



# USER MANUAL

## **QUICK REFERENCE I/S-TURBO REV 1.2**

### **POWER UP**

When the power is turned on with the main power switch on the back of the machine, a needle positioning cycle is made. Check that there is nothing in the way of the needle before turning on the power.

While the machine is powering up sounds and lights give important setup information:

- ONE BEEP: the motion detector for constant speed is disabled.
- TWO BEEPS: the motion detector for constant speed is enabled.
- FOUR BEEPS WITH FAIL LIGHT FLASHING: the setup memory was lost or corrupted.  
NOTE that after the beeps the factory default settings are reloaded and the machine goes into setup mode.
- "RUN" LIGHT FLASHING: shows that the light is operational.

### **DUAL CONTROL**

All the controls are active on both sides of the machine, you can make a single stitch, position the needle, operate the thread cutter, turn on/off the channel lock and the laser from both sides. However, when the black start/stop switch is pushed on one side, the controls on the other side will be disabled, with the exception of the black start/stop switch that acts as an emergency stop. The stitching starts in a mode that was set by the dial on the side where the start/stop switch was pushed.

### **NEEDLE POSITIONER**

Hitting the button marked DOWN on the control panel will toggle between up and down needle positions. The light above the button is turned on when the needle is at the down position. The needle will return to the position that was set before starting stitching when the stitching is stopped with the black start/stop switch. If the needle is at the down position when the start switch is pressed, it will be pulled up before the stitching starts. NOTE that you should wait with moving the arm until the pull-up is complete to avoid needle flexing and breakage.

### **CHANNEL LOCK (if exists)**

The button marked CTRL on the control panel toggles between turning the channel lock on and off. The light above the button is turned on when the lock is activated.

### **DUAL CHANNEL LOCK (if exists)**

The first push of the CTRL button turns on the arm lock and the light above the button. Pushing the button again turns off the arm lock and engages the carriage lock. The light above the button flashes. The next push of the button turns off the carriage lock and the light.

### **THREAD CUTTER (if exists)**

The button marked CTRL on the control panel activates the thread cutter. Note that the thread cutter button is disabled during sewing and when the needle is not at the top position.

### **LASER CONTROL**

The button marked LASER on the control panel toggles the laser light on and off. The light above the button is turned on when the laser is on.

## **SINGLE STITCH**

A single stitch can be made by pushing the red switch on the front or rear handle. If the switch is held down, the single stitch will be repeated until the switch is released. NOTE that when the needle positioner is set in the down position, the single stitch is inhibited and a beep will sound when the single stitch switch is pushed.

## **ACCIDENTAL START PREVENTION**

The machine is protected from accidental starts triggered by a noise spike on the power line, or an accidental hit of the start switch. The start switch should be held down for about one sixteenth of a second to start either the constant speed or stitch regulator mode.

## **CONSTANT SPEED MODE**

The constant speed mode is selected when the selector dial is set anywhere between the 1 stitch per second and MAX. speed range at the moment when the black start/stop switch is pushed. NOTE that turning the dial to the stitch regulator side after starting will not switch to the stitch regulator mode, it will keep the 1 stitch per second speed setting instead.

## **NO-DRAG SLOW SPEED**

A unique IntelliStitch feature, the No-Drag Slow Speed eliminates the needle flexing and fabric stretching experienced at extremely slow constant speed settings. When the dial is set between 1 and 10 stitches per second the machine will run in a pulsed mode. Single stitches will be made starting from one stitch per second to 10 stitches per second. Above the 10 stitches per second marker the motor runs continuously, with variable speed, determined by the dial setting.

## **STITCH REGULATOR MODE**

The stitch regulator mode is selected when the selector dial is set anywhere between the B1 and S markers at the moment when the black start/stop switch is pushed. NOTE that turning the dial to the constant speed side after starting will not switch to the constant speed mode, it will keep the shortest regulated stitch length setting instead.

NOTE that although the selector dial is continuous, there are only seven discreet settings in the stitch regulator mode. The notch on the dial should be aligned with the SPI marker lines. If the notch is set, for example, between the 10 and 12 markers, the setting will NOT be 11 SPI, but 10 or 12, depending on which marker is closer to the notch. Similarly, if the notch is set between the stitch regulator and the constant speed scales when the start switch is pushed, no selection will be made and a beep will sound, indicating that the notch on the dial is not at a definite position.

In stitch regulator mode the motor will not start when the start/stop switch is pushed. The green RUN light will be turned on instead, indicating that the machine is "armed". The motor will start when the arm starts moving, and will continue to "fire" stitches according to the preset stitch length until the arm is stopped, or the start/stop switch is pushed again. If the start/stop switch is not pushed, but the arm movement stops, the needle will be pulled up and the machine will stay armed for about 8 seconds and the motor will start again when the arm is moved again. You can exit the stitch regulator mode by pushing the start/stop switch. Then the needle will return where it was set before the stitching started.

## **BASTING MODE**

If the selector dial is at the B1 or B2 setting when the black start/stop switch is pushed, the machine will make 1" or 1/2" long basting stitches. In the basting mode the arm should be moved carefully, watching the flexing of the needle. NOTE that the proper take up lever position is critical in the basting mode, if it is not high enough to release the thread from the hook between stitches, the needle return position should be readjusted.

## **STIPPLING MODE**

When the Stippling Mode (“S” on the dial) is selected, the machine will make about 16 stitches per inch. NOTE that at this very short stitch length the regulation may not be as accurate as at longer stitches, mostly due to the frequent speed and direction changes during stippling.

## **NEEDLE PULL-UP**

In those rare cases in the stitch regulator mode when the needle stays in the fabric when the arm movement abruptly stops, the I/S controller automatically pulls up the needle after about 1/2 second. It is not necessary to wait until the pull-up is complete. The controller will continue stitching when movement is detected during the pull-up.

## **LONG STITCH INDICATION**

The stitch regulator keeps the stitches at the selected length within wide arm movement speed range. However, the stitches will get longer when the arm moving speed approaches the speed limit of the motor. Every time a given stitch gets longer than twice the selected length, the red FAIL light will be turned on and a beep will sound. NOTE that the long stitch indication is turned on not only when the arm movement is way too fast, but when there is a sudden speed or direction change, usually at corners of points of the patterns.

The long stitch beep can be turned on/off by holding the DOWN key down while turning the power on. NOTE that this programming needs to be done only when you want to change the enabling of the long stitch alert beep.

## **HIGH SPEED REGULATED MODE**

In order to minimize long stitches, the controller detects high speed turns at points or corners and keeps the momentum of the motor at these points. As a result, the occurrence of long stitches coming out of points is greatly reduced. It is recommended to use the high speed regulated mode for pantographs and higher speed freehand work.

NOTE that the long stitch elimination works ONLY if the arm movement is fast enough to produce 20 stitches per second (e.g. 2 inches per second at 10 stitches per inch setting), AND you don't hesitate at the points or corners longer than 2/10th of a second. In other words, in the High Speed mode you need to move the arm without too much slow down and hesitation at the points, much like when using the constant speed mode.

## **PRECISION QUILTING MODE**

The Precision Quilting mode was added to the stitch regulator mode to smoothen the needle movements when slow speed quilting is necessary, like when stitching in the ditch, outlining, etc. To start the PQ mode the start/stop switch must be held down until a beep sounds, indicating that the PQ mode is active. The RUN light will flash slowly while the machine is in PQ mode.

NOTE that there is no provision for long stitch reduction in the PQ mode. You need to slow down going in, and gradually accelerate coming out of points or corners.

## **SPEED SENSITIVE STITCHING**

In the PQ mode the controller measures the arm moving speed and increases the speed of the precision stitch needle cycle when acceleration is detected. This feature allows for a moderate arm moving speed increase while still maintains the smooth stitching of the PQ mode.

## **MOTION DETECTOR FEATURE**

A motion detector feature was added to the constant speed mode. When it is enabled, the motor will not start when the start/stop switch is pushed. The green RUN light will be turned on instead, indicating that the machine is "armed". The motor will start when the arm is moved more than 1/16" in any direction, and will run with the preset constant speed, until the arm stops (does not move more than 1/16") for about 1/10 of a second, when the motor stops and the needle is pulled out of the fabric automatically. NOTE that the needle will be pulled UP even if the down position was set before the stitching started. The machine will stay armed for about 8 seconds and the motor will start again when the arm is moved again. You can stop the motor and exit the motion detector mode by pushing the start/stop switch again. Then the needle will return where it was set before the stitching started.

The motion detector feature can be turned on/off with a simple programming step. Holding the black start/stop switch down while the power turned on to the machine will change the motion detector enabling. NOTE that this programming needs to be done only when you want to change the enabling of the motion detector. The status of the motion detector enable is indicated by sound when the power is turned on: ONE beep indicates that the motion detector disabled, TWO beeps indicate that it is enabled.

## **NEEDLE JAM DETECTION AND RECOVERY**

If there is any minor obstruction against the needle movement (tighter spot in batting, seam under the needle, etc) that would cause the needle to slow down or stop moving, a slightly more powerful pulse will be applied by the motor to move the needle out of the jam. If after four such attempts the needle still does not move, the power will be removed from the motor and the red FAIL light and alarm sound will be turned on. This may be an indication that a bigger problem exists (thread trapped in the bobbin area, needle flexing, etc.), so the power should be turned off and the cause of the jam should be found and eliminated before the machine is turned on again.

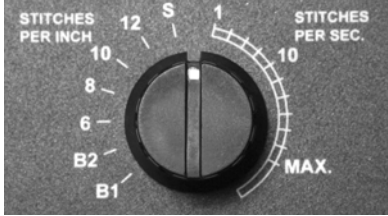
## **SETUP DATA SAFETY**

The setup data (motor speed and needle positions) are stored in the memory of the controller. This memory retains the data even if the power is turned off. However, in very rare cases, environmental effects (lightning, power surge) may damage the data. Every time the machine is turned on a data validity test is performed and the machine will go into normal operation only when the setup data are not corrupted. If a data integrity error is detected, four beeps will sound and the machine goes into setup mode with default settings on all setup items.

All the setup items (speeds and needle positions) should be checked, but only those need to be adjusted where the default setting is not acceptable. Turning the power off and on again after the "four beep start" will bring the machine to normal operating mode.

## ADJUSTMENT PROCEDURE I/S-TURBO REV 1.X

The REV 1.x revisions of the I/S-TURBO software provide adjustment means to set the needle speed, the needle positioner's up and down positions, the needle return position of the regulated stitch and the constant speed range. The SELECTOR DIAL on the back of the machine is used to select the adjustment modes. **NOTE that the front dial is disabled in adjustment mode.**

	<b>REAR SELECTOR DIAL POSITION</b>	<b>ADJUSTMENT MODE</b>
	B1	needle speed
	6 stitches per inch	high speed coasting
	12 o' clock	needle positions
	MAX.	precision stitch position, maximum constant speed



The DOWN pushbutton is used to select between increasing (light off) and decreasing (light on) the settings

To enter the adjustment mode, hold the RED SINGLE STITCH BUTTON down while powering up the unit. The button should be held down until the machine stopped beeping.

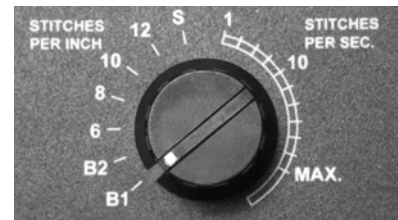
### A. NEEDLE SPEED ADJUSTMENTS

In this mode the needle speed for the needle positioner can be adjusted.

**Note that the needle positioner speed adjustment will affect ALL of the other settings, so it should be performed first.**

#### NEEDLE POSITIONER SPEED

1. Turn the SELECTOR DIAL to the B1 position.
2. Push and hold down the RED BUTTON. Instead of a full single stitch cycle, a needle positioning step (up or down) will be made.
3. Check the speed and strength of the needle movement. The speed should be low enough to notice the fine adjusting second phase when the needle is pulled up. Avoid setting the needle speed too high, for it may cause the needle to run over its top and bottom positions. On the other hand, a too low positioning speed may not be enough to pull out the needle from the fabric.
4. If the speed and strength are sufficient, release the RED BUTTON, the adjustment is completed.
5. If the speed and strength are not sufficient, while still holding the RED BUTTON down, turn on the DOWN light if the speed needs to be decreased, turn it off if increasing is necessary.
6. While still holding the RED BUTTON down, hit the BLACK BUTTON. A beep will indicate that the speed was increased/decreased and the new value was stored in the computer's memory. A missing beep indicates that a high/low limit was reached.
7. Release the RED BUTTON and repeat the procedure from Step 2 until the desired speed is reached.



## REGULATED STITCHING SPEED

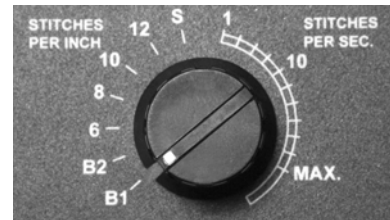
The REGULATED STITCHING SPEED directly affects the quality of the stitch regulation. If you can "outrun" the machine, in other words, the stitches get longer when you move the machine faster, the REGULATED STITCHING SPEED is not high enough. On the other hand, if the stitches are shorter than the selected length, because double stitching occurs, the REGULATED STITCHING SPEED is too high. Too high speed can also cause motor overheating.

While most of the adjustments are "What You See Is What You Get", the REGULATED STITCHING SPEED setting requires testing outside the adjustment mode: After changing the speed, return to the normal operating mode by turning the power off and on again. Test the quality of the stitch regulation by moving the arm with your slowest and fastest speed and decide whether further adjustments are necessary. If yes, return to the adjustment mode and make the changes.

**The optimum setting of the REGULATED STITCHING SPEED will be just high enough to provide accurate stitch length, but not too high to cause motor overheating or double stitching. Always start with a low speed setting and gradually increase it until acceptable regulation is reached.**

To change the REGULATED STITCHING SPEED, follow the procedure below:

1. Based on the regulation quality test, decide if the speed needs to be increased or decreased.
2. Turn on the DOWN light if the speed needs to be decreased, turn it off if increasing is necessary.
3. With the SELECTOR DIAL still at the B1 position, push and hold down the BLACK BUTTON. A fast single stitch will be made.
4. While still holding the BLACK BUTTON down, hit the RED BUTTON. A beep will indicate that the speed was increased/decreased and the new value was stored in the computer's memory. A missing beep indicates that a high/low limit was reached.
5. Release the BLACK BUTTON and repeat the procedure from Step 3, changing the speed by one or two steps at a time.
6. Set the machine in normal operating mode and test the results of the adjustment.
7. Repeat the procedure from Step 1, if necessary.



## B. HIGH SPEED COASTING ADJUSTMENT

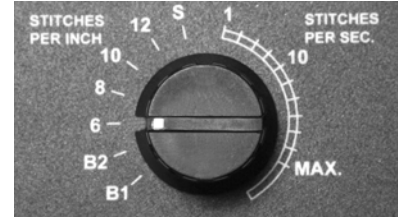
The I/S-TURBO software eliminates the long stitches at sudden speed or direction changes by keeping the motor coasting around these critical spots. The amount of coasting will affect the stitch quality at points: too much will cause stitch pile-up, too little will result in long stitches coming out of a point.

Similarly to the REGULATED STITCHING SPEED, the amount of coasting should be tested in normal operating mode. Test the stitch quality by sewing patterns with points (stars, feathers, etc.), and decide whether the coasting needs to be increased or decreased.

**NOTE that the arm should be moved fast enough for the machine to make more than 20 stitches per second, AND you should not hesitate longer than 2/10th of a second at direction changes to turn on the coasting effect.**

If the coasting needs adjustment, follow the procedure below:

1. Set the SELECTOR DIAL to the 6 stitches per inch position.
2. Based on the stitch quality test, decide if the amount of coasting needs to be increased or decreased.
3. Turn on the DOWN light if the amount of coasting needs to be decreased, turn it off if increasing is necessary.
4. Push and hold down the BLACK BUTTON. A fast single stitch will be made.
5. While still holding the BLACK BUTTON down, hit the RED BUTTON. A beep will indicate that the amount of coasting was increased/decreased and the new value was stored in the computer's memory. A missing beep indicates that a high/low limit was reached.
6. Release the BLACK BUTTON and repeat the procedure from Step 4, changing the amount of coasting by one or two steps at a time.
7. Set the machine in normal operating mode and test the results of the adjustment.
8. Repeat the procedure from Step 1, if necessary.



### C. NEEDLE POSITION ADJUSTMENTS

The needle position sensor's timing is set at the time of the installation, there is no need to re-time the sensor. It is recommended, however, to check the proper timing before the needle position adjustment takes place.

To check the sensor timing:

1. While watching the red FAIL light, turn the handwheel **very slowly** to the forward direction (counter-clockwise, if viewed from the rear) until the light comes on. If the light just flashes, turn the handwheel backward until the light is on again. With fine adjustments of the handwheel the red light can be constantly turned on.
2. If the red light stays on when the take-up lever is at or near its top position, the timing is correct, you can proceed to the UP/DOWN POSITION ADJUSTMENT.
3. If the red light is turned on when the take-up lever is not at the desired position, please call the manufacturer or IntelliStitch installer for assistance.

### UP/DOWN POSITION ADJUSTMENT

The correct "needle up" position can be found as follows:

1. Turn the handwheel at the back of the machine counter-clockwise, until the needle reaches its top position.

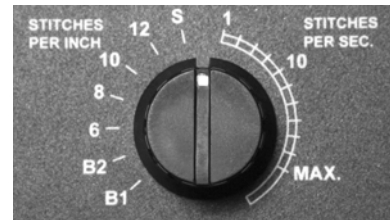
Draw a vertical line across the center of the handwheel.

2. Continue turning the handwheel counter-clockwise until the line is about 30 degrees forward from its original vertical position.
3. Mark the spot where the take-up lever comes out of the slot at this needle position, this will be your reference when adjusting the "needle up" positions.



To adjust the needle up/down positions:

1. Turn the SELECTOR DIAL to the 12 o'clock position.
2. Push and hold down the RED BUTTON. Instead of a full single stitch cycle, a needle positioning step (up or down) will be made.



**To differentiate between the "up" and "down" positions a beep will sound when the needle is supposed to be at the "up" position.**

3. Check the up or down position of the needle.

When adjusting the "up" position, the take-up lever should return to the "needle up" mark.



When adjusting the "down" position, the needle should stop about 1/8" before its lowest position.



4. If the up(down) position is correct, release the RED BUTTON, and go to Step 1 to check the other position.
5. If the up(down) position is not acceptable, while still holding the RED BUTTON down, test whether forward or backward adjustment is necessary:
  - Turn the handwheel slowly forward (counter-clockwise, if viewed from the rear)
  - If the take-up lever and the tip of the needle are going TOWARD the right positions, FORWARD ADJUSTMENT is necessary, so turn the DOWN light OFF.
  - If the take-up lever and the tip of the needle are going AWAY from the right positions, BACKWARD ADJUSTMENT is necessary, so turn the DOWN light ON.
6. While still holding the RED BUTTON down, hit the BLACK BUTTON. A beep will indicate that the new position was stored in the computer's memory.

7. Release the RED BUTTON. To check the setting you have just adjusted, press and release the RED BUTTON, then press the RED BUTTON again and hold it down. Go back to step 5.
8. If the setting is correct for the position you have just checked, release the RED BUTTON then press the RED BUTTON again and hold it down. You are now checking the opposite position. Repeat the procedure until the desired needle positions are reached.

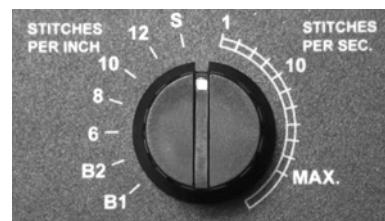
In some cases excessive overrun and occasional double stitching may occur during the up/down position adjustment. This may be due to unnecessary high needle positioner speed. Repeat the NEEDLE POSITIONING SPEED adjustment, reducing the speed by one or two steps.

If in normal operating mode the single stitch "doubles", i.e. makes two cycles, it may be caused by too advanced needle down position, which can be corrected by adjusting the down position backwards (turning ON the DOWN light during the position adjustment).

**To avoid double stitches in basting mode, make sure that the needle return positions stay AT or BELOW the "needle up" mark. If the take-up lever stops ABOVE the "needle up" mark in basting, the auto pull-up feature will make one more cycle to bring it back to the desired height.**

## NEEDLE RETURN POSITION ADJUSTMENT

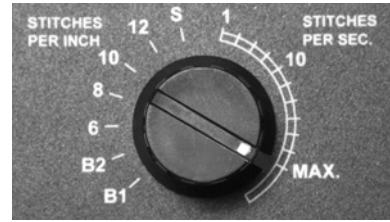
1. With the SELECTOR DIAL still at the 12 o'clock position push and hold down the BLACK BUTTON. A fast single stitch will be made.
2. Check the needle return position. The take-up lever should return to about ¼" below the "needle up" mark.



3. If the needle return position is correct, release the BLACK BUTTON, the adjustment is completed.
4. If the position is not acceptable, while still holding the BLACK BUTTON down, test whether forward or backward adjustment is necessary:
  - Turn the handwheel slowly forward (counter-clockwise, if viewed from the rear)
  - If the take-up lever is going TOWARD the right position, FORWARD ADJUSTMENT is necessary, so turn the DOWN light OFF.
  - If the take-up lever is going AWAY from the right position, BACKWARD ADJUSTMENT is necessary, so turn the DOWN light ON.
5. While still holding the BLACK BUTTON down, hit the RED BUTTON. A beep will indicate that the new position was stored in the computer's memory.
6. Release the BLACK BUTTON and repeat the procedure until the desired needle return position is reached.

## PRECISION NEEDLE RETURN POSITION ADJUSTMENT

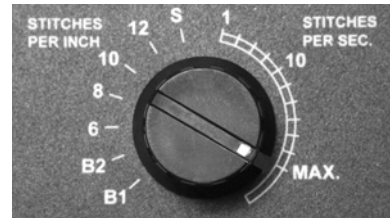
1. Turn the SELECTOR DIAL to the MAX. position.
2. Push and hold down the BLACK BUTTON. A reduced speed (precision) single stitch will be made.
3. Check the needle return position. The take-up lever should return to about  $\frac{1}{4}$ " below the "needle up" mark.
4. If the needle return position is correct, release the BLACK BUTTON, the adjustment is completed.
5. If the position is not acceptable, while still holding the BLACK BUTTON down, test whether forward or backward adjustment is necessary:
  - Turn the handwheel slowly forward (counter-clockwise, if viewed from the rear)
  - If the take-up lever is going TOWARD the right position, FORWARD ADJUSTMENT is necessary, so turn the DOWN light OFF.
  - If the take-up lever is going AWAY from the right position, BACKWARD ADJUSTMENT is necessary, so turn the DOWN light ON.
6. While still holding the BLACK BUTTON down, hit the RED BUTTON. A beep will indicate that the new position was stored in the computer's memory.
7. Release the BLACK BUTTON and repeat the procedure until the desired needle return position is reached.



## D. MAXIMUM CONSTANT SPEED ADJUSTMENT

1. With the SELECTOR DIAL still at the MAX. position, push and hold down the RED BUTTON. The motor will start running continuously with the fastest constant speed.

**Note that the RED BUTTON should be held down continuously during the whole procedure.**
2. If the maximum speed needs adjustment, while still holding the RED BUTTON down, turn on the DOWN light if the speed needs to be decreased, turn it off if increasing is necessary.
3. While still holding the RED BUTTON down, hit the BLACK BUTTON. A beep will indicate that the speed was increased/decreased. Repeat the procedure from Step 2 until the desired maximum speed is reached.
4. Release the RED BUTTON to save the adjusted maximum speed in the computer's memory.



**After the adjustments are made the power should be turned off and on again to start the unit in normal operating mode.**