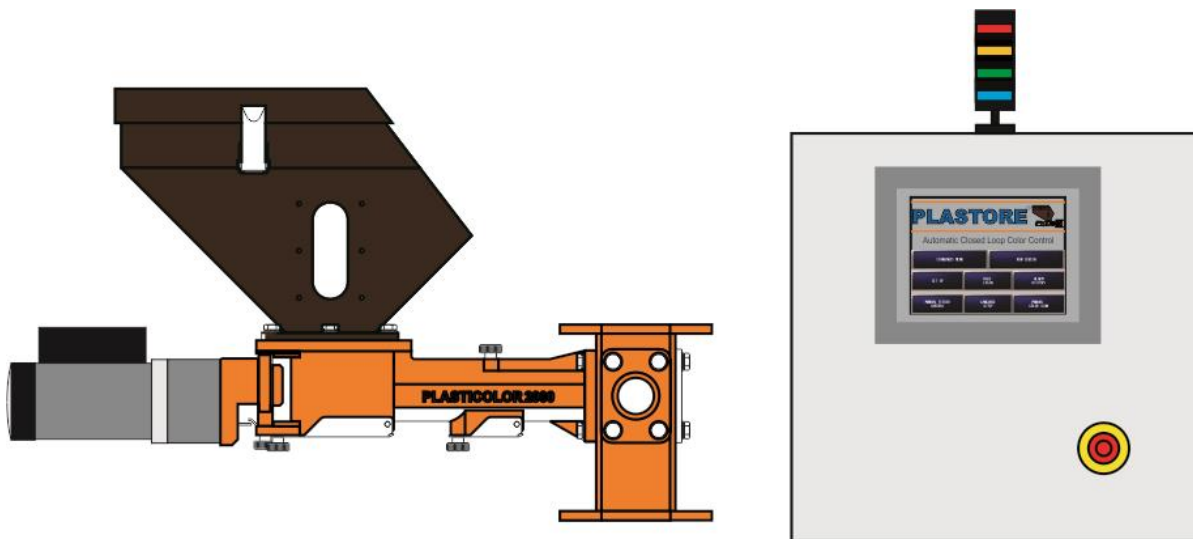


OPERATING INSTRUCTIONS



Plastore Automatic Closed Loop Color Control

OPERATING INSTRUCTIONS

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Introduction

Thank you for selecting a Plastore product for your needs.

To help assure fast, trouble-free installation of this product, we strongly recommend that you *please review this manual in its entirety before installing or operating the equipment.*

Warnings

As with any industrial equipment installation, care should be used in the installation and operation of this equipment. Please note the following:

1. **Always disconnect power before servicing the ACLCC Controller.**
2. **Use extreme care when opening the controller.** It contains high voltages Only authorized, trained personnel should open and maintain this Controller. When power is connected to the Controller, the AC drive portion of the control has voltage present.
3. High voltages can be present in the Controller for up to 5 minutes after the unit has been switched off. **Use caution!**

Disclaimer

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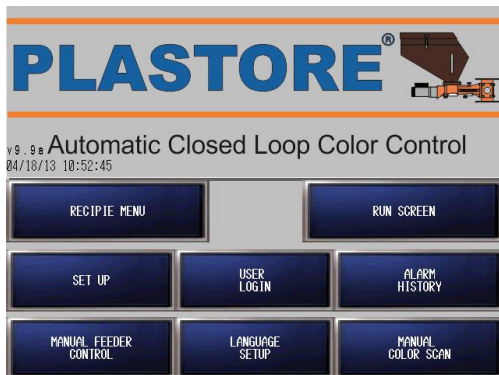
All rights reserved. No part of this publication may be reproduced, photocopied, stored on a retrieval system, or transmitted without the express prior written consent of the publisher.

2.1 What is ACLCC

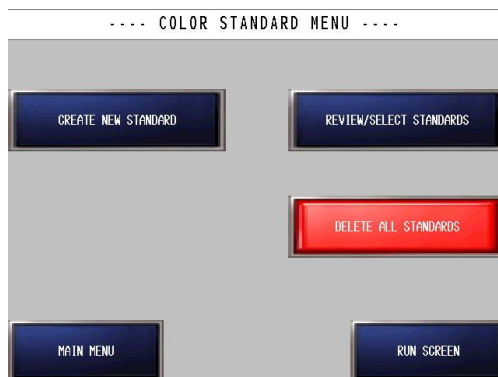
The Plastore Automatic Closed Loop Color Control system is a fully integrated, online color measurement and control system tailor made for the plastics industry. This unique system allows for automatic color feed adjustments to be made in real-time, based on measurements taken directly from the process stream

2.2 Main Menu Functions

After the system is powered up, the Main Menu will be displayed. From here, all of the features of the unit are accessible



2.2.1 Standards Menu



Covered in section 5 of the manual.

2.2.2 Set Up



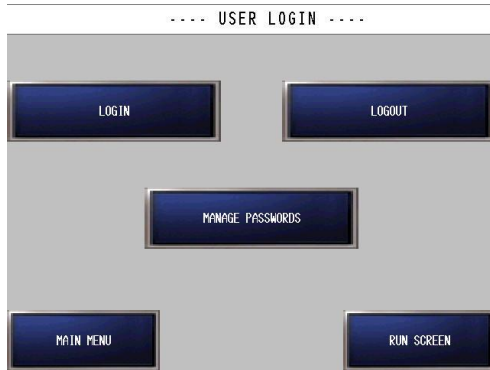
Covered in section 4 of the manual.

2.2.3 Manual Feeder Control



Covered in section 7 of the manual.

2.2.4 User Login



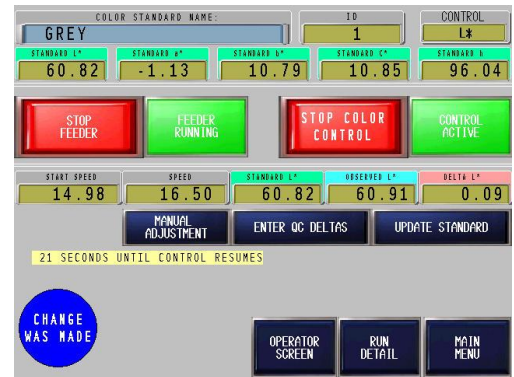
Covered in section 12 of the manual.

2.2.5 Language Setup



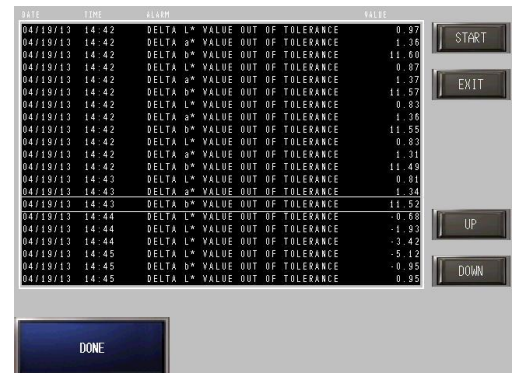
The Language Setup Screen lets the user choose between preprogrammed languages by pressing the flag that represents the language. These will vary dependent on regions.

2.2.6 Run Screen



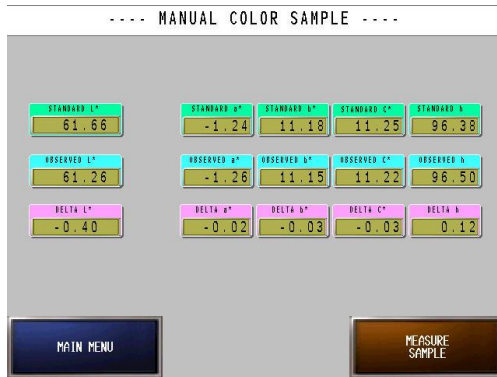
Covered in section 6 the manual.

2.2.7 Alarm History



Covered in section 9 in the manual.

2.2.8 Manual Color Sample



Covered in section 7 of the manual.

ACLCC Controller Installation

WARNING: Disconnect the control from the AC power source before working on the control, motor, or driven equipment

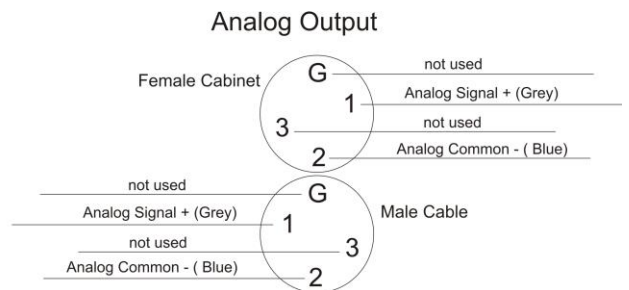
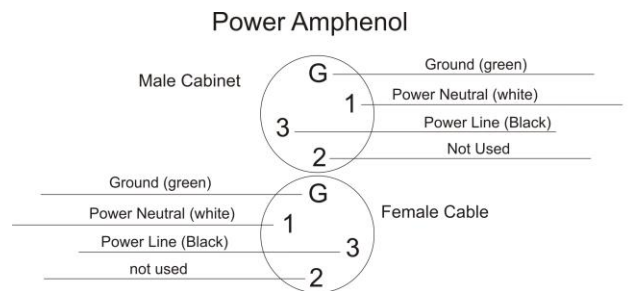
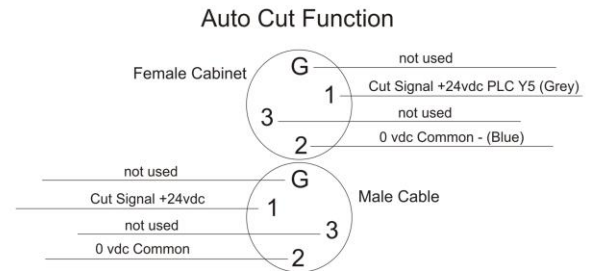
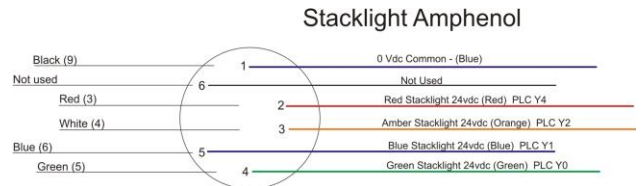
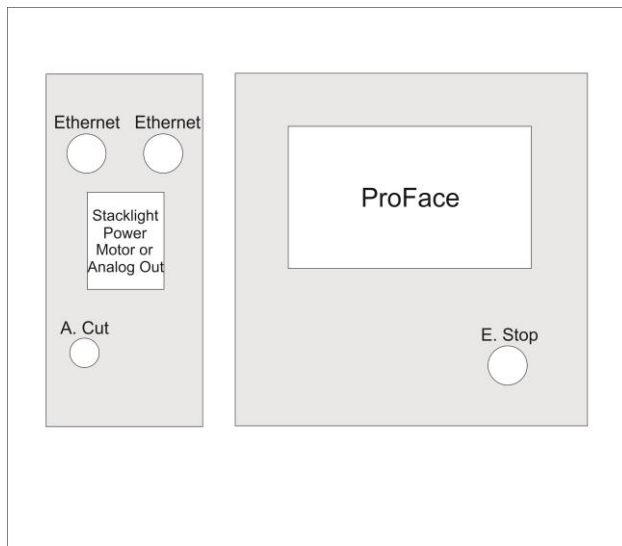
3.1 Electrical Connections to the ACLCC

The Electrical wiring diagram for the ACLCC Controller is located in Addendum 1.

Supply Voltage

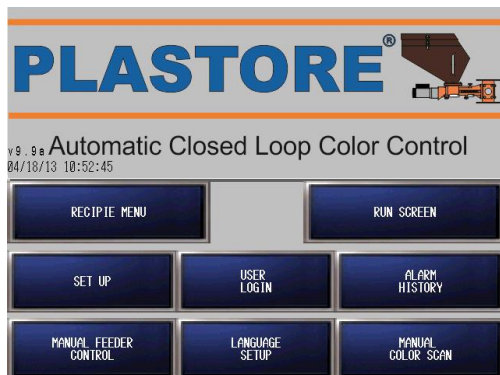
If the system is supplied with motor control . Connect 220 VAC, Single Phase, 50/60 Hz, 5 amp capacity power to the control box

If the system is supplied without motor control it can be connected to 120 VAC Single Phase 5 amp



4 Setup Parameters

To access the Setup area, press the *Setup* button located on the Main Menu.



4.1 Setup Screen

The Setup screen allows direct access to several general parameters as well as links to more specialized areas.

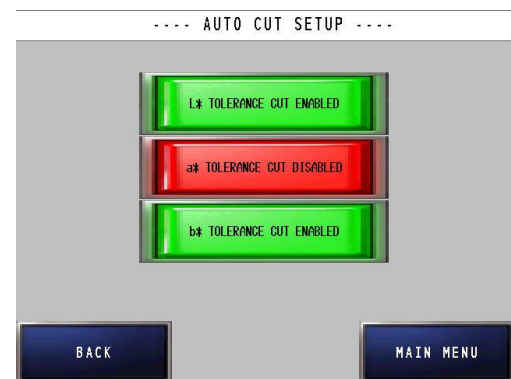
1. **Max Motor RPM** – This variable is set to the maximum rated RPM of the feeder motor. It is used in calculation of displayed RPMs.
2. **Boost Speed** – This is the speed at which the motor will run when the system is in Boost Mode. For details on Boost Mode, see the Terms and Definitions section at the end of this document.
3. **Scan in Manual Mode** – This button is a toggle that selects whether or not the system will take color samples when running in Manual (Open Loop) mode.

Note: When in Manual Feeder Control mode the sensor will always be idle.



4.2 Auto-Cut Setup

The Auto-Cut Setup screen determines which Out of Tolerance values will trigger the output provided for an external cutter. Each color space parameter has its own toggle that may be turned on or off as desired.

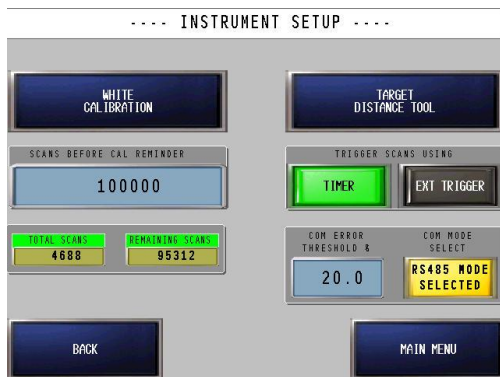


4.3 Sensor Setup

There is a toggle that allows the selection of either the Timer or External Trigger mechanism to initiate a color scan. When Timer is selected, the instrument will scan based on the Scan Interval value of the currently loaded Standard. The External Trigger function is designed to synchronize scans to a cyclic process variable such as an embossing wheel. A proximity switch or other appropriate device provides a 24VDC signal to the system whenever a scan is required. The use of the External Trigger function affects all aspects of the scanner, including scanning Master Color Data for new standards.

4.3.1 Timer or Trigger

The system can be set to trigger the sensor by either timer or an external trigger.

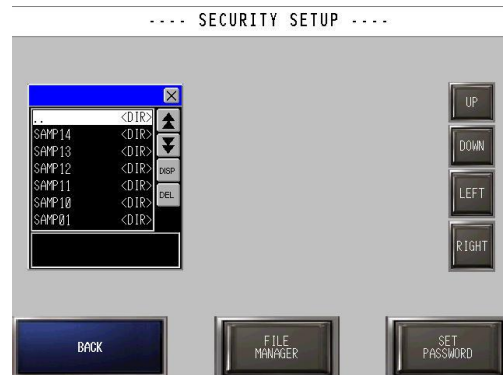


4.3.2 Com Error Threshold

Lets you increase or decrease the sensitivity of the sensor Com Error. To eliminate problems that can occur if the color being run is close to a material that are under the profile like rollers.

4.4 Security Settings

The Security setup screen will allow you to create and edit passwords for the system.



The file manager button will bring up the directory viewer. Make sure that the security.csv file is highlighted in viewer. Press the display button. The existing passwords, touch the area you want to edit a keypad will appear.

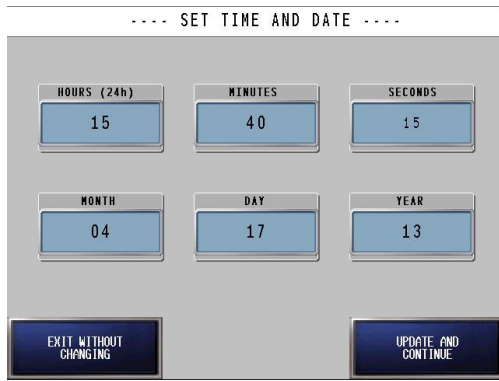
When done with the edits press the Set Password button to save the changes to the database.

4.5 Auto Save

Auto Save will save the standard after a pre set time of the system running without any changes. This feature can be turned off



4.6 Time and Date



4.7 Drive Selection

The Drive Selection allows the selection of various motor controllers that are compatible with the system. It is important that the drive type selected exactly matches the motor controller in use with the system.



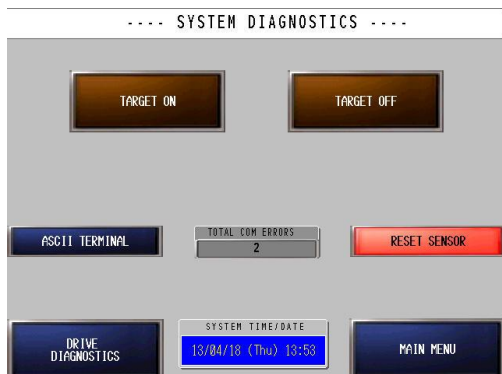
4.8 Analog output to Motor Drive

If your system is delivered with an optional analog output there will be a connector on the side of the control box for connecting a motor drive with analog control.

4.9 Info and Diagnostics

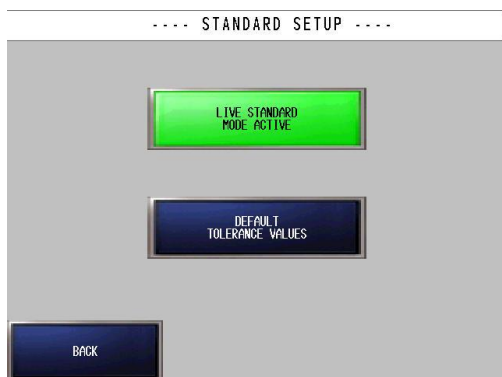
The Info and Diagnostics screen provides a window into the operations of the instrument as well as the motor controller.

A link to a drive-specific diagnostic page is located here as well, providing detailed real time information about the motor controller.



4.10 Standards Setup

The Standard Setup screen contains the button for turning Live Standard on or off. And access to the screen for default values



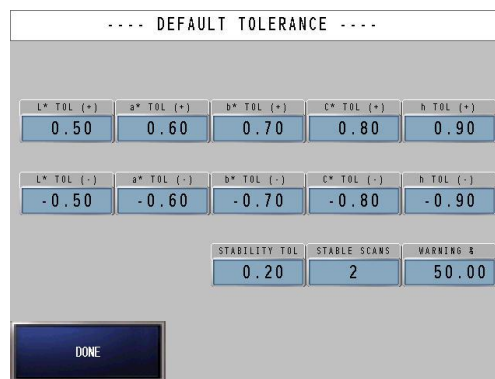
4.10.1 Live Standard button

Lets you turn Lives Standard on or off.

See 6.4 for information on Live Standard

4.10.2 Default Values

Lets you preset the tolerances for L^* , a^* , C and H , Stability, Stable scans and Warning % for easy application when creating a new standard



5.1 What is Standard

The ACLCC system uses a number of stored parameters to provide the proper control and tolerances for each product being scanned. Together these parameters form a Control Standard. A brief description of each parameter follows:

5.1.1 Standard Name:

A unique 10-digit alphanumeric identification for the Standard.

5.1.2 Standard L*, a* and b*:

The color space values that define the Standard's color

5.1.3 Standard L*, a*and b* Tolerances:

Each color space variable has provisions for a high and low tolerance value. This value represents the absolute extreme of acceptable product. Anything outside of this band is subject to the Auto-Cut function, if enabled for the variable in question. The tolerance band is outlined by Red bars on the strip chart.

5.1.4 Warning %:

This value represents the point at which the system will take corrective measures in an effort to bring the Control Variable back into specifications. The value is based on a percentage of the Tolerances described above. The warning band is outlined by Yellow bars on the strip chart.

5.1.5 Correction Delay:

This is the time in seconds that is allowed to pass after a speed change has been made in order to assure that the product being scanned has been effected by the change. This time can be calculated as the residence time in the extruder plus the time required to reach the sensor, plus a small safety margin.

5.1.6 Bad Scans Allowed:

The system will allow for multiple scans outside the warning band before making a speed correction. The number of scans tolerated may be set here.

5.1.7 Boost Duration:

This variable contains the amount of time in seconds of the Boost Cycle. The Boost Speed is a global variable and defined in the main Setup screen.

5.1.8 Start Speed:

This is the initial speed of the feeder. The value will be entered as an RPM value as determined in the main Setup screen.

5.1.9 Screw / Sleeve Size:

This parameter is provided as a reference-only indication of the correct feed screw and sleeve size required by the Standard.

5.1.10 Co-Base Speed:

This parameter is provided as a reference-only indication of the correct Co-Base or Substrate extruder speed required by the Standard.

5.1.11 Stability Tolerance:

This tolerance value is utilized by the system to determine when the process has stabilized enough to begin color control. The tolerance value represents the allowable +/- delta of the control variable during normal stabilized conditions.

5.1.12 Stable Scans:

This variable contains the number of scans meeting the criteria above that must be recorded in succession before the system will consider the process stable.

5.1.13 Regression Value:

This parameter defines how aggressively the system will change the feeder speed to correct an color error. The value is defined as the amount of change to the process variable that occurs by increasing the feeder speed by one RPM. The values are entered as negative numbers for L* positive value for a* and b*

Example: If the L* regression is -0.300 an increase of 1 RPM will move the L* -0.300 and a decrease of 1 RPM will move the L* 0.300.

5.1.14 Sample Interval:

This is the amount of time in seconds that is allowed to pass between scans. Note that if the system is set to use the External Trigger this value is ignored.

5.1.15 Scans to Average:

This variable contains the number of scans that the system will average when calculating the process variable. This is a rolling average and will update every scan. A maximum of 5 scans may be averaged.

5.1.16 Control Variable:

This selector defines which of the color space values will be used to control the process.

5.2 Create a New Standard

The ACLCC system supports the local storage of up to 64 unique Recipe. To create a new Standard, begin at the Main Menu and select the *Recipe Menu* button.



The Color Recipe Menu is displayed. From here, select the *Create New Standard* button to navigate to the creation screen. The Create New Standard Screen is displayed. From here the operator may enter all of the parameters described above. Follow the sequence below to create a new Standard.

5.2 Create a New Standard cont.

1. To begin, enter the name of the standard at the top of the form.
2. Select *Scan Color Data* at the bottom of the screen to acquire or manually enter the color space data for the Standard. The system will temporarily navigate away from the main entry screen, but will return automatically once this step is completed.

From the Color Standard Setup screen, select *Scan Master Color* to initiate an automated scanning sequence. The

system will take several scans at the defined interval and calculate an average that will be used for the Standard. After the scanning has completed, select *Use These Values* to accept the color space average and return to the previous screen. A second method for obtaining color space data is to select *Manual Entry* and enter the values on the screen provided.

Either case will return you to the New Standard Setup screen automatically after selecting *Use These Values*.

3. Select *Tolerance Entry* at near the center of the screen to enter the color space tolerance data for the Standard. The system will temporarily navigate away from the main entry screen, but will return automatically once this step is completed

5.2 Create a New Standard cont.

Remember that the tolerance variables are the absolute range of acceptable product, not the point at which the system will take action. (This is the Warning Percentage parameter) Each color space parameter must have a high and low tolerance value. After completing the color space tolerances, enter the stability tolerances and warning percentage near the bottom of the screen. Press *Done* to accept the values and return to the New Standard Setup screen automatically.

4. Load Defaults loads the values that were entered in Default tolerance value during setup.
5. Regression and Control Variable.
Enter the Regression value, a negative number for L* and positive for a* and b*.

Sample interval is how often you want the sensor to scan normal is 5s intervals.

Scans to average this variable contains the number of scans that the system will average when calculating the process variable. This is a rolling average and

Select control variable this selector defines which of the color space values will be used to control the process.

6. Enter the remaining parameters highlighted in blue on the New Standard Setup screen.
7. Press *Save This Standard* to save the standard to the internal database. If there are no problems encountered, the system will indicate success with a green banner. Remember that recipe must have unique names. If a duplicate name is found, a red banner will prompt the user to re-enter the name.

5.3 Search for a Standard

To locate a standard, touch the Search button in top right corner. The search function lets you search by Name or Id, enter the name or id and touch the valid search button. The system will display a message indicating whether or not the standard was located. press the select button and you will be taken back to the browser screen.

An alternative to searching is to use the yellow buttons marked *Prev*, *First* and *Next* to page through the entire database one standard at a time. When the appropriate standard has been located

5.4 Modify a Standard

Recipe stored within the system's database may be modified by selecting the *Review / Select Standard* button on the Color Recipe Menu screen. This will display the Recipe Browser screen.

STANDARD BROWSER

STANDARD NAME: GREY ID: 1 SEARCH

STANDARD A*	STANDARD B*	STANDARD C*	STANDARD D
60.01	-2.47	-0.73	2.55
19.72			
L* TOL (+)	0.50	0.60	0.70
A* TOL (+)	0.60	0.70	0.80
B* TOL (+)	0.70	0.80	0.90
L* TOL (-)	-0.40	-0.60	-0.70
A* TOL (-)	-0.60	-0.70	-0.80
B* TOL (-)	-0.70	-0.80	-0.90
WARNING A	50.00		
CONTR. VAR	L*		
BAR SCANS	5		
SCANS AVERAGED	1		
STARTUP (OPH)	25.6		
SCREW / SLV		450.59	
BRIST DURATION	15		
REGRESSION VAL	-0.500		
SAMPLE INT	6		
COB DELAY	30		
STABILITY TOL	0.20		
STABLE SCANS	5		

Navigation: <-- PREV, -- FIRST --, NEXT -->

Buttons: STANDARD MENU, DELETE THIS STANDARD, MODIFY THIS STANDARD, USE THIS STANDARD

The browser screen allows easy access to all of the recipe stored in the system. To locate a standard, Select Search to go to the search screen enter the desired Name or ID number at the top of the form, then select *Search*. The system will display a message under the standard's name indicating whether or not the standard was located. An alternative to searching is to use the yellow buttons marked *Prev*, *First* and *Next* to page through the entire database one standard at a time. When the appropriate standard has been located select *Modify This Standard* to display the Standard

Modification screen. This screen functions much like the Create New Standard screen does. Simply alter the values as needed and select *Update Standard* to re-save for future use. For detailed information on entering values on this screen, please see the Create New Standard section.

MODIFY RECIPE

RECIPE NAME: GREY ID: 1

STANDARD A*	STANDARD B*	STANDARD C*	STANDARD D
60.01	-2.47	-0.73	2.55
19.72			
L* TOL (+)	0.50	0.60	0.70
A* TOL (+)	0.60	0.70	0.80
B* TOL (+)	0.70	0.80	0.90
L* TOL (-)	-0.40	-0.60	-0.70
A* TOL (-)	-0.60	-0.70	-0.80
B* TOL (-)	-0.70	-0.80	-0.90
WARNING A	50.00		
CONTR. VAR	L*		
BAR SCANS	5		
SCANS AVERAGED	1		
STARTUP (OPH)	25.6		
SCREW / SLV		450.59	
BRIST DURATION	15		
REGRESSION VAL	-0.500		
SAMPLE INT	6		
COB DELAY	30		
STABILITY TOL	0.20		
STABLE SCANS	5		

Buttons: DO NOT UPDATE, UPDATE RECIPE

5.5 Load a Standard

To load a Standard into memory for use, select the *Review / Select Standard* button on the Color Recipe Menu screen.

STANDARD BROWSER

STANDARD NAME: ALL 30 ID: 30 SEARCH

STANDARD A*	STANDARD B*	STANDARD C*	STANDARD D
11.35	0.65	1.24	1.40
62.24			
L* TOL (+)	0.50	0.60	0.70
A* TOL (+)	0.60	0.70	0.80
B* TOL (+)	0.70	0.80	0.90
L* TOL (-)	-0.40	-0.60	-0.70
A* TOL (-)	-0.60	-0.70	-0.80
B* TOL (-)	-0.70	-0.80	-0.90
WARNING A	65.45		
CONTR. VAR	A*		
BAR SCANS	4		
SCANS AVERAGED	4		
STARTUP (OPH)	25.6		
SCREW / SLV		0.500	
BRIST DURATION	15		
REGRESSION VAL	0.51		
SAMPLE INT	6		
COB DELAY	30		
STABILITY TOL	0.51		
STABLE SCANS	5		

Navigation: <-- PREV, -- FIRST --, NEXT -->

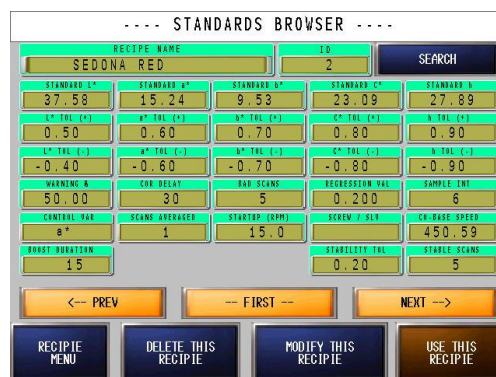
Buttons: STANDARD MENU, DELETE THIS STANDARD, MODIFY THIS STANDARD, USE THIS STANDARD

5.5 Load a Standard contd.

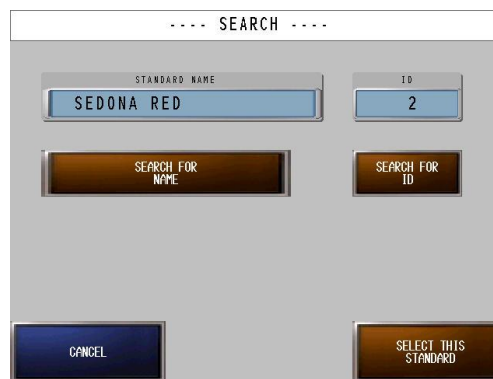
This will display the Recipe Browser screen. The browser screen allows easy access to all of the recipe stored in the system. To locate a standard, enter the desired name at the top of the form, then select *Search*. The system will display a message under the standard's name indicating whether or not the standard was located. An alternative to searching is to use the yellow buttons marked *Prev*, *First* and *Next* to page through the entire database one standard at a time. When the appropriate standard has been located select *Use This Standard* to load it into memory and display the Run screen.

5.6 Delete a Standard

To permanently delete a Standard from the system's database, select the *Review / Select Standard* button on the Color Recipe Menu screen. This will display the Recipe Browser screen. The browser screen allows easy access to all of the recipe stored in the system. To locate a standard, press the Search button in top right corner.



The search function lets you search by Name or Id, enter the name or id and touch the valid search button. The system will display a message indicating whether or not the standard was located. Press the Use This Standard button and you will be taken back to the browser screen. An alternative to searching is to use the yellow buttons marked *Prev*, *First* and *Next* to page through the entire database one standard at a time.



When the appropriate standard has been located select Delete This Standard. A password security screen is immediately displayed to access the Confirm Delete Standard screen.



Enter a valid password and press *OK*

Press the Delete Standard button.

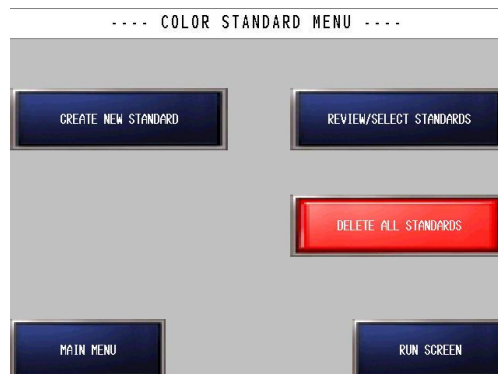
5.6 Delete a Standard cont.



The standard will be deleted and you will be taken back to the Recipe Browser Screen. To Cancel and return to the Browser screen without deleting the standard press the Cancel button.

5.7 Delete all Recipe

Delete all Recipe lets you delete all recipe in the system. To access the screen press the Delete All Recipe button.



A password security screen is immediately displayed to access the Confirm Delete All Recipe screen.



Press the Delete Standard button. All Recipe will be deleted and you will be taken back to the Color Recipe Menu. To Cancel and return to the Color Recipe Menu screen without deleting the standard press the Cancel button.

Note this action is irreversible, once the delete button is pressed all recipe will be deleted permanently.



6.1 Feeder Only Mode

Feeder Only Mode will operate the feeder while leaving the sensor completely idle. No color samples will be taken, no color data stored, and no Auto-Cuts will be made. This is the most basic mode of operation and consists of one single display screen. From the Main Menu select Manual Feeder Control to display the control screen. From here, the feeder may be turned on or off and the speed may be adjusted. Once this screen is displayed, a security password is required to return to the main system area. This allows the color feeder to be used by operators not fully trained on the higher level functions of the system.

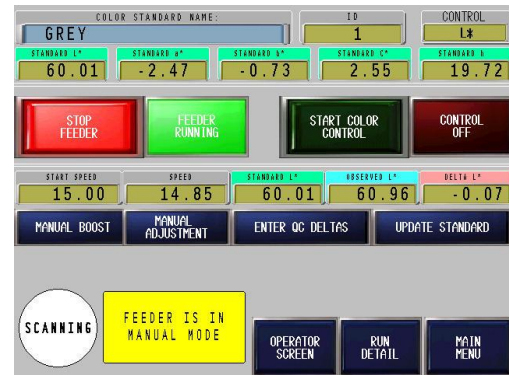


6.2 Open Loop Mode

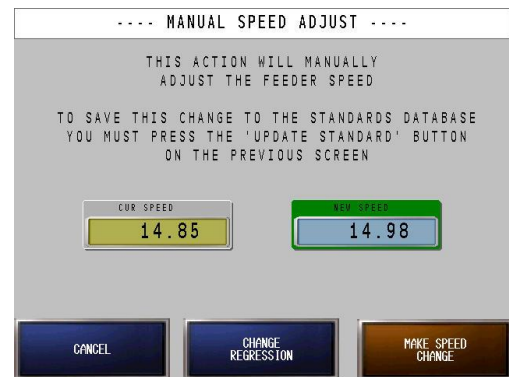
In Open Loop Mode, the system will allow the Spectra Trend HT sensor to scan and compare the color to the loaded standard, but will not automatically make speed changes to the feeder. All Feeder speed changes must be made by the operator. To operate the feeder in open loop mode, select *Run Screen* from the main menu to display the Feeder Run Screen. Start the feeder by selecting the *Start/Stop* feeder button near the top left of the screen. Note that the feeder will

start at whatever speed is shown in the *Current Speed* box. At this time, the Sensor may or may not begin scanning based on the Parameters on the Setup screen. Check the Setup screen to be sure the system is set to scan in Manual mode and that the sensor is set to the appropriate trigger. (Timer or External trigger) Stop the feeder by selecting the *Start/Stop* feeder button near the top left of the screen.

The status of the feeder motor can always be seen to the right of the *Start/Stop* button.



To change the speed of the feeder, select *Manual Adjustment* located just below the *Current Speed* indicator to display the Manual Speed Adjustment screen.



Enter the new speed in the blue box labeled *New Feeder Speed* and choose *Make Speed Change*

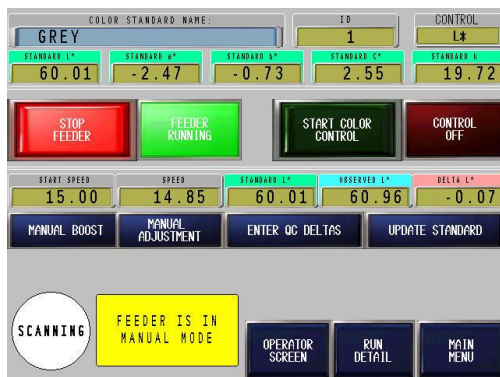
to immediately change the feeder's speed. To cancel and return to the previous screen without changing the feeder's speed, select *Cancel*.

6.3 Closed Loop Mode (Automatic)

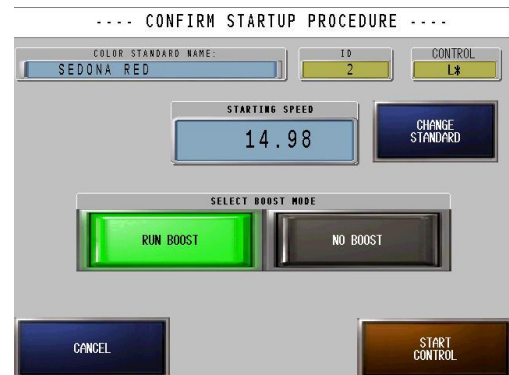
In Closed Loop Mode, the system will use the sensor to scan and compare the color to the loaded standard, and will automatically make speed changes to the feeder as needed to keep the color within the tolerances of the loaded standard. Feeder speed changes may also be made by the operator if desired.

To operate the feeder in closed loop mode, select *Run Screen* from the main menu to display the Feeder Run Screen.

Before Closed Loop (Automatic) mode may be started, the feeder must first be running. Start the feeder as described above to make the

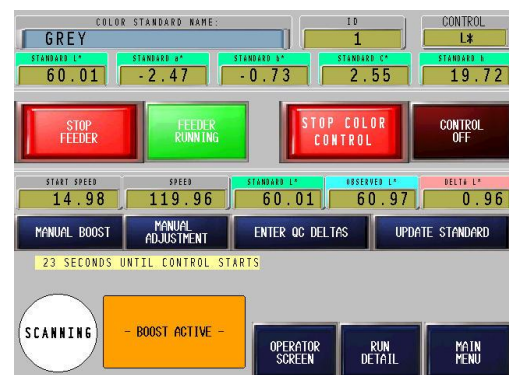


Start Color Control button visible. To start Closed Loop Mode, press the *Start Color Control* button to display the Confirm Startup Procedure screen.



This screen provides an opportunity to confirm that the correct standard and feeder start speed have been loaded. If anything is incorrect, changes may be made before entering automatic mode.

Select the desired boost mode using the blue toggle and select *Start Control* to return to the Run Screen and begin the automatic mode startup sequence. If a boost was selected, the system will immediately set the feeder to the boost speed specified on the main setup page. The boost will run for the duration specified in the color standard currently loaded.

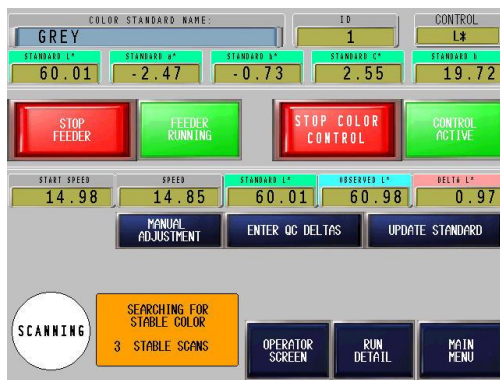


The boost sequence is easily identified by the indication block at the bottom of the run screen.

After the boost duration has elapsed, the feeder will be set to the startup speed specified in the loaded standard.

The system will now wait for the new color to exit the extruder before searching for a stable process. This waiting period is specified in the loaded standard using the Correction Delay variable. The amount of time remaining will be displayed above the indication block, and the block itself will state Waiting for Residence.

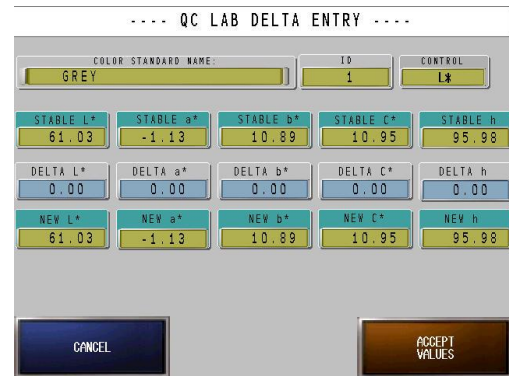
Once the residence time has elapsed, the feeder will begin to search for a stabilized process color. A stable color is defined by the Stability parameters of the loaded standard. See the What are Standards section for detailed descriptions of these terms.



While the system is searching for stable color, it will also be comparing the scans against the loaded standard and graphing the results on the Run Detail screen.

As soon as the required number of stable scans has been achieved, the system will prompt the operator to take a sample to the Quality Control lab for analysis. The Delta Entry screen will be displayed automatically and will store a

snapshot of the last stable scan so as to more closely match the sample taken to the lab.



To synchronize the **live standard*** with the lab, the operator must enter the results from the lab scan on the entry form above. In this example, the lab indicated that the sample was .13 L* light, or delta L* of .13. This will automatically adjust the target L* value to 65.43, reflecting the need to darken the standard slightly.

Enter all of the remaining values. If a value is not used, simply leave the delta at zero, indicating that the current reading is already in sync with the lab. When completed, select Accept Values to return to the Run Screen and use the newly revised standard.

Once back at the run screen, the system is in fully automatic mode and will begin to adjust the feeder speed as needed. Note that if the deltas entered forced the system to be outside of the warning tolerance a speed change will take place immediately, without regard to the number of bad scans allowed in the loaded standard.

To monitor the process more closely, select the *Run Detail* button at the lower right of the screen. This will display detailed data and real-time charts of critical process variables.

The detail screen is broken into two parts, top and bottom. The top section contains the current motor speed, the target color space values for the loaded standard, the currently observed color space data, and the resulting delta values.

The bottom section of the screen is dedicated to a series of line graphs that contain historical data for each of the color space variables. A set of yellow buttons below the chart allow easy selection of the desired variable. Each graph has two zoom levels, selectable from the top right of the chart area.

The chart area holds the last 100 scans of data. These records may be scrolled through using the control buttons at the top left of the chart area. In addition, important process data will be displayed at the top of the chart area to keep the operator informed. At any time, select *Run Screen* to return to the previous screen for control purposes.



6.4 What is a Live Standard

A live standard (also known as “ad hock”) is a standard that is created “live” at the beginning of the production run. Because the lab instrument geometry is different from the online instrument, you cannot use the same values (i.e.

transfer the lab values to the online instrument).

So at the beginning of a production run, the lab will approve color as in spec based on the lab instrument. At this point, a measurement is taken with the online instrument in the production line and saved as the standard for that run only. This is then a “live” standard.

Conversely, if the standard is stored for use on a future run, then this is a “stored” standard

Note!

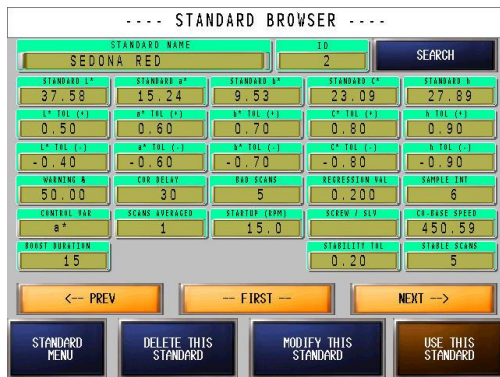
The user should never save the online instrument values to their lab instrument. The two need to be kept distinctly separate. Keep in mind that the values will always be different, however the trend in color movement should be the same, so the adjustments needed to correct are the same regardless of the instrument used.

6.4 Color Change Sequence (Automatic Mode to Automatic Mode)

When the system is up and running in Closed Loop mode and the operator loads a new standard, a unique set of steps occur to guide the user through the color change. This is done to achieve the fewest number of scrap pieces and bring the new color into specification as quickly as possible.

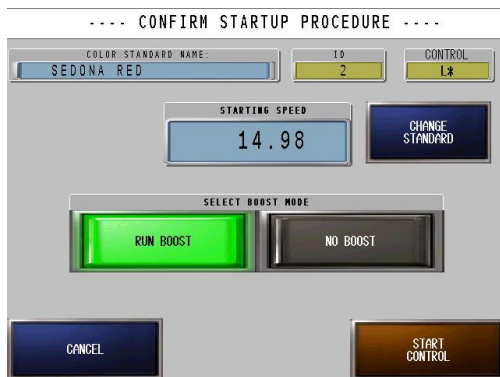
6.4.1 Select a new Standard

The first step in the sequence is to select a new standard. From the Standard's Menu, select Review / Select Standard. (A shortcut to this screen is to press the current standard's name from the Run or Run Detail screen) Find the appropriate standard as described in the Load a Standard section. Select *Use This Standard*.



6.4.2 Confirm the Startup

Just as when entering closed loop mode from manual mode, the system will prompt the user to confirm the standard, startup speed, and boost condition. In this case, the boost selector defaults to use the boost since it is a color change scenario. Select *Start Control* to continue the sequence.

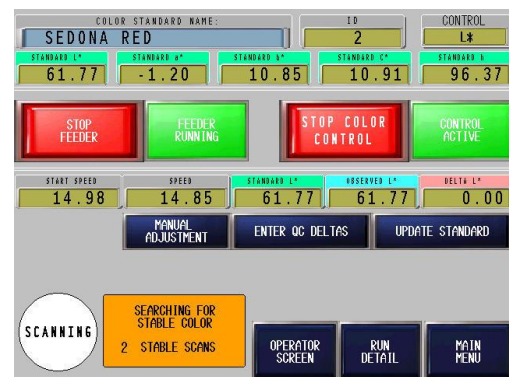


6.4.3 Boost / Residence Time

The system will next run the boost (if selected) and wait for the appropriate residence time as specified by the *Old* standard. Throughout this step, the system will be scanning and reporting deltas based on the *Previous* standard. This is due to the fact that good product from the *Previous* standard will continue to exit the extruder for some time after the *New* color has been started. Stack lights will reflect the result of the current scan as compared to the *Previous* standard's tolerances. If the Auto-Cut is enabled, it will be targeting the *Previous* standard's tolerances.

6.4.4 Stability Check

The next step in the sequence is to search for a stability of the New color. This is done in the same manner described earlier. While searching for stability the system will be scanning and reporting deltas based on the *Previous* standard. Stack lights will reflect the result of the current scan as compared to the *Previous* standard's tolerances. If the Auto-Cut is enabled, it will be targeting the *Previous* standard's tolerances.



6.4.5 Quality Lab Delta Entry

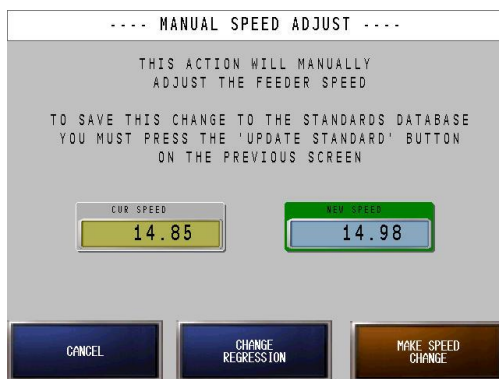
The final step in the sequence is to enter the Quality Lab Deltas for the New color. This is done in the same manner described earlier. While waiting for the operator to enter deltas, the system will continue scanning and comparing against the *Previous* standard. Stack lights will reflect the result of the current scan as compared to the *Previous* standard's tolerances. If the Auto-Cut is enabled, it will be targeting the *Previous* standard's tolerances. As soon as the operator has completed the Quality Lab Delta entry and accepted the values, the system will begin to scan and compare values using the *New* standard for all operations.

6.5 Manual Adjustments

Lets you adjust speed and regression settings without accessing the standard setup.

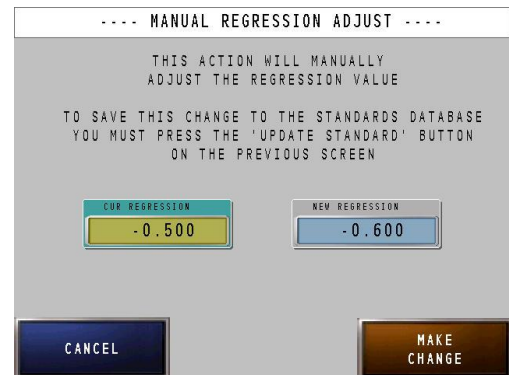
6.5.1 Change Speed

Lets you adjust the speed manually without accessing the standard setup.



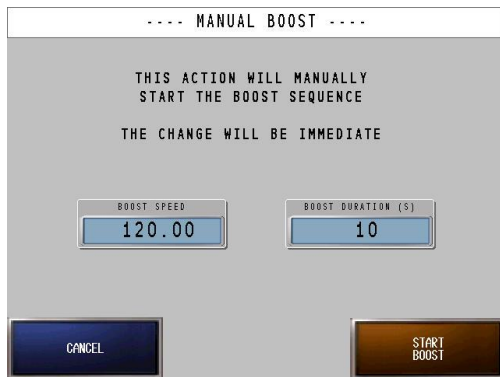
6.5.2 Change Regression

Lets you change the regression without accessing the standard setup.



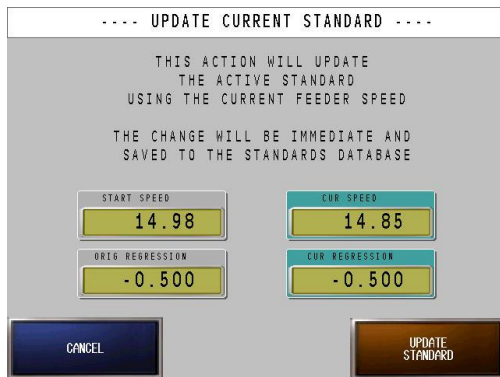
6.6 Manual Boost

This action will manually start the boost sequence. When in manual mode. The boost will be executed as soon as the start boost button is pressed



6.7 Update Standard

This will update the active standard using the current speed and regression settings.



7. Manual Controls

Manual controls enables t

7.1 Manual Feeder Control

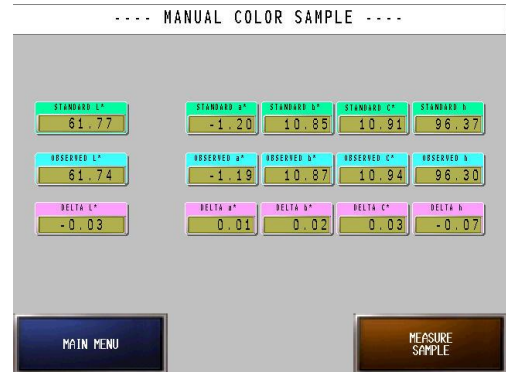
Manual Control is used to run the feeder in manual mode the operator can only change the speed and start and stop the color feeder . In this mode the operator is locked out of the rest of the system and a password is needed to exit. The sensor is not scanning.



Note: That when in Manual Feeder Control mode the sensor will always be idle.

7.2 Manual Color Sample

Manual Color sample lets the operator take a reading form the profile. The screen displays the programmed standard values , the observed values and the deltas.



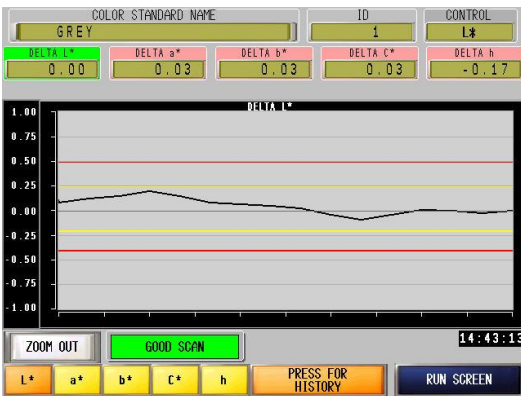
Run Detail Trending and Historical Graphs. Section 8

8. Run Detail Trending and Historical Graphs.

The Run Detail screen will show live trending charts for L^* , a^* and b^* .

8.1 Trending

In addition, important process data will be displayed at the top of the chart area to keep the operator informed. A set of yellow buttons below the chart allow easy selection of the desired variable. Each graph has two zoom levels selectable from the lower left of the chart area.



L^*



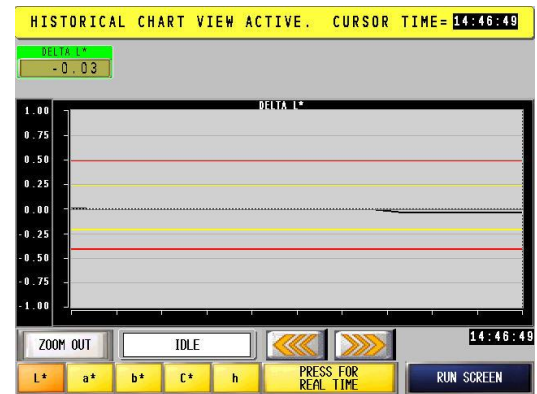
a^*



b^*

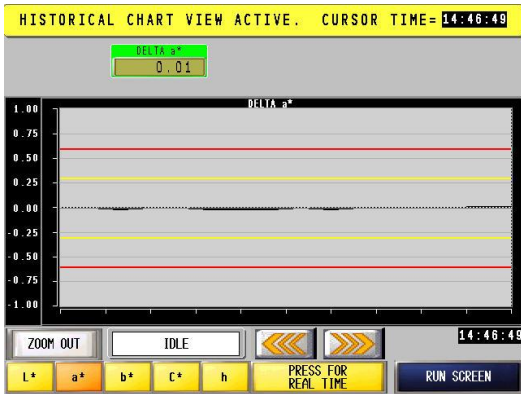
8.2 History

The history chart area holds the last 100 scans of data. These records may be scrolled through using the **BACK** and **NEXT** button. Data points can be read by pressing your finger tip on the graph. The value at that point will display in the variable field above the graph.

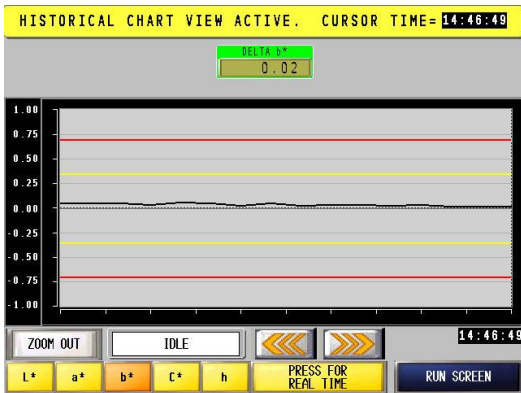


L^*

Run Detail Trending and Historical Graphs. Section 8



a*

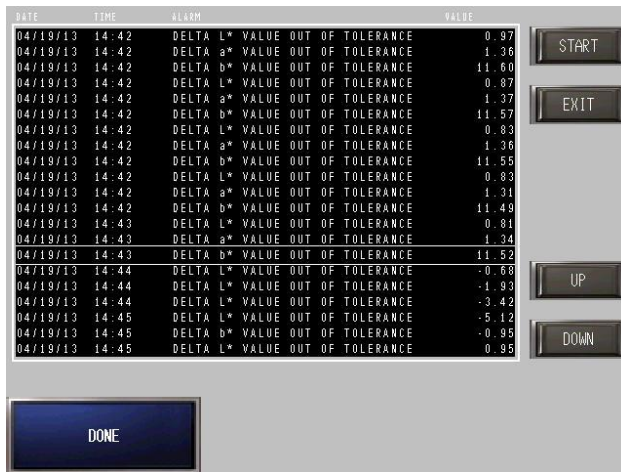


b*

9. Alarm Screen

The alarm screen shows all alarms.

Press the Start button to activate the scroll function. Use the UP and DOWN button to scroll up and down the alarm list.



10. Data Acquisition

The system will save scan data to the Compact Flash Card that is installed in the ProFace display, or to a USB thumb drive.

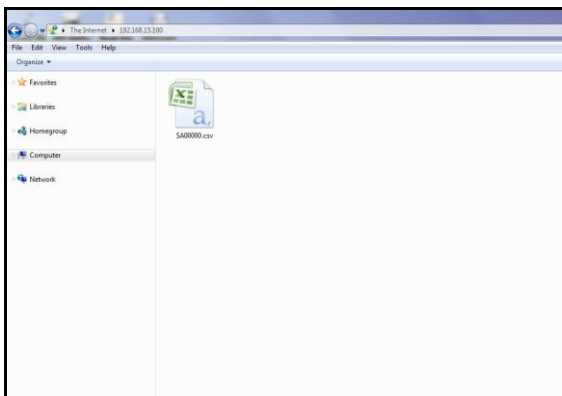
The system is configured for automatic and continuous data acquisition providing access to long-term historical data. Each time the sensor scans a sample, all aspects of color data are stored to either the built-in Compact Flash card, or to an external USB storage device.

To select USB storage, insert the drive before starting the feeder. If no drive is detected the default storage location is the Compact Flash card. Access to the Compact Flash is achieved either via FTP, via the built-in Web Server or by using the Compact Flash Utility program.

9.1 FTP

To connect to the Compact Flash card using FTP, simply enter the IP address of the screen using standard FTP format.

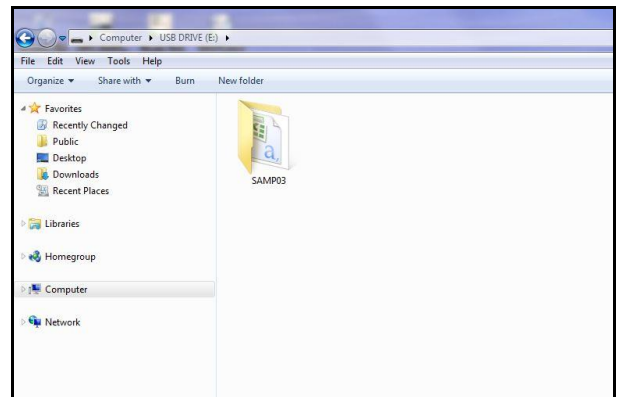
Example: To access data from a screen at IP address 192.168.15.100 enter the following into the Windows Explorer address bar:
ftp://192.168.15.100/



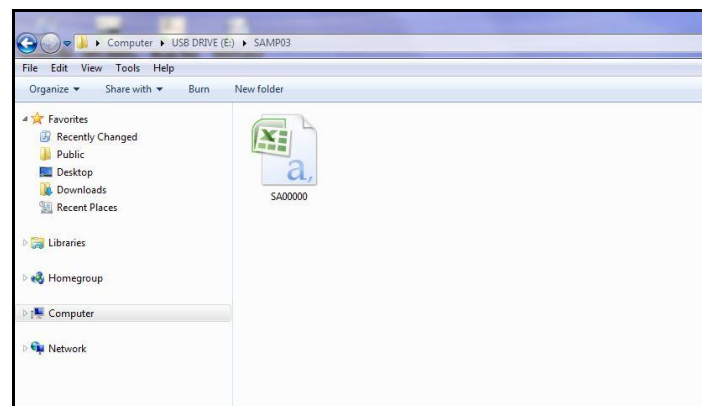
10.2 USB

To select USB storage, insert the drive before starting the feeder. If no drive is detected the default storage location is the Compact Flash card.

To retrieve data stored on a USB device, simply remove the device. It is recommended that the system be stopped before removal to avoid possible data corruption.



Plug the USB drive in to your computer and open the SAMP03 to access the files.



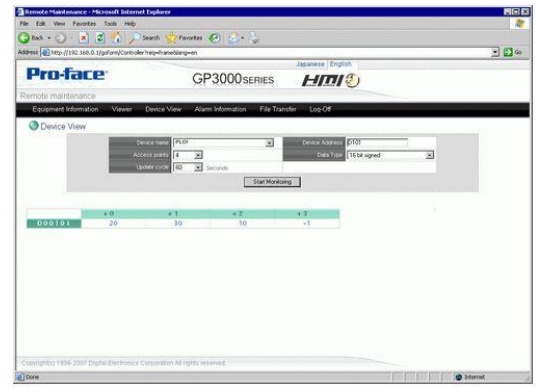
10.3 Report Content

The system saves the following information to the Historical Data report.

DATE	TIME
RECIPE ID	TARGET L*
TARGET a*	TARGET b*
ACTUAL L*	ACTUAL a*
ACTUAL b*	DELTA L*
DELTA a*	DELTA b*
DELTA E	L* TOLERANCE HIGH
L* TOLERANCE LOW	L* WARNING HIGH
L* WARNING LOW	a* TOLERANCE HIGH
a* TOLERANCE LOW	a* WARNARNIG HIGH
a*WARNING LOW	b* TOLERANCE HIGH
b* TOLERANCE LOW	b* WARNING HIGH
b* WARNING LOW	REGRESSION
MOTOR RPM	CONTROL VARIABLE
CONTROL MODE	SCANS TO AVE
SAMPLE INTERVAL	BAD SCANS ALLOW
SCAN RESULT	TOTAL SCANS

10.4 Web Server

The built in Web Server can be used to remotely monitor alarms and down load log files.



Example: To access the Web Server data from a screen at IP address 192.168.15.100 enter the following into a Web browser:
<http://192.168.15.100/>

ACLCC Trouble shooting guide

Message/Symptom	Cause	Solution
com read time out	No contact with Instrument	Check cables between the instrument and the PLC
Scan Errors	No material under Instrument	Make sure there is material passing under the Instrument
PLC Communication Time out	No contact between Screen and PLC	Check cables in the cabinet

To access the codes from the ACLCC display go to the **Set Up** screen and then **Info and Diagnostics** screen. The command line is as follows:

12 Password.

The Password set up can be accessed in two ways.

12.1 System Security Setup screen.

The first is via the System Security Setup screen

Go to the Set Up screen from the Main Menu
Press the Security Settings button.

When in the Security Setup screen press the button labeled File Manger. A window will open on the left side of the screen. Choose the file labeled Security.csv by touching it. Press the display button. A list of a passwords will show to the right of the file manager.

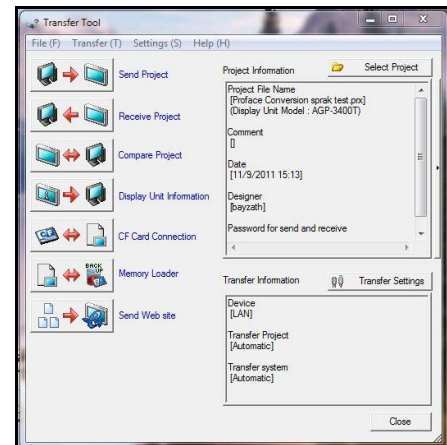
Choose the user data you want to change by touching it, a keyboard will appear enter the data and press enter.



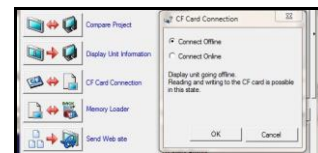
When finished with the edit of the data press the Set Password button and the data is saved to the CF card.

12.2 Using the ProFace Transfer Tool.

The second is via the supplied transfer tool that allows you to access the memory card from a computer and edit the password file in a spreadsheet program.

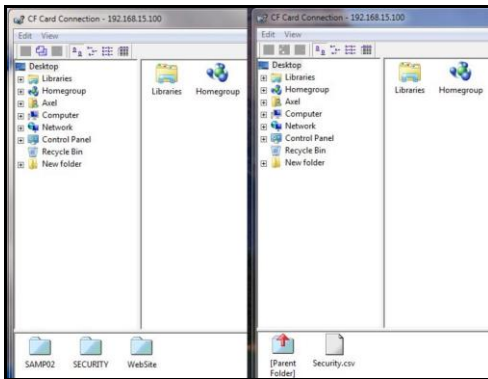


Start the transfer tool, click on CF Card Connection button, choose connect off line.



A window will open that shows your desktop and drives in the upper part. The files on the compact flash card will show in the lower part.

12.2 Using the ProFace Transfer Tool cont.



Open the folder named Security. It contains a file named Security.csv. Grab it and drag it up to your desktop. Minimize or close the CF card connection. You can now open the file with a spreadsheet program. Make the changes and save it as a csv file.

	A	B	C
1	Mode	ID	Password
2	Level	UserID	
3	4	Bill	ACR45
4	1	Carl	2222
5	4	Brandon	2261100
6	1	Brenda	Qwe1234
7	15	Bruce	sDy1234
8			

To install the changed file, maximize or restart the CF Card connection. Open drag the file from the desktop to the security folder and let it overwrite the existing file.

6.1 Feeder Only Mode

Feeder Only Mode will operate the feeder while leaving the sensor completely idle. No color samples will be taken, no color data stored, and no Auto-Cuts will be made. This is the most basic mode of operation and consists of one single display screen. From the Main Menu select Manual Feeder Control to display the control screen. From here, the feeder may be turned on or off and the speed may be adjusted. Once this screen is displayed, a security password is required to return to the main system area. This allows the color feeder to be used by operators not fully trained on the higher level functions of the system.

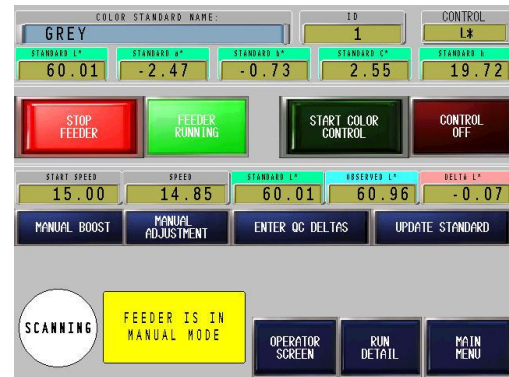


6.2 Open Loop Mode

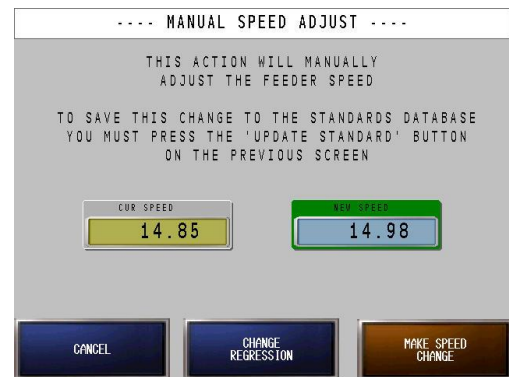
In Open Loop Mode, the system will allow the Spectra Trend HT sensor to scan and compare the color to the loaded standard, but will not automatically make speed changes to the feeder. All Feeder speed changes must be made by the operator. To operate the feeder in open loop mode, select *Run Screen* from the main menu to display the Feeder Run Screen. Start the feeder by selecting the *Start/Stop* feeder button near the top left of the screen. Note that the feeder will

start at whatever speed is shown in the *Current Speed* box. At this time, the Sensor may or may not begin scanning based on the Parameters on the Setup screen. Check the Setup screen to be sure the system is set to scan in Manual mode and that the sensor is set to the appropriate trigger. (Timer or External trigger) Stop the feeder by selecting the *Start/Stop* feeder button near the top left of the screen.

The status of the feeder motor can always be seen to the right of the *Start/Stop* button.



To change the speed of the feeder, select *Manual Adjustment* located just below the *Current Speed* indicator to display the Manual Speed Adjustment screen.



Enter the new speed in the blue box labeled *New Feeder Speed* and choose *Make Speed Change*

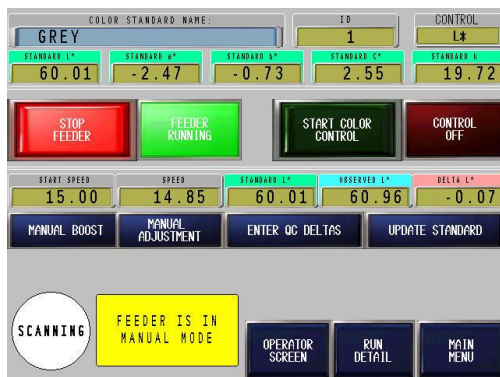
to immediately change the feeder's speed. To cancel and return to the previous screen without changing the feeder's speed, select *Cancel*.

6.3 Closed Loop Mode (Automatic)

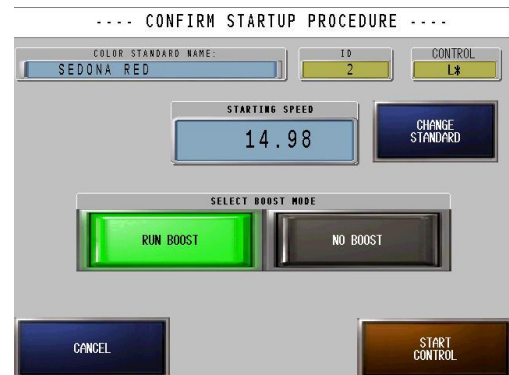
In Closed Loop Mode, the system will use the sensor to scan and compare the color to the loaded standard, and will automatically make speed changes to the feeder as needed to keep the color within the tolerances of the loaded standard. Feeder speed changes may also be made by the operator if desired.

To operate the feeder in closed loop mode, select *Run Screen* from the main menu to display the Feeder Run Screen.

Before Closed Loop (Automatic) mode may be started, the feeder must first be running. Start the feeder as described above to make the

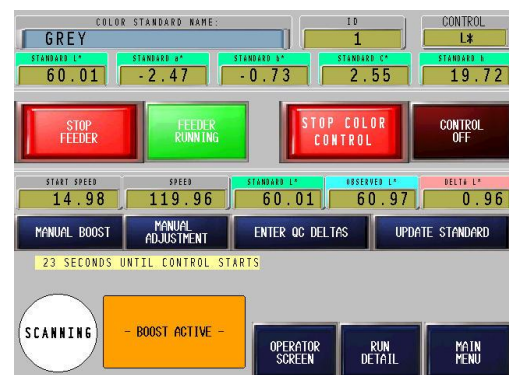


Start Color Control button visible. To start Closed Loop Mode, press the *Start Color Control* button to display the Confirm Startup Procedure screen.



This screen provides an opportunity to confirm that the correct standard and feeder start speed have been loaded. If anything is incorrect, changes may be made before entering automatic mode.

Select the desired boost mode using the blue toggle and select *Start Control* to return to the Run Screen and begin the automatic mode startup sequence. If a boost was selected, the system will immediately set the feeder to the boost speed specified on the main setup page. The boost will run for the duration specified in the color standard currently loaded.

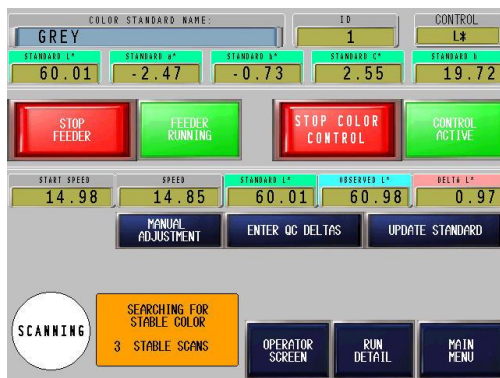


The boost sequence is easily identified by the indication block at the bottom of the run screen.

After the boost duration has elapsed, the feeder will be set to the startup speed specified in the loaded standard.

The system will now wait for the new color to exit the extruder before searching for a stable process. This waiting period is specified in the loaded standard using the Correction Delay variable. The amount of time remaining will be displayed above the indication block, and the block itself will state Waiting for Residence.

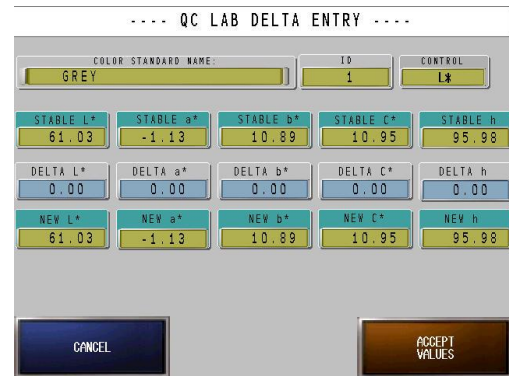
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snapshot of the last stable scan so as to more closely match the sample taken to the lab.



To synchronize the **live standard*** with the lab, the operator must enter the results from the lab scan on the entry form above. In this example, the lab indicated that the sample was .13 L* light, or delta L* of .13. This will automatically adjust the target L* value to 65.43, reflecting the need to darken the standard slightly.

Enter all of the remaining values. If a value is not used, simply leave the delta at zero, indicating that the current reading is already in sync with the lab. When completed, select Accept Values to return to the Run Screen and use the newly revised standard.

Once back at the run screen, the system is in fully automatic mode and will begin to adjust the feeder speed as needed. Note that if the deltas entered forced the system to be outside of the warning tolerance a speed change will take place immediately, without regard to the number of bad scans allowed in the loaded standard.

To monitor the process more closely, select the *Run Detail* button at the lower right of the screen. This will display detailed data and real-time charts of critical process variables.

The detail screen is broken into two parts, top and bottom. The top section contains the current motor speed, the target color space values for the loaded standard, the currently observed color space data, and the resulting delta values.

The bottom section of the screen is dedicated to a series of line graphs that contain historical data for each of the color space variables. A set of yellow buttons below the chart allow easy selection of the desired variable. Each graph has two zoom levels, selectable from the top right of the chart area.

The chart area holds the last 100 scans of data. These records may be scrolled through using the control buttons at the top left of the chart area. In addition, important process data will be displayed at the top of the chart area to keep the operator informed. At any time, select *Run Screen* to return to the previous screen for control purposes.



6.4 What is a Live Standard

A live standard (also known as “ad hock”) is a standard that is created “live” at the beginning of the production run. Because the lab instrument geometry is different from the online instrument, you cannot use the same values (i.e.

transfer the lab values to the online instrument).

So at the beginning of a production run, the lab will approve color as in spec based on the lab instrument. At this point, a measurement is taken with the online instrument in the production line and saved as the standard for that run only. This is then a “live” standard.

Conversely, if the standard is stored for use on a future run, then this is a “stored” standard

Note!

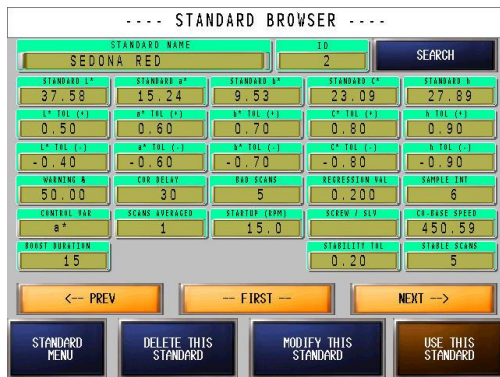
The user should never save the online instrument values to their lab instrument. The two need to be kept distinctly separate. Keep in mind that the values will always be different, however the trend in color movement should be the same, so the adjustments needed to correct are the same regardless of the instrument used.

6.4 Color Change Sequence (Automatic Mode to Automatic Mode)

When the system is up and running in Closed Loop mode and the operator loads a new standard, a unique set of steps occur to guide the user through the color change. This is done to achieve the fewest number of scrap pieces and bring the new color into specification as quickly as possible.

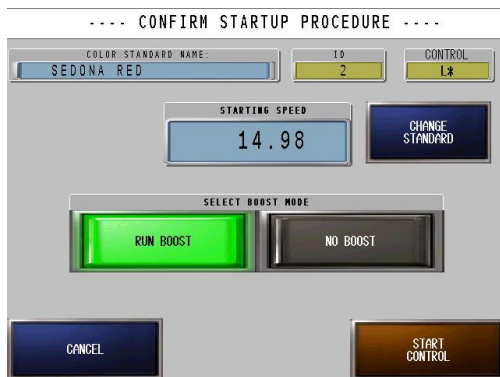
6.4.1 Select a new Standard

The first step in the sequence is to select a new standard. From the Standard's Menu, select Review / Select Standard. (A shortcut to this screen is to press the current standard's name from the Run or Run Detail screen) Find the appropriate standard as described in the Load a Standard section. Select *Use This Standard*.



6.4.2 Confirm the Startup

Just as when entering closed loop mode from manual mode, the system will prompt the user to confirm the standard, startup speed, and boost condition. In this case, the boost selector defaults to use the boost since it is a color change scenario. Select *Start Control* to continue the sequence.

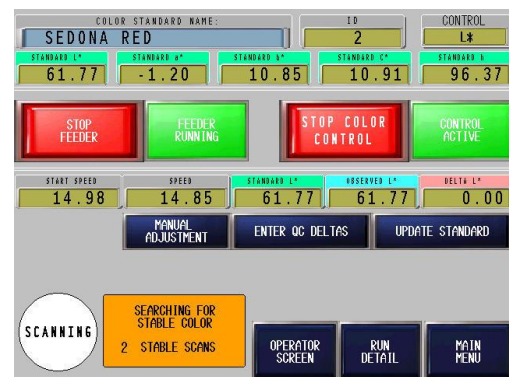


6.4.3 Boost / Residence Time

The system will next run the boost (if selected) and wait for the appropriate residence time as specified by the *Old* standard. Throughout this step, the system will be scanning and reporting deltas based on the *Previous* standard. This is due to the fact that good product from the *Previous* standard will continue to exit the extruder for some time after the *New* color has been started. Stack lights will reflect the result of the current scan as compared to the *Previous* standard's tolerances. If the Auto-Cut is enabled, it will be targeting the *Previous* standard's tolerances.

6.4.4 Stability Check

The next step in the sequence is to search for a stability of the New color. This is done in the same manner described earlier. While searching for stability the system will be scanning and reporting deltas based on the *Previous* standard. Stack lights will reflect the result of the current scan as compared to the *Previous* standard's tolerances. If the Auto-Cut is enabled, it will be targeting the *Previous* standard's tolerances.



6.4.5 Quality Lab Delta Entry

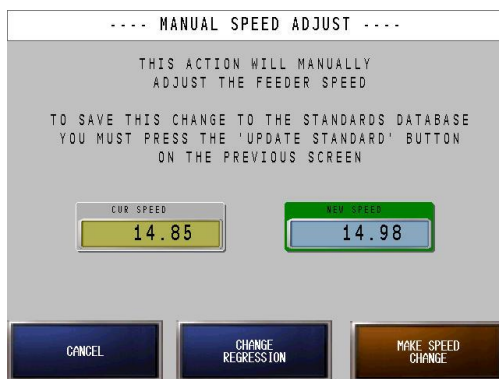
The final step in the sequence is to enter the Quality Lab Deltas for the New color. This is done in the same manner described earlier. While waiting for the operator to enter deltas, the system will continue scanning and comparing against the *Previous* standard. Stack lights will reflect the result of the current scan as compared to the *Previous* standard's tolerances. If the Auto-Cut is enabled, it will be targeting the *Previous* standard's tolerances. As soon as the operator has completed the Quality Lab Delta entry and accepted the values, the system will begin to scan and compare values using the *New* standard for all operations.

6.5 Manual Adjustments

Lets you adjust speed and regression settings without accessing the standard setup.

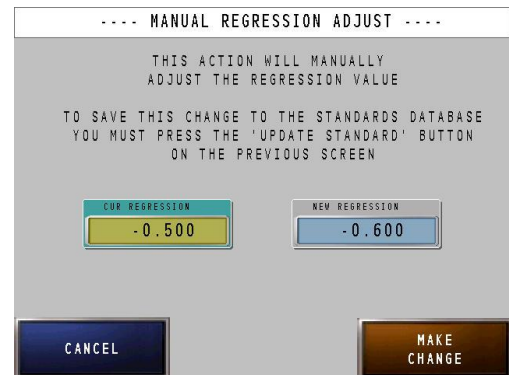
6.5.1 Change Speed

Lets you adjust the speed manually without accessing the standard setup.



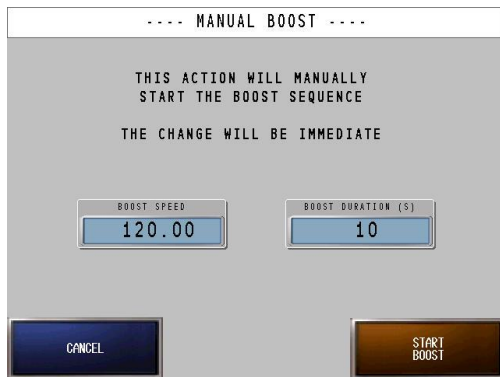
6.5.2 Change Regression

Lets you change the regression without accessing the standard setup.



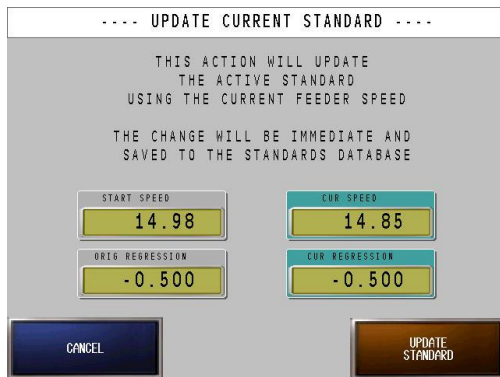
6.6 Manual Boost

This action will manually start the boost sequence. When in manual mode. The boost will be executed as soon as the start boost button is pressed



6.7 Update Standard

This will update the active standard using the current speed and regression settings.



9

Maintenance

1. Cleaning the Display
2. Periodic Check Points
3. Replacing the Installation Gasket
4. Replacing the Backlight

This chapter explains cautions and inspection criteria that will ensure trouble-free use of the GP.

9.1 Cleaning the Display

When the surface or frame of the display become dirty, soak a soft cloth in water with a neutral detergent, wring the cloth tightly, and wipe the display.

IMPORTANT

- Do not use paint thinner, organic solvents, or a strong acid compound to clean the unit.
- Do not use hard or pointed objects to operate the touch-screen panel, since it can damage the panel surface.

9.2 Periodic Check Points

To keep your GP unit in its best condition, please inspect the following points periodically.

■GP Operation Environment

- Is the operating temperature within the allowable range (0°C to 50°C)?
- Is the operating humidity within the specified range (10%RH to 90%RH, dry bulb temperature of 39°C or less)?
- Is the operating atmosphere free of corrosive gasses?

When using the GP unit inside a panel, the ambient environment refers to the interior of the panel.

■Electrical Specifications

- Is the input voltage appropriate?

AC100 to 240V 50/60Hz

DC19.2 to 28.8V

■Related Items

- Are all power cords and cables connected properly? Have any become loose?
- Are all mounting brackets holding the unit securely?
- Are there many scratches or traces of dirt on the installation gasket?

9.3 Replacing the Installation Gasket

The installation gasket provides protection against dust and moisture.

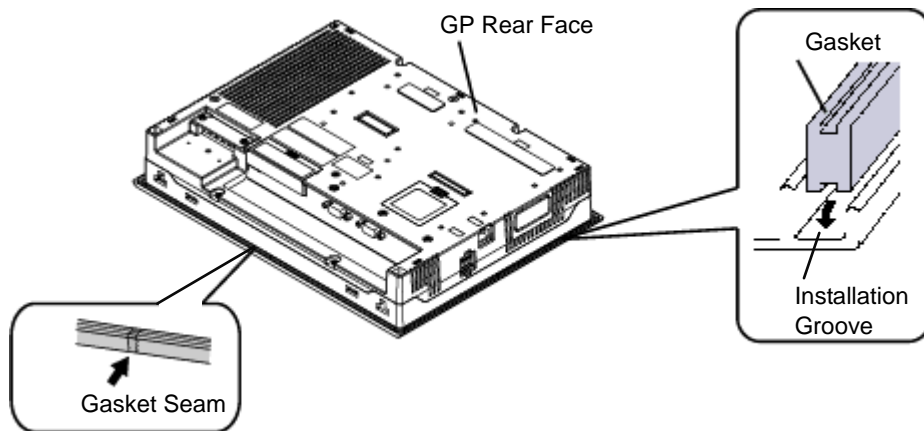
IMPORTANT

- A gasket which has been used for a long period of time may have scratches or dirt on it, and could have lost much of its water resistance. Be sure to change the gasket at least once a year, or when scratches or dirt become visible.
- The GP unit installation gasket's model number is as follows.

GP-3200 Series	ST400-WP01
GP-3300 Series	CA3-WPG6-01
GP-3400 Series	CA5-WPG8-01
AGP-35*0T	CA5-WPG10-01
AGP-3500L/3500S	CA3-WPG12-01
GP-3600 Series	CA3-WPG12-01
GP-3700 Series	CA3-WPG15-01

■ Installation Gasket Attachment Procedure

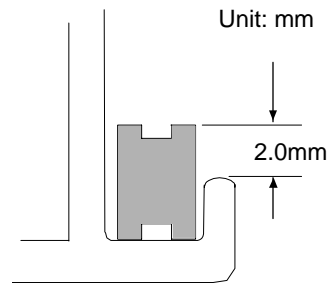
- (1) Place the GP on a flat, level surface facing the display face downwards.
- (2) Remove the gasket from the GP.
- (3) Attach the new gasket to the GP. Be sure to insert the gasket into the GP's groove so that the gasket's groove sides are vertical.



- (4) Check that the gasket is attached correctly to the GP.

IMPORTANT

- The gasket must be inserted correctly into the groove for the GP's moisture resistance to be equivalent to IP65f.
- Since the gasket is flexible but not elastic, be careful not to stretch it unnecessarily, as doing so could tear the gasket.
- Be sure the gasket's seam is not inserted into any of the unit's corners, only in the straight sections of the groove. Inserting it into a corner may lead to its eventually tearing.
- To ensure stable resistance against dust and moisture, insert the gasket so that the seam is at the bottom of the GP unit.
- The upper surface of the gasket should protrude approximately 2.0 mm out from the groove. Be sure to check that the gasket is correctly inserted before installing the GP into a panel.



9.4 Replacing the Backlight

IMPORTANT

- The backlights of the following GP cannot be replaced by the user. When the backlight needs to be replaced, please contact your local GP distributor.
 - GP-3200 Series, GP-3300 Series, GP-3400 Series
 - AGP-3500L
 - AGP-3650U
 - AGP-3600-U1-D24-CA1M
 - AGP-3600T / AGP-3650T / GP-3700 Series which is marked on Rev.5
- If the status LED continues turning ON in Orange after the backlight replacement, GP unit malfunction may be occurred. Please contact your local GP distributor.

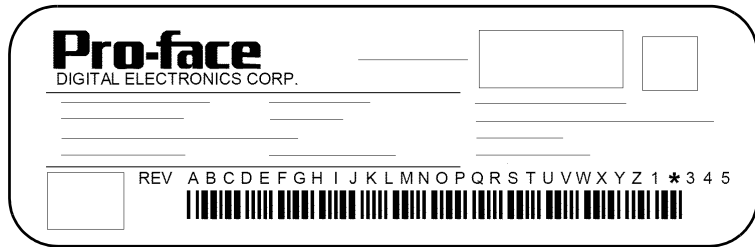
9.4.1 AGP-35*0T

NOTE

- Use the following table to check that you have ordered the correct backlight.

GP	Rev*1	Backlight Model	Attachment Procedures
AGP-3500T AGP-3550T	-	CA5-BLU10T-01	SEE → ■CA5-BLU10T-01 (page 9-6)
	Rev.2 is marked.	CA6-BLU10T-02	SEE → ■CA6-BLU10T-02 (page 9-11)
AGP-3510T AGP-3560T	-		

1 The revision number of the GP is shown in the label affixed to the GP. In the example shown below, an asterisk "" is displayed in the position



■CA5-BLU10T-01

◆ Preparation

Please have the following ready beforehand.

- Replacement backlight (Model: CA5-BLU10T-01)
- One pair of clean (preferably new) cotton gloves.
- Phillips screwdriver (no.2)

About the Backlight

GP units use a CFL, long-life type backlight. In a real world situation, the backlight may need to be replaced depending on the GP's operating environment. It is recommended that it be replaced periodically.

A backlight life refer to "■Display Specifications (page 4-48)", when the backlight is lit continuously (time required for brightness to fall to half its normal level.)

NOTE

- If the backlight or the display unit is damaged, the screen display will go out. Even if the screen goes out, however, there is a possibility that the touch panel is still operating correctly. Therefore, since any type of touch panel contact could have an unexpected or dangerous effect or result, be sure not to touch the screen when this condition occurs.



WARNING



[Electric shock]

- Whenever changing the backlight, be sure the GP's power cord has been disconnected and that the unit is cooled down.
- When the GP's power cord is connected and the GP is ON, high voltage runs through the wires in the backlight area do not touch them!



[Burn]

- When the GP's power has just been turned OFF, the backlight area is still very hot! Be sure to wear gloves to prevent being burned.



[Glass]

- The backlight is very fragile. Do not touch the glass tube directly or try to remove its power cord. If the glass tube breaks you may be injured.

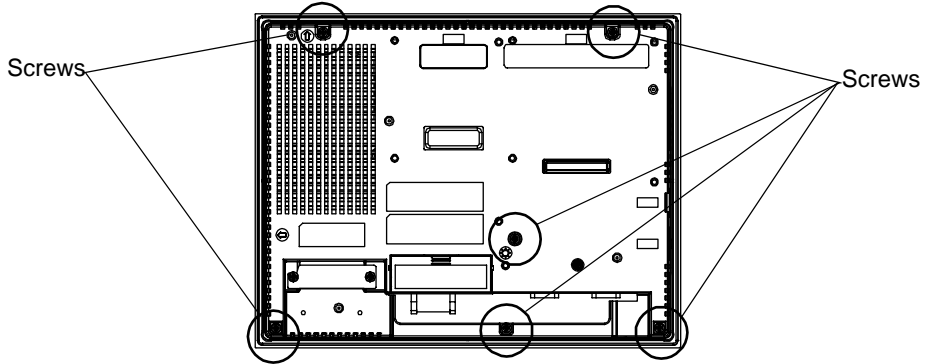
◆ Procedure for replacing the backlight

- (1) Unplug the power cord from the main power supply.

IMPORTANT

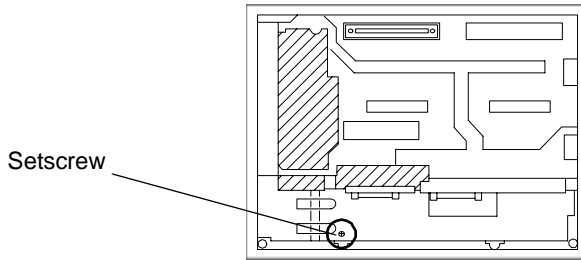
- Remove the GP unit from the equipment to which the unit has been incorporated, and work with the GP unit with the display surface facing downward. Be sure to perform the backlight changeover on a flat, level surface. This will prevent damage to the GP unit and the accidental cutting of any of its power cord.
- Be sure to protect the display surface to prevent damage during the operations.

- (2) Remove the retaining screws (6) on the rear cover.

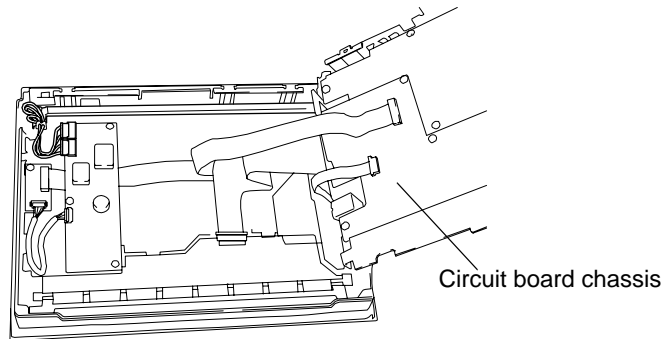


IMPORTANT • Do not let the attachment screws fall inside the GP, or lose them

- (3) Open the rear cover carefully from the bottom of the unit to the top.
- (4) Remove the setscrew (1) on the circuit board chassis.

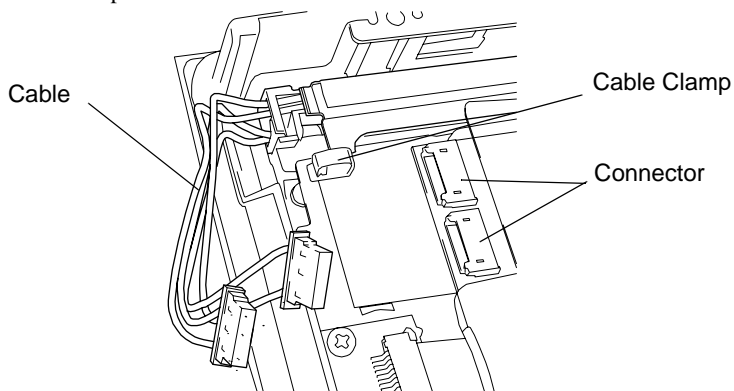


- (5) Open the circuit board chassis, it's turn left to right.

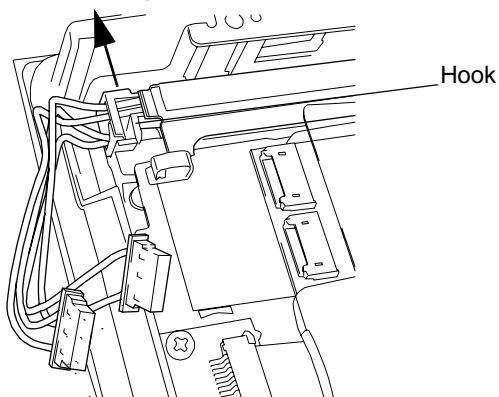


IMPORTANT • A hot circuit board chassis can burn you. Be sure the chassis has cooled completely prior to replacing the backlights.

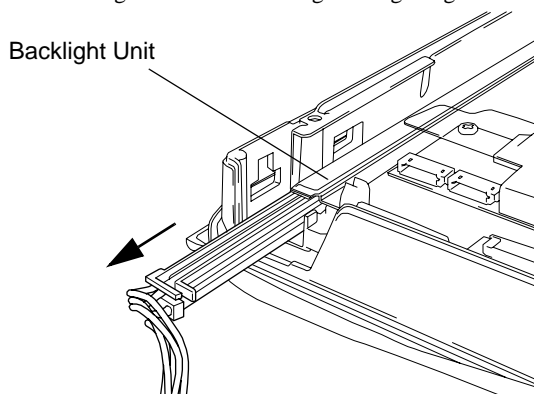
- (6) Disconnect the Backlight Unit cable from the connector on the inverter board, and then remove the cable from the cable clamp.



- (7) Remove the hook from the Backlight Unit.



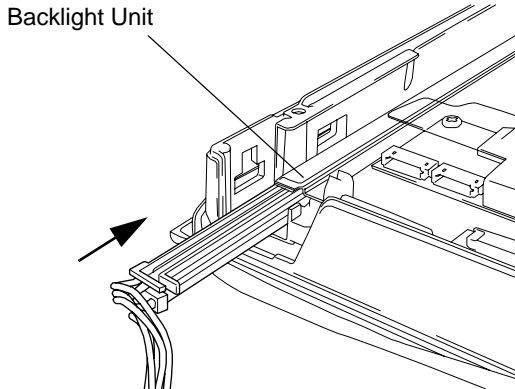
- (8) Remove the Backlight Unit while sliding it along the groove.



(9) Insert a new Backlight Unit while sliding it along the groove.

IMPORTANT

- Be careful that no dust or dirt adheres to the backlight surface or to the backlight holder.
- Be careful not to soil the Backlight with moisture, oil content or finger prints; otherwise, the life duration of the Backlight will be shortened.



(10) Insert the Backlight Unit cable to the connector on the inverter board, and secure the cable with the cable clamp.

IMPORTANT

- Be sure the cable is inserted completely into the backlight connector. Failure to do so may cause arcing, which can damage the connector.

(11) Return the circuit board chassis to the original position, and reattach the setscrew. The necessary torque is 0.5N•m.

(12) Return the rear face cover to the original position, and secure the cover in place using the mounting screws (6). The necessary torque is 0.5N•m.

IMPORTANT

- The cable clamp is used to prevent the cable from being caught inside in the GP unit and possibly damaged. Be sure to insert the cable in the cable clamp around the cable before replacing the rear cover.
- If any of the screws is missing, check if it fell inside the GP unit's chassis. If the power is turned ON while a screw is inside, it may cause an accident or fire.

NOTE

- After backlight replacement is completed, turn the GP unit's power ON and check if the screen's display is normal. If the display is not correct, please contact the GP distributor from whom you purchased the backlight unit.

■CA6-BLU10T-02

◆ Preparation

Please have the following ready beforehand.

- Replacement backlight (Model: CA6-BLU10T-02)
- One pair of clean (preferably new) cotton gloves.
- Phillips screwdriver (no.1:for the attachment of the backlight unit's one (1) attachment setscrew.
no.2:for the attachment of the other mounting screws.)

About the Backlight

GP units use a CFL, long-life type backlight. In a real world situation, the backlight may need to be replaced depending on the GP's operating environment. It is recommended that it be replaced periodically.

A backlight life refer to “■Display Specifications (page 4-48)”, when the backlight is lit continuously (time required for brightness to fall to half its normal level.)

NOTE

- If the backlight or the display unit is damaged, the screen display will go out. Even if the screen goes out, however, there is a possibility that the touch panel is still operating correctly. Therefore, since any type of touch panel contact could have an unexpected or dangerous effect or result, be sure not to touch the screen when this condition occurs.

⚠ WARNING

⚠ [Electric shock]

- Whenever changing the backlight, be sure the GP's power cord has been disconnected and that the unit is cooled down.
- When the GP's power cord is connected and the GP is ON, high voltage runs through the wires in the backlight area do not touch them!

⚠ [Burn]

- When the GP's power has just been turned OFF, the backlight area is still very hot! Be sure to wear gloves to prevent being burned.

⚠ [Glass]

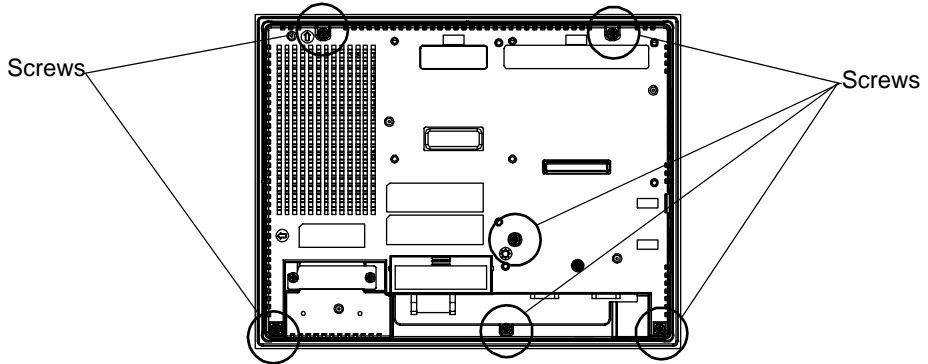
- The backlight is very fragile. Do not touch the glass tube directly or try to remove its power cord. If the glass tube breaks you may be injured.

◆ Procedure for replacing the backlight

(1) Unplug the power cord from the main power supply.

- IMPORTANT**
- Remove the GP unit from the equipment to which the unit has been incorporated, and work with the GP unit with the display surface facing downward. Be sure to perform the backlight changeover on a flat, level surface. This will prevent damage to the GP unit and the accidental cutting of any of its power cord.
 - Be sure to protect the display surface to prevent damage during the operations.

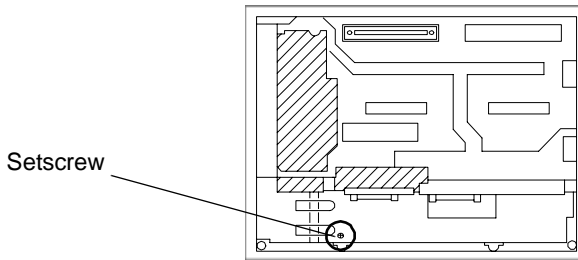
(2) Remove the retaining screws (6) on the rear cover.



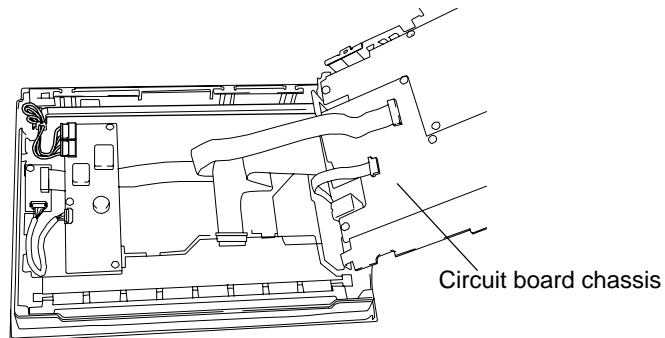
- IMPORTANT**
- Do not let the attachment screws fall inside the GP, or lose them

(3) Open the rear cover carefully from the bottom of the unit to the top.

(4) Remove the setscrew (1) on the circuit board chassis.

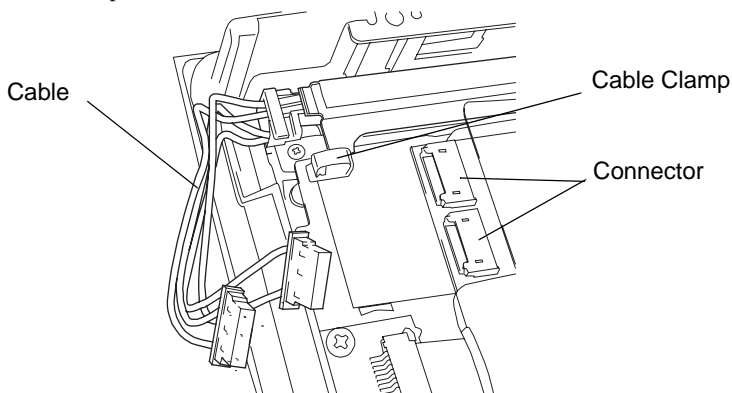


(5) Open the circuit board chassis, it's turn left to right.

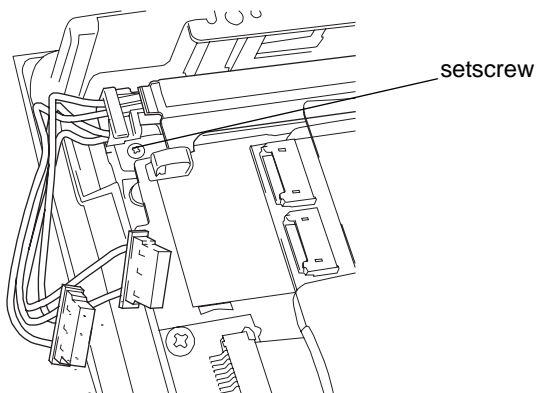


- IMPORTANT**
- A hot circuit board chassis can burn you. Be sure the chassis has cooled completely prior to replacing the backlights.

- (6) Disconnect the Backlight Unit cable from the connector on the inverter board, and then remove the cable from the cable clamp.

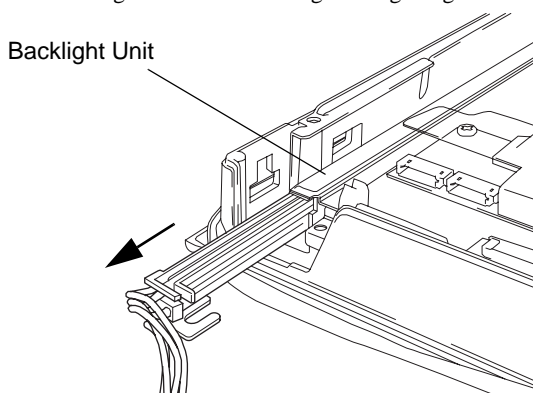


- (7) Remove the setscrew from the Backlight Unit.



NOTE • Use the Phillips sTcrewdriver No.1.

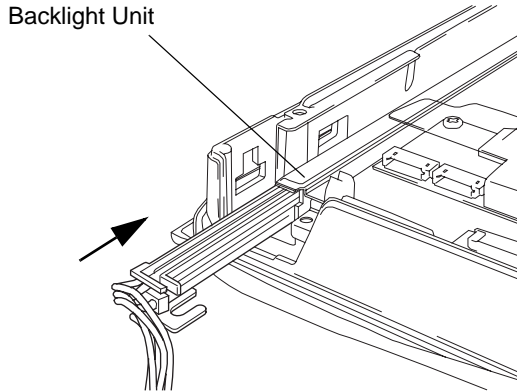
- (8) Remove the Backlight Unit while sliding it along the groove.



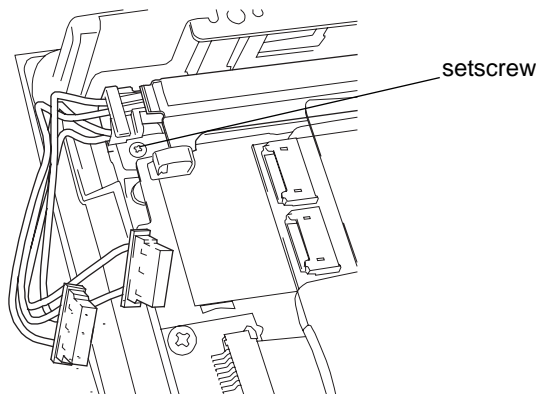
- (9) Insert a new Backlight Unit while sliding it along the groove.

IMPORTANT • Be careful that no dust or dirt adheres to the backlight surface or to the backlight holder.

- Be careful not to soil the Backlight with moisture, oil content or finger prints; otherwise, the life duration of the Backlight will be shortened.



(10) Reattach the backlight unit's setscrew. The necessary torque is 0.196N•m.



NOTE • Use the Phillips screwdriver No.1.

(11) Insert the Backlight Unit cable to the connector on the inverter board, and secure the cable with the cable clamp.

IMPORTANT • Be sure the cable is inserted completely into the backlight connector. Failure to do so may cause arcing, which can damage the connector.

(12) Return the circuit board chassis to the original position, and reattach the setscrew. The necessary torque is 0.5N•m.

(13) Return the rear face cover to the original position, and secure the cover in place using the mounting screws (6). The necessary torque is 0.5N•m.

IMPORTANT • The cable clamp is used to prevent the cable from being caught inside in the GP unit and possibly damaged. Be sure to insert the cable in the cable clamp around the cable before replacing the rear cover.

- If any of the screws is missing, check if it fell inside the GP unit's chassis. If the power is turned ON while a screw is inside, it may cause an accident or fire.

NOTE

- After backlight replacement is completed, turn the GP unit's power ON and check if the screen's display is normal. If the display is not correct, please contact the GP distributor from whom you purchased the backlight unit.

9.4.2 AGP-3500S

■Preparation

Please have the following ready beforehand.

- Replacement backlight (Model: PS501S-BU00 (Set of two))
- One pair of clean (preferably new) cotton gloves.
- Phillips screwdriver (no.2)

About the Backlight

GP units use a CFL, long-life type backlight. In a real world situation, the backlight may need to be replaced depending on the GP's operating environment. It is recommended that it be replaced periodically.

A backlight life refer to "■Display Specifications (page 4-48)", when the backlight is lit continuously (time required for brightness to fall to half its normal level.)

NOTE

- If the backlight or the display unit is damaged, the screen display will go out. Even if the screen goes out, however, there is a possibility that the touch panel is still operating correctly. Therefore, since any type of touch panel contact could have an unexpected or dangerous effect or result, be sure not to touch the screen when this condition occurs.

WARNING



[Electric shock]

- Whenever changing the backlight, be sure the GP's power cord has been disconnected and that the unit is cooled down.
- When the GP's power cord is connected and the GP is ON, high voltage runs through the wires in the backlight area do not touch them!



[Burn]

- When the GP's power has just been turned OFF, the backlight area is still very hot! Be sure to wear gloves to prevent being burned.



[Glass]

- The backlight is very fragile. Do not touch the glass tube directly or try to remove its power cord. If the glass tube breaks you may be injured.

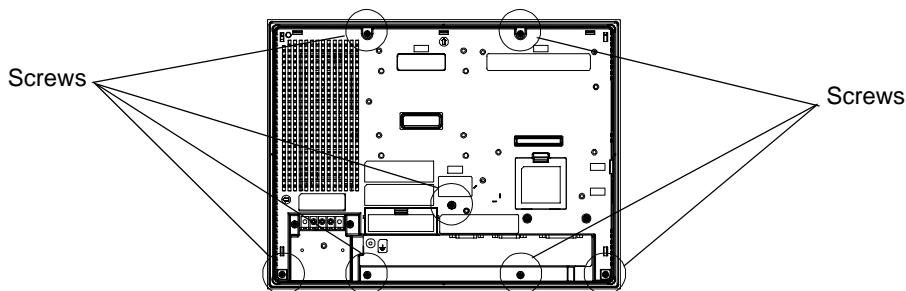
■ Procedure for replacing the backlight

There are two backlight of AGP-3500S.

- (1) Unplug the power cord from the main power supply.

- IMPORTANT**
- Remove the GP unit from the equipment to which the unit has been incorporated, and work with the GP unit with the display surface facing downward. Be sure to perform the backlight changeover on a flat, level surface. This will prevent damage to the GP unit and the accidental cutting of any of its power cord.
 - Be sure to protect the display surface to prevent damage during the operations.

- (2) Remove the I/F cover and retaining screws (7) on the rear cover.

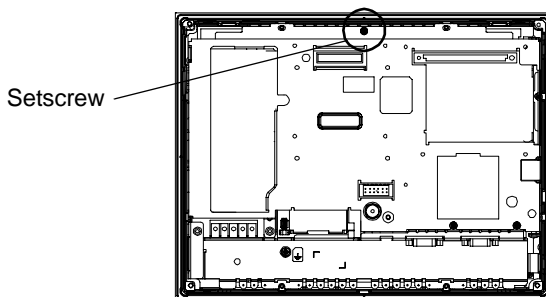


- IMPORTANT**
- Do not let the attachment screws fall inside the GP, or lose them

- (3) The top face of the rear cover uses two (2) alignment tabs. Open the rear cover from the bottom of the unit to free these tabs.

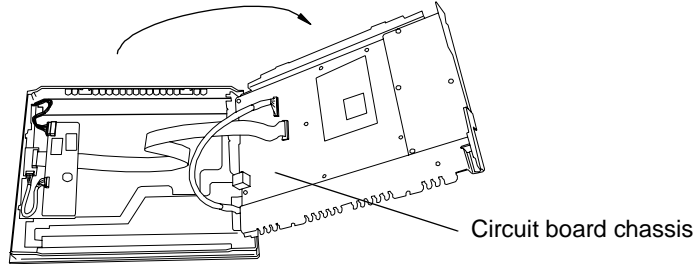
- IMPORTANT**
- Be sure to open the cover from the bottom of the GP. Attempting to open the cover from the top of the GP could damage the alignment tabs.

- (4) Remove the setscrew (1) on the circuit board chassis.



- NOTE**
- The Setscrews are not attached to all DC model of GP.

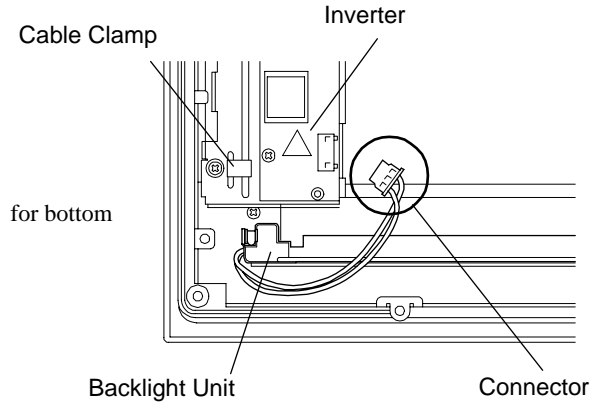
- (5) Open the circuit board chassis, it's turn left to right.



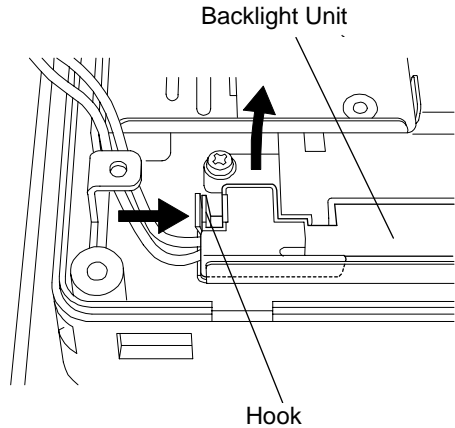
IMPORTANT

- A hot circuit board chassis can burn you. Be sure the chassis has cooled completely prior to replacing the backlights.

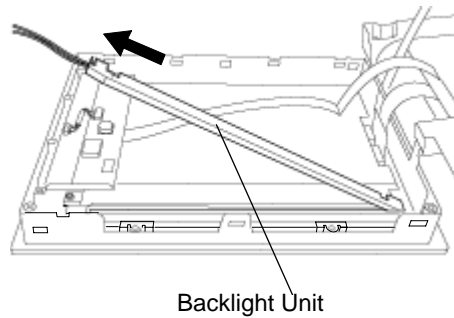
- (6) Disconnect the Backlight Unit cable from the connector on the inverter board, and then remove the cable from the cable clamp.



- (7) As shown here, push the backlight unit's attachment clip to the right to release the backlight unit.



- (8) Insert the new lower backlight unit into the backlight holder as shown here. After the backlight is completely inserted and the attachment clip clicks into place, lower the unit into the GP.



- IMPORTANT**
- Be careful that no dust or dirt adheres to the backlight surface or to the backlight holder. Be sure to handle the replacement backlight unit carefully, since it can be easily damaged or broken.

- (9) Confirm that the backlight unit is securely in place and reattach the backlight unit power connector.

- IMPORTANT**
- When replacing the Backlight unit, be sure not to catch any wiring on the edge of the unit. If a wire is caught and becomes cut, it could cause a fire.

- (10) Replace the upper backlight unit by repeating the procedures shown in steps (6) to (9).

- (11) Return the circuit board chassis to its original position and reattach the rear cover by reversing steps (1) to (5).

- IMPORTANT**
- The cable clamp is used to prevent the cable from being caught inside in the GP unit and possibly damaged. Be sure to insert the cable in the cable clamp around the cable before replacing the rear cover.
 - If any of the screws is missing, check if it fell inside the GP unit's chassis. If the power is turned ON while a screw is inside, it may cause an accident or fire.

- NOTE**
- After backlight replacement is completed, turn the GP unit's power ON and check if the screen's display is normal. If the display is not correct, please contact the GP distributor from whom you purchased the backlight unit.

9.4.3 AGP-3600T/3650T

NOTE

- Here is the procedure for replacing the backlight only for AGP-3600T/3650T which is NOT marked on GP Rev. 5.

■Preparation

Please have the following ready beforehand.

- Replacement backlight (Model: CA3-BLU12-01)
- One pair of clean (preferably new) cotton gloves.
- Phillips screwdriver (no.2)

About the Backlight

GP units use a CFL, long-life type backlight. In a real world situation, the backlight may need to be replaced depending on the GP's operating environment. It is recommended that it be replaced periodically.

A backlight life refer to “■Display Specifications (page 4-65)”, when the backlight is lit continuously (time required for brightness to fall to half its normal level.)

⚠ WARNING



[Electric shock]

- Whenever changing the backlight, be sure the GP's power cord has been disconnected and that the unit is cooled down.
- When the GP's power cord is connected and the GP is ON, high voltage runs through the wires in the backlight area do not touch them!



[Burn]

- When the GP's power has just been turned OFF, the backlight area is still very hot! Be sure to wear gloves to prevent being burned.



[Glass]

- The backlight is very fragile. Do not touch the glass tube directly or try to remove its power cord. If the glass tube breaks you may be injured.

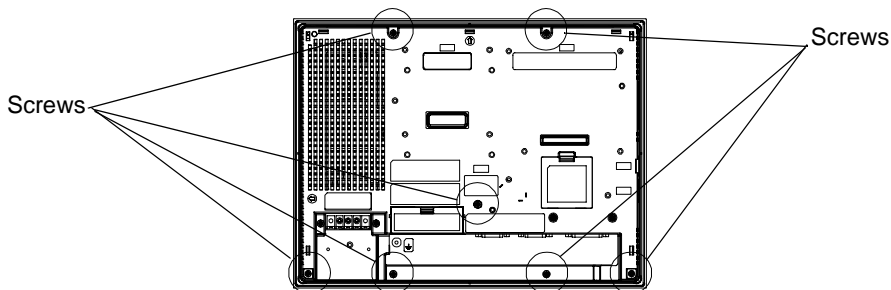
■Procedure for replacing the backlight

- (1) Unplug the power cord from the main power supply.

IMPORTANT

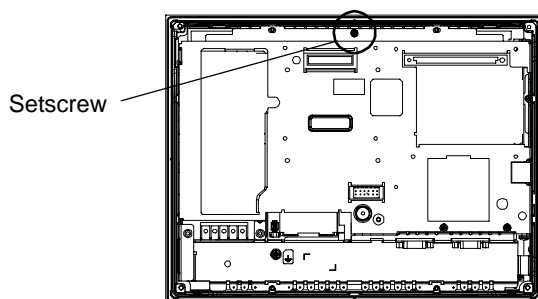
- Remove the GP unit from the equipment to which the unit has been incorporated, and work with the GP unit with the display surface facing downward. Be sure to perform the backlight changeover on a flat, level surface. This will prevent damage to the GP unit and the accidental cutting of any of its power cord.
- Be sure to protect the display surface to prevent damage during the operations.

- (2) Remove the retaining screws (7) on the rear cover



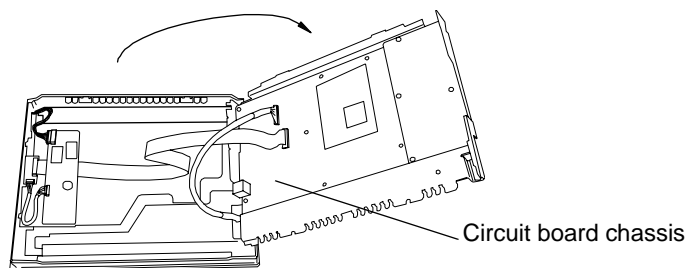
IMPORTANT • Do not let the attachment screws fall inside the GP, or lose them

- (3) Remove the setscrew (1) on the circuit board chassis.



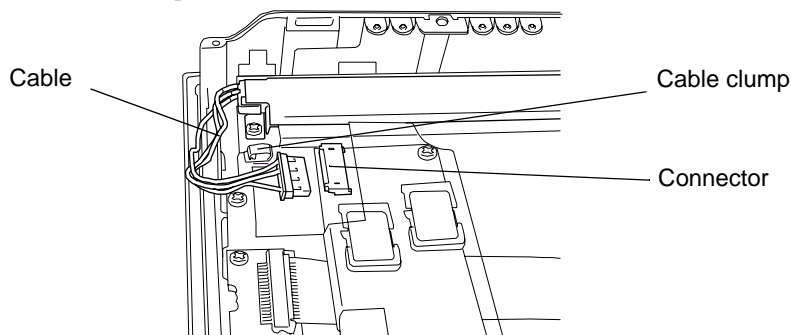
NOTE • The Setscrews are not attached to all DC model of GP.

- (4) Open the circuit board chassis, it's turn left to right.



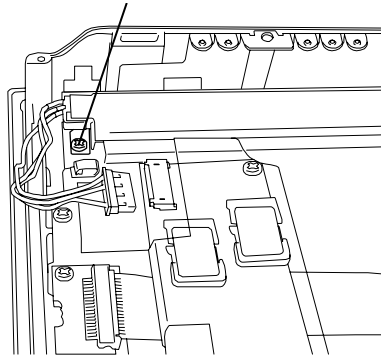
IMPORTANT • A hot circuit board chassis can burn you. Be sure the chassis has cooled completely prior to replacing the backlights.

- (5) Disconnect the Backlight Unit cable from the connector on the inverter board, and then remove the cable from the cable clamp.



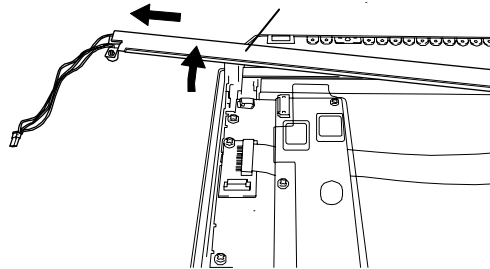
- (6) Remove the Setscrew from the Backlight Unit

Setscrew for the Backlight Unit



- (7) Lift the edge of the Backlight Unit, and remove the unit while sliding it along the groove

Backlight Unit

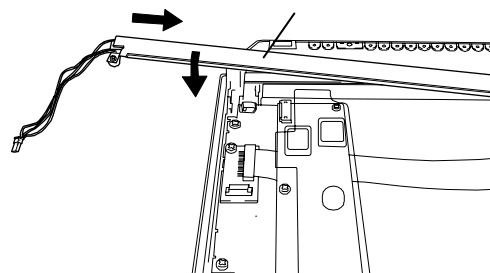


- (8) Insert a new Backlight Unit while sliding it along the groove.

IMPORTANT

- Be careful that no dust or dirt adheres to the backlight surface or to the backlight holder.
- Be careful not to soil the Backlight with moisture, oil content or finger prints; otherwise, the life duration of the Backlight will be shortened.

Backlight Unit



- (9) Fasten the setscrew for the backlight unit. The necessary torque is 0.147N•m.

- (10) Insert the Backlight Unit cable to the connector on the inverter board, and the secure the cable with the cable clamp.

IMPORTANT

- Be sure the cable is inserted completely into the backlight connector. Failure to do so may cause arcing, which can damage the connector.

- (11) Return the circuit board chassis to the original position.

- (12) Return the rear face cover to the original position, and secure the cover in place using the mounting screws (7). The necessary torque is 0.5N•m.

IMPORTANT

- The cable clamp is used to prevent the cable from being caught inside in the GP unit and possibly damaged. Be sure to insert the cable in the cable clamp around the cable before replacing the rear cover.
- If any of the screws is missing, check if it fell inside the GP unit's chassis. If the power is turned ON while a screw is inside, it may cause an accident or fire.

NOTE

- After backlight replacement is completed, turn the GP unit's power ON and check if the screen's display is normal. If the display is not correct, please contact the GP distributor from whom you purchased the backlight unit.

9.4.4 GP-3700 Series

NOTE

- Here is the procedure for replacing the backlight only for GP-3700 Series which is NOT marked on GP Rev. 5.

■Preparation

Please have the following ready beforehand.

- Replacement backlight (Model: CA3-BLU15-01 (Set of two))
- One pair of clean (preferably new) cotton gloves.
- Phillips screwdriver (no.2)

About the Backlight

GP units use a CFL, long-life type backlight. In a real world situation, the backlight may need to be replaced depending on the GP's operating environment. It is recommended that it be replaced periodically.

A backlight life refer to “■Display Specifications (page 4-79)”, when the backlight is lit continuously (time required for brightness to fall to half its normal level.)

WARNING

[Electric shock]

- Whenever changing the backlight, be sure the GP's power cord has been disconnected and that the unit is cooled down.
- When the GP's power cord is connected and the GP is ON, high voltage runs through the wires in the backlight area do not touch them!

[Burn]

- When the GP's power has just been turned OFF, the backlight area is still very hot! Be sure to wear gloves to prevent being burned.

[Glass]

- The backlight is very fragile. Do not touch the glass tube directly or try to remove its power cord. If the glass tube breaks you may be injured.

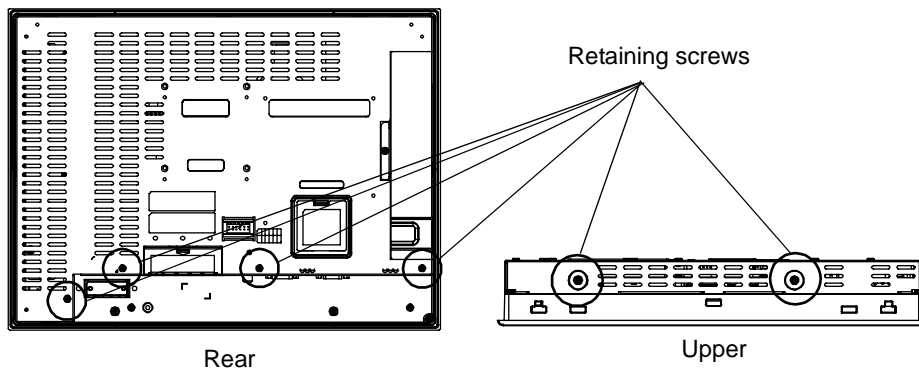
■Procedure for replacing the backlight

There are two backlight of AGP-3750T.

- (1) Unplug the power cord from the main power supply.

- IMPORTANT**
- Remove the GP unit from the equipment to which the unit has been incorporated, and work with the GP unit with the display surface facing downward. Be sure to perform the backlight changeover on a flat, level surface. This will prevent damage to the GP unit and the accidental cutting of any of its power cord.
 - Be sure to protect the display surface to prevent damage during the operations.

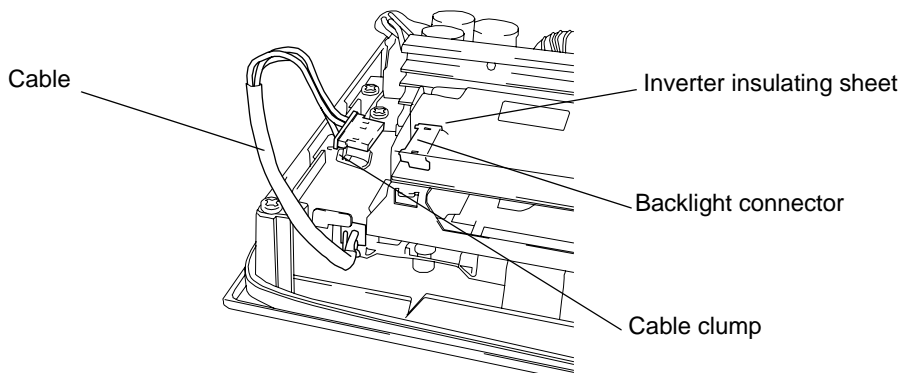
- (2) Remove the retaining screws (6) on the rear cover, and detach the cover from the main unit.



- IMPORTANT**
- Do not let the attachment screws fall inside the GP, or lose them.

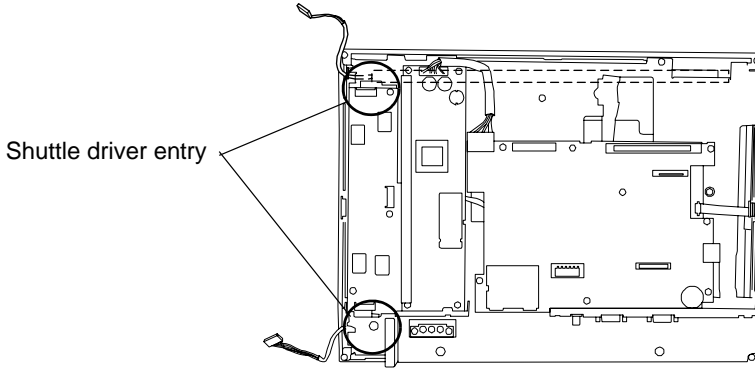
- (3) Pull out cable from inverter insulating sheet, and remove from cable clump.

Remove cable from backlight connector on inverter circuit board.

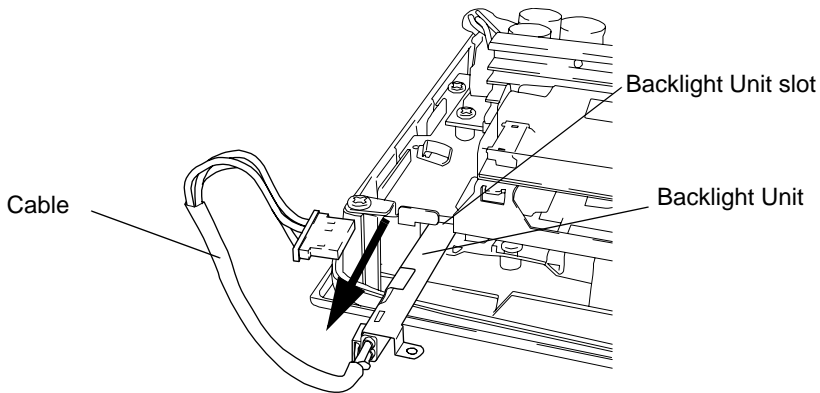


- IMPORTANT**
- A hot circuit board chassis can burn you. Be sure the chassis has cooled completely prior to replacing the backlights.

- (4) Insert shuttle driver to circular hole, and remove backlight setscrew. There are two circular hole.



- (5) Draw out the cable in the direction of an arrow. Creep out backlight unit from backlight unit slot.



IMPORTANT • Replace backlight the whole backlight unit.

- (6) Insert a new backlight unit in backlight unit slot.

Secure the backlight setscrew. The necessary torque is 0.147N•m. (The procedure of opposite to procedure 4.)

- (7) Insert the cable to backlight connector.

Secure the cable with the cable clamp.

(The procedure of opposite to procedure 3.)

IMPORTANT • Be sure the cable is inserted completely into the backlight connector. Failure to do so may cause arcing, which can damage the connector.

- Backlight has used 1 each of top and bottom LCD. The case of exchange 2 please exchange simultaneously.

- (8) Return the rear face cover to the original position, and secure the cover in place using the mounting screws (6). The necessary torque is 0.5N•m

IMPORTANT

- The cable clamp is used to prevent the cable from being caught inside in the GP unit and possibly damaged. Be sure to insert the cable in the cable clamp around the cable before replacing the rear cover.
- If any of the screws is missing, check if it fell inside the GP unit's chassis. If the power is turned ON while a screw is inside, it may cause an accident or fire.

NOTE

- After backlight replacement is completed, turn the GP unit's power ON and check if the screen's display is normal. If the display is not correct, please contact the GP distributor from whom you purchased the backlight unit.