

Color iQC Help

PDF files of the Online Help System for Color iQC

Document Version 1.0

Document Date: July 2005

Color iMatch Help

Contents

Getting Started --- Topics associated with setting up the software options.

Desktop Management --- Topics outlining the desktop management option. Desktop management is not required and is included only as an adjunct to program operations.

Spectro Management --- Topics containing instructions on the operation of the spectrophotometer.

Data Management --- Topics covering the storing and retrieving of data stored either in jobs or in the database.

Color Difference/How To --- Topics of instruction on viewing data for evaluating color difference (Quality Control).

eSubmit/How To --- Topics of instruction on using the eSubmit function.

Taper Tool/How To --- Topics of instruction on using the Taper Tool option.

Menu Commands --- Topics covering the program commands available through the main menu items.

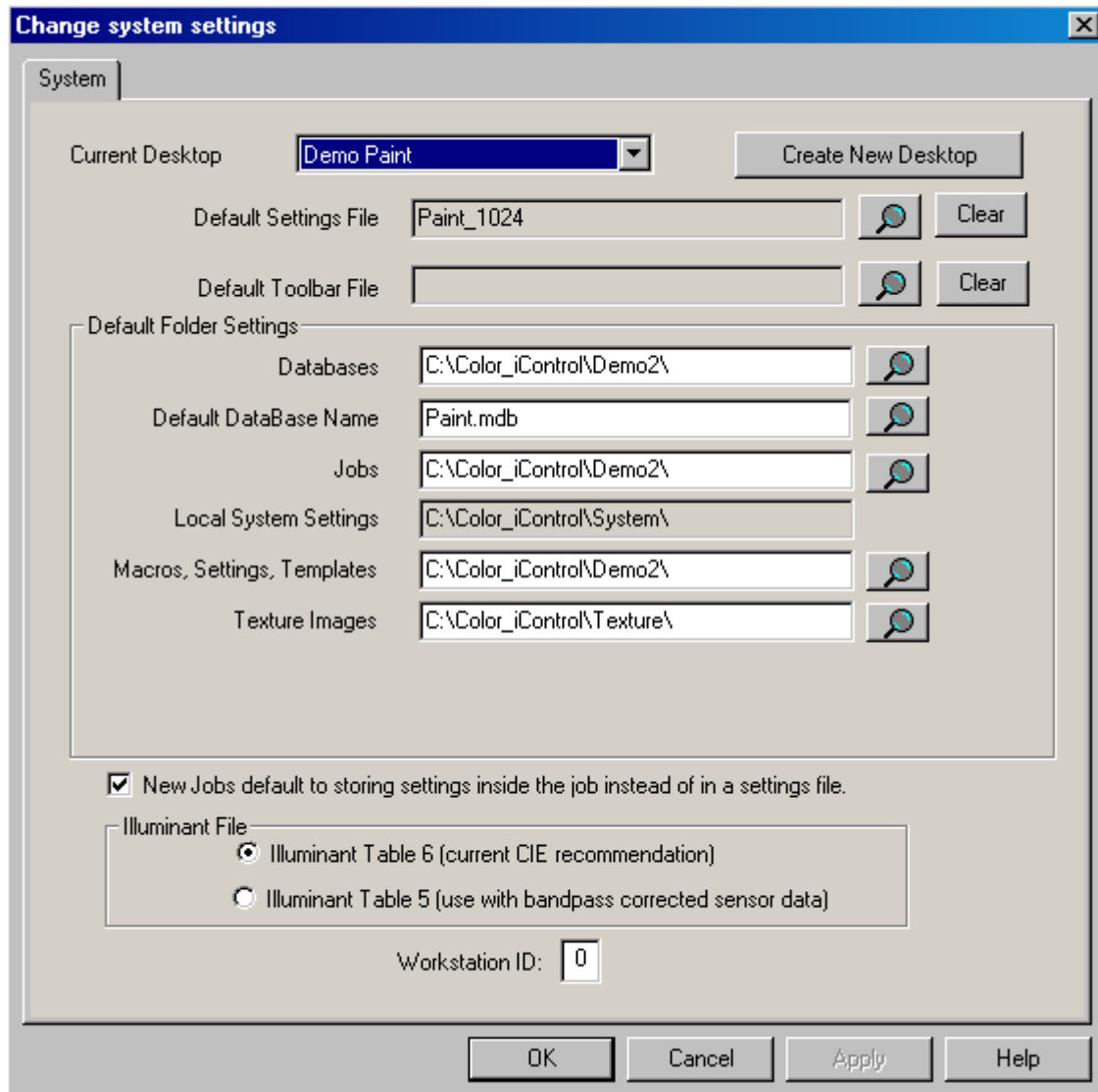
Getting Started

Edit Default System Settings

The Change System Settings dialog (see image below) allows you to choose several default behaviors and the location of the default database and working job folders for Color iControl. Color iControl can only keep up with one of each of these path settings at a time.

If you create a new database using the "Create an empty Data Base" command under the Data menu, you must close out all current jobs and use this option to point to the newly created database. Otherwise, the program will have no way to access the database you created. However, you should keep track of where all your databases are stored. Color iControl will not be able to remember where you have placed your data once you have changed the settings in this dialog.

Below are field descriptions for the various options in this dialog.



Default System Settings Dialog Field Descriptions

Current Desktop --- This field allows you to select from among the available desktops. You may also create a new desktop by clicking on the button to the right. The desktop feature is not required for system operation but is only included as a customizing option. See [Desktop Management](#) for more info.

Default Settings File --- This field will display the settings file associated with the currently selected desktop. You may browse for other settings files using the magnifying glass button to the right. The desktop feature is not required for system operation but is only included as a customizing option. See [Desktop Management](#) for more info.

Default Toolbar File --- This field will display the toolbar file associated with the currently selected desktop. You may browse for another toolbar file by using the magnifying button to the right. The desktop feature is not required for system operation but is only included as a customizing option. See [Desktop Management](#) for more info.

Databases --- This field allows you to select the default database path. You should enter the full path name including the drive letter and any folders in the tree structure above the location of your database. (You may have more than one database.

Default Database Name --- This field allows you to select the default database you wish to use by name. Enter the full name including the .mdb extension.

Jobs --- This field allows you to set the default path leading to the directory where you wish to store all the jobs created in Color iControl. Include the drive letter and any folders in the tree structure above the location where you wish to store jobs.

Local System Settings --- This field displays the path location where the files created by Color iControl containing the various settings options, including sensor settings and passwords are stored. This settings cannot be changed.

Macros, Settings, Templates --- This field displays the path to the default location for storing macro file, settings files, and job templates.

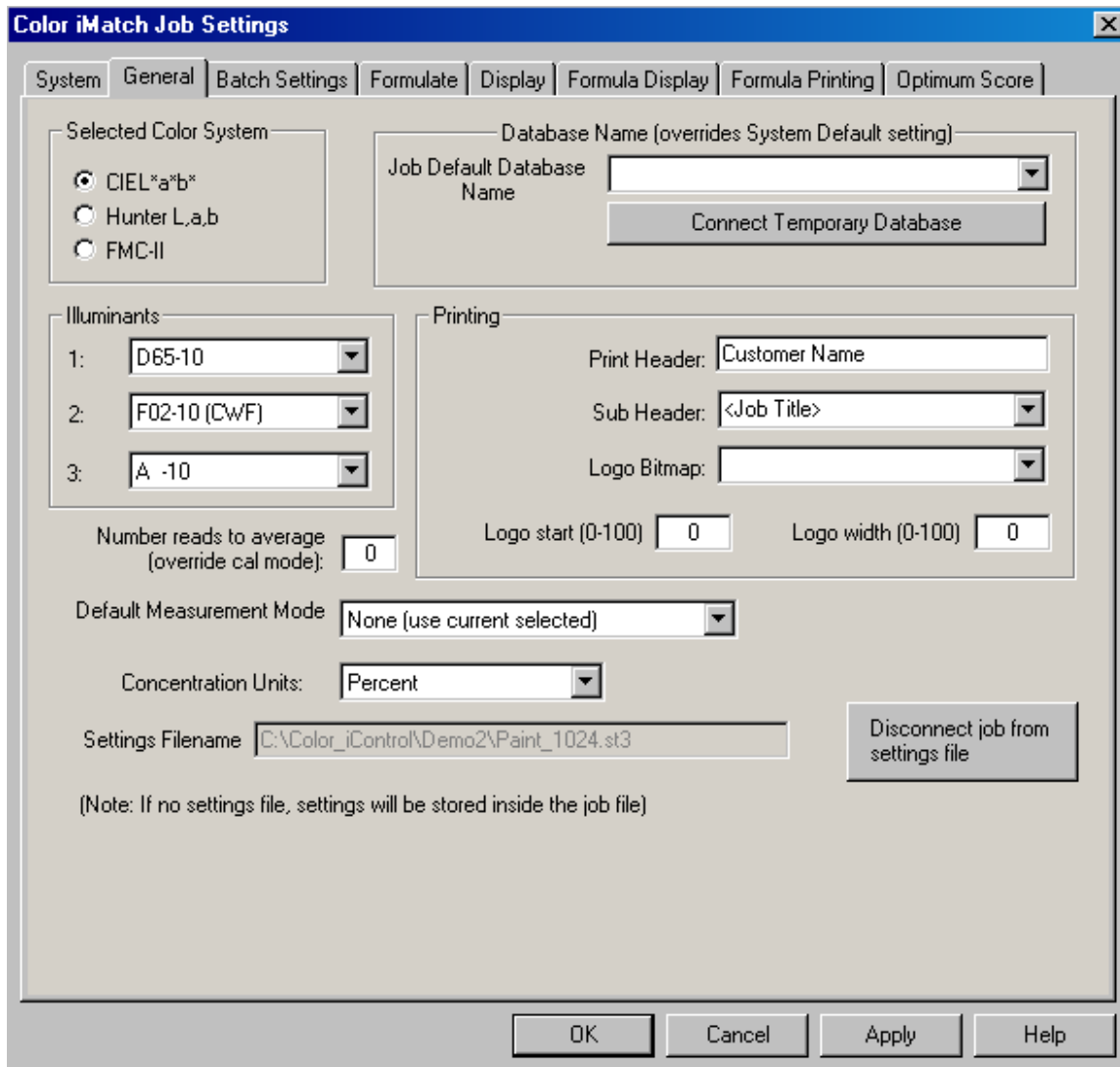
Texture Images --- This field displays the path to the default location for storing texture images used for rendering samples with unusual surface features.

New jobs default to ... --- When selected, this checkbox instructs the system to store settings in each job rather than in a settings file.

Illuminant File --- These two radio buttons allow you to choose between different Illuminant tables, Table 5 for sensors with bandpass correction and Table 6 for sensors without bandpass correction. See the documentation provided with your instrument to determine the capabilities of your instrument.

General Settings

The dialog box below shows the General Settings dialog options. Selected settings (for any mode) are stored in the settings file associated with that job. Field descriptions are included below.



Selected Color System --- These radio buttons allow the selection of the color system to be used within the various modes of Color iControl when making calculations.

Database Name --- Allows the user to select the database to be associated with this job. This setting will override the default database setting for the system for this job. However, the database you select should still be located at the same path location as specified in the Default System Settings. You may also connect to a different database temporarily by clicking on the "Connect Temporary Database" button.

Illuminants --- These three selection fields allow the selection of the primary, secondary, and tertiary illuminants for use in all modes while running Color iControl. Illuminants are named according to type (daylight, cool white fluorescent, incandescent, etc.) and the observer function (two or ten degree).

Concentration Units --- This selection box allows you to choose the concentration units that will be used in Formulation and Correction modes. The units selected here should match the units used in the preparation of your primaries before any measurements are taken. For some units, a small checkbox marked "Imperial" may appear which you can check should that option be needed.

Number of Reads to Average (override cal mode) --- This field may be used to override the number of reads taken and averaged to create a measurement as set in the calibration mode. Setting this value will alter it for the current job. You may also use it when creating settings files or templates to create new jobs with a different value than that defined in the sensor's calibration mode.

Printing --- This set of fields allows you to enter the name of your company (or whatever name you desire) which will appear as the header on all printouts generated by Color iControl. A print sub-header field is also included immediately below this one.

In addition, a company logo may be included at the top of the printout if a bitmap image can be provided. This bitmap should be located in the System sub-folder of the Color iControl main folder.

The positioning of the bitmap at the top of the printout can be controlled using the two fields beneath the bitmap selection drop-down. The first, Logo Start, requires a value between 0 and 100 for the location of the left edge of the bitmap, 0 being the left margin and 100 being the right margin. The second, Logo Width, requires a value between 0 and 100 as well, representing the size of the image in percent.

Care should be taken when using the logo option since careless placement of the image could overwrite any headings included at the top of the printout.

Default Measurement mode --- This field allows you to select a default mode for the spectrophotometer when taking measurements.

Settings Filename --- This field displays the settings file (including full path) that is associated with the current job.

Disconnect this job from settings file --- This button allows you to disconnect the current job from its settings file and store the job settings in the job.

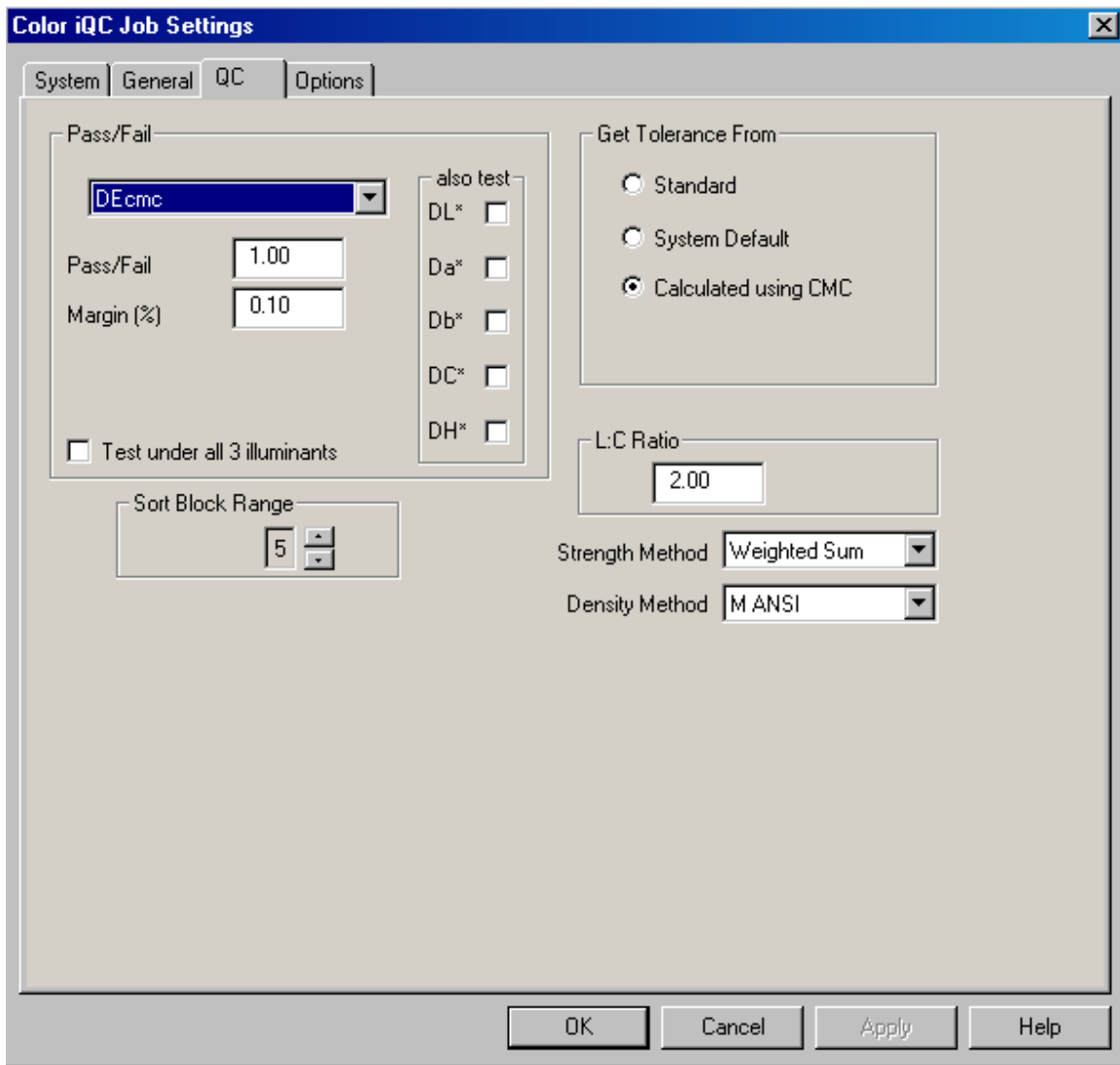
QC Settings

This tab in the dialog box allows you to specify settings governing the quality control functions of the program. The settings illustrated below are sufficient for most applications. Letting Color iControl calculate tolerances using the DEcmc equation is generally the most efficient method.

These settings will govern pass/fail tolerances for the program globally. If you need to set tolerances for an individual standard, you must do that through the Stored Tolerances tab of the standard's Properties... dialog.

In addition, you must be sure to set the program to get the tolerances from the standard; otherwise, even if tolerances are stored with the standard, the system will use the program default. This is done in the "Get Tolerance From" section of the Quality Control tab of the Settings dialog.

See below for field descriptions.



Pass/Fail --- This section of the dialog allows you to specify the color difference equation which will be used by Color iControl to calculate color difference

between a sample and the target. The selections available will depend on the color space you have chosen in General Settings.

When CIELAB is the chosen color space, there are six choices for the equation: DE_{cmc} , DE^* , DE^*_{94} , Rectangular (DL^* , DC^* , DH^*), Rectangular (DL^* , Da^* , Db^*), and Rectangular (DL^*_{94} , DC^*_{94} , DH^*_{94}). DE^*_{cmc} is the standard CIE equation which uses weighted terms to calculate color differences. DE^* calculates the distance in CIELAB units from the standard without using the weighted factors employed by the CMC equation. DE^*_{94} is a newly-developed experimental equation which has been included for those interested in aiding in its evaluation. You may use this new equation at your own discretion. The last three options allow you to select to use a rectangular shape rather than an ellipsoid as your pass/fail option. One rectangular selection is available for each of the three equations previously listed.

When you have either Hunter Lab or FMC-II as your chosen color space, there will only be two options in this drop-down menu. For Hunter Lab, the choices will be DE and Rectangular DL, Da, Db . For FMC-II, the choices will be DE_f and Rectangular DL_f, DRG_f, DYB_f .

Pass/Fail Field --- This field allows you to enter a pass/fail limit for comparing samples to the target. Samples which are farther than this value away from the target will fail; samples which fall closer to the target than this value will be considered passing.

Pass/Fail Margin --- This field allows you to enter a value which will mark samples as only marginal rather than passing or failing. For example, if you set your pass/fail limit to 1.00 DE_{cmc} , you may set your margin value to 0.2. This means that samples falling between 0.8 and 1.0 will be marked with a question mark rather than as an outright passing sample. This marginal value only governs samples falling below the pass/fail limit.

Test Under All Three Illuminants --- Checking this button will cause the system to automatically test the trial against the standard under all three selected illuminants.

Also Test --- These check boxes also allow you to test individual delta values for the main CIELab or CIELCh color spaces.

Get Tolerance From --- These three radio buttons allow you to select the location from which Color iControl will retrieve the tolerances that are to be used when comparing samples to the standard. There are three choices:

From standard - Selecting this option means that you wish Color iControl to retrieve the tolerances which were stored with the standard at the time it was measured. If no tolerances were stored with the standard, then Color iControl

will use the values stored as the system default. To check and see if tolerances are stored with the standard, right click once on the standard in question in the Job Tree and select "Properties." A dialog box will appear allowing you to examine any tolerances stored with that standard.

System Default - Selecting this option means that you wish to use the system default settings as your tolerances for comparing standards and samples. See [Advanced QC Settings](#) for more information.

Calculated - Selecting this option means that you wish Color iControl to calculate tolerances for each standard at the time you are comparing them to your samples. The calculate option is only available when the CIELAB color space option is chosen in General Settings and DEcmc is the chosen equation. Tolerances cannot be calculated for either the Hunter Lab or FMC-II color spaces and must be either stored with the standard or retrieved from the System Default.

Important Note: The tolerance source is a cascade setting - if "From Standard" is specified but no tolerance is stored in the current standard, the software will fall back to the next level (From System), and if no system tolerances are stored then the software will use the "Calculated" option.

Block Range --- The Block Range determines the number of sort blocks by which the ellipsoid of acceptability will be divided when using the 555 Shade Sorting method. The options are 1, 3, 5, 7, and 9. For more information on 555 Shade Sorting, see [Shade Sorting in Color iControl](#).

L:C Ratio --- The L:C ratio governs the lightness to chroma ratio of the ellipsoid of acceptability when using the DEcmc equation for calculating color difference. This value is set to 2:1 for most textile applications.

Strength Method - QC Settings --- This option allows you to select the method Color iControl will use to calculate strength for the strength-adjusted calculations available as attributes for display in the Standard/Multi-Trial View. The options are Single Wavelength, Summed, and Weighted Sum. Single Wavelength is the preferred method for calculating strength based on transmittance data. Weighted Sum is the preferred method when calculating strength based on reflectance data.

Density Method --- This drop-down box allows you to select the method used to calculate density. Values for this drop-down list are located in the "density.table" located in the system subfolder of the main Color iControl folder.

Settings Options

This tab of the Settings dialog allows you to select from a variety of program options. Clicking on the checkbox enables the item.

Auto-accept standards --- Selecting this option prevents Color iControl from double-checking with the user before storing newly read measurements from the instrument. Normally, after measuring a standard the program will display the measurement data, along with fields for naming the standard, concentration, etc., and then ask you if you wish to store the data. This option eliminates the double-check and immediately stores the standards and moves on to the next measurement. Also, if this option is turned on, the user will not be given the opportunity to enter tolerances for that standard manually.

Auto save measurements to database --- Normally, in order to save measurements to the database, you must select "Save to Database..." from under the Data menu. However, selecting this option instructs the program to automatically save all measurements to the database for recall later.

Auto promote standards on trial reading --- Checking this box instructs the program to automatically select among multiple standards which standard is to be promoted to current status in the job based on the Pass/Fail tolerances in that job. This will be done as each trial is read so long as the standard being promoted is 1.5 (default) Pass/Fail tolerances from the standard. If a trial is read that is not within the pass/fail limits, the currently selected standard will be demoted so that the main standard slot is empty.

Auto save/refresh colorants to database --- This checkbox affects program operations whenever you are in Primary Evaluation. If checked, whenever you evaluate a set of primaries and store them as a colorant into the current job, that colorant will also be stored to the database at the same time. This does not mean you will store those primaries to the database, only the colorant will be auto-stored. **Note:** Primaries can only be evaluated and colorants stored in the iMatch version of Color iControl.

Checking this option also instructs Color iControl to re-load all of the colorants in the current job from the database immediately upon opening the job. This ensures that all colorant information in the job is current. For example, some colorants may have had their cost values increased. By auto-refreshing the colorants, an older job would automatically have the correct cost value.

Auto save jobs every --- This field allows you to set Color iControl to auto-save jobs in case of a system crash or other malfunction. You may use the field provided to enter an interval (in minutes) for the auto-save to be performed. This field defaults to sixty (60) minutes.

Auto Average Trials --- Checking this option enables the system for auto-averaging during the trial measurement process. With this option enabled, the

"Read Trials" dialog box will contain a small button that reads <End Avg>. Clicking on this button will automatically average all of the trials read up to that point; a dialog box will appear that allows you to name the average. Once you have named the average, the system will place it into the current job at the bottom of the trial list in the Tree View.

The "Read Trials" dialog also contains a button allowing you to enable this feature without opening the settings dialog. When reading trials, simply click on the "Begin Avg" button before you read the first trial you wish to include in the average value. Once all the trials you wish to average have been read, click on the <End Avg> button. Name the average and click on OK.

Auto Clear Views on Read Dialog --- Checking this option instructs the program to clear all of the samples from all of the current views when the user opens a Read dialog in order to make measurements.

Auto Show Only Associated Trials --- This checkbox instructs the system to automatically display only those trials in a job that are associated with the current standard.

Close Read Dialog after measurement --- This checkbox instructs the program to close the read dialog after each measurement.

Use name formatting --- Selecting this option enables the formatted **Naming Conventions**. See that section for more information.

Default To Transmittance mode --- This checkbox changes the default for your sensor to measuring in transmittance mode rather than reflectance.

Ask for Comment on measure --- Checking this box enables the system to allow the user to enter a comment with each measurement. A comment field will appear in the Read dialog box immediately after you enter a name for the measurement, replacing the name field. You may enter a comment up to a maximum of sixty characters.

Ask for Length of Trial on measure --- This setting causes the program to include a field in the Read dialog which allows the user to enter the length of the piece being measured.

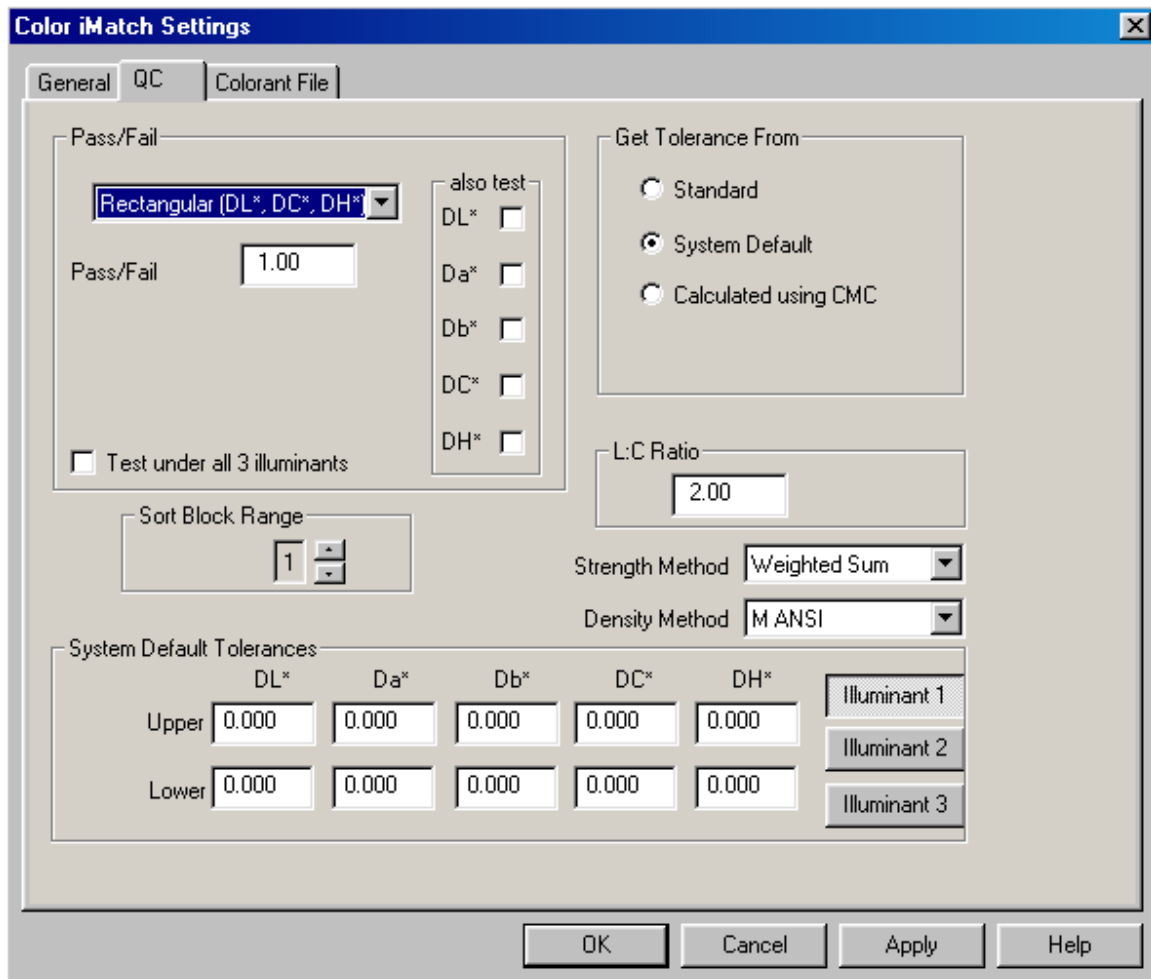
Advanced QC Settings

Although this section is referred to as Advanced QC Settings, all the items discussed here are set from the same tab as in the regular QC Settings. This section is referred to as "advanced" due to the complexity of some of the other settings.

The image below shows the QC tab when the Rectangular (DL*, DC*, DH*) option is selected in the Pass/Fail box. Rectangular tolerancing allows you to include those samples which would normally fall outside the ellipsoid of acceptability calculated using DEcmc (i.e., those samples falling into the corners cut off by the ellipsoid).

In this figure, notice that the Block Range is set to one and the Tolerance Location is set to "System Default." When a Tolerance Location other than Calculated is selected (either "From standard" or "System Default"), a set of fields will appear at the bottom of the dialog allowing you to enter the desired tolerances. (Values set in the System Default fields will be used whenever Color iControl cannot locate tolerances stored with the standard, even when "From standard" is the selected tolerance source.)

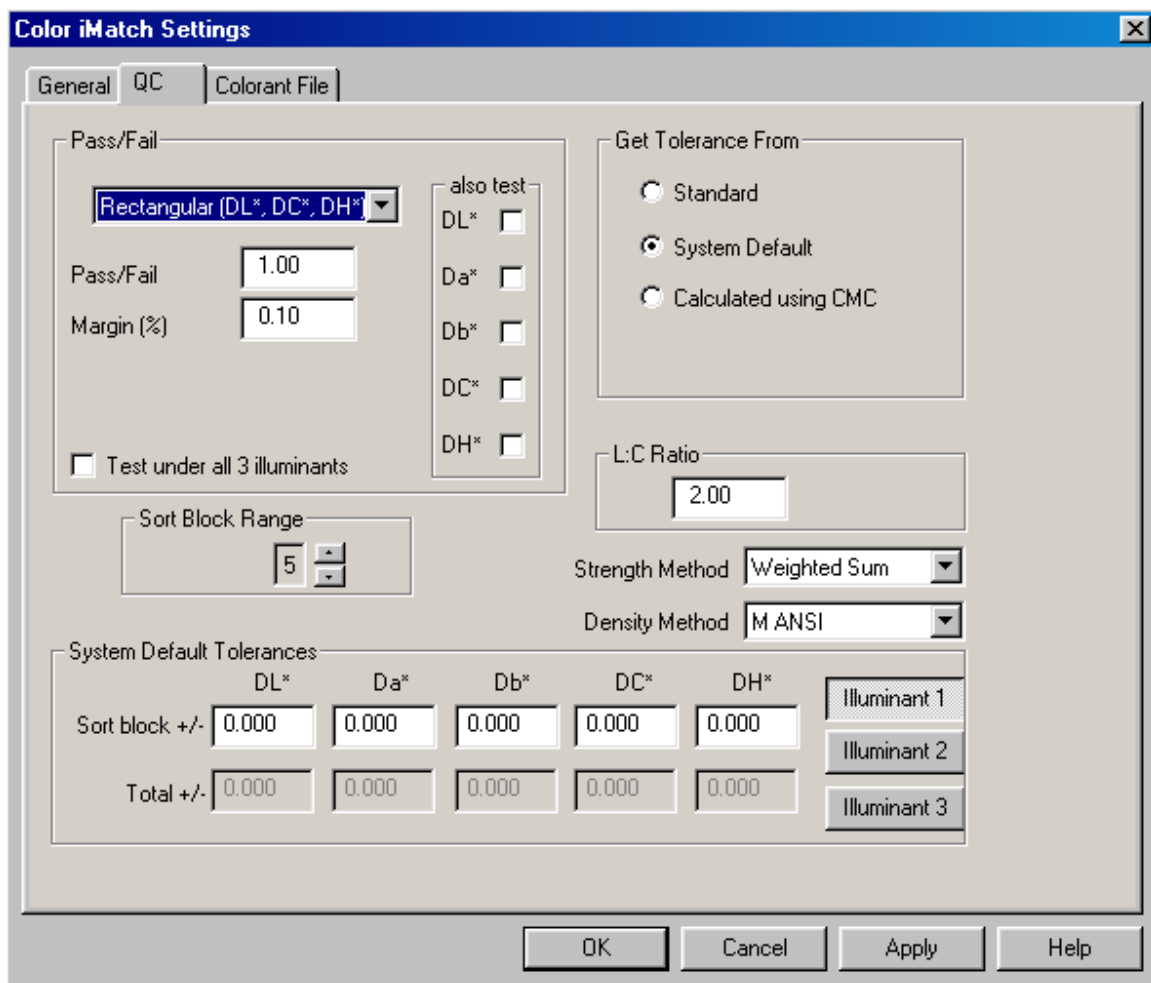
The Margin field will not be available when rectangular tolerances are selected and the Block Range is set to one.



Furthermore, if the Block Range is set to one, you may select tolerances which offset the location of the standard within the rectangular shape designated

as equivalent to the standard in shade. This is accomplished by allowing you to enter both lower and upper tolerances for each of the five values included for these settings (DL*, Da*, Db*, DC*, DH* -- These selections are only available when CIELAB is the selected color space. The selections for Hunter Lab and FMC-II are DL, Da, Db and DLf, DRGf, and DYBf, respectively.) You may only enter upper and lower tolerances when the Block Range is set to one.

A higher setting for Block Range will cause the System Default Tolerances area to only display entered tolerances as plus/minus, that is, the dimensions of the rectangle will be symmetrical with respect to the standard. This option is illustrated below. Notice also that the Pass/Fail and the Margin fields are once again available.



How to Set Pass/Fail Tolerances

Color iControl has been designed to allow color evaluation in a variety of industrial settings. Because of this, some of the controls governing color tolerancing can be quite complicated. One aspect that can be very confusing is

the textile industry's practice of shade sorting, i.e., not only determining whether a piece is on-shade or not, but also sorting the samples so that each one can be grouped with others very close in color, yet all still on-shade to the standard. This process is completely unnecessary for many of the other applications of Quality Control.

For those users who do not need any form of shade sorting, the main setting that needs attention is the "Block Range" option found in the [QC Settings](#) dialog box. For textile users, this box determines how the 555 shade sorting method will be applied by the software. See [Advanced QC Settings](#) for more options.

For non-textile users, this feature should be set to a value of one (1). Setting the Block Range to one basically turns off the shade sorting features.

Once the Block Range is set to one, the other settings governing a basic pass/fail system of tolerancing can be put into place. Selecting whether you wish to use CIELab's DEcmc equation, simple DE, or rectangular coordinates can be done using the available drop-down list. Once the equation is selected, enter the pass/fail value as well as a pass/fail margin in the fields provided. The margin value is used to determine questionable passing samples that are still within tolerances but outside the margin value. For example, if you set your tolerances to one DEcmc and your margin to 0.10, then a sample falling 0.95 DEcmc away from your sample would be marked as questionable.

Important Note: To see Pass/Fail icons or the Pass/Fail column in the Standard/Multi-Trial view, the "Pass/Fail"Margin" attribute must be selected for display in the view's Properties... dialog.

Setting Tolerances for Individual Standards --- DEcmc, Logical and Statistical Tolerancing

Tolerances set through the Quality Control Settings tab will be applied globally throughout the program. However, in many instances, users may need to set tolerances for individual standards with each standard having different tolerances. When this is the case, the tolerances will need to be set for that standard through the Stored Tolerances tab of the standard's Properties... dialog. (When using tolerances stored with the standard, remember to set the program to retrieve tolerances from the standard in the QC settings dialog.)

You may enter in the desired tolerances by hand or use the automatic options. The first automatic option allows you to set the program to use tolerances based on the CIELab DEcmc equation. Just click on the "Calculate from DEcmc" and the program will automatically calculate the tolerances.

The second automatic option is Statistical Tolerancing. This option requires that at least ten trials be selected in the job (this provides a sufficiently large data set). Enter a Sigma limit in the field provided and click on the Compute Statistical Tolerances button.

The last automatic option is Logical Tolerancing. This method requires that at least ten failing trials be loaded into the job and selected. (Only failing trials should be selected.) Then, click on the Compute Logical Tolerances button. The system then calculates the smallest tolerances in each dimension that includes the acceptable samples. Once that is done, the system calculates the largest tolerances possible that still exclude the highlighted failing samples. The software then determines which samples fall on or between those two ranges. Those samples are then averaged in order to calculate the mean "best fit" tolerances between the two boundaries. The resulting tolerances are then loaded as the default for the standard.

See [Additional Properties of Standards](#) for more information.

Shade Sorting in Color iControl

Shade sorting is a term used to describe the quality control practice of comparing samples to a standard and sorting them into groups having similar differences from the standard. The alternative to shade sorting is a pass/fail method. Shade sorting is a more complicated method than pass/fail. Pass/fail simply checks a sample's distance in color space from the standard and compares that difference to an established pass/fail limit. For example, DEcmc is an excellent tool for pass/fail. If it is over the pass/fail tolerances set by the user, then the sample fails as a match to the standard. However, this method does not really tell us anything about the sample's relationship to other samples or the quality of the difference between the standard and the sample, i.e., does the sample differ in hue, chroma, or lightness? The 555 shade sorting method offers limited advantages over a simple pass/fail.

555 Shade Sorting

555 shade sorting is a process often employed when a large number of samples need to be separated into groups based on shade similarity. The 555 sorting system consists of a three-dimensional arrangement of rectangularly shaped boxes, stacked nine deep in each of three dimensions (usually lightness, chroma, and hue) and centered around the standard.

These nine sort block levels (or whatever that value is set to) will all fall within the established tolerances. That is, if you have sort blocks set to five, then only the five levels immediately around the standard will fall within the ellipsoid of acceptability.

Color iControl will actually calculate as many sort blocks as necessary to place all the samples, resulting in the possibility of seeing sortcodes like 20, 30, or even 100, depending on how off-shade the given sample is.

The center box, within which the standard falls, is designated the 555 box, and any other samples which fall into this box are judged to be equal to the standard and given the same sort code of 555.

As samples fall further away from the standard in any direction, they will fall into other boxes and be accordingly classified. Thus, you can instantly relate the fact that five rolls which are each coded 375 are darker and brighter than the standard, but sufficiently close to one another to be used in the same garment.

This ability of sort code numbers to convey useful information about each sample's relationship not only to the standard but to other samples makes it a successful method for minimizing the problems associated with shade variation.

How close the samples all falling into one sort block are to each other depends on the size of that sort block. In Color iControl, you have the choice to select from one to nine as the sort block range, with the most common choice being five (this is also the default range).

A sort block setting of five means that there will be two levels of sort blocks (within the tolerances) calculated above the central block level containing the 555 block and two below, setting the range to seven means that there will be three levels of sort blocks above and below the one containing the 555 block.

However, no matter how many or how few sort blocks you choose, they will be dividing up the same ellipsoid of acceptability. Therefore, the greater the sort block range, the smaller each block will be and the closer each sample in that block will be in shade to each other.

So, we must understand what are the factors that determine the ellipsoid of acceptability.

Factors Determining the Ellipsoid of Acceptability

There are three factors which determine the size of the ellipsoid of acceptability which Color iControl draws around the standard and which is divided up to form the 555 shade sorting blocks (when using DEcmc to calculate).

These three factors are the $L^*a^*b^*$ values for the standard, the pass/fail volume, and the $l:c$ ratio. The $L^*a^*b^*$ values determine the standard's location in color space. This is very important since color space is not uniform. The ellipse for a yellow sample will be larger than the ellipse for a blue sample even if the three factors are set to the same values due to the differences in the yellow portion of color space as opposed to the blue.

The pass fail volume determines the basic diameter of the ellipse, while the l:c ratio (standing for lightness to chroma) determines how long the ellipse will be compared to its width. (This value is typically set to 2:1 for textile applications.)

All of these values may be set in the QC tab of the Settings dialog.

Using the 555 Shade Sorting Method in Color iControl

To use the 555 shade sorting in Color iControl, you must select to display the 555 sortcodes in the Standard/Multi-Trial view. To do this, you must edit the Std/Multi-Trial View Properties and select Sortcodes- DLab, Sortcodes DL*a*b*, or Sortcodes-DL*C*H* as a display option. The Sortcodes-DL*C*H* option displays sortcodes exactly the same as the DL*a*b* option except that the second sortcode represents the DC* of a sample rather than its da* value and the third sortcode represents the DH* value rather than the Db* value. The sortcodes for each sample will then appear in the appropriate column.

Desktop Management

Desktop Management

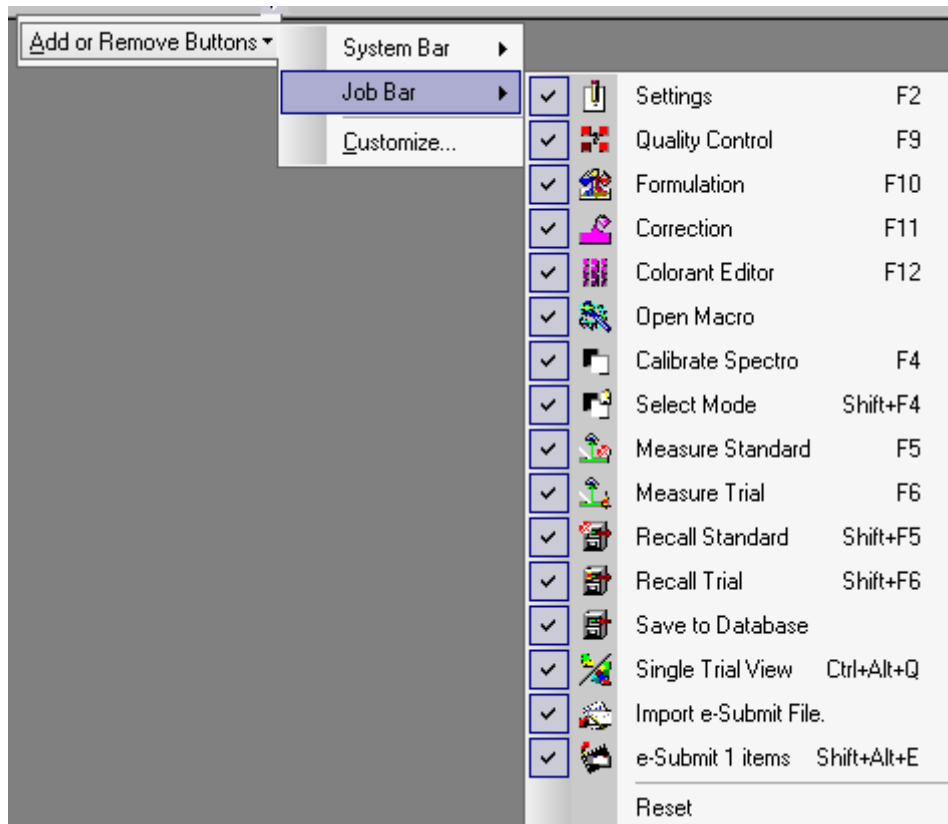
Color iControl allows the creation of desktop layouts that can affect many of the software's operating parameters, including such global settings as the default database folder or default jobs folder. In addition, a desktop can be associated with a user ID so that as soon as a user logs on to the system (even if passwords are disabled), the correct desktop will instantly be applied to the program.

Desktops are selected and created from the System tab of the Settings dialog box. A drop-down list at the top allows you to select from previously stored desktops. All of the default system settings will be stored with the desktop. This means that any or all of the default data paths may be left alone or changed when creating new desktops. This allows different desktops for different users to point to different databases or to store their jobs in different folders.

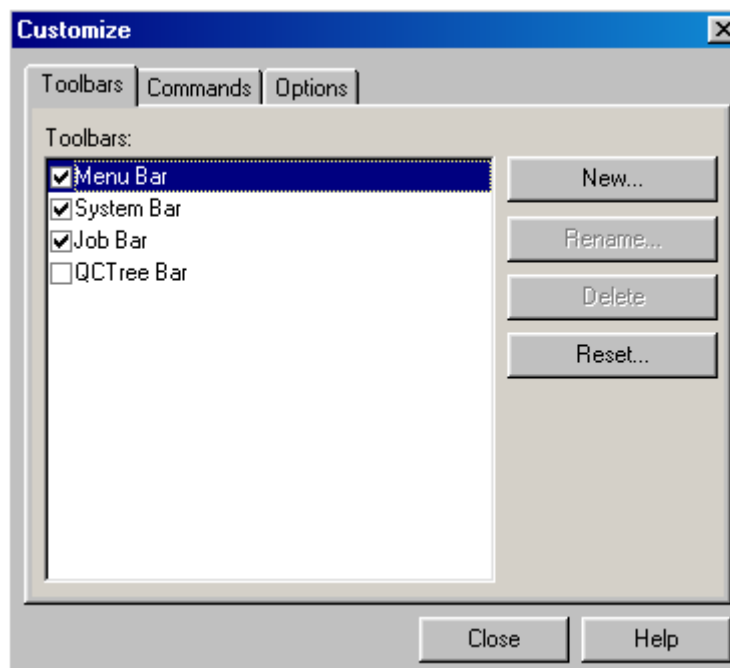
In addition, this dialog allows you to select a default settings file (*.st3) to be associated with each desktop, as well as a default toolbar file (*.tlb). See Settings, Templates, and Layouts for more information on settings files. See below for information about editing the toolbars (toolbars in Color iControl are user-configurable).

Editing the Toolbars

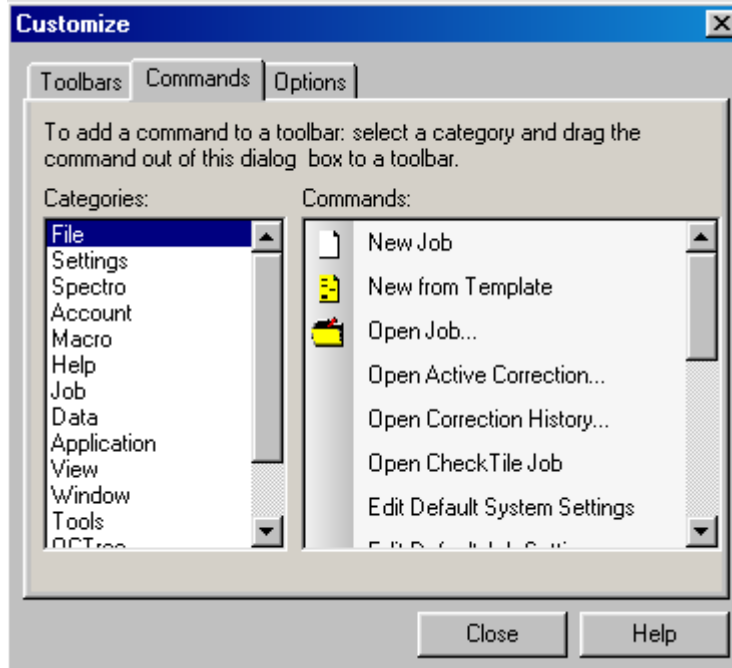
The toolbars may be configured to each user personal preference. To do so, click on the downward facing arrow located at the bottom of the darkened bar at the right-end of the toolbar. A small popup box will appear with the words "Add or Remove Buttons." Placing the mouse cursor on this popup will cause another menu to appear displaying the current toolbars. Placing the mouse cursor over one of these will display that toolbar's default selections. You may check or uncheck each button option as needed (see image below). In addition, a "Reset" option is at the bottom to restore the toolbar to its default state.



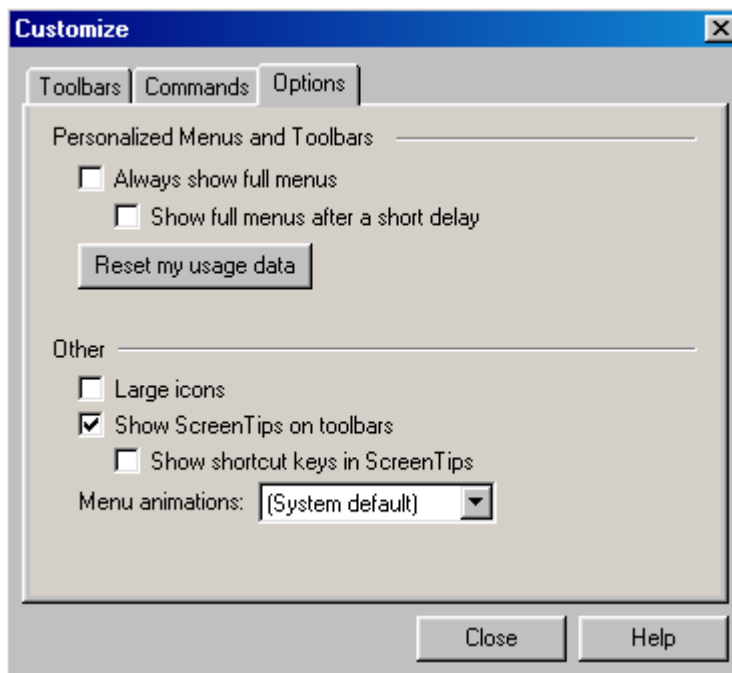
In addition, the "Customize..." option at the bottom of the second menu allows you to add a toolbar for any command available from the main menus. Clicking on this option opens a dialog box (see image below). Each of the three tabs allow different levels of toolbar creation and/or display.



This tab allows you to select to create a new toolbar, reset an existing toolbar, rename a toolbar, or delete a toolbar. (You may not delete or change the basic four default toolbars except as noted above.)



This tab allows you to add a button from any of the main menu selections to your personal toolbar.



This tab allows you to specify various behaviors and some aspects of the toolbar's appearance.

Permissions Descriptions

Using the "Manage" command from the Account menu allows supervisors to create user accounts. You may specify the amount of access to program functions each user has by checking that option. Each of the available permissions are listed below with a brief explanation.

Delete Data from Jobs - Selecting this option allows the account to delete data from jobs. This includes replacing a standard in a job with a standard already loaded. For example, you open a job with a standard already loaded into it and you do **not** have permission to delete data from jobs. You will not be able to read a new standard into that job since a job can only contain one standard and reading in a new one entails deleting the old one, an action which you do not have permission to perform.

Delete Data from the Database - Selecting this option allows the account to delete data from the database.

Set Up Name Formatting - Selecting this option gives the account access to the Formatted Name Setup dialog box (reached through the Configure Naming Conventions... command under the Data menu).

Modify Data in Job - Deselecting this option disables several of the right-click menu options in the Job Tree View in QC mode preventing the user from altering the data in the job. The "Create Hitch," "Correct Measurement Using Hitch Factors," and "Properties..." options will be grayed out and unavailable unless this option is selected for use by the account.

Save Data to Database - Selecting this option disables the "Save to Database" command for the account, both from the Job Tree right-click menu in QC mode and under the Data option in the main menu.

Do Formulations - Selecting this option gives the account access to Formulation mode.

Do Corrections - Selecting this option gives the account access to Correction mode.

Evaluate and Store Primaries - Selecting this option gives the account access to the Primary Evaluation mode.

Change System Settings - Selecting this option gives the account access to the main settings dialog box in each mode, otherwise, that option will be grayed out. In addition, the "Properties..." option in the right-click menu of each view will also be unavailable without this permission.

Setup or Modify Password Accounts - Selecting this option gives the account access to the Account Management dialog box opened through the "Manage" command under the Account menu.

Run the Instrument - Selecting this option gives the account access to the instrument, including calibration and taking measurements.

Change Database Path - Selecting this option gives the account access to the Default System Settings dialog box accessed through the Settings dialog menu. (Also available through the Edit Default System Settings command under the File menu.

Toolbar Buttons

The toolbar at the top of the screen provides quick access to many functions in Color iControl via its buttons. All functions incorporated into the toolbar may also be accessed through the drop-down menus. There are also several buttons in the program specific to each mode. These buttons do not appear in the general toolbar. The icon image selected for each button is displayed below (in order from left to right), along with a brief explanation of the button's function.



Opens a new job.



Opens a new job based on an existing template.



Saves the current job.



Opens an already existing job.



Prints data from the current mode of the current job.

Settings Button



Opens a dialog box which allows the specification of settings associated with the current mode.

Macro Selection Dialog



Opens a dialog box allowing the user to select a macro to run in Color iControl.

Sensor Management Buttons



Opens a dialog box which allows the sensor to be calibrated.



Opens a dialog box which allows the specification of settings governing the calibration of the sensor.

Data Management Buttons



Reads a sample from the sensor and automatically stores it as a standard (target) in the current job.



Opens a dialog box which allows you to recall a standard from the database.



Reads a sample from the sensor and automatically stores it as trial data in the current job.



Opens a dialog box which allows you to recall trial measurements from the database.



Opens a dialog box which allows you to save any form of data from the current job to the database.

E-Submit and Extended Tagging Buttons



This button will only activate when a QTX or XML file is waiting in the appropriate mailbox or folder after having been received as a submit.



This button will activate when any trials are selected and allows you to use the eSubmit option to export the data as a QTX or XML file.

Tree View Toolbar Buttons

The Tree View has its own toolbar which allows users to choose from a wide variety of display functions, review an item's properties, or to export items to a particular file format (EXP, QTX, etc.). Each of the toolbar's buttons are illustrated below with a brief explanation of its function.



This button expands the Tree View to display all the various levels of data, standard, trials, substrates, resins, colorants, etc.



This button displays all of the data in the Tree View (not including colorants) in the available data views.



This button displays only the selected data from the Tree View in the available data views.



This button removes all item from the data views.



This button sorts the data in the Tree View by date of measurement.



This button eliminates any sorting done and returns the data in the Tree View to its original sort order.



This button copies a selected item to the data section of the Tree View.



This button copies a selected item to the standard position. (Remember, only one item can be in the Standard slot at a time.)



This button opens a dialog box allowing you to create a measurement.



This button will average a new trial measurement based on all of the trials currently selected when the button is clicked on.



This button will average a new standard based on the data currently selected when the button is clicked on.



This button opens the Properties dialog box for the selected item.



This button will show the selected items in the available data views.



This button will export the currently selected items to an EXP formatted file.



This button will export the currently selected items to a QTX formatted file.



This button will export the currently selected items to a NetPalette file.



This button will automatically start the formulation process and attempt to match the currently selected item.



This button will sort the data on colorimetric data.



This button will sort the data by name.



This button will export the selected data to a CXF formatted file.

Settings Files and Templates

It is important to understand the differences between these two program options and how they affect the operation of the system. Each is discussed below.

The Settings File

Users may choose how they want their settings saved, in the job or in a "settings file." The default method is to use the settings file option. However, the first time you run the software after installation you will be prompted to select the System Default Settings at which point a checkbox allows you to switch the system from using settings files back to storing that information in each job.

Whichever method you select, you will still have the option to change the way in which an individual job stores its settings when running the software.

The settings file option has been designed to provide an easy way to ensure continuity for the settings established for any particular type of job (i.e. quality control, formulation, correction, etc.) Multiple jobs can all point to the same settings file, providing a single source for the values governing calculations in all those jobs. Multiple settings files may be created and jobs linked to them, providing an easy way to set up for a variety of tasks while still maintaining continuity for the settings established for those tasks.

One of the main advantages to using the settings file (as opposed to storing them in each job) is that it allows users to make global changes to large numbers of jobs by simply editing one settings file.

For example, you have a large number of formulation jobs, each loaded with a particular standard. Previously, you had the system set up to sort the formulas on DEcmc, Predicted Performance, and Cost. However, you now need to sort formulas on Predicted Performance, Metamerism, and Cost.

The settings file allows making this change easily. Simply open one of the formulation jobs and make the change in the Formula Display tab of the settings dialog, then click once on the "Save Settings" command under the Job menu. The new settings will be saved to the file. All formulation jobs pointing to that settings file will now sort their formulas on the Predicted Performance, Metamerism, and Cost.

One of the other advantages to using the new settings files is in the creation of templates. Previously, you could include settings (as well as data) in a template; new jobs created from that template would automatically include the settings from the template. However, editing the template to include new or different settings would only affect jobs created using that template after the changes were made. Jobs created from that template prior to the changes would still contain the old settings.

Templates (like jobs) may now be created to point to a particular settings file. Any jobs created from that template will also point to that settings file. If you need to make changes to that template, you may simply edit the settings file. Not only will all new jobs created using that template contain the changes, but all of the old jobs associated with (pointing to) that settings file will also be changed at the same time.

However, not all users require that kind of continuity. In fact, there are many users who need different settings for their jobs on a regular basis. For those users, the option to store their settings in the job is the best way to set up the system. This is because if every job needs different settings, then every job would have to have its own settings file. This would be a waste of system storage space as well as a waste of time for the user who would have to create a unique settings file for each job.

Another reason to store settings in the job is that it makes sharing data between users easier. Sending a job via e-mail to another user is a lot easier when that job is self-contained. When a job is linked to a settings file, both the job and the settings file would have to be sent since the job cannot be opened without its settings.

Templates

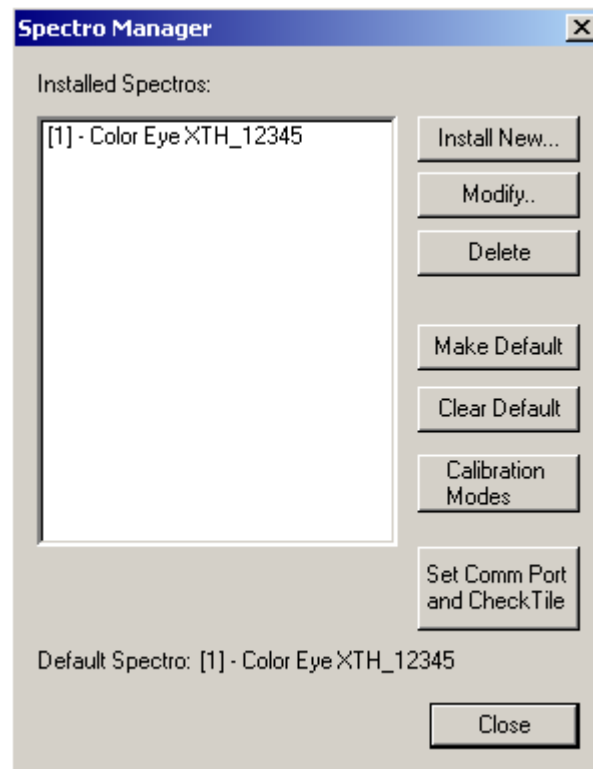
Templates in Color iControl are much the same as the templates you can create in a word processing or spreadsheet application. For example, many word processing packages allow you to create templates for documents you need on a regular basis, such as business letters, price quotations, packing slips, etc. In Color iControl, creating templates can be a good way to set up jobs ahead of time for frequently performed tasks.

For example, you know that you frequently have to formulate using the same substrate and the same set of colorants but a different standard. Setting up a template ahead of time by loading the substrate and colorant data into it makes creating those formulation jobs a breeze. You would simply select the "New Job from Template" option from under the Job menu, select your template, and click <Open>. Read the standard with the sensor or recall it from the database and you are ready to formulate.

Spectro Management

Install or Configure

This command is located under the Spectro menu and allows you to install a new instrument or configure the selected instrument. Clicking on this command brings up the Spectro Management dialog box illustrated below.



From this dialog box, you may:

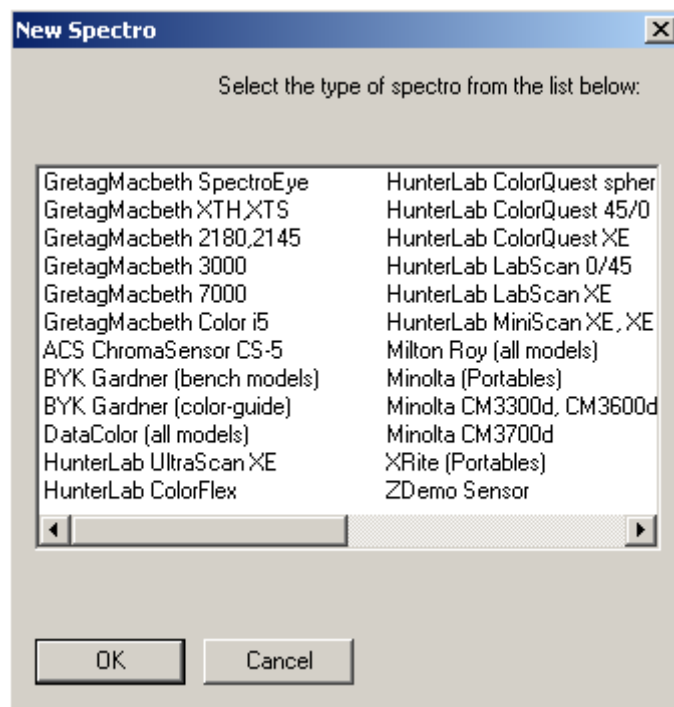
- Install a new instrument using the Spectrophotometer Installation Wizard, a built-in utility which takes you through several dialog boxes prompting you for information about the instrument you are installing.
- Modify an instrument's settings. This procedure also brings up the Spectrophotometer Installation Wizard.
- Delete an instrument from the currently available list.
- Change the mode of the current instrument or alter the comm port through which it communicates with the computer.

Jumps are provided below to topics containing detailed instructions for each of these options or you may click on the <Contents> button to return to the main help topics.

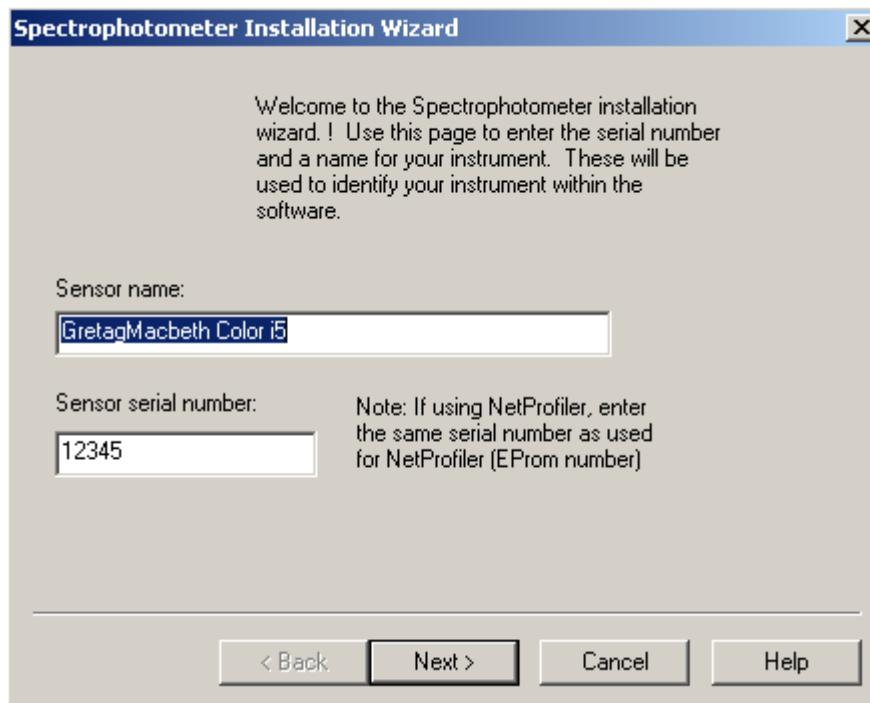
[Installing a New Instrument](#) [Select Mode](#) [Modifying an Existing Instrument](#)
[Deleting an Instrument](#) [Calibrate](#)

Installing a New Instrument

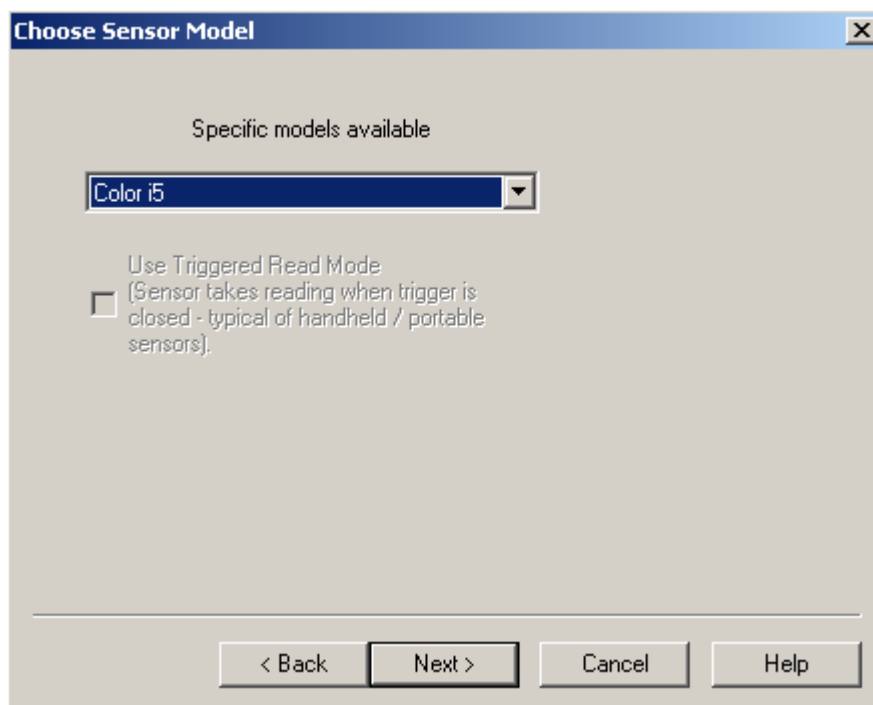
When installing a new instrument, begin by clicking once on the "Install New" button in the Sensor Management dialog box (See [Install or Configure](#) for more information). Doing this will bring up the New Spectro dialog box (illustrated below). Select the instrument you are installing from the list and click "OK." (Depending on the instrument, you may be asked for a calibration disk(s) that should have been provided with your sensor. If this is the case, follow the instructions on-screen before proceeding to the next step below.)



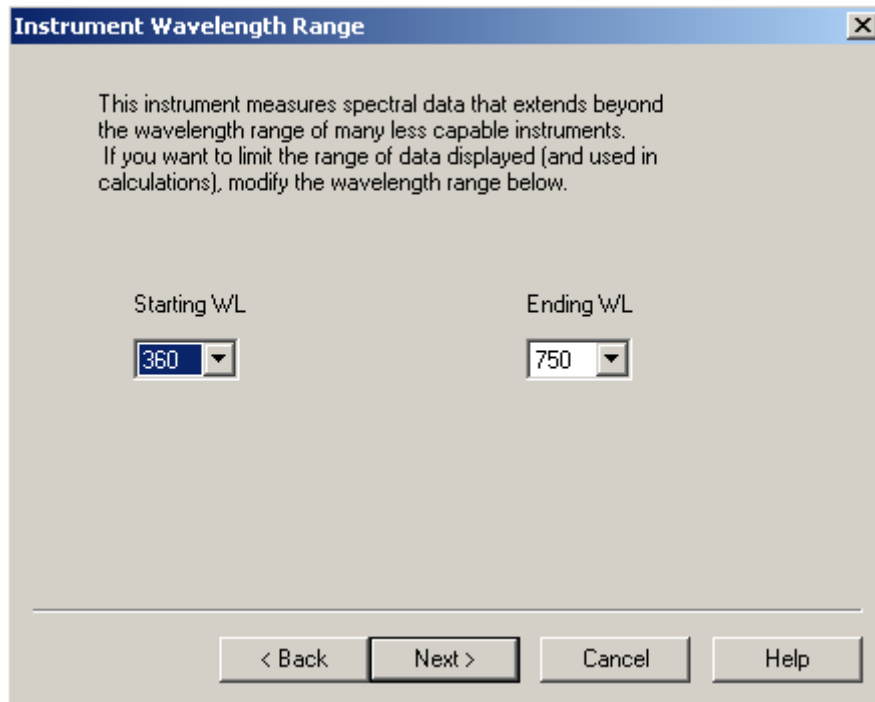
A second dialog box will appear, the Spectrophotometer Installation Wizard dialog (pictured below). Enter the name and serial number of the sensor you wish to install and click "Next."



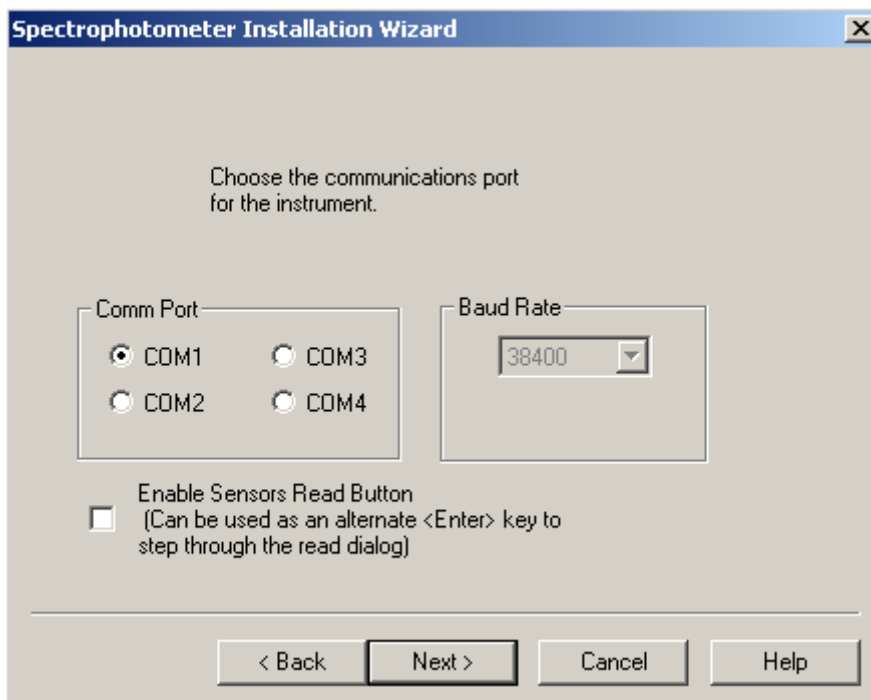
The third dialog in the installation process will appear, Choose Sensor Model (picture below). Click once on the drop-down list to see what models are available. Click once to select the model of the specific sensor you are installing. Click "Next" to continue.



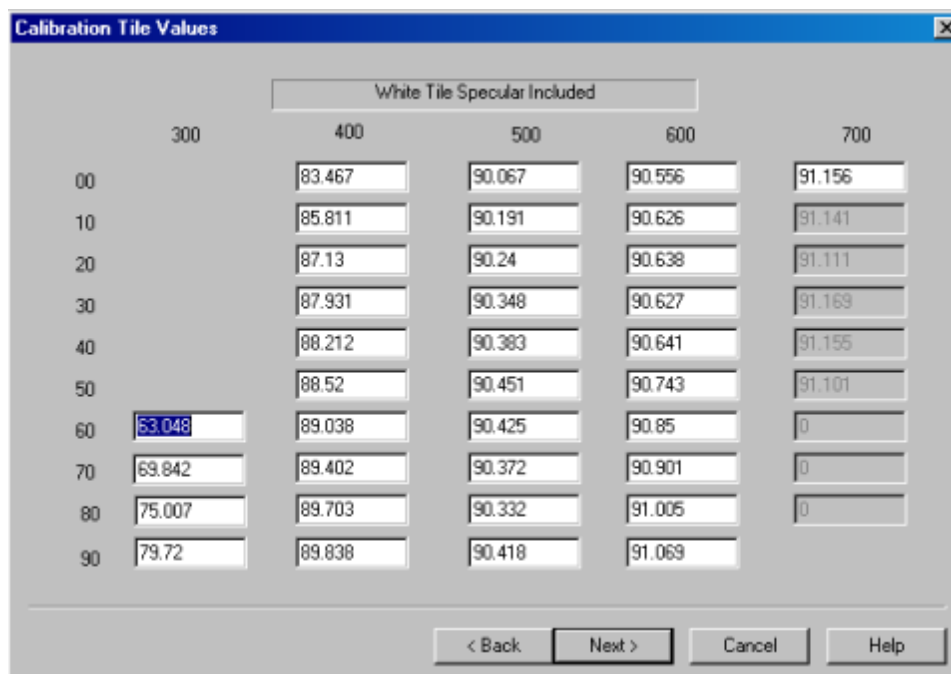
If you have an instrument which can measure wavelength ranges beyond the average instrument, you may get a dialog box (picture below) which allows you to select the wavelength range for the instrument you are installing. Enter in the desired range and click <Next>.

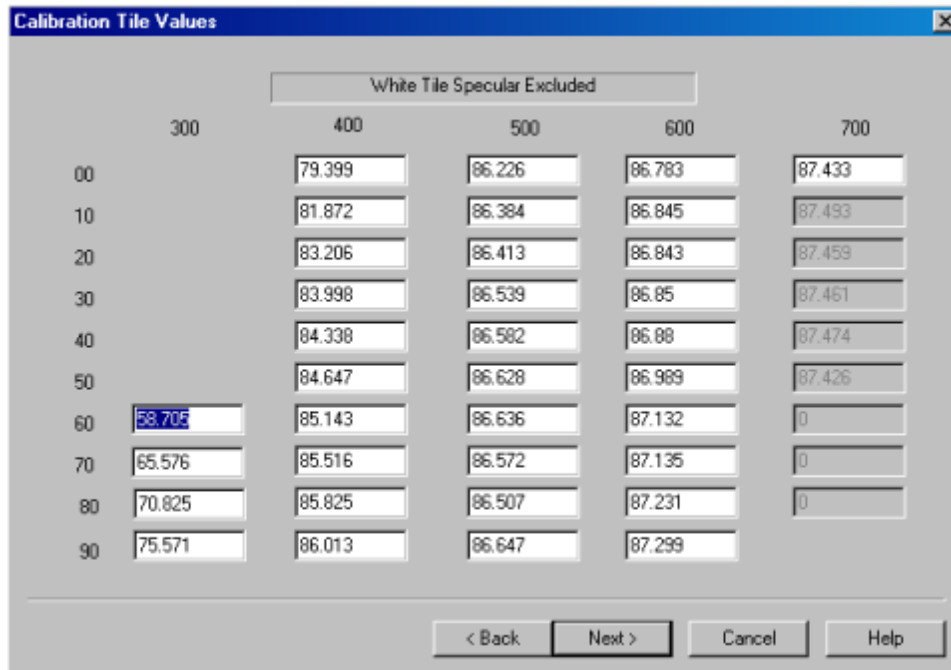


Once you have selected the instrument model and wavelength range, the next step is to choose the communication port connecting the sensor to the computer. Click on the radio button next to the comm port to which the instrument is connected. For instruments capable of communicating at different baud rates, you may choose the rate as well, although generally, the field will default to the correct rate. Click "Next" when you are done.



If you had a calibration file for use with this instrument, then several other dialog boxes may appear displaying the calibration file data. Two examples of these dialogs are listed below displaying white tile values for specular included and specular excluded.





Once you have selected the comm port and baud rate and reviewed the calibration file data, you are done. The "Installation Complete" dialog will appear (pictured below). Click on the "Finish" button to complete the installation.



Once the installation is complete, the Calibration Mode Properties dialog box will appear. This dialog is used to create different standardization modes for

the different types of measurements you may need. See [Select Mode](#) for more detailed information about creating and selecting different modes for use with your sensor.

Modifying an Existing Instrument

You may modify certain aspects of a currently installed instrument by clicking once on the "Modify" button in the Spectro Manager dialog. (Click on the "Install or Configure..." command under the Spectro Menu to access the Spectro Manager.)

Clicking on this button brings up the same set of dialog boxes as when installing an instrument (except for the initial dialog where you select the instrument to be installed). You may alter the name, serial number, model type, the comm port, and the baud rate. See [Installing a New Instrument](#) for examples of the dialog boxes and instructions.

Deleting an Instrument

To delete an instrument from the Spectro Management dialog, simply select the sensor you wish to remove by clicking on it once. Then click once on the "Delete" button. That instrument will be deleted and no longer available for use. To use it again, you would have to go through the installation procedure.

Changing the Mode of an Instrument

Changing the mode of an instrument means that you wish to take readings with different settings governing the way in which that instrument measures. The extent to which you can alter the mode of your instrument depends on the capabilities of that instrument. (Refer to your sensor's documentation for information about its full capabilities.) For example, your instrument's geometry cannot be altered; it will either be sphere, 45/0, or 0/45. However, you may have two different ports which can be attached to that instrument, one for large area view and one for small area view, depending on the type of samples you are measuring. Some instruments are capable of taking both reflectance and transmittance readings, while some will measure only reflectance.

Whatever the capabilities of your instrument, you may set up several different modes for making measurements and store them with a name so that you can easily switch from one mode to the other. For more information, see [Select Mode](#).

Changing the Comm Port of an Instrument

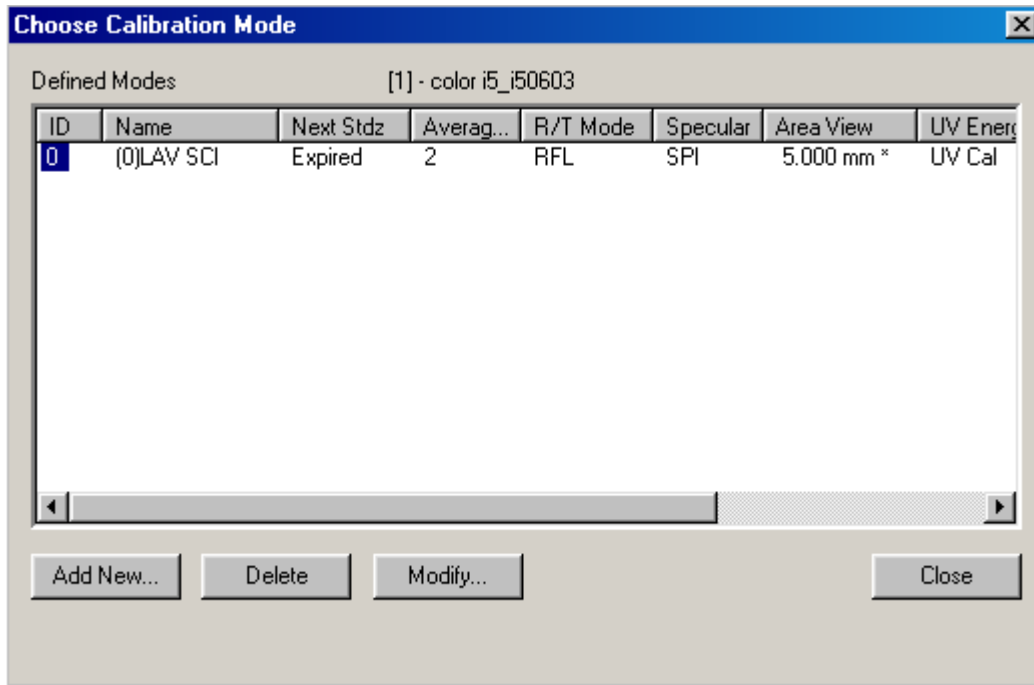
From the Spectro Management dialog box, you may change the communication port through which the instrument exchanges data with the computer. Clicking on the <Set Comm Port and Check Tile> button will bring up a dialog box containing the available comm port selections. You may select the comm port by clicking on the radio button associated with the desired comm port.

Select Mode

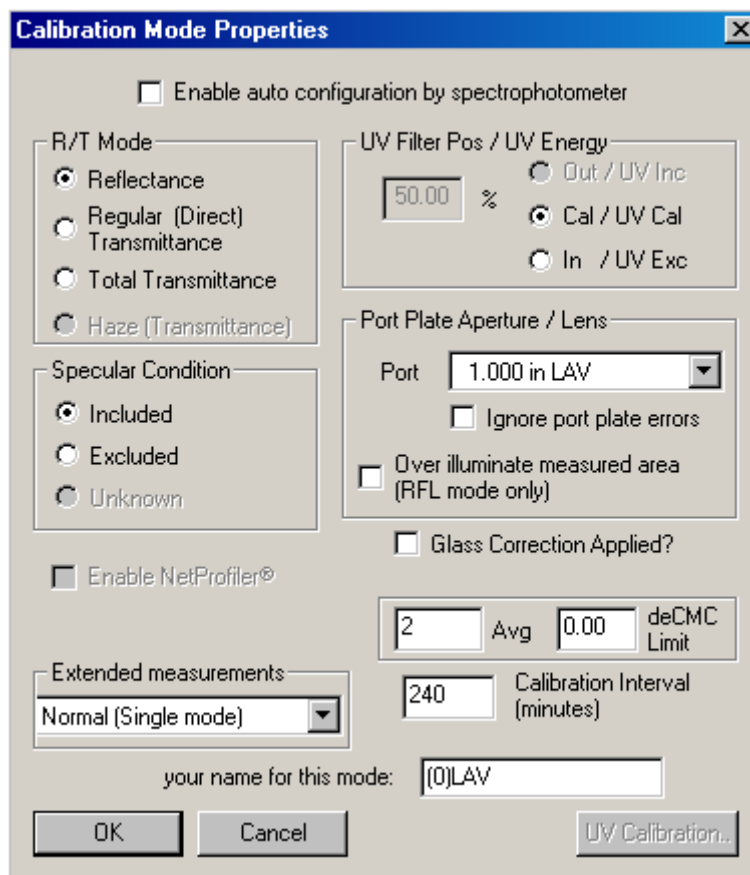
This command from the Spectro menu will cause the Choose Calibration Mode dialog box to appear which allows you to select an operational mode for your instrument. (This dialog box is also available from the Spectro Management box by clicking once on the <Spectro Modes> button.) These modes must be defined and stored ahead of time. If you have not stored any mode specifications for your current instrument, you will have to do so before the instrument can be calibrated and used to take readings.

To add a new mode, click once on the <Add New> button. The Calibration Mode Properties dialog box will appear (see second image below). This same dialog will also appear when you click on the <Modify> button to make changes to a mode.

Not all the items in this dialog will be available for all instruments. Some instruments have more functionality than others. For more information, see the documentation provided with your instrument.



Calibration Mode Properties Dialog



This dialog is used to define the properties of the instrument for a specific calibration mode. For example, you may need to define two different modes, one for taking reflectance readings and one for taking transmittance readings.

Enable Auto-configuration by spectrophotometer --- This checkbox enables the auto-configuration option. When checked, the current calibration mode properties will be ignored if changes are made to the spectro. For example, if the current mode is set for a small area view but the operator changes that to the large area view, the sensor will communicate that to Color iControl and the proper adjustments will be made.

R/T Mode --- These three radio buttons allow you to select measurement type. The options are: Reflectance, Regular Transmittance, and Total Transmittance.

Specular Condition --- These three radio buttons allow you to either include or exclude the specular component of the measurements. The third option, "Unknown," is for instruments where you are unsure of how they treat the specular component.

Enabled NetProfiler --- This checkbox enables GretagMacbeth's internet-based instrument profiling software.

Port Plate Aperture/Lens --- This drop-down list allows you to select the size of the measurement port for the mode being defined. A checkbox also allows you to instruct the program to ignore port plate errors. A checkbox also allows you to set the spectro to overilluminate the sample.

UV Filter Pos/UV Energy --- These radio buttons allow you to set the location of the UV filter for those instruments so equipped. There are three options. "Out/UV Inc" instructs the program that the sensor should not filter UV when taking measurements. "Cal/UV Cal" instructs the program that the sensor has a filter which can be calibrated for UV when taking measurements. "In/UV Exc" instructs the program that the sensor should completely filter the UV component when taking measurements. To determine the UV capabilities of your sensor, see the instrument's documentation.

Glass Correction Applied? --- Checking this box means that, for the mode being defined, samples will be measured behind glass so that a correction factor will need to be applied to compensate for the distortion the glass creates.

Avg --- Generally when measuring color, several readings are taken and then averaged to create a single measurement. Enter the number of readings you wish the system to take and average to create a single measurement in this field.

A second field, deCMC Limit, allows you to place a limit on how different each reading can be from the average of all the readings; when this limit is passed, a warning will appear in the Read dialog box. This function is disabled if this field is left set to zero.

Calibration Interval --- This field determines the amount of time allowed between calibrations of the instrument in the current mode.

Your name for this mode --- This field allows you to name the different standardization modes defined for a particular instrument. Modes default to just being numbered if you do not name them with the first being zero.

Calibrate

The instrument will need to be calibrated on a regular basis. You cannot take measurements without calibrating the spectro or if the most current calibration has expired.

Clicking on this menu option will bring up a small dialog box which will ask you to read a certain number of check tiles or a light trap. The exact number of tiles, their color, and the order you read them will depend on the type of instrument you have and how it is set up. (Generally, a light trap and a white tile, representing zero percent light and 100% light, are the minimum used in any calibration.) See the documentation provided with your instrument for more information about calibrating it.

Once you have read all the tiles requested, a final message box will appear informing you that the instrument has been successfully calibrated.

[Calibrating with a Colored Check Tile](#)

GretagMacbeth highly recommends the use of a colored check tile during the calibration process. Generally, this tile will be green or blue. Taking this measurement in addition to using the light trap and a white tile helps to assure the accuracy of measurements made by the spectro.

Once the use of the colored check tile during calibration has been set up, the system will automatically prompt the user to read it after the light trap and white tile have been measured. In fact, the system will inform you that the calibration is complete through a small dialog box. When you click on the <OK> button to close the message dialog, the system will open the check tile file along with the Read dialog box. Instead of a name, the system will place the date and time into the name field. Place the colored check tile over the instrument port and take the reading. The measurement will be stored with the date/time information as its name into the top of the trial data in the tree view. (The measurement will be placed at the top of the trial portion of the tree view no matter how the system is set to store other measurements.)

For more information about using the colored check tile option, see [Calibrating with a Colored Check Tile](#).

[Calibrating the UV Filter](#)

Some instruments have the capability to filter the ultra-violet portion of the spectrum for use when calculating the Whiteness Index of a particular standard or sample. For instruments so equipped, Color iControl has a routine which allows the filter to be calibrated. This requires a GANZ Whiteness standard or a CIE Whiteness standard, both of which should have been provided with the instrument. For more information, see [UV Calibration Dialog](#).

Calibrating with a Colored Check Tile

Color iControl has the ability to calibrate with a colored check tile. GretagMacbeth recommends using a third colored tile in addition to the light trap and white tile when calibrating the sensor. If the instrument fails when reading the colored tile, the calibration fails and no measurements can be taken. This helps to ensure that measurements made by the spectro are uniform, accurate, and stable over time. In addition, the check tile's measurements are stored in a file so that an historical record of the instrument's performance is maintained. This record can be of significant help when attempting to analyze problematic measurements or troubleshoot the instrument.

Jumps are provided below to topics containing instructions for using or disabling this option.

[Setting Up the Colored Check Tile Option ? Using the Colored Check Tile During Calibration ? Disabling the Colored Check Tile Calibration Option](#)

Setting Up the Colored Check Tile Option

GretagMacbeth recommends using a colored check tile as part of your routine calibration procedure. You may select to enable the colored check tile for all modes or for only Mode 0. (See checkbox options in the image below.) This is done through the Sensor Properties box accessed through Sensor Management. The system will automatically use the name and serial number entered during the spectro installation process to construct a name for the check tile file using the form, "sensorname_serial#_0.job". Of course, the final element, "_0", will vary depending on the number of the mode you are creating the check tile file for. This filename will be displayed in the Sensor Properties dialog box in the field provided for it (see image below). However, at this point, only the filename has been created; the file itself still does not yet exist.

You must edit the file prior to its being used; when you do this, the system will actually create the file.

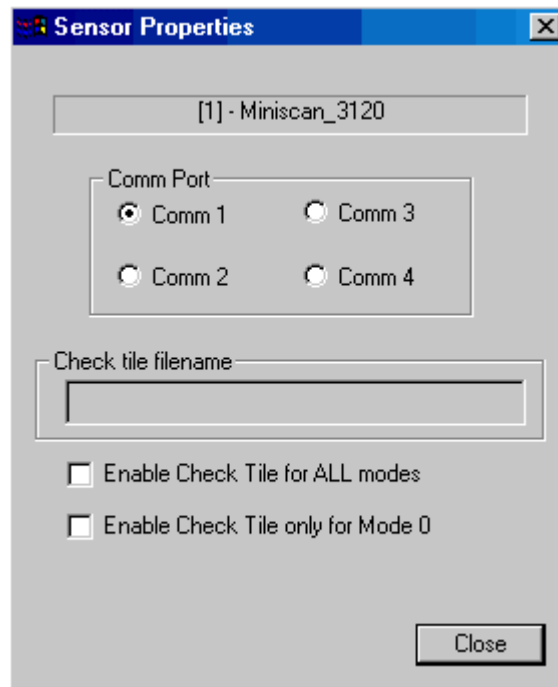
To do this, first be sure you are in the mode for which you wish to create the check tile file. Then, close all jobs and click on the "Open Check Tile Job" command under the File menu.

The system will attempt to find the check tile job as it is listed in the Sensor Properties dialog. The standard "File not found" message will be displayed by the system. Close the message box by canceling it.

At this point, the system will create the file and open it so that you may edit it for use.

Editing the check tile file is simple and requires only one action: reading the colored checktile that came with your instrument and storing it as the standard in the job. This allows the system to compare the reading it takes of the colored tile during calibration with the measurement you make of the tile when installing the sensor. If the colored tile reading fails to pass within the specified DEcmc limit, the calibration will fail.

You will need to do this for all modes for which you need a colored check tile for calibration.



Disabling the Colored Check Tile Calibration Option

To disable the colored check tile option during the calibration process, you must open the Sensor Management dialog box using the "Install or Configure" command under the Sensor menu.

At the bottom of the Sensor Management dialog is a button: <Set Comm Port and Check Tile>. Click once on this button to open the Sensor Properties dialog.

At the bottom of the Sensor Properties dialog are two checkboxes, "Enable Check Tile for mode 0" and "Enable Check Tile for All Modes." One or both of these checkboxes should be selected (checked). Click once to deselect the check tile option you wish to disable.

Your sensor will no longer require reading the colored check tile as part of the calibration process for the mode(s) selected.

Using the Colored Check Tile During Calibration

When actually calibrating the instrument, the colored check tile will be the last item measured. Clicking on the "Calibrate" command will first cause the program to prompt for a light trap, followed by the white tile. Once these two items have been measured, the program will display the "Calibration Complete" message. Click on <OK>. Immediately after you close the "Calibration Complete" dialog box, the check tile file will be opened automatically along with the Read dialog. Read the check tile using the normal read process. The check tile data will be placed into the check tile file. The Read dialog will remain open until you close it; this allows you to see the measurement that has been placed into the file.

UV Calibration Dialog

Prior to calibrating the UV filter on the instrument, you must perform a normal calibration using the black and white tile. A colored tile may also be required depending on how the instrument has been set up. In addition to performing a normal calibration, you must also have the mode defined for calibrating the UV filter. This is done in the Calibration Mode Properties dialog. See [Select Mode](#) for more information.

Important Note: When calibrating for the UV component, only two calibrations will be necessary, one for the mode defined using LAV (large area view) and one for all other view size options. Even if you have two other modes defined requiring UV calibration (for example, one with medium area view and

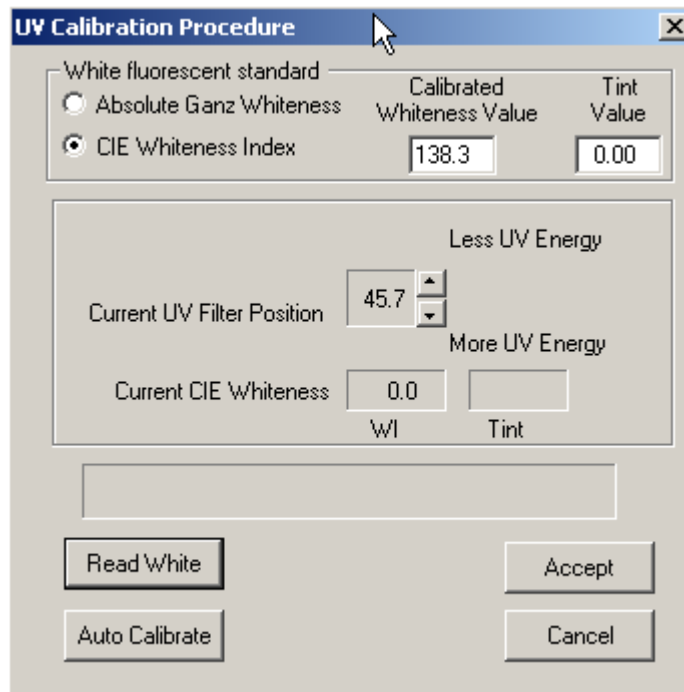
one with small area view), you will only need to calibrate the UV for one of them since the calibration will be effective for all options other than LAV.

Accessing the UV Calibration Dialog

To access the UV Calibration dialog box, open the Choose Spectro Mode dialog box either by clicking on the Sensor Mode button in the toolbar (white and black tiles with a small pencil and pad) or the "Select Mode..." command under the Sensor menu. From the Choose Sensor Mode dialog box, click on the desired mode to select it (this mode must be defined for calibrating the UV filter). Then, click on the <Modify> button. The Standardization Mode Properties dialog will open. At the very bottom right of this dialog is a button marked <UV Calibration.> Click once on this button.

The UV Calibration Dialog Box

Once you have clicked on the <UV Calibration> button, the UV Calibration dialog box will open (see image below).



Depending on your instrument, you will either be using a Ganz Whiteness standard or a CIE Whiteness standard. Consult the documentation that came with your instrument to determine which standard you will be using. Once you have determined this, click on the appropriate radio button selecting the type of whiteness standard you will be using. The Ganz or CIE Whiteness value for your UV Whiteness standard should be provided with the standard; this value should be entered into the appropriate field at the top right of the dialog. The Tint field is

provided for those instruments which require a tint value in addition to the whiteness value for the UV standard. (Most instruments do not require this value; see your sensor's documentation to determine if yours does.)

The actual calibration procedure has two methods, Manual and Auto.

The Manual method uses the "Read White" button. Place your UV Whiteness standard over the instrument port and click once on the "Read White" button.

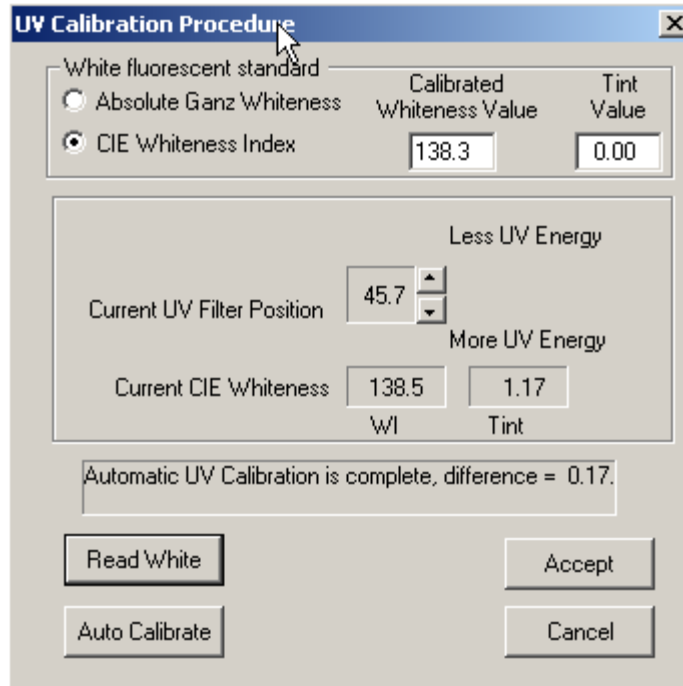
A message will be returned informing you of the difference between the current Ganz or CIE value and the one entered at the top of the dialog. (Current GANZ or CIE whiteness values will be displayed in their appropriate boxes beneath the UV Filter Position field.)

If this value is off by more than a few tenths, you should probably recalibrate. You may increase or decrease the position of the UV Filter to adjust before you perform another calibration.

The Auto-Calibrate option is easier and recommended. Simply place the UV Whiteness standard over the instrument port and click once on the "Auto-Calibrate" button.

The system will automatically attempt to match the Ganz or CIE Whiteness value entered, adjusting the filter a little bit with each try. Once the current Ganz or CIE Whiteness value closely approaches value established for the standard, you will be informed and a difference value will be displayed. (See the second image below.)

Press the "Accept" button to accept the calibration.



Measuring Data from the Instrument

Important Note: Prior to taking any measurements, the instrument must have been recently calibrated. If not, you will be prompted to calibrate the instrument prior to taking any measurements. You must also have defined at least one operational mode for the instrument. See the [Spectro](#) menu for more information about defining operational modes and calibrating the sensor.

Placing the mouse cursor over the "Measure with Spectro..." option under the Data menu will cause a small second popup menu to appear allowing you to select the type of data you wish to measure. Only four types of data may be read into Color iControl from the instrument: standards, trials, substrates, and primaries.

Choosing to measure data for any of these data types will bring up a dialog box. Of course, when reading trials, the dialog will say "Measure Trial." When measuring substrates, the dialog will say "Measure Substrate," etc. In these instructions, the generic term "sample" will be used to refer to all the different types of measurements being made even though the images being referred to will contain a specific reference to reading a standard.

See [Measuring Data: The Process](#) for more information.

Setting up the Measurement Process

Color iControl offers many special settings governing the behavior of the system when taking measurements. These settings are located in the General tab of the Settings dialog and in the tab marked Options. They allow you to set the system to automatically store measurements to the database, enter comments for each reading, auto-accept standards, as well as turn on the name formatting function, among others.

Name Formatting

Name formatting is another element of the system's operation which must be decided upon prior to taking any measurements. Name formatting allows users to specify each sample's name as a series of entries rather than as one name. For example, you may include in each standard's name information conveying the style, color, and substrate for that item. Each of these names will have to be entered separately at the time of the sample's measurement. However, they can also provide much more flexibility when searching the database by allowing you to search only for those sample with a specific style, color, etc. See [Naming Conventions](#) for more information.

User Groups

Deciding whether or not you will use the User Groups function is also important prior to beginning your measurements. User Groups allow users to enter up to three fields of information about each measurement. These fields are stored with the sample and may be used to restrict searches of the database. For more information, see [User Groups](#). You will not need to set anything in the software for this option; the <Groups> button is always available when reading data. However, you will need to decide upon a consistent usage strategy for this option should you decide to implement it.

Sample Mounting Procedure

Another element that will need to be set up by the user is the Sample Mounting Procedure. The way in which a sample is mounted can affect the measurement greatly. When comparing standards and trials, they should always be measured using the same Sample Mounting Procedure. To enable the Sample Mounting Procedure for a particular standard, open that standard's Properties... dialog and click on the Data Condition tab. The Sample Mounting Procedure drop-down list-box is located at the lower right portion of the dialog. Select from among the options. Once the procedure is defined for the standard, Color iControl will always prompt you with which procedure is being used and request that you select the procedure to be used for any trial measurements. See [Sample Mounting Procedure](#) in [Additional Elements of the Measure Dialog](#) for more information.

Extended Measurements

In addition, some items in the Standard/Multi-Trial view cannot be calculated unless measurements are taken in a special way using a specially defined calibration mode. See Extended Measurements in [Additional Elements of the Measure Dialog](#) and [Select Mode](#) for more information.

Measuring Data: The Process

The instructions for taking measurements below are of the basic measurement process. Some variation may exist due to selections made in the General or Options tab of the Settings dialog. In addition, sample names are treated as if Name Formatting is **not** selected for use and the calibration mode of the spectro does not include Extended Measurements.

Reading Data

1. Click once on the Data menu.
2. Place the mouse cursor over the "Measure with Spectro" option. The sub-menu will pop-up.
3. Click once on the "Measure Standard" option.
4. The Measure Standard dialog box will appear. (See illustration below.) The cursor will be in the "Full Name" field. Once you have entered the sample name and specified any user groups, simply press Enter (or Next) to begin measurement. You should receive a "...Read in Progress..." message.

Measure Standard (mode={0}LAV)

ID Info

Fullname: Blue Standard

Enter name, then press <Next> when ready to read.

Group1:

Group2:

Group3:

Move previous standard to data section

Next Reset Groups Close

5. If a number of measurements to average was set for the standardization mode in the Standardization Mode Properties box, the prompt will change to "Reading 2 of x; Press <Enter> to read," where x is the total

number of measurements to average. Press Enter (or Next) again. The "...Read in Progress..." message will reappear.

6. Repeat for as many measurements as necessary.

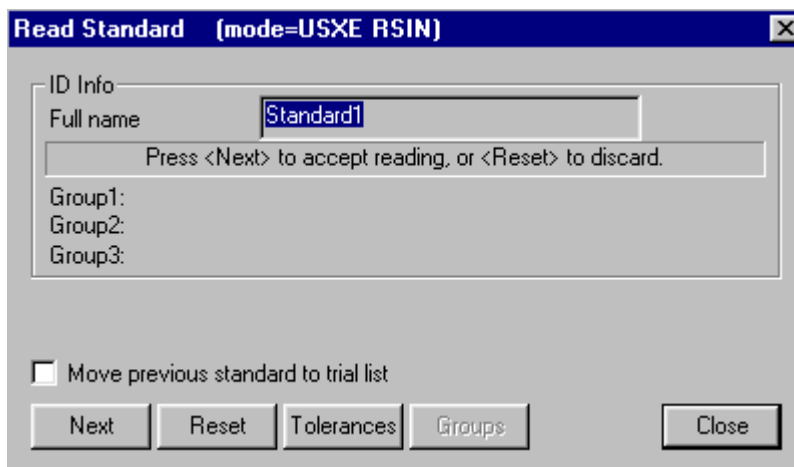
7. When the number of readings necessary for the average have been taken, you will receive your final prompt: "Press <Next> to accept reading, or <Reset> to discard." The measurement will be added to the tree view in the current job.

Additional Elements of the Measure Dialog

Depending on the settings you have specified for taking measurements with the spectro, you may see variations in the Measure dialog box. The available variations are listed below with an illustration and a brief explanation.

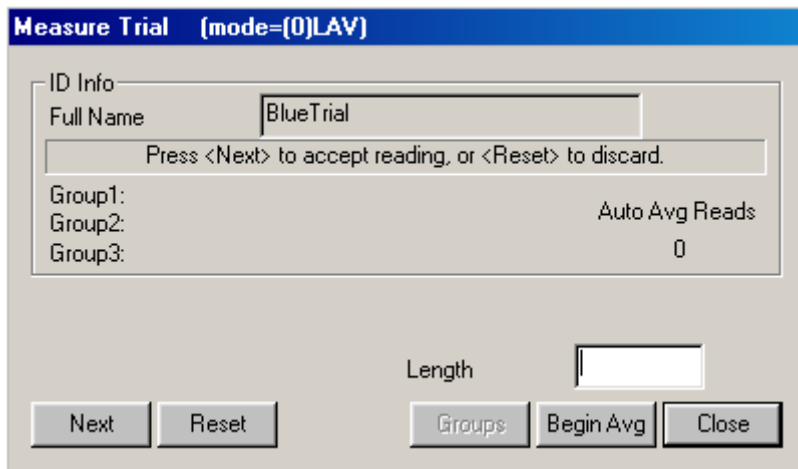
Standard Tolerances

When measuring standards, an additional button will be available in the measure dialog allowing you to set the tolerances governing what is and is not an acceptable match to that standard (see illustration below). Clicking on this button will cause the Standard Properties dialog box to appear. Tolerances may be set from this dialog. This option will not be available if you have "Auto-Accept Standards" checked in Options tab of the Settings dialog.



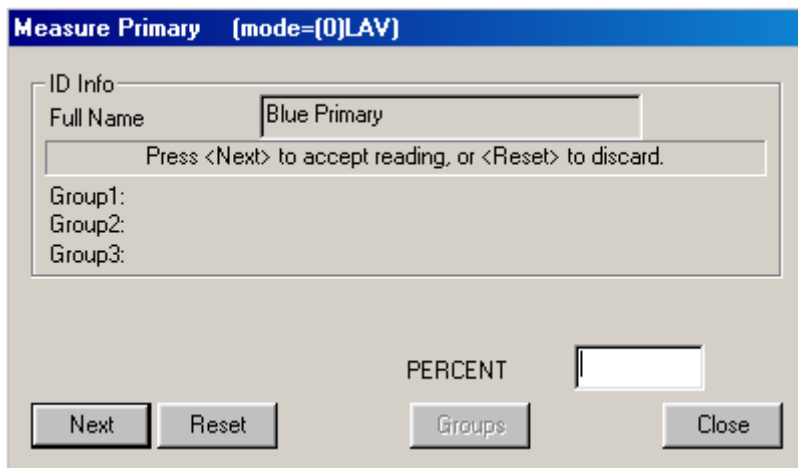
Length

When measuring trials, you may set the program to prompt for a length value if you wish (see illustration below). This length value will be in whatever units have been selected for use by the system. The "Length" field will appear in the lower right corner of the dialog. For the program to be set to prompt for length, a checkbox must be selected in the Options tab of the Settings dialog box.



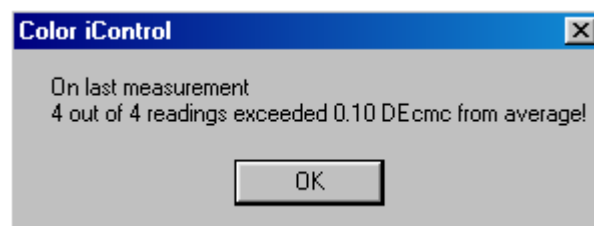
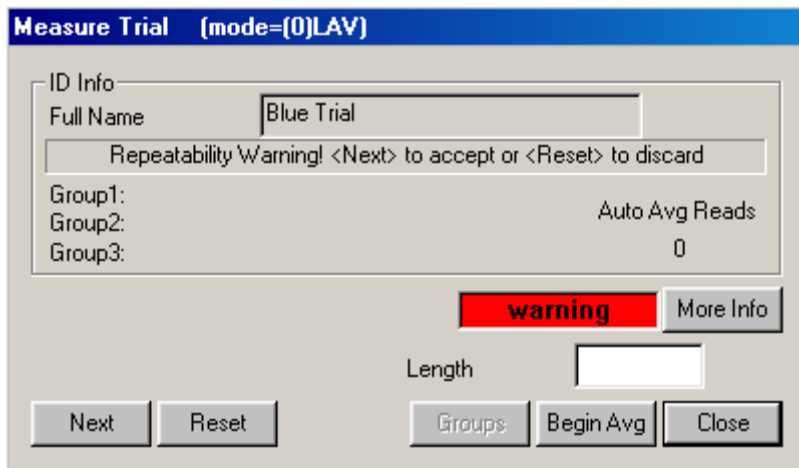
Percent

When measuring primary data, the system will automatically prompt you for the percent value for that primary sample at the conclusion of the measurement but before closing the measure Primary dialog. A field marked "Percent" will appear after the last reading so that you may enter in the percent value.



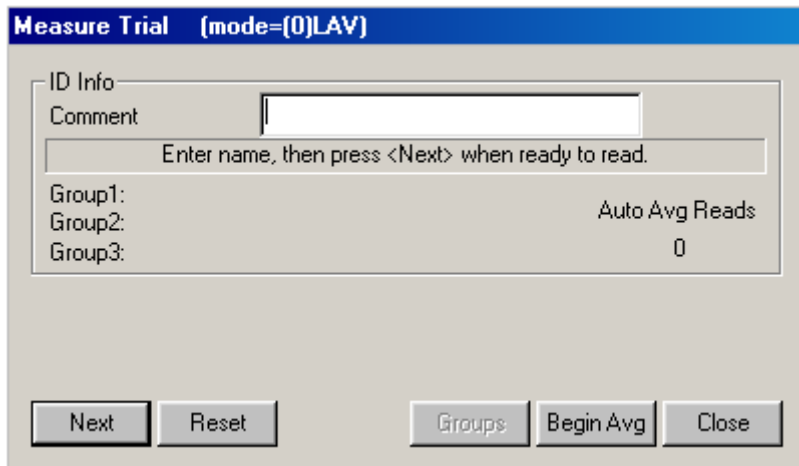
dEcmc Limit

You may also define a dEcmc limit on each measurement when compared to the average of all the reads taken for any single measurement. (This dEcmc limit is defined as part of the mode. See [Select Mode](#) for more information.) If this limit is exceeded, then a warning will be displayed in the measure dialog (see image below). In addition, a button marked "More Info" may be clicked on to determine how many reads exceeded the dEcmc limit (see an example of this dialog in the second image below).



Comment Field

You may enter a comment (maximum 254 characters) which will be stored with the sample's Properties. This option must be turned on (selected) in the Options tab of the Settings dialog. The Comment field will appear immediately after you have entered the sample name (See illustration below.) Comments are entered in the same box as the sample's name, but the field ID will change to indicate that you are entering a comment.



Averaging and Auto-Averaging

You may automatically average a set of trial measurements if needed by checking the "Auto-Average Trials" item in Options tab of the Settings dialog. Doing this will set the program to automatically average every trial measurement made until you click once on the <End Avg> button which appears in the lower right corner of the measure dialog (see figure below).

Even if you do not have the Auto-Average option enabled, you can still average any measurements you make by clicking once on the <Begin Avg> button which is available in the measure Trial dialog box (see second figure below). Clicking on this button starts the averaging process; the button will change to the <End Avg> button. Click on that when you have measured all of the trials you wish to average.

Closing the measure dialog (in the case of Auto-averaging) or clicking on the <End Avg> button (in the case of Averaging) will cause an abbreviated properties dialog to open. This dialog will only have a Name tab and represents properties of the average. The default name for the averaged measurement will be "Averaged Data." Once you close this dialog, the average will appear at the bottom of the trials portion of the Tree View.

Measure Trial (mode={0}LAV)

ID Info

Fullname:

Enter name, then press <Next> when ready to read.

Group1: Auto Avg Reads

Group2: 0

Group3: 0

Next Reset Groups End Avg Close

Measure Trial (mode={0}LAV)

ID Info

Full Name

Press <Next> to accept reading, or <Reset> to discard.

Group1: Auto Avg Reads

Group2: 0

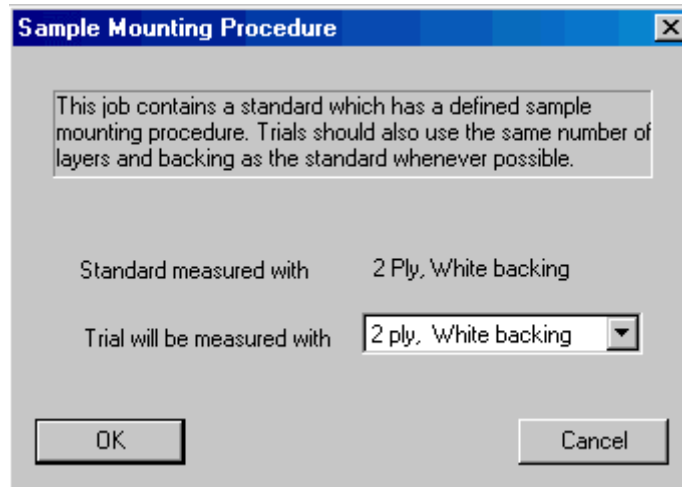
Group3: 0

Length

Next Reset Groups Begin Avg Close

Sample Mounting Procedure

You may also include the sample mounting procedure for each trial. If a Sample Mounting Procedure has been defined for the standard, then the system will automatically prompt the user with a small dialog box (see below) identifying the procedure used for the standard and allow him to select a procedure for measuring the trials. For more information, see [Setting Up the Measurement Process](#).



Extended Measurements

Some items in the Standard/Multi-Trial view attributes require special measurements in order for their value to be calculated. For example, opacity requires that a sample be measured over a dark backing and a white backing. In order to enable these measurements, you must define them as part of the calibration mode. See [Select Mode](#) for more information. Once the calibration mode is defined by the system and the appropriate item selected for display in the Standard/Multi-Trial View, the Read dialog will prompt the user for the extended measurements.

Timed Measurements

The system may be set to take measurements at set intervals by using the "Timed Measurements" command in the "Measure with Spectro" sub-menu under the Data menu. You should open a new job for this operation.

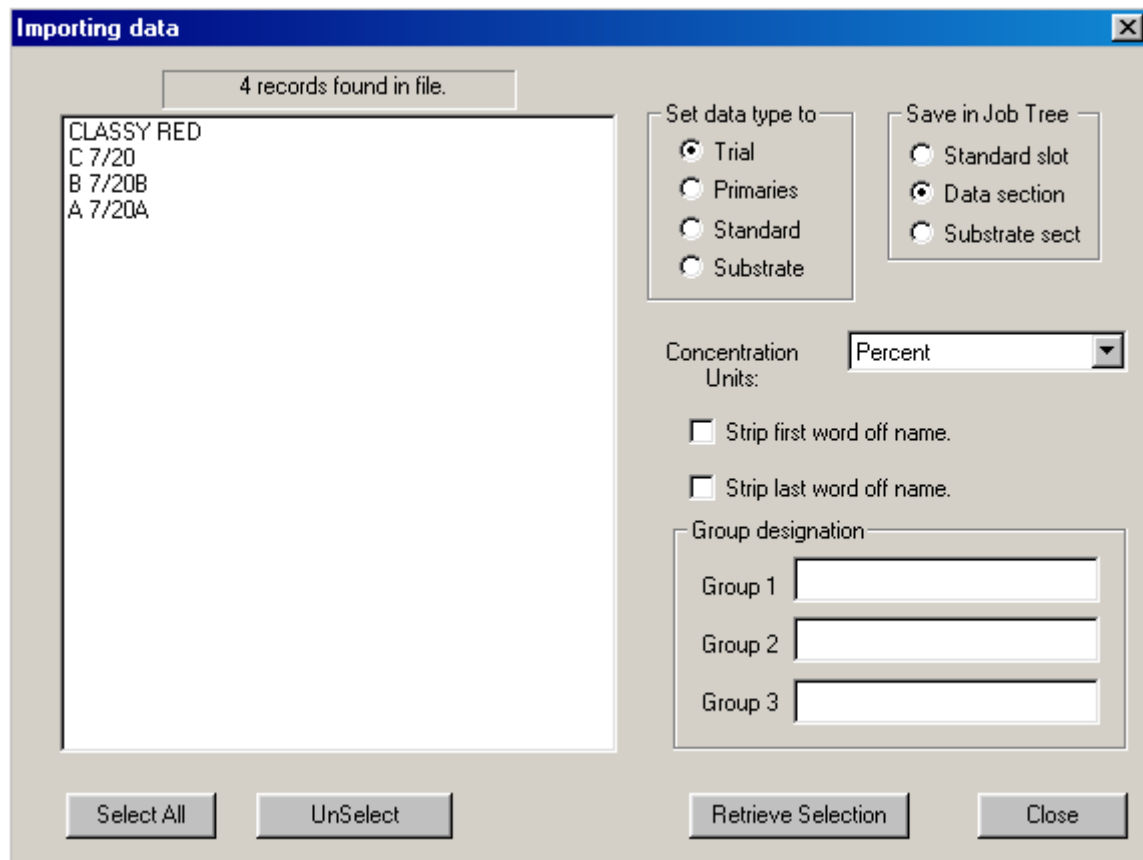
Clicking on this option will open a small dialog box which allows you to enter a base name for the timed measurements and the interval at which to take the readings. Once you have entered the name and interval, click on <OK> to start the timed reads.

This option is primarily intended for diagnostic use when troubleshooting the instrument.

Upload Data from a Portable Spectrophotometer

This command allows you to upload data stored in the memory of a portable spectrophotometer. Selecting this option causes the standard import data dialog box to appear with a list of measurements uploaded from the spectrophotometer (see image below).

You may select which measurements you wish to retrieve just as you would when importing data from a file or the database. Select the data you wish to upload by clicking on it. Multiple, non-sequential items may be selected by clicking on them while simultaneously holding down the <Ctrl> key. If you wish to select a sequence of items, select the first item with the mouse, then select the last item in the range while simultaneously holding down the <Shift> key; all the items between the first and last sample will then be selected. You may select all the items by clicking once on the <Select All> button. Click once on the <Retrieve Selection> button to load the uploaded data into the current job.



In addition, you may specify **User Groups** and the Data Type for the selected data as well. You may specify different a different data type for storage in the database as opposed to storage in the current job.

Data Management

Recalling Data from the Database

Any data previously stored to the database may be recalled for use in the current job. The five data types each have their own command, listed in order under the Data menu: Recall Standard, Recall Trial, Recall Substrate, Recall Primaries, and Recall Colorants. Clicking on any of these commands will bring up a dialog box allowing you to specify the data you wish to use (see illustration below).

Retrieve from database C:\Color_iControl\Demo2\testone.mdb

Full name: *

Retrieve Trials Associated with Std

Formatted:

Data Type: Standard

Spectral Type:

Reflectance

Transmittance

Color Search:

Search on Color

Illuminant: D65-10

L*: 46.7157

a*: -2.2155

b*: -10.4412

DEcmc DE*

1.00

Group and Tagging Fields:

Group1:

Group2:

Group3:

Date Range:

Starting Date: 1/1/1970

Ending Date: 5/10/2005

Only recall measurements containing formulas which meet these attributes:

Substrate: *

Process: *

Colorant: *

Search Clear Cancel

If you are recalling a colorant, the above dialog will appear slightly differently. The main difference will be that the choices under Spectral Type will be limited to two, Reflectance and Transmittance, and you will not be able to select a data type since only colorants may be recalled from the Recall Colorants from Database dialog.

The main "Recall from Database" dialog box has been designed to allow you to specify a particular attribute of the data you wish to retrieve and search the database for all items containing that attribute. The attribute may consist of the item's name, any of the parts of a formatted name, or any user groups associated with that item.

If you choose not to specify any limiting attributes, clicking OK will bring up a second dialog box (see below) allowing you to select from the entire database. This means that all of the standards (or whatever data type was specified) in the database will be retrieved for viewing in the selection dialog. This is not recommended for a large database since retrieving the data will be time-consuming.

Specifying Search Attributes for Data Recall

There are seven different attributes you may specify to limit your recall from the database. These are: Full name, Formatted name, Data Type, Spectral Type, User Group Designations, Color Search, and Measurements Containing Formulas.

Data Type may be specified by the option you select from the Data menu, i.e., Recall Standard, Recall Trial, etc. In case you wish to recall one type of data into another data type position, a drop-down menu is also provided in the Recall from Database dialog box to allow you to select the data type. For example, you may choose Recall Standard and change the data type to Trial using the pull-down menu. The trial recalled in this manner will be displayed as a standard.

The remaining attributes may be entered into the Recall from Database dialog box. Two of those attributes, Full name and Formatted name, are mutually exclusive; that is, you will never really want to use both these fields at the same time. If you are not using the name formatting option, you should just use the Full name field. Type in the name of the sample(s) you wish to retrieve. A partial name may be entered as long as you use an asterisk at the end. The asterisk tells Color iControl that you are searching on a partial name. For example, you wish to find all samples beginning with the letters "lan". You would enter into the name field, "lan*". Color iControl would retrieve all samples with "lan" as the first three letters.

However, if you are using the name formatting option, you should ignore the main Full name field altogether and use the Formatted area of the dialog. Using this section allows you to search on any individual string which may be contained in the name. For example, you set up a formatted naming system to have four fields: dye lot, color, fabric, style. However, if you wanted all samples that were a particular color, but were not concerned with their dye lot, fabric, or style, you could enter that color in the color field and only samples containing that color in the second string would be retrieved. Or you could combine the color with a dye lot number or a fabric and only retrieve items that were that color from that particular dye lot or dyed on that fabric.

It is possible to type in the entire formatted name into the Full name field and retrieve the data. However, you would have to type in the correct fill and separator characters in order for Color iControl to be able to find the item in question. When using the formatted names, it is best to ignore the Full name field and only use the Formatted name area of the dialog.

The fourth search specification is the spectral type of the data. Use the radio buttons in the dialog to select the spectral type for the data you wish to retrieve. The choices are: Reflectance, Total Transmittance, and Diffuse Transmittance. When recalling colorants, your choices will be limited to Reflectance and Transmittance.

The fifth search specification you have at your disposal is the User Group Designation. If you know the user groups designations for the samples you are seeking, enter them into the fields provided. You may specify only one or all of the user groups your samples have been placed into.

For example, you have decided to identify all of your acid-based colorants by labeling them as "acid" in the User Group 1 field. Furthermore, you have broken them down further by labeling them according to whether they are high, medium, or low energy dyes. This information is contained in the User Group 2 field.

If you place the "acid" label into the Group 1 field, when you click OK, Color iControl will bring up all the colorants that have been identified as acid-based. However, you could furthermore limit the search by entering the "high energy" label into the User Group 2 field. This would only bring up the colorants that are high energy and acid-based.

Alternatively, you could skip the first user group field and only enter the "high energy" label into the second user group field. This would result in Color iControl bringing up all colorants that are high-energy. However, since you did not limit the search in the first user group field, you would see all colorants that are high-energy and not just the ones that are acid-based.

Along with User Groups, you may use up to four e-Submit fields as additional search criteria provided you have enabled that option. Immediately below the User Group fields are two sets of drop-down lists. The set on the left allows you to select from the e-Submit labels as defined in the current format file. The set on the right allows you to select from the content options for each selected label.

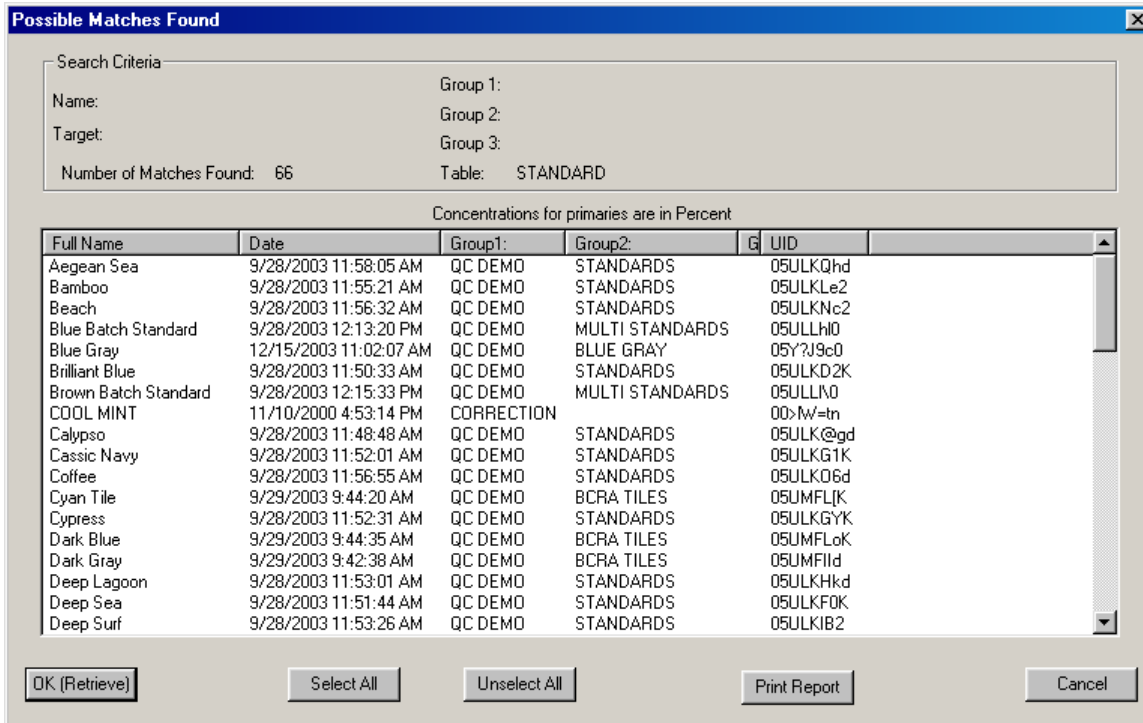
Sixth, you may perform a color search. Type L*a*b* values into the appropriate boxes. Alternatively, you may choose any sample in the Job Tree and then choose the Recall command to have the L*a*b* values for that sample automatically entered into the boxes. Click the radio button for either DEcmc or DE* and enter the desired DE value. When OK is pressed, the database will be searched for samples with L*a*b* values within the specified DE of the L*a*b* values entered here.

The seventh and last option is located at the bottom of the dialog and allows you to instruct the program to only retrieve colorimetric matches containing formulas meeting specific conditions. There are three fields allowing you to specify attributes of a formula: Fiber, DyeClass, and Process. Fiber allows you to select a substrate for the formula you wish to retrieve. DyeClass allows you to select the type of dye the formula contains, i.e., acid, disperse, vat, etc. Process allows you to specify the process used for the actual dyeing, i.e., exhaust, continuous, pad, or other. Of course, this option only works if the formulas stored with the standard or trial had its attributes set at the time it was stored to the database.

Selecting the Data from the Possible Matches

Once any search specifications are entered into the Recall from Database dialog and you have clicked OK, a second dialog listing the possible matches to your search will appear (see image below).

A fourth column is included in this dialog which displays each data item's unique ID assigned to that item when it was originally read into the job. Use the scroll bar to view this column when examining data whose names are identical (generally primary data will all have the same name). The unique ID (consisting of several letters and numbers combined) is displayed in Name tab of the data items Properties... dialog.



Once the possible matches to your search have been located, you may select the data you wish to recall into the current job. You may use the Select All button at the bottom of the dialog. If you do not need all of the matches found, you may select individual items by pressing and holding the Ctrl key and clicking on any data desired. You may also select a short range from the list by clicking once on an item, then moving down the list and pressing the Shift key and clicking on a second item. All the data between the two items clicked on will be selected. Click OK (Retrieve) once you have selected all desired data.

The <Print Report> button allows you to print out the data in a report without actually retrieving the data into the job.

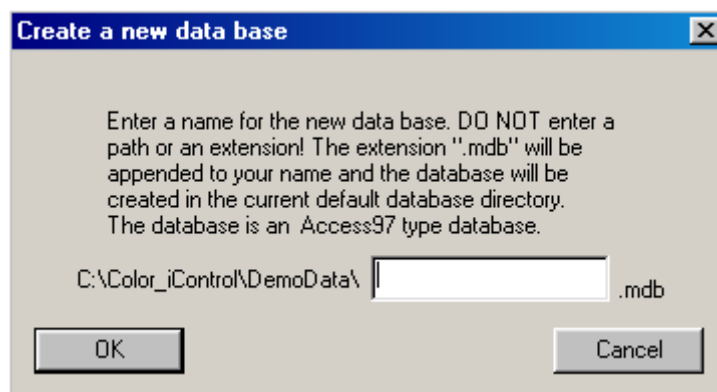
<Cancel> exits the dialog without doing anything.

Save to Database

The Save to Database command under the main Data menu allows any data read in from the instrument or imported from a file to be stored permanently into the current database. (This command is also available as a Tree View toolbar button and an option from the right-click menu. To do this, select all the data you wish to save and then click on this menu option. A small dialog indicating Color iControl's progress in the save will appear. Once that dialog box has vanished, the data will have been stored.

Create an Empty Data Base

This Data menu option allows you to create another database for storing measurements: primaries, samples, targets, colorants, substrates, etc. Selecting this option will bring up a dialog box which allows you to create the database and give it a name. If you wish to create a new database in a directory other than the one listed in the dialog box, you must close all open jobs and use Create an empty Database command under the File menu option to set Color iControl to a new default database directory. (Note: The File menu is only available when there are no jobs open.)



Upgrade the Database

This Data menu command allows you to upgrade your database whenever you are upgrading the program. In many cases, newer versions of Color iControl will not be able to utilize data from an older database until the database is upgraded.

Delete Data from the Database

This command from the main Data menu allows you to delete data from the database. Data may be deleted from the database in the same way that it is retrieved.

Select the data type you wish to delete from the sub-menu. A dialog box similar to the Recall from Database dialog will appear allowing you to specify the data you wish to delete. If you use any search specifications, the Possible Matches dialog will appear. Select the data you wish to delete and click on OK.

Naming Conventions

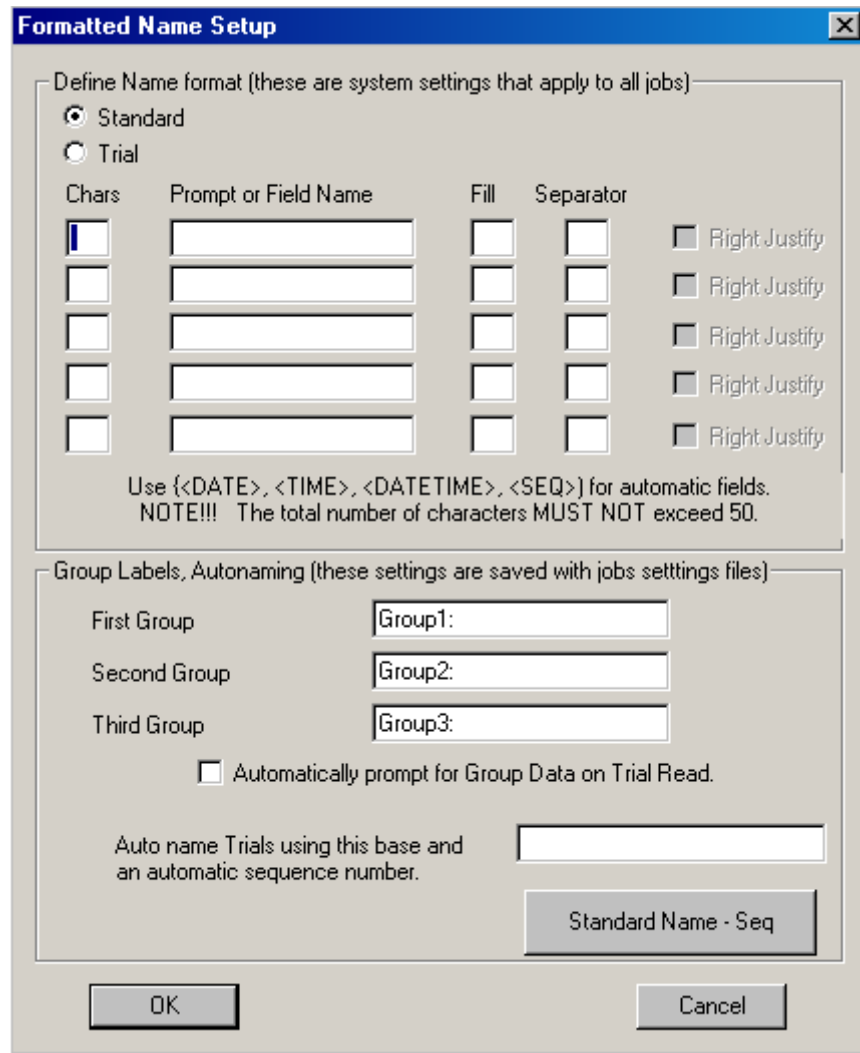
This option brings up a dialog box which allows you to establish your own naming conventions in accordance with standard company or plant procedures. There are five fields which may be used to establish the naming conventions. You may enter information such as the dye lot, style, fabric, etc. The sum of all of the various parts of a name cannot exceed fifty characters.

In addition, several pre-defined attributes can be inserted into the name fields so that the program will automatically insert them as part of the name, including: <DATE>, <TIME>, <DATETIME>, and <SEQ>. The sequence value (<SEQ>) will automatically increase by one with every new read by the sensor.

If naming conventions are not established, the name prompt will be a single blank box into which you can type any alphanumeric name.

This dialog also allows you to define the label/prompt for the User Groups feature. The default values are Group 1:, Group 2:, and Group 3:. In addition, if you define the label/prompt for the First Group to be "STDNAME", then the first twenty characters of the standard name will be automatically entered into the first group field. See [User Groups](#) for more information.

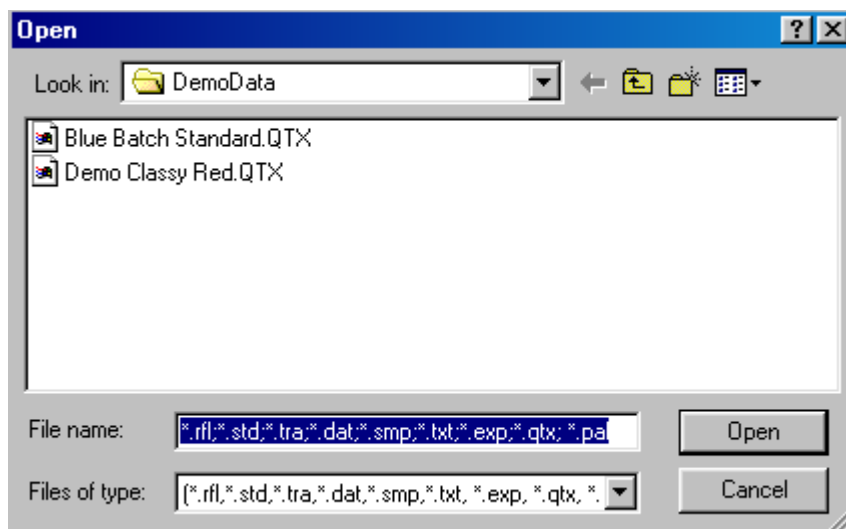
The last item is the Name Trials field. This field allows you to enter a base name for each measurement. When the Read dialog is opened, it will automatically take the base name and append a sequence number to it. The sequence will always start with 0001 as the first sequence number. However, you may edit the number in the Read dialog's name field to another value the first time you take a measurement and the system will automatically pick up the sequence from that point on.



Import...

The import function allows importing data from a SLI-Scan system in a Datacolor ".EXP" formatted file, an ICS ".DAT" formatted file, or a ColorRite ".QTX" formatted file.

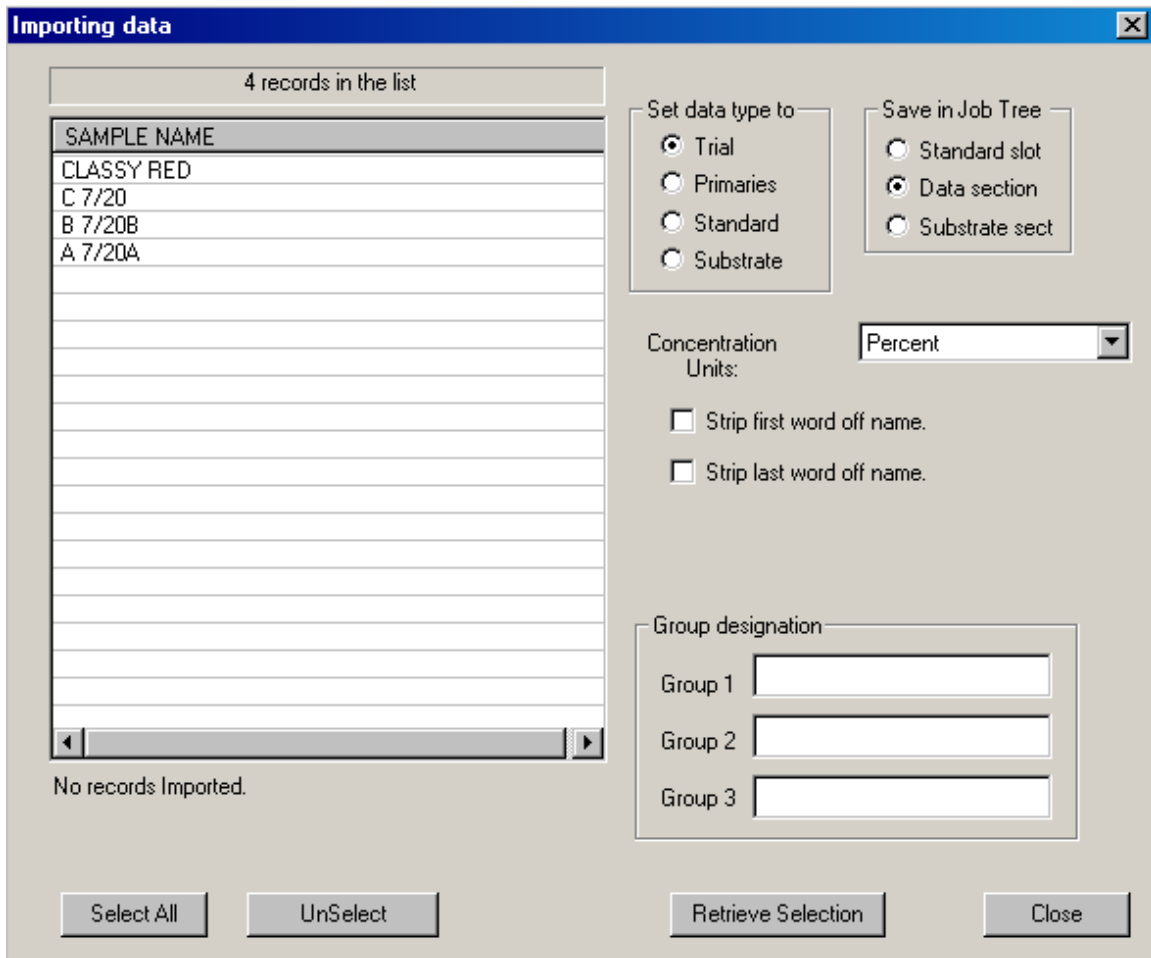
Selecting the Import function brings up a dialog box to select the desired file. (See the illustration below.) Once the data is imported into the job, if you wish to store this data in the database, you must use the "Save to Database" command under the Data menu.



Once you have selected the desired file for importation, click on the Open button. A second dialog box will appear (see below). This box displays the contents of the file you selected and allows you to select and import any or all of the data contained in the file. You may select the data type, the concentration units, as well as stripping the first or last formatted words off of the name.

You may also assign User Group designations for the imported data as well.

Click <Retrieve Selection> once you have made your choices.



User Groups

User groups are a feature designed to aid in the searching of the database and the recalling of data. They allow any data to be placed into user-defined groups and sub-groups. This allows you to search a portion rather than the entire database when looking for specific information. The maximum number of groups any data item may belong to is three. (Only three fields are provided for storing the user groups information along with the data item.) User Groups are defined in the Formatted Name Setup dialog box accessed through the Configure Naming Conventions command under the Data menu.

The user groups to which a data item belongs may be specified in several different ways. First, there is a "Groups" button available in the Measure dialog boxes to allow you to specify data groups at the time measurements are taken. Second, the data Properties dialog box allows you to place the data item into any

user groups you wish merely by typing in the name of the groups in the fields provided. Finally, you may place data into user groups whenever you import data from a file.

The most efficient way to utilize this feature of Color iControl is to develop a way of breaking down your data into logical groups. For example, when storing colorant data, you may wish to use the User Group 1 field to specify the chemical class to which the colorant belongs, i.e., reactive, disperse, acid, etc. Use the second user group field to break down the colorants further, identifying each of the colorants as high, medium, or low energy. Another example might be to group substrates according to fiber type, cotton, wool, synthetic, etc. You could then use the second user group field to identify each of the substrates based on whether it was a weave or a knit. The possibilities are really endless. The user groups allow you to design your own classification system for all of your data to improve access to the Color iControl database.

Data Properties

When in the Quality Control mode of Color iControl, you may right-click on an item in the Job Tree View. A menu will appear. One of the available items will be "Properties." Clicking on Properties will bring up a dialog box containing several tabs. Each of the tabs contains different information about the data in question. Some of the data types will contain more tabs than others. Jumps to explanations of the various types of data properties displayed are provided below. Colorants have their own unique properties and do not include the basic data properties information explained below.

Basic Data Properties --- Click here to view the basic properties tabs which are included in all data properties dialog boxes, including: Standards, Trials, Substrates, and Primaries.

Additional Properties of Standards --- Click here to view the tabs which appear in addition to the basic properties when examining the properties of standards.

Basic Data Properties

There are three tabs which are always present in the first four data types (excluding colorants, which have their own special data properties). These are

Name, Data Condition, and Spectral Data. These three tabs will always be present when examining the properties of standards, trials, substrates, and primaries. The Name tab of the Properties dialog is shown below. Jumps are provided to information about the Data Condition and Spectral Data portions of the dialog.

Data Condition ? Spectral Data

Properties

Name | Data Condition | Spectral Data | Stored Tolerances | Tolerances Used

Full name:

Operator ID: Tony
 Unique ID: 05Y?J9c0 [0]
 Created: 12/15/2003 11:02:07 AM

Formatted:

Data Type: PERCENT
 | | |

User Defined Group Designation
 Group1:
 Group2:
 Group3:

Approval Status:

Comment:

Visual Comment: NOT DONE

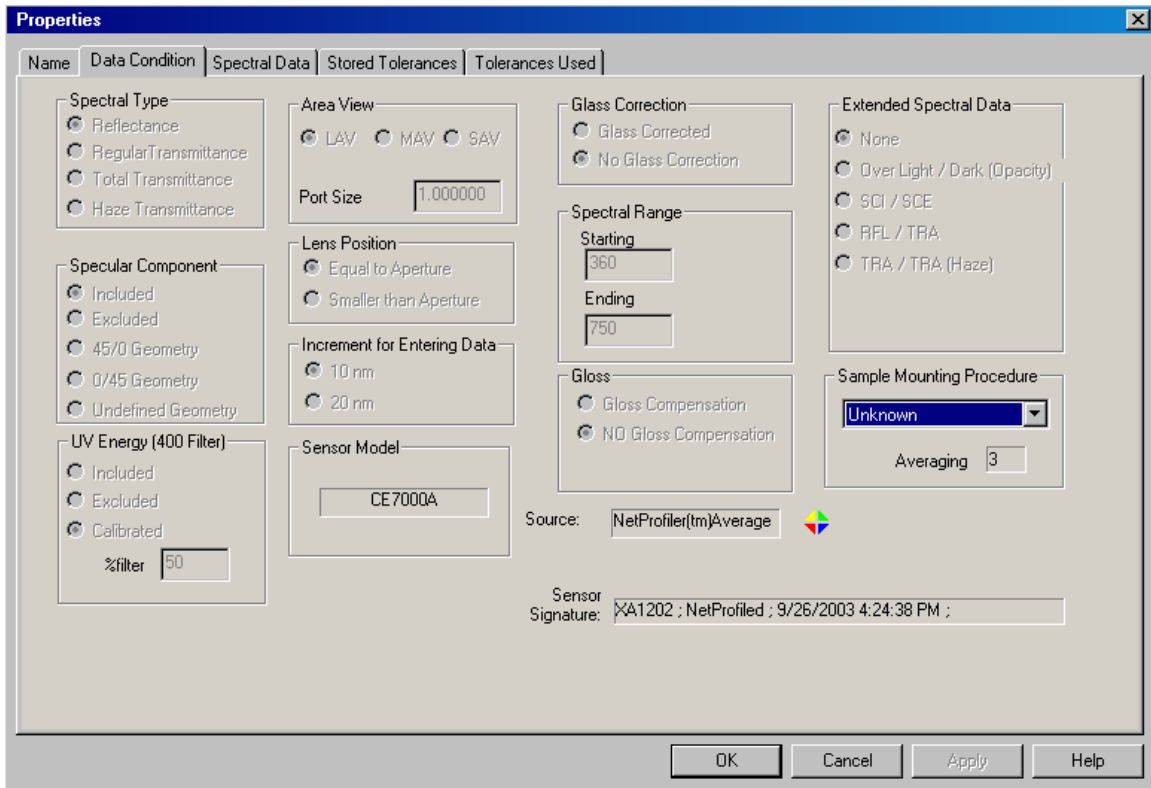
Using data from sample	Data	Using data from sample	Data
customer		process	
order			

OK Cancel Apply Help

Data Condition

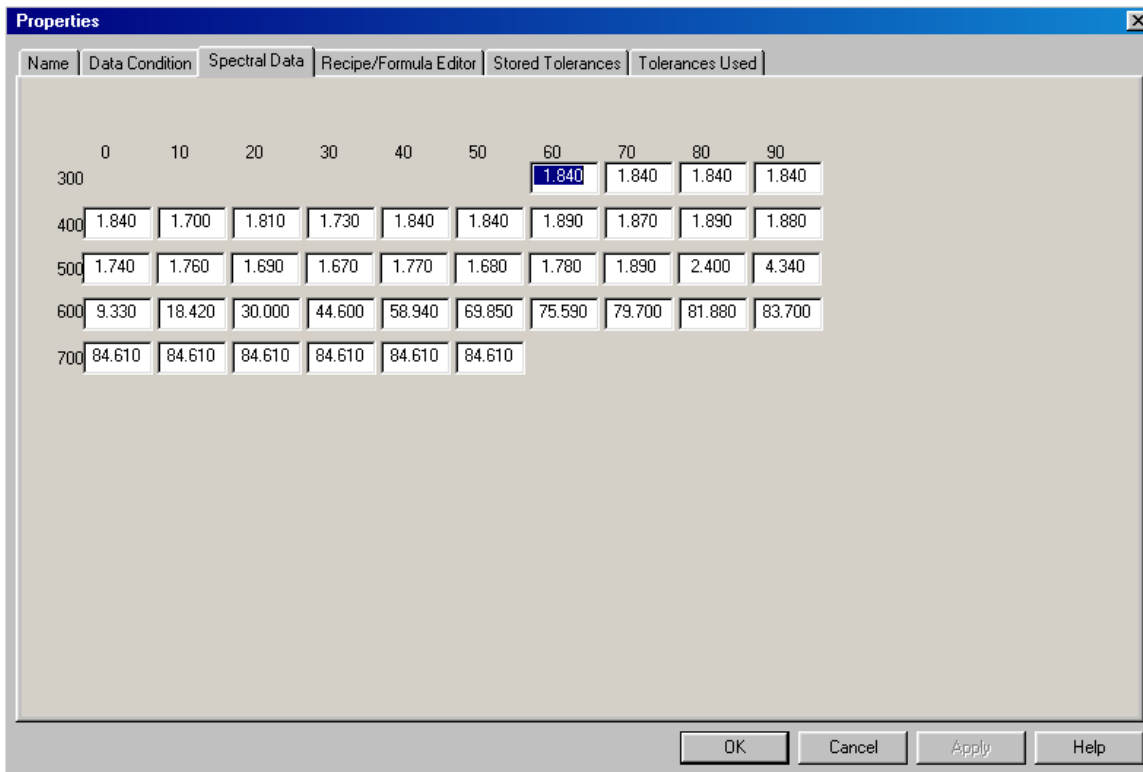
This tab will exhibit the various aspects of the instrument mode at the time the measurement in question was made. Ordinarily, these fields will automatically be filled in by Color iControl when the instrument is installed based on the program's communication with the instrument and the answers provided to the program by the person installing the sensor. These fields may change depending on the calibration mode selected for the sensor. See [Select Mode](#) for more information about calibration modes in Color iControl.

In addition, this tab contains a drop-down list which allows the selection of a Sample Mounting Procedure. Selecting a Sample Mounting Procedure for a standard will automatically cause Color iControl to prompt the user when reading trials with that information. For more information, see [Setting Up the Measurement Process](#) and [Additional Elements of the Measure Dialog](#).



Spectral Data

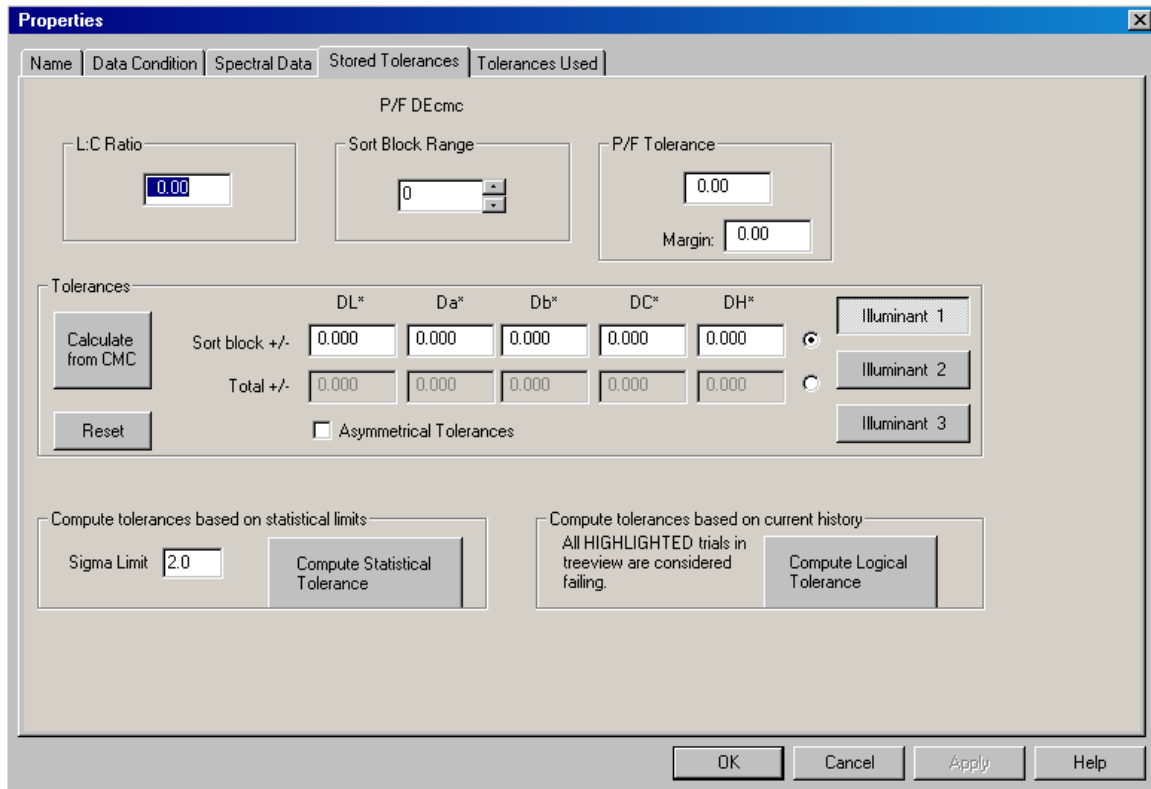
This tab will allow you to examine or edit the exact spectral data gathered by the instrument. The data will be displayed across the wavelength range of the instrument in ten nanometer increments. The full wavelength range of the visible spectrum is represented here. However, not all instruments measure the entire visible spectrum. In our example below, you can see that the 360, 370, and 750-780 are grayed out. This means the instrument used to take this measurement did not include those wavelengths. Color iControl copies the first and last measurement into these spaces as place holders. This also prevents drop-offs whenever the data is displayed in a graph.



Additional Properties of Standards

Three additional tabs are included when examining the properties of standards: Stored Tolerances, Formula Editor, and Tolerances Used. The Stored Tolerances tab is illustrated below. Click on the jump provided to see the tabs on Tolerances Used or the Formula Editor.

[Tolerances Used ?](#) [Recipe/Formula Editor ?](#) [Advanced QC Settings](#)

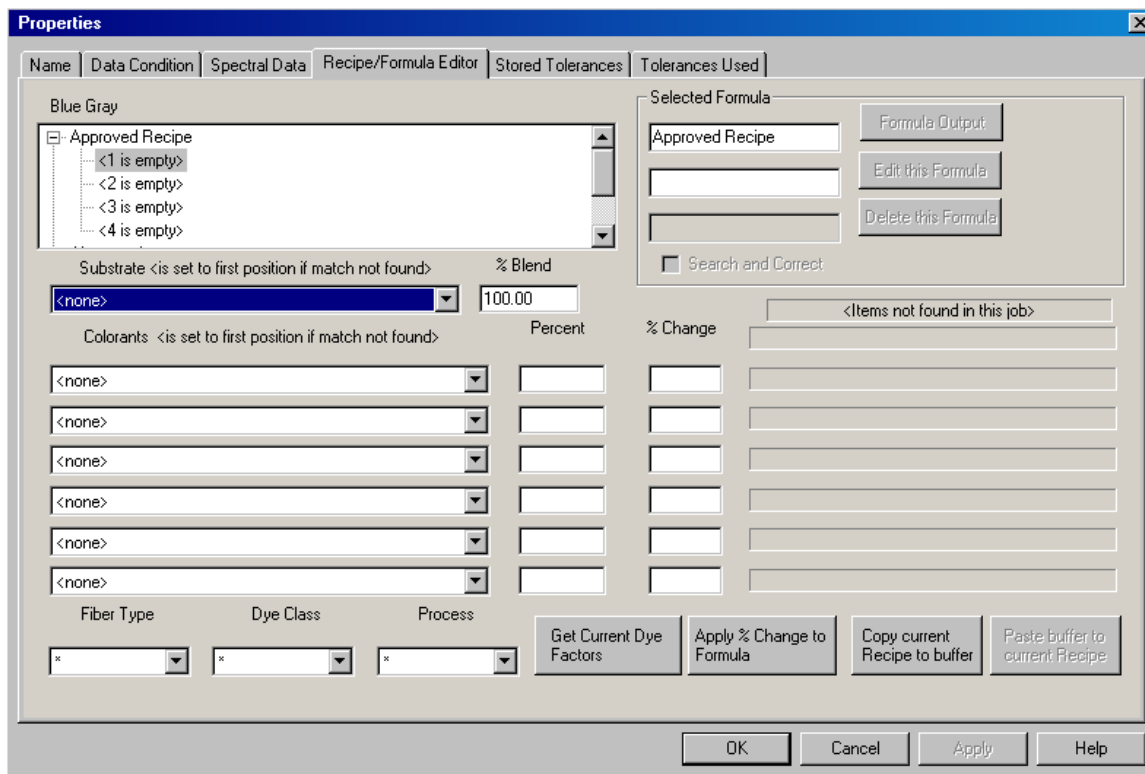


Tolerances Used

This tab will display the tolerances which are currently being used. It has been included to help you keep up with where the current tolerances are coming from. The source of each value is listed beneath each field. You may not change any of these values from this screen; it is intended to be used for informational purposes only. The only actions you may take in this screen is to display tolerances for the different illuminants or to save the tolerances to the standard using the buttons provided.

Recipe/Formula Editor

This tab allows you to edit formulas that have been stored with either the standard or a trial. Formulas may only be stored with these two types of data.



Formula Name --- These fields allow you to specify which of four formulas stored with the standard you wish to view. You may select the approved formula or one of the three alternatives.

Selected Formula --- These fields display the currently selected formula. The buttons allow you to output the formula, edit it, or delete it.

Substrate - Formula Editor --- The substrate will be listed here. For multi-fiber substrates, the blend percentage will be included.

Colorants - Formula Editor --- The colorants included in the formula will be listed here by name along with their concentrations.

Items Not Found in this Job --- This portion of the dialog will display items related to this standard's formulas but not stored in the current job.

Process Attributes - Fiber Type, Dye Class, Process --- These fields will display any process attributes associated with the formula when it was stored. You may use the drop-down lists to change the attributes for a stored formula.

Copy current recipe to buffer --- This button copies the current recipe to a memory buffer for pasting into another recipe storage slot. This allows you to move recipes and formulas from one storage slot to another within the associated standard or trial's properties dialog.

Paste buffer to current recipe --- This button pastes the recipe stored in the buffer into the currently selected storage slot for a formula or recipe. This allows you to move recipes and formulas from one storage slot to another within the associated standard or trial's properties dialog.

Apply factor to current formula --- This button and associated field allow you to enter and apply an overall correction factor to the currently displayed formula.

Color Difference/How To

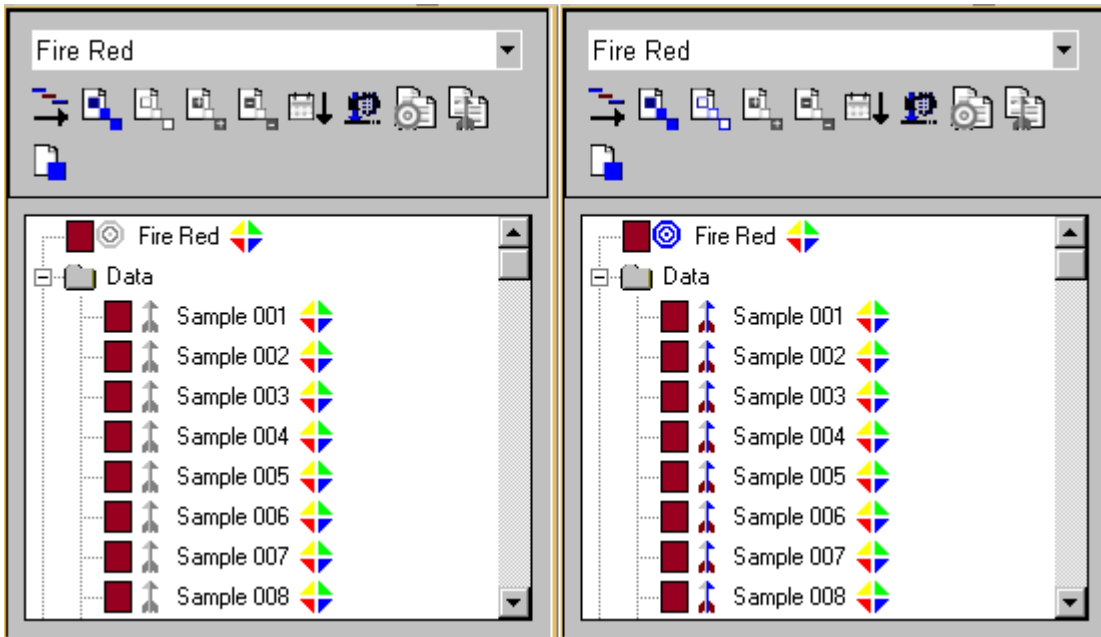
Display Data in Views

Data is selected for display in the Tree View. (For more information, see Tree View in the Quality Control topic.) All data currently loaded into the job will be displayed in the Tree View; however, not all data loaded into the job will be displayed in the data views. To view data in the various views, you must select it for display.

The easiest way to select data is to use the “Show All” button (See figure below) from the Tree View toolbar. This command is also available in the Tree View right-click menu.



Clicking once on this button will automatically select all data from the Tree View for display in the other views. The figure below shows the Tree View before and after selecting the data for display. Notice that the data type icons (the target and dart images) are greyed out before the data is selected but are displayed in color afterwards.



If you wish to select only a portion of the items displayed in the tree view, you will need to manually highlight the desired items using the mouse prior to selecting them for display.

Manual Selection: To manually highlight the data you wish displayed, left-click on individual items with the mouse while holding down the <CTRL> key. This method is best used when you only have a few items to view. You may highlight multiple items by selecting a range. To do this, left-click on the first item, then hold down the <Shift> key and left-click again on the last item. Every item between the first and the last will be highlighted.

Once you have manually highlighted the desired items, click once on the <Show Only> button in the Tree View toolbar (See figure below). This command is also available as an item in the Tree View Right-Click menu.

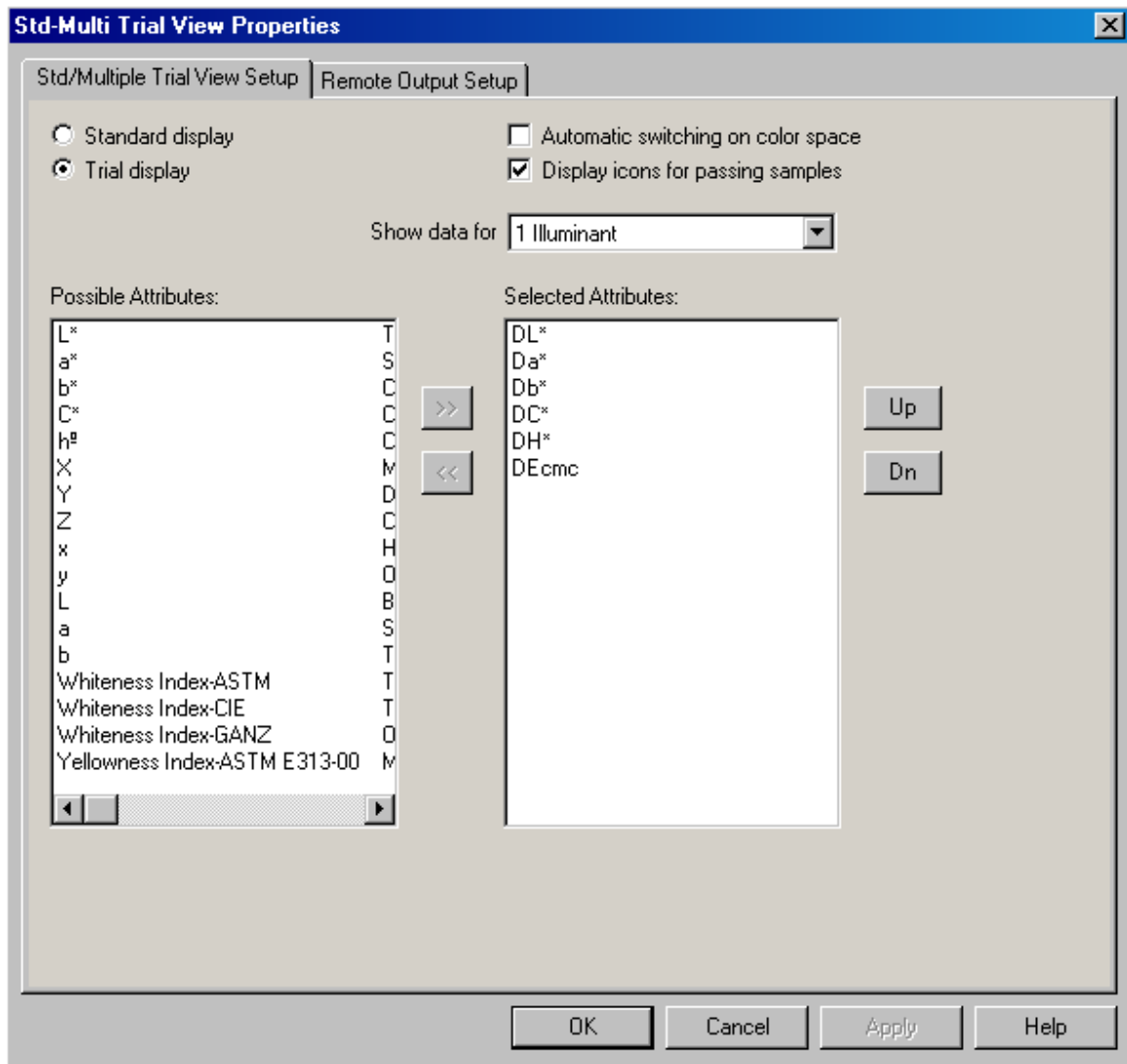


View Color Difference Data

The main view for displaying color difference data is the Standard/Multi-Trial view (see image below). Items in the Standard/Multi-Trial view are known as attributes. If you need to save space, you may exclude the standard's information by deselecting the "Show standard info" option in the view's right-click menu.

Standard Name	L*	a*	b*	C*	h°		
Blue Gray	46.72	-2.22	-10.44	10.67	258.02		
Trial Name	DL*	Da*	Db*	DC*	DH*	DEcmc	GS Stain
✓ Blue Gray	0.00	0.00	0.00	0.00	0.00	0.00	5
✓ 429398	0.76 L	-0.02 G	0.27 Y	-0.26 D	-0.08 G	0.43	5
✓ 429953	-1.27 D	0.03 R	-0.22 B	0.21 B	0.07 R	0.63	4.5
✓ 429076	-1.02 D	0.03 R	-0.14 B	0.13 B	0.06 R	0.50	5
✓ 429460	0.23 L	0.09 R	0.52 Y	-0.53 D	-0.02 G	0.44	5
✓ 429441	-0.56 D	-0.03 G	-0.33 B	0.33 B	0.04 R	0.38	5
✓ 429457	0.00 D	0.01	0.00 D	0.00 D	0.00 D	0.17	5

To display a particular attribute, you must select it for display through the Standard/Multi-Trial view's Properties... dialog (see figure below.) To access this dialog, right-click once in the view with the mouse and click on "Properties..."



Notice that there are two radio buttons at the top left. These determine whether you are selecting attributes for the standard display or for the trial display.

Below the standard/trial radio buttons are two display areas: Possible Attributes and Selected Attributes. To move an item from the Possible Attributes box to the Selected Attributes box, click once on the item to highlight it. (You may select multiple items using <Ctrl> click or a range by using <Shift> click.)

Once the desired item is highlighted, click on the right-facing double arrow button between the two boxes. This will cause the item to move from “possible” to “selected.”

Once the item is in the “Selected Attributes” box, it may be moved up and down by using the buttons to the right. Selected attributes are displayed in their top-down order in the Standard/Multi-Trial view from left to right.

Change Views/Edit a View's Properties

Any of the data views in Color iQC can be changed except for the Tree View. The Tree View cannot be moved or replaced with another view. For a complete list of data views, see the Quality Control topic.

To change a view, right-click once in that view to open that view's pop-up menu. Select the “Change View” option. The current view will be replaced with the view selected.

To edit a view's properties, right-click once to open that view's pop-up menu. Select the “Properties...” option. A dialog box containing the available options for altering the display of that view will open. You may make selections and then click <OK>. The display of the view will be changed according to your selections.

For more information on the properties of the various views, see the topics on each view available through the Quality Control topic.

Print Color Difference Data

Color difference data may be printed out in two ways, by printing an individual view or by including a view in the Full Printout option.

To print an individual view, right-click once in that view to open the pop-up menu. Select the Print option.

The Full Printout option is available through the Print button on the toolbar (See figure below) as well as the “Print” option under the Job menu. Clicking on this button or selecting the “Print” command will send a print job to the printer. Only

the views where the “Include in Full Printout” option in the right-click menu has been checked will be included in the print job.



Color iQC also includes a “Print Preview” option under the Job menu that allows you to view what the output will look like prior to actually sending the print job to the printer. Simply click on the “Print Preview” option and a dialog will open allowing you to examine the output. You may browse the pages of the job, zoom in or out, and print from this dialog.

Attributes for Standard/Multi-Trial View Display

Color iControl has a wide variety of possible attributes available for display for either the standard or any trial data loaded into a job. Following is a complete list, with brief definitions, of each of those attributes. This list is comprehensive and includes attributes for both Standard and Trial display; however, not all of these attributes will be applicable to the standard (delta values, for example).

Available Attributes

L* --- Represents a standard or sample's position on the lightness axis in either CIELAB or CIELCH color space. This attribute is also available in Strength Adjusted form.

a* --- Represents a standard or sample's position on the green/red axis in CIELAB color space, green being in the negative direction and red being in the positive direction. This attribute is also available in Strength Adjusted form.

b* --- Represents a standard or sample's position on the blue/yellow axis in CIELAB color space, blue being in the negative direction and yellow being in the positive direction. This attribute is also available in Strength Adjusted form.

C* --- Represents a standard or sample's chroma value in CIELCH color space. This attribute is also available in Strength Adjusted form.

h* --- Represents a standard or sample's hue value in CIELCH color space. This attribute is also available in Strength Adjusted form.

X --- Represents a standard or sample's X tristimulus value for the 1931 CIE XYZ color space.

Y --- Represents a standard or sample's Y tristimulus value for the 1931 CIE XYZ color space.

Z --- Represents a standard or sample's Z tristimulus value for the 1931 CIE XYZ color space.

x --- Represents a standard or sample's position on the horizontal axis in the chromaticity diagram.

y --- Represents a standard or sample's position on the vertical axis in the chromaticity diagram.

L --- Represents a standard or sample's position on the lightness axis in Hunter color space. This attribute is also available in Strength Adjusted form.

a --- Represents a standard or sample's position on the green/red axis in Hunter color space. This attribute is also available in Strength Adjusted form.

b --- Represents a standard or sample's position on the blue/yellow axis in Hunter color space. This attribute is also available in Strength Adjusted form.

Whiteness Index (ASTM, CIE, GANZ) --- The Whiteness Index of a standard or sample can be calculated by either the ASTM method, the CIE method, or the GANZ method.

Yellowness Index --- The Yellowness Index of a standard or sample. This attribute is calculated using the ASTM E313.

Tint (CIE, GANZ) --- The Tint of a standard or sample can be calculated using either the CIE method or the GANZ method.

Single Wavelength %R --- This value displays the wavelength used for calculation of the Color Value/Strength using the Single Wavelength method. The wavelength to be used for this can be entered into the Properties dialog of the standard (field marked "SWL for Strength"). If no value is entered into this field, then the system will default to using the minimum wavelength for calculating this value.

Color Value (WSUM, SUM, SWL) --- The Color Value is a single numerical value related to the amount of color absorbing material (colorant) contained in a sample. It is most often used to calculate the difference in strength (% strength) between two colored specimens. Color Value may be calculated by any one of three acceptable methods: WSUM, SUM, and SWL.

Minimum Wavelength --- This attribute identifies at which wavelength the least amount of light is reflected from your sample and its percent reflectance value.

This attribute will always display the minimum wavelength regardless of what the value "SWL for Strength" is set to in the standard's Properties dialog box.

Date/Time --- Displays the day and time that the measurement was taken.

Comment --- This option allows you to display any comments entered into the Comment field in the measurement's Name tab of its Properties... dialog box.

Haze --- Calculation requiring extended measurements TRA/TRA. Correlated Haze requires measurement of transmission using a white then a black trap. See Extended Measurements in [Setting Up the Measurement Process](#) and [Additional Elements of the Measure Dialog](#) for more information. See also Calibration Mode Properties Dialog in [Select Mode](#).

Opacity_CR --- This value is the opacity using the contrast ratio method. To use this value, the calibration mode of the spectro must include extended measurements for over light and over dark. Samples must then be measured using both a light backing and a dark backing. See Extended Measurements in [Setting Up the Measurement Process](#) and [Additional Elements of the Measure Dialog](#) for more information. See also Calibration Mode Properties Dialog in [Select Mode](#).

Berger_WI --- This Whiteness Index is specified for illuminant C and 2 degree observer; however, it is commonly used with other illuminants and observer functions. The value displayed will depend on the selected illuminant and observer function.

Stensby_WI --- This Whiteness Index is for use in HunterLab color space with the Hunter color co-ordinate values.

Taube_WI --- This Whiteness Index is specified for the illuminant C and 2 degree observer; however, it is commonly used with other illuminants and observer functions. The value displayed will depend on the selected illuminant and observer function.

Tappi_452 --- This Brightness Index is typically used only in the paper industry for evaluating the quality of untreated pulp, paper, and paperboard. It is not recommended for evaluating the normal color appearance of whites, especially if fluorescent agents are present.

Tappi_525 --- This Brightness Index provides a measure of the diffuse brightness of pulp. Diffuse reflectance is measured at an effective wavelength of 457 nm. It is not recommended for evaluating the normal color appearance of whites, especially if fluorescent agents are present.

OJ_Index --- This index was developed by the U.S. Department of Agriculture for use with the GretagMacbeth Color-Eye 2020+ or GretagMacbeth Color-Eye 3000 spectrophotometers equipped with an orange juice test tube holder accessory.

Munsell HVC Notation --- This item will display the Munsell Hue Value Chroma notation for the sample.

SRR Gloss --- ASTM method E429 Specular Reflectance Ratio gloss calculation for sphere spectrophotometers using Specular included versus Specular excluded measurements. SRR Gloss requires Extended Measurements.

Oper ID --- This attribute displays the operator ID for the measurement, ie, the person who took the reading.

Gloss 60* --- This attribute displays a correlated 60 degree gloss method using SCI/SCE measurement and an equation that correlates the differences to measurements taken on a true 60 degree gloss meter. Gloss 60* requires Extended Measurements. See Extended Measurements in [Setting Up the Measurement Process](#) and [Additional Elements of the Measure Dialog](#) for more information. See also Calibration Mode Properties Dialog in [Select Mode](#).

DL* --- The delta value for the L* attribute. This attribute is also available in Strength Adjusted form.

Da* --- The delta value for the a* attribute. This attribute is also available in Strength Adjusted form.

Db* --- The delta value for the b* attribute. This attribute is also available in Strength Adjusted form.

DC* --- The delta value for the C* attribute. This attribute is also available in Strength Adjusted form.

Dh* --- The delta value for the h* attribute. This attribute is also available in Strength Adjusted form.

DE* --- The distance a sample falls from the standard in CIE color space using a simple, straight-line calculation. This attribute is also available in Strength Adjusted form.

DEcmc (2.0:1) --- This value also represents the distance in color space that a sample falls from the standard but is calculated using the CIE DEcmc equation which includes weighting functions that predict visual acceptability more accurately than the simpler DE* calculation. This attribute is also available in Strength Adjusted form.

DL --- The delta value for the L component of Hunter color space.

Da --- The delta value for the a component of Hunter color space.

Db --- The delta value for the b component of Hunter color space.

DEh --- The distance a sample falls from the standard in Hunter color space.

DLf --- The delta value for lightness in FMC-II color space.

DRGf --- The delta value for the red/green value in FMC-II color space.

DYBf --- The delta value for the yellow/blue value in FMC-II color space.

DCf --- A delta value representing total chromatic color difference in FMC-II color space.

DEf --- The delta E value for the FMC-II color space.

DL*00 --- The delta value for the L* attribute from a proposed new color space. This attribute is also available in Strength Adjusted form.

DC*00 --- The delta value for the C* attribute from a proposed new color space. This attribute is also available in Strength Adjusted form.

DH*00 --- The delta value for the H* attribute from a proposed new color space. This attribute is also available in Strength Adjusted form.

DL*cmc --- The delta L* weighted by the CMC equation. This attribute is also available in Strength Adjusted form.

DC*cmc --- The delta C* weighted by the CMC equation. This attribute is also available in Strength Adjusted form.

DH*cmc --- The delta H* weighted by the CMC equation. This attribute is also available in Strength Adjusted form.

Gray Scale for Staining --- This attribute displays the Gray Scale value for staining between the standard and a sample.

Gray Scale for Color Change --- This attribute displays the Gray Scale value for staining between the standard and a sample.

Metamerism Index (1,2; 1,3; 2,3) --- This attribute display the Metamerism Index between either the first and second (1,2), the first and third (1,3), or the second

and third (2,3) illuminants. You may set which illuminants Color iControl considers first, second, and third in the Illuminants section of the Settings dialog box. This attribute is also available in Strength Adjusted form. Metamerism is also an attribute on which you may sort formulas when in Color iControl's formulation mode and can be selected from that mode's Settings dialog.

Pass/Fail/Margin --- This item displays a pass, fail, or marginal indicator for samples measured against the standard. It must be selected in order for the pass/fail/marginal icons (green ball, stop sign, yellow question mark, respectively) to be displayed in the Standard/Multi-Trial view.

Sort Codes (DL*C*H*, DL*a*b*, DLab) --- This attribute displays the 555 Sort Codes for the selected samples compared to the standard. You may select Sort Codes for DL*C*H*, DL*a*b*, or DLab. Also available in Strength Adjusted form for the DL*C*H* and DL*a*b* sort codes..

Strength (WSUM, SUM, SWL) --- This attribute displays the relative difference in strength between a standard and a sample. This calculation employs the Color Value of each of the specimens so that you have a choice as to how that Color Value is calculated, WSUM, SUM, or SWL.

DY --- The delta value for the Y element of the chromaticity diagram.

Dx --- The delta value for the x element of the chromaticity diagram.

Dy --- The delta value for the y element of the chromaticity diagram.

Group/Sequence --- This attribute will only be available if you have purchased the SLI-Taper/W32 option with your Color iControl system. It identifies each sample's place in a set(s) of tapered samples. If more than one group was tapered with a data set, then the groups will be identified as well as the sequence.

Group_1, Group_2, Group_3 --- These attributes allow you to display any User Groups that the sample has been included within. See [User Groups](#) for more information.

Length --- This attribute displays the length of the fabric in whatever units have been selected by the user. You can set the program to prompt for a length value whenever you do an instrument read in the Options tab of the Settings dialog box.

Str Adjusted --- This attribute appears before many of the colorimetric terms previously listed and allows you to display those terms in their strength adjusted form. That is, Color iControl corrects the sample(s) so that its strength is equal to the standard. Then color difference data is calculated again. Strength adjusted

data is helpful in determining whether or not correcting only for strength differences will result in a hue shift. Terms that are available in Strength Adjusted form are so indicated.

Color Inconstancy --- This attribute indicates a color change in the sample (without any reference to the standard) under different illuminants. This property is sometimes known as "**flare**." You may select to display a Color Inconstancy value for samples for the first and second illuminants, the second and third illuminants, and the first and third illuminants. This is a new index for which experimental data has not been gathered and therefore no hard and fast rules on acceptable tolerances have been established. Higher values of Color Inconstancy (over 1.0) probably indicate an unacceptable color difference; however, it would be wise to also examine the trial measurement in question in the Color Rendering View with the Multiple Illuminants option turned on to examine the color change visually rather than depending purely on the numeric value listed in the Multi-Trial View. Color Inconstancy is also an attribute on which you may sort formulas when in Color iControl's formulation mode and can be selected from that mode's Settings dialog.

Roll-Roll DEcmc --- This item displays the DEcmc from roll to roll when the SLI-Taper software is used to sequence a set of measurements depicting rolls of fabric.

sR, sG, sB --- These attributes allow you to display RGB values as given in SRGB color space.

Tappi_Opacity --- This index is a measure of opacity (sometimes called hiding power or contrast ratio). It is the ratio of Y tristimulus for the sample measured over a black substrate divided by the Y tristimulus for the sample measured over a white substrate, expressed as a percentage. This calculation is based on the 1931 standard observer (2 degree) and Illuminant A.

APHA --- This attribute is defined by the American Public Health Association for determining color (clarity) of water.

eSubmit/How To

eSubmit and Extended Tagging

The e-Submit option, along with Extended Tagging, allows users to enter information which is useful for customers working with their suppliers to electronically communicate color data throughout their supply chain; this is done through a set of fields (maximum 30) included as part of the information stored with the measurement. Usually this is done for the standard or target colors specified by the designer which needs to be reproduced in the color matching process. These "tagged" fields can be viewed in a special e-Submit View in the Quality Control mode (listed as just "Submit View" in the Change View dialog). Information included in the tagged fields may be printed out in the form of a report or transmitted electronically in the *.QTX or *.XML file format through your computer's e-mail system for use with ColorTools or NetPalette. Of course, since the data is embedded in the measurement itself, you may also e-mail a Color iControl job containing several data items which have been tagged provided the recipient also has Color iControl. In fact, the tagging function is useful even if you do not need to employ the e-Submit function.

Enabling the e-Submit Option

To enable the e-Submit option, you must check the "Enable e-Submit Option" under the Settings menu when there are no jobs open. The Settings menu is not available unless all jobs have been closed.

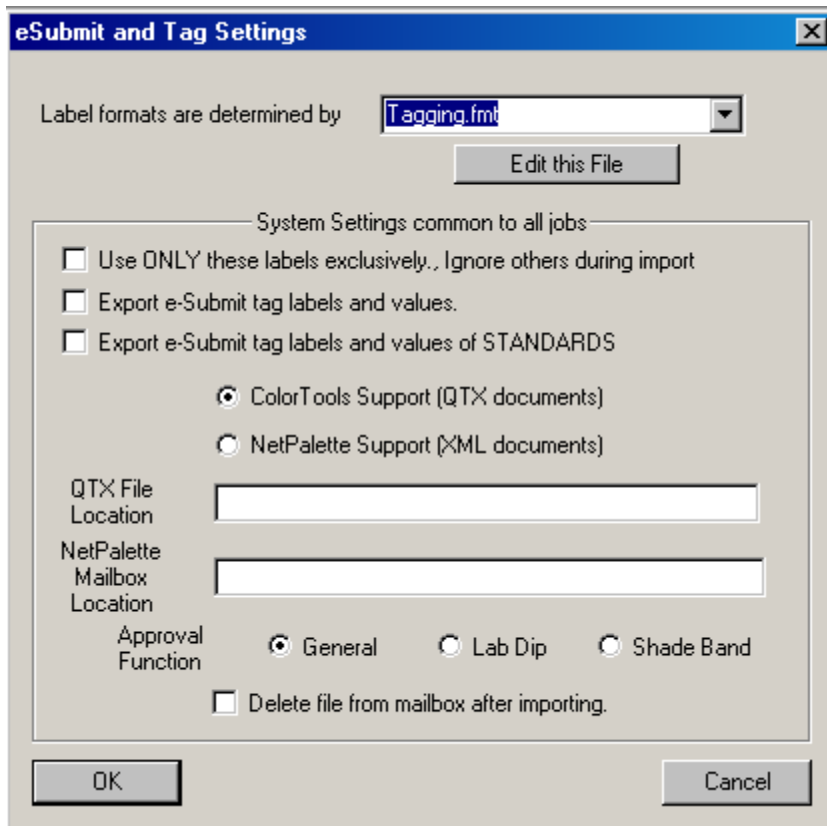
For more information, see the How To topics below.

[Setup eSubmit ?](#) [Edit an eSubmit Format File ?](#) [Edit the eSubmit Fields ?](#) [Send and receive eSubmit Files](#)

Setup eSubmit

The e-Submit tool in Color iQC must be enabled before it can be used. To enable e-Submit, click once on the "Enable e-Submit and Extended Tagging" item under the Settings menu when there are no jobs open. This option will not be available through the Settings menu when a job is open.

In addition to enabling the e-Submit tool, settings for the tool must be selected. The "Setup e-Submit and Tagging" option under the Settings menu will open a dialog box allowing you to do this (see figure below).



The first item is the e-Submit format file. You may select from the drop-down list, select to edit a file from the list, or enter a new name to create a new format file. Creating and editing a new eSubmit format file is covered in the How to Edit an eSubmit Format File. See that topic for more information.

The rest of the fields will be settings employed system-wide and common to all jobs.

The first checkbox allows you to set the system to only receive files formatted the same as the specified format file. Any other labels in the file will be ignored when the file is imported.

The second checkbox informs the system to export all the eSubmit tags.

The third checkbox informs the system to export the eSubmit fields only for the Standard data type.

The two radio buttons in the center of the dialog are mutually exclusive. You must choose whether you are using the ColorTools format (QTX) or the NetPalette format (XML) for your eSubmit files.

The path fields following the radio buttons allow you to specify the folder (system directory) where you wish incoming eSubmit files to be stored prior to import.

Three radio buttons allow you to select the Approval Function. The options are: General, Lab Dip, and Shade Band.

Finally, a checkbox at the bottom allows you to set the system to automatically delete QTX and XML files located in the mailbox once they are imported into the system.

Edit an eSubmit Format File

You may edit or create a new eSubmit format file from the “Setup eSubmit and Extended Tagging” dialog box.

To edit an existing file, select it from the drop-down list and click once on the <Edit this file> button below the list display field.

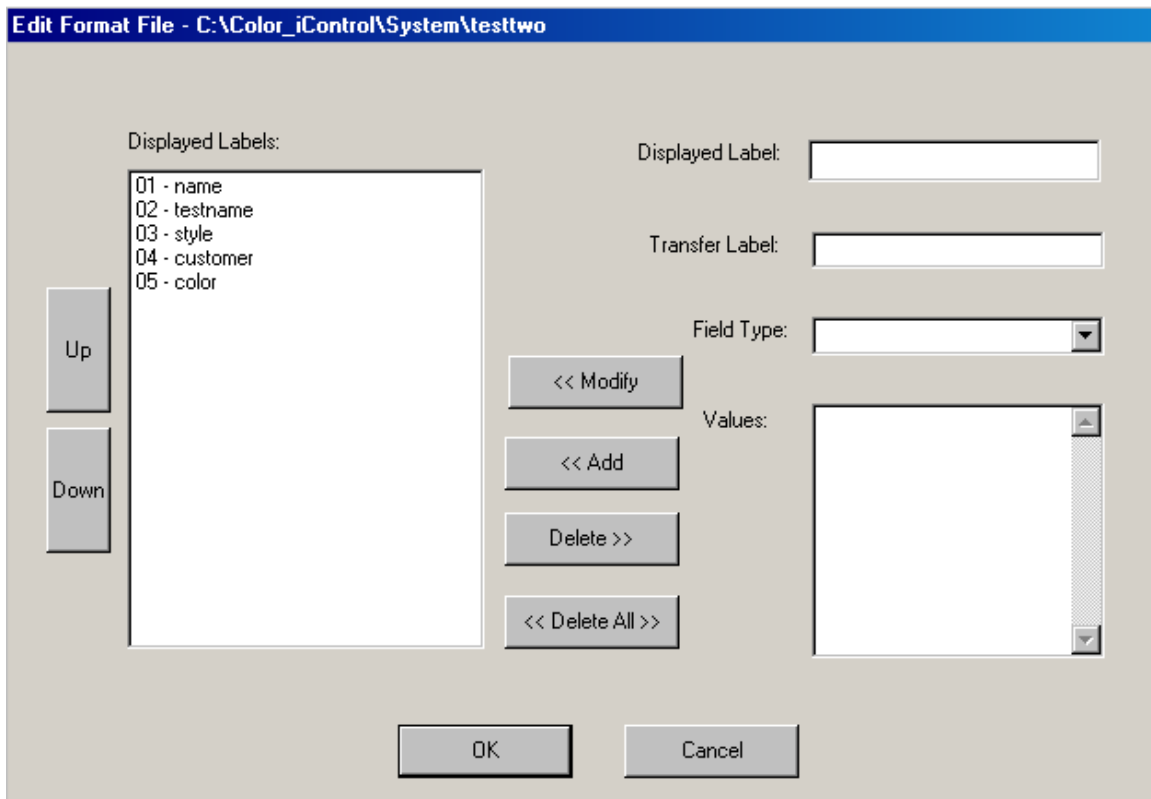
To create a new format file, type in a new name in the list field, deleting the name displayed if necessary, and click on the <Edit this file> button.

The Edit Format File dialog will open (see figure below). This dialog allows you to define the various data fields for use with the eSubmit and extended tagging functions.

Enter the first item you want into the field at the upper right titled “Displayed Label”. The field below allows you to enter in an additional “Transfer Label” if it is needed.

The drop-down list allows you to select the type of field the item will be: an editable text field, a drop-down list of predetermined options, or an editable list.

The Values box below the list will become active if you select either the Drop-down List or the Edit List option for the field. You may enter the values you wish displayed in the eSubmit field on separate lines by pressing the <Enter> key after each item.



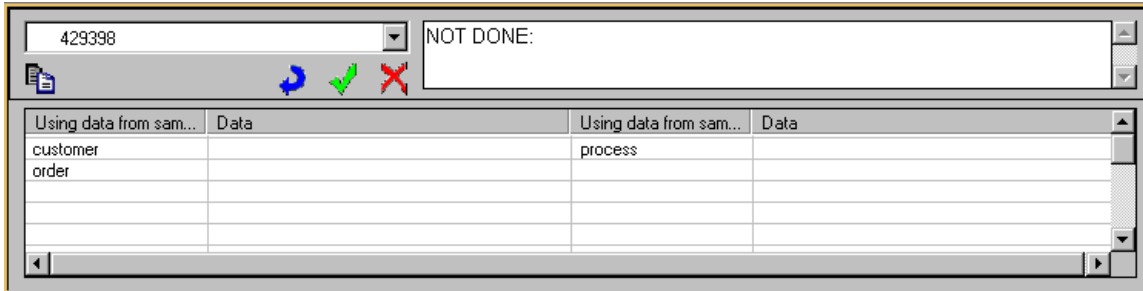
Once you have the fields on the right side of the dialog filled in, click once on the <Add> button. The new item will be listed in the “Displayed Labels” box.

The system will automatically increment the number of the field as items are added. You may change the order of the items by selecting one and using the <Up> and <Down> buttons to the left of the box.

Click <OK> to finalize the modification or create the new file.

Edit the eSubmit Fields

To edit the eSubmit fields, you should make sure that you have the eSubmit View as one of your current views. If you do not, right-click in one of your views (preferably one you do not need) and select the Change View option. Select the Submit View (see figure below).



Now that you have the Submit view, you must select the data for display. You may use the “Show All” button in the Tree View toolbar.

All items will be available in the view. How you edit each field depends on the type of field it is.

The Text Edit type of field simply allows you to click within the field and place a text cursor into the field. Enter the desired text and then select the next field.

The Drop List type of field will open the list when you double-click it. Each item will be displayed; scroll through the list and double-click your selection.

The Edit List type of field opens that item’s Properties... dialog box where you may enter in your data directly into the submit fields for that item.

The easiest way to perform this task is to fill out the Submit fields for the first sample and then use the “Copy information to all other measurements in view” button located beneath the sample selection drop-down list. All the other measurements selected for display in views will automatically be updated with the Submit field information entered into the currently displayed item.

The other three buttons allow you to mark each item as not done (blue curved arrow), accept (green checkmark), or rejected (red X) once a determination has been made regarding that item’s disposition.

The Visual comment field to the right top of the view allows simple text entry. In addition, another comment field is available in the Name tab of each item’s Properties... dialog.

Send and Receive eSubmit Files

The e-Submit option allows you to submit targets (potential standards) to your customer electronically via e-mail. This prevents the time consuming

process of sending colored swatches to your customer via ordinary mail and then waiting for a response. Data on your targets is stored in a QTX (ColorTools format) or XML (NetPalette format) file and the recipient must have a software package capable of reading that file format (or Color iQC). Instructions for using the e-Submit option are listed below. (For more information on the e-Submit option, see the Tools menu options as well as eSubmit and Extended Tagging.

Sending an e-Submit file

1. Be sure that the program is in Quality Control mode and that the Submit view fields for each target have been properly filled out.
2. Select the targets (trials) from the Tree View by clicking on them once to highlight. You may use <Ctrl>+click to select individual items or select an item and then use the <Shift>+click combination to select a range.
3. Once the needed items are selected, click on the "e-Submit xx items" command either in the Tree View's right-click menu or from under the Tools menu.
4. A dialog box will appear prompting you to name the file. The default behavior is to name the file according to the current standard in the job. However, you may alter that to any file name that you wish.
5. Once you have name the file, the system will automatically open your e-mail utility, create a new e-mail, and attach the file you just created. The name of the current standard from the job used to create the file will be inserted into the subject line of the e-mail.
6. Address the e-mail as usual and click <Send>.
7. Your customer will receive the submitted targets for evaluation.

Receiving an e-Submit file

If you are on the receiving end of an e-Submit file, you may open that file by using the "Read an e-Submit file" command under the Tools menu. The data in the file will be imported into the current job, so it is a good idea to open a new blank job before using this command. Otherwise, the imported data will be mixed in with whatever data was in the job that was open when you executed the command. In addition, the standard in the file will replace the standard in the current job (if there is one).

Taper Tool/How To

Setup the Taper

Click on the “Setup SLI-Taper parameters” option from the Tools menu. The SLI-Taper Tolerances and Commands dialog will open (see figure below). From this dialog, you must select the way in which you wish the taper calculations to be performed by the system.

The screenshot shows the "SLI-Taper Tolerances and Commands" dialog box. It has a blue title bar with a close button. The main area is divided into several sections:

- DEcmc Pass/Fail Tolerance:** A sub-dialog box containing four input fields: "to Standard" (value: 2), "to Average" (value: 1.5), "Roll to Roll" (value: 0.5), and "Range" (value: 5).
- Taper Settings File:** A text input field with the label "(not normally required)".
- Sequencing methods:** Three radio buttons: "None", "Linear", and "Minimum Path" (selected).
- Grouping methods:** A grid of radio buttons: "None", "Cluster" (selected), "BSort (Automatic split)", "LMD2", "LMD3", "Adaptive Cluster (tm)", "Linear2", "Linear3", "Adaptive Review", "BSort2", and "BSort3".
- Grouping Limits:** Three input fields: "Lower limit" (0), "Upper limit" (0), and "Min Yards" (0).
- Checkboxes:** Three unchecked checkboxes: "Print each group on separate report.", "Automatically print report when complete.", and "Automatically exit SLITaper when complete."
- Remote Server Operation:** A section with the label "(only used for remote access methods)" containing three input fields: "Computer used for Remote Exec Server", "Path for Taper.dat file (use UNC format)", and "Computer used for Adaptive Cluster Server". A "Timeout" field is set to 10.

At the bottom, there are "OK" and "Cancel" buttons.

There are four tolerances: Standard, Average, Range, and Roll. The Standard tolerance is the maximum acceptable dEcmc between a sample and the standard. The Average tolerance is the maximum acceptable dEcmc between a sample and the average of all the samples. The Range tolerance is the maximum acceptable dEcmc between the last and first samples in a linear taper group. The

Roll (to-Roll) tolerance is the maximum acceptable dEcmc between two adjacent samples.

For an explanation of the Sequencing and Grouping settings options, see the Methods of Tapering and Grouping topic.

The Grouping Limits section allows you to enter the upper and lower limits for the LMD or Bsort grouping methods. These values are in DEcmc units.

Three checkboxes allow you to select to print separate reports for each tapered group, to automatically print the report once the taper is done, and automatically exit SLI-Taper and return to Color iQC once the calculations have been completed.

The last section is for users who are using the remote server option. It has three fields. The first is the network name for the computer where the remote server is installed. The second identifies the path to the folder where the taper.dat files are stored prior to loading them into the program. The third identifies the computer by network name where the Adaptive Cluster Server has been installed.

Calculate the Taper

(These instructions assume that the taper calculation parameters have been selected in the SLI-Taper Tolerances and Commands dialog. See How to Setup the Taper for more information.)

To calculate the taper, the first step is to select all of the data in the tree view for display. Remember, the data type icon for selected data is colored; for deselected data, it is greyed out. This will ensure that all of the measurements are properly imported into the SLI-Taper software.

Once the data is selected, you should make sure that the Grp/Sequence attribute has been selected for display in the Standard/Multi-Trial view. This will ensure that the data will be displayed in its tapered order once SLI-Taper has completed its calculations.

Open the Tools menu and click on the SLI-Taper command. Once SLI-Taper has run, you may examine the taper report within the SLI-Taper program or exit and examine the data in Color iQC, that is, unless the “Automatically exit SLI-Taper” checkbox has been selected in the setup dialog.

Methods of Tapering and Grouping

Linear Tapering

Linear tapering is the simplest way to taper a group of samples. This is a method used when the major variation in color exists in only one direction in color space, or when the variation of one color parameter is predicted by a second, that is, the samples only run from lighter to darker, or from duller to brighter. When this is the case, a straight line-of-best-fit is calculated through the distribution of the sample readings and followed from one end to the other, consecutively ordering samples as they are encountered. Generally, a preset tolerance is programmed into the calculations so that if the distance between two adjacent samples is over a certain value (typically 0.40 dEcmc units), a new taper sequence is begun. In this way, more than one taper group may be calculated from a single set of data. A **linear taper** is generally most effective when variations in the data are predominantly in lightness and/or chroma.

Minimum Path Tapering

Minimum path tapering is used when the distribution in the data set is more random. The goal of a minimum path taper is to plot a line through the samples such that the total colorimetric distance (measured as dEcmc) required to travel that line is the lowest possible value while still including all the samples in the distribution. In other words, we are seeking the **minimum path** through the data set. Research performed by SheLyn, Incorporated has demonstrated that this will generally produce a taper sequence very similar to those produced by human shade sorters. However, this method only works when the distribution of the data is uniformly random. If the distribution is linear in any way, a minimum path calculation will produce a taper that is less satisfactory than those produced by the linear method above.

Grouping Methods

Clustering

The distribution of the data can also affect the taper in another way. The above methods only work well when the data is distributed in a more or less uniform fashion. After the data is plotted, if distinct subgroups, or clusters, of points exist, then tapering the group by either the linear or minimum path method may prove unsatisfactory. While gaps in the plotted data created by the uneven grouping can be taken into account so that each break is treated as a new taper sequence, a better method is to divide the entire data set into clusters prior to

applying the taper process. This method of **clustering** non-uniform data sets before tapering, either by linear or minimum path method, is generally thought to be more effective than simply allowing the computer to treat breaks as new taper sequences.

Linear Grouping

SLI-Taper/WTM has two other ways to group the data set so that more than one taper can be performed. The first is **linear grouping**. Two options exist for this method. The data set can be divided into two or three linear groups. This method of dividing the data set relies on the same calculation as a linear taper, that is, determining the line-of-best-fit. Dividing the data into two groups is quite simple. The line-of-best-fit is calculated through the data set and then all the points that fall above that line are one group and all the points that fall below that line are the second. These two groups may then be tapered by either the linear or minimum path method. (Linear grouping is just that, grouping. It does not imply that the linear method of tapering must be used.) Dividing the data set into three groups is a bit more complicated. Again, the line-of-best-fit must be calculated. However, for three groups, two more lines are placed into the data set, one above and one below, parallel to the line-of-best-fit. The three groups are then formed by the samples above the top line, the samples below the bottom line, and the samples between the two parallel lines. As with two linear groups, these three groups may be tapered by either the linear or the minimum path method.

LMD Grouping

The second method of dividing up a data set for tapering is through **LMD grouping**. As with the linear grouping, SLI-Taper/WTM can group data into two or three LMD groups depending on what the user chooses. This method uses the lightness value of the data to divide it up into light, medium, and dark samples (hence the term LMD grouping). Limits in dEcmc units which define how these groups are formed are either specified by the user or the program may be set to calculate these from the data. That is, how many dEcmc units must the program move upwards from the lightest sample before it should consider the samples it is encountering to be of medium lightness, and then dark. Obviously, when dividing the data into only two groups, the medium lightness value is omitted.

BSort Grouping

The third method is called **B sort grouping**. This method of dividing up the data set uses the b^* value for each sample, comparing it to the standard. This method is especially useful for denim. It divides the data set up according to whether or not it tends towards the yellow end of the b^* axis or the blue end of the b^* axis. You may select to group the data into two or three BSort groups, or

you may let the program auto-select a BSort method. Samples which exceed the standard tolerance or which exceed the dEcmc average for the data set will be sorted into separate groups but not tapered.

Menu Commands

File/Job

Note: This topic actually covers two different menus, File and Job. The File menu is only available when there are no jobs open in the main program window. The Job menu is only available when there *are* jobs open in the main program window. Basic commands are present in both menus but some commands are unique and only available in the menu in which they appear.

The definition of a job in Color iControl depends on how you wish to set up the system for the completion of your work. The exact nature of a job has been kept open-ended to provide flexibility in the program for the complete spectrum of customers who may be using the software. Jobs may be defined to keep separate the different tasks that Color iControl allows to be performed. One job may be set up to contain all the data for a complete QC operation, including the standard and all the samples, as well as spectral data on the substrates, whereas another job is set up to contain a target or targets, a set of colorants, and data on the desired substrates in order to carry out formulation.

On the other hand, jobs may be set up to be operator-specific. That is, instead of defining jobs based on their operational mode, jobs may be defined according to who will be running that job. Alternatively, jobs could be set up to reflect their respective points of origin, keeping dye house jobs separate from jobs being run in the laboratory.

In essence, jobs are files, except that a job will store and keep separate the various types of data stored within it (i.e., trial samples, primaries, substrates, colorants). The Job menu takes the place of the File menu that is seen in many Windows applications, and it contains many of the same types of commands that a file menu would have. Click on the jumps below for more detailed information about either job conventions in Color iControl or specific instructions about the Job menu options.

[File Menu Options ?](#) [Job Menu Options](#)

File Menu Options

The File menu is only available when there are no jobs open in the main program window. Available commands are listed below with a brief explanation. Links are provided to topics with more information.

New Job-- This command opens a new job in the current mode using the Color iControl default template. The keyboard alternative is Ctrl + N.

New From Template -- This command opens a new job from a user-selected template. The keyboard alternative is Ctrl + T. A template may be created from any currently selected job. For more information, see Settings Files, Templates, and Layouts.

Open -- Open allows you to open a pre-existing job that has been stored on the computer's hard drive. The keyboard alternative is Ctrl + O.

Open Active Correction -- This option allows you to open a currently active correction job. Note: Unavailable in the QC version of Color iControl.

Open Check Tile Job -- This command opens the check tile job where check tile readings from instrument calibrations are stored so that the user may review them.

Edit Default Job Settings -- It allows you to edit the default settings file associated with the default template. Follow the jump for more information.

Edit a Template -- This command allows you to open and edit a template.

Edit a Job Settings File -- It allows you to open and edit any settings file that has been stored.

Batch Job Conversions -- This command allows you to convert a group of files by changing the associated settings file for all of the selected jobs. Click on the jump for more information.

Print -- This command opens a dialog box which allows you to print the current job and to choose such options as the printer, page orientation, number of pages to print, etc. There is also a Properties button allowing further options for printing, such as Paper (select tray), Graphics, Device Options, and PostScript. When using this print option, only those views that have had the "Include in Full Print" option selected in their right-click menu will be included.

Print Setup -- This command opens a dialog which allows you to specify printing options for hardcopies of data stored or calculated by Color iControl.

Print Preview --- This option opens a screen-sized dialog box which will display the current job as it will be printed out. You may move from page to page and examine the formatting for the print job, as well as display two pages side-by-side.

Single View Print Setup -- This option opens the same dialog box as the main Print Setup option. The only difference is that selections made using this command control the printing of a single view. Color iControl allows you to print individual views, such as the Standard/Multi-Trial View or the Color Space View. The individual print option for views is selected by using the Print command in that view's right-click menu.

Job Menu Options

The Job menu is only available when there is at least one job open. The options available through the Job menu are described below.

New Job-- This command opens a new job in the current mode using the Color iControl default template. The keyboard alternative is Ctrl + N.

New Job from Template -- This command opens a new job from a user-selected template. The keyboard alternative is Ctrl + T. A template may be created from any currently selected job.

Open Existing Job -- Open allows you to open a pre-existing job that has been stored. (See also Recent Files, below.) The keyboard alternative is Ctrl + O.

Open Active Correction -- This option allows you to open a currently active correction job. This option is only available in the iMatch version of Color iControl.

Close Current Job -- This option closes the current job. You will be prompted to save the job if you have not already done so.

Quit Current Job without saving -- This option quits the current job so that the system will not prompt you to save it.

Save -- This command will save the current job. The keyboard alternative is Ctrl + S.

Save As -- This option allows you to save the current job under a new name.

Save As Template -- This option allows you to create a template from the current job.

Save Settings -- This option saves the current job settings to the settings file with which that job is associated.

Recall Settings -- This option recalls into the current job the original settings from the settings file associated with that job. This option allows you to make changes to the settings in a job (without saving them) and then recall the original settings by clicking once on this command.

Change settings file reference -- This command allows you to change the settings file associated with the currently active job. In addition, this command allows you to create new settings files.

Print -- This command opens a dialog box which allows you to print the current job and to choose such options as the printer, page orientation, number of pages to print, etc. There is also a Properties button allowing further options for printing, such as Paper (select tray), Graphics, Device Options, and PostScript. When using this print option, only those views that have had the "Include in Full Print" option selected in their right-click menu will be included.

Print Setup -- This command opens a dialog which allows you to specify printing options for hardcopies of data stored or calculated by Color iControl.

Print Preview -- This option opens a screen-sized dialog box which will display the current job as it will be printed out. You may move from page to page and examine the formatting for the print job, as well as display two pages side-by-side.

Single View Print Setup -- This option opens the same dialog box as the main Print option. The only difference is that selections made using this command control the printing of a single view. Color iControl allows you to print individual views, such as the Standard/Multi-Trial View or the Color Space View. The individual print option for views is selected by using the Print command in that view's right-click menu.

Recent Jobs -- Recently opened or created jobs will appear here for easy recall. Choose a job from the list to recall it in its last-used mode.

Mail -- This option allows you to e-mail jobs to another location. Follow the jump for more information.

Delete Current Job -- This command deletes the current job.

Exit -- This command allows you to exit Color iControl.

Settings Menu

The Settings menu only appears when there are no jobs open. Each item is listed below with a brief explanation.

Toolbars --- This menu item allows you to select to view and access the toolbars in Color iControl.

Status Bar --- This menu item allows you to select to view or not to view the status bar at the bottom of the Color iControl window.

Add Trials to top of list --- When selected, this item instructs the software to add newly measured trials to the top of the trial list in the Tree view. Checked equals selected; unchecked equals unselected.

Edit Default System Settings -- This command opens the System tab of the Settings dialog box which allows you to specify the working paths for storing jobs, settings etc.

Setup eSubmit and Tagging --- This command opens a dialog box which allows you to select among the various options for using the eSubmit and Extended Tagging functions. See [eSubmit and Extended Tagging](#) for more information.

Enable eSubmit and extended Tagging --- Clicking on this item enables the eSubmit and Extended Tagging functions. Checked equals selected; unchecked equals unselected. See [eSubmit and Extended Tagging](#) for more information.

Application

The Application menu is mostly unavailable in the Quality Control version of Color iControl (Color iQC). The other applications will be listed but grayed out unless you purchase the iMatch version of Color iControl. The one option that will be available Settings —dialog. The Settings dialog is also available through the "Pad and Pencil" button on the toolbar.

View

This menu allows you to set up the screen display according to your personal preferences. This menu will have different options depending on whether or not there are any jobs open. The items which only appear when no jobs are open are notated below.

Status Bar -- When selected, this option displays the status bar at the bottom of the screen. Deselecting this option causes the status bar not to be displayed.

Toggle button text -- This option will toggle between displaying text labels for each of the toolbar buttons and only displaying the icon.

Add trials to top of list -- When selected, this item adds any trials read in from the instrument to the top of the tree view's trial list. This allows you to see each sample as it is read without continually scrolling the tree view to the bottom.

Sort Measurements by... -- This option allows you to sort the measurements displayed in views by their full name or any part of a formatted name.

Single Trial QC Display --- This option converts the Standard/Multi-Trial view into a simplified standard/trial view which allows only one trial to be compared to the standard at a time.

Toggle Full QC Tree View --- This option toggles the Tree View to take up the maximum space vertically within the job window.

Clear all Highlights -- This option will clear any highlights in the views.

Accessing View Options Using the Mouse

The mouse may be used to resize or change the current views.

Resizing the View : Click on the view you wish to alter. It will become outlined in amber. Place the cursor on the amber line. It will change shape to a double-line with two arrows pointing in opposite directions. Holding down the left mouse button, drag the cursor until the view is the desired size. Let go of the mouse button.

Changing the View : To change a view, right-click once in the view to select it. The currently active view will be highlighted in amber. A menu box will pop-up with various options. Select "Change View". The Change View dialog box with the available view options will appear. Click on the desired view and select OK. The new selection will appear in the view box.

Spectro

The Spectro menu allows you to perform operations dealing with the program's interaction with the spectrophotometer. Each of this menu's available options are listed below with a brief explanation. In some cases, jumps will be provided to topics with more detailed information on that subject. If no jobs are currently open, then the only option available will be "Install or Configure." See Spectro Management for more information.

Available Spectro Menu Options

Reset Spectro Connection - This menu item is really only applicable for those users who have more than one spectrophotometer available for use with the program. This command is included for those rare occasions when you need to change spectrophotometers for an open job. Normally, a job is associated with the instrument selected when that job is first opened. To do this, click on the "Install or Configure" option. The Install Spectro dialog box will appear. Select the instrument you desire to associate with the current job. Click <CLOSE>. Then, click on **Spectro | Reset Spectro connection**. The previously selected instrument should now be the instrument associated with that job.

Select Mode --- This command allows you to specify certain operating parameters for the spectrophotometer. Follow the jump to receive complete instructions on selecting instrument modes.

Calibrate --- This command allows you to standardize the instrument. Follow the jump for instructions on standardizing your instrument.

Install or Configure --- This command allows you to install or configure any instruments connected to the computer running Color iControl.

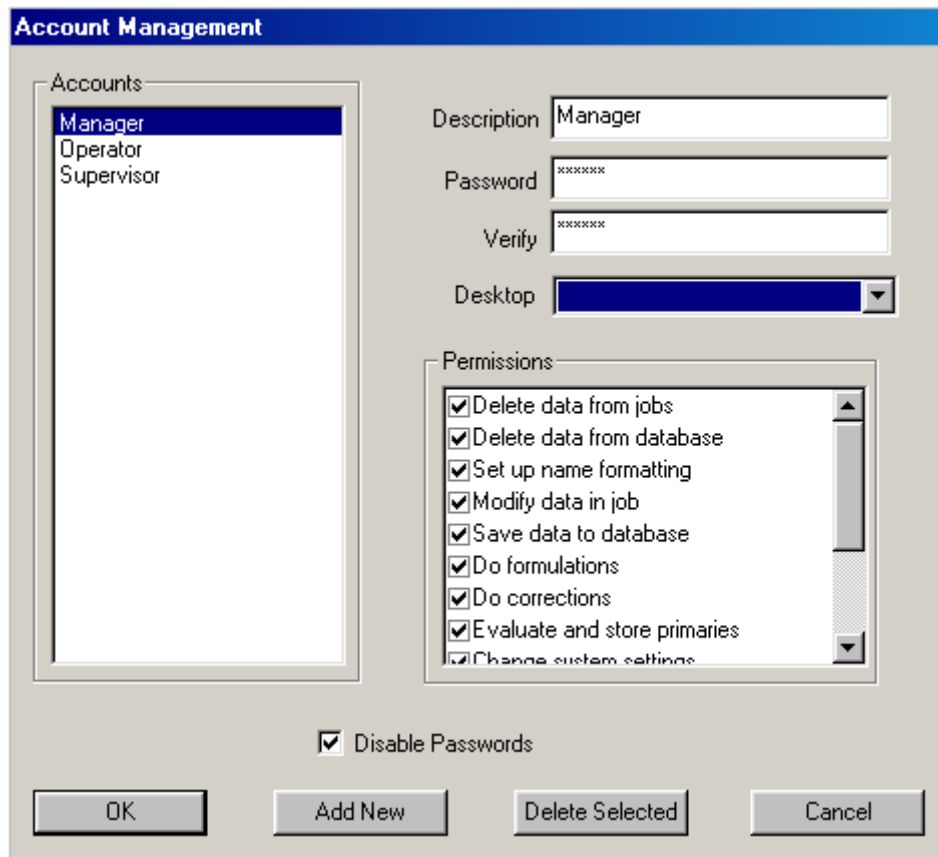
See the topics under Spectro Management for more information.

Account

This menu item has three or four options, Change, Manage, Save Registry Settings, and Restore Registry Settings, depending on whether or not you have a job open.

The "Change" option brings up the original splash screen where you logged on prior to using the program. This option may be used to change the current user to another user without shutting down the program.

The second option, "Manage", brings up a dialog box (below) which allows the system manager to set up user accounts, including passwords and menu access based on those passwords.



The last two options, Save Registry Settings and Restore Registry Settings, are useful in a variety of situations. They allow you to save a copy of the registry settings as currently set for the software in a file which is placed in the main Color iControl folder on the C: drive. This file will be named "ColoriControl.rgs." Since many of the program's default behaviors are saved in the Windows registry, this file can then be used to "Restore Registry Settings". This is most often done when a computer has crashed and the main hard drive has had to be reformatted or when upgrading to a better machine and the software (along with the operating system) has to be installed from scratch. This command allows you to import your old settings without having to recreate them using the program.

Window

The Window menu allows you to control the display of the job windows while Color iControl is running. There are only four commands, Cascade, Tile Vertical, Tile Horizontal, and Close All Jobs. The Cascade command can only be

used when you have more than one job open. Cascade will pile the different jobs you have open one on top of the other with the current job on top. All that will be visible of the other open jobs is the title bar. Clicking on any of the visible title bars will select that job as the current job and place it on top of the stack.

Tile Vertical and Tile Horizontal open the jobs side-by-side either vertically or horizontally. Generally, the number of jobs you can tile (either way) is dependent on the size and resolution of your monitor.

The Close All Jobs command automatically closes all jobs and saves any changes. If you have any open jobs without names, you will be prompted to name the job before it is closed by Color iControl.

In addition to above commands, there will be a list of currently open jobs at the bottom of the menu which allows you to select a job with the mouse to bring to the front.

Tools

The Tools menu allows access to a variety of procedures designed to supplement the operation of the Color iControl package. Currently, the main supplemental option available is SLI-Taper, SheLyn's shade tapering software. The Tools menu allows you to run SLI-Taper (both the 16 and 32-bit versions) without exiting from Color iControl. This option must be run from the QC Mode. In addition to the SLI-Taper option, the Tools menu also includes the e-Submit function. Commands associated with each of these functions are listed below with a brief explanation.

SLI-Taper --- When you select this command, the data currently selected in the Job Tree for display in the QC views will automatically be imported into the Taper program and tapered according to SLI-Taper's current settings and then exported back into Color iControl and displayed. A hotkey option has been included to allow quick access to the Taper function: <Shift> + <Alt> + T. (You should make sure that you have the Group/Sequence item selected for display in the Standard/Multi-Trial view. This can be done from the Standard/Multi-Trial View Properties dialog available through the right-click menu.)

Import SLI-Taper sequence --- This command will import the last taper performed by SLI-Taper. This data is kept in a file that is overwritten every time you run a taper, so only the last taper performed is available.

Enable Adaptive Cluster Label after Read --- This option is a toggle control which allows the system to be set to automatically adaptively cluster a sample immediately after it has been measured with the spectro.

Setup SLI-Taper parameters --- This command opens a dialog box allowing you to select various parameters governing how the taper is to be performed, including the taper method, grouping method, and various tolerances governing the taper (see image below). You may also specify the name of a Taper Settings File containing that information. For more information about these settings, you should see the documentation provided with your SLI-Taper option.

Send an e-Submit using selected trials --- This command will take the selected trials and place them into a QTX or XML file. (You should first enter in any of the "submit" information needed for each trial using the e-Submit view. You will be prompted to name the file. After you name the file, the system will automatically open a new e-mail dialog box and append the QTX file to the blank e-mail. You will need to enter the addressee for the e-mail and enter a message, then click the <Send> button. The e-mail will be sent to its destination with the QTX file attached.

Read an e-Submit file --- This command allows you to select a file (QTX, XML, etc.) that has been sent to you via e-mail and import the contents into a job. Clicking on this file will cause the Open dialog box to appear with the contents of the Jobs directory displayed (or whatever you have set as your default jobs folder). Select the file by clicking on it and then click <OK>. (You may have to save the file from the e-mail it was sent with to this directory. See note below.) The data in the file will be imported into the currently open job. The standard located in the file will replace the standard in the job; therefore, you may want to open a new job for importing the data.

Important Note: Receiving an e-Submit file

When receiving the file generated by the e-Submit option, you will need to save the file (attachment) from the e-mail in which you receive it into the "Color iControl\Jobs" directory (folder). Exactly how you do this depends on the e-mail software you are using. Some e-mail systems display the attached file as a small icon. When this is the case, you may simply right-click on the icon and select the "Save As..." option. Other e-mail systems may have a small button you have to click on to see the attached file and access the save options. See the documentation for your e-mail software for more information.

Setup Tagging Format --- This command opens the "eSubmit and Tag Settings dialog which allows you to select the format file for the eSubmit and tagging functionality. See the topics under eSubmit/How To for more information.

Macro

The macro menu has two main commands: Edit/Create a Macro and Open Macro.

Help

The Help menu contains two options when you have a job open, Help Topics and About Color iControl. The first will open this indexed help file and allow you to browse for topics containing information about the running of Color iControl.

The second command will bring up the Color iControl "About" box which provides certain basic information about the software (see image below). The version number and copyright information is listed there, as well as a field displaying the expiration date of your software service agreement and a button allowing you to check for software updates. The "About" box also displays whether or not you have SLI-Taper as an option, as well as the serial number of your software activation license.



If you do not have any jobs open, the Help menu has an additional item, License Activation, which opens the dialog box used to contact GretagMacbeth via the internet and download the activation code needed to license the software

for use. In addition, the License Activation dialog also has buttons allowing you to transfer the existing license to another computer. This allows users to periodically update their hardware without having to contact GretagMacbeth for a new user license.