

SETUP AND INSTALLATION OF THE HELMEL PHOENIX MODEL 112-102 DCC CMM

REMOVE THE CMM FROM THE SHIPPING CRATE

Locate the side of the shipping crate marked “FRONT”.

Remove the front cover of the crate by removing the screws that are circled. Once the front of the crate is removed, remove the wooden braces holding the CMM in place. Remove any loose items from the floor of the crate such as wrapped covers or boxes. Next, remove the circled screws around the bottom of the crate. With these screws removed, carefully slide the remaining crate structure (left, right, and back walls as well as the top) off of the base of the crate. At this point the CMM should be sitting on the base of the crate with all four sides exposed. Use a fork lift to lift the CMM off of the base. Lift the CMM at the bottom of the machine cabinet ONLY.

NOTE: LIFTING THE CMM AT THE BRIDGE OR PLATE WILL RESULT IN SEVERE DAMAGE. LIFT ONLY AT THE BOTTOM OF THE CABINET!

LOCATING THE CMM



Move the CMM to the area where it will be located. The CMM should be placed on a solid and level floor. Be sure to allow enough room around the CMM to access the back side of the cabinet and sides of the machine. Use a bubble level on the surface plate to level the CMM by adjusting the leveling feet.

For best results, place the CMM away from air vents, air conditioners, outside doors, windows, or direct sunlight. Sudden changes in temperature will affect the accuracy of the CMM.

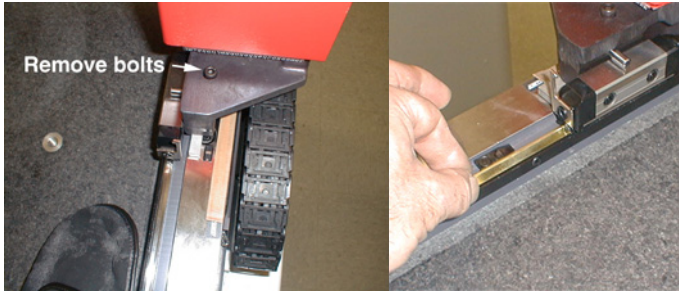
CLEAN AND LUBRICATE BEARING WAY SURFACES

Using a lint free cloth and alcohol, clean the rust inhibitor or any dirt and debris from all the ground surfaces on the CMM. Do not leave any debris that could damage either the way surfaces or the bearings. When clean, lubricate the ways by wiping some light oil onto the bearing surfaces using a lint free cloth, then remove excess oil leaving a very thin film on the ground surfaces.

REMOVE SHIPPING BRACKETS FROM THE MAIN SUPPORT AND LEG



Remove the leg bearing shipping bracket. Using a 3/16” allen wrench, remove the 1/4-20 bolt holding the bracket to the leg. Next, using a 5/16” allen wrench remove the 3/8-16 bolt that holds the leg bearing bracket to the surface plate. Slightly lift the leg and slide the bracket out. Gently lower the leg bearing onto the leg rail.

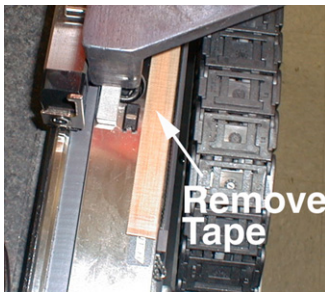


Next, using a 3/16" allen wrench remove the two 1/4-28 bolts that hold the main support down on the shipping brackets.

Remove the tape holding the brass angle under the main support bearings and slide the brass angle out – both sides.

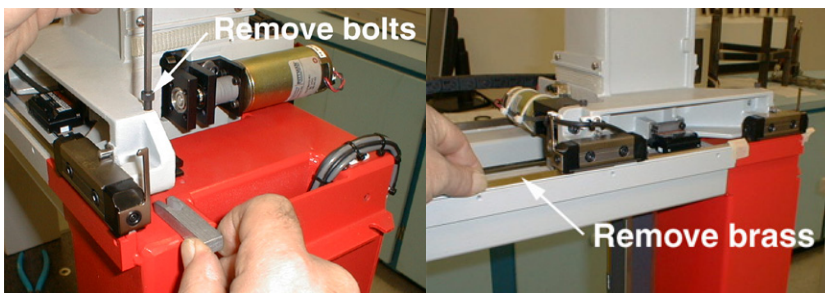


Gently lift the main support enough to slide the forked shipping bracket out from the front side. Gently lower the main support until the main support bearing contacts the main rail. Repeat these steps to remove the forked bracket from the backside of the main support.

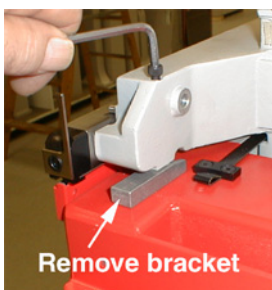


Slowly and carefully remove the brown protective tape that is covering the Y axis scale. Travel the bridge structure to both ends of travel to check for smooth operation.

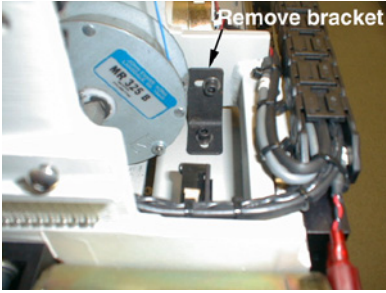
REMOVE THE SHIPPING BRACKETS FROM THE CARRIAGE



Using a 5/32" allen wrench remove the two 10-32 bolts that hold the carriage down on the shipping brackets. Remove the tape holding the two brass angles that are under the bearings on the front side of the carriage. Slide the brass angles out.



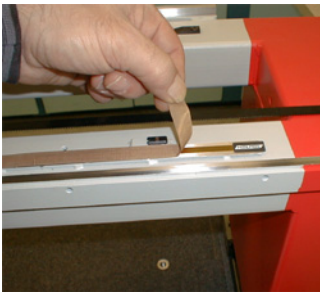
Slightly lift the carriage enough to slide the forked bracket out from under the carriage then gently lower the carriage onto the bridge rail. Follow the same steps to remove the other forked bracket from the front of the carriage.



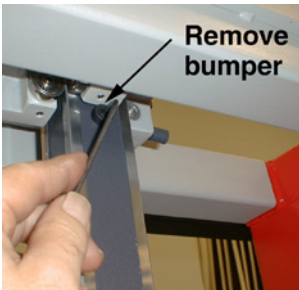
Remove the shipping bracket from the back side of the carriage. Using a 9/64" allen wrench, remove the two 8-32 bolts from the rear shipping bracket and gently lower the rear bearing of the carriage onto the rear bridge rail. Lift the shipping bracket out.



Adjust the bottom bearing of the carriage rear bearing block. Using a 1/8" allen wrench, loosen the bottom bearing set screw. Using a 5/32" allen wrench, adjust the bottom bearing until it contacts the the bottom side of the rear bridge rail. Adjust the bearing "skid" by placing your finger on the bearing applying enough force to prevent the bearing from rotating as you travel the X axis forward and back. The "skid" is adjusted properly when you are able to prevent the bearing from rotating with "medium" pressure from your finger. Tighten the set screws to lock the bearings in place.



Slowly and carefully remove the brown protective tape that is covering the X axis scale. Slowly travel the carriage back and forth to each end of travel on the bridge to check for smooth operation.



Using a 7/64" allen wrench remove the 6-32 screw and rubber bumper from the front of the probe bar near the bottom side of the carriage.

Slowly and carefully pull off the brown protective tape that is covering the Z axis scale. Check the "skid" on all the bearings coming into contact with the probe bar. If any of the bearings are not "skidding" properly, adjust the "skid" at this time. Travel the probe bar up and down to check for smooth operation.

INSTALL THE MONITOR STAND AND MONITOR



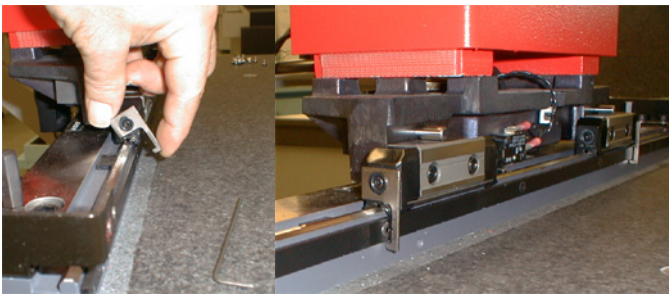
Install the arm section of the monitor stand. Using a 3/16" allen wrench, insert two 1/4-20 bolts (located in accessories labeled monitor stand bolts) through the monitor stand arm and into the right side of the cabinet and tighten.



Place the monitor stand base onto the arm, locating the stud that is attached to the base through the existing hole in the top of the arm. Install the washer and lock knob onto the stud on the bottom of the stand and tighten.

Remove the monitor from its box and assemble. Place the assembled monitor onto the monitor stand and align the holes in the bottom of the monitor base with the holes in the monitor stand base. Using a 7/64" allen wrench, install the three 6-32 screws through the stand and into the plastic monitor base. Be careful not to over tighten the screws.

ADJUST THE ANTI-LIFTOFF HOOKS ON THE MAIN SUPPORT AND CARRIAGE



Adjust the anti-lift-off hooks on the main support. Using a 2mm allen wrench loosen the screw on the end of the recirculating bearing. **DO NOT REMOVE THE SCREW COMPLETELY.** Rotate the hook downward until it is under the anti-lift-off rail. Be careful that the anti-lift-off hook is not touching the top of the "V" on the main rail and that it does not touch on the under side of the anti-lift-off rail. Once

the hook is located properly, tighten the screw. **BE CAREFUL NOT TO OVER TIGHTEN THE SCREW.**



Repeat this procedure for the second anti-lift-off hook on the main support and for the anti-lift-off hooks on the carriage. When all the hooks are positioned, travel the X and Y axis to make sure they are not coming into contact with the rails at any point in the travel.

INSTALLATION OF THE TOUCH PROBE INTO THE PROBE BAR



Using a 1/8" allen wrench loosen the set screw in the probe bar end cap. Insert the 3/8" shank on the touch probe all the way into the 3/8" hole in the end cap. Orient the touch probe so that the red light is facing the front of the machine. Tighten the set screw. Plug the touch probe wire coming from the probe bar end cap into the back of the touch probe. The wire will only fit one way.

INSTALLATION OF THE COMPUTER AND WIRING

At the back side of the CMM remove the two black thumb screws that hold the back cabinet cover in place. Using the handle on the back cover, lift the cover up and out to remove it.

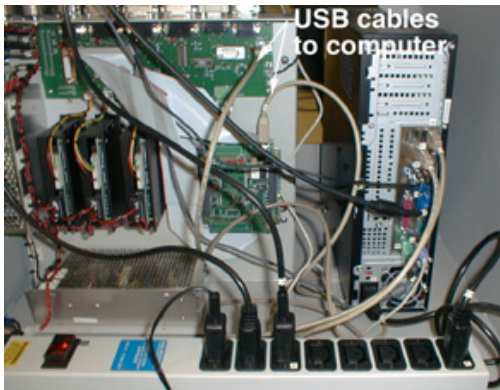
COMPUTER INSTALLATION



Unpack the computer and install it inside the machine through the back of the cabinet. From the back, the computer is located on the right hand side of the electronics panel. The monitor cable, monitor power cable, speaker cable, mouse cable, and joystick cable must be routed under the right side cover of the machine. Remove this cover to allow for installation of these cables. Attach the monitor cable to its appropriate spot on the back of the computer. Plug the monitor power cable into the power strip. Remove the mouse from computer accessory box, and place on monitor shelf, and attach cable to the computer. Install the speaker wire from the monitor to the computer

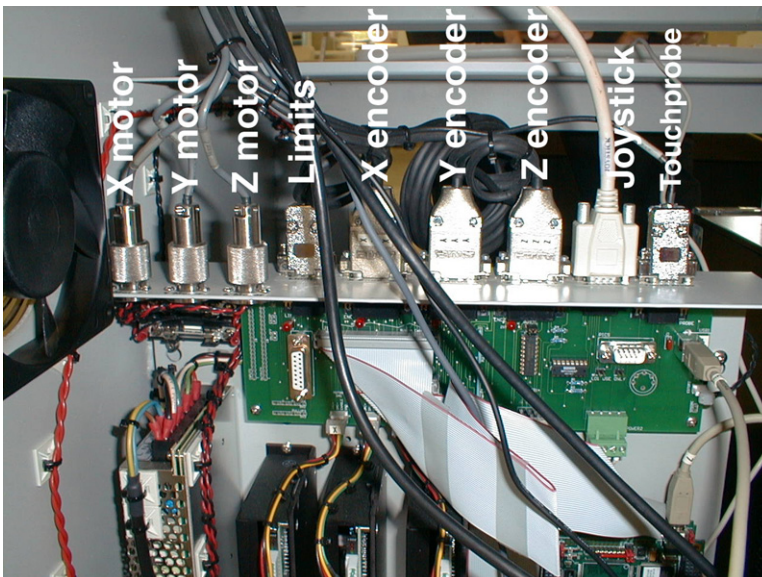
sound card. Install the computer power cable into the computer and then plug into the power strip. Remove the keyboard from its box and place on the sliding tray on the front of the machine and connect the cable to the computer. Lastly, install the joystick cable. One end of this high density DB15M connector hooks to the joystick pendant and at the other end the DB15M connector connects to the joystick jack on the interconnect card. Re install the right side cover.

INSTALLATION OF MACHINE WIRING



The electronics have two USB connections that need to be made. The first connection is the PMAC control card to the computer. Install one end of USB cable to the PMAC card and the other to the computer. The second connection is for the joystick circuitry, install one end of the USB cable to the interconnect card and the other end to the computer.

The machine wiring is labeled and should be connected to the proper locations during shipping. The following procedure outlines the installation of these connections for future reference.



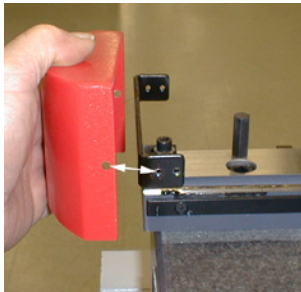
The machine wiring will connect to the interconnect card along the top of the electronics panel from the left to the right (looking from the back of the machine). All connections have screw type connections that need to be fastened but **DO NOT OVERTIGHTEN** these connections or damage to the interconnect board will occur. The first connection is for the Limit switches; this cable is a DB9M type connector and connects to the LIMITS jack on the electronics panel. There are encoder connections for each axis of travel (X, Y, and Z). These are DB15M connectors that connect

to the appropriate connection on the interconnect card (X Encoder, Y Encoder, Z Encoder). The final interconnect connection is the touch probe cable (DB9M) and this plugs into the Touch Probe connection on the interconnect card. Next the 3 motor connections need to be installed. Each motor connection is a 5 pin silver connector. These plug into the appropriate jack on the left side of the electronics panel.

INITIAL MACHINE POWER UP

Install the main power cord into the side of the cabinet. Plug machine into an appropriate AC receptacle. Check that the red stop switch on the front of the cabinet is pulled out (twist to release). Turn on the main power switch on the right side of the cabinet. Move the machine to the center of all axis travel by hand prior to starting the computer. Open the front door, and turn on the computer. Start the Geomet software by double clicking on the Geomet icon from the Windows desktop. You will be prompted to turn the motors on and home the machine using the appropriate buttons. The machine should move in the +z direction (up), the +x direction (right), and the -y direction (towards the front) and complete the homing routine. The machine is now ready to be operated.

COVER AND BELLOWS INSTALLATION



Install the main rail/main support covers. Begin with the two end cap covers. (These are the curved covers). Align the two holes in the end cap cover with the holes in the cover bracket. Using a 3/32" allen wrench, install an 8-32 button head screw in each hole and tighten.

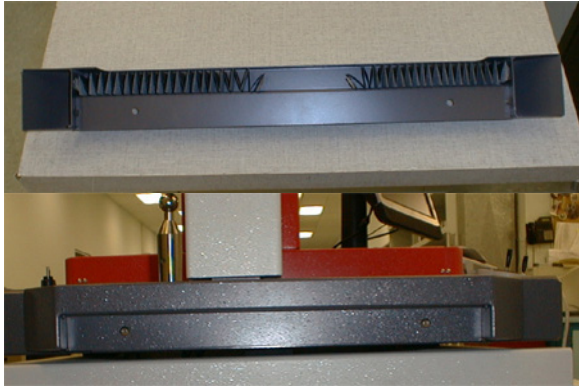


Next, install the inside main rail cover. Align the two holes in the cover with the holes in the cover bracket. Install two 8-32 button head screws and tighten. Finally, install the outside main rail cover. Note that this cover has four holes in it. Align the upper two holes with the cover brackets and install the two 8-32 button head screws. Now, install two 8-32 button head screws

cover and into the cover bracket (already attached to the CMM stand) and tighten.



Install the Y axis bellows in the guide tracks located on the inside of the covers. Attach the bellows at each end by pressing the "Vel-Cro" together. Make sure that the bellows expand and contract freely with the travel of the CMM.



Install the leg rail cover. Align the two holes in the leg rail cover with the two holes in the leg rail. Using a 5/32" allen wrench install two 1/4-20 button head screws and tighten. Install the leg rail bellows in the guides inside the cover and attach them at each end by pressing the "Vel-Cro" together. Make sure the bellows expand and contact freely with the travel of the CMM.



Install the bridge cover. Move the carriage to the center of the bridge. Lift the bridge cover over the probe bar and carriage. Lower the bridge cover onto the bridge aligning the four 8-32 studs at each end to the four slots on the bridge. Make sure the bridge cover is resting completely on the bridge. Install an 8-32 "thumb-nut" on each stud and tighten. Move the carriage to each end of travel for the X axis to ensure that it is not contacting the cover at

any point. Insert the X axis bellows into the guides on the inside of the bridge cover. Attach them at each end by pressing the "Vel-cro" together. Make sure that the bellows expand and contract freely with the travel of the carriage.



Install the Z axis tower cover. Lift the tower cover above the probe bar. Carefully lower the tower cover over the probe bar and down onto the carriage. Align the four slots of the tower cover with the holes in the carriage. Using a 3/32" allen wrench, install an 8-32 button head screw in each hole and tighten. Move the probe bar to its full up position and then down to ensure that it moving freely within the cover.

CMM COMPONENTS

