



ABM International, Inc.

M-Series INNOVA
Lightning Stitch
Stitch Regulation User Manual

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Overview

INNOVA M24 Lightning Stitch Controller and User Interface

The Innova M24 is equipped with a machine controller that handles all the electronic functions of the machine. The controller performs the following tasks:

- stop and start the sewing motor
- maintain and adjust sewing speed
- perform needle positioning - up and down
- display sewing speed
- display thread break
- display electronic error messages in case of failure
- maintain stitches per inch
- deactivation of stitch regulation if idle for more than 20 seconds

The user interface provides the Innova user the ability to modify settings of the lightning stitch regulator as well as maintain and troubleshoot problems if needed. When the Innova is turned on, the Lightning Stitch controller and interface will take a few moments to boot – usually 30 seconds to 1 minute. The boot up procedure allows the controller to check that all components of the system are functioning properly. If problems are detected, the controller will notify the user through the user interface. Though not required, it is recommended that the machine be allowed to boot up completely before attempting to operate the machine. This will ensure that all components function properly. Upon completion of a successful boot sequence, the main user screen will be displayed.

The system has been engineered in such a way that the interface is not imperative to the operation of the system. This means that if the interface were to fail, the lightning stitch assembly would still function and operate based on its last parameter settings for stitches per inch and quilting mode. However, without a working interface, the settings would be unchangeable.

The user interface allows the user to make choices to adjust the tasks and features to their specifications. A blue button indicates the status of that button's function setting as ON, while a gray button indicates the button function setting as OFF. The green buttons are needle action buttons. Pressing a green button will cause the needle to move so precautions must be taken to avoid accidental stitches.

Accessing the User Interface

When the Innova is powered ON, the machine controller User Interface defaults to the main screen (Figure 1.0) after complete boot sequence. If the User Interface is not interacted with for a period of 5 minutes, the Sleep Screen (Figure 2.0) will appear. Tapping on the Sleep screen will “wake up” the application software so the user can access the User Interface. If waking from the sleep screen during use of the INNOVA system, the last screen open will re-open.

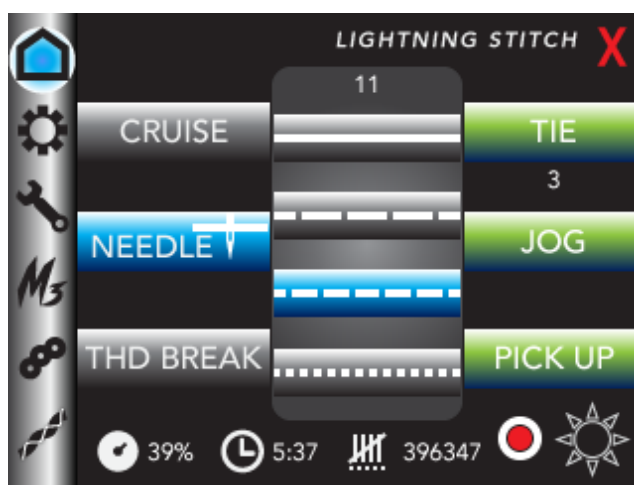


Figure 1.0 – Main Screen



Figure 2.0 Sleep Screen

Screen Selection Side Bar

Located vertically down the left side of the Innova sewhead computer user interface, the Screen Selection Side Bar (Figure 3.0) allows you to select the desired screen. The blue dot indicates the current screen selection. AutoPilot Mach 3, Sequins, and Couching screens are only accessible if you have purchased and installed these options. Tap on the icon to open the desired screens.

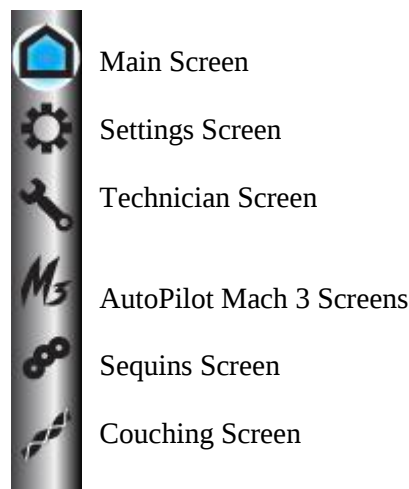


Figure 3.0 Screen Selection Side Bar

Main Screen

The main screen (Figure 1.0) provides all the needed settings for quilting on a day-to-day basis. The screen contains buttons that allow access to additional screens where more technical parameters may be adjusted. Choose from Manual or 3 preset Stitch Regulated modes. The user can set the Cruise Control, Needle Down, and Thread Break Sensor to on/off, or right click to enter Cruise Control and Thread Break settings. The green “needle action” buttons activate Tie, Jog, and Pick Up functions. Bobbin percentage, stitch Time, and stitch Count can be re-set and display current status. Buttons for the Innova laser and lights are in the lower right corner. The red X in the upper right corner is the exit button that will allow the user to exit out of the user interface software and access the computers operating software. Only access the operating software if instructed to do so by an ABM technician. If the button is accidentally pressed, cycle the power of the machine OFF and then back ON to re-boot the system.

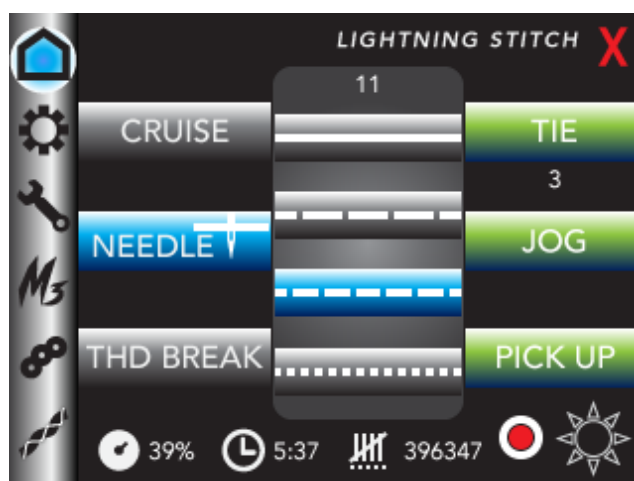


Figure 1.0 Main Screen

Cruise Control

Cruise Control is used with Stitch Regulation. When turned ON (Figure 4.0), the Innova will continue to stitch at the set minimum sew speed whether the machine is moving or not. When turned OFF (Figure 5.0), the Innova will only stitch according to preset stitch regulation when moved. Right click to set the minimum sew speed on the pop-up keypad entry. The set minimum sew speed will be displayed below the CRUISE button.



Figure 4.0 Cruise On



Figure 5.0 Cruise Off

About Cruise Control

Cruise Control is used only with Stitch Regulation. Using stitch regulation means that stitch length is controlled by the machine. The faster you move the machine, the faster it stitches, keeping the stitch length consistent. Cruise Control is a type of override to the stitch regulator. It provides a minimum speed setting which keeps the machine stitching even if the user has slowed or stopped the movement of the machine entirely. Cruise control has been used in the industry to combat large stitches when accelerating the machine from a stand-still or in sharp corners. The accuracy of Lightning Stitch eliminates the necessity of this feature for that purpose. ABM recommends use of the Innova stitch regulation without Cruise Control on. Use of Cruise Control creates smaller stitches than the set regulated stitch length when movement slows or ceases, thus creating inconsistent stitch length. There are some micro quilters who have found a use for this feature in a smoother sound and feel with the safety of a small regulated stitch if their movement becomes too fast. A typical setting for this style of quilting would be 300-500 on Cruise, with 17-22 stitches per inch set for regulation.

Needle Position

The Needle position sets the location of the needle when you stop sewing. The blue Needle Down button (Figure 6.0) indicates that the needle will stop in the down position when the Innova stops sewing.

The gray Needle Up button (Figure 7.0) indicates the needle will be up and out of the fabric when the Innova stops sewing. Tapping on the button toggles the selection between Needle Up and Needle Down.

*Needle Down is NOT available when operating AutoPilot or Navigator computerized quilting systems. If the needle position is not completely up or down as expected, the needle UP position may be adjusted by accessing the technician screen and calling ABM International for assistance at 1.888.99QUILT (see Page 13). An ABM International Innova technician will provide you with a password.



Figure 6.0 Needle Down



Figure 7.0 Needle Up

Thread Break Sensor

The Thread Break Sensor will alarm when the thread break sensor registers the number of missed stitches as set. Right click to access keypad to set number of missed stitches. The set number will display below the button. Blue indicates the Thread Break Sensor is ON (Figure 8.0). Gray indicates the Thread Break Sensor is OFF (Figure 9.0).



Figure 8.0 Thread Break Sensor ON



Figure 9.0 Thread Break Sensor OFF

Stitch Controls

Click on any one of the four buttons (Figure 10.0) to choose between manual mode or three preset regulated stitch lengths. Blue indicates the current selection. The number display shows the speed if in manual mode, or the stitch length if in any of the three preset stitch regulated selections.

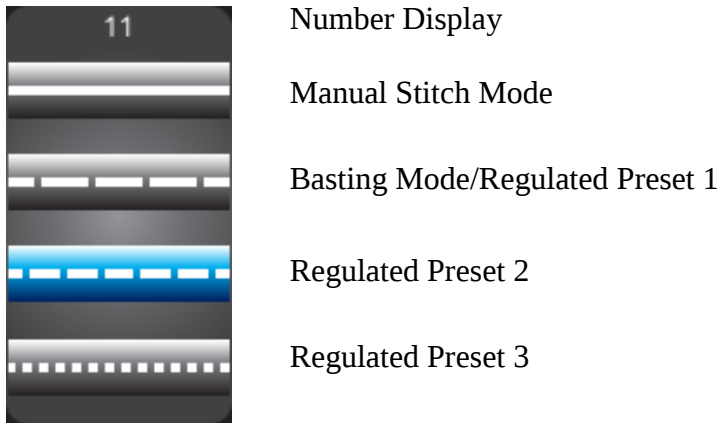


Figure 10.0 Stitch Controls

Manual Stitch Mode

Manual stitch mode runs the Innova at a constant set speed. The movement of the Innova sewhead then dictates the stitch length. The speed can be set by right clicking the Manual Mode button to access the keypad entry. The user may enter any number between 75 and 3000 RPM. The speed can be adjusted “on the fly”, or stationary, by holding down the right handle button to increase speed or holding down the left handle button to decrease the speed. The Manual Stitch button in blue (Figure 11.0) indicates selection of Manual Stitch Mode. Gray indicates the machine is not in Manual Stitch Mode (Figure 12.0).



Figure 11.0 Manual Stitch Mode ON



Figure 12.0 Manual Stitch Mode OFF

Stitch Regulation

Before setting the stitch regulator the user should understand the basics of the system. Stitch regulation is used to maintain stitches per inch during quilting. When in regulated mode the machine will automatically accelerate and decelerate based on the quilting user’s movements. This occurs when the encoders mounted on the tracks send digital pulses to the controller which in turn increases and decreases the voltage to the motor running the sewhead. The number of stitches per inch is fully adjustable from 3-22 stitches per inch. We recommend that you set your machine between 8 and 12 stitches per inch to achieve the best results. Once all the values are adjusted, the user may start stitch regulation. Press and release the right button (or left if you have programmed the controls to Start/Stop on the left handle button (see page 13)) on the handle bar. If Cruise is OFF or set to zero, the machine starts to sew only when the head is moved, maintaining the stitches per inch set. If Cruise is ON and set to some value other than zero, the machine will start to sew at the set speed. Stitching speed will only increase if the machine is moved fast enough to require a speed increase to hold the proper stitches per inch. (NOTE: Setting the Cruise too high may result in poor stitches per inch consistency).

Press and release the right handle button again to stop stitch regulation (or left if you have programmed the controls to Start/Stop on the left handle button). This will allow the user to move the quilting machine to a new position without

There are three presets for stitch regulation. The default settings give you a baste, medium, and small selection. The preset stitch per inch for any of these three presets can be changed by right clicking on the button to access the keypad entry. Any value between 1 and 22 may be entered. Touching the ENTER key will close the keypad and record the setting. Any value outside the range will be disregarded. Setting a value of 4 or less puts the Lightning Stitch regulator into AUTO-BASTE mode. This allows the user to move the machine at a slow speed and the machine will perform a rapid single stitch at the correct stitches per inch. The stitches per inch can also be temporarily changed by right clicking the display field to access the keypad entry. This will not change the settings for the buttons. Blue indicates the current selection, gray indicates unselected preset. See Figures 13.0 through 19.00.



Figure 13.0 Baste Preset ON



Figure 14.0 Baste Preset OFF



Figure 15.0 Preset Medium ON



Figure 16.0 Preset Medium OFF



Figure 17.0 Preset Small ON



Figure 18.0 Preset Small OFF



TIE, JOG, and PICK UP are all action buttons (indicated by the green color) that will cause the needle to move. Take all necessary precautions to prevent accidental stitching.

Tie

Click the TIE button (Figure 19.0) to make a tie off.

Set the number of stitches for this function on the Settings Screen (see page 12). The set number will display below the TIE button.



3 (set tie number)

Figure 19.0 Tie button

Jog

Click the jog button (Figure 20.0) to incrementally cycle the needle. This function is best described as an electronic fly wheel.



Figure 20.0 Jog button

Pick up

Click the pick-up button (figure 21.0) to cycle the needle one rotation for easy pick up of the bobbin thread.



Figure 21.0 Pick up button

Bobbin Counter

The bobbin counter (figure 22) displays the percentage of bobbin thread length remaining. This is a valuable tool that helps keep the user informed of the amount of thread left on the bobbin. The value is a countdown percentage based on the calculated sewing distance recorded by the controller. Click the bobbin display and click enter to reset the counter to 100%. Use the keypad to adjust the value if needed. The Bobbin Length value is the distance in yards of the thread on the bobbin. Larger thread sizes will allow less thread to be wound on the bobbin and thinner threads will allow more. Adjust the value as needed. In most cases, this will be an experimental value. An initial value of 100 to 120 is a good place to start. Make adjustments as needed.



Figure 22.0 Bobbin Counter

Timer

The Timer (figure 23.0) displays the time (hours and minutes) your machine has been running. This can be used to track run time for an individual quilt. Click the Timer to reset to zero.



Figure 23.0 Timer

Stitch Counter

The Stitch Counter (figure 24.0) displays the number of stitches, or cycles of the needle. Click the Stitch Counter to reset to zero.

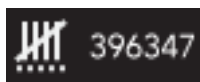


Figure 24.0 Stitch Counter

Laser Light

Tap the Laser Light icon (figure 25.0) to toggle laser light ON/OFF.



Figure 25.0 Laser Light icon

LED Light Control

Toggle through LED Light Control icons (figure 26) to reach desired light setting. The options are Bright, Dim, Black, and Off. White indicates bright light, gray indicates dim light, purple indicates black light, and white outline indicates light OFF.



Figure 26.0 LED Light Control icons

Settings Screen

The Settings screen (figure 27.0) allows you to set the sensitivity level of the Innova stitch regulation, enter the tie off stitch number, and program the Innova sewhead handle button controls.

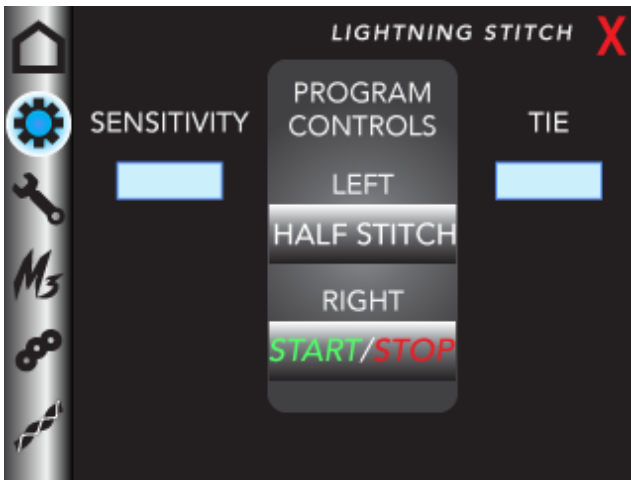


Figure 27.0 Settings Screen

Sensitivity

The Sensitivity setting can be set anywhere from 1 to 10, with 10 being the most sensitive. The lightning stitch motor reacts to movement of the sewhead and will fire more rapidly when the sensitivity setting is high. Click on the number field to access the keypad entry. The default number is 7 for this setting. The correct sensitivity is ultimately the user's choice, but ABM recommends the lowest possible setting for everyday quilting. If small intricate work must be accomplished, a higher sensitivity will help to ensure consistent stitches per inch. If higher speed work with long sweeping movements is to be performed, a lower sensitivity will help to smooth out the machine as sudden acceleration is not required.

Tie

Click on the number field to enter the number of stitches you prefer for a tie off. This number will display on the main page under the TIE button. This allows the user to set how many complete stitches the machine will make when the green TIE button is pressed on the main user screen.

Program Controls

This setting affects the functions of the buttons located on the left and right handle bars of the Innova sewhead. Toggle through the user interface program buttons until you reach the desired combination. The same function cannot be on both buttons. Start/Stop must be on one button with either Half Stitch or Full Stitch on the other button.

Technician Screen

The Technician screen (figure 28.0) is where you will find information an Innova technician may ask you for during a service call. This is where you set the home position of the needle relative to the motor. Additionally,

there is a total machine stitch count for the life of your machine, and the version number of the installed Lightning Stitch software.

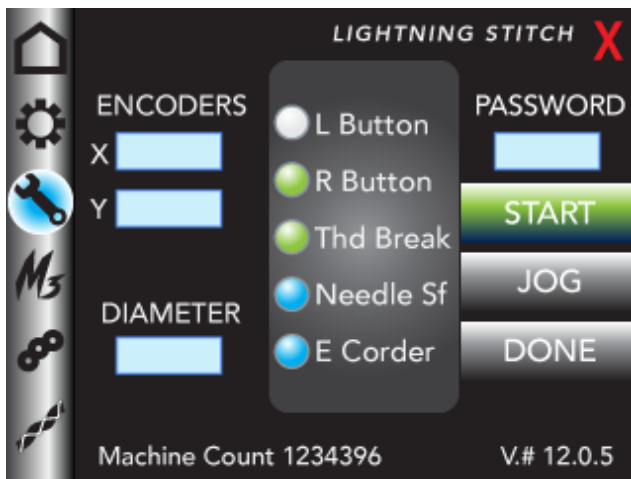


Figure 28.0 Technician Screen

Encoders

X and Y encoder display fields show activity of encoders. Moving the machine left or right will change the value of the X position. Moving the machine forward or backward will change the value of the Y position.

Diameter

The Encoder Diameter value allows the user to alter the factory setting for different diameter wheels. The user should not have a need to change this value unless instructed by the factory to do so. A smaller value will decrease the actual stitches per inch and a larger value will increase the stitches per inch. Only small adjustments, plus or minus 0.02, should need to be made if any. The default number for the Diameter field is 1.24. Do not change this number unless instructed by an Innova technician.

Indicator Lights

The indicator lights allow the Innova technician to verify the status of electrical components. Pressing and holding the button will change the color of the specified lamp. Releasing the button will return the lamp back to its original color.

Password

The Password field is where you will enter a password given to you by an Innova technician in order to gain access to adjust the needle UP position (or home the needle position relative to the motor). Once accessed, the START, JOG, and DONE buttons will turn green when they are available options. Pressing the START button will cycle the needle to predetermined location. JOG the needle by clicking the JOG button until the take up

lever is about one-half inch from the top of its stroke, on its way up and the needle is starting to move down. You may jog the needle down and up again if you pass the position. Once the take up lever is in the correct position click the DONE button and go back to the MAIN SCREEN. **Please note that correct adjustment is critical. "Damage" to fabric may occur if the needle position has not been set properly.**

Machine Count

The Machine Count is a display of the stitches for the life of the machine.

Version Number

The version number indicates the version of Lightning Stitch software currently installed on your Innova.

AutoPilot Mach 3 Screens

The AutoPilot Mach 3 Screens are only available if an AutoPilot Mach 3 system is connected to the Innova. The screens and available options change depending on actions taken by the user. These duplicate the options available on the AutoPilot computer interface.

Sequin Screen

The Sequin screen is only available if the Sequin Setter attachment is connected to the Innova. Settings for stitch and sequin size along with adjustment settings are located on this screen.

Couching Screen

The Couching screen is only available if the E-coder Couching system is connected to the Innova. Settings for stitch length are located on this screen.

Running Screen

When the green button is pressed to begin sewing, the text “MACHINE RUNNING” will display across the main user screen (See Figure 29). Pay close attention to the display. Certain stitch regulated modes will make the machine appear as though it is in a “no sew” mode when in fact it is waiting for the machine to be moved.

The “MACHINE RUNNING” text will inform the user of the machines enabled condition. The speed of the machine will display on this screen.

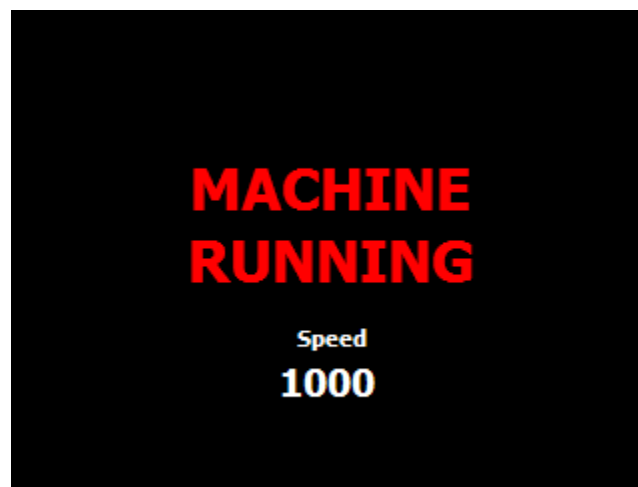


Figure 29.0 Machine Running

Fault Screen

In addition to the standard screens, Lightning Stitch contains fault screens that will help to inform the user and ABM technicians of problems that the machine might encounter (See Figure 30). The fault screen displays a list of descriptions preceded by a fault code number and a white check box. If the machine has a fault, the fault screen will appear, and a check box will be marked next to the current problem. Pressing RESET will attempt to clear the problem. If the fault screen disappears and does not return after pressing RESET, the problem has been fixed. If the fault screen reappears, it is necessary to contact ABM directly.

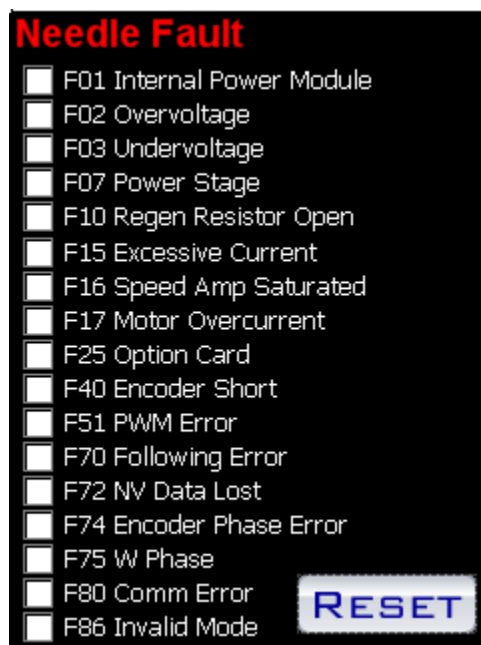


Figure 30.0 Needle Fault screen

Quick Reference

See page 13 for variations and options for Innova sewhead handle button programming (Program Controls). Changing the program controls will change the following steps accordingly.

Operating in manual mode –

Step 1: Quickly pressing and releasing the left-hand button will toggle the machine between needle up and down position.

Step 2: Press and release the right-hand button and the sewhead will start to run

Step 3: Press and hold the right-hand button and the sewhead will increase sewing speed.

Step 4: Press and hold the left-hand button and the sewhead will decrease sewing speed.

Step 5: Press and release the right-hand button again and the sewhead will stop.

Operating in stitch regulated mode –

Step 1: Quickly pressing and releasing the left-hand button will toggle the machine between needle up and down.

Step 2: Press any of the three preset stitch regulation buttons, the blue button will indicate which preset stitch regulation (SR) is activated.

Step 3: Press and release the right-hand button and the sewhead will start to run

Step 4: The faster you move the machine the faster it will run.

Step 5: The slower you move the machine the slower it will run.

Step 6: Press and release the right-hand button again and the sewhead will stop.

Step 7: Press and hold any of the preset stitch regulation buttons to change the value for that selection.

Step 8: The current stitches per inch will be displayed at the top of the center stitch selection panel on the main screen.