



SPORTS VISION TRAINER
EYE HAND COORDINATION DEVICE

User manual for SVT™ Professional
version 1.04 (30th August 2016)

32 & 80 LIGHT SVT™

www.sportsvision.com.au

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INTRODUCTION

Background

Welcome to the Sports Vision Trainer (SVT™) – an advanced visual motor performance instrument designed to assist human performance including athletes, humans in rehabilitation and specific occupations such as the military. The unique features of the (SVT™) are based on over 10 years of research at the New South Wales Institute of Sport, Sydney Australia. The programs used to test and train athletes encompass the principles of motor learning to provide a scientific approach to enhancing the central nervous system through eye-hand coordination. The recent addition of multi-coloured lights takes the (SVT™) into a new dimension of assessing and training decision making skills that are a key component in all aspects of human performance.

Why test for eye-hand coordination?

Eye-hand coordination is an integral component of human performance and is defined as a perceptual-motor skill involving the integration and processing in the central nervous system of visual and tactile information so that purposeful motor movements can be made. It is the ability to see and react within milliseconds to people and objects moving at different speeds and through different trajectories, whether in the direct line of sight or on the visual periphery.

The SVT™ – the ultimate eye-hand coordination trainer

The SVT™ mimics the eye-hand coordination demands of many team sports, including defence in basketball, goal-keeping in water polo and general passing and throwing in football, cricket and other ball sports.

It can be used to:

- Replicate and test the stressful demands of sport.
- Assess and train for specific body movements.
- Test both central and peripheral vision, enhancing athletes' awareness of external stimuli.
- Identify weakness in vision and motor movements.
- Assess improvements in general or specific training periods and drills.
- Provide an alternative to physical activities during rehabilitation from injury.

The SVT™ is also more than a sports product – it has wider applications in the fields of rehabilitation, motor behaviour, sports psychology, orthoptics and optometry.

It can be used to:

- Identify and rehabilitate motor dysfunction caused by strokes, cerebral palsy, Down's syndrome and other debilitating conditions.
- Help in the injury rehabilitation process for car accident victims and amputees.
- Improve visual deficiencies through the testing of visual acuity, range, colour fields, limits and eye movements.

Please note: the SVT™ is not a substitute for an eye examination.
If a visual problem is suspected, please consult an eye care professional.

OVERVIEW

An overview of the SVT™

Using the SVT™ is simple. The athlete or test subject stands in front of a large light board (adjusted to suit their height), which consists of either 32 or 80 circular lights. The SVT™ encourages the athlete to:

- Use fast eye and head movements and their peripheral vision to detect individual lights as they are activated.
- Move their feet and body so they can reach and touch one light after another.

The system operates in three standard modes, three two-handed modes that require the test subject to use both hands during the test and two decision making modes that require the test subject to decide which light to touch based on the light colour. The included database is preloaded with several protocols for each of the eight modalities. Alternatively, protocols can be created and stored in the database for later use.

Standard Modes

- 1 **Proactive:** The lights stay lit until the test subject responds by hitting it. They must see and hit each light as fast as possible. The SVT program waits until the light is hit and measured the response before switching on the next light.
- 2 **Reactive:** The lights are illuminated with a pre-programmed fixed time interval. The test subject must endeavour to match this speed and hit all the lights in the specified timeframe. If they fail to hit a light in time, no response is recorded for that light and the next light in the sequence is lit.
- 3 **Reactive Random Time Interval:** Is based on reactive mode where the software will randomly select the time duration for each light within the range determined by the random time interval range parameters.

Two Handed Modes

- 1 **Proactive Simultaneous lights:** Based on the standard proactive mode differing only in that two lights are lit simultaneously requiring the test subject to respond by hitting both lights at the same time using two hands. The time recorded for each pair of lights in the sequence is the time at which the last light was hit. The distance and angle between the two lights is determined by the Adjacent Light GUI (Graphical User Interface).
- 2 **Reactive Simultaneous:** Based on the standard reactive mode with the requirement of using two lights and two hands as in Proactive Simultaneous Lights.
- 3 **Reactive Random Simultaneous:** Based on the standard Reactive Random Time Interval mode with the requirement of using two lights and two hands as in Proactive Simultaneous Lights.

Decision Making Modes

- 1 **Reactive Go No-Go:** Utilizing the multicolored lights, the examiner using the design bench or a pre programmed preset contained in the database, programs some lights to be hit by the athlete and other lights not to be hit. This feature involves decision making skills in combination with reaction times. The test records all lights being hit and indicates the percentage of Go and No-Go hits in real time.
- 2 **Reactive Random Go No-Go:** Based on Reactive Go No-Go but with the addition of random time intervals and its associated controls.

SETUP

How to set up the SVT™

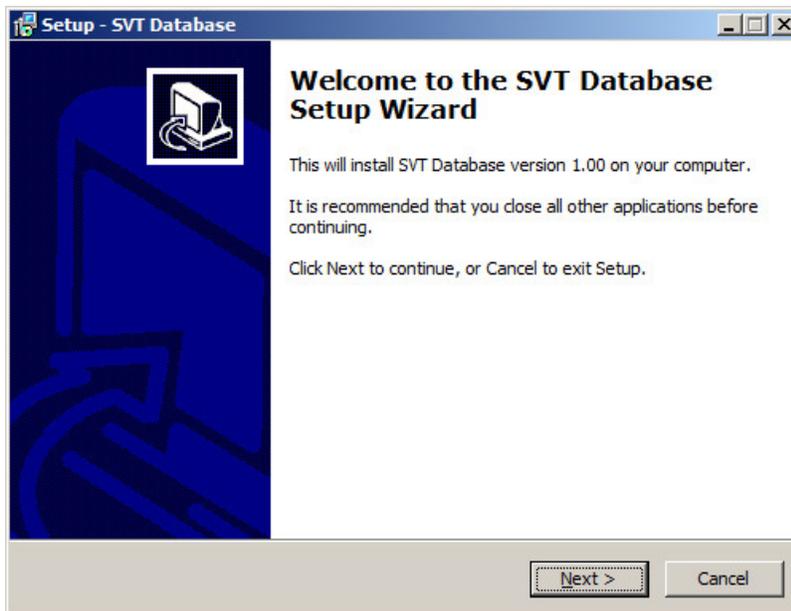
The SVT™ Professional software is compatible with Microsoft® Windows™ XP, Vista, 7, 8, 8.1 and 10 in both 32bit (x86) and 64bit (x64) environments.

Setting up your SVT takes 3 simple steps:

1. Installation of the SVT™ database.
2. Installation of the SVT™ software.
3. Connecting the SVT™ board to the computer.

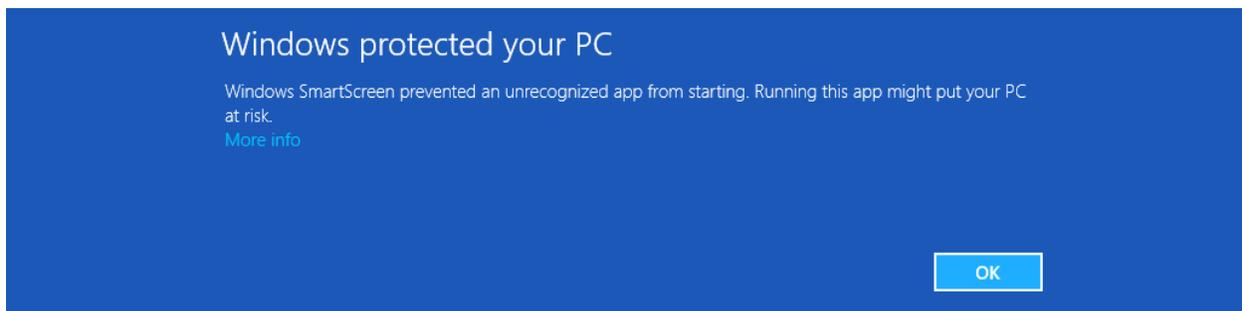
Install the SVT™ Database

If you have previously installed the database and only wish to update the SVT software or migrate from SVT 4.xx to SVT Pro 1.xx, skip the database installation process.



Double click on the database setup file and follow the automated instructions.

If using Windows™ Vista, 7, 8, 8.1 or 10, log in as the Administrator or right click the installer file and select "Run as administrator" otherwise you may need to contact your system administrator in order to get administrator rights to install the database.



On newer versions of Windows and depending on your security settings, you may get a warning from SmartScreen as shown above.

If so, click on "More info" then click on "Run Anyway" to enable the installer to run. On older versions of Windows, there may not be a "More info" text, in this case click on the "Run Anyway" button.

Install the SVT™ Professional software



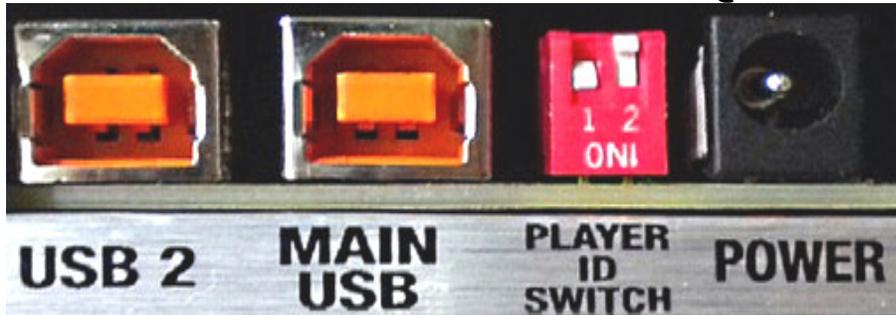
Double click on the SVT setup file and follow the automated instructions. If using Windows™ Vista, 7, 8, 8.1 or 10, log in as the Administrator or right click the installer file and select "Run as administrator" otherwise you may need to contact your system administrator in order to get administrator rights to install the software.

Connecting your SVT™ board to the computer

PLAYER ID SWITCH (all models) should be set as shown in the images (switch 1 ON and switch 2 OFF) if you are running only one SVT.

When running 2 SVT panels on a single computer, please set the player ID switch on the second panel to ID = 2 (switch 1 OFF and switch 2 ON).

Models Manufactured before Q1 2016

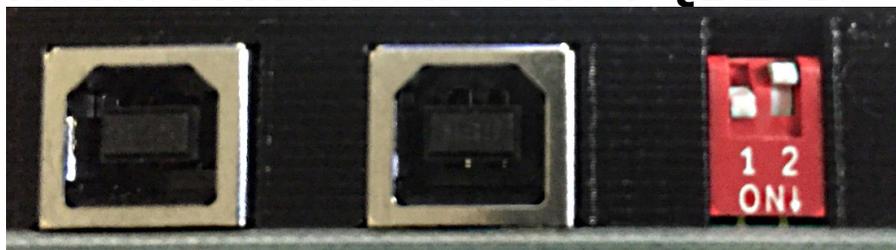


Power to the SVT board is supplied via the USB connection to your computer. The **POWER** socket on older SVT board is not used.

The **MAIN USB** is used to connect your computer to the SVT board. after setting the player ID switch, connect the USB cable from your PC to the **MAIN USB** Port on the SVT™ panel.

USB 2 is not used.

Models Manufactured after Q1 2016



On more recent models, after setting the player ID switch, connect the USB cable from your PC to any one (not both) of the USB Ports on the SVT™ panel.

HANDY TIP!

- *You can open the SVT™ software first then insert the USB cable or insert the USB cable first then run the software...any sequence will work as the software auto detects connection to the light panel!*

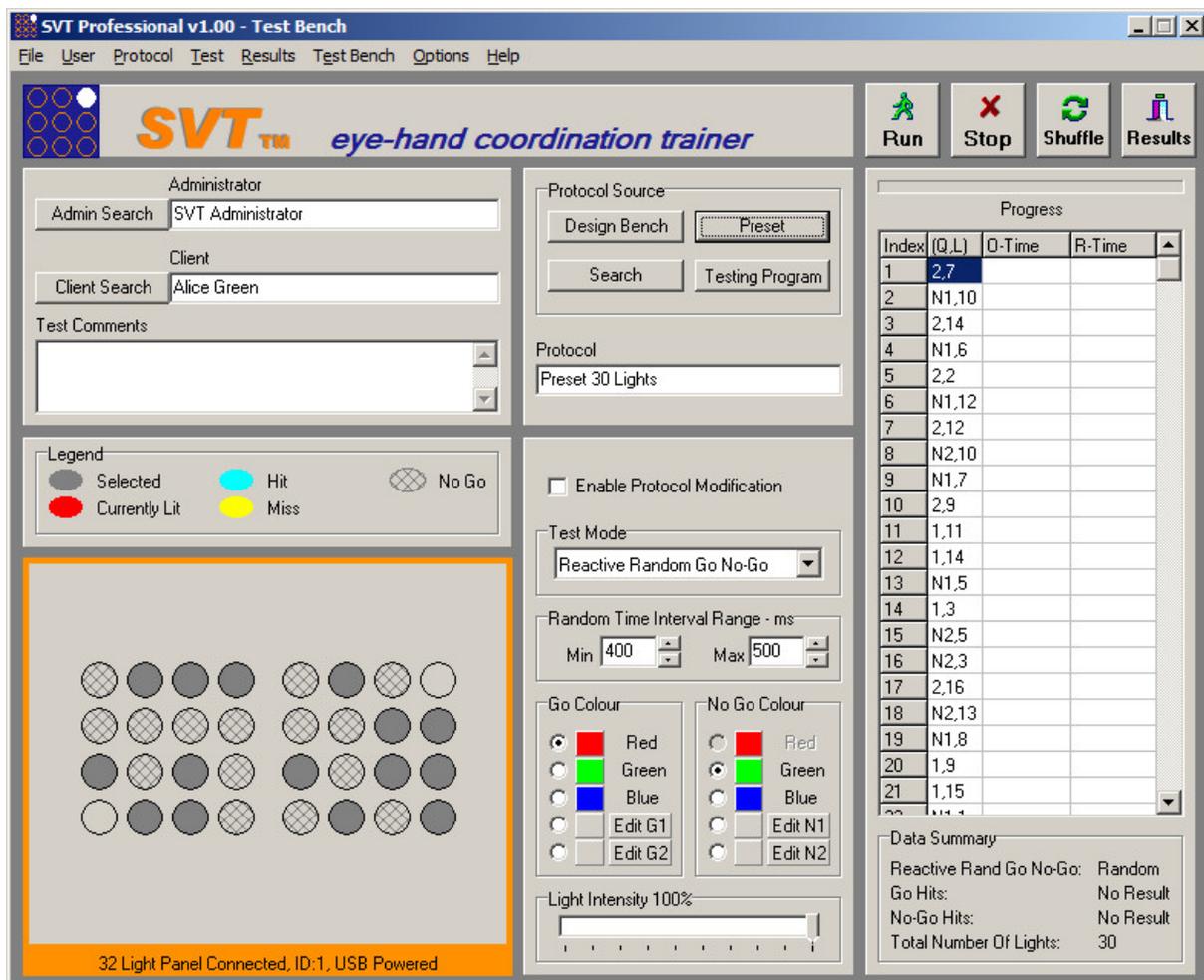
SVT™ Professional software

The SVT™ and how to use it

The SVT™ is comprised of multiple windows or forms namely Test Bench, Design Bench, Progress report, View Analysis as well as a Settings Control Panel and several other windows used to access user information, protocols and test results contained in the database.

The Included SQLite3 database is the core of the new SVT™ software and stores test subject information, test protocol information and test result information with great detail.

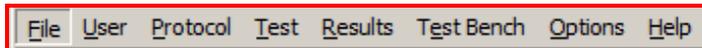
Preloaded in the database are 104 "Preset" protocols and an "Administrator" account for ease of getting started.



HANDY TIP!

- To start using the SVT™ without creating any protocols or user profiles: First click on "Client Search" and select the "SVT Administrator", then click on "Preset" and choose one of the built in presets then click on "Run". After the test has completed, view the results by clicking on "Results".

Test Bench



The Test Bench pull down menu at the top of the window has the following menu items. Many of the menu items also have corresponding buttons on the Test Bench window that perform the same task.

File:

Exit: Exits the SVT™ software.

User:

Add New: Opens the "Edit User" window to allow the creation of a new Administrator or test subject (client) profile.

Admin Search: Opens the "Administrator Search" window. With the SVT professional software, an administrator must be selected before tests may commence. The administrator is linked to each test, allowing tests results to be grouped by who administered them.

Client Clear: Clears the clients details on the Test Bench.

Client Search: Opens the "Client Search" window, where many user centric database operations may be performed.

Protocol:

Design Bench: Opens the "Design Bench" window where new protocols can be created/edited or existing legacy SVT™ 1-3 protocols can be loaded from disk and converted to the new SVT™ Professional protocol format for storage in the database.

Preset: Opens the "Preset Search" window so that pre programmed protocols can be selected.

Search: Opens the "Protocol Search" window so that designer generated protocols can be selected.

Shuffle: Allows you to randomly shuffle the sequence of lights in the test without changing the lights you have selected.

Testing Program: Opens the "Testing Program" window so that a series of pre programmed tests batched together may be cued and run. These tests are a good starting point for identifying basal and progressive reaction times.

Test:

Run: Runs the currently loaded test.

Stop: Stops the current test.

Results:

Progress Report: Opens the "Progress Report" window where a single client's test result progression may be visually analysed.

Search: Opens the "Results Search" window where test results contained in the database may be viewed and sorted based on various key parameters.

Test Bench:

Clear Results: Clears the last test results from the Test Bench.

Clear Results And Protocol: Clears the test results and the test protocol. Client information and "Test Comments" are left unchanged.

Open Slave TestBench: If 2 SVT™ panels are connected to the PC, select this to open a small Test Bench acting as a slave to the main Test Bench facilitating the testing of 2 test subjects simultaneously.

Options

Settings: Opens the "Settings" window where settings may be altered.

Mute all sound: Check this item to mute all sounds. This setting is remembered after closing the software.

Help:

About: Opens a dialog box that shows the current version information.

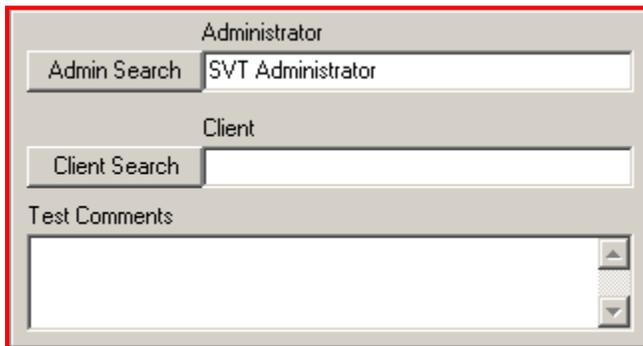
Check For Updates: Takes you directly to the SVT downloads page.

Contact SVT: While connected to the internet you can directly email us.

SVT Home: Takes you directly to the Sports Vision home page.

User Manual: Open this user manual using your installed PDF viewer. If you don't have a PDF viewer installed, there are many free PDF viewers available from 3rd party vendors such as Adobe® Viewer and Foxit® Reader.

Administrator, Client and Test Comments fields

The image shows a screenshot of a software interface with three distinct sections. The top section is titled "Administrator" and contains a button labeled "Admin Search" and a text input field containing the text "SVT Administrator". The middle section is titled "Client" and contains a button labeled "Client Search" and an empty text input field. The bottom section is titled "Test Comments" and contains a large, empty text area with vertical scroll bars on the right side. The entire interface is enclosed in a light gray border.

Admin Search: Click on the "Admin Search" button to search and select an administrator.

Tests may not be conducted until an administrator has been selected so that test results may be grouped by their respective administrators.

Once the Administrator has been selected, the software will remember the last selected administrator until a new administrator is selected.

Client Search: Click on the "Client Search" button to search and select a client.

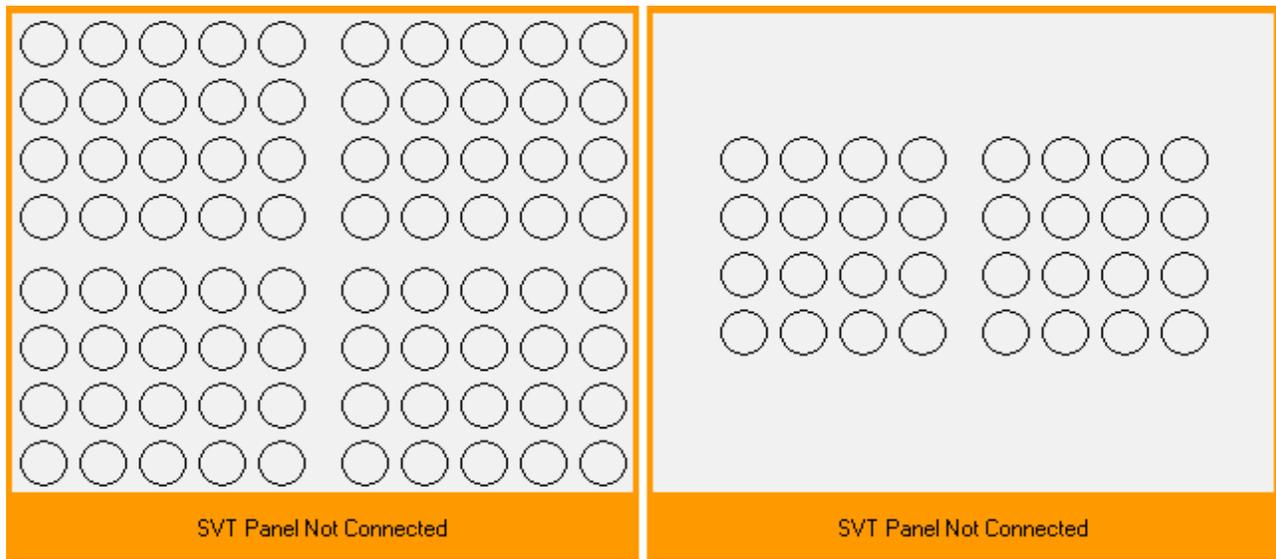
Tests may not be conducted until a client has been selected so that test results and protocol information can be attached to the relevant client in the database.

Test Comments: Enter your own commentary regarding the individual test about to be conducted. Comments may also be entered / edited at a later stage in the "Result Search" window.

HANDY Info!

- *Administrators are the people setting up and monitoring the testing and or training on the SVT whereas Clients are those actually participating in the testing and or training.*
- *When a test is conducted, the currently logged in administrator is recorded in the test results and therefore test results can be sorted / filtered by administrator.*

Light indicator panel



The panel on the left represents the lights on the SVT board for the 80 light SVT™. It is divided into four quadrants of 20 lights each whereas the 32 light SVT™ pictured on the right is divided into two quadrants of 16 lights each.

The lower orange area of the Light Indicator Panel shows real time information about the connected physical panel.

The light panel works as follows:

Before a test:

When a test protocol is loaded and ready to run, the Indicator lights are dark grey. If a light will be activated more than once during the test, its circle has a broken outline. If the test mode is Go No-Go, then the No-Go lights will be cross-hatched rather than solid.

During a proactive test:

During a proactive test, the results appear on the Indicator panel as they happen.

- An active light is red until it is touched by the athlete.
- If a light is activated only once during the test, the indicator turns blue when it has been touched.
- If a light is activated more than once during the test, the indicator turns lime green when it has been touched and blue when it has been touched for the last time.

During a reactive test:

During a reactive test, the results appear on the indicator panel as they happen.

- An active light is red until it is touched by the athlete.
- When the athlete touches an active light, the Indicator light turns pale blue.
- If the athlete fails to touch an active light, the Indicator turns yellow.
- If a light is activated more than once during the test, the circle has a broken outline if:
 - The athlete achieves a combination of hits and misses on that light, it shows as lime green.
 - The athlete always hits the light: the indicator turns pale blue.
 - The athlete always misses the light: the indicator turns yellow.

Test Record grid panel

Index	(Q,L)	R-Time	D-Time
1	3,5		
2	2,16		
3	1,15		
4	2,12		
5	1,20		
6	4,2		
7	2,11		
8	3,4		
9	4,1		
10	2,17		

The Test Record grid panel consists of four columns of information:

Index: This shows the sequence that the lights will be activated.

(Q, L): This shows the location of the indexed light on the light board. "Q" represents the relevant quadrant, and "L" the light in that quadrant (lights are numbered from left to right the top-left light being 1 and the bottom light being 20 for the 80 light board. For the 32 light boards the top left light is 1 and the bottom light being 16).

R-Time: This is the "reaction time" for the light in Q, L. In proactive mode this is the total time for the test, and in reactive mode it is the time taken to turn off an active light and a miss is recorded as "0".

D-Time: This is used only in proactive mode and records the time difference between the athlete touching the previous light and touching the active light. (This column is left blank in reactive mode.)

Enable Protocol Modification.

In order to allow modification or overriding of the original protocol source, the "Enable Protocol Modification" Checkbox must be checked.

This tells the software to apply the new settings and also to attach the altered settings to the test results stored in the database for later retrieval.

The software will warn you if the modifications are not within the scope of the currently loaded protocol or light sequence.

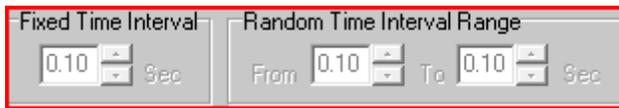
Test Mode Menu



The Test Mode menu has 8 different modalities as follows:

1. Proactive
 2. Reactive
 3. Reactive random time interval
 4. Proactive simultaneous lights
 5. Reactive simultaneous lights
 6. Reactive random simultaneous
 7. Reactive Go No-Go
 8. Reactive random Go No-Go
- In Proactive mode, The SVT™ will wait for the test subject to touch one light before switching on the next one, and record the time taken to do this. The maximum time between lights is 10 minutes – an audible alarm will let you know that this has been reached and the test will be stopped.
 - In Reactive mode, choose the interval you want between each activated light. The minimum time is 100ms (milliseconds) or 0.1 seconds, the maximum is 9990ms or 9.99 seconds
 - If you select the one of the Reactive Random Modes and choose a range between 400ms and 500ms then the duration between each light is generated randomly between 450ms and 500ms.
 - The Simultaneous Modes require the test subject to hit 2 lights simultaneously using 2 hands.
 - The Go No-Go modes require the test subject to hit all the Go lights and ignore the No-Go lights.

Time Interval controls

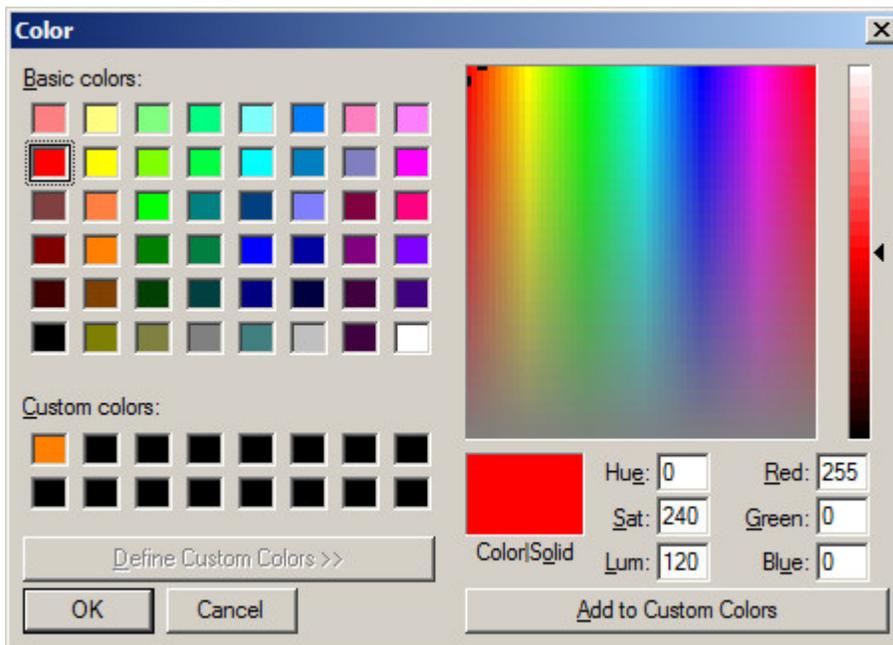


Depending on the modality, the time Interval controls allow you to set the timing for fixed time interval or the lower and upper range for random time interval protocols. As the controls are context driven, the inactive control will be hidden when not used.

Colour Selectors

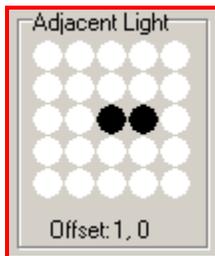


The Colour Selectors are also context driven and will appear only if a level 2 license or higher has been purchased. With a level 1 license, the light colour on the SVT board always display as red and therefore the Colour Selector is hidden. A Level 2 licenses allows the choice of red green or blue.



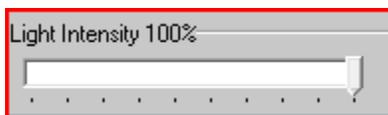
A level 3 license gives you the ability to choose or mix any colour from a palette of 16 million colours by clicking on the Edit button in the Colour Selectors.

Adjacent Light Selector



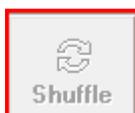
The Adjacent Light selector may be used to control the spacing between the lights in any of the **Simultaneous Lights** modes. This feature is only available with a level 3 license. License levels 1 and 2 have the spacing fixed to a x, y offset of 1, 0 (to the right one space). The Adjacent Light Selector remains hidden until one of the Simultaneous Light modes is selected using the Test Mode Menu. When using an 80 Light SVT™, the range of control is 2 lights in any direction from the centre whereas due to less available lights on the 32 Light SVT™, the control range is 1 light in any direction from the centre.

Light Intensity Slider



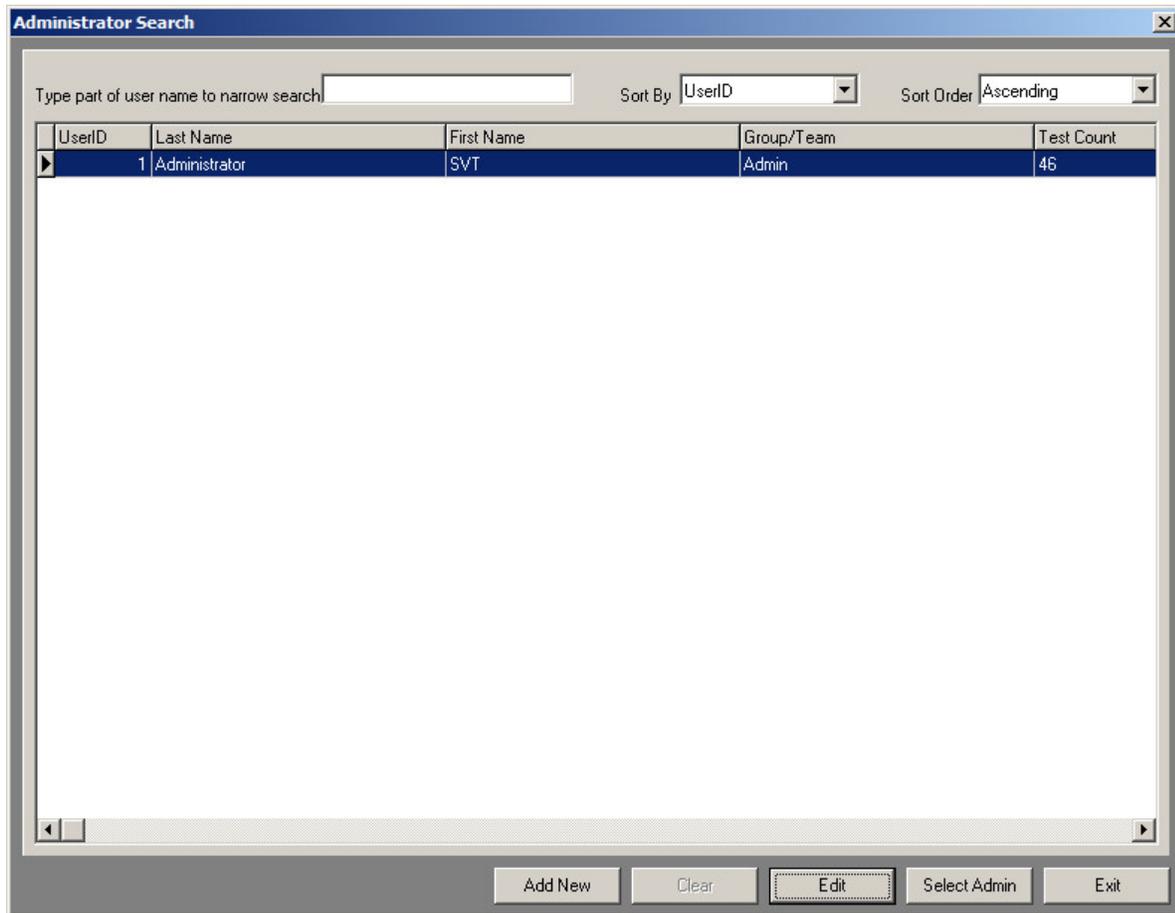
The Light Intensity (Brightness) is defaulted to 100% but can be decreased using the slider.

Shuffle Button



The Shuffle button allows you to randomly shuffle the sequence of lights in the test without changing the lights you have selected.

Administrator Search



The screenshot shows a window titled "Administrator Search". At the top, there is a search input field with the placeholder text "Type part of user name to narrow search". To the right of the input field are two dropdown menus: "Sort By" set to "UserID" and "Sort Order" set to "Ascending". Below these is a table with the following data:

UserID	Last Name	First Name	Group/Team	Test Count
1	Administrator	SVT	Admin	46

At the bottom of the window, there are five buttons: "Add New", "Clear", "Edit", "Select Admin", and "Exit". The "Edit" button is currently highlighted with a dashed border.

The Administrator Search window is used to select the current administrator. Once selected, the administrator will remain logged in until another administrator is selected.

Add New: Opens the "Edit User" window with a blank form so that new details can be entered, to create an administrator, select "Administrator" from the "Objective" pull down menu.

Edit: Open the "Edit User" window with details of the currently highlighted user.

Select Admin: The currently highlighted administrator will be selected and put on the Test Bench.

Cancel: Close the Administrator Search window without any operation(s).

Client Search

UserID	Last Name	First Name	Group/Team	Test Count
5	Green	Alice		0

The Client Search window is your one stop launch pad for user management operations. From here you can:

Add New: Opens the “Edit User” window with a blank form so that new details can be entered.

Clear: Clears the client details on the Test Bench (if any).

Edit: Open the “Edit User” window with a copy of the highlighted client.

Select Client: The currently highlighted client will be selected and put on the Test Bench.

Cancel: Close the client search window without any operation(s).

HANDY TIP!

- *Narrow down the number of clients displayed by typing any part of the clients first or last name. “Sort By” Selects the sorting column.*

Edit User

Edit User

Mandatory Information

Unique UserID: 1

Gender: Female Male

First Name: SVT

Last Name: Administrator

Birth Date: Thursday, 22 April 1971

Objective: Administrator

Optional Information

Height: cm 0 Metric

Mass: Kg 0 Imperial

Ethnicity: [Dropdown]

Occupation: Administrator

Group/Team: Admin

Position: [Text Box]

Phone 1: [Text Box]

Phone 2: [Text Box]

Email Address: [Text Box]

Save User To Database Cancel

The Edit User window is used to add new or edit existing users (clients and administrators).

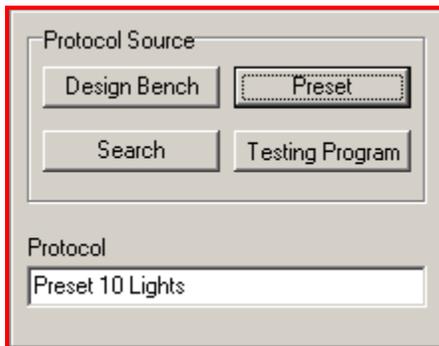
The software will not allow the users details to be saved until at least all of the "Mandatory Information" has been completed.

It is highly recommended that the "Optional Information" fields be filled in as well as this information can be used for advanced data processing and searching to find links between various parameters and test results.

Information can always be added or edited at a later stage should the need arise.

Note! The built in Administrator with Unique UserID 1 cannot be edited or deleted.

Protocol Source



Protocol Source:

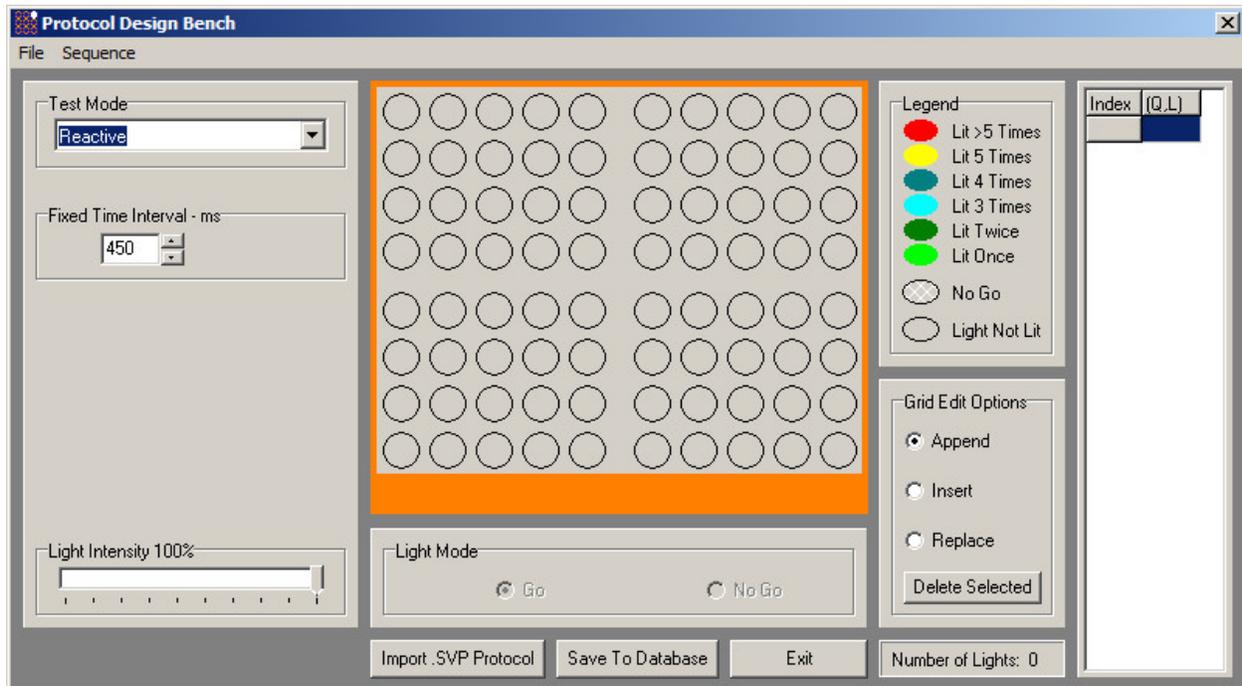
Design Bench: Opens the "Design Bench" window where new protocols can be created/edited or existing legacy SVT™ 1-3 protocols can be loaded from disk and converted to the new SVT™ Professional protocol format for storage in the database.

Preset: Opens the "Preset Search" window so that pre programmed protocols can be selected.

Search: Opens the "Protocol Search" window so that designer generated protocols can be selected.

Testing Program: Opens the "Testing Program" window so that a series of pre programmed tests batched together may be cued and run. These tests are a good starting point for identifying basal and progressive reaction times.

Design Bench



The Design Bench is where you design, edit and save your test protocols. The example above depicts an 80 Light SVT™.

Hot Tip: Spot your location!

When you hover the mouse over the light on the light board, it displays the light's coordinates.

Hot Tip: Use the right mouse button!

Click the right mouse button on a light in the Light board and you'll see at the bottom of the screen:

- *the light's quadrant coordinates*
- *the number of times it's been selected in the test*
- *its location in the test*

The Design Bench contains an "Import .SVP" button, a "Save To Database" button, a "Cancel" button, a "Delete Selected" button as well as a menu bar that has two drop-down menus as follows:

File:

New: Clears the Design Bench workspace for a new protocol.

Import .SVP protocol: Opens an existing legacy SVT™ 1-3 protocol for conversion to the currently used SVT™ Professional format. Legacy protocols do not contain any auxiliary protocol information such as light colour, time interval and modality but can be set using the controls on the Design Bench before saving.

Save To Database: Opens the "Save Protocol To Database" window where a name and description may be attached to the protocol prior to saving in the database.

Exit: Exits the Design Bench and returns you to the Test Bench.

Sequence:

Clear: Clears the Design Bench light sequence in the grid.

Create Random: You choose the number of lights you want in the test, and the SVT will select a random sequence.

Refill Random: Replaces the current light selection with a random selection.

Design Bench Light Panel

This panel represents the lights on the light board – you use it to choose the light activation sequence. Simply click on the light and it appears in the Test Record grid panel on the right-hand side of the screen.

Different colours indicate how often the light will be selected during the test and the indicator is cross-hatched if a **No Go Light Mode** is selected.

Red	Light will appear more than five times during the test
Yellow	Light will appear five times during the test
Aqua	Light will appear four times during the test
Cyan	Light will appear three times during the test
Lime Green	Light will appear once during the test
Silver Grey	Light has not been selected
Dark Green	Light will appear twice during the test

Design Bench Test Record Panel

The Test Record panel consists of two columns of information:

Index: This shows the order in which the lights will be activated. Index 1 is always the first light.

(Q, L): This shows the location of the index's light on the light board. "Q" represents the relevant quadrant, and "L" the light in that quadrant (lights are numbered from left to right, with the top=left light being 1 and the bottom-right light being 20).

Design Bench Grid Edit

You have three options when creating the test protocol and a "Delete Selected" button:

Append: Choose a light for the test by clicking on its position on the Light Board. Its coordinates will be automatically added after the last index on the Test Record panel.

Insert: Choose insert to add a new light within the test (there must be at least one light already in the Test Record panel):

- Select the Insert option.
- Click on the cell in the Test Record panel's (Q, L) column that will go after the new one.
- Click on the new light in the Light Board.

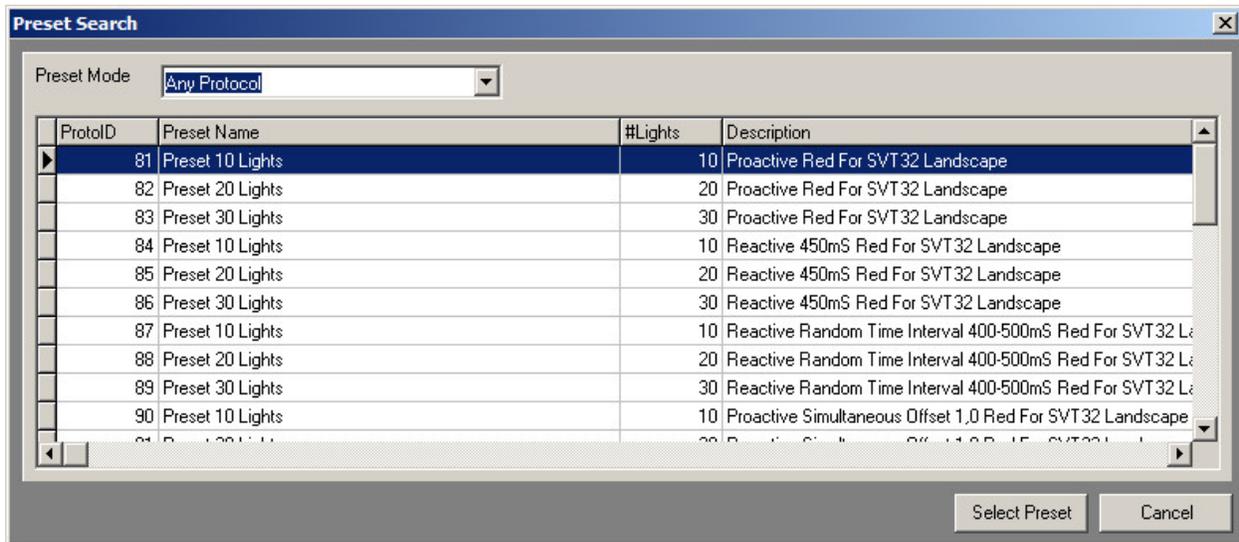
Replace: Choose Replace to replace one light in the test with another.

- Select the Replace option.
- Click on the cell in the Test Record panel's (Q, L) column that will be replaced.
- Click on the new light in the Light Board.

Delete Selected: Click on the cell in the Test Record panel's (Q, L) column that will be deleted.

- Click on the Delete button to delete the selected light.

Preset Search



The Preset Search windows enables quick selection of the protocols that come shipped with the pre programmed database.

To Use, simply highlight the desired protocol then click on the "Select Preset" button. To narrow down the list of protocols, choose a modality with the "Preset Mode" pull down menu.

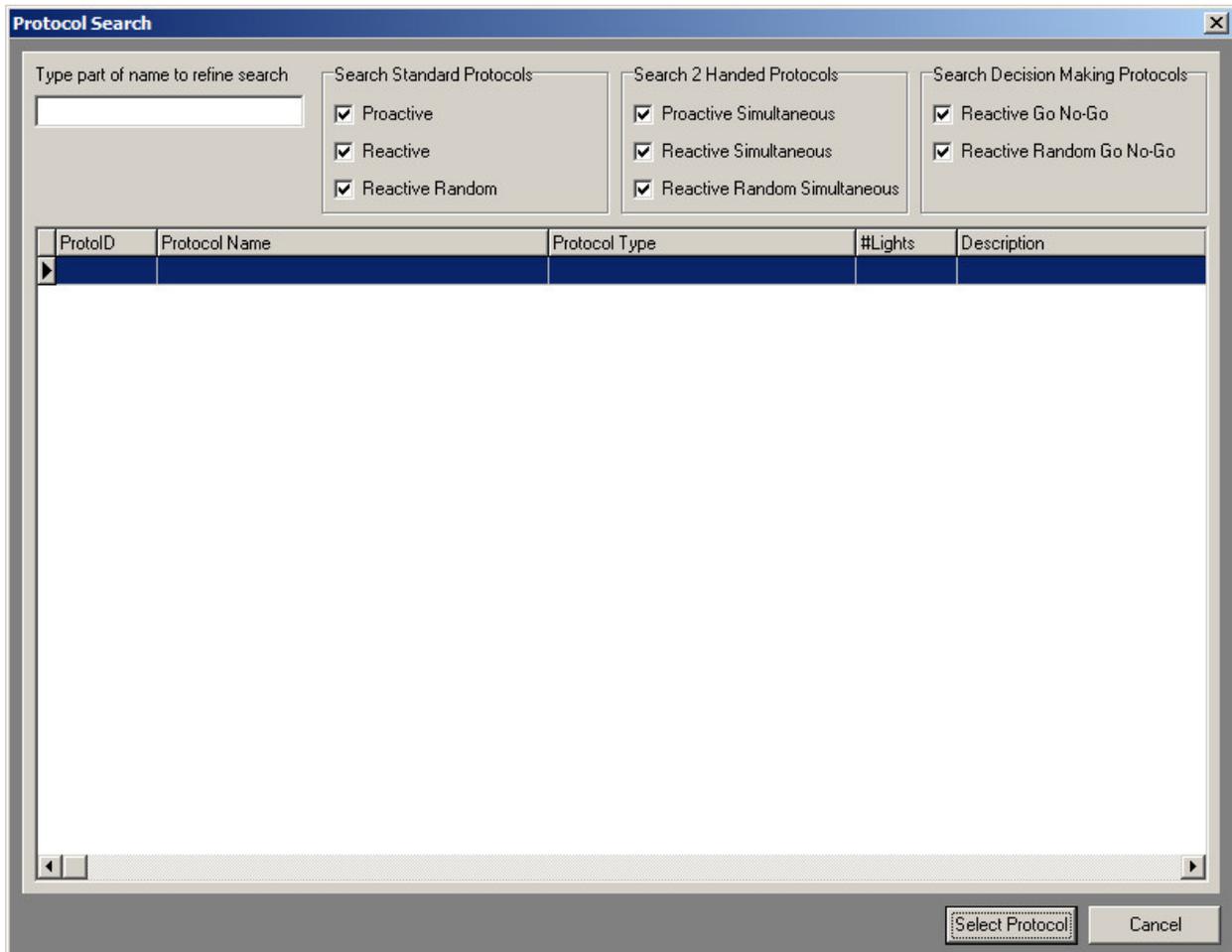
HANDY TIP!

- *The database contains protocols custom tailored to suit the SVT™ 32 and 80 light systems. The SVT™ 32 also has two variants of each protocol based on whether the panel is used in portrait or landscape mode. The applicable protocols are shown and the irrelevant protocols are hidden from view but in order for this to work correctly, make sure the panel is plugged in so that the software can identify the panel type and show the correct set of protocols.*
- *The same behaviour can be obtained by correctly setting the "Default Panel If None Found" and "Orientation For 32 Light Panel Only" Fields in the Options->Settings->Panel tab.*

HANDY TIP!

- *After selecting a protocol, if desired, you may fine tune the protocol on the Test Bench by highlighting "Enable Protocol Modification".*

Protocol Search



The Protocol Search window enables selection of protocols previously saved in the database using the Design Bench.

To Use, highlight the desired protocol then click on the "Select Protocol" button.

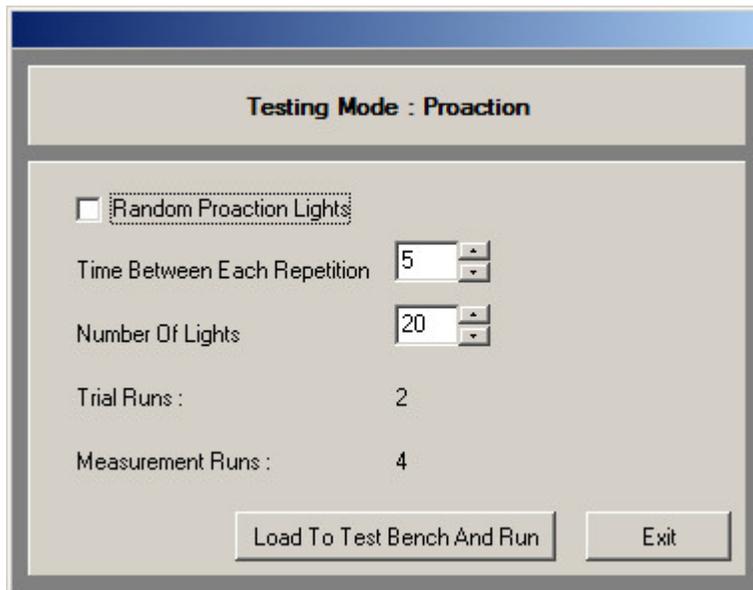
To narrow down the list of protocols, enable or disable the desired protocol modalities.

If known, type any part of the protocols name and the list will narrow in real time as you type.

HANDY TIP!

- *If required, use the horizontal scroll bar to scroll across and show some of the hidden information columns such as "Date Created".*

Testing Program



The screenshot shows a software window titled "Testing Mode : Proaction". Inside the window, there is a checkbox labeled "Random Proaction Lights" which is currently unchecked. Below this checkbox are three settings: "Time Between Each Repetition" set to 5, "Number Of Lights" set to 20, and "Trial Runs :" set to 2. Below these settings is "Measurement Runs :" set to 4. At the bottom of the window, there are two buttons: "Load To Test Bench And Run" and "Exit".

The automated testing program has 3 customizable options.

Random proaction lights: Check this checkbox if you want each repetition to be a random pattern, this includes the 2 trial runs and the 4 measurements. By not checking this option, a non-randomized pattern will be used.

Time Between Each Repetition: Sets resting period between each repetition from 1 second to 30 seconds.

Number of Lights: You can set the number of lights to 10, 20 or 30 lights for all the individual tests.

Stage 1 - PROACTION

- Automatically runs the below drill to determine proactive threshold:

Number of lights = 20.

Trial runs = 2.

Measurement runs = 4.

- The same pattern is used throughout this test.
- There is a 5 second break between each repetition.
- The average of 4 measurement runs is displayed at the end of the last test. Using this average, stage 2 finds the reaction mode threshold.

Stage 2 – REACTION

Starting speed = the average calculated in stage 1 (Proaction) testing.

Number of lights = 20 (randomly shuffled for each repetition).

Repetitions = 5.

- If 3 out of 5 attempts are scored at 80% or better, then the reaction time automatically decreases by 20ms and the testing restarts.
- There is a 5 second break between each repetition.
- This loop is repeated until 3 out of the 5 attempts are less than 80%.
- If 3 out of 5 attempts are scored at less than 80% then the reaction time automatically increases by 20 ms and testing starts again.
- This loop is repeated until 3 out of 5 attempts is 80% or better.
- **NB: during the 5 attempts the software will change to the next reaction time level once 3 attempts have been achieved at 80%, therefore not all 5 attempts have to be completed.**

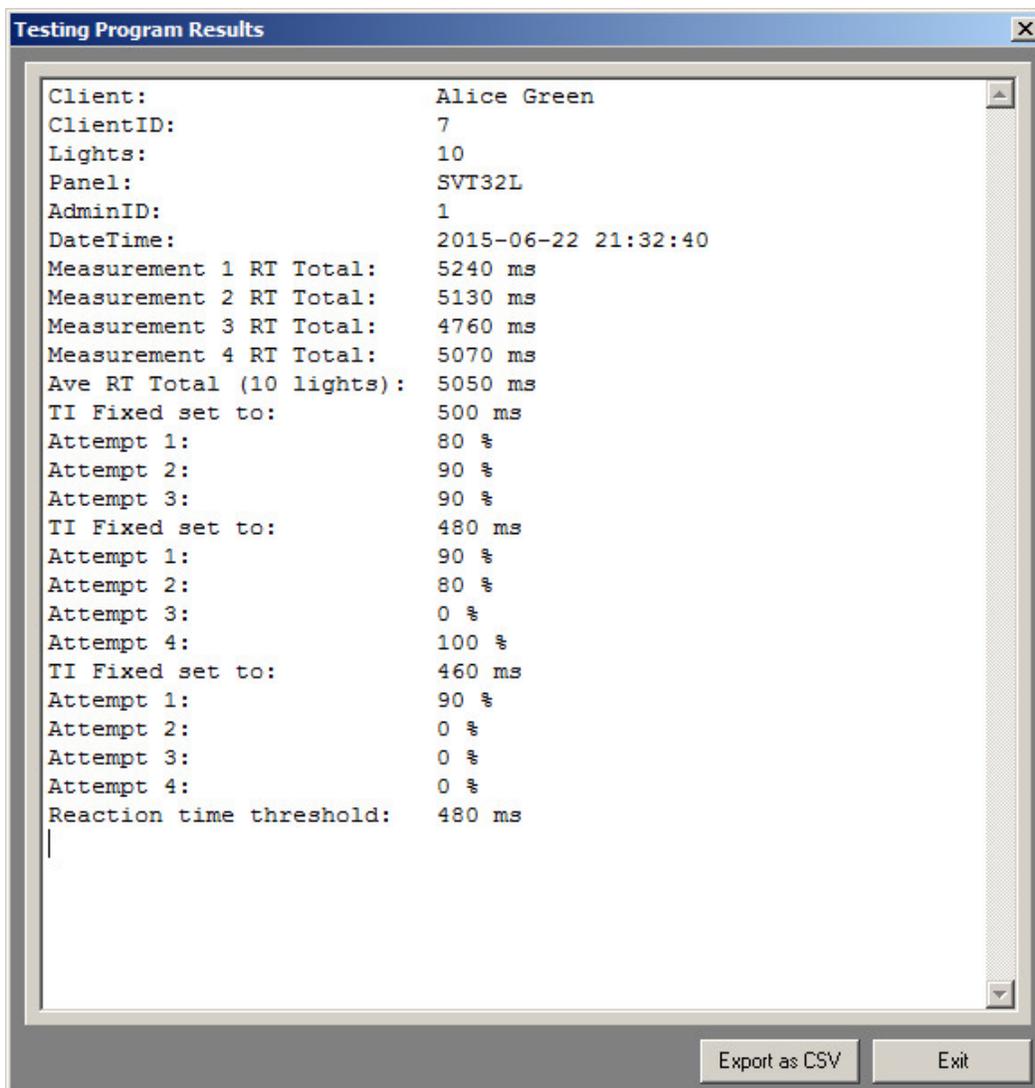
FINAL SCORES

Average proaction reaction time 20 lights = e.g. 500 ms.

Reaction time threshold = e.g. 420 ms to hit 20 lights.

Example: The below example first shows the reaction time to hit 10 lights for the 4 measurements followed by the average for the 4 measurements. Thereafter the threshold speed for 10 lights is shown with the % result for each attempt up to 5 repetitions.

Because the subject in this example failed to achieve 3 x 80% strike rate at 460 ms the Reaction time threshold is noted as 480 ms.



Results Search

The screenshot shows the 'Results Search' window with the following data table:

DateTime	Client	ClientID	TestID	ProtoID	BatchID	Test Mode	#Lights	Proto Mod	TI Fixed	TI Rnd Min	TI Rnd Max	RT Min	RT Max	RT Ave	RT Total	Hits Go%	Hits NE
2015-06-23 23:10:02	Alice Green	5	361	81	33	Proactive	10	No	450	400	500	312	453	352	3526	100.0	0.0
2015-06-23 23:10:10	Alice Green	5	362	81	33	Proactive	10	No	450	400	500	312	421	344	3448	100.0	0.0
2015-06-23 23:10:18	Alice Green	5	363	81	33	Proactive	10	No	450	400	500	312	967	411	4118	100.0	0.0
2015-06-23 23:10:25	Alice Green	5	364	81	33	Proactive	10	No	450	400	500	250	609	361	3619	100.0	0.0
2015-06-23 23:10:33	Alice Green	5	365	81	33	Proactive	10	No	450	400	500	296	764	369	3698	100.0	0.0
2015-06-23 23:10:41	Alice Green	5	366	81	33	Proactive	10	No	450	400	500	312	374	327	3276	100.0	0.0
2015-06-23 23:10:55	Alice Green	5	367	84	33	Reactive	10	Yes	367	400	500	203	359	269	2154	80.0	0.0
2015-06-23 23:11:03	Alice Green	5	368	84	33	Reactive	10	Yes	367	400	500	125	374	304	3041	100.0	0.0
2015-06-23 23:11:12	Alice Green	5	369	84	33	Reactive	10	Yes	367	400	500	202	344	254	2292	90.0	0.0
2015-06-23 23:11:24	Alice Green	5	370	84	33	Reactive	10	Yes	347	400	500	202	296	235	2355	100.0	0.0
2015-06-23 23:11:31	Alice Green	5	371	84	33	Reactive	10	Yes	347	400	500	156	327	210	1685	80.0	0.0
2015-06-23 23:11:39	Alice Green	5	372	84	33	Reactive	10	Yes	347	400	500	218	312	251	2012	80.0	0.0
2015-06-23 23:11:50	Alice Green	5	373	84	33	Reactive	10	Yes	327	400	500	218	266	238	2388	100.0	0.0
2015-06-23 23:11:57	Alice Green	5	374	84	33	Reactive	10	Yes	327	400	500	187	281	226	2263	100.0	0.0
2015-06-23 23:12:05	Alice Green	5	375	84	33	Reactive	10	Yes	327	400	500	172	296	214	1934	90.0	0.0
2015-06-23 23:12:16	Alice Green	5	376	84	33	Reactive	10	Yes	307	400	500	203	234	220	2200	100.0	0.0
2015-06-23 23:12:23	Alice Green	5	377	84	33	Reactive	10	Yes	307	400	500	281	297	292	2044	70.0	0.0
2015-06-23 23:12:31	Alice Green	5	378	84	33	Reactive	10	Yes	307	400	500	250	281	262	2621	100.0	0.0
2015-06-23 23:12:38	Alice Green	5	379	84	33	Reactive	10	Yes	307	400	500	203	312	240	1683	70.0	0.0
2015-06-23 23:12:46	Alice Green	5	380	84	33	Reactive	10	Yes	307	400	500	250	297	274	1374	50.0	0.0

The Results Search window is used to search, view, compare, analyse, export and edit some of the information stored in test results database.

To narrow down the list, use any or all of the following options:

Narrow By Keyword:

Nothing (Disabled): Narrowing of results by keyword is disabled.

Country: Adds a Country column to the table, you may also choose to narrow the list by typing part or all of the desired Ethnicity.

Group/Team: Adds a Group/Team column to the table, Ideal for viewing the results of a particular group of clients.

Objective: Adds an Objective column to the table, Ideal for viewing the results of clients that share the same objective.

Occupation: Adds an Occupation column to the table, Ideal for viewing the results of clients that share the same Occupation.

Position: Adds a Position column to the table, this is used to view the results of clients that share the same position for instance one example of a Position within a team is a goal keeper.

Narrow By Parameter:

Nothing (Disabled): Narrowing of results by keyword is disabled.

Age: Adds an Age column to the table, you may also choose to narrow the list by typing the desired age of the shown clients.

Gender: Adds a Gender column to the table, you may also choose to narrow the list by typing the desired gender of the clients.

Narrow By Administrator:

Search: Will open the "Administrator Search" window to allow selection of a particular administrator. Results will be shown for all the client's tests that were conducted under the selected administrator.

Clear: Will clear the selected administrator (if any) and allow results to be shown for any administrators.

Narrow By Client:

Search: Will open the "Client Search" window to allow selection of a particular client. Results will be shown only for the selected client.

Clear: Will clear the client (if any) and shown results for all clients.

Narrow By Protocol:

Test Mode: Allows narrowing of the search results based on the test mode. All supported protocol modalities including testing batch programs are supported.

Protocol Source: Allows narrowing of the search results based on the protocol source allowing you to include or exclude preset protocols, modified protocols and designed protocols (sourced from the design bench) in various useful combinations.

Results Sorting:

Sort By: Chooses the parameter for sorting results as follows:

Date/Time/TestID: Test timestamp in the form (YYYY-MM-DD HH:MM:SS).

Batch ID: Individual tests from a testing program share the Batch ID.

RT Ave: Average reaction time.

RT Min: Minimum reaction time.

RT Max: Maximum reaction time.

RT Total: Total reaction time for all the lights in the sequence.

Hits Go%: The percentage of Go lights hit.

Hits NG%: The percentage of No-Go lights hit.

#Lights: Number of lights in the protocol.

Sort Order: Chooses if the sorting order is ascending or descending.

Edit Admin: Allows you to assign an administrator to an individual test result. This is useful when a database from a previous SVT software release is still in use as versions prior to the release of SVT Professional v1.00 didn't

require an administrator to be assigned to tests. Assigning an administrator allows test results to be narrowed to the administrator that conducted them.

Edit Comment: Allows you enter and or edit comments linked to an individual test. Especially Useful for updating test comments or if you forgot to type them in the first place.

Export Result(s): Allows you to export all details of the highlighted test to a CSV file for further investigation in your favourite spreadsheet software. A file name recommendation will be provided in the "Export Test Result as CSV" dialog as determined by the settings in the "Options->Settings->Data Export" tab.

To select multiple test result for export, hold the left mouse button down while dragging up or down to highlight the desired tests before clicking on the "Export Result(s)" button.

When exporting multiple results, a folder must be chosen where the exported CSV files shall be saved. The files are named automatically as determined in the "Options->Settings->Data Export" tab.

Export Table: Will export the complete table or list in the "Results Search" window to a CSV file for later viewing and or analysis using external or 3rd party software.

Progress Report: Using the highlighted ClientID as a focal point, a new window will be opened containing all of the test results for that client in a time domain based analysis, please refer to the section on "Progress Report" for more information.

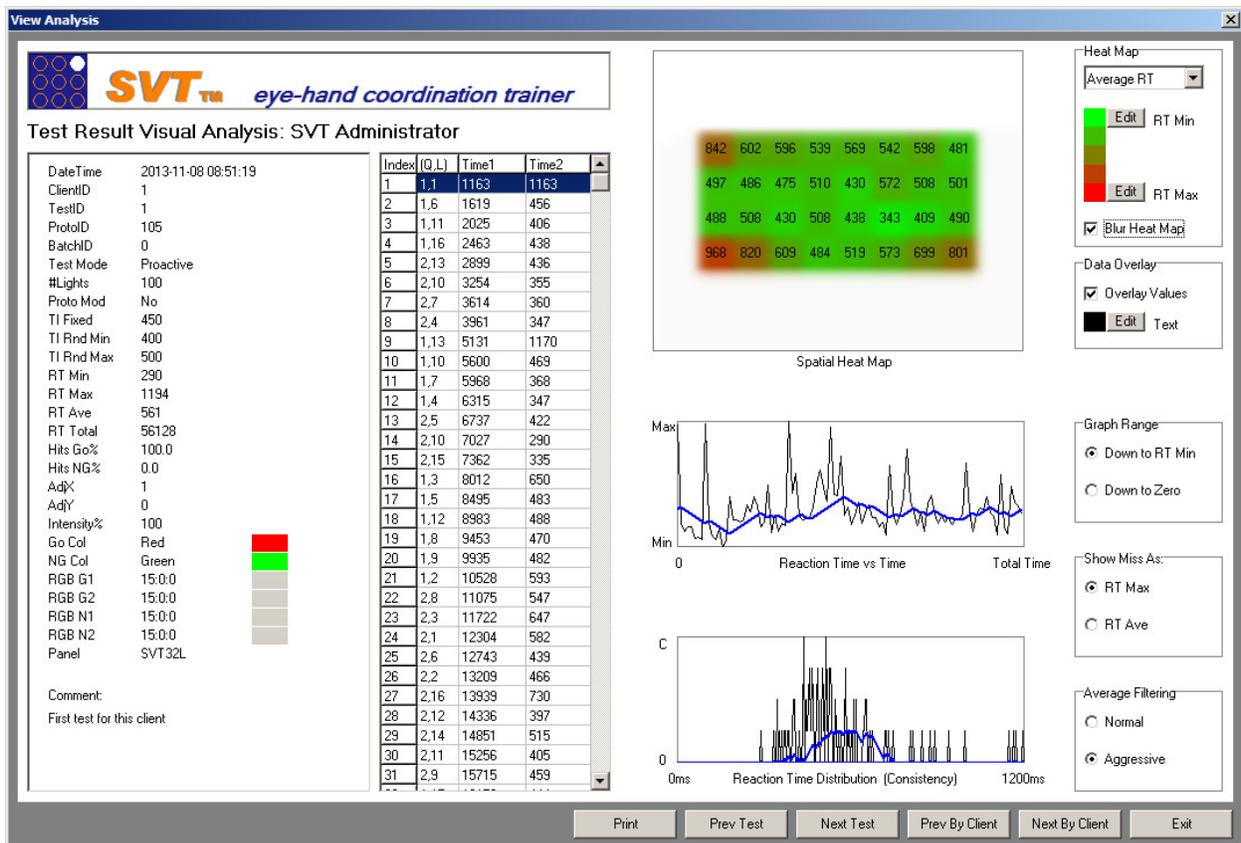
Repeat Test: Simply click on the "repeat Test" button to recreate the exact test conditions of the highlighted test result. The client, protocol and modifications (If any) will be sent to the "Test Bench" and are a quick way to repeat the same test.

Testing Results: Click on this button after first highlighting a test result with a BatchID of greater than 1 to open the "Testing Program Results" window.

From this window, you may view or "export as CSV" the tests linked to the selected BatchID.

View Analysis: Opens the "View Analysis" window where advanced visual analysis is performed on the selected test result. Please refer to the section on "View Analysis" for more information.

View Analysis



The "View Analysis" window is your one stop destination for visually analysing test results. From here you can easily navigate and print the test results using the quick navigate buttons at the bottom of the window.

The printable section of the window is intentionally coloured white for high contrast when printing on paper.

The left half of the windows contains the protocol test parameters, key result parameters and also the protocol's light sequence and test subject's response to the lights in the grid table.

The right half of the window contains multiple charts or graphs and controls to fine tune how they are displayed.

Spatial Heat Map: Displays a visual representation of the position of the actual lights on the SVT board overlaid with the test subject's reaction times for that position.

In essence, this map can be used to show how a test subject's performance varies based on spatial position; typically, performance tapers off towards the periphery of the board.

Within the map, each block is coloured based on reaction time as determined by the gradient map and the source of the data can be:

Average RT: An average reaction time for each and every position.

Lowest RT: The lowest (best) reaction time for each and every position.

Highest RT: The highest (worst) reaction time for each and every position.

The end point colours in the gradient map can be set individually as can the colour of the overlaid text.

The overlaid text can be switched off by un-checking the "Overlay Values" checkbox.

The gradient map can be blurred to help emphasize any trends in the map and also help contrast the overlaid values.

Reaction Time vs Time: Displays a line chart showing the reactions times obtained as they progressed with time.

Overlaid with a thicker blue line is the moving average of the reaction times which helps to clarify any trends in the data.

The depth of the average filtering can be set to "Normal" or "Aggressive" depending on your preferences.

This chart can be used to identify fatigue, particularly when there are over 100 lights in the protocol.

As reactive mode protocols record a miss as Zero, the graphing algorithm will replace all Zeros with RT Ave (average reaction time) or RT Max (max reaction time) depending on the setting in "Show Miss As:" Group.

The vertical scale of the chart can also be manipulated with the settings in the "Graph Scale" group to show more detail by checking "Down To RT Min" or exact scale by checking "Down To Zero".

Reaction Time Distribution (Consistency): Displays a line chart showing the distribution of the reaction times.

Overlaid with a thicker blue line is the moving average of the distribution which helps to clarify any trends in the data.

In essence, this will show a bell curve where the taller and narrower the bell curve is, the more consistent the test subject is at achieving similar reaction times. Conversely, a flatter and wider spread bell curve indicates inconsistency with reaction times.

Print: Will open the "Print" dialog where you can select a printer and print the current view of the "View Analysis" window.
Note that the layout and print margins are determined by the tab in Option->Settings->Printer but these can be temporarily overridden in the "Print" dialog.

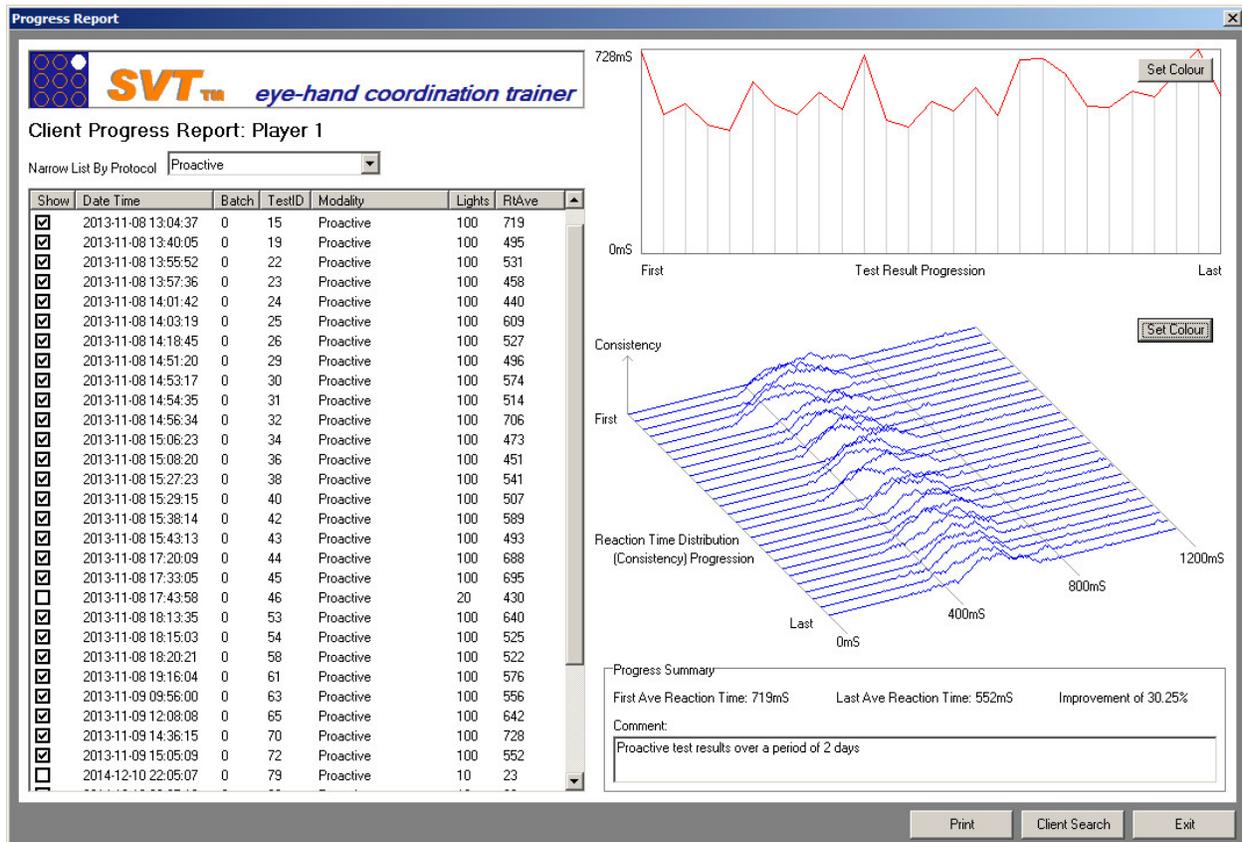
Prev Test: Seeks the data and analysis for the previous chronological test in the database.

Next Test: Seeks the data and analysis for the next chronological test in the database.

Prev By Client: While keeping the currently selected client in focus, the data and analysis for the previous test by the same client will be displayed.

Next By Client: While keeping the currently selected client in focus, the data and analysis for the next test by the same client will be displayed.

Progress Report



The "Progress Report" window is useful for generating a final report that will show the checked test results in a graphically comparative way. Progress can be easily gleaned by looking at the charts and by reading the progress summary.

The printable section of the window is intentionally coloured white for high contrast when printing on paper and is ideally given to test subjects upon completion of a training program.

The left half of the window displays a grid list of the test results available for analysis. Any test results that have an RTAve of zero are unchecked in the list automatically but can be checked to enable them if desired.

Narrow List By Protocol: This drop menu can be used to narrow the number of test results displayed by selecting a protocol modality. After selecting the desired modality, remember to check and uncheck the desired test results in the "Show" column of the test result list.

The right half of the window displays the charts, progress summary and colour controls as follows:

Test Result Progression: Displays a line chart of the RTAve (average reaction time) from the checked test results. The line chart also shows vertical lines for each sample point. The chart is automatically scaled to the highest RTAve from the list of checked test results. The colour of the line in the chart can be set by clicking on the "Set Colour" button.

Reaction Time Progression: Displays a 3D waterfall plot of the reaction time distribution. Each line in the plot consists of the reaction time distribution for each checked test result. Each line should resemble a bell curve where the height and steepness correlates to consistency in the reaction times. Flatter lines are to be expected where there is a lack of consistency in test results or where protocols with a low number of lights are used. The plot lines are ordered such that the First (oldest) checked test is at the back of the waterfall and the "Last" (newest) checked test is at the front. The colour of the line in the chart can be set by clicking on the "Set Colour" button.

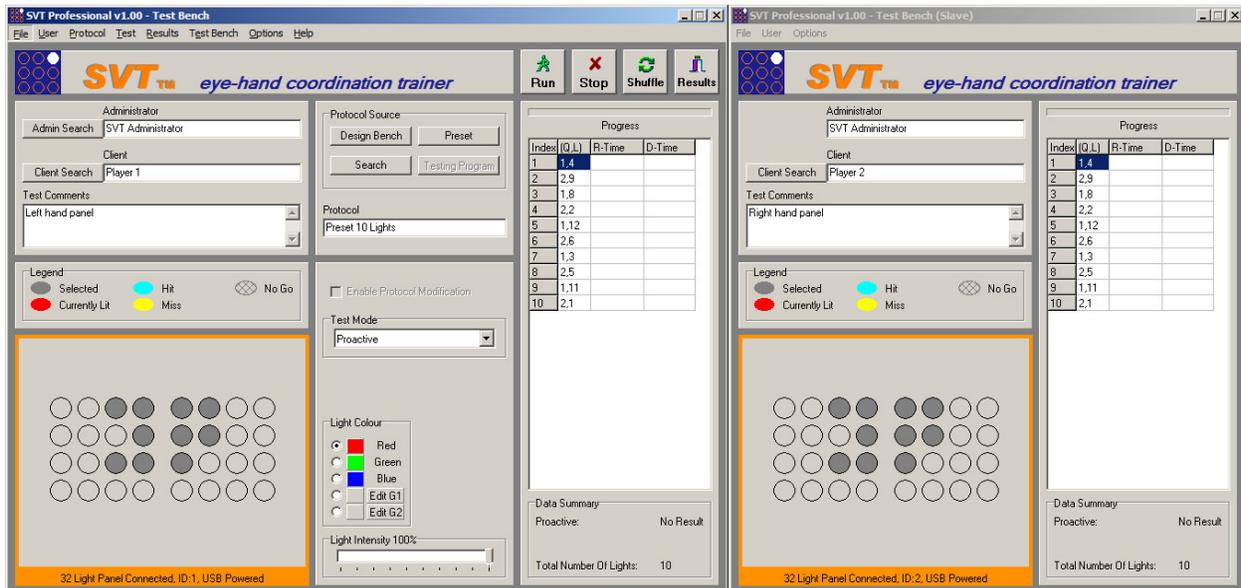
Progress Summary: Shows the "First" and "Last" average reaction times checked for use in the charts. If the "Last" average reaction time is lower (better) than the first, the improvement is shown as a percentage figure.

Comment: For convenience, the comment section can be filled out prior to printing the report.

Print: Will open the "Print" dialog where you can select a printer and print the current view of the "Progress Report" window. Note that the layout and print margins are determined by the tab in Option->Settings->Printer but these can be temporarily overridden in the "Print" dialog.

Client Search: Will open the "Client Search" window so that another client's progress can be viewed and or printed.

Simultaneous Panels



The SVT™ Professional software allows you to run 2 identical SVT™ panels simultaneously on the one computer.

In this configuration, 2 instances of the SVT™ professional software are run in a master-slave relationship where the master window (the larger of the 2 windows) controls the slave window.

There are pre-requisites in order for “Simultaneous Panels” mode to work:

- 1.** Both panels must have the “Player ID switches” set correctly as follows:
SVT panel #1 is set to Player ID = 1 (switch 1 ON and switch 2 OFF).
SVT panel #2 is set to Player ID = 2 (switch 1 OFF and switch 2 ON).
- 2.** You must have 2x 32 light panels or 2x 80 light panels connected to the same PC and both panels must have at the minimum licence level to support the desired functionality.
- 3.** Ideally, the PC’s display should have a resolution of at least 1366x768 pixels (or both SVT Test Bench windows will not fit on the screen).

If all of the pre-requisites have been satisfied, to use simultaneous panels:
Simply run the Test Bench software as you normally would with a single panel then click on the menu->Test Bench->Open Slave Test Bench.

This will open the slave window and begin simultaneous mode.

If the "Open Slave Test Bench" menu item is greyed out, please check the Player ID of the second panel as this menu item is only active when a correctly configured panel is connected.

All common controls and functions are accessed on the master window. In essence, the slave window mimics anything that is done on the master window.

Conversely, Client Search and Test Comments must be accessed separately on each window or form.

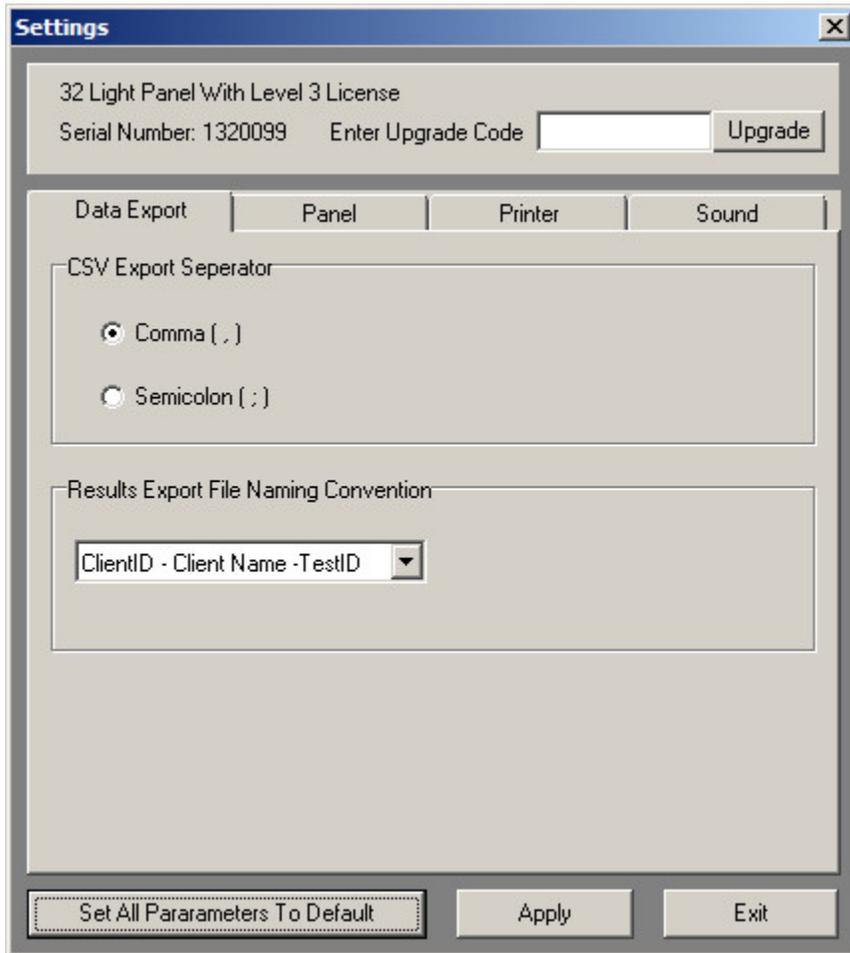
As the idea behind simultaneous mode is to have identical test conditions for 2 clients or test subjects at the same time, controls that adversely modify test conditions on the fly are disabled.

Therefore, "Testing Program" and "Enable protocol Modification" items are not available when using the "Simultaneous Panels" mode of operation.

To end simultaneous mode, close the slave window.

If you have finished using the SVT software, closing the master window will cause the slave window to close as well.

Settings Control Panel



The settings window allows you to configure the SVT software to suit your preferences as well as showing license Information about the light panel's hardware and if the panel is connected to the PC.

All Items set in the settings window are stored and therefore remembered each time the SVT™ software is run.

The upgrade code (if you have been issued with one) is permanently stored in the light panel's hardware and need only be entered once.

There is no limitation to the number of computers the SVT™ software can be installed on and used.

Set All Parameters To Default: Will restore all of the setting to their default values, in order to save the settings, you must click on "Apply".

Apply: Apply any changes to the settings and save them.

A description of the individual settings in each tab follows:

Data Export:

CSV Export Separator: Determines if all of the exported CSV files will use a comma “,” or a semicolon “;” as the separator.

Set this according to your regional settings so that your spreadsheet software can open and correctly interpret the exported files.

Setting this correctly will allow you to double click on any exported result and have it open and view correctly with your spreadsheet software without any warnings or prompts to convert the file.

Results Export File Naming Convention: Determines the convention used for the pre naming of results files.

When exporting a single test result file at a time, the suggested file name can be changed before saving.

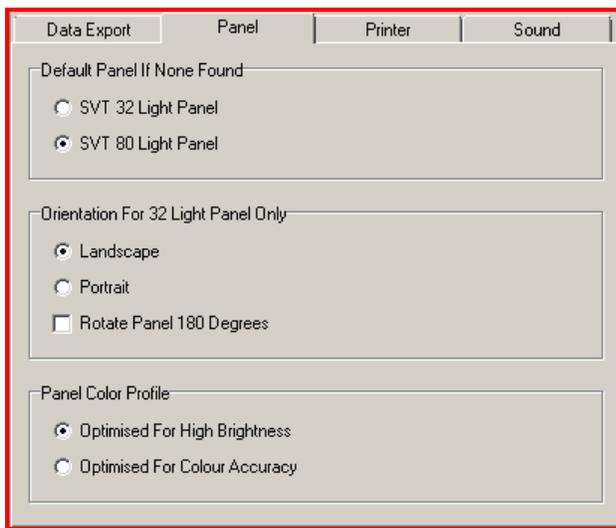
When exporting multiple test results, only the unique suggested file name is used for each test result file but the destination folder can be set.

The choices for naming conventions are:

ClientID - Client Name - TestID

Client Name - ClientID - TestID

Panel:



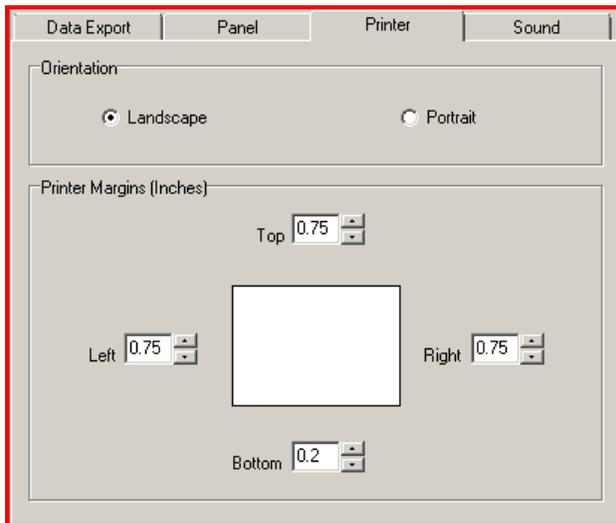
Default Panel If None Found: Choose 32 Light Panel or 80 Light Panel, this setting determines the software behaviour if a physical panel is not connected, allowing you to create and explore test protocols without the physical panel being present. Upon connecting a physical light panel, the software will automatically detect the type of panel and reconfigure the

software in real time; reverting back to the selected default panel should it be disconnected.

Orientation For 32 Light Panel Only: If you have a 32 light SVT you can run it in "landscape" or "portrait" mode and also rotate the panel 180 degree's if desired.

Panel Colour Profile: Determines if light brightness is maximised at the expense of colour accuracy or alternatively optimise the colour accuracy at the expense of absolute brightness.

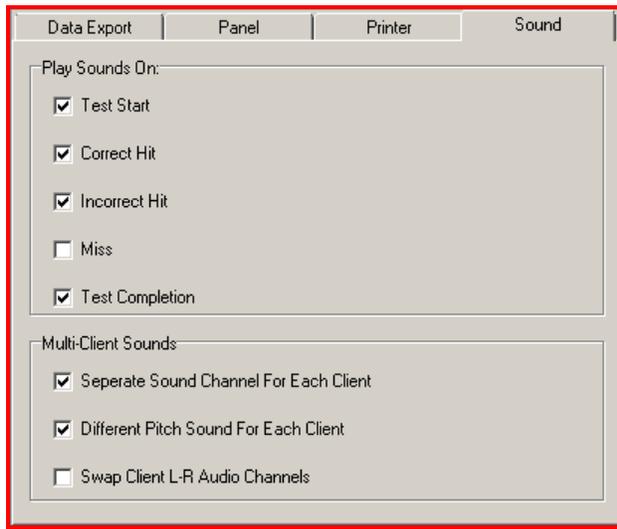
Printer:



Orientation: Set the print orientation as landscape or portrait. Although the printable windows in the SVT™ Professional software are all designed to be printed in landscape orientation, since all printer and paper combinations may behave differently, we have exposed controls to allow correction of the printer margins especially when printing in portrait mode.

Printer Margins (Inches): Fine-tune the printer margins to centre the image on the page. As there is a great deal of variance between printers and paper sizes, adjust the margins to best suit your equipment and supplies.

Sound:



Play Sounds On: Allows granular control of when the software will play audible tones based on events. If the "Mute All Sounds" option has been checked in the Test Bench's Options menu: then no sounds will be played.

Multi-Client Sounds: A new low latency sound engine has been created in order to have higher quality and more control over how the sounds are played.

When using 2 SVT™ panels at the same time on the one PC, the sound engine will delegate the sounds for panel 1 to the left speaker and the sounds for panel 2 to the right speaker.

The left and right channels can be swapped to suit your particular setup if required by checking "Swap Client L-R Audio Channels".

In order to help identify the sounds from panel 1 and panel 2, the sounds for each panel can have a different pitch if "Different Pitch Sound For Each Client" is checked.

Product Feature Tables

Various License levels are available for both the 32 and 80 Light SVT™ Sports Vision Trainers.

Only the features that vary by model or license level are listed as all other features are available to all models and levels of licensing.

	<i>SVT™ 32 and 80 Light Sports Vision Trainers</i>		
Product Licence Level	Level 1	Level 2	Level 3
Choice of Light colours	Red	Red, Green and Blue	16 Million
Go No-Go test protocol	✘	✓	✓
Adjacent Light selection	✘	✘	✓

License levels can be upgraded at any time by contacting your local sales distributor.