MiTek®
Machinery Division

Service Bulletin

Machinery Affected:	***BLADE*™ Wood Processing System**
Document:	**SB218 rev. D**
Title:	**Upgrading to PLC v. 4.000.000+, *BLADE* v. 4.0.0+, and *Board Stretcher*™ v. 4.1.45.0+**
Distribution:	**All Existing *BLADE* Customers**

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Applicability	Field equipment
Effectivity	BLADE saws <Frame 97

Purpose and Scope

This document provides education and instructions regarding the improvements and new features inside the latest *BLADE* software. Follow theses instructions carefully to download the enclosed software and ensure all *BLADE* operators are aware of the changes made to the software.

The latest software for the *BLADE* wood processing system provides some valuable, time-saving features including:

- Automatic calibration monitoring and homing for Gripper, LASM, and Stroke.
- New Calibration screens with no measuring required!

Table of Contents

Overview

The software referenced in this document is:

- RX3i PLC software for BLADE wood processing system, v. 4.000.000 or higher
- BLADE operating software, v. 4.0.0.0 or higher
- Board Stretcher optimizing software, v. 4.1.45.0 or higher

The parts included in this kit are listed in Table 1. Please ensure all parts are present.

Small slotted screwdriver

Wire strippers

Table 1: Parts in SB218KIT

Qty.	Part Description	Part #
1	RDSD containing PLC RX3i software for BLADE	92280-504
1	RDSD containing BLADE & Board Stretcher software	92283
1	Jumper cable, 18-gauge	92053
1	Service Bulletin document	SB218

Figure 1: RSDS Devices Included in Kit (version number may vary)

If you have any questions, call MiTek Machinery Division Customer Service at 800-523-3380.

	⚠ WARNING
	**ELECTROCUTION HAZARD!** **All electrical work must be performed by a qualified electrician and in conformance with governing codes.** **Only a qualified electrician, using the personal protective equipment and following the procedures recommended in NFPA 70E should ever attempt service or repair of or near an energized area or component of the machine.** **Whenever maintenance is performed while the equipment is electrically energized, there is a potential electric arc flash hazard. Refer to NFPA 70E for the personal protective equipment required when working with electrically energized components. Pneumatic and hydraulic components may move unexpectedly if not de-energized. Physically restrain any components capable of movement when working on or near those components.**

Downloading the Software

AFTER the software is downloaded, the saw must be homed and calibrated EXACTLY as instructed on page 12. Follow this procedure in the exact order it is given.

Downloading the PLC RX3i Software

The PLC software must be upgraded in order to work with the new *BLADE* software.

1. Before beginning:

    a) Locate the supplied Removable Data Storage Device (RDSD) labeled *Blade Updated PLC.*

    b) Ensure the saw disconnect handle is in the ON position.

    c) Ensure the touch screen is powered on.

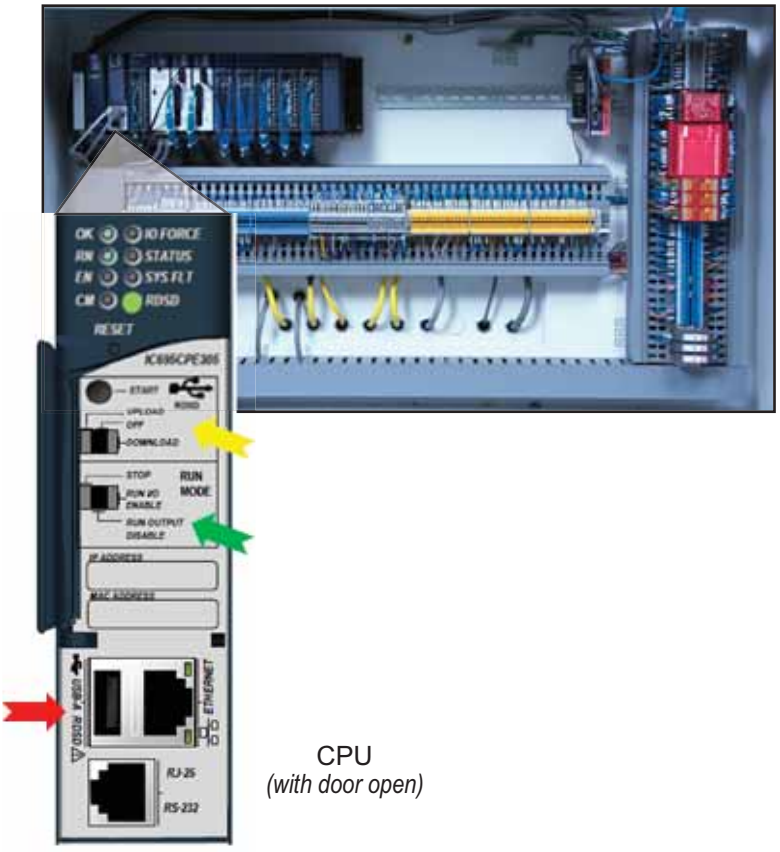
    d) Shut down the *BLADE* software.

2. Prepare the PLC's CPU to accept the new software update using these steps:

    If the RDSD is removed during data transfers to the CPU, the RX3i controller will generate a fatal fault (sequence store fault). You will need to clear the fault by power cycling the CPU with the Energy Pack disconnected before attempting to download again.

    a) Locate the PLC CPU (IC695CPE305) in the main electrical enclosure. The CPU is shown in Figure 2.

Figure 2: CPU for PLC



b) Open the small door on the CPU to expose the switches as seen in Figure 2.

c) Plug the *Blade Updated PLC* RDSD into the USB-A RDSD slot indicated with a. ➔ in Figure 2.

d) Wait until the RDSD LED turns solid green. This indicates that the CPU has detected the RDSD and is ready for downloading.

e) Switch the RUN MODE direction switch to the left (STOP) position. It is indicated with a ➔ in Figure 2.

f) Move the RDSD direction switch to the right (DOWNLOAD) position. It is indicated with a. ➔ in Figure 2

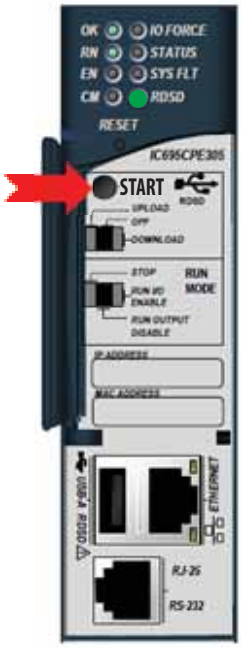
Be very careful NOT to select UPLOAD. To upload means the program on the CPU will be loaded onto the RDSD, thus corrupting the program you are trying to download. If by accident you upload, contact Customer Service for a new RDSD.

DO NOT remove the RDSD from the CPU during transfer!

Transferring the software to the PLC should take approximately 6-10 minutes.

3. Momentarily depress the START pushbutton to begin transferring the program to the CPU. The start button is indicated in Figure 3.
   - If the RDSD indicator light **blinks green**, the program is downloading. It will become solid green once the download is complete. Once the download is complete, proceed to step 4.
   - If the RDSD indicator light **blinks red**, this is acceptable. It has acknowledged that the program has a different name than what is currently loaded; momentarily depress the START pushbutton again. The RDSD indicator light should then blink green during the transfer.
   - If the RDSD indicator light turns **solid red**, the transfer has failed. Perform these steps:
     - Power down the PLC, wait a few minutes, then power it back up.
     - Try repeating the entire process before contacting MiTek Customer Service for support.

Figure 3: Start Button on CPU



Errors are indicated when the RDSD LED becomes solid red (not blinking). All errors are reported in the Controller fault table and are written to a file on the RDSD. The fault tables are written to a file ***plcfaultafter.dat*** and ***iofaultafter.dat*** and can be viewed by MiTek Customer Service.

4. When the RDSD indicator light turns a solid green, the transfer has completed successfully. Perform these steps:

   a) Remove the RDSD from the CPU.

   b) Return the CPU's RDSD switch to OFF and the RUN MODE switch to RUN I/O ENABLE.

   c) Validate the CPU is back in RUN mode by verifying the following is true:
      - OK LED is solid green.
      - RN LED is solid green.
      - EN LED is solid green.

Downloading the *BLADE* Operating Software

To upgrade the *BLADE* operating software and take advantage of its time-saving features, follow this procedure.

1. Before beginning:

    a) Locate the supplied Removable Data Storage Device (RDSD) labeled *Blade Installer.*

    b) Ensure the saw disconnect handle is in the ON position.

    c) Ensure the touch screen is powered on.

    d) Shut down the *BLADE* software.

2. Save your current *BLADE* software folder to a different location to use as a backup in case the download gets interrupted.

    a) Copy the folder: **c:\program files (x86)\mitek\blade**

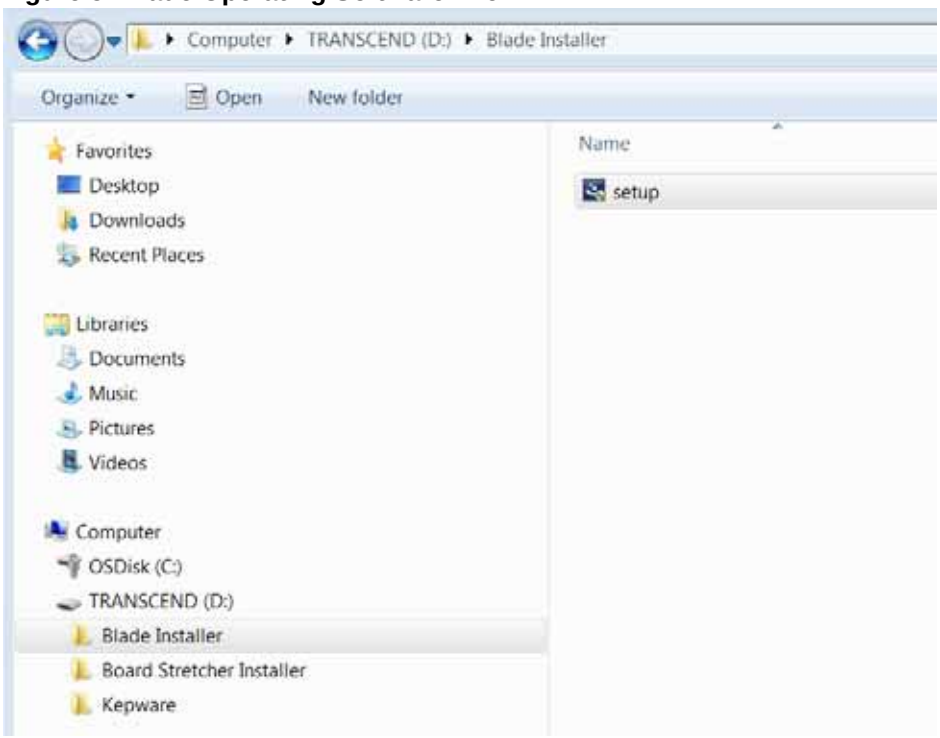
    b) Paste the folder in another location such as c:\backup. It is acceptable to overwrite existing files in the backup folder.

3. Insert the RDSD labeled *Blade Installer* into either of the USB ports on the side of the HMI (touch screen) enclosure shown in Figure 4. They may be located on the right or left side of the touch screen enclosure.

Figure 4: USB Ports on HMI

4. Browse to the RDSD (named TRANSCEND in Figure 5). Open the *Blade Installer* folder and double-click the *Setup.exe* file. See Figure 5.

Figure 5: Blade Operating Software File



5. The software should automatically display an Installer window to walk you through the installation process. Follow the prompts from the Installer.

6. When complete, open the *BLADE* software and go to *Help>About* to verify that the correct software version is showing in the window. Software version should display as: 4.0.0.0 or higher.

Updating *KepServerEX* Configuration

Kepware® software is the interface between the *BLADE* software and the PLC software. It must be upgraded in order to work with the new *BLADE* software.

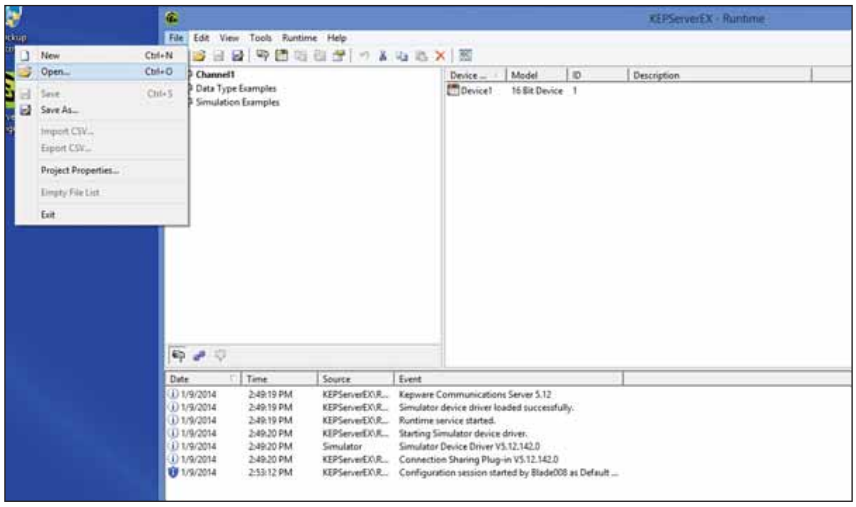
1. Insert the RDSD labeled *Blade Installer* into one of the USB ports on the saw's HMI. The USB ports are located on the outside of the touch screen enclosure, on either the right or left side, as shown in Figure 4 on page 7.

2. Start the *KepServerEX* 5 Configuration program using the desktop icon shown in the top half of Figure 6. If this icon is not on the *Windows* Desktop, find the same icon in the *Windows* System Tray (lower right of the HMI screen). It is shown in the bottom half of Figure 6. Once found, press and hold (same as right click) on the icon and select *Configuration*.

Figure 6: Two Ways to Open *Kepware* Software

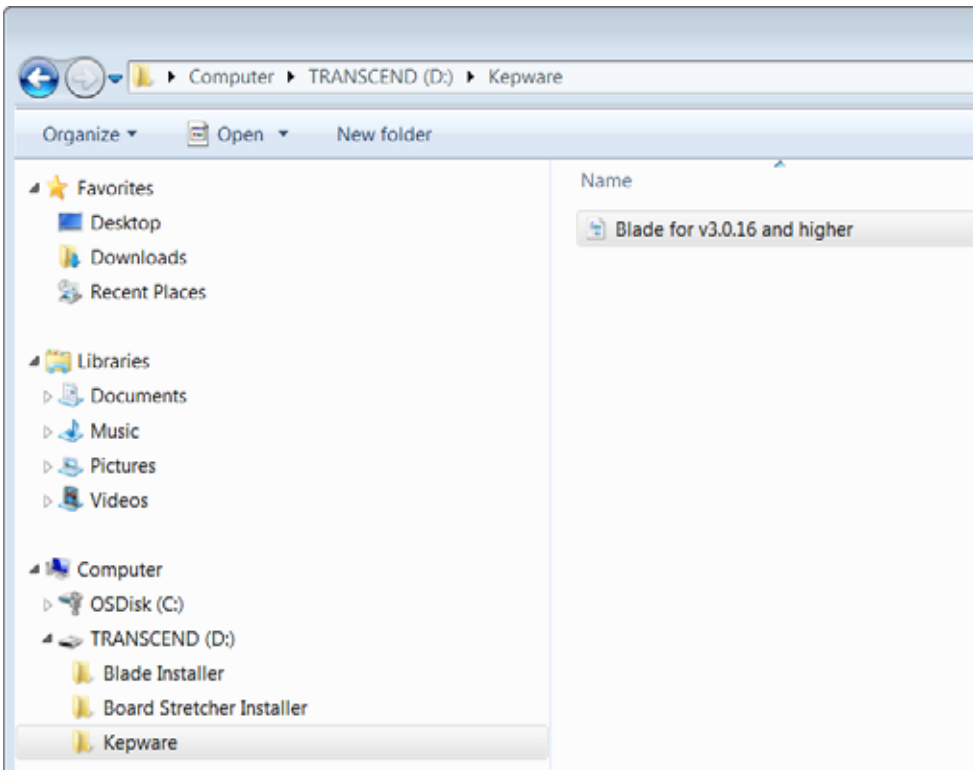
3. Select *File>Open* from the *KepServerEX* 5 program.

Figure 7: From the File Menu, Select *Open*



4. Browse to the RDSD (named TRANSCEND in Figure 8). Open the *Kepware* folder and double-click the *Blade for v3.0.16 and higher* file.

Figure 8: *Kepware* File

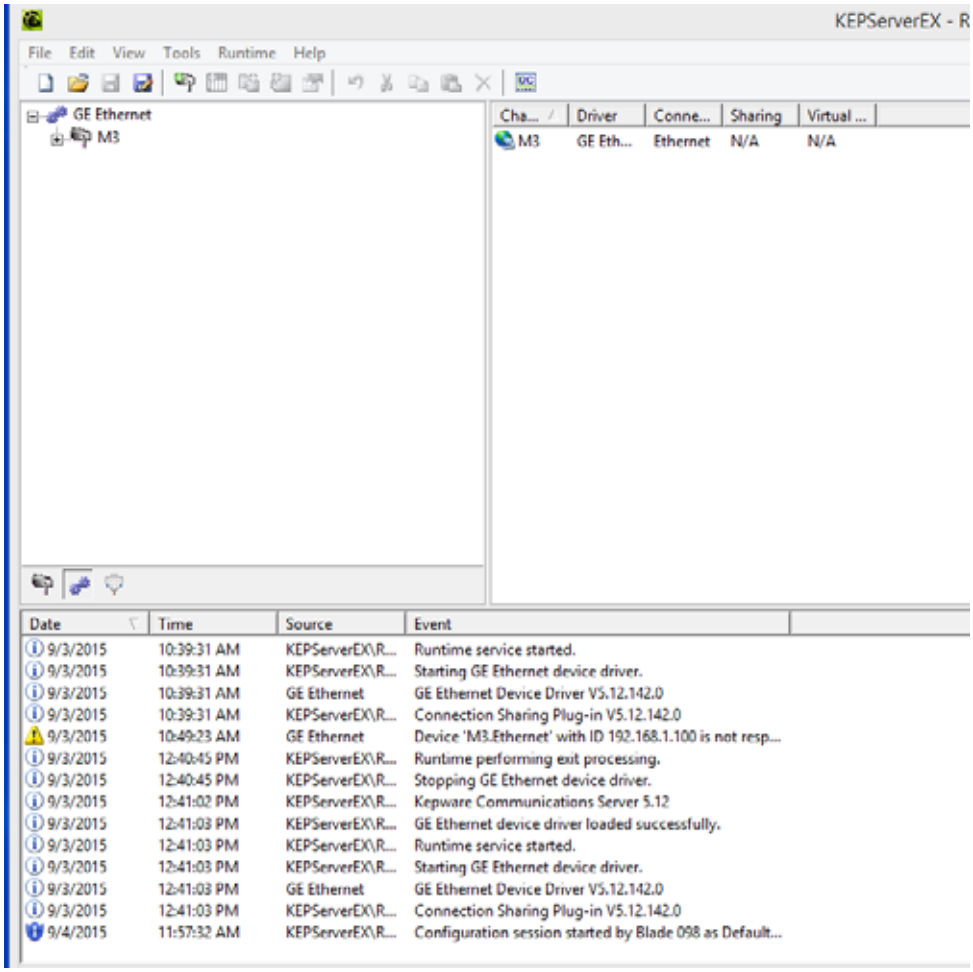


5. Click *Yes, Update*.

Figure 9: Verify the Update

6. Verify the *Kepware* update was successful, before continuing to the next step. It should look like Figure 10.

Figure 10: New Configuration



Verify and Home the Saw

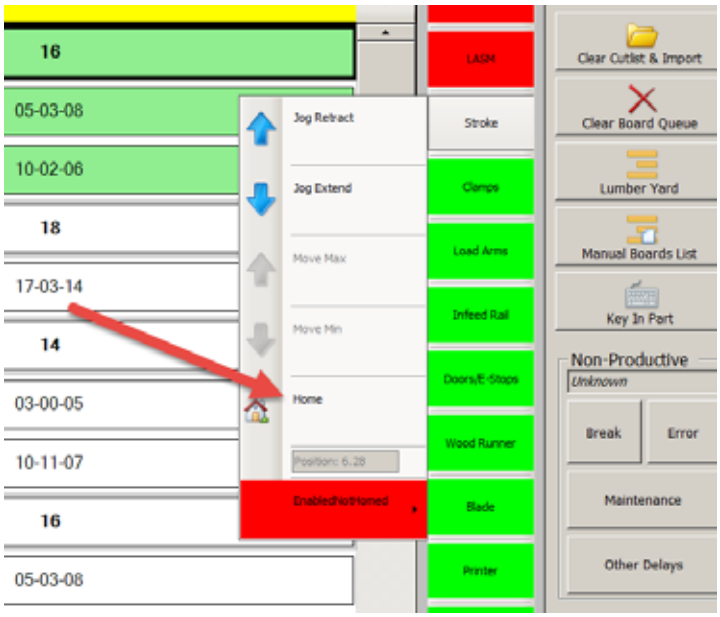
1. Verify on the HMI (touch screen) that the PLC version number has been updated. It is shown on the HMI by going to *Diagnostics>Detailed Diagnostics>PLC* tab located on the bottom half of the screen. The version number should display as 4.000.000 or higher.

2. Home and recalibrate the saw EXACTLY as described here.

    a) Home the Stroke axis only, by following these steps and Figure 11:

        1) On the status indicators on the Home screen, select *Stroke*.
        2) From the Stroke drop-down menu, select *Home*.

Figure 11: Select Home on the Stroke Menu



    b) Reset the Stroke offset with these steps:

        1) Go to *Detailed Diagnostics* and click the *Stroke* tab. Select the Home Offset RESET button.
        2) A message displays explaining what will happen. Select YES.

    c) Home the rest of the system by clicking the HOME SYSTEM button on the Toolbar.

    d) The Ready light on the front of the touch screen enclosure illuminates when all axes are homed and ready to calibrate. Follow the procedure on page 17 to calibrate the following axes:

        Gripper, LASM, and Stroke

Downloading the *Board Stretcher*™ Software

1. Before beginning:

    a) Locate the supplied RDSD labeled B*lade Installer.*

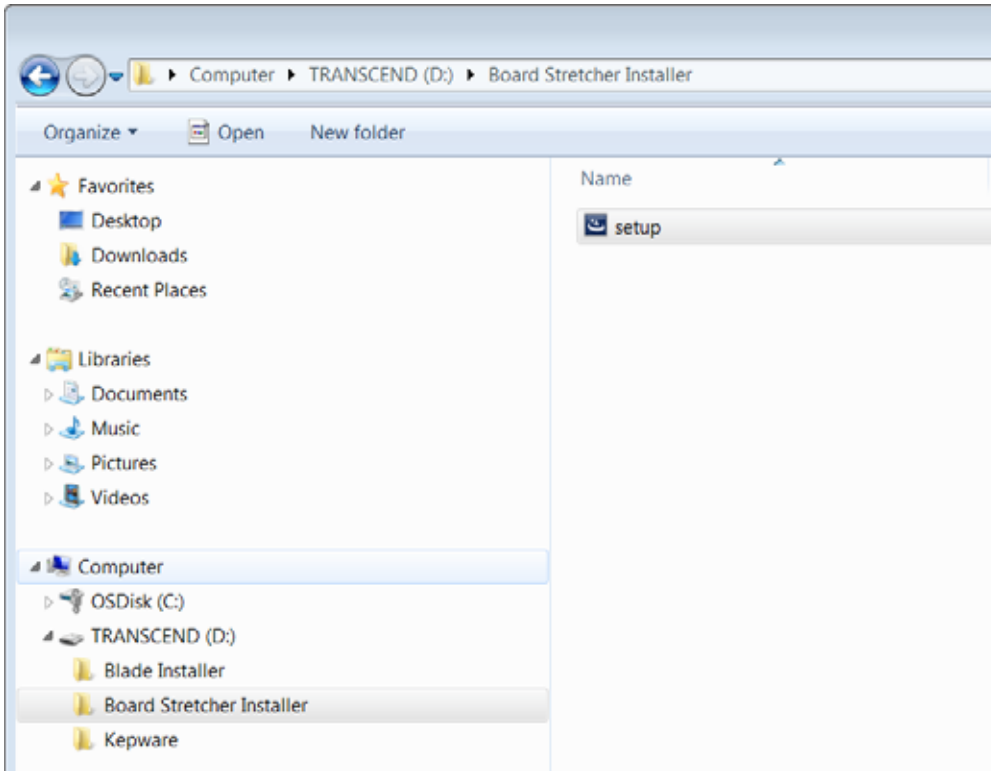
    b) Go to the computer(s) in your facility where board optimization is accomplished and ensure it is powered on.

2. Insert the *Blade Installer* RDSD into a USB port on the board optimization computer.

3. Browse to the RDSD (named TRANSCEND in Figure 12). Open the *Board Stretcher Installer* folder and double-click the *Setup.exe* file. See Figure 12.

4. The software should automatically display an Installer window to walk you through the installation process. Follow the prompts from the Installer.

Figure 12: *Board Stretcher* File



Adding Components

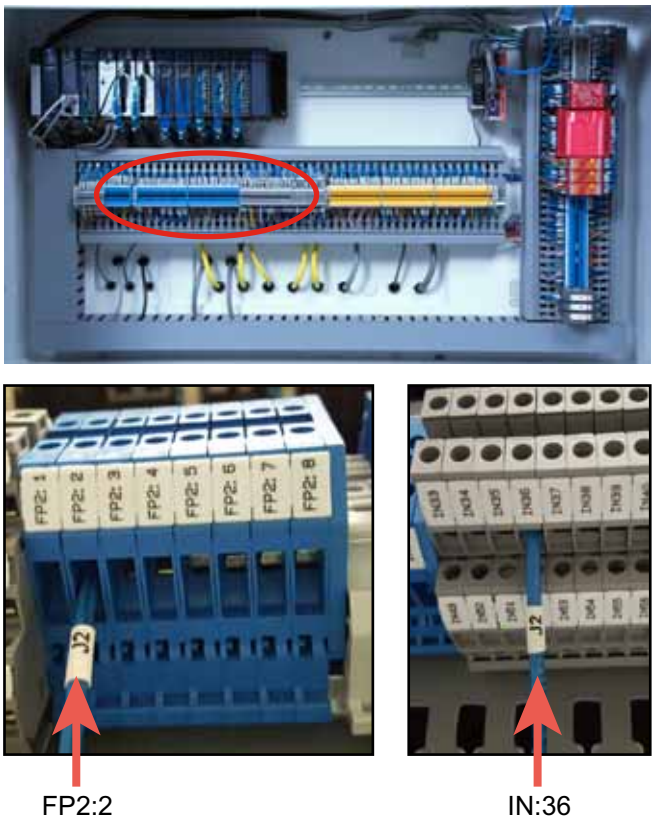
Adding a Jumper

Connect the supplied jumper cable (PN 92053) to the terminals indicated in Figure 13. This can be done before or after downloading the software, but it MUST be done before operating the saw in production.

If the terminal is already used by an existing wire, secure both the existing wire and the new jumper at that terminal.

1. Place one end of the cable into the terminal on the bottom of the FP2:2 terminal block, and tighten the screw.
2. Place the other end of the cable into the terminal on the bottom of the IN:36 terminal block, and tighten the screw.
3. Gently tug on each end to ensure they are secure.

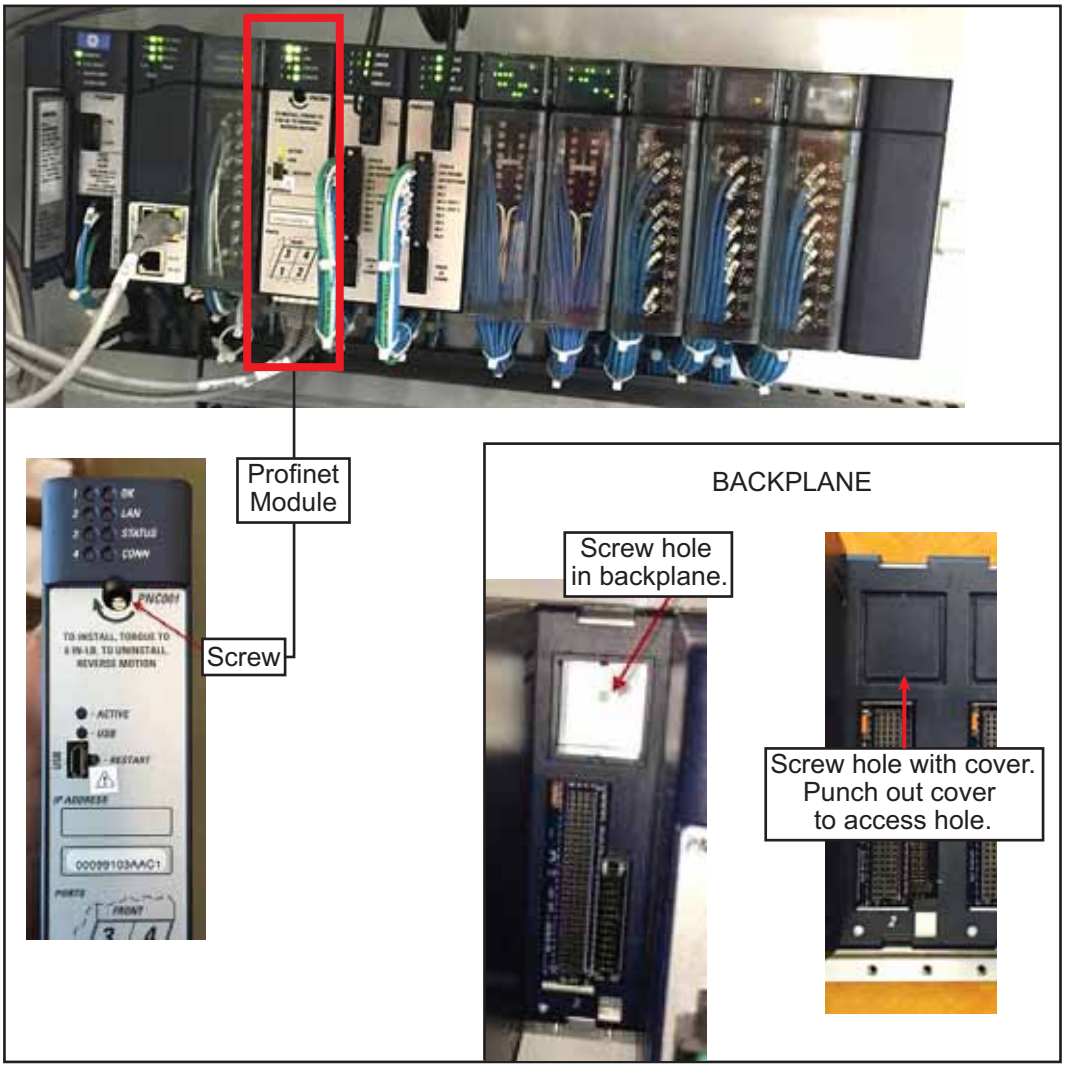
Figure 13: Connect Jumper Cable to Terminals on Bottom of Terminal Blocks



Securing the Profinet Module

The Profinet Module is located in the main electrical enclosure and must be secured properly to avoid component damage. Failing to secure the Profinet Module may cause it to overheat and stop working, ceasing production on the saw. Follow Figure 14 to locate the screw and screw hole.

Figure 14: Snap the Profinet Module Into Place and Tighten the Screw



How to Use the *BLADE* Operating Software

All *BLADE* operators and maintenance personnel should study this section to properly use and maintain the *BLADE* wood processing system. Keep this section in the manual.

Homing Changes for: Gripper, LASM, & Stroke

This section applies only to the gripper, LASM, and stroke axes. The location of each axis is now monitored anytime the saw is operating in Auto Mode. It will automatically "home" itself in order to recalibrate the axis when needed. Since the saw never lets its home position become compromised, manual recalibration is rarely required.

The home z-pulse value no longer needs to be monitored or mechanically reset to be in the 30000 to 100000 range since the new software no longer uses the z-pulse on the gripper, LASM, and stroke.

The primary reason the home position may become compromised and needs to home itself is that a jam in any given axis may cause the motor collar to slip. The motors are designed to let this happen to avoid costly damage. By automatically homing itself, occasional slips are planned for and dealt with automatically. But, if the saw is experiencing a high number of out-of-calibration instances on a certain axes, the root cause must be determined and fixed. If the saw reads 4 or more slippages on the same axes within an hour, it gives the following error: The xx servo has mechanically slipped many times in a short duration. The Online Support button will display a web page with information on how to eliminate this issue. Online Support is accessible from this error, from the saw's Home Screen, and from our web site.

Tech Talk

The counts do not reset at 4, but continue to count up within any 60-minute time frame. Online Support describes all the points to check on each axis. The way it tracks the axis position and the accuracy it requires is shown in Table 2

Table 2: How It Tracks the Position

Axis	Measures Inaccuracies	How it Tracks Position
Gripper	>3/32"	Reads where trailing edge of board passes beam of Leading Edge Sensor (receiver/transmitter pair on front end of Infeed Rail), and beam reconnects.
LASM	>1/16"	Uses LASM Lockout Sensor (also called No Fly Zone sensor) to tell when LASM is directly in front of blade (if blade is at 90 deg). As LASM moves toward outfeed side and passes sensor, position is captured.
Stroke	>1/16"	Uses Home Sensor on retract motion to capture position.

Calibration Changes

This section applies only to the angle, bevel, elevation, and CLS axes. The other axes are kept in calibration with the automatic homing feature.

New Calibration Procedure

1. Ensure the status banner on the HMI shows READY. You may need to press the HOME SYSTEM button on the Toolbar if the system is not in the Ready state.
2. Place the saw in Manual Mode.
3. Go to *Tools>Calibrate*.
4. Select which axis to calibrate and choose START. Only calibrate the axis that requires it. Overcalibrating can cause other system complications.
5. Follow the instructions on the screen. What happens next is listed in Table 3.

Table 3: What Happens During Calibration

Axis	What Happens	Select	Indicate
Angle	With a flat saw blade, cuts 7 plunges at top of board, at different angles. The height of the raised areas on each side of a cut are to be focused on.	Pick the cut that has the raised areas on both sides of it at approximately the same height.	On the Calibration screen showing on the HMI, press the ID letter that is printed next to your selection.
Bevel	Cuts 14 plunges (7 pair). 1 pair = 1 partial cut, then flips blade 180° and makes cut in same place, with stroke slightly retracted.	Pick the pair with the cuts in exact same place (or closest to).	On the Calibration screen showing on the HMI, press the ID letter that is printed next to your selection.
Elevation	10 plunges, creates stair steps in bottom of wood. In calibrated saw, the first 5 don't touch the wood.	Count the # of stair corners visible on the board that are complete semi-circles.	On the Calibration screen showing on the HMI, press the # matching the number of stair corners.
CLS	Performs a "stability check". Determines if the CLS sensor eye is failing to sense the board because it is not physically aligned with the board location or if there is a sensor and/or electrical issue.		


Refer to...
Figure 15
Figure 16


Refer to...
Figure 17


Refer to...
Figure 18
Figure 19

Graphics Supporting Calibration

Figure 15: Angle Calibration Screen

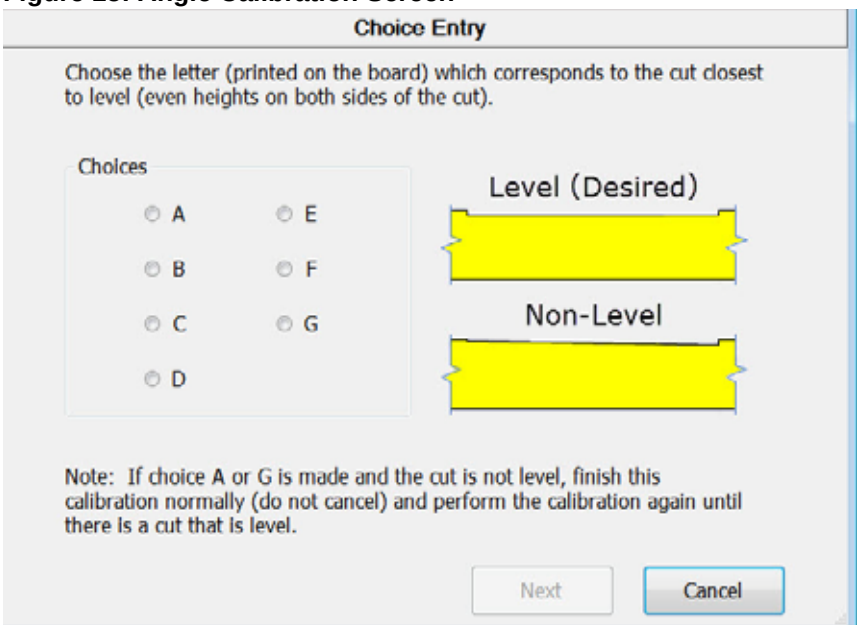


Figure 16: Angle Cut

Figure 17: Bevel Calibration Screen

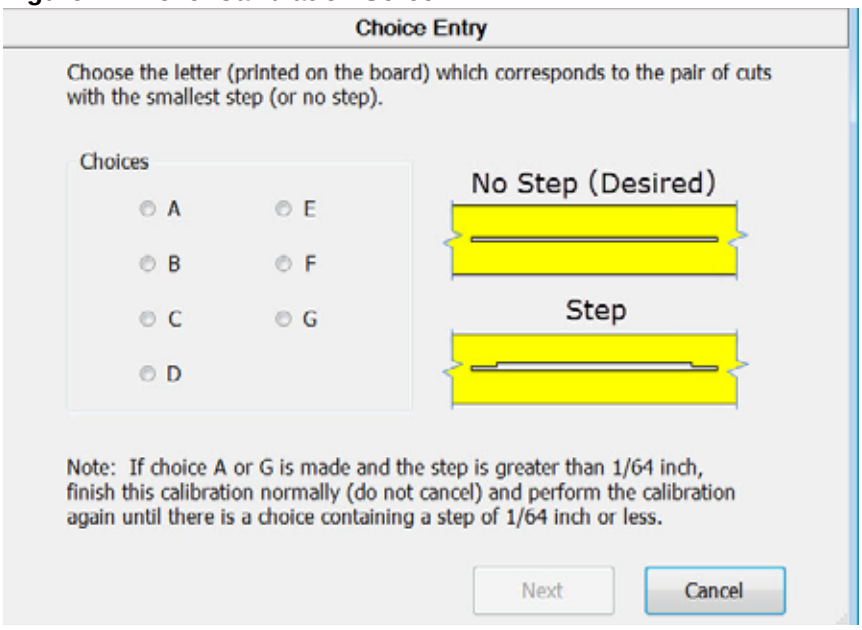


Figure 18: Elevation Calibration Screen

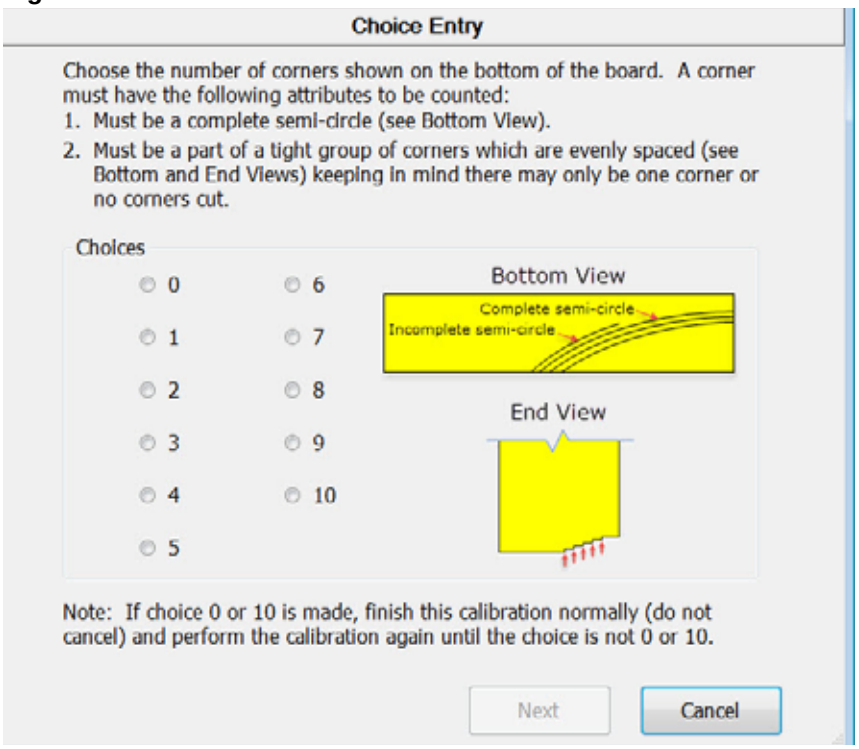


Figure 19: Elevation Cut

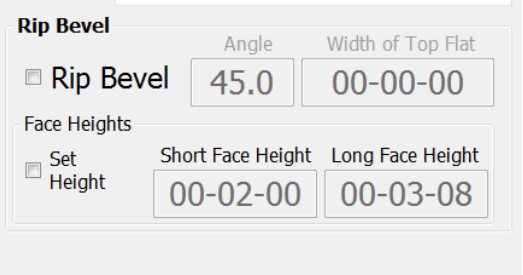
Create Straight Board Feature

It is still vitally important to use a straight board when calibrating any axis. A new feature has been added that trims one edge of a board to ensure a straight, flat edge for calibrating certain axes. The CREATE STRAIGHT BOARD button has been added to the Calibration screen, and is available at any login level. It is grayed out until the saw is in Auto Mode and the saw blade is started. Once the CREATE STRAIGHT BOARD button is pressed, the saw rips across the top of a board to create a straight edge that can be trusted for certain tests. Always use this method to create a straight edge for CLS and Elevation Home calibration.

New Rip Bevel Fields

In the *Key-In* screen, new fields and a diagram have been added labeled *Rip Bevel*. It allows the operator to set the short side to a specific dimension in order to create specifically-sized blocks or boards that are not in a Job file.

Figure 20: New Rip Bevel Fields



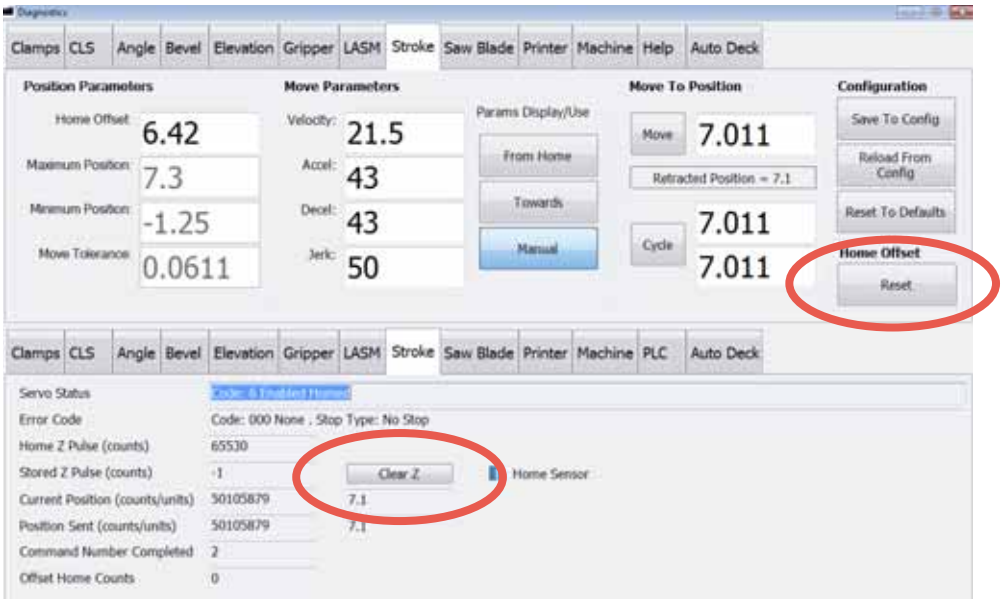
Errors You May See

Solution to Possible Stroke Error

Depending on where the Stroke z-pulse is located when the HOME SYSTEM button is pressed, in rare cases, the stroke axis will retract all the way to the hard stop and display an error. To remedy this:

1. Go to *Diagnostics>Detailed Diagnostics* in the *BLADE* software at the HMI.
2. Click the *Stroke* tab.
3. Click the RESET button circled in Figure 21.

Figure 21: RESET Button on Stroke Tab

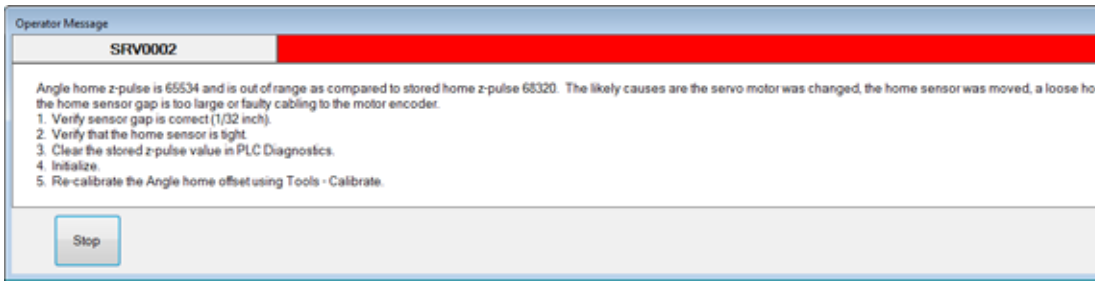


Solution to Z-Pulse Error

If during calibration, either of the messages shown in Figure 22 or Figure 23 are shown for any axis, take the following steps.

Figure 22: Error SRV006

Figure 23: Error SRV002



1. From the HMI's Home Screen, go to *Diagnostics>Detailed Diagnostics*, and select the tab for the axis that the error indicates.

2. Select the CLEAR Z button to clear the error. The Stroke screen is shown in Figure 21 on page 21 with the CLEAR Z button circled.

END OF SERVICE BULLETIN