlier. Protocols created on firmware version 2.14 or earlier can be imported or restored into version 2.20.
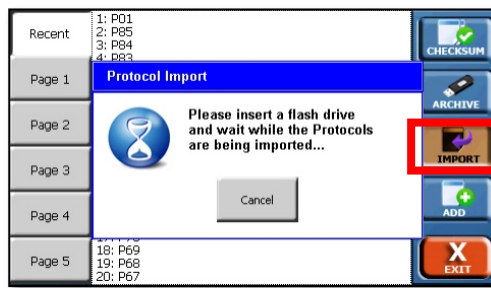
Term	2.14 file name	2.20 file name	Used for	Existing protocols/users	Data sent
Backup	Proto.bak	Dproto.bak	All protocols or users	Overwritten	Writes to USB drive
Restore	Proto.bak	Dproto.bak	All protocols or users	Overwritten	Copies from USB drive
Export	*.hpf	*.hpd	Single protocols	Kept	Writes to USB drive
Import	*.hpf	*.hpd	Single protocols	Kept	Copies from USB drive

Table D-1 Summary of USB Transfer Functions

Add button

The Add button allows the user to create a new protocol.
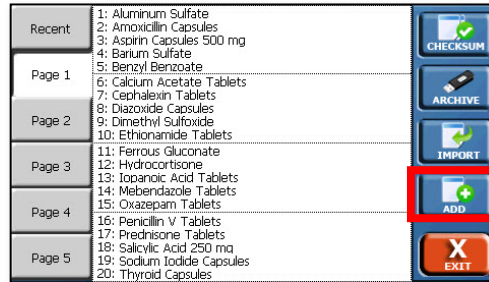
To select a protocol, first select the group it is in.
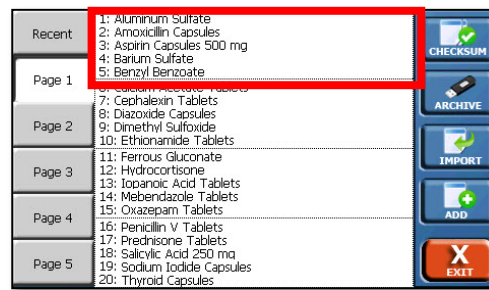
Select the individual protocol on the screen. The revision date of each protocol is displayed and cannot be directly edited. If security features are enabled the last user to edit the protocol is displayed.
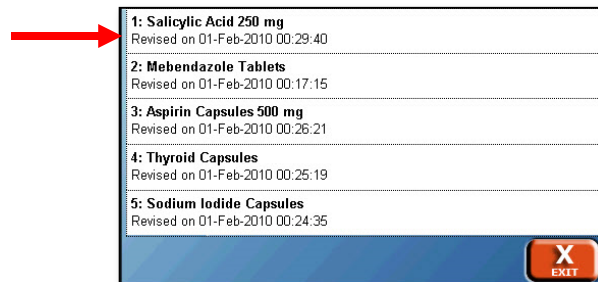
Once you have loaded or created a protocol, buttons on at the bottom of the Protocol screens will appear. These are:

Event Library: Touching this will convert the protocol into an event library, which is used with the Call event. For more information, see appendix E.

Export: Exports the open protocol to a USB flash drive. The exported protocols are saved with a .hpd extension.

Copy: Creates a copy of the loaded protocol for the user to work on. The copy is immediately loaded for editing.

Delete: Deletes the open protocol.

Print: Prints the selected protocol.

Tabs available on the Protocol screen are:

Labels tab

The Labels tab provides the user a place to list the protocol name as well as other information on the protocol.

Protocol Name: This is the name of the protocol and must be unique. The Protocol Name is how the protocols are organized on the protocol selection screens.

NOTE: Do not use a comma (,) in the Protocol Name field. Doing so will cause communication issues with the dissolution tester.

Comments: Allows the user to add any notes specific to the protocol.

The following field names can also be edited by the user though the configuration settings on the title screen.

Drug Name: The name of the drug the protocol is designated to test (e.g. prednisone).

Dosage: The dosage size of the drug to be tested (e.g., 300 mg).

Apparatus: Lists the apparatus used for the testing (i.e. Paddles, Baskets, Paddle over Disk, or apparatus number [e.g., 2]).

Protocol ID: A secondary identifier for the protocol. This does not need to be unique like the Protocol Name.

Media Type: Lists the media type used for the dissolution test (e.g., Water, pH 7.4 Phosphate Buffer).

Media Volume: Lists the media volume used for the dissolution test (e.g., 900 mL).

Dissolution tab

The Dissolution tab provides information and settings for the supported dissolution testers. If a tester is unsupported these values are for reference only.

Drive Speed: The target drive speed for the dissolution test. Range is 0, 25 - 250 rpm.

Speed Tolerance: The tolerance for the motor speed for a dissolution test. The default value is ± 4% of the set point. Range is 0 (off), 1 - 10%.

Tester Temperature: The target tester temperature of the dissolution tester. Range is 0, 25.00 - 55.00°C.

Temperature Tolerance: The tolerance for the primary temperature probe on the dissolution tester. The default value is ± 0.5 °C. Range is 0 (off), 0.10 to 5.00 °C.

Test Length: the total time of the dissolution test. The range is 0 - 999:00 (hh:mm).

Digital Temp Probes: Allows vessel temperature probes mounted on the AutoMag or SuperMag of the Vision Elite 8 to be monitored during the test. The options are Enabled or Disabled.

Print Interval: The interval at which the tester status (speed, temperature, etc.) will be printed. The range is 0 to 999:00 (hh:mm). If the user does not wish the status to print the Print Interval should be set to 00:00.

NOTE: The tester status is printed by default at all sample points, even if the print interval is set to 00:00.

Vessel Goal Temperature: The desired temperature of the vessels. This is option is only applicable when Digital Temp Probes field is set to Enabled. The range is 0 (off), 25.00 to 55.00 °C.

Sampling tab

This tab allows the user to select the sampling mode and specify all the parameters related to sampling.

Sampling Mode: determines the type of sampling procedure:

- Manual: sample is collected manually. Manual protocols cannot be run on the AutoPlus.

- Collect Only: The AutoPlus collects a sample.

- Collect and Detect: a sample is collected and the system pauses for the Read Delay for detection by UV/Vis spectrophotometric analysis.

Rack Type: The type of rack used for sample collection during the test. 16 x 100 (default), 13 x 100, 12 x 32, 12 x 32 UPLC, T 12 x 32 and SA 12 x 32. If the wrong rack is installed, the test will not start.

Rinse Volume: The amount of volume pumped before detection or collection is done. This volume should be large enough to ensure that old material in the lines is rinsed past the needles of the collector and/or UV cells to ensure the sample collected or detected is representative of what is in the vessels of the tester. The default value is 7 mL. See the maintenance section for details on determining proper rinse volume.

NOTE: If a Vision AutoFilter is installed, this volume is pumped without a filter in place.

Rinse Volume with filter: This field is only visible if a Vision AutoFilter is installed. This is the sample rinse volume pumped with a filter in place. The range is 0 - 99.9 mL. A minimum of 3 mL is recommended. This option is not visible if the AutoFilter option in the protocol is set to No. A filter icon is present to indicate this volume is pumped with a filter in place.

Collect Volume: The volume collected into test tubes or vials during a sampling cycle. The range is 0 - 99.9 mL. The maximum for 16 x 100 test tubes is recommended to be no more than 15 mL, for 12 x 32 vials, no more than 1.5 mL. A Filter Icon will appear in the Collect Volume field when the AutoFilter is enabled.

NOTE: If a Vision AutoFilter is used, a filter is always in place for the collect volume.

Media Replace: Volume from the media replace source (typically Source C if configured) to be transferred to the current source after sampling. The range is 0 - 99.9 mL.

If the AutoFilter is configured for pull-through, an option is available to select whether or not the AutoFilter will keep a filter in place for the Media Replace step. If enabled an icon of a filter will appear in the Media Replace field.

Generally the media replace volume should be set to be the same as the total of the rinse volume and the collect volume. For systems that use a retrieval reservoir, the media replace volume should be same as the collect volume.

Detect Volume: The volume pumped after detection by a UV spectrophotometer. Only applicable with Collect and Detect mode. The range is 0 - 99.9 mL. This volume must be less than the collect volume.

Read Delay: This is the time required to hold the flow cell full for detection, and should be programmed to the time required to analyze all the flow cells used. It is the length of the pause that occurs between the collection volume and detect volume. This option is only applicable with Collect and Detect mode. The range is 0 to 12,000 seconds.

Magazine Travel: This parameter defines magazine stroke from home to the sampling position. The range is 0 (disabled) to 100 mm (for 1 L vessels) or 140 mm (for 2 L vessels). The default value is 60 mm. Preset options for magazine travel are Baskets 500, Baskets 900, Paddles 500, Paddles 900, Small Vol, and Chinese Small Vol for selecting predetermined sampling height based on apparatus and commonly used media volume in the vessels.

For example, Baskets 500 would be a preset value for the proper magazine travel in a test involving 500 mL of media in each vessel.

The travel values are approximate and fine tuning may be necessary. The suggested travel values do not account for additional distance that may be needed due to tip filters.

Auto Dosage Delivery Delay: If Auto Dosage Delivery covers are installed on the Vision Elite 8, this value is the delay between when the ADD covers are triggered, and the time the test starts. The recommended value for this is 5 seconds. The range is 0 (disabled) to 99 seconds.

Tester Offset Time: This determines the offset between the testers when running multiple testers. The minimum recommended value is 0:05 minutes. The range is 0:00 to 1:30 (hh:mm).

Options tab

The Options tab allows for testing options to be set outside of sampling and dissolution tester settings.

Auto-Start Test: This option allows the user to determine if the test will automatically start. For the types of auto-starts, see the testing section. The options available are:

- Enabled: The protocol will automatically start once the conditions are reached.

- Disabled: The protocol will not automatically start once the conditions are reached and it must be started manually.

- Prompt: When the protocol is set up to run, the user will be prompted if they want to automatically start the test or not.

Pre-Start Rinse Time: Allows the user to set the Vision G2 AutoPlus to start the pumping ahead of the scheduled sampling time to allow for fine tuning sample points. The range is 0-3600 seconds.

Backflush Filter: When enabled, the system will withdraw 1 mL of sample and return it to the source before the sampling cycle begins in order to clean material out of any installed filters. The options are Yes or No.

NOTE: The pumping for the Backflush Filter option begins on the second sample point.

Auto Wash At End: When enabled, the instrument will perform a wash routine at the end of the test. The wash routine is defined in the automatic syringe control screen.

Infinity Test Length: The length of the infinity test which follows the dissolution test. If no infinity test is desired set this value to 0:00. The range is 0:00 to 9:59 in h:mm format.

NOTE: The infinity test begins after the dissolution test is over or after the sample is collected by the AutoPlus. For example, if a dissolution test was 2 hours, with a 30-minute infinity test, the user would need to set a sample point at 2:30 (h:mm) to collect an infinity test sample.

Infinity Test Speed: Sets the speed of the infinity test that follows the normal test. The range is 0, 25 to 250 rpm.

Retrieval Volume: The volume that will be pumped out of the retrieval reservoir and back to a dissolution tester when the retrieval reservoir is used. An option is available to select whether or not the AutoFilter will keep a filter in place for the Retrieval Volume step. A filter icon will appear in the Retrieval Volume field if the option to use a filter is selected.

The range is 0 to 99.9 mL; the recommended retrieval volume is 1.5x the sample rinse volume. For example, if the rinse volume is 8 mL, the retrieval volume should be set to 12 mL.

Use AutoFilter: This setting toggles whether or not the AutoFilter will be used for this protocol. If Yes, the AutoFilter will change filters at the programmed times. If No, then the coupling assembly of the AutoFilter will remain in the through position.

Events tab

The Events tab allows the user to add events or modify the Event Table.
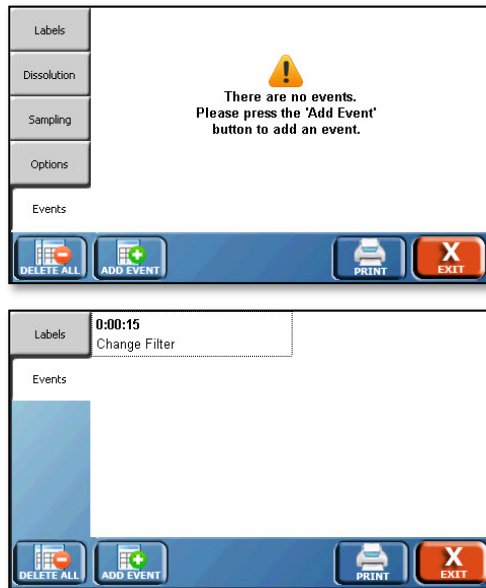
The Event Table is a sequence of up to 50 events for the AutoPlus, or AutoFilter in master mode, that will take place at user-programmed times.

The AutoPlus has two types of events: sampling and remote commands. Sampling events must have a time assigned. Remote command events may occur during the test, pre-run (before the test), or post-run (after the test).

NOTE: Pre-run and post-run events cannot be sampling events.

Pre-Run: Events programmed as a pre-run event will occur before the test begins.

For example, an operator programs a pre-run event of Drive Speed for 25 rpm. Prior to the test starting the motor will spin at 25 rpm. When the test begins, the motor will go to the speed programmed on the Dissolution tab.

Post-Run: Events programmed as post-run will occur after the test has completed.

For example, an operator programs a post-run event of Bath Temp for 40 °C. Once the test completes, the bath temperature will be set to 40 °C.

Labels	PRE-RUN Rinse Volume=4.00	4:00:00 Sample
Dissolution	1:00:00 Sample	5:00:00 Sample
Sampling	2:00:00 Sample	6:00:00 Sample
Options	3:00:00 Sample	7:00:00 Sample
Events	3:00:00 Drive Speed=100	POST-RUN Print Statistics

To edit or delete an event, touch the field in which it appears; this will open the Edit Event screen.

To delete all the events in a protocol, touch the Delete All button.

Add Event button

To add a new event, touch the Add Event button; the following screen is displayed:

The Add Event screen allows the user to add an event or events to the event table.

Start Time: This defines the start of the first event. The range is 0:00 to 999:00 (hh:mm). Preset buttons are Pre-Run and Post-Run.

NOTE: A warning will appear if sample points may overlap due to the protocol settings. This warning is based on the total volume pumped by the AutoPlus at each sample point, testers configured, tester offset time, and AutoFilter use. The warning will appear when the user attempts to save the protocol. The warning will not appear if the user views the protocol without making any changes.

Event Type: This defines the type of event that is to occur. By default, all events are sampling events. An (S) before the event indicates that it is performed by the Sampler. A (T) before the event indicates it is performed by the Tester. A (B) before the event indicates it is performed by either or Both the autosampler and dissolution tester. An (F) indicates the command is performed by the Filter Changer:

(S) Sample: Collects a sample. If an AutoFilter is installed, the following options will appear to modify the sampling process.
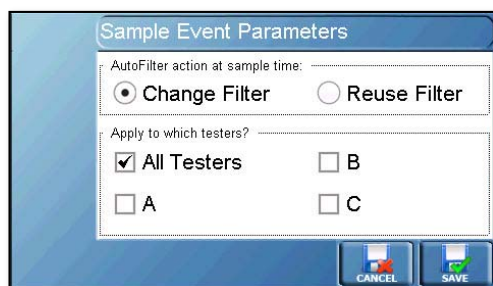
- Change Filter: Instructs the AutoFilter to change the filter on the specified tester(s). Cannot be selected together with the "Reuse Filter" option for the same sample point.

- Reuse Filter: Instructs the AutoFilter to reuse the filter for the specified tester(s). Cannot be selected with "Change Filter" option for the same sample point.

- All Testers: Apply the option (reuse or change filters) to all testers at the sample point.

- A, B, or C: Select tester(s) A, B, and/or C individually to reuse or change filters at the sample point.

- For example:

- Reuse Filter/All Testers: The filters will be reused for all testers on this sample point.

- Change Filter/B: The filters will be changed on tester B. Tester A will reuse the filter from the previous sample point.

(S) Backflush Filter: The options are Enabled or Disabled. This draws 1 mL of media from the vessels on the dissolution tester, then pumps the media out back to the vessels, before a sampling cycle begins. This removes any particles that might clog the tip filter.

(T) Bath Temp: The parameter is a temperature value. It allows the user to set a new dissolution tester bath temperature.

(F) Change Filter: Instructs the Vision AutoFilter to change a filter. The parameters are the testers (A, B, or C) for which the filter is changed.

For example, if B was entered, the AutoFilter would change a filter for the sample on tester B, but would not change the filter for tester A.

(S) Collect Volume: This allows the user to set a new collection volume for the test.

(B) Delay: This allows the user to set a delay for the start of the test. The delay waits for the specified amount of time. Range 1 to 12,000 sec. It is valid for Pre-Run only.

NOTE: To stop paddle rotation temporarily during a dissolution test, use the Pause event.

(S) Detect Volume: The parameter is the detection volume. It allows the user to set a new Detect Volume for the test.

(S) Dilute: The options are (dilution) Volume, Rinse (volume), Source, StartRow, and RowCount. It allows the user to perform a dilution at the time of the event rather than after each sample (dilution event). The range is 0 to 99.9 mL.

NOTE: The Dilute event is only compatible with port B or port C set as a media source. It will not function with Home Port 2 set as a media source.

For example, if the user programmed a Dilute event at 2 hours with 5, 7, C, 3, 10, the AutoPlus would first rinse from C to D with 7 mL, then pump 5 mL from source C in to rows 3 through 13.

(S) Dilution: The options are Volume, Rinse, and Source. It allows the user to perform a dilution during the test only after each sample. The range is 0 to 99.9 mL. Set volumes to 0.0 to turn off.

For example, for a dilution volume of 5 mL, a rinse of 7 mL, and a source C, the parameter would read: 5,7,C.

(F) Discard Filter: The AutoFilter discards the current filter. The parameters are the tester.

For example, if an operator entered A, the filter would be discarded for tester A sample points.

(S) Dispense Flow Rate: The parameter is speed of the syringes while dispensing. This changes the speed at which the Vision G2 AutoPlus syringes dispense material. The range is 0.6 to 23.8 mL/min. The default setting is 19.0 mL/min.

NOTE: 19.0 mL/min. should not be exceeded, or the Vision G2 AutoPlus could be damaged.

(T) Drive Speed: The parameter is the tester drive speed. It allows the user to set a new motor speed for the dissolution tester. The range is 0 for off, or 25 to 250 rpm.

(F) Filtered Media Replace: Toggles whether or not the media replace is done with a filter in place. The options are yes and no.

(F) Filtered Retrieval: Toggles whether or not the retrieval volume is pumped with a filter in place. The options are yes and no.

(S) Load Flow Rate: The parameter is speed of the syringes while loading. This changes the speed at which the Vision G2 AutoPlus syringes load material. The range is 0.6 to 23.8 mL/min. The default setting is 19.0 mL/min.

NOTE: 19.0 mL/min. should not be exceeded, or the Vision G2 AutoPlus could be damaged.

(B) Mag Home Offset: (Version 2.64 and above only) Allows the mag home offset position to be set as a pre-run event. The offset remains active for the duration of the test but user interaction such as printing the test report or acknowledging the test over prompt clears the offset position. The range is 0-30 mm.

(T) Magazine Travel: This parameter defines magazine stroke from home to the sampling position. The range is 0 (disabled) to 100 mm (for 1 L vessels) or 140 mm (for 2 L vessels). The default value is 60 mm. Preset options for magazine travel are Baskets 500, Baskets 900, Paddles 500, Paddles 900, Small Vol, and Chinese Small Vol for selecting predetermined sampling height based on apparatus and commonly used media volume in the vessels.

For example, Baskets 500 would be a preset value for the proper magazine travel in a test involving 500 mL of media in each vessel.

(S) Media Replace: The parameter is volume, and the range is 0 to 99.9 mL. This changes the media replace volume pumped during the test.

(T) Pause: The parameter is time in minutes from 1 to 999. This stops the spindles on the testers from spinning for the specified amount of time. The tester will then count up for the duration of the pause, while the total elapsed time is held constant. If pause is set to 0, the pause is indefinite, so the user must resume the tester manually.

For example, if a pause was programmed for 2 minutes, the paddles would stop spinning for 2 minutes, then resume spinning after the 2 minutes had expired.

(T) Print Interval: The parameter is the interval between printing. This changes the print interval for printing the status of the dissolution testers.

(B) Print Statistics: This prints the current statistics for the test. There are no parameters for this command.

(T) ProbeDown: Moves the AutoMag down.

(T) ProbeUp: Moves the AutoMag up.

(B) Prompt: This creates a pop-up message box with a message. The message may be up to 11 characters in length.

(S) Read Delay: This changes the read delay when working with collect and detect protocols. The parameter is time; the range is 0 to 12,000 sec.

(S) Retrieval Volume: This changes the volume pulled when operating the retrieval reservoir; the range is 0 to 99.9 mL.

(F) Reuse Filter: This instructs the AutoFilter to reuse a filter. If a filter is not coupled, but is in the hold position, the filter will be reused for the sample point. If a filter is already in the filter coupled position, then the filter will be kept in place. If there is not a filter in the filter coupled position or on the shuttle assembly, then a new filter is loaded. The parameters are the testers that the filter will be reused for.

For example, if a A,B were entered, the filter would be reused for tester A and B at the next sample point.

(S) Rinse Volume: This allows the user to set a new sample rinse volume (0 to 99.9 mL) during the test.

(S) Rinse Volume with Filter: This allows the user to set a new sample rinse volume with a filter (0 to 99.9 mL) during the test.

(A) Send to Serial: The options are PortNum and Text. Text is the string that is sent to the port. PortNum refers to the port number of the Vision instrument.

- 1 – Host port

- 2 – Printer

- 3 – Collector (for AutoPlus) or Vision Heater (for tester). This port is not applicable to the AutoFilter.

(T) Speed Tolerance: This changes the dissolution tester motor speed tolerance for the protocol. The options are 0 (disabled), or 1 to 10%.

(T) Status: This allows the user to get an automatic status at the specified time. The speed and temperature are reported.

(T) Temperature Tolerance: This changes the dissolution tester temperature tolerance for the protocol. The options are 0 (disabled), or 0.1 to 5.00 °C.

(S) Transfer: The options are Volume, Source, Destination. It allows the user to transfer a specified volume of solution from a specified source to a specified destination.

For example, if a transfer of 5 mL from source C to source A is desired, the parameter would read: 5,C,A.

The following sources/targets are available when using a Transfer command in the event table of a protocol.

- U: This source/target keeps the needles up. It is useful as a source to pull air into the syringes to dry out the lines. It can also be used to push any remaining media back to the vessel.

- W: This source/target lowers the needles into Home Port 2 of the AutoFill.

- H: This lowers the needles into the Home Port 1 (or waste port) of the AutoFill.

- 1-25: This can be used as a target only. This target will lower the needles into the corresponding row of the rack.

  For example, if "10" was entered, the needles would lower in the 10th row of the installed rack.

- D: Keep the collector in the current position when the transfer will occur. Using D will not lower the needles of the collector when performing transfers!

- X: Will deliver to or pull from the current tester.

- P: Will deliver to the previous row, or the row the last sample was collected in.

- N: Will deliver to the next row, or the row the next sample will be collected in.

(F) Uncouple and Hold Filter: This instructs the AutoFilter to uncouple and move the filter to the load position. The parameters are the testers.

For example, if the user put in A,B, the filter would be uncoupled and put in the load position for testers A and B.

(S) Valve Delay: This changes the dispense valve delay when an AutoPlus is working in conjunction with an AutoFilter. The delay allows extra pressure caused by the filter to bleed off, allowing for more accurate transfer volumes. The delay is changed only when a filter is coupled in the AutoFilter. The parameter is the time in seconds. The default value for this is 7 seconds. A minimum of 5 seconds is recommended.

(B) Vessel Goal Temperature: The parameter is the temperature value. It allows the user to change the desired vessel temperature when used with Digital Temperature Probes (DTPs) on the Vision Elite 8 AutoMag. The options are 0 (for disabled), or 25 to 55 °C.

(B) Call: Executes an event library starting at the time of a call event. For more information, see appendix E.

Number of Events: This allows the user to set the number of times this event will occur. By default, only one occurrence of the event is created. For multiple occurrences, the first event begins at the start time.

Interval Between Events: This allows the user to set the interval between the events occurring when multiple events are being added to the event table, in the format hh:mm, where hh is hours and mm is minutes. The range varies depending on the number of events and the sampling times.

How to Program a Protocol

Below are the instructions on how to program a basic protocol.

1. Touch the Menu button on the home screen to bring up the menu.
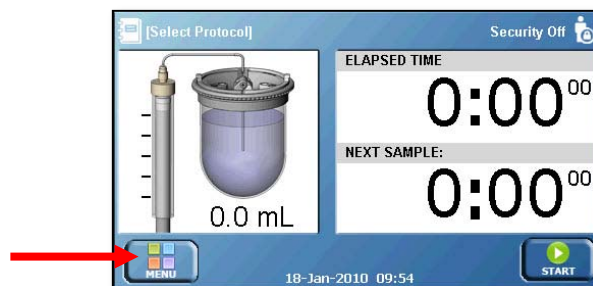
2. Touch the Protocols button on the menu to bring up the protocol screen.

3. Touch the Add button to create a new protocol.
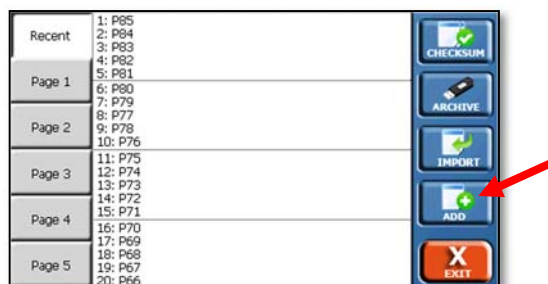
4. The Labels tab of the protocol will appear first. Protocol names must be unique and set before the protocol can be saved. To change the protocol name, touch the Protocol Name field and enter an appropriate protocol name.

NOTE: Do not use a comma (",") in the Protocol Name field. Doing so will cause communication issues with the dissolution tester.

5. Touch the other fields to enter the appropriate information for each of those fields. When finished, touch the Dissolution tab on the left side of the screen.

6.   The dissolution options will appear. Begin by entering the drive speed for the dissolution testers by touching the Drive Speed field.

7.   Once the drive speed is entered, touch the other fields to enter the appropriate information. When finished, touch the Sampling tab.

8.   The sampling options will appear. Touch the Sampling Mode field to set the appropriate sampling mode.

9. With the correct sampling mode entered, proceed to enter the rest of the information by touching on the appropriate fields. When finished entering the information, touch the Options tab on the left.

10. Configure the options as appropriate for the protocol by touching the fields and entering appropriate data. When finished, touch the Events tab on the left.

11. Touch the Add Event button on the bottom to add a new event.

12. Select the Start Time of the first event and the Event Type by touching the respective fields. If there is more than one of the event, as with sampling, touch the Number Of Events field to set the total number of events (for example, the number of sample points). Finally touch the Interval Between Events field to set the time that occurs between the events.
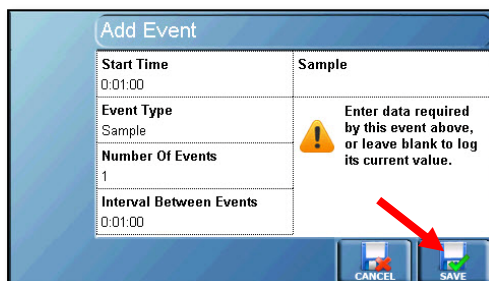
13. When the event is configured touch the Save button on the bottom right to add the event to the Events table.

14. If an event is not desired, for example an extra sample point, touch the field the event appears in. On the Edit Event screen, touch the Delete button to remove the event.

15. If no more changes are needed, touch the Exit button in the bottom right of the screen to save the protocol.

Testing

Test Menu

When starting a test on the Vision G2 AutoPlus, a number of screens appear that are unique to the process.

The Prev ( ) and Next ( ) buttons are common to each screen. Next ( ) advances the user to the next screen in the process of starting a test. The Prev ( ) button allows the user to return to the previous screen.

Header Information screen

The header information screen allows the user to enter information specific to that test run. The labels for the headers can be changed through the configuration screens. The fields are:

User Name: Allows the user to enter a name, or if security is enabled, the name of the user logged in is automatically displayed.

Test Name: Allows the user to enter a test name, if applicable.

Lot Number: Allows the user to input the lot number of the item being tested.

Comments: Allows the user to add any comments related to the test run.

Select Tester(s) screen
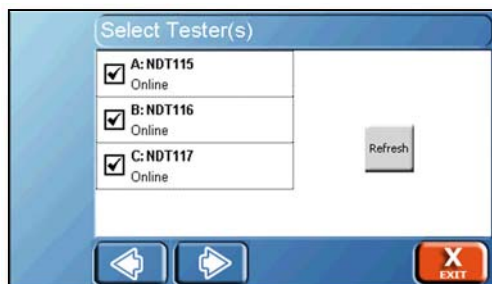
The Select Tester(s) screen allows the user to choose which tester or testers to execute the protocol. To select a tester, touch the field in which it is listed.

NOTE: Tester's instrument ID will be displayed once communications are established.

The status of each tester will be listed within its field. Tester status will be:

Online: The tester is available for testing.

NOTE: Only online testers can be selected for testing.

Busy: The tester is currently running another test.

Offline: The tester is offline. If a tester is offline and is powered on, touch the refresh button to attempt to contact the testers again. If communication still cannot be established with the tester, refer to the troubleshooting appendix.

Testers will always be run in the order A, B, C. At least 1 tester must be selected in order to run a test.

Test Options screen

Select the options as appropriate for the test. The following options are available on the Test Options screen.

Auto Print Test Report: Determines if the test report will automatically print at the end of the test. The options are:

- No: The user must command the instrument to print the test report at the end of the test.

- Print Summary: This prints just the summary report. The summary report is identical to the first page of the full report.

- Print Full Report: This prints the full test report. It includes the summary page, and what occurred with all the dissolution testers.

- Print Per Tester Report: This prints a report for each tester user during the dissolution test. Each per tester report includes the tester and autosampler actions.

  For example, if a user ran a dissolution test on tester A and B; the per tester reports would be a log of tester A with all the related autosampler actions, and a separate log for tester B with all the related autosampler actions.

Heater Off At End Of Test: This option causes the Vision G2 AutoPlus to turn off the heaters of the controlled dissolution testers at the end of the dissolution test in order to reduce power consumption.

NOTE: This option only applies to Vision G2 dissolution testers.

Starting Row: Allows the user to change the row at which the test will begin sampling. For example, if the starting row was set to 5, the first sample drawn during a test would be placed in row 5 of the AutoFill, and the samples following that would be placed in rows 6, 7, 8 and so on. The starting row is limited to the maximum number of rows on the installed rack.

NOTE: Starting Row is disabled if Collection Rack Zoning is enabled in the system configuration.

Auto-Start: Displays if the protocol will automatically start when conditions are met. If Auto-Start is disabled in the protocol, this field is locked as "No." If Auto-Start within the protocol is set to Prompt or Yes, the field can be changed to the following Auto-Start options:

- When Temp Ready: Starts the test when the bath temperature is within specification.

- At Set Time: Starts the test at a specific date and time regardless of temperature. This adds date and time fields which allow the user to set the time and date the test will start.

- Temp and Time: Starts the test when both the temperature and time are met. If the tester temperature is not within specification at the programmed time, the test will start when the temperature is within specification. If the tester is at the correct temperature before the programmed time, the test will start at the programmed time.

Start Date: The date the test should begin.

Start Time: The time the test should begin.

How to Start a Test

1. To start a test, first begin at the home screen and touch protocol name or [Select Protocol] text in the upper left-hand corner of the screen.

2. Select the correct protocol from the list. Then touch Exit, and OK again to return to the home screen.
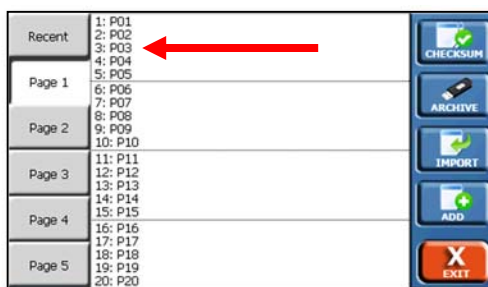
3. Touch the Start button located on the lower right of the home screen.
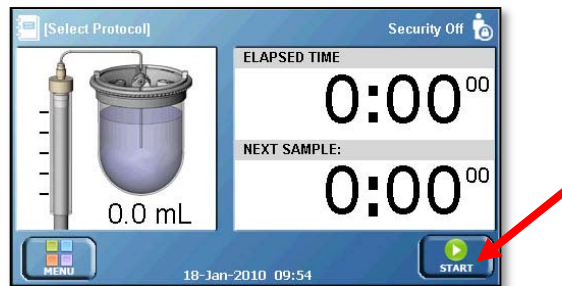
4. Enter the appropriate information in the Edit Header Information screen. This is for information only and will appear on printed reports. When finished, touch the Next ( ) button at the bottom of the screen.
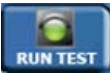
5. Select the tester or testers that the protocol will be executed on.
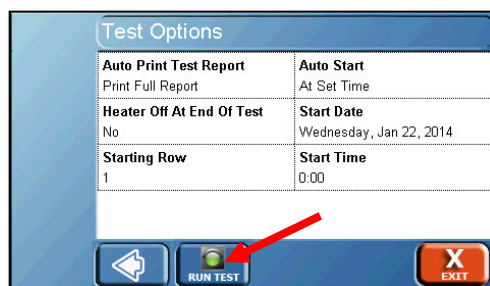
6. Select the options as appropriate for the test. Once the options are set, touch the Run Test ( ) button.
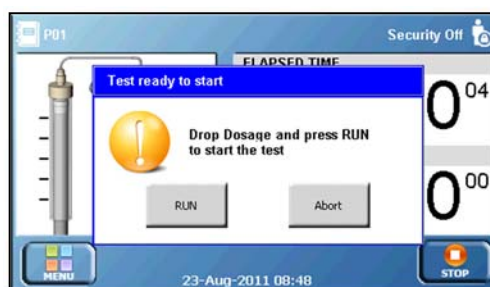
7. The Vision G2 AutoPlus will return to the home screen. If Auto-Start is not enabled, the tester will prompt the user to drop the dosage and touch the Run button, starting the test (or Abort to cancel).

    NOTE: The test will not start unless the correct rack is installed.

Simultaneous Start with Vision G2 AutoPlus and AutoMag (Elite 8)

1. Confirm the vessels, paddles, or baskets and basket shafts are clean and in good condition. Install them in their designated positions.

2. On the tester, touch the temperature to bring up the set temperature screen. Enter the desired temperature (+ 0.10 °C of the desired vessel temperature is recommended) and touch OK.

3. Fill vessels with media.

4. Prepare the apparatus:

   a. Paddles: lower the drive head so paddles are in the testing position.

   b. Baskets: raise basket shafts and lower the drive head to the testing position, ensuring the baskets remain above the vessel covers.

   c. Place covers on vessel; orient/adjust as necessary for the AutoMag.

5. Once the media has stabilized, ensure the protocol is loaded by checking the upper left corner of the screen. If the correct protocol is loaded, do nothing. If it is not, touch the upper left corner of the screen, then touch Exit and select the protocol to be used for testing.

6. Touch the Start button in the lower right corner of the screen. Enter the header information as appropriate, then touch Next ( ).

7. Select the tester or testers the protocol will be run on.

8. Apparatus:

    a. Baskets

        i. Place the dosage in each basket and install the baskets on the basket shafts.

        ii. Remove the vessel cover over each of the positions.

        iii. Rapidly lower each basket into its respective vessel by pushing the spindle shafts down.

        iv. Touch Run to start the test.

        v. Replace the vessel covers over each of the positions.

    b. Paddles

        i. Remove the vessel cover over each of the positions.

        ii. Rapidly drop a dosage in each position.

        iii. Touch Run to start the test.

        iv. Replace the vessel covers over each position.

9. If more than one tester was selected, there will be a countdown on each tester to inform the operator when to drop the tablets.

Simultaneous Start with Vision G2 AutoPlus, AutoMag, and DTPs

1. Confirm the vessels, paddles, or baskets and basket shafts are clean and in good condition. Install them in their designated positions.

2. On the tester, touch the temperature to bring up the set temperature screen. Enter the desired temperature (+ 0.10 °C of the desired vessel temperature is recommended) and touch OK.

3. Fill vessels with media.

4. Prepare the apparatus:

    a. Paddles: lower the drive head so paddles are in the testing position.

    b. Baskets: raise basket shafts and lower the drive head to the testing position, ensuring the baskets remain above the vessel covers.

    c. Place covers on vessel; orient/adjust as necessary for the AutoMag.

5. Use tester controls to lower DTPs into the vessels.

6. Once the media has stabilized, ensure the protocol is loaded by checking the upper left corner of the screen. If the correct protocol is loaded, do nothing. If it is not, touch the upper left corner of the screen, then touch Exit and select the proper protocol.

7. Touch the Start button in the lower right corner of the screen. Enter the header information as appropriate, then touch Next ( ).

8. Select the tester or testers the protocol will be run on.

9. Apparatus:

    a. Baskets - Elite 8

        i. Place the dosage in each basket and install the baskets on the basket shafts.

        ii. Remove the vessel cover over each of the positions.

        iii. Rapidly lower each basket into its vessel by pushing the spindle shafts down.

        iv. Touch Run to start the test.

        v. Replace the vessel covers over each of the positions.

    b. Paddles

        i. Remove the vessel cover over each of the positions.

        ii. Rapidly drop a dosage in each position.

        iii. Touch Run to start the test.

        iv. Replace the vessel covers over each position.

10. The AutoMag will lower to measure the temperature in the vessels, and/or take media samples, per the protocol selected.

11. If more than one tester was selected, there will be a countdown on each tester to inform the operator when to drop the tablets.

Simultaneous Start with Vision G2 AutoPlus, AutoMag, and ADD, Using Auto-Start

1. Confirm the vessels, paddles, or baskets and basket shafts are clean and in good condition. Install them in their designated positions.

2. On the tester, touch the temperature to bring up the set temperature screen. Enter the desired temperature (+ 0.10 °C of the desired vessel temperature is recommended) and touch OK.

3. Fill vessels with media.

4. Lower the drive head so paddles are in the testing position.

5. Prepare ADD covers:

   a. Close the chamber of the ADD cover by pressing the hinged portion on the bottom of the cover closed.

   b. Place ADD covers on vessel; orient/adjust as necessary for the AutoMag.

   c. Place the dosage in each of the dose tubes located on the ADD cover for all positions.

   d. Place the dose caps on top of the dose tubes for all positions.

6. Once the media has stabilized, ensure the protocol is loaded by checking the upper left corner of the screen. If the correct protocol is loaded, do nothing. If it is not, touch the upper left corner of the screen, then touch Exit and select the protocol to be used for testing.

7. Touch the Start button in the lower right corner of the screen. Enter the header information as appropriate, then touch Next ( ).

8. Select the tester or testers the protocol will be run on.

9. Touch Run to start the test.

10. The AutoMag will lower to measure the temperature in the vessels, and/or take media samples, per the protocol selected.

11. If more than one tester was selected, there will be a countdown on each tester to inform the operator when to drop the tablets.

Simultaneous Start with Vision G2 AutoPlus, AutoMag, ADD, and DTPs, Using Auto-Start

1. Confirm the vessels, paddles, or baskets and basket shafts are clean and in good condition. Install them in their designated positions.

2. On the tester, touch the temperature to bring up the set temperature screen. Enter the desired temperature (+ 0.10 °C of the desired vessel temperature is recommended) and touch OK.

3. Fill vessels with media.

4. Lower the drive head so paddles are in the testing position.

5. Prepare ADD covers:

   a. Close the chamber of the ADD cover by pressing the hinged portion on the bottom of the cover closed.

   b. Place ADD covers on vessel; orient/adjust as necessary for the AutoMag.

   c. Place the dosage in each of the dose tubes located on the ADD cover for all positions.

   d. Place the dose caps on top of the dose tubes for all positions.

6. Use tester controls to lower DTPs into the vessels.

7. Once the media has stabilized, ensure the protocol is loaded by checking the upper left corner of the screen. If the correct protocol is loaded, do nothing. If it is not, touch the upper left corner of the screen, then touch Exit and select the protocol to be used for testing.

8. Touch the Start button in the lower right corner of the screen. Enter the header information as appropriate, then touch Next ( ).

9. Select the tester or testers the protocol will be run on.

10. Touch Run to start the test.

11. The AutoMag will lower to measure the temperature in the vessels, and/or take media samples, per the protocol selected.

12. If more than one tester was selected, there will be a countdown on each tester to inform the operator when to drop the tablets.

Maintenance

Scheduled Maintenance Overview

Before Each Test

Replace sample filters if applicable.

After Each Test

The wash function should be used to clean all the liquid lines of the unit. DI or better quality water is recommended for the wash solution.

NOTE: Please contact Teledyne Hanson Research Technical Support before pumping organic solvents through the unit.

Weekly

Inspect syringes for leaks. Ensure that no air bubbles are entering the syringe from the side of the plunger. Syringes should be replaced when they have reached 100,000 cycles, regardless if they are leaking or not. For instructions on syringe replacement, refer to the maintenance section.

Every 6 Months

Inspect sample lines and fittings. Ensure all fittings are tight. Sample lines should be free of debris, kinks, or breaks. For information on how to remove debris from the lines, or repair kinked or broken lines, please contact Teledyne Hanson Research Technical Support.

Inspect AutoFill needles for damage and replace as necessary.

Inspect AutoFill dispense head for smooth motion.

Wash Routine

About

The wash routine on the Vision G2 AutoPlus is designed to provide a thorough cleaning of all the liquid lines utilized during a test. This can be run automatically at the end of a test, or run through the automatic syringe control screen located in the Tools menu.

How it Works

The wash routine requires that a wash source be connected to the AutoPlus. The wash source should be clean DI or better quality water. Other solvents can be used, but Teledyne Hanson Research Technical Support should be contacted prior to attempting washes with more aggressive solvents.

Probes on all the testers are maintained in a raised position to prevent any contamination caused by media remaining in vessels that have yet to be cleaned.

The Vision G2 AutoPlus will pull from the wash source and pump the wash solution to each of the testers and the waste lines or retrieval reservoir. To ensure that all lines reach their specified rinse volumes, a priming step is performed on the wash lines any time the needles return to that position. The priming step dispenses out the probes of the first dissolution tester (A).

NOTE: It is recommended to have at least 100 mL of volume available in tester A prior to beginning a wash cycle.

The waste lines are rinsed in the same manner as the testers; however, if a retrieval reservoir is installed, it will be filled to the specified volume (no more than 14 mL is recommended), then drained. Extra syringe cycles during the draining portion will be done to ensure that all the wash solution placed into the retrieval reservoir is removed. Any material removed from the retrieval reservoir is pumped out to the first dissolution tester (A).

After the waste lines or retrieval reservoir is washed, the Vision G2 AutoPlus will then pull from the wash source and dispense out to the dissolution testers for the specified volume. The volume is specified in multiples of the syringe capacity.

If programmed, a dry cycle will occur after the testers have been washed. The dry cycle raises the needles on the AutoFill and pulls air into the syringes. It then pumps this air out to the testers, the waste lines or retrieval reservoir, and the wash port. This drying cycle ensures that no wash solution remains in the lines and that the system is now ready for another test after the vessels have been cleaned.

Fig. F-1 Wash Function Flow Chart
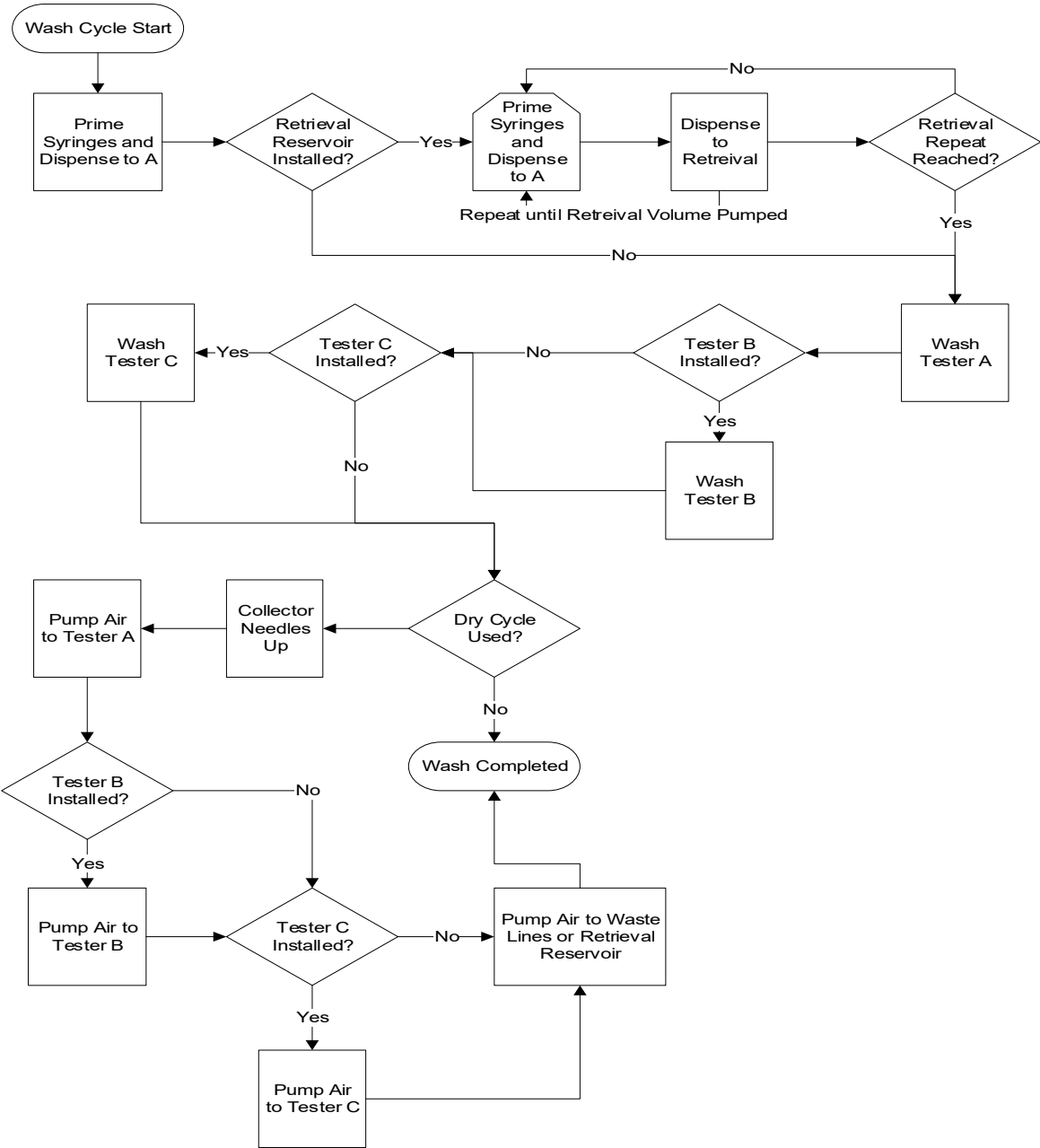
General Cleaning

The autosampler and collector have been designed to be a low maintenance instrument. In general, the instruments are maintained by wiping clean after each use, as well as running DI-grade water through the units after each test to clean the lines.

The exterior of the instrument should be periodically wiped down with a damp cloth. Frequency of cleaning depends on the instrument usage and operating environment. If there is spillage on the unit, clean it up as soon as possible.

Cleaning Method for Tubing, Valves and Syringes

Supply DI-grade water (or better) to the cleanest source on the autosampler. If media replace is used, supply the DI-grade water to source C. From the cleanest source, pump out to the dissolution testers and collectors. This will push any debris away from the valves and help prevent any damage or clogs from occurring.

Syringe Replacement

Replace syringe plungers when the maintenance log indicates 100,000 cycles or as needed. After replacing syringes, Volume Calibration should be performed. DI or better quality water should be used for this procedure.

1. Remove the front cover of the AutoPlus.

2. Using the autosampler controls, select the manual control option and load the syringe with 2 mL water.

3. Remove the shoulder screw at the bottom of the syringe.

4. Using the autosampler controls, select the manual control option and load the syringe with 5 mL water.

5. Gently unscrew the syringe by grasping the barrel and turning it clockwise.

6. Install the new syringe by screwing it in counter clockwise

   NOTE: When the syringe contacts the manifold, turn no more than 45 degrees in order to ensure a good seal and not damage the valve.

7. Using the autosampler controls open the valves for any lines

8. Gently pull the syringe plunger down and align it with the drive bar

9. Reinstall the shoulder screw.

   NOTE: The shoulder screw should be able to be installed finger tight until it is flush with the syringe plunger. If the screw cannot be turned with only your fingers, adjust the plunger and try again. Once the screw is flush with the syringe plunger, it may be tightened with a screwdriver.

Volume Calibration

Use DI-grade water at room temperature.

1. Weigh empty sample collection vials or test tubes and record (tare weight). Caps are required in order to ensure accuracy.

2. Program the autosampler to collect the required the sample volume.

3. Weigh full sample collection vials and subtract the empty (tare) weight from the full weight. Make any necessary calculations to account for water density.

$$\text{Volume (mL)} = \frac{\left(\text{Fill Weight(g)} - \text{Tare Weight(g)}\right)}{\text{Density (g/mL)}}$$

If the volume does not fall within the specifications in the specifications section, contact Teledyne Hanson Research Technical Support.

Tubing Volume

Tubing volume can be calculated using the following information.

Common configurations:

- V8, AP, AutoMag

- V8, AP, AutoMag, AFC

- V6, Resident, AP, AF

Tubing description	Locations	Volume (mL/inch)	Volume (mL/cm)
1/16 in. PTFE Tubing	Tubing harnesses, autosampler tubing, collector tubing, sample harness located on tester	0.0176 (Note highside tolerance)	0.00496 (Note highside tolerance)
Vision AutoMag Probes	Vision Elite 8 AutoMag or SuperMag	0.0503	0.01979

Common items	Tubing length (inches)	Tubing length (cm)
1/8 in. Stainless Steel Probes	15	38.1
1/16 in. Stainless Steel Sample Return Probes	17.05	43.307
Vision G2 AutoPlus Tubing on Source A, B, and C	36	91.44
Vision G2 AutoPlus Tubing on Source D	36	91.44
AutoFill (To needle)	Total mL	
Vision Tester or Extension Tubing Harness (3')	36	91.44
1 L AutoMag Probe	6.3	16.00
2 L AutoMag Probe	7.6	19.30
AutoFilter	Total mL	

To calculate the dead volume:

(Tubing length in. or cm) * (mL/in. or mL/cm) + (Tubing length in. or cm) * (mL/in. or mL/cm) and repeat for each section.

Rinse Volume

Materials required:

1. 1 UV/Vis Spectrophotometer

2. 1 Absorbing solution with a UV absorbance

   a. Caffeine solutions or prednisone solutions are suitable choices

   b. An absorbance of 0.90 to 1.10 AU is strongly recommended

3. DI or higher quality water

4. 12 Test tubes

   a. Vials are not recommended due to sample size.

   b. Recommended sample size is 7 - 10 mL for UV analysis.

   c. Filters may be used at operator discretion.

This procedure uses only Line A1. There is no need to perform this procedure on other lines. See "Carryover" in the maintenance section for how to perform a carryover test, to verify the rinse volume on all the lines.

1. Prime Line A1 with no less than 20 mL using DI Water.

2. Use the Vision G2 AutoPlus controls to obtain two samples (Blank 1, and Blank 2) without removing the probe from the DI water.

3. Round the Theoretical Dead Volume up to the next whole number.

4. Place the probe in the absorbing solution and rinse the lines with the amount determined in step 3.

5. Use the Vision G2 AutoPlus controls to obtain a sample for UV analysis.

6. Place the probe back in the DI water and prime the system with 20 mL.

7. Move the probe back to the caffeine solution and rinse by a volume 1 mL greater than the previous rinse volume.

8. Obtain a sample for UV analysis using the Vision G2 AutoPlus controls.

9. Repeat steps 6 through 8 until a total of 10 samples of the absorbing solution are obtained.

10. Run the samples on a UV/Vis spectrophotometer starting with the two blanks and working from the lowest rinse volume to highest.

11. Clean probes using DI water.

12. Use the following equation in order to determine the rinse volume.

$$A_r = \frac{(A_{100\%} - A_{0\%}) * 99\%}{100\%} + A_{0\%}$$

A_r = the minimum absorbance required

$A_{100\%}$ = the average absorbance of the 9th and 10th readings of the absorbing solution

$A_{0\%}$ = the average of the absorbance of the two blank diluent solution readings

This is how to use the equation:

1. Obtain the average of the blanks ($A_{0\%}$).

2. Obtain the average of the last two absorbing solution samples ($A_{100\%}$).

3. Subtract the value from step 2 from the value of step 1.

   $(A_{100\%} - A_{0\%})$

4. Multiply the value from step 3 by 0.99 (99%)

   $(A_{100\%} - A_{0\%}) * 0.99$

5. Divide the value obtained in step 4 by 1.00 (100%).

   $((A_{100\%} - A_{0\%}) * .99) / (1.00)$

6. Add the values in step 5 and step 1 for the final value.

Carryover

The carryover evaluation tests the rinse volume to ensure it is true for all the lines in the system. This test is performed on all lines used, but only on source A.

Materials required

1. 1 UV/Vis Spectrophotometer

2. 1 Absorbing Solution with a UV Absorbance of approximately 1.00 Au

   a. Caffeine solutions or prednisone solutions are suitable choices.

   b. An absorbance of 0.90 to 1.10 AU is recommended.

3. DI or higher quality water

4. Test Tubes

   a. Vials are not recommended due to sample size.

   b. Recommended sample size is 7 - 10 mL for UV analysis.

This is the procedure for obtaining the samples

1. Place all the sample lines for source A into the DI water.

2. Prime the system with no less than 20 mL of DI water.

3. Using the Vision G2 AutoPlus controls obtain a sample of the blank solution.

4. Place the sample probes in the absorbing solution.

5. Rinse with the previously determined rinse volume.

6. Using the Vision G2 AutoPlus controls obtain a sample of the absorbing solution.

7. Place the sample probes in the DI water.

8. Rinse with the determined rinse volume.

9. Using the Vision G2 AutoPlus controls obtain a sample of the blank solution.

10. Repeat steps 4 through 9 until there are 3 samples of the absorbing solution and 3 samples of the blank solution.

11. Clean probes using DI water.

Due to variation over time on many UV/Vis spectrophotometers, it is recommended to run the samples in the following order:

Line 1, Blank sample 1 Line 1, Blank sample 2 Line 1, Blank sample 3 Line 2, Blank sample 1 Line 2, Blank sample 2 … Line 8, Blank Sample 3 Line 1, Absorbing Sample 1 … Line 8, Absorbing Sample

When the absorbances of the samples are obtained, it must be determined whether or not the rinse volume is sufficient. To do this, use the two following calculations.

For absorbing solutions

Absorbing solution absorbances must not be less than 0.99 x (first absorbing solution for the line).

For blanks

Blank value must not be more than 0.01 x (first absorbing solution for the line) + (first blank sample for the line).

Moving and Storage

If the AutoPlus will not be used for a short period of time (3 days or more), the instrument should be cleaned and the power should be turned off. If the AutoPlus will not be used for an extended period of time (30 days or more), the instrument should be cleaned, covered, and unplugged from the power source.

The instrument is heavy and great care should be taken when moving it. If the instrument is moved to a new location, revalidation should be considered.

Two people are required to lift the AutoPlus and/or AutoFill. Lifting should be done with one person situated on each side of the instrument. Remove the collection rack before moving the instrument. Lift the equipment by the base (applies to both AutoPlus and AutoFill).

Warning: Lifting without assistance may cause injury.

AutoPlus

1. Remove all liquid sources and program the AutoPlus to pump 20 mL of air to clear as much liquid from the system as possible.

2. Turn the power off. Disconnect all tubing, communication, and electrical connections from the unit.

AutoFill

1. Turn the power off. Remove rack and secure needle arm.

2. Disconnect all tubing, communication, and electrical connections from the unit.

Troubleshooting

Contacting Teledyne Hanson Research for Technical Support

For technical support, please submit a TSR form located at:

http://www.teledynehanson.com/tech-support-request

or e-mail hansontechsupport@teledyne.com

If you require phone support, please call 818.882.7266 and select the option for Technical Support. Please have the following information available:

1. Instrument Type

2. Serial Number

3. Firmware Version

4. What is the system configuration? How is the Vision G2 AutoPlus connected to other equipment?

5. How long did the equipment work before the problem occurred?

6. How old is the equipment?

7. Were there any recent repairs or maintenance on the unit?

8. How is the system being used? What is the application?

9. Detailed information about the problem. What is working and what is not?

10. The troubleshooting steps that have already been taken.

Communication Troubleshooting

Problem	Possible Causes	Recommended Action
Vision G2 AutoPlus will not communicate with network	Vision G2 AutoPlus not properly configured	Ensure correct IP address, Gateway Address, and Subnet Mask are entered in the configuration screen.
	Network cable is faulty	Replace network cable.
	Network switch or port is faulty	Contact THR Technical Support.
Vision G2 AutoPlus will not communicate with Vision dissolution testers	Vision G2 AutoPlus not properly configured	Ensure correct IP address, Gateway Address, and Subnet Mask are entered in the configuration screen.
	Testers are not properly configured	Ensure correct IP address, Gateway Address, and Subnet Mask are entered in the configuration screen for each tester.
Vision G2 AutoPlus will not print to a network printer	Vision G2 AutoPlus not properly configured	Ensure correct IP address, Gateway Address, and Subnet Mask are entered in the configuration screen. Printer port may be improperly configured. Consult IT department for correct port.
	Printer is not configured properly	Contact IT department for printer configuration.
	Printer does not support PostScript in the firmware	Change printer to one that supports PostScript.
Vision G2 AutoPlus will not communicate with AutoFill	Vision G2 AutoPlus is not properly configured	Set Collector to AutoFill in Setup Screen.
	AutoFill is not connected	Connect AutoFill to Vision G2 AutoPlus using RS-232 cable between Sampler and Collector ports.
	AutoFill is not turned on	Ensure AutoFill is powered on.

Electrical Troubleshooting

Problem	Possible Causes	Recommended Action
Unit will not turn on	Power switch is off	Turn power switch to the ON position.
	Power is disconnected	Check and connect power.
	Power supply is defective (no light on power supply)	Check or replace power supply.
	Room or building is without power	Contact maintenance or electric company as appropriate.
Touchscreen display not responding properly	Touchscreen is not calibrated	Calibrate touchscreen from Display menu using stylus. Calibrate touchscreen by touching the screen within 3 seconds of the version number being displayed as the Vision G2 AutoPlus boots up.
	Touchscreen is damaged	Contact THR Technical Support.
No sound when buttons are touched	Volume is turned down	Raise volume through display screen.
	Touchscreen is damaged	Contact THR Technical Support.

Mechanical Troubleshooting

Problem	Possible Causes	Recommended Action
Sample volumes inconsistent	Not using vial caps	Use recommended vial caps.
	Leaking syringe	Check and replace syringe.
	Plugged valve or line	Check valve and lines.
Sample volumes incorrect	Not using vial caps	Use recommended vial caps.
	Offset volume not set or set incorrectly	Contact THR Technical Support.
	Plugged valve	Check valve.
Excessive carryover	Inadequate rinse volume	Increase rinse volume.
	Used sample filters	Replace sample filters.
Drug loss	Sample adsorbing to filters or other parts of the liquid flow path	Evaluate filters; sample may be absorbing to them. See list of wetted parts.

Serial (Validation) Printer Troubleshooting

Problem	Possible Causes	Recommended Action
Light always blinks	No paper.	Replace paper roll.
	Paper incorrectly installed.	Check paper to see that it is installed correctly and that the paper indicator button is not stuck. Consult printer operation manual.
Prints a little and then light blinks	Paper incorrectly installed.	Check paper to see that it is installed correctly and that the paper indicator button is not stuck. Consult printer operation manual.
Will not print	No paper.	Replace paper roll.
	Paper incorrectly installed.	Check paper to see that it is installed correctly and that the paper indicator button is not stuck. Consult printer operation manual.
	Printer not connected.	Connect printer.

Serial (Validation) Printer Self-Test

Turn power off, hold down the LF button, and turn power back on. When unit begins to print, release button.

Network Printer Troubleshooting

Problem	Possible Causes	Recommended Action
Tester will not print	IP address incorrect.	Set the IP address of tester to work with printer.
	No PostScript support.	Switch to a printer with PostScript supported by the printer firmware.
	Printer settings incorrect.	Ensure printer settings are correct for printer in system configuration.

Specifications

Vision G2 AutoPlus Specifications

Weight: (dry) 21.3 kg (47.0 lbs.)

Size:

Height: 46.8 cm (18.4 in.)

Width: 38.1 cm (15.0 in.)

Depth: 66.0 cm (26.0 in.)

Power:

Input: 24 VDC, 3.75 A, 90 W

Only use external power supply (listed below)

AutoFill Specifications

Weight: (dry) 14.5 kg (32.0 lbs.)

Size:

Height: 40.1 cm (15.8 in.)

Width: 28.0 cm (11.0 in.)

Depth: 47.3 cm (18.6 in.)

Power:

Input: 24 VDC, 3.75 A, 90 W

Only use external power supply (listed below)

External Power Supply

Power:

Input: 100 - 240 V~,50 - 60 Hz, 1.5 A max

Output: 24 VDC, 3.75 A, 90 W

General Specifications

Sampler Volume Accuracy:

0.5 to 5.0 mL: ± 0.05

5.1 to 10.0 mL: ± 0.10

10.1 to 15.0 mL: ± 0.15

Sampling:

Minimum sample interval: 1 min (5 min is normal)

Maximum sample interval: 999 hours, 59 min (999:59)

Sample time points: 50 max

Maximum sample volume: 90% of vial capacity

Collection:

13 x 100 rack: 18 x 8 test tubes, 144 total

16 x 100 rack: 18 x 8 test tubes, 144 total

12 x 32 rack: 21 x 8 vials, 168 total

UPLC rack (12 x 32): 3 trays 6 x 8 vials, 144 total

Septum: Pre-cut type only.

Warning: Failure to use pre-cut septa can result in damage to the AutoFill needles.

Wetted Materials

Part Number	Description	Wetted Materials
AutoPlus		
	Tubing	PTFE, ETFE
91-450-056	DissoScan Valve	PEEK, EPDM, 304SS
91-450-076	Maximizer Valve	PEEK, EPDM, PFE, 304SS
60-200-550	5 mL Syringe	PTFE, PEEK, Borosilicate Glass
AutoFill		
61-207-717	Home Port Stand	PVDF (PVDF)
61-207-723	PEEK Needles	PEEK
91-030-051	16 mm x 100 mm Test Tubes	Borosilicate Glass
91-030-150	12 mm x 32 mm Vials	Borosilicate Glass, Silicone, PTFE
61-107-003	16 mm Evaporation Caps	Polyethelene
61-105007	Retrival Block	PVDF (PVDF)
61-105-029	Syringe Barrel	Borosilicate Glass
91-425-028	Viton O-Ring	Viton
91-951-004	Silicone Compound	Silicone

Table H-1 Wetted Materials

General Warranty

Teledyne Hanson Research (THR) is a division of Teledyne Instruments, Inc. Teledyne Hanson products are warranted for one full year including parts and labor. Service contracts and preventive maintenance contracts are available for post-warranty support. International dealer warranties may vary. THR makes no warranty, expressed or implied, for glassware, consumables, or products not manufactured by THR, as evidenced by nameplate on the item or other designation. THR will give reasonable assistance to buyer in obtaining from the respective manufacturer whatever adjustment is available under the manufacturer's own warranty. THR shall be released from any and all obligations under any warranty, either expressed or implied, if the product covered is repaired or modified by other than its own personnel, or without written authorization from THR. There are no other warranties, expressed or implied, and THR shall not be liable under any circumstances for damages of any kind, direct, consequential, or otherwise.

Appendix A: Errors

Vision Errors

Error Code	Error Category	Title	Message	Fault	Check the Following
0001	2	Backup Error	Corrupted data encounterd during backup. Contact Tech Support.	Cannot open one of the protocols on the monument board when backing up the protocols.	1. Try a new USB drive. 2. Try a new copy of the backup file. 3. Contact Technical Support if problem persists.
0002	2	USB Drive Backup Error	Error accessing the protocol backup file on the USB drive. Make sure the USB drive has enough space or try a different USB drive.	Cannot read or write the protocols backup file from the USB flash drive when restoring protocols from backup.	1. Try a new USB drive. 2. Try a new copy of the backup file. 3. Contact Technical Support if problem persists.
0003	2	Restore Error	Error restoring the protocols from a protocol backup file. Data in the instrument memory might be corrupted. Contact Tech Support.	When restoring protocols from a backup, the checksum of the backup file was checked one more time at the end of the restore, and it failed. The protocol data that was copied to the monument board memory might be corrupted. Corrupted protocols backup file or the backup file contains protocols of an unknown version.	1. Try a new USB drive. 2. Try a new copy of the backup file. 3. Contact Technical Support if problem persists.
0004	2	USB Drive Restore Error	Error accessing the protocol backup file on the USB drive. The protocol backup file on the USB drive might be missing or corrupted.	Corrupted protocols backup file or the backup file contains protocols of an unknown version.	1. Try a new USB drive. 2. Try a new copy of the backup file. 3. Contact Technical Support if problem persists.
0005	2	USB Drive Write Error	Error occurred while writing data to the USB drive. Make sure the USB drive has enough space or try a different USB drive.	Information could not be sent to USB flash drive.	1. Unsupported USB flash drive 2. Monument board failure 3. Main board failure
0006	1	Could Not Import Logo	Make sure the logo.jpg file being imported has the correct format as described in the User Guide.	Logo.jpg does not meet system requirements.	Logo.jpg requirements in User Guide
0007	4	Missing Report Template	Report template missing. Contact Tech Support.	Printing templates data is not found in main board memory. Could be that memory went bad, or cannot communicate with memory or that data was not written there during the firmware update, which means corrupted firmware update image.	1. Bad image file for firmware update 2. Main board failure
0008	4	Corrupt Report Template	Report template corrupted. Contact Tech Support.	Corrupted or invalid data in the printing templates memory.	1. Bad image file for firmware update 2. Main board failure
0009	2	Instrument Memory Error	Error occurred while accessing instrument memory. Contact Tech Support.	Error Reading or Writing information to the instrument memory located on the monument board.	1. Normal after a firmware update - should not persist after first reboot 2. Monument board failure 3. Main board failure
0010	6	Instrument Memory Error		Error Reading data from the instrument memory or corrupted data in the instrument memory.	Contact Technical Support
0011	4	I2C Bus Error	I2C Bus Error detected. Restart the instrument. If the problem persists, contact Tech Support.	The system detected I2C bus error.	1. Monument board failure 2. Main board failure 3. Display failure
0012	4	SPI Bus Error	SPI Bus Error detected. Restart the instrument. If the problem persists, contact Tech Support.	The system detected SPI bus error. SPI bus error was detected when reading printing templates from memory during printing.	Main board failure
0013	4	Checksum Error	Error occurred while calculating the protocols checksum. Contact Tech Support.	System is unable to caclulate a checksum for the protocols.	1. Monument board failure 2. Main board failure or corrupted memory or unknown version of protocol data

Error Code	Error Category	Title	Message	Fault	Check the Following
0014	2	Firmware Update Failed	Firmware update failed. Contact Tech Support.	Part of the firmware update process failed to work.	1. Firmware file may be corrupted 2. Monument board failure 3. Main board failure 4. Display failure
0015	2	Display Image Version Mismatch	Display image version mismatch. Contact Tech Support.	Firmware image does not match display firmware, or unexpected display image version returned by the display.	1. Display firmware is compatabile with system firmware 2. Display failure
0016	1	Version Compatibility Error	The firmware versions of the instruments in the system are not compatible. Contact Tech Support.	Mistmatched firmware between different instruments.	Compatibility of firmware between instruments
0017	3	Test Log Full	Test log is full. Update the protocol so it generates less test log data.	The test has generated more data than is capable of fitting in the instruments memory.	Occurrence of print status messages
0018	1	Auto-Start Can't Be in Past	Check current time and set Auto-Start time in the future.	User set Auto-Start in the past.	Auto-Start date set in the future
0019	7	Temp Tolerance Error X °C		Temperature reached an out of tolerance value during a test.	1. Pump flow 2. Temperature probe accuracy
0020	3	Speed Tolerance Error X rpm	The drive speed is outside of the tolerance. Contact Tech Support.	Motor speed reached an out of tolerance value during the test.	Contact Technical Support.
0021	7	Vessel X Tolerance Error: X		Temperature reached an out of tolerance value during a test.	1. Pump flow 2. Temperature probe accuracy
0022	1	Printer Comm. Error	The printer is not communicating. Make sure the printer is online and connected.	The printer is off or not configured correctly.	1. Printer connection 2. Printer tab in system configuration 3. Printer status
0023	1	Protocol Has No Name	Protocol has no name. Assign a name for the protocol or delete the protocol.	Protocol name field is blank.	Protocol name filed in protocol
0024	1	Protocol Name Already in Use	Protocol name already in use. Choose a different name for the protocol.	Protocol name is in use by another protocol.	Protocol name filed in protocol
0025	1	Protocols at Maximum	Maximum number of protocols reached (100). Cannot continue.	Action would create more than 100 protocols.	Unused protocols should be removed.
0026	1	Events Beyond Max Number	This selection creates more than the allowed number of individual events. Check the User Guide.	The number of programmed events has exceeded 50.	1. Occurrence field of events 2. Total events number 50 or less
0027	1	Events Beyond Max Time	One or more event times are beyond the max test length. Check the User Guide.	Events cannot occur past 999:00 (hhh:mm).	1. Occurrence field of events 2. Time between events field
0028	1	AutoMag Configuration Mismatch	AutoMag configuration and the protocol do not match.	Magazine travel in protocol exceeds that of configured AutoMag.	1. Magazine travel field for protocol 2. System configuration of AutoMag
0029	1	Not Configured for AutoMag	Tester not configured for AutoMag required by the protocol.	A protocol has a magazine travel set to something besides 0 when no AutoMag is present in the configuration.	1. Magazine travel field for protocol 2. System configuration of AutoMag
0030	1	Need DTP for Vessel Goal Temp	DTPs need to be enabled for non-zero Vessel Goal Temperature.	Protocol parameter conflict; enable DTPs in protocol.	1. The vessel temperature field for protocol 2. System configuration of Digital Temperature Probes (DTPs)
0031	1	AutoDosage Delay for AutoStart	Need AutoDosage delay value for using Auto-Start. 5 seconds is recommended.	Protocol parameter conflict; specify AutoDosage delay.	1. Auto Dosage Delivery covers configuration 2. Auto Dosage Delivery delay setting
0032	1	ADD Configuration Mismatch	ADD configuration and the protocol do not match.	The protocol specifies use of Auto-Start, but Auto Dosage Delivery covers are not configured.	1. Auto Dosage Delivery covers configuration 2. Auto Dosage Delivery delay setting
0033	3	Delay Only for Pre- or Post-Run	Delay events are only valid for Pre-run or Post-run events.	User tried to set delay event during test.	Pause event in User Guide

Error Code	Error Category	Title	Message	Fault	Check the Following
0034	3	Illegal Parameter at Event X	Event X has illegal parameter value. Update the protocol and use a valid parameter.	One of the parameters of the specified event is incorrect.	Event and User Guide for proper syntax
0035	1	Illegal Parameter	The parameter value specified is invalid. Use a valid parameter.	One of the parameters of the specified event is incorrect.	Event and User Guide for proper syntax
0036	1	No Pre- or Post-Run Samples	Pre-run or Post-run time sampling not supported. Set sample event during test.	User tried to sample in pre-run or post-run.	Sampling events occur during testing.
0037	1	1 Pre/Post-Run Event at a Time	Pre- and Post-run events can only be made one at a time. Change Number of Events to 1.	The occurrence was greater than 1 when creating a pre- or post-run event.	The occurrence field when creating an event
0038	4	Real Time Clock Error	Set the date and time of the instrument. If the problem persists, contact Tech Support.	Time or date not set or corrupted, reported when the instrument is powered on. Time or date not set or corrupted, reported right before the test run.	1. Time and date set 2. Instrument powered on for 5 minutes 3. Main board failure
0039	1	Incorrect Alarm Date/Time	The alarm cannot be set in the past. Check current time.	User attempted to set alarm in the past.	Alarm set for the future
0040	1	System Date Not Set	System date needs to be set before setting alarm date.	System date has not been set.	System date
0041	1	System Date Not Set	System date needs to be set before setting alarm time.	System date has not been set.	System date
0042	1	System Date Not Set	System date needs to be set before setting start date.	System date has not been set or has been corrupted.	System date
0043	1	System Date Not Set	System date needs to be set before setting start time.	System date has not been set or hasbeen corrupted.	System date
0044	1	Password Change Failed	Re-entered password didn't match the new password.	The re-entered password didn't match the first password entered.	Password and verification should match.
0045	1	Collect Must Be > Detect Vol	The collect volume can't be lower than the detect volume. Increase Collect volume or lower Detect volume.	The detect volume is the same as or greater than the collect volume.	Collect volume is greater than the detect volume.
0046	3	Call X Late X min X s	Call X was late X min X s due to a timing conflict. Check event times.	The Call event occurred later than programmed because another event was taking place.	Time between events
0047	1	Possible Timing Conflict	The event at time X might cause a timing conflict.	One or more of the events may overlap causing a delay.	Time between events
0048	3	Sample X Late X min X s	Sample X was late X min X s due to a timing conflict. Check event times.	The sample collection was delayed because one or more events were still being executed.	Time between events
0049	1	No Pre- or Post-Run events	Pre-run or Post-run time events not supported in events libraries.	Pre run or post run events can only be executed at the protocol level.	Review user guide.
0050	1	Call Event Not Supported	Calling an event library from an event library is not supported.	Call events can only be used in protocols	Review user guide.
0051	1	Event Library Name Too Long	Event Library name cannot be more than 11 characters long.	Event library name is too long. Shorten the event library name.	Review user guide.
0052	1	Cannot Load the Library	Library X could not be loaded. Check that it exists.	The event library may have been deleted after the protocol was created.	Review existing protocols and event libraries.
0053	1	No Pre- or Post-Run Samples	Library X has a sample event. It cannot be called at Pre-run or Post-run.	Sample events are not permitted in pre or post run. This includes event libraries called in the pre or post run.	Review user guide.

Appendix A: Errors

Vision AutoPlus/Microette Errors

Error Code	Error Category	Title	Message	Fault	Check the Following
1200	4	Tester X Comm. Error	Tester X is not communicating. Make sure it is online and connected.	Tester X is not communicating with the autosampler.	1. Connection to tester X 2. System configuration of tester X
1201	1	Tester X Comm. Error	Tester X is not communicating. Make sure it is online and connected and press 'Refresh'.	Tester X is not communicating with the autosampler.	1. Connection to tester X 2. System configuration of tester X
1202	5	Tester X Comm. Recovered			
1203	4	Unexpected Response From X	Tester X returned bad or unexpected response. If the problem persists restart the system.	The response the autosampler expected was not the response it received from the instrument on port X.	Compatibility of autosampler and instrument firmware
1204	4	Unexpected Data From X	Tester X returned unexpected data. Contact Tech Support.	Most likely caused by firmware version mismatch between the sampler and instrument on port X.	Compatibility of autosampler and instrument firmware
1205	1	Tester X ADD Config. Mismatch	Tester X Auto-Dosage Delivery configuration and protocol do not match.	Protocol is set for Auto-Dosage-Delivery but the tester is not configured for it.	1. Protocol settings 2. System configuration
1206	1	Tester X AutoMag Config. Mismatch	Tester X AutoMag configuration and protocol do not match.	Protocol is set for AutoMag use but tester is not configured for it.	1. Protocol settings 2. System configuration
1207	1	Tester X DTP Config. Mismatch	Tester X DTP configuration and protocol do not match.	Protocol is set for using DTP's but tester is not configured for it.	1. Protocol settings 2. System configuration
1208	5	Stirrer X Comm. Recovered			
1209	4	Stirrer X Comm. Error	Stirrer X is not communicating. Make sure it is online and connected.	An instrument on port X is not communicating.	1. Connection to instrument on port X 2. System configuration of instrument on port X 3. For Microette, check the ComSwitch
1210	1	Stirrer X Comm. Error	Stirrer X is not communicating. Make sure it is online and connected, then press 'Refresh'.	An instrument on port X is not communicating.	1. Connection to instrument on port X 2. System configuration of instrument on port X 3. For Microette, check the ComSwitch
1211	5	Circ. Waterbath Comm. Recovered			
1212	4	Circulating Waterbath Comm. Error	The circulating waterbath is not communicating. Make sure circulating waterbath is online and connected.	The circulating waterbath is not communicating.	
1213	4	Homing Error	The autosampler cannot find the home position for the syringes. Contact Tech Support.	The autosampler cannot find the home position for the syringes.	1. Syringe motor failure 2. Home sensor failure 3. Valve board failure 4. Valve board connect 5. Autosampler main board failure

Error Code	Error Category	Title	Message	Fault	Check the Following
1214	6	Dispense Used X Extra Steps		The number of encoder steps for the syringe motor when dispensing was not correct.	1. Guide rods and syringe motor for damage/restriction 2. Syringe motor failure
1215	6	Load Used X Extra Steps		The number of encoder steps for the syringe motor when loading was not correct.	1. Guide rods and syringe motor for damage/restriction 2. Syringe motor failure
1216	1	Syringes Not Home	Syringes not at home position. Use the Tools menu to dispense the contents of the syringes and move the syringes to home position.	The syringes are not in the home position.	1. Syringes have not been homed prior to command 2. Home sensor failure 3. Valve board failure 4. Valve board connection 5. Main board is damaged
1217	1	Syringes Never Homed	Syringes were not homed at startup. Restart the instrument to home the syringes.	Syringe homing failed at startup.	
1218	1	Syringes Not Homed	Syringes not homed. Make sure AutoFill is online and restart the autosampler.	Syringe homing failed at startup due to collector.	
1219	4	Syringe Pump Position Error	The syringes are not in the position expected by the autosampler. Contact Tech Support.	The syringes are not in the position expected by the autosampler.	Syringe motor is stalling or syringe motor encoder is failing
1220	4	AutoFill X Comm. Error	AutoFill X is not communicating. Make sure AutoFill is online and connected.	The autosampler cannot communicate with the AutoFill. The AutoFill was unable to move the needles when commanded.	1. AutoFill connection 2. AutoFill power 3. For Microette, check the ComSwitch 4. Needle jams 5. Needle motor failure 6. Needle motor connection
1221	4	AutoFill Comm. Error	AutoFill is not communicating. Make sure AutoFill is online and connected.	Unable to communicate with the AutoFill.	Check connection to the AutoFill
1222	4	Command Buffer Overrun	Too many commands sent to AutoFill too quickly. If problem persists, use Tools menu to home AutoFill 3 times or restart system.	The memory used for storing AutoFill commands is full.	The user has sent too many commands to the AutoFill at once.
1223	1	AutoFill Configuration Mismatch	AutoFill configuration and protocol do not match.	Protocol requires an AutoFill but system is not configured for one.	
1224	1	SR8-Plus X Is Not Ready	SR8-Plus X not ready. Check printer, protocol and configuration.	SR8-Plus is saying it is not ready to start the test.	Inspect SR8-Plus
1225	4	SR8-Plus X Comm. Error	SR8-Plus X is not communicating. Make sure it is online and connected.	AutoPlus and SR8-Plus are not communicating.	Inspect communication connection to SR8-Plus
1226	1	SR8-Plus X Configuration Error	SR8-Plus X is not configured properly. Check configuration on SR8-Plus.	SR8-Plus configuration does not match AutoPlus protocol.	Check AutoPlus protocol and SR8-Plus configuration

Error Code	Error Category	Title	Message	Fault	Check the Following
1227	1	Protocol Incompatible with SR8	Too many sampling points for SR8-Plus (40 max). Lower the number of sampling points.		
1228	1	Protocol Incompatible with SR8	Temperature out of range for SR8-Plus (30-40C). Change protocol temperature.		
1229	1	Protocol Incompatible with SR8	Print interval too large. Lower protocol print interval.		
1230	1	Protocol Incompatible with SR8	Magazine stroke out of range for SR8-Plus (25-150). Change protocol Magazine Travel.		
1231	1	Protocol Incompatible with SR8	Event X not supported by SR8-Plus. Remove event from protocol.		
1232	1	Protocol Incompatible with SR8	SR8-Plus X doesn't support protocol parameter or configuration mismatch. Check system config and protocol.		
1233	3	AutoFilter Not Coupled	AutoFilter not coupled. Risk of leak present. Check AutoFilter.		
1234	3	AutoFilter Removed from Test	User removed the AutoFilter from the test.	User has stopped the test on the AutoFilter.	
1235	3	AutoFilter Error	The AutoFilter had an error. Check AutoFilter.		
1236	5	AutoFilter Comm. Recovered			
1237	3	AutoFilter Coupled Through	The AutoFilter had to couple in the through position without filters. Check AutoFilter.		
1238	3	AutoFilter Filters Discarded	The AutoFilter had to discard the filters unexpectedly. Check AutoFilter.		
1239	3	AutoFilter Filters Not Reused	The AutoFilter had to change the filters. The filters were not reused.		
1240	3	AutoFilter Change Filter Failed	The AutoFilter could not change the filters. Check AutoFilter.		
1241	3	AutoFilter Reuse Filter Failed	The AutoFilter could not reuse the filters. Check AutoFilter.		
1242	3	AutoFilter Discard Filter Failed	The AutoFilter could not discard the filters. Check AutoFilter.		
1243	3	AutoFilter Hold Filter Failed	The AutoFilter could not hold the filters. Check AutoFilter.		

Error Code	Error Category	Title	Message	Fault	Check the Following
1244	1	AutoFilter Config. Mismatch	AutoFilter configuration and protocol do not match.	Protocol uses AutoFilter while none is specified in the system configuration.	
1245	1	AutoFilter Display Lock Error	An error occurred when trying to lock the AutoFilter display. Check AutoFilter.		
1246	1	AutoFilter Coupling Error	AutoFilter error while coupling. Check AutoFilter.		
1247	4	AutoFilter Comm. Error	AutoFilter is not communicating. Make sure AutoFilter is online and connected.		
1248	4	Unexpected Response From AutoFilter	Bad or unexpected response received from AutoFilter. If the problem persists restart the system.	Most likely caused by firmware version mismatch between the sampler and AutoFilter	
1249	3	AutoFilter X Error	X AutoFilter command failed to execute. Check AutoFilter.		
1250	3	AutoFilter Command Error	AutoFilter command did not complete fast enough. Check AutoFilter.		
1251	3	Sample X Missed	An error occurred which caused a sample to be missed. Review the Test/Error Log.	An error occurred, which caused a sample to be missed. Syringe Error, Rack Missing, or AutoFilter did not couple properly.	Error and Test Log; exact cause will vary
1252	3	Transfer Late X min X s	Transfer late X min X s due to a timing conflict. Check event times.		
1254	7	Transfer Skipped, Uncoupled	Transfer skipped because AutoFilter did not couple. This and subsequent transfers must be done manually.		
1255	3	Transfer Skipped, Syringe Error	Transfer skipped because of syringe pump error. This and subsequent transfers must be done manually.		
1256	3	Sample X Skipped, Uncoupled	Sample skipped because the AutoFilter did not couple. This and subsequent samples must be done manually.		
1257	3	Sample X Skipped, Syringe Error	Sample skipped because of syringe pump error. This and subsequent samples must be done manually.		
1258	7	Media Replace Skipped			
1259	7	Retrieval Skipped			
1260	7	Dilution Skipped			

Error Code	Error Category	Title	Message	Fault	Check the Following
1261	3	Wash Sequence Error	An error occurred during the wash sequence. Wash aborted. Review Test/Error Log.	An error occurred during the wash, which caused it to abort.	Error and Test Log; exact cause will vary
1262	4	Wash Aborted	Wash aborted. Review the Test/Error Log.		
1263	1	Choose at Least 1 Instrument	At least one instrument must be selected in order to run a test. Select an instrument.	No tester or cell group selected for a test.	Tester or cell group selection for test
1264	1	Can't Pause While Sampling	Cannot pause the test while the syringe is moving. Wait for transfer to complete before pausing.	Tests can't be paused while sampling.	If user intends to stop test, user should touch the Stop button.
1265	1	Unsupported Sampling Mode	Manual sampling protocols must be run on the tester. Set mode to Collect Only or Collect and Detect.	User has tried to run a protocol with manual sampling on an autosampler.	Sampling Mode field in the protocol
1266	1	Retrieval Config. Mismatch	Retrieval configuration and protocol do not match.	The protocol specifies use of a Retrieval Reservoir while it is not configured.	1. Retrieval volume field in the protocol 2. Retrieval option in the system configuration
1267	1	Media Replace Config. Mismatch	Media Replace configuration and protocol do not match.	Protocol specifies media replacment while port C is not configured for it.	1. Media replace field in the protocol 2. The ports in the system configuration
1268	1	Auto Wash Config. Mismatch	Auto Wash configuration and protocol do not match.		
1269	1	Invalid Tester Combination	Cannot select both SR8-Plus and Vision G2 tester for the same test run.		
1270	1	Collect > Test Tube Volume	The Collect Volume is larger than the selected rack's test tube volume.		
1272	3	Sample X Skipped, AutoFill Error	Sample skipped because of AutoFill jam or error. This and subsequent samples must be done manually.		
1273	3	Transfer Skipped, AutoFill Error	Transfer skipped because of AutoFill jam or error. This and subsequent transfers must be done manually.		
1274	1	0 Collect Volume	The Collect Volume is 0.	For collect and collect and detect methods, the collection volume should be greater than 0 mL.	

AutoFill Errors

Error Code	Error Category	Title	Message	Fault	Check the Following
1400	4	Dispense Head Movement Error	Check for obstruction around AutoFill dispense head. If the problem persists, contact Tech Support.	The AutoFill was unable to move the dispense head when commanded.	1. Dispense head jam 2. Dispense head drive motor failure 3. Dispense head motor connection
1401	4	Needles Movement Error	Check for obstruction around AutoFill needles. If the problem persists, contact Tech Support.		
1402	5	Needles Needed X Extra Steps		The needle motor is jamming when attempting to move.	1. Restriction of needle drive 2. Needle motor failure
1403	5	Disp. Head Needed X Extra Steps		The dispense head motor is jamming when attempting to move.	1. Restriction of dispense head drive 2. Dispense head motor failure
1404	3	No Rack Detected	The rack is missing. Please install the rack.	The AutoFill cannot detect a rack.	1. Rack is missing on the AutoFill 2. The rack is not sitting properly on the AutoFill 3. The AutoFill rack detection mechansim failure
1405	3	Unknown Rack	AutoFill does not recognize the rack. Contact Tech Support.	The AutoFill does not recognize the rack.	1. The rack is not programmed into the AutoPlus 2. Rack damage 3. AutoFill rack detection mechanism failure
1406	3	Rack Mismatch	Rack does not match the protocol. Replace the rack.	The protocol specifies a different rack for sample collection.	1. Rack field for the protocol 2. Rack installed on the AutoFill
1407	1	Rack Mismatch	Rack type doesn't match the protocol. Replace the rack and continue or cancel.	The protocol specifies a different rack for sample collection.	1. Rack field for the protocol 2. Rack installed on the AutoFill

Error Code	Error Category	Title	Message	Fault	Check the Following
1408	4	AutoFill Missing Parameter	AutoFill reported missing parameter. Contact Tech Support.	A parameter was missing from a command sent to the AutoFill.	Corruption of the AutoPlus firmware
1409	4	AutoFill CPU Command Error	AutoFill detected CPU command error. Contact Tech Support.	AutoFill software has crashed.	AutoFill main board failure
1410	2	AutoFill Flash Write Error	AutoFill detected error when writing to its internal flash memory. Contact Tech Support.	Memory of AutoFill could not be updated.	1. Interruption in firmware update process 2. AutoFill main board failure
1411	2	AutoFill Flash Read Error	AutoFill detected error when reading its internal flash memory. Contact Tech Support.	Memory of AutoFill could not be read.	AutoFill main board failure
1412	4	AutoFill Unknown Error	AutoFill reported an unknown error X Contact Tech Support.		
1413	4	Command Buffer Overrun	AutoFill reported command buffer overrun. Contact Tech Support.	Too many commands are being sent for the AutoFill to process.	1. AutoFill is connected to the AutoPlus. 2. Reset both instruments and see if problem persists.
1414	2	Unknown Needle Stroke	Unknown needle stroke. Make sure collector is online and restart the autosampler.	AutoFill was powered on after the AutoPlus was powered on.	1. Cycle power on AutoPlus. 2. Check the hardware menu to confirm the stroke length is set properly.

Appendix B: Networking

Networks

A network is a series of devices that are connected together and able to communicate with each other. The Vision G2 dissolution testers and samplers communicate with each other as a network using TCP/IP protocols.

In order for the Vision G2 AutoPlus to communicate with the Vision dissolution testers, it must be connected through a network switch. The AutoPlus and testers each communicate through a TCP/IP protocol which requires a unique IP address, default gateway address, and subnet mask.

A network PostScript capable printer may be connected directly to the switch if the operator wants to use this printer while keeping the system isolated from the larger corporate network.

Isolated Networks

If the operator wishes to have an isolated system, then the switch does not need to be connected to anything else, other than the AutoPlus and testers.
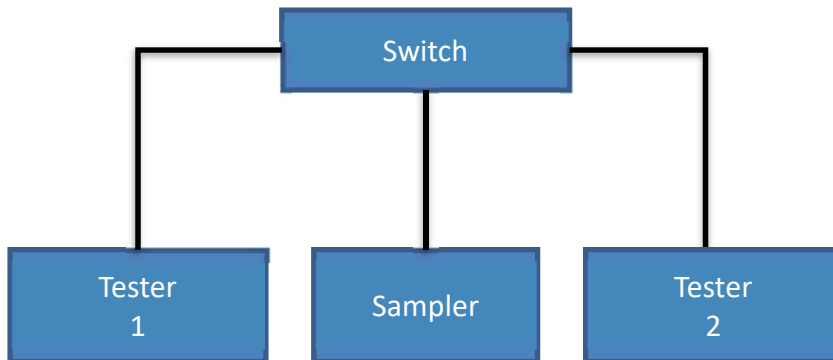
An isolated THR Vision G2 system should be set up as follows:

Vision G2 AutoPlus
IP Address: 192.168.1.10
Default Gateway: 192.168.1.1
Subnet Mask: 255.255.255.0

Vision Dissolution Tester 1
IP Address: 192.168.1.20
Default Gateway: 192.168.1.1
Subnet Mask: 255.255.255.0

Vision Dissolution Tester 2
IP Address: 192.168.1.21
Default Gateway: 192.168.1.1
Subnet Mask: 255.255.255.0

Vision Dissolution Tester 3
IP Address: 192.168.1.22
Default Gateway: 192.168.1.1
Subnet Mask: 255.255.255.0

Network Printer (if applicable)
IP Address: 192.168.1.30
Default Gateway: 192.168.1.1
Subnet Mask: 255.255.255.0

Connecting to Agilent ChemStation systems

When connecting Vision G2 instruments to an Agilent ChemStation system it is required that the PC with the ChemStation software and the 8453 be configured with correct IP addresses. The following settings are recommended:

Agilent ChemStation Computer
IP Address: 192.168.1.1
Default Gateway: 192.168.1.1
Subnet Mask: 255.255.255.0

8453 UV/Vis Spectrophotometer (configured through bootp)
IP Address: 192.168.1.2
Default Gateway: 192.168.1.1
Subnet Mask: 255.255.255.0

NOTE: Teledyne Hanson Research Dissolution System Drivers version 5.0 are required for communication with Vision G2 instruments. Vision G2 instruments require firmware 2.1 or higher.

Corporate Networks

It is also possible to connect the Vision G2 AutoPlus, and Vision dissolution testers to a corporate network. However, when doing so, the operator should contact the IT department to obtain unique IP address settings for the AutoPlus and each of the installed dissolution testers.

For connections to corporate networks, contact the IT department and request the information for each dissolution tester, sampler, or printer to be added. If the IT department requires more information regarding the THR equipment, contact Teledyne Hanson Research Technical Support.
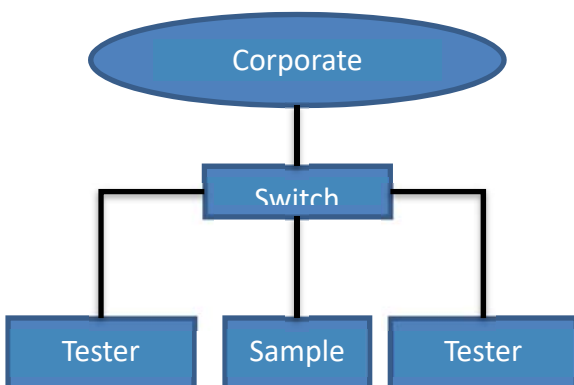
Appendix C: Working with the THR SR8-Plus Dissolution Tester

The Vision G2 AutoPlus autosampler can sample from up to three SR8-Plus dissolution testers. The Vision G2 AutoPlus and SR8-Plus interface is similar to the legacy AutoPlus and SR8-Plus interface, with some exceptions, which are noted in this appendix.

NOTE: This appendix assumes the user's knowledge of terms and concepts explained in the SR8-Plus Operation Manual (p/n 73-100-810) and this user guide.

Firmware Requirements

1. In order for a Vision G2 AutoPlus to interface with a Teledyne Hanson SR8-Plus tester, the Vision G2 AutoPlus must be operating under firmware revision 2.11 and above.

2. In order for a Teledyne Hanson SR8-Plus tester to interface with a Vision G2 AutoPlus, the SR8-Plus must be operating exclusively under firmware version 3.11.

Installation and Configuration

The Vision G2 AutoPlus sampler communicates and controls up to three SR8-Plus testers via RS-232 cables. The Vision G2 AutoPlus communicates directly to the first SR8-Plus and uses the daisy chaining capability of the SR8-Plus to communicate with the other SR8-Plus testers in the system.

Refer to the installation section "Other Dissolution Testers" of this manual and configure each applicable port to "SR8-Plus."

NOTE: If the sampler is configured with a combination of SR8-Plus and Vision G2 testers, then all of the SR8-Plus testers must be configured first, starting with port A and continuing in alphabetical order. So, for a system with two SR8-Plus testers and a Vision tester, the first SR8-Plus must be on port A, the second on port B, and the Vision G2 tester on port C However, a dissolution test cannot be run using SR8-Plus and Vision G2 testers simultaneously.

1. Refer to the installation section "Liquid Connections" of this manual and make all the liquid handling connections shown.

2. Refer to the operation section "Configuration" of this manual and configure the Sampling Probe in the Accessories tab. Select either Magazine for an SR8-Plus equipped with E-Probes or Fixed for a tester equipped with stationary probes.

3. Refer to the operation section "Configuration" this manual and configure the Automatic Dosage Delivery to Yes if the SR8-Plus is equipped with ADD vessel covers.

4. Connect an RS-232 cable (THR p/n 47-200-759) from the Host port on the sampler to COMM1 of the first or only SR8-Plus tester (tester on port A).

5. If required, connect an additional RS-232 cable from COMM2 of the first bath to COMM1 of a second tester (tester on port B).

6. If required, connect an additional RS-232 cable from COMM2 of the second bath to COMM1 of a third tester (tester on port C).

7. If the system has a serial validation printer, it must be connected to COMM3 of the last SR8-Plus in the daisy chain. The Printer setting of the SR8-Plus connected directly to the printer must be configured to Yes. The Printer setting of the rest of the SR8-Plus testers in the daisy chain must be configured to Remote.

    NOTE: If printing is also required on the Vision AutoPlus, then the AutoPlus must be configured with its own serial printer, or a network printer.

Using Vision G2 AutoPlus Protocols

Vision G2 AutoPlus protocols contain all the parameters required by the SR8-Plus testers. There is no need to create additional protocols in the SR8-Plus. When a test starts, the sampler sends the protocol parameters to the SR8-Plus and then commands the tester when to start the dissolution test.

NOTE: Protocol #25 must be reserved for the use of the Vision G2 AutoPlus. At the start of a dissolution run, the sampler will download the test parameters to protocol #25 of the SR8-Plus tester(s) selected. The protocol will be overwritten every time. Use SR8-Plus protocols 1-24 for manual sampling testing.

Appendix C: SR8-Plus Diss. System

Since the SR8-Plus lacks some of the capabilities of the Vision G2 tester, the following limitations must be observed.

Parameter or Event	Restriction
Stagger extension	Default 3 min; cannot be 0.
Drive speed tolerance	Actual value ignored, USP flag set if non-zero. Cannot change during the test run.
Temperature tolerance	Actual value ignored, USP flag set if non-zero. Cannot change during the test run.
Drive speed	Needs to be non-zero and valid for SR8-Plus (25 - 250 rpm). Cannot be changed during the test run.
Bath temperature	Needs to be non-zero and valid for SR8-Plus (30 - 40 °C). Cannot be changed during the test run.
Test length	Needs to be non-zero and valid for SR8-Plus (000:01-999:59 in hhh:mm format).
Print interval	If Print Interval is specified, status will not be printed at sampling times. Cannot change during the test run.
Printing status	Status is printed at the start and end of the test, also either at Print Interval, if it's non-zero, or at sampling time.
Vessel goal temperature	Needs to be valid for SR8-Plus. Cannot change during the test.
Print statistics	Statistics are printed at the end of the test.
Magazine travel	Needs to be valid for SR8-Plus. Cannot change during the test. Magazine travel range is 25 – 140 mm.
Number of sampling events	Maximum number is 40.
Pause event	Not supported (not a valid event).
Drive speed event	Not supported (not a valid event).
Bath temp event	Not supported (not a valid event).
Speed tolerance event	Not supported (not a valid event).
Temperature tolerance event	Not supported (not a valid event).
Print interval event	Not supported (not a valid event).
Status event	Not supported (not a valid event).
Vessel goal temp event	Not supported (not a valid event).
Print statistics event	Not supported (not a valid event).
Magazine travel event	Not supported (not a valid event).

1. Not all the parameters, options and events of a protocol can be used on protocols intended to run on the SR8-Plus. The table above shows the protocol parameters and events that have restrictions when the protocol is run on the SR8-Plus.

2. The default stagger extension time is 3 minutes. To change the value, temporarily set the Sampling Type parameter to Manual. This displays the stagger extension time and allows it to be edited. Once the value is edited to the desired value, change Sampling Type back to a mode other than manual.

3. The actual values of the drive speed tolerance and temperature tolerance are not used during the run. Instead, if either of these values is non-zero, the USP tolerances flag on the SR8-Plus is set. If both of these values are zero, the USP tolerances flag on the SR8-Plus is cleared.

4. If a print interval time is specified in the protocol, the tester status will not be printed at the sampling times, only at the designated print interval. If the print interval is 0, the tester status will be printed at the sampling times.

5. The Vision protocol may contain up to 50 events, but when working with the SR8-Plus, only 40 of those may be sampling events.

6. Events that can change the drive speed, bath temperature, vessel goal temperature, etc. during the test are a new feature of the Vision G2 instruments and are not supported by the SR8-Plus testers.

Running a Dissolution Test

If the user attempts to run a protocol that has any of the restricted parameter values or unsupported events, the sampler reports an error and the test will not start.

NOTE: A dissolution test cannot be run using SR8-Plus and Vision G2 testers simultaneously.
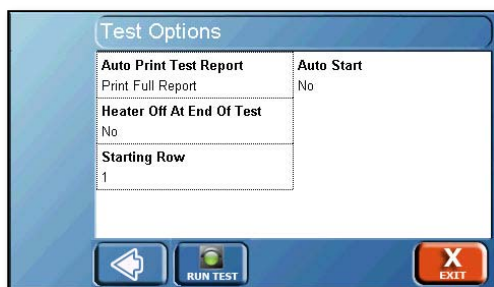
The user is able to configure most of the test options that are available on the sampler, with the following restrictions:
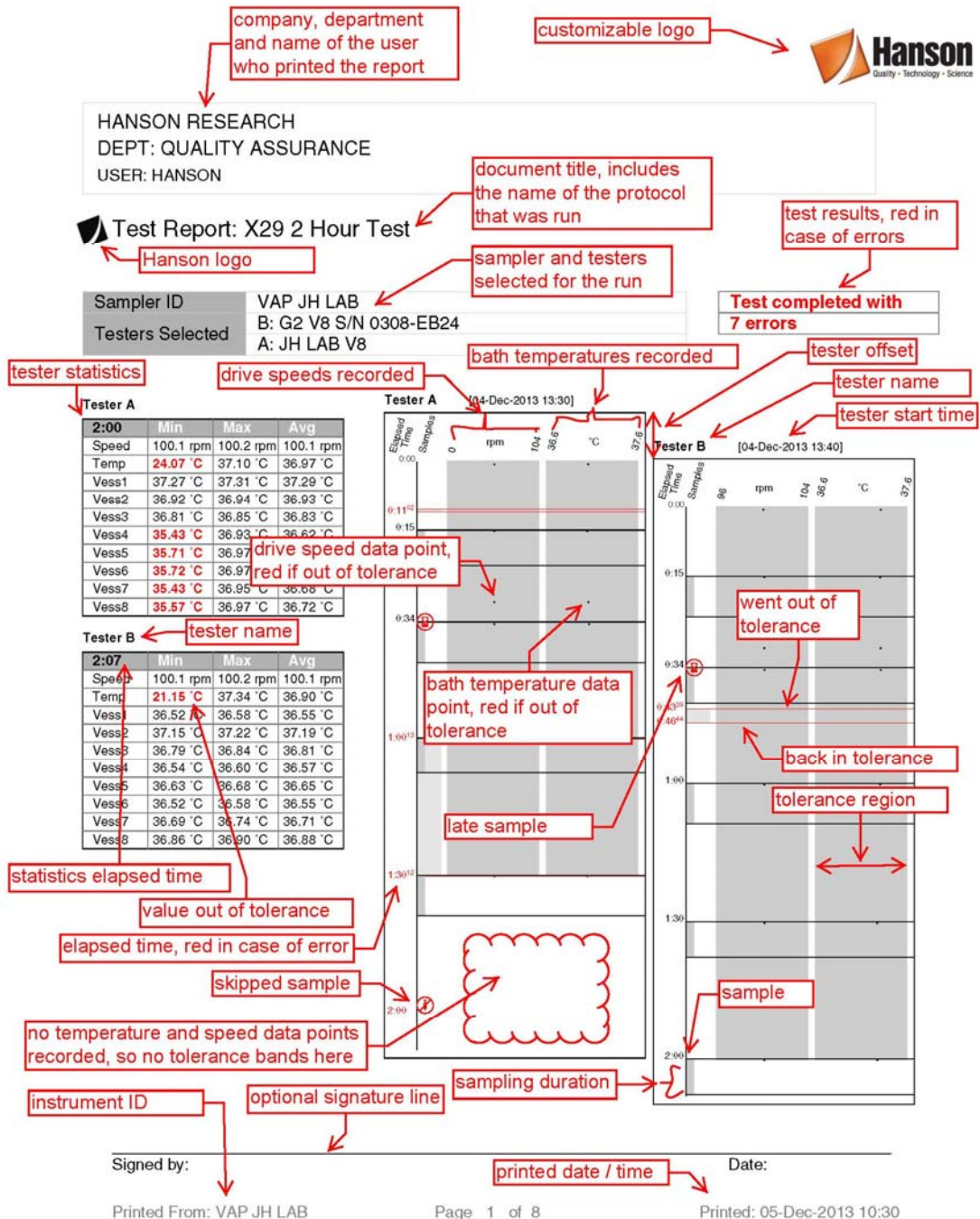
Test Option	Restriction
Heater off at end	The user is not able to configure the option of automatically turning off the heater at the end of the test from the sampler. Note that the user is able to set this feature in the SR8-Plus itself, but only before a test is initialized and the SR8-Plus keypad is still unlocked.
Auto-Start	When using the Auto-Start feature, if the temperature tolerances are enabled in the protocol, the user is not able to configure the option of starting the test at a set time regardless of the bath temperature. It's not possible to start a test on an SR8-Plus before the bath is at the temperature specified by the protocol. The system will only function using Auto-Start with temperature if the SR8-Plus has temperature tolerances enabled.
Pausing a test	Not supported.
USP tolerances setting	At the start of the test, the sampler sets or clears the USP tolerances flag on the SR8-Plus based on the protocol parameters. Since that flag is a global flag, the previous setting of the flag in the SR8-Plus is lost.
Test run data	Test run information generated on the SR8-Plus is printed on the printer configured for the SR8-Plus. The printout includes the protocol parameters, status, and statistics. The Vision G2 AutoPlus protocol name is also printed as well, marked with the PROTOCOL ID label.
Vision test log	None of the test run information that's generated on the SR8-Plus will be available in the Test Log on the sampler and won't be printed on the printer attached to the sampler. The Test Log on the sampler will only contain test run information generated on the sampler. This sampler information will not be sent to the SR8-Plus printer as it was with the legacy AutoPlus.

Appendix D: Reports

Appendix D: Reports

Tester A

0:36:58				Sample
Sample 2	0:36:58	Sample Rinse with Filter, 3.0 ml		Row 3
	0:38:00	Collect with Filter, 5.0 ml		
	0:39:06	Media Replace, 5.0 ml		
	0:40:27	Rinse Retrieval, 15.0 ml		

Tester B

0:30:33	Speed	100.2 rpm	Temperature		37.32 ˚C					Status
	Vessels (˚C)		1	36.90	2	36.74	3	36.56	4	36.68
			5	36.60	6	36.84	7	37.22	8	36.58

Tester A

0:43:41	Sample Done

Tester B

❌ 0:34:45	**Sample late 4 min 45 s**

Tester B

0:34:46	Sample Rinse, 7.0 ml

Tester B

0:35:15	Speed	100.2 rpm	Temperature		37.32 ˚C					Status
	Vessels (˚C)		1	36.90	2	36.74	3	36.57	4	36.65
			5	36.59	6	36.84	7	37.21	8	36.58

Tester B

0:36:50	AutoFilter Filter reused

Tester B

0:36:50				Sample
Sample 2	0:36:50	Sample Rinse with Filter, 3.0 ml		Row 4
	0:37:52	Collect with Filter, 5.0 ml		
	0:38:58	Media Replace, 5.0 ml		
	0:40:19	Rinse Retrieval, 15.0 ml		
	0:42:28	Sample Done		

Tester B

⚠ 0:43:39	**Temp tolerance error 24.30 ˚C**

Tester B

⚠ 0:46:44	Temp within tolerance 36.62 ˚C

Tester A

1:00:01	Sample Rinse, 7.0 ml

Signed by: _____   Date: _____

HANSON RESEARCH
DEPT: QUALITY ASSURANCE
USER: HANSON

Test Report: X29 2 Hour Test

Tester A
2:00:03

Statistics

statistics message

	Min	Max	Avg
Speed	100.1 rpm	100.2 rpm	100.1 rpm
Temperature	24.07 ˚C	37.10 ˚C	36.97 ˚C
Vess1	35.57 ˚C	36.97 ˚C	36.72 ˚C
Vess2	35.43 ˚C	36.95 ˚C	36.68 ˚C
Vess3	35.72 ˚C	36.97 ˚C	36.75 ˚C
Vess4	35.71 ˚C	36.97 ˚C	36.74 ˚C
Vess5	35.43 ˚C	36.93 ˚C	36.62 ˚C
Vess6	36.81 ˚C	36.85 ˚C	36.83 ˚C
Vess7	36.92 ˚C	36.94 ˚C	36.93 ˚C
Vess8	37.27 ˚C	37.31 ˚C	37.29 ˚C

value out of tolerance

Tester A
2:00:03 | Test finish 04-Dec-2013 15:30:25

Tester B
2:00:01 | Sample Rinse, 7.0 ml

Tester B
2:00:13

Speed	100.2 rpm	Temperature	37.28 ˚C					Status
Vessels (˚C)	1	36.86	2	36.71	3	36.54	4	36.64
	5	36.56	6	36.79	7	37.19	8	36.54

Tester B
2:02:05 | AutoFilter filter set discarded

Tester B
2:02:05 | AutoFilter Filter changed

Tester B
2:02:05
Sample 5

			Sample Row 10
	2:02:05	Sample Rinse with Filter, 3.0 ml	
	2:03:08	Collect with Filter, 5.0 ml	
	2:04:15	Media Replace, 5.0 ml	
	2:05:36	Rinse Retrieval, 15.0 ml	
	2:07:45	Sample Done	

Signed by: _____   Date: _____

Printed From: VAP JH LAB   Page 7 of 8   Printed: 05-Dec-2013 10:30

HANSON RESEARCH
DEPT: QUALITY ASSURANCE
USER: HANSON

Test Report: X29 2 Hour Test

Tester B

2:07:48

Statistics

	Min	Max	Avg
Speed	100.1 rpm	100.2 rpm	100.1 rpm
Temperature	**21.15 ˚C**	37.34 ˚C	36.90 ˚C
Vess1	36.86 ˚C	36.90 ˚C	36.88 ˚C
Vess2	36.69 ˚C	36.74 ˚C	36.71 ˚C
Vess3	36.52 ˚C	36.58 ˚C	36.55 ˚C
Vess4	36.63 ˚C	36.68 ˚C	36.65 ˚C
Vess5	36.54 ˚C	36.60 ˚C	36.57 ˚C
Vess6	36.79 ˚C	36.84 ˚C	36.81 ˚C
Vess7	37.15 ˚C	37.22 ˚C	37.19 ˚C
Vess8	36.52 ˚C	36.58 ˚C	36.55 ˚C

Tester B

2:07:48	Test finish 04-Dec-2013 15:48:10

VAP JH LAB

2:17:55	Test finish 04-Dec-2013 15:48:16

Signed by: _____   Date: _____

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Appendix E: Event Libraries

Event Libraries are a new feature introduced in Vision (G2) AutoPlus autosampler and Vision (G2) dissolution tester firmware version 2.3. Event libraries allow users to create a sequence of events, which can be called from a protocol. When called, the event library executes the events during the dissolution test. This allows for a larger number of events to be reserved for things that may occur only once during the dissolution test.

NOTE: This feature is intended for experienced users. All protocols and event libraries should be verified to work properly before running live product.

How Event Libraries Work

1. The call event used during a protocol will execute an event library. The event library will be executed during the test beginning at the time the call event is used. The test will continue to execute until the event library has completed, this is the same behavior as a sample event at the end of the test. If the event library is executed in the middle of a test, no time is added to the dissolution test.

   Example 1:

   A protocol calls an event library at 1 hour into the test.

   The event library has a sample point at 0:00:00.

   The sampling process will begin at the same time as the call event, 1 hour into the test.

   Example 2:

   A protocol calls an event library at 1 hour into the test.

   The event library has a sample point at 10 minutes.

   The sampling process will begin at 1 hour and 10 minutes.

2. It is the responsibility of the user to ensure that the behaviors of the protocol and event library are properly matched. Some features of the AutoPlus may interfere with the intended execution of an event library if they are not fully understood. Some examples are:

   a. Backflush Filter: This is typically executed 30 seconds prior to a sample point. If events are programmed before a sample event in the event library, the sample point may be delayed. If backflush filter is necessary but does not work when enabled in the protocol, consider adding a transfer of 1.0 from X,X to the event library to replicate the behavior.

   b. Filter Changes: Loading of a new filter will typically occur 2 minutes before a sample point. If this interferes with the intent of the event library, consider adding more time before the sample point, or performing filter changes using the change filter event.

Creating a Basic Event Library

1. Create a new protocol.

2. On the Labels tab, touch the check box in the lower left corner that says, "Event Library". The tabs for Dissolution, Sampling, and Options will disappear.

3. Ensure event library name is no more than 11 characters long. Fill out the other labels as appropriate.

4. Touch the Events tab.

5. Add events to the event library the same way as for a protocol. It is important to be aware of the following:

   a. If all the event times in the event library are set to 00:00:00, then the events will be executed as quickly as possible without notification of timing conflicts.

   b. For events that may take place before a sampling event, it is recommended to add times that allow for the operations prior to the sample point.

   c. The delay event is still restricted to pre- and post-run. It may not be used in an event library.

   d. Sample events may not be in an event library which is executed during the pre-run or post-run.

6. When finished, touch the Exit button to save the library.

Using an Event Library

The Call event is used to execute an event library during a protocol.

1. Go to the Events tab of the protocol.

2. Add a new event.

3. Touch the Event Type field and select the Call event located at the bottom of the event list.

4. Touch the Parameter field.

5. A list of the existing event libraries will appear. Touch the event library to select it.

6. Set the start time, number of events, and interval between events as appropriate.

7. Touch the Save button when finished.

8. When the protocol is executed, the event library will be called automatically during the test.

Appendix E: Event Libraries

Examples of How to Use an Event Library

1. Using an Elite 8 with a third party autosampler. Create an event library with the following:

   a. 0:00:00 Probe Down

   b. 0:01:30 Probe Up

   The time can be adjusted as appropriate to ensure the AutoMag stays down for the duration of the sampling. A sample event can be added at 0:00:00 so that the sampling alarm goes off when samples are going to be collected.

2. Split a sample between 2 rows on the Vision AutoPlus. Note: This assumes the total time to pump the rinse and collect the sample is 2 minutes.

   a. 0:00:00 Probe Down

   b. 0:00:00 Sample

   c. 0:02:00 Rinse Volume = 0

   d. 0:02:00 Rinse Volume with Filter = 0

   e. 0:02:00 Sample

   f. 0:02:00 Probe Up

   g. 0:02:02 Rinse Volume = 8 mL

   h. 0:02:02 Rinse Volume with Filter = 3 mL

3. Add a stabilizer to samples after they are collected. For this example, the system configuration is:

   Port A: Tester

   Port B: Stabilizer

   Port C: Media Replace

   Port D: AutoFill

   a. 0:00:00 Sample

   b. 0:00:00 Transfer 1.0,B,X – This step adds the stabilizer to the current row.

   c. 0:00:00 Transfer 5.0,U,B – This empties the D/Collector lines of stabilizer.

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