**Questar Wedge Wire Bonder Standard Operating Procedure**

**QUICK GUIDE**

![PROCEDURE OVERVIEW for manual bonding](image)

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![CRITICAL PRECAUTIONS AND COMMON MISTAKES](image)

- Always lower the stage before selecting the “Load Position” button
- Nothing on the sample should be positioned such that it is higher than the bottom of the wedge tool (e.g. connectors, housing, cables, etc.)
- Even slight bumping of the wedge tool will knock it out of alignment
- Device to be bonded must be securely mounted to the substrate (epoxy)
- Device to be bonded must be flat
- Bonding surface must be free of any organic contaminants; cleaning is an important process before wire bonding

**Before you start**

- Enable all axis
- Confirm Wedge is threaded

**Tool condition for the next user**

- If you install a custom jig top, the standard top MUST be replaced before log out
- Do not leave the wedge tool “UN”threaded
- Logout
- Clean up anything you bring in
1. **Startup Procedure**

1.1 Log into the tool using Mendix system

*Note:* The login window will show up on the screen

1.2 Click “Login” button and Log onto bonder

1.3 Turn on the lights

*Note:* If the machine is power down, push in the green “Reset” button on the right hand panel; Click Shortcut to “Wirebond.exe” program icon and click YES to initialize the axes
2. Sample Loading

2.1 Lower the stage using Locking nut and Adjusting Height knob
2.2 Move the stage to the Load position by pressing ‘Load Position/Return’
Note: When the table is at the load position, this button’s name will change to ‘Return’
2.3 Place the sample on the stage and secure

3. Moving the Stage

3.1 Move the stage with your sample under the wedge by pressing ‘Return’
3.2 Position the wedge tip over the lowest surface to be bonded
Note: You can move the X-Y table using:
   (a) Center Scroll Button on mouse; hold while moving in the Vision-PRS window
   (b) Click anywhere within the Vision-PRS window
   (c) Click a location on the blue Macro Window
4. Adjusting Stage Height

4.1 Position the wedge tip over the lowest surface to be bonded
4.2 Select yellow “Maintenance” button
4.3 Select the “Jog” and then lower the “Z” arrow till it reached 15300 on the Z read-out
4.4 Loosen the Locking knob and rise the stage till the wedge tip just touches the lowest surface to be bounded; You will hear an audible “beep”
4.5 Secure the Locking not at this point
4.6 Exit when complete; your sample should be near focus at this point

Note: At this point, nothing on the sample should be positioned such that it is higher than the bottom of the wedge tool
5. Manual Bonding

5.1 Confirm the wire is threaded through the wedge
5.2 Select “Manual Bond” button
5.3 Select the appropriate “Bond Parameter File”
5.4 Move the crosshair to the target position for the first bond and click on the “Set Bond Location #1” button; This sets the current location as bond location #1
   **Note:** “f” allows to adjust the focus for bond location
5.5 Move the crosshair to the target position for the second bond and click on the “Set Bond Location #2” button; This sets the current location as bond location #2
5.6 Select “Bond Wire” to bond a wire from bond location #1 to bond location #2

**Note:**
- “Single Step” selected causes that bonding will perform in incremental steps
- “Low Speed” selected causes the Wire Bonder to move at a slower speed than in normal operation
- “Reset Reference Heights” selected (recommended) causes the Wire Bonder to re-learn the Reference Heights during the bonding of every wire
- Ref Height 1: Height at which the last first Reference was found
- Ref Height 2: Height at which the last second Reference was found
6. Setting Bond Parameters

6.1 Click “Wire Parameters”

- **CV Height** (Contact Velocity Height): The height at which contact velocity will be achieved
- **Contact Velocity**: The velocity the wedge will be moving when it contacts the surface
- **Overtravel**: The amount of travel that will occur after the wedge contacts the surface
- **Bond Time**: The amount of time the ultrasonics will be active
- **Ultrasonic**: The ultrasonic channel that will fire for the selected bond

Schematic representation of parameters affecting bonds formation

- **Reverse Height**: Height at which reverse motion occurs in order to create a kink in the wire
- **Reverse Loop**: The amount of reverse motion to perform at Reverse Height
- **Rise to Loop**: The distance to stretch the wire while moving to Loop Height from CV Height
- **Loop Stretch**: The distance to stretch the wire past the second bond location
- **Loop Height**: The height above the first bond that the bond head moves to while traveling from Bond 1 location to Bond 2 location
- **Z Up**: Height to move up from second bond
- **Wire Feed**: Distance to move in the X-Y plane after Z Up, and before closing the wire clamp
- **Tear**: Distance to move in the X-Y plane after closing the wire clamp to cause the wire to break at second bond
7. Threading Wire through Wedge Tool

7.1 Lower the stage and move away to get an access to wedge tool
7.2 Select yellow “Maintenance” button
7.3 Disable Theta Axis to be able to rotate the head and get access to the wedge tool
7.4 Wire clamp can be open and closed by “CTRL-C”
7.5 The wire needs to go first through fork, then clamp and wedge tool; by manually moving the clamp and using tweezers, the wire can be introduced into the feed hole

8. Standard Wedge Tool and Wire Specifications for Al Wire Configuration