SnapREG User's Manual

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Contents

1   Introduction

This manual is for use with AVTs' SnapREG system, an on-web registration system.

Scope

This manual is for the SnapREG product.

Typographic Conventions

To make this manual easier to follow, bold letters are used to show touch- control buttons, icons, or view names, such as **OK**, **Apply**, or **Press Status**.

Note: Notes contain specific information. They may explain why a certain step should be performed. Sometimes they contain tips about a particular step in a process.

Helpful Hints

Helpful Hints may appear at the end of sections. They contain tips on how to use the SnapREG system more effectively.

WARNING: Warnings appear when specific instructions must be followed to avoid creating a problem.

2 Warnings

2.1 Warning Labels

 WARNING: Warning labels as shown at left indicate electric shock hazard zones on the equipment. DO NOT remove guards or place hands in these locations at any time that power is applied.

 WARNING: Warning labels as shown at left indicate that there are no user serviceable parts inside. Customer Service can assist you if system components need to be exchanged or replaced.

 WARNING: Warning labels as shown at left indicate a crush hazard in this area. Hands can be crushed between moving machinery while it is in operation.

 WARNING: General warning labels as shown at left indicate there is a threat to personal injury or health.

2.2   Operator Warnings

A shock hazard exists on the inside of the Camera Control Module (CCM) equipment cabinet. The cabinet door should remain locked at all times. Only authorized electricians should access this cabinet. **DO NOT place hands inside the Camera Control Module equipment cabinet at any time that power is applied**.

A shock hazard exists on the inside of the Register Interface Box (RIB) enclosure. This enclosure should remain sealed at all times as there are no user serviceable parts inside. **DO NOT place hands in RIB enclosure at any time that power is applied.**

There exists a potential pinch hazard between the SnapREG scan heads and the transports. The force required to stall the transport motors is much less than is usually required to cause bodily harm. However, **DO NOT place fingers in the area of the scan heads at any time that power is applied**.
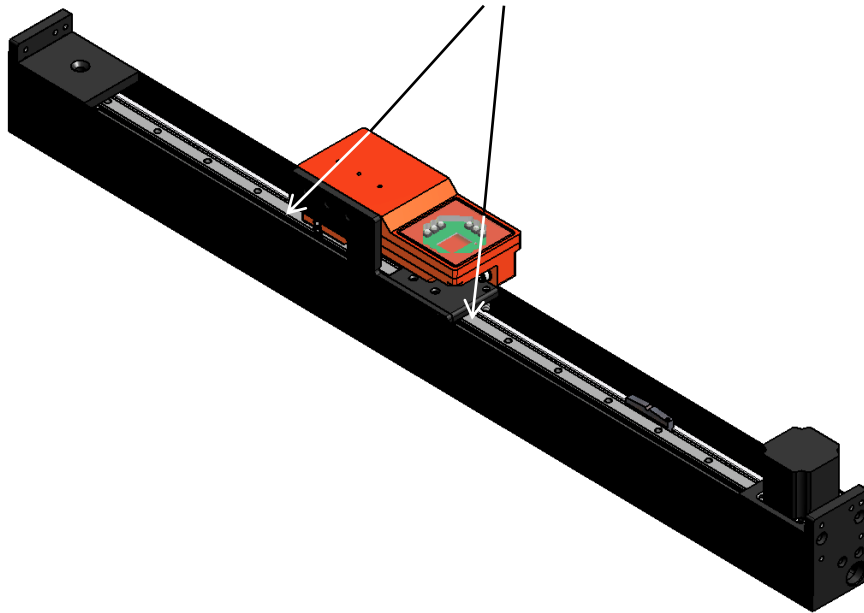
3 System Overview

This section describes the SnapREG system components, how the system operates, and how to power On/Off the SnapREG on-press unit.

3.1 SnapREG System Description

SnapREG is an optional, add-on module to the Clarios on-press, in-line color control system or to the Mercury ink control system. The system is composed of an on-press unit and a scan head working in conjunction with the Clarios or Mercury system.

SnapREG controls the plate positions by measuring the distance between the marks on the registration targets. It changes the plate positions as necessary to maintain proper registration.

The SnapREG software and display runs on the Clarios or Mercury server.

3.2 SnapREG System Components

The system components include:

- **SnapREG Camera Control Module (CCM)**

  The Camera Control Module contains the encoder interface, scan head interface, and transport control PLC, if using an optional motorized transport.

- **SnapREG Register Interface Box (RIB)**

  The Register Interface Box contains the register motor control PLC. This Register Interface may be in a separate box or it may be simply on a plate and mounted within a press cabinet.

- **SnapREG Scan Head**

- The Scan Head finds the register targets on the web and performs the required measurements.

- **SnapREG Motorized Transport**

  The Motorized Transport moves the Scan Head to the correct location to find the marks via a motor and is controlled by the operator through the GUI. This is optional equipment.

- **SnapREG Manual Transport**

  The Manual Transport provides a mount for the Scan Head and allows manual position of the camera over the web. The operator must physically touch the Scan Head to move it. There are sometimes detents on the transport to allow for preset locations to be defined.

- **Clarios or Mercury/SnapREG Server**

  All job data is created by the operator on the Clarios or Mercury/SnapREG server in the SnapREG application. The application receives runtime scan data from the SnapREG scan head, which triggers plate motor moves when necessary. The SnapREG application runs independently of the Clarios or Mercury applications.

3.3　On-Press Power

Camera Control Module

Power to the Camera Control Module is controlled by a main AC breaker inside the enclosure. Refer to the detailed electrical drawings supplied with your system for further information.

Register Interface Box

Power to the Register Interface Box is controlled by a main AC breaker inside the enclosure. This AC breaker only controls the PLC and its components. It normally should not be necessary to power this unit off. Many times there is a secondary source of power, coming from the press that controls the actual register motors.
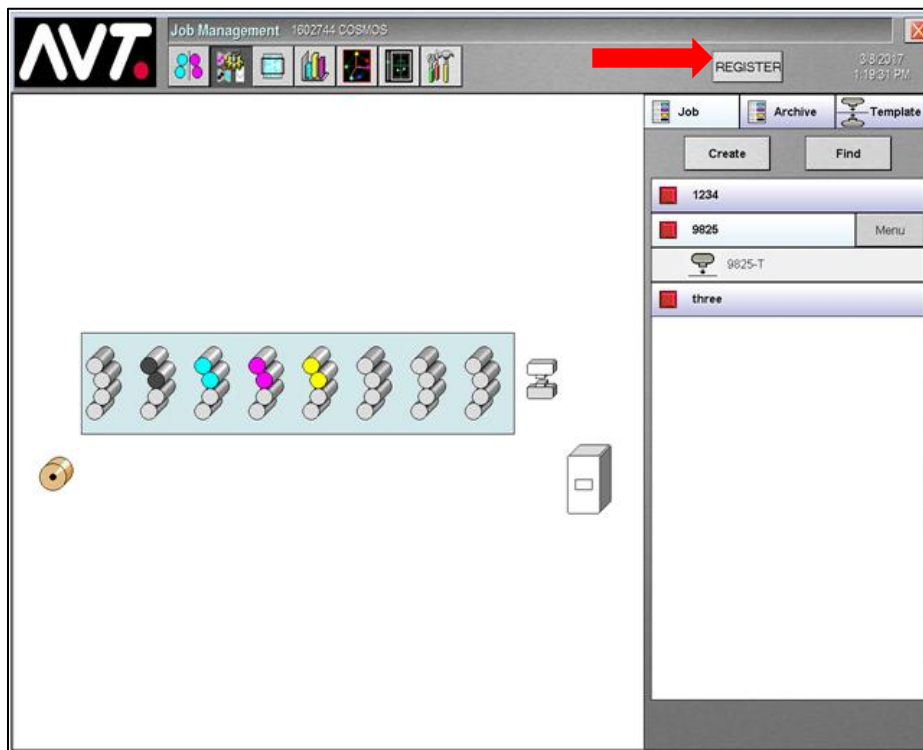
Refer to the detailed electrical drawings supplied with your system for further information.
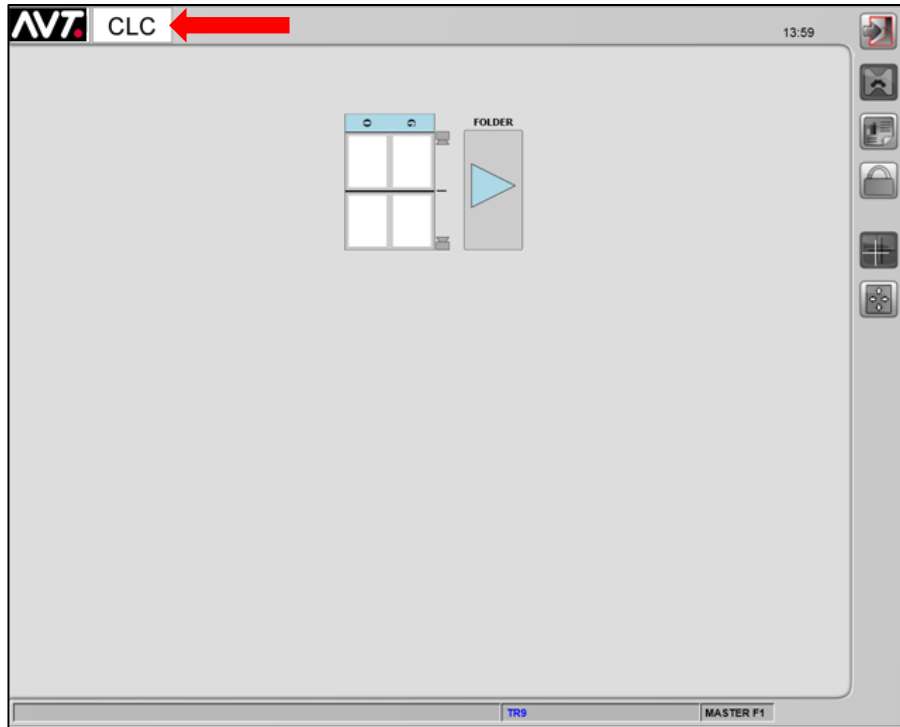
4   Starting Up the System

When the computer is booted up, the applications will start automatically.
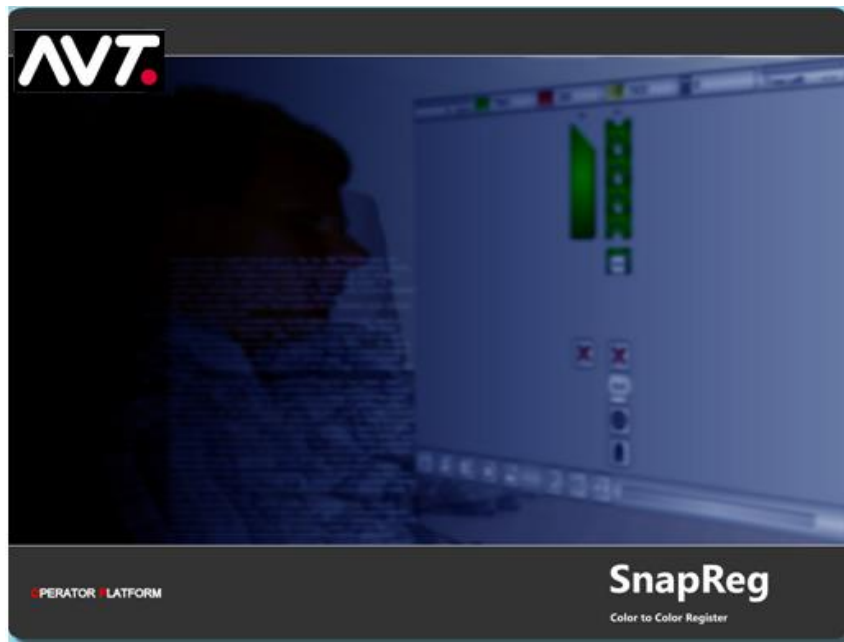
When SnapREG is started a "splash" screen is displayed. The display may only be temporary until the Clarios client starts.

To see SnapREG when viewing Clarios client, touch **REGISTER** button in the Clarios tool bar.

To see Clarios client when viewing SnapREG, touch the **CLC** button next to AVT logo.

Use the tool bar buttons on the right of the operator interface to navigate between different menus of SnapREG. The buttons are, from top to bottom:

Quit – Quit SnapREG and return to Clarios client or Windows. Available only when operator is logged on. See chapter on user level.

Registration Menu - Manage registry adjustments.

Configuration Menu - Configure the SnapREG units.

User Level - User level password entry.

Register Status – Access Register Status screen from configuration setup, cutoff control, and phaser control.

Cutoff (optional) – Allows cutoff control.

The selected menu displays with a darker button. Registration Menu is selected here.

Note: When the Clarios computer is rebooted for any reason, the register transports MUST be re-calibrated so that the lateral position of the cameras will be accurate. Failure to do this may result in scanning issues. See page 16 for details on the calibration procedure.

5   Using the Registration Menu

The Registration menu is used to manage registry adjustments and simultaneously get an overview of the SnapREG status. The menu consists of two regions.

- Upper region - Used to select the web and web surface that is currently active.
- Lower region - Displays the status and also adjustments that can be made on the selected print units.

5.1   Registration Menu - Upper Region

Each web is divided into upper and lower scan heads, and 2 alleys: A & B. The alleys are usually not individually selectable. You touch any alley to select the scan head to display. The display will vary depending on the number of webs and scan heads available on a press.

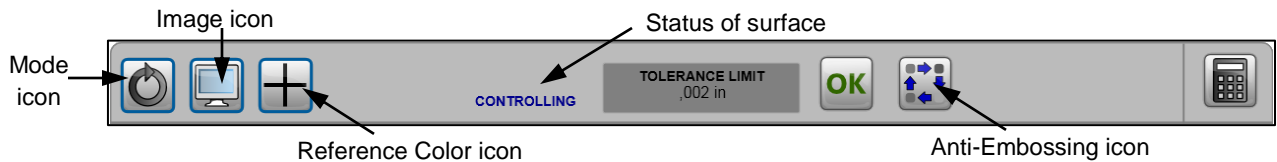The sample below shows the upper head selected.
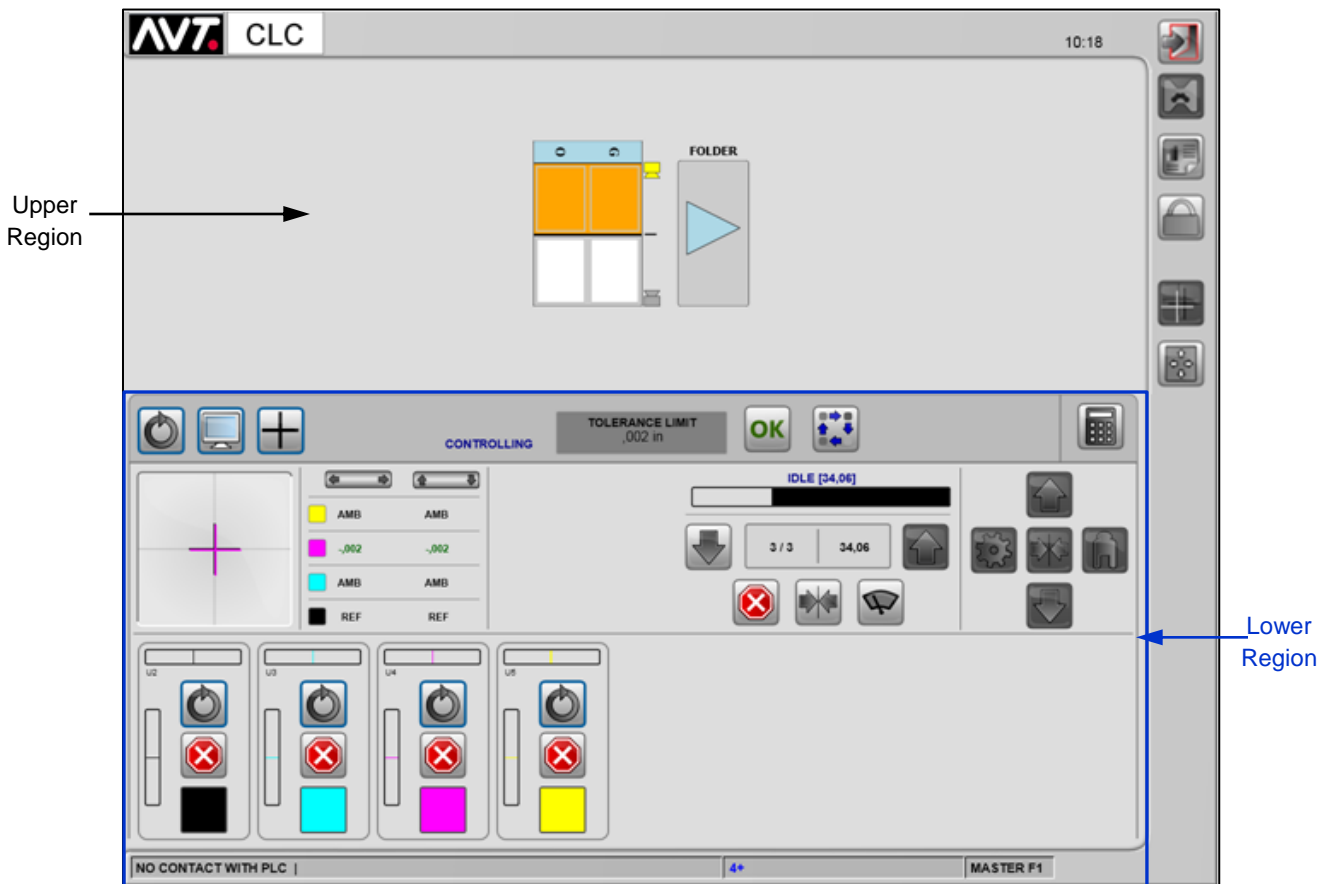
5.2   Registration Menu - Lower Region

The lower region consists of the:

- Status Bar (Top)
- Monitor
- Adjustments buttons
- Motorized Camera Transport
- Register Monitor
- Status Bar (Bottom)

Status Bar (Top)

At the top of the lower region is a status bar.

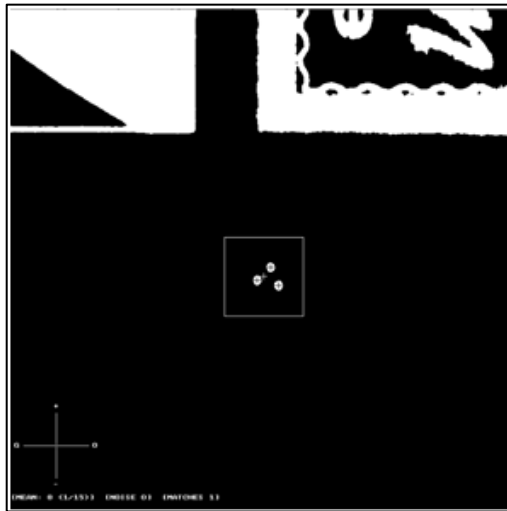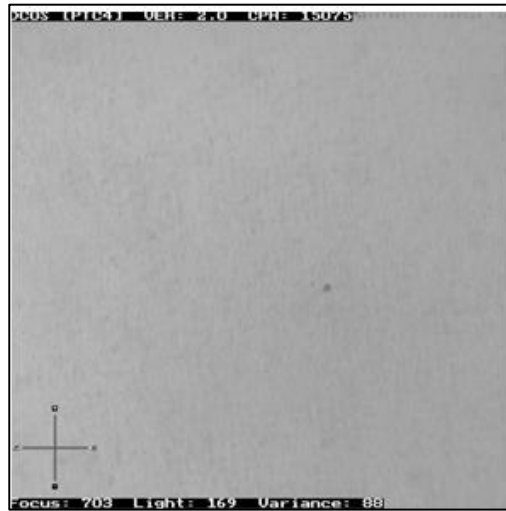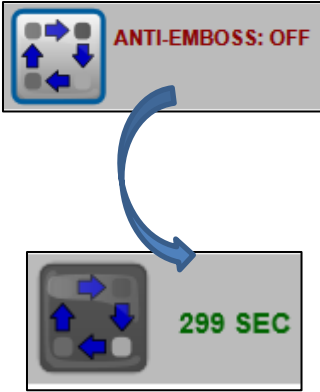| Mode icon	Touch the **Mode** icon to switch between Manual and Automatic mode.
 Manual Automatic	➢ In Manual mode no registration moves are issued. ➢ In Automatic Mode the register motors are controlled by the SnapREG system.
Image button	Touch the **Image** button to display an image from the scan head.
	The service image has two positions and shapes as shown below. The screen always shows the selected scan head that can be used to locate the register marks if the lateral position is not correct.
	➢ The left image shows a service image, which displays when the device is in Manual mode.
	➢ The right image displays when the camera is in Automatic mode.
	Touch the image to close it.
	Note: Images are only available on the Master Console.

| Image – Manual mode | Image – Automatic mode |

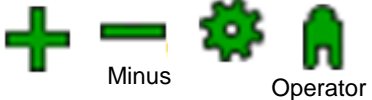|	
Reference Color icon	Touch the **Reference Color** icon to control the surface's reference color. The color of the icon's cross will change to indicate the selected color while cycling through the available print units. An operator adjustment of the reference color will automatically affect all colors in the same direction.
Error icon	The **Error** icon will appear if there is an error. Detailed information and procedures for recovery may be found in the lower region of the display. Note that this symbol can only be displayed when the unit has a motorized transport installed.
Status	A status bar shows the status of the surface in text form. The following texts may be displayed: • **Offline** – System has no connection with camera control box. Check power to camera control box to ensure Ethernet cables are connected properly. • **Idle** – Unit is in manual mode or waiting for ink-on signal delay to clear. • **InkOnDelay** – Time delay after ink-on in order to allow paper to be clean of excess ink. • **Searching** – Device is active and looking for register marks. • **Controlling** - Registration marks have been found and system has locked on to them. SnapREG automatically controls register if in automatic mode.

Anti-Embossing icon	Anti-embossing is used at regular cycles to move all the plates in predefined patterns to prevent pilling, etc. on the blanket. Range and size of adjustments vary and are set during installation of the system. Typically, a 10 minute interval is used with a .002 step.
	Touch the **Anti-Embossing** icon to activate Anti-Emboss. Adjustments occur only when ink-on is enabled and SnapREG is in Automatic mode.
	Anti-embossing is a global function and applies to all print units. This means that the feature is activated and deactivated for all print units by the same key. When Anti-Emboss is activated, there is a countdown to show how much time will elapse before the next Anti-Emboss move occurs.

Monitor

In the middle of the lower region is a monitor display.

This display shows the current deviation of each unit for each page. Also shown are the units that are currently making a movement. Below is an explanation of the symbols that can be displayed.

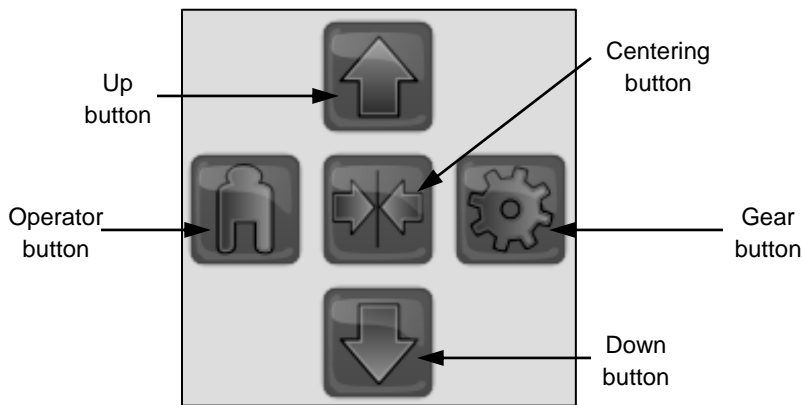|	Indicates direction.
	Shows the register is in end position. Units cannot be moved further in this direction.
	Centering symbol that disappears when the cycle is complete. This only works if the register motors have limit switches on all motors.

Current data from each color generates a record cross-hair in the monitor. This cross gives a good overview of how registration between the different colors at the moment looks. Beside this cross-hair display is the current deviation from the reference color in 1 / 100 mm.

Reference color is designated as **REF**. Alternatively, the following text appears:

- **MIS** (Missing) - Indicates that the mark cannot be located.

- **AMB** (Ambiguous) - Indicates that there was more than one valid mark found on the previous reading.

Adjustments

To make a move or adjustments on a print unit, touch the display for the unit/color.

	To advance, press the **Up** button and enter the distance to be moved in the pop-up window on the screen.
	To retard, press the **Down** button and enter the distance to be moved in the pop-up window on the screen.
	To move to the operator, press the **Operator** button and enter the distance to be moved in the pop-up window on the screen.
	To move to the gear, press the **Gear** button and enter the distance to be moved in the pop-up window on the screen.
	Use the **Centering** button to center plate motors on a print unit. This is only possible when register is in Manual mode and if all register motors (circ and lateral) have functioning limit switches. The middle position can be the center between two limit switches or a specified value depending upon the installation. Confirm the centering in the pop-up dialog that appears.

Motorized Camera Transport Controls

Feedback is displayed as text and graphics for the scan head position on the transport. The number in the left box indicates which of the pre-programmed positions is being used. The number in the right box is the absolute position in centimeters.

pre-programmed positions

Absolute position

IDLE [111]

1 / 4   111

Clear Error button

Wash-Up Mode button

Calibration buttons

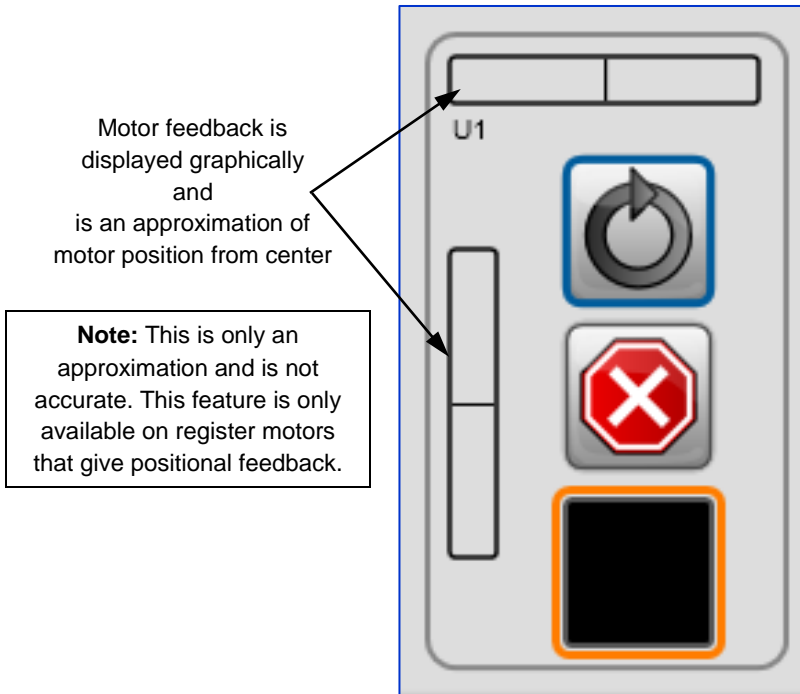|	
	Pressing **Down** arrow moves head to previous pre-programmed position. Pressing **Up** arrow moves head to next pre-programmed position. Select a position and a pop-up screen comes up to enter a new lateral position for the position number currently selected.
	When you use the **Calibration** buttons, the transport performs the calibration sequence measuring the width and setting the zero position. This must be done each time the PLC is restarted.
	Use Wash-Up mode button to move carriage to service position. This position is the maximum to the gear or operator side, and will vary for each installation. When the button is dark gray (pictured right) the transport is in the service position. Press the **Wash-Up Mode** button to return to normal running mode. In the service position, it is easier to perform maintenance on the scan head such as cleaning the glass,
	Use the **Clear Error** button to clear a transport motor error.
	When the Alarm icon appears, it means that one or more alarms or alerts are active from the transport. Press the **Alarm** button to display a pop-up dialogue to the right. This dialog provides information about what has occurred. The alarm reset button is at the bottom of the dialog box.

Register Monitor

At the bottom of the lower region is the register display.

Motor feedback is
displayed graphically
and
is an approximation of
motor position from center

Note: This is only an
approximation and is not
accurate. This feature is only
available on register motors
that give positional feedback.

U1

Auto Manual	Monitoring can be set in **Manual** or **Automati**c mode. In Manual mode, there are no automatic data adjustments.
Reset	The **Reset** button can be used to interrupt current motor moves and clear the current offset.

If SnapREG is having difficulty finding the marks, likely causes are:

- The scan head's glass is dirty.
  Solution: Clean the glass.

  Note: Use a household glass cleaner or alcohol to wipe the lens and then wipe clean with a soft, dry cloth.

- The scan head's lateral position is wrong.
  Solution: If the transport is motorized, re-measure location and enter it into the configuration. If the transport is manual, move head to the "click" into position.

- Marks are not dark enough to pick up.
  Action: Increase the amount of ink for the color that is too light.

- Marks are located on top of one another and flow together (mark overlap).
  Action: Make a move on one of the colors manually. If the plates are made properly, there should be no reason for the register marks to overlap.

- Marks are too small.
  Action: Ensure that any plate correction curves in pre-press have not been applied to the marks.

Status Bar (Bottom)

There is a status bar at the bottom of the lower region that displays:

- PLC status
- Configuration name
- Master or Slave

| NO CONTACT WITH PLC | | 4+ | MASTER F1 |

PLC status   Configuration name   Master / Slave
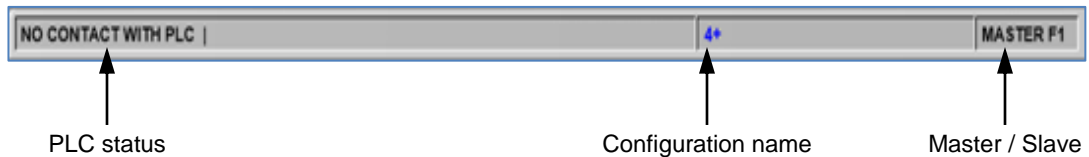
6   Using Cutoff Control (Optional)

The cutoff control feature is a purchased option provided on some presses.

There may be more than one cutoff control on any given press, even if there is only one web. For example, an M600 press may have an upper and lower compensator. This requires two cameras / transports and would control separate compensators. If this press also has a sheeter, there would be a third camera/ transport and yet another compensator.
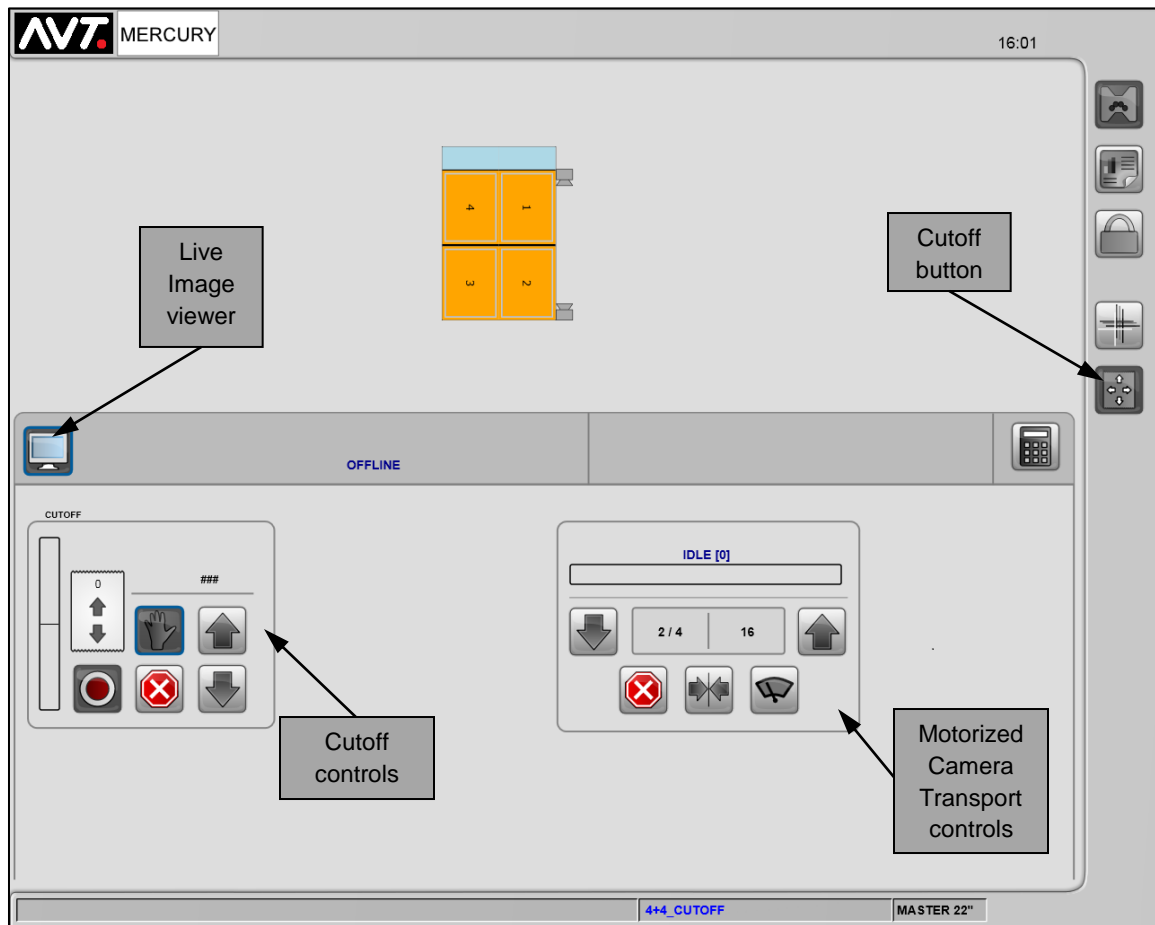
Cutoff Button

When cutoff control is provided, a **Cutoff** button is added to the main run screen.

Live Image Viewer

The **Live Image Viewer** button works the same as the Image button on the Registration menu.

Motorized Camera Transport Controls

The Motorized Camera Transport controls work the same as on the Registration menu. These motorized controls are optional; manual transports are standard.

Cutoff Controls

Use the cutoff controls to make adjustments to the cutoff position.
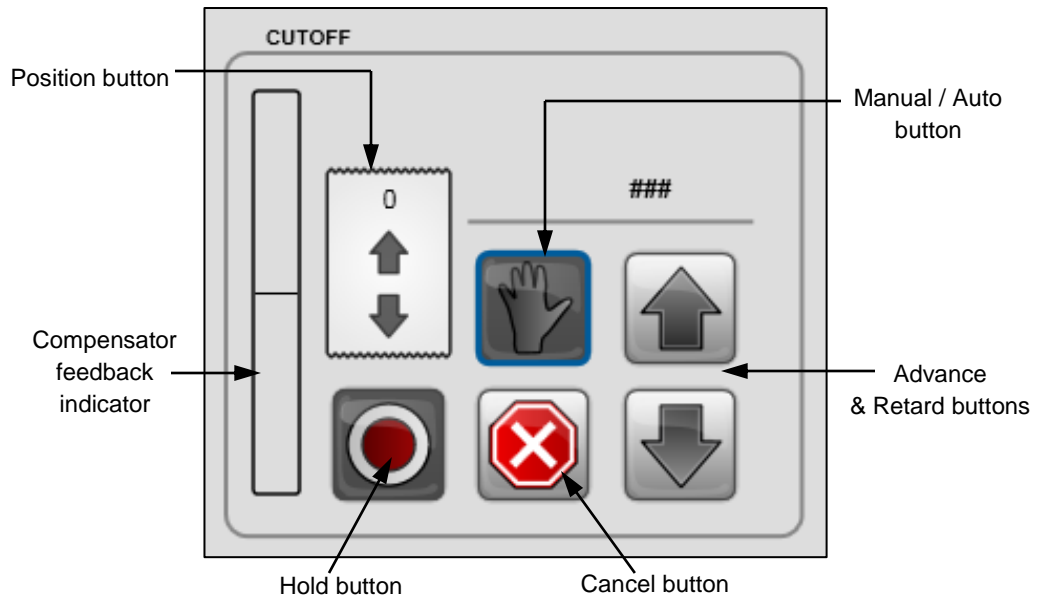
|	
	Compensator feedback indicator. View the current compensator position.
	Position button. Use to manually move compensator to achieve desired cutoff.
	Hold position button. Use to hold the cutoff position.
	Manual / Auto mode selection button. Use to set cutoff in Manual or Automatic mode. In Manual mode, there are no automatic adjustments.
	Cancel button. Use to cancel current adjustments and clear the current cutoff.
	Advance button. Press and enter the distance to be moved in pop-up window.
	Retard button. Press and enter the distance to be moved in pop-up window.

6.1 Cutoff Adjustments

When a new configuration is loaded, the cutoff control starts in Manual mode (open loop) by default.

1	Begin press makeready.
2	Make sure the web is centered in the press, with sufficient ink density on the cutoff mark (minimum .65 density). Then ensure that the desired cutoff camera is searching in the correct location of a cutoff mark.
3	Manually move the compensator to achieve the desired cut. This can be done with a manual override switch or from the SnapREG GUI.
4	Once the cutoff camera is scanning the mark and you have the cutoff where you want it, select the **Hold** button. You will get a prompt to FREEZE REGISTER.
5	Select the **green check mark**. The delta should go to zero or near zero. (It will be a floating number around zero. The amount of variance depends on how stable the web is.)
6	Select the **Auto** button to hold the cutoff where it is.
7	To make further adjustments to set position, select the **Advance** or **Retard** button and then enter the desired amount of movement from the keypad.

6.2   Phaser Controls

A separate Phaser control is a purchased option provided on some presses that do not have alternate press controls to operate them. This is typical on some Harris in-line presses.

Phaser control is not part of the automatic, color-to-color register. That is to say, register control will not automatically move phasers during closed loop register. These controls are only used on a manual basis. You simply select the desired unit and advance or retard the unit the desired amount.
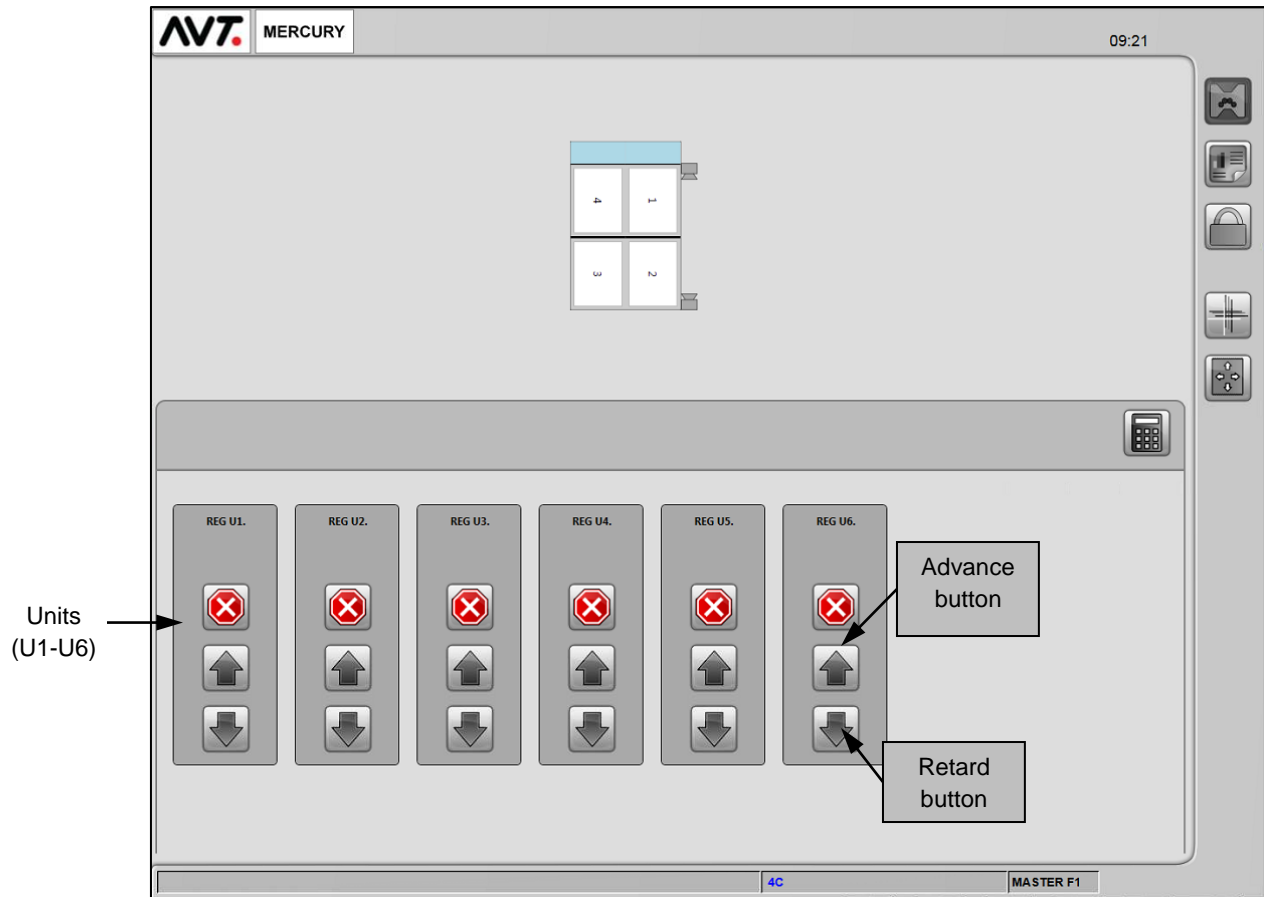

Note: Phaser control, as used here, does not apply to a 4-high tower. In the case of a 4-high tower, the belt phasers are used for the circumferential adjustment of the 13 side cylinders and do not have the separate controls as described in this section.

7 Using the Configuration Menu

The configuration menu is used to configure the SnapREG units to be included in the upcoming production.

7.1 Start Screen

To enter the configuration menu, touch the **Configuration** icon on the right of the screen. The START screen will open.
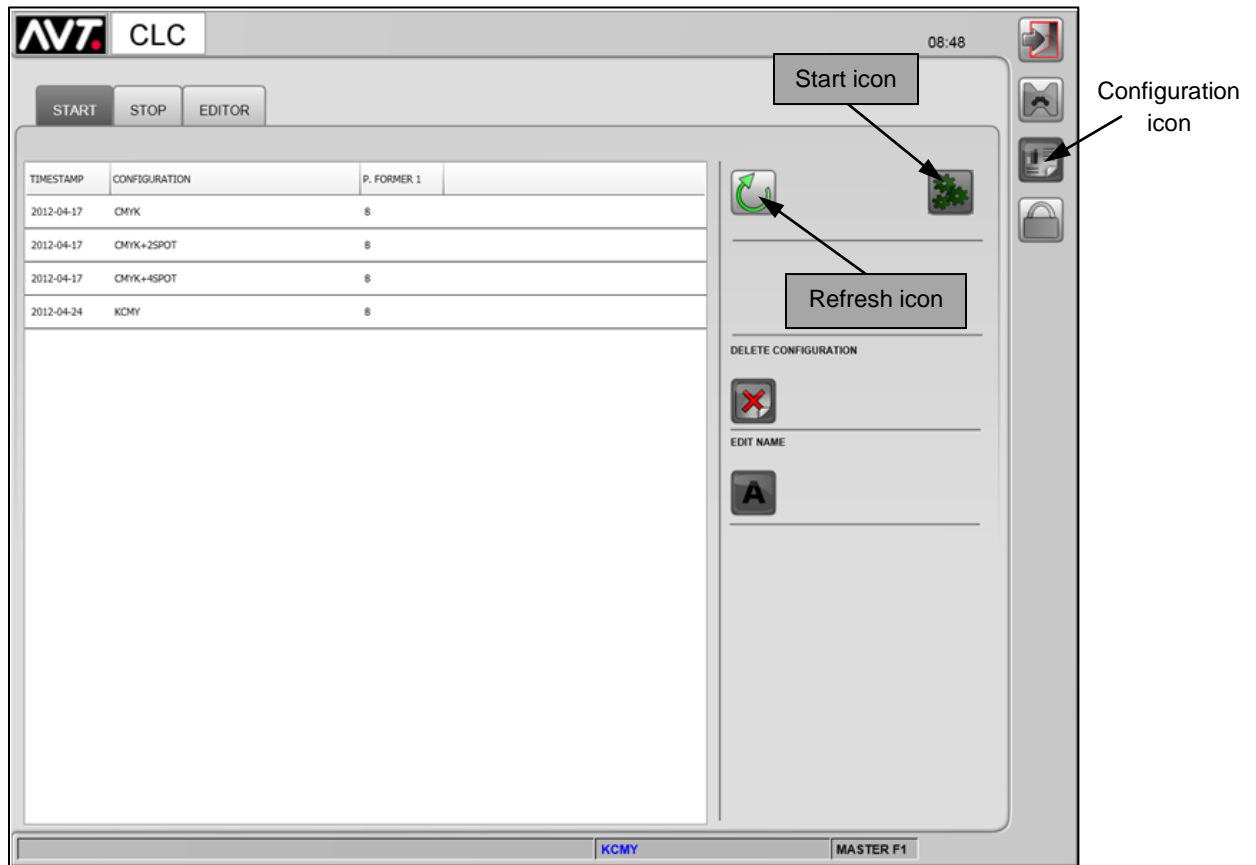

The active configuration is displayed in the status bar at the bottom of every screen.

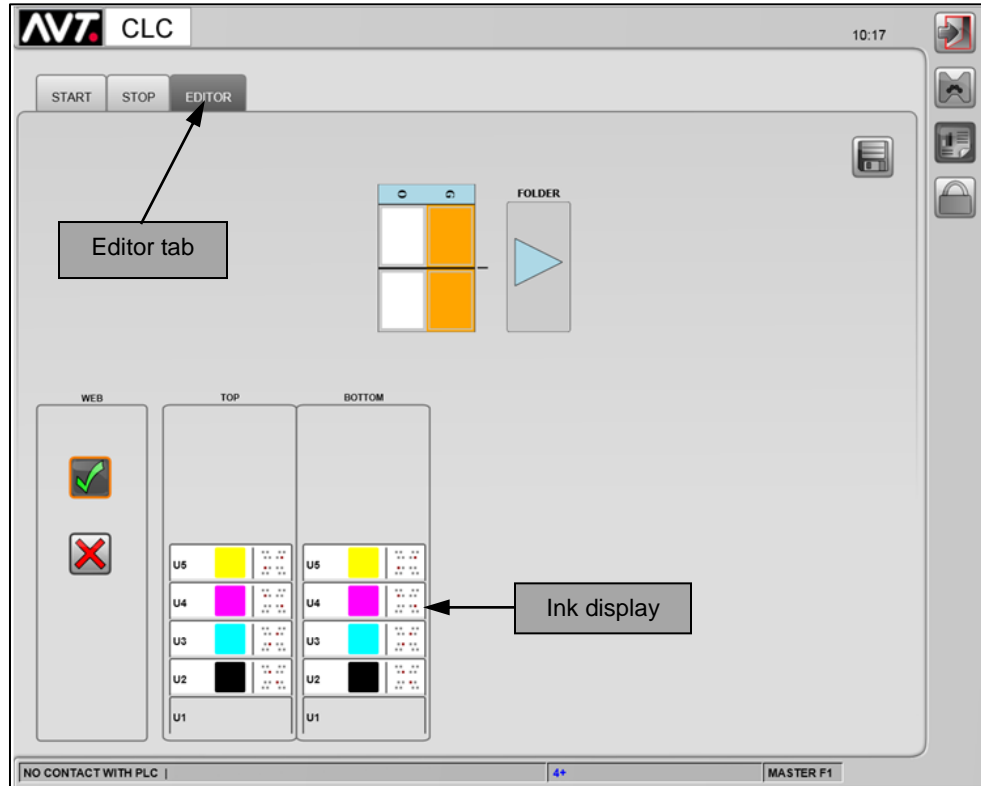|	
	If there is no active configuration, one may be started by selecting it from the list and touching the green **Start** icon. Touch the confirmation box to exit.
	A selected configuration may be deselected or the list may be refreshed by touching the **Refresh** icon.

7.2   Stop Screen

To stop the active configuration, touch the **STOP** tab on the configuration screen and then touch the red **STOP** icon and confirmation box to exit.
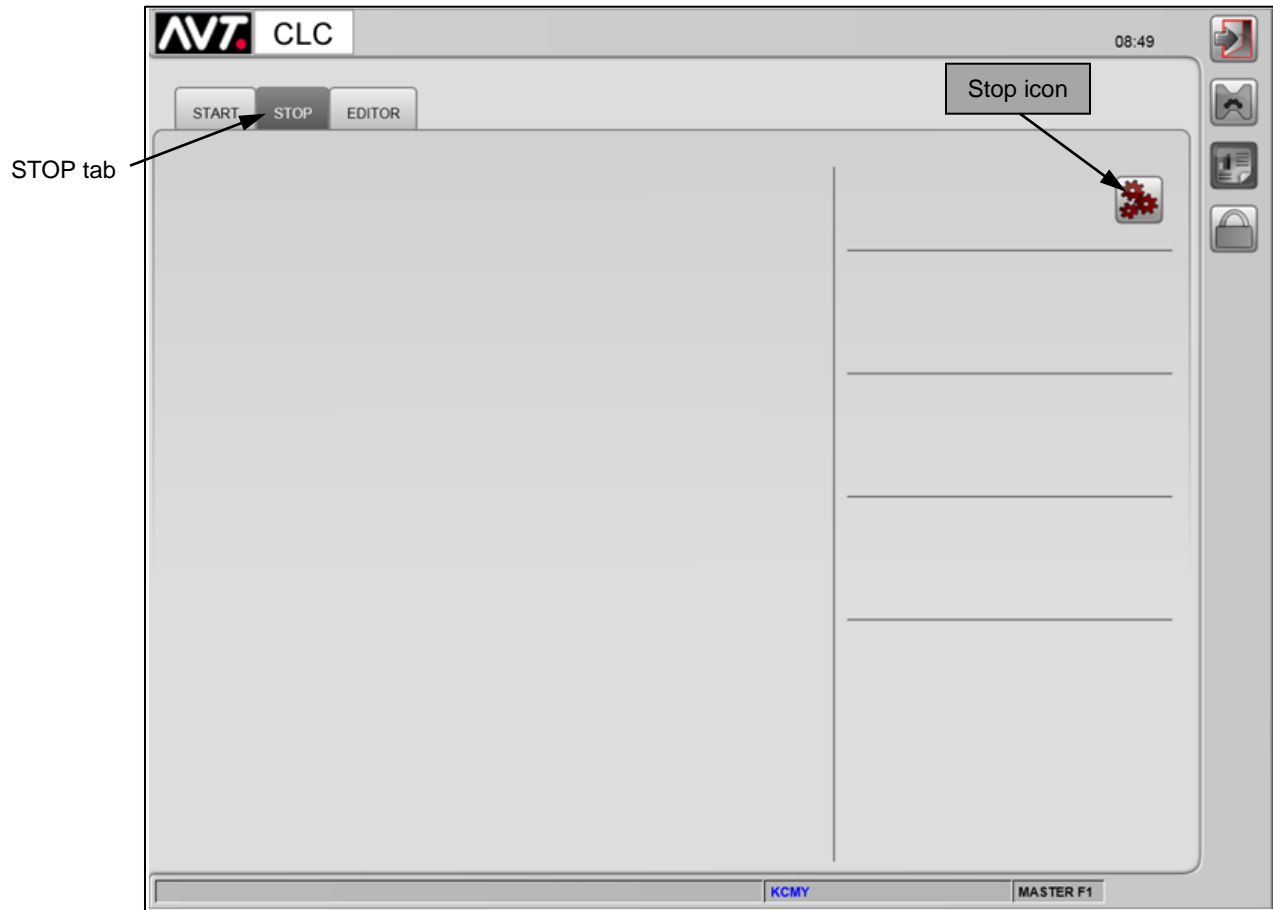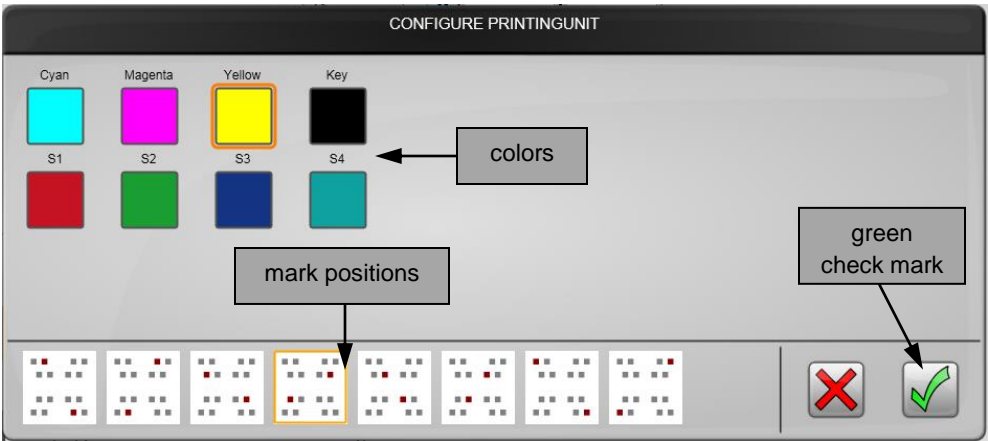
7.3   Editor Screen

|	
1	To enter a new configuration, touch the **EDITOR** tab. **Note:** This tab does NOT edit an existing configuration; you can only create new configurations. If you have a configuration you wish to change, you must create a new one and then delete the old one.
2	In the upper portion of the screen, select a **surface** from a web to see the WEB and the available units in the INK display on the lower portion of the screen. Each surface (top and bottom) must be set up separately. This allows for multiple combinations of colors and register pattern assignments to be used in the same unit number for those situations that require it.

3	Touch a **print unit** in the INK display on lower portion of the screen to assign a color and mark position to the print unit. The following screen displays.
4	Touch a **color** to select it, touch a **mark position** to assign the pattern to the selected color/unit, and then touch the **green check mark** to complete the configuration of the print unit. Touch the next print unit and assign a color and mark position, and continue until all required print units have been configured.
5	To **REMOVE** a color from a unit, just deselect all colors and then select the green check mark. This will remove the color and any assigned pattern from that unit.

In the example above, you can see the color yellow being assigned to its normal mark position of 4. Note that the yellow and Mark 4 icons are highlighted.

Normal assignments are:

- **Black – Mark 5**
- **Cyan – Mark 6**
- **Magenta – Mark 3**
- **Yellow – Mark 4**

The non-process colors are usually assigned as needed. The actual assignment of color to pattern number will depend on how your Pre-Press department plated the job. The pattern numbers are shown in this example.
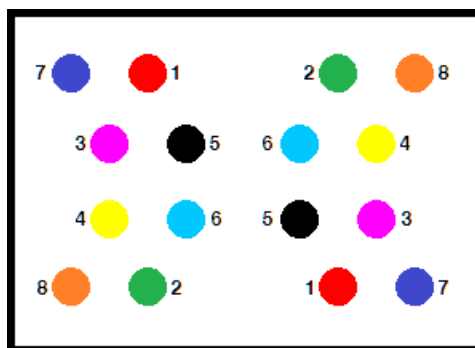
Helpful Hints

To **REMOVE** a color from a configuration, simply de-select the color selected and then select the **green check mark** (✓). This will empty the unit of any color.

To run a **VARNISH**, set up the configuration normally and select any unused color / mark combination. However, when running the configuration set the Varnish unit to MANUAL mode. This way, you can still manually move the register on the varnish unit when required.

When the configuration is complete, touch the **Save** icon (💾) in the upper right to save. A keyboard will appear on the screen.

Enter **name** (maximum 44 characters) and then touch the **green check mark** (✓) to confirm the name and exit the Editor.

**Delete and Edit Keys**

	Delete Configuration	The **Delete Configuration** and **Edit Name** keys require secure access to operate.
	Edit Name	Follow the instructions in Section 8 (User Level) to unlock these functions.

7.4   Register Mark Geometry Options

Cutoff Mark

There is only one cutoff mark size available and it will work with both low quality and high quality paper substrates. The cutoff mark is directional. Think of the mark itself as an arrow.
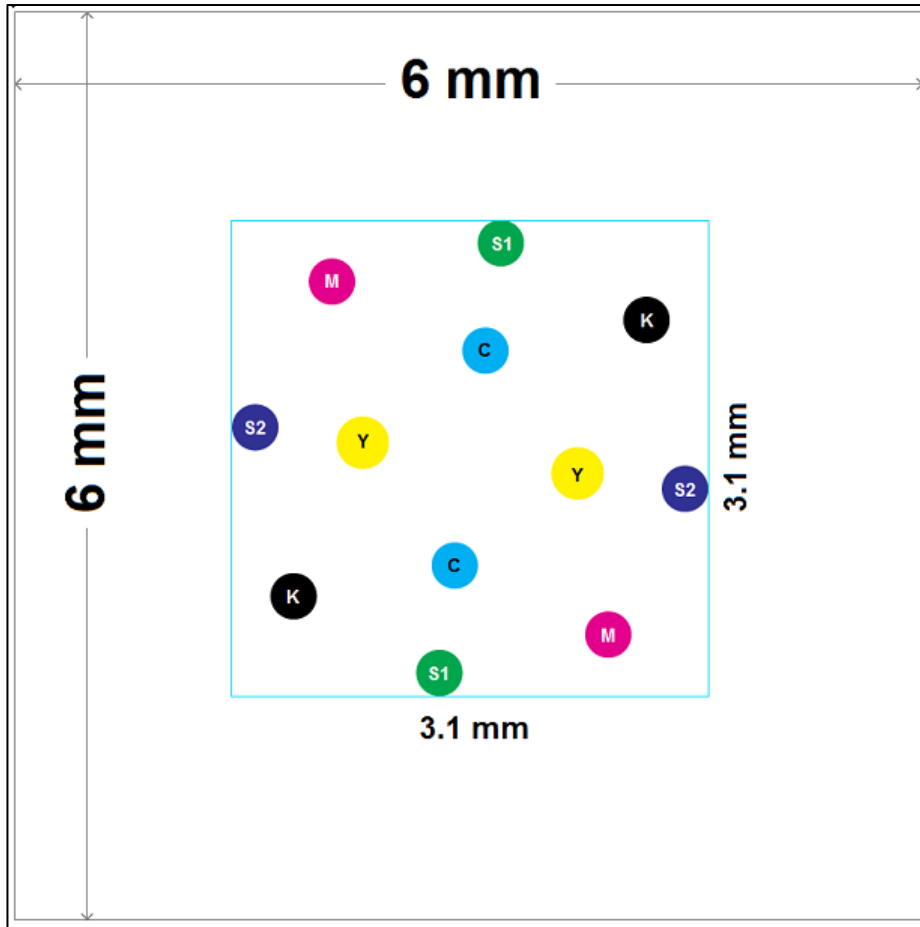
In the illustration below, the tip of the arrow is pointing up. This is also the direction of web travel.
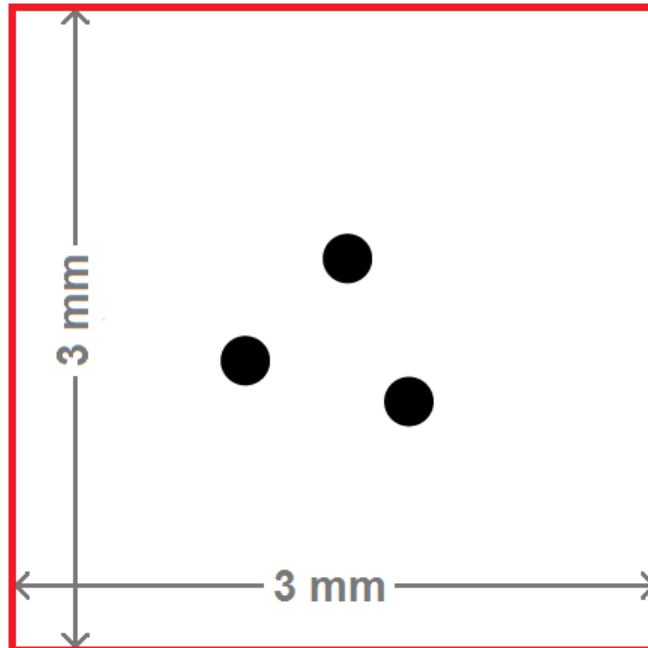
This mark may be provided in colorbar artwork when combined with an AVT Clarios system.

6C Mark

Below is an illustration of a 6C mark with the recommended minimum white space.

Some advantages and disadvantages of a 6C mark include:

- Requires more circumferential white space (slightly more than a 2mm colorbar).
- Allows for automatic control with greater mis-register deltas.
- Allows for greater mis-register deltas without element overlap.
- Larger element dots allows for wider range of rough paper substrates.
- Only available to a maximum of 6 colors.
- This mark may be provided in colorbar artwork when combined with an AVT Clarios system.

8C Mark

Below is an illustration of an 8C mark with the recommended minimum white space.
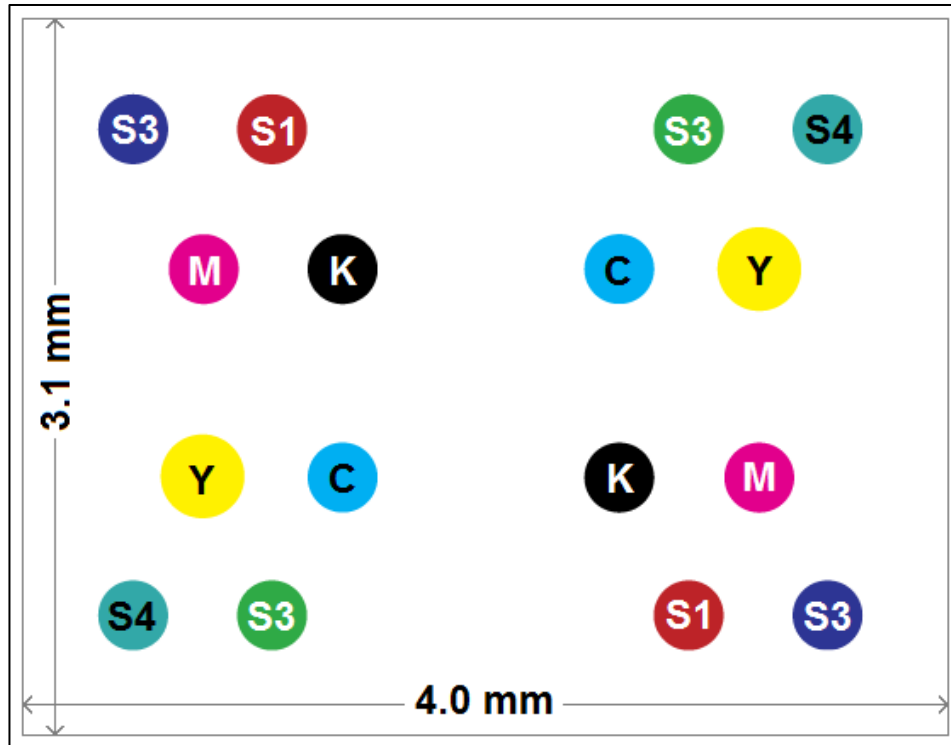
Some advantages and disadvantages of an 8C mark include:

- Requires less circumferential white space (fits within a 2mm colorbar height).
- Limited mis-register deltas for automatic control (may need to require manual adjustment to move elements out of printed area).
- Limited mis-register delta before element overlap occurs.
- Smaller element dots only suitable for smooth or gloss paper substrates.
- Available to a maximum of 8 colors.
- This mark may be provided in colorbar artwork when combined with an AVT Clarios system.

8   User Level

SnapREG is built with two different levels of security, in order to protect certain parts of the software against unauthorized access.

The security settings can vary from plant to plant, although the password is specific to the plant, since the functions have preferences for whether they should be password protected or not.

Your assigned password is: _____

1		Press the **Lock** icon to enter the user level password entry.
2		Enter the **password** on the keypad.
3		When a correct password has been entered the **Close** button appears in the upper right corner.

Locking is done by entering an invalid password. The system is locked at boot-up by default.

9   Popup Dialogs

On occasions when the system expects the operator to provide an acknowledgment or a new value, a popup/dialog box appears on the screen.

NOTE: When the system displays a popup on the screen, the operator must respond to it before any other operations can be performed.

These are examples of two different popups.

Enter the desired value and click **OK** (✓) to confirm your entries. Click **Cancel** (✗) to exit without saving your input value.

10 Physical Technical Specifications

Weight and size varies depending on the width of the press and the transport option.

Camera Control Module

> Average Weight: 20 lbs./9.0 kg.
>
> Average Dimensions:
>
>> Length: 23.6 in./0.60 m.
>>
>> Width: 8.3 in./0.21 m.
>>
>> Height: 15 in./0.38 m.
>
> Noise Pressure Level at operator station: < 70dB(A)

Register Interface Box

> Average Weight: 20 lbs./9.0 kg.
>
> Average Dimensions:
>
>> Length: 24.1 in./0.61 m.
>>
>> Width: 10 in./0.25 m.
>>
>> Height: 5.1 in./0.13 m.
>
> Noise Pressure Level at operator station: < 70dB(A)

Scan Head and Transport

> Average Weight: 20 lbs./9.0 kg.
>
> Average Dimensions:
>
>> Length: 51.2 in./1.30 m.
>>
>> Width: 5.2 in./0.13 m.
>>
>> Height: 3.1 in./0.08 m.
>
> Noise Pressure Level at operator station: < 70dB(A)

Revision History

Revision Date	Revised By	Version	Section/Page Numbers	Revision Description
11/26/2012	RWR	A	All	Initial release.
4/15/2013	TLR	B	8-15, 17, 18, 21-23, 27	New screenshots, features, and descriptions.
3/18/2015	SL	C	1 and 2	Updated address and logo.
12/18/2107	SW	D	All	• Changed all GMI to AVT. • Changed references to Clarios to be Clarios or Mercury. • Updated screen shots, as needs. • Added new features – Cutoff Control, Phaser Control, and Register Mark Geometry options.