MIKON MACHINERY

MULTICAM Complete CNC Solutions



CNC Router Pre-Installation Guide

Ensure a smooth and efficient setup for your MultiCam CNC equipment with our comprehensive Pre-Installation Guide, detailing all steps for proper preparation and installation.

Router Pre-Installation Guide

Congratulations on purchasing a MultiCam CNC System, which is just one of thousands of MultiCam cutting systems in use for a variety of industries worldwide. We recognize that Service after the Sale is important to all customers, and we have focused our efforts in providing both to each customer since we opened our doors in 1989.

Organizations from industries such as cabinetry, furniture, woodworking, metal fabrication, sign making, HVAC, solid surface, and plastics fabrication find MultiCam CNC systems to be a reliable and indispensable addition to their company.

With over 60 technology centers worldwide, MultiCam provides customers with access to factory-trained technicians in various distribution locations who are committed to ensuring each system meets the customer's demands.

We are proud to welcome each new member into the MultiCam Family!



Installation Process

This document will be forwarded to the person(s) responsible for handling the installation process. That person will become the contact between the company and the distribution center handling the installation.

A MultiCam Technician will contact each member to schedule the machine installation. Once the completed Notification Memo with documented Voltage Reading information has been received by the local distribution center, a MultiCam Technician will contact the person named on the Notification Memo to explain the installation process involved. This document will cover the necessary floor plan and procedures involved in the installation process and will prepare the member for what accommodations are expected at the facility for the router to be correctly delivered and installed.

The standard training program is described later in this document; however, training arrangements may vary depending on the CAD/CAM software currently owned or purchased by each member. The technician can advise of any anticipated considerations in relation to the router being shipped and is available to answer installation questions and service issues during regular business hours.

Some members may believe that the originally purchased days of on-site training are not enough and may purchase additional instruction for on-site demonstrations or instruction at the distribution center. The MultiCam Technician is scheduled to be on-site for a determined number of days to assist in training employees on the router, and members should make sure that all the necessary requirements for proper installation (i.e., electrical setup, adequate space to deliver and install the router) have been confirmed. Time lost for last-minute modifications is not included in the agreed-upon time for instruction.

Members should recognize that MultiCam provides no connectors (e.g., wiring, hoses, regulation devices, communication lines, disconnect devices, or grounding rods) with any system. Members are required to purchase all necessary connectors prior to installation and have those devices available for the installation process. Members may contact MultiCam for recommendations on power requirements.

The preferred order of activates regarding the purchase, preparation, and installation are as follows:

* The member finalizes the purchase of the router from MultiCam.
* The sales coordinator calls the member for verification and forwards this document.
* The member reviews the document, makes necessary preparation, and faxes the Notification Memo.
* The member contacts an electrician, who checks out the site and install the disconnect switches.
* The Notification Memo is received and forwarded to the appropriate technician.
* The technician calls the contact person to verify floor plan, procedures, and status of preparation.
* The contact person and technician agree on a date for installation, and the member contacts a rigger.
* The router is delivered, with all components checked against the packing slip, and proper installation and training are completed. Installation will take several days. The technician cannot properly train until the machine is fully installed.
* The electrician is called back for final wiring, and a cable vendor may be called in for custom-length cables at the member's expense.
* The technician provides the member with a verification form showing that all training issues have been addressed and that the member understands how the machine works, how jobs are started and completed, and how available resources such as User Manuals and websites are accessed.

MultiCam Router Pre-Installation Guidelines

Please refer to the following information when preparing for the arrival of the MultiCam Router. The Notification Memo and Voltage Reading at the end of this document should be completed, signed, and forwarded to the MultiCam Distribution Center at the fax number provided on the form.

This document will address the following requirements and recommendations:

* Customer Responsibilities
* Space Requirements
* Shipment Information
* Receiving and Handling
* Electrical Requirements
* Air Requirements
* Chip Removal
* Sacrifice Material
* Communications Cable
* Computer Requirements

Training

Customer Support

Customer Responsibilities

The member is responsible for providing the following items for proper installation:

* Electrical specifications described
* Electrician available for final machine cabinet hookup after the machine is installed
* Ethernet or serial connections (i.e., hubs, routers, or switches)
* ¾” x 10” lag bolts with nuts and washers (quantity to be determined by the machine size)
* Maintenance personnel, concrete hammer drill, and drill bit for installing the lag bolts
* Ethernet connections (i.e., switch, cabling from network if preferred)
* Network administrator on-call for Ethernet connections

1 to 2 employees who will be operating the machine

Space Requirements

Positioning of the router must be in compliance with local building codes. Any costs associated with post-installation modifications necessary to achieve compliance with local building codes are the customer's responsibility. The following guidelines should be used when selecting the location for the MultiCam Router:

1. Consider the space required for moving the router to its final location, such as the size of doorway and height between floor and ceiling.
2. Determine whether the material will be loaded from the front or side and allow adequate space for material handling. The E-chain or cat track is usually supported on the XA side.
3. Establish a minimum clearance of 4' (1.2m) on all sides as recommended.
4. Select flooring that is level within ½" (12.7mm) over the entire machine footprint with at least 4" (102mm) thick reinforced concrete (3000 psi strength) for optimum machine performance and reliability as recommended. Avoid joints as this will affect the output performance.
5. Allow adequate space (i.e., 4' x 4' [1.2m x 1.2m]) for the vacuum pump at the rear of the machine or as applicable.

Shipment Information

Depending on the length of the table, the router could have 2 forklift tracks welded to the base near the mid-point of the machine. Each member should make sure the forks are long enough to reach more than halfway across the bed. Industrial skates are available at many rental houses and can facilitate moving the machine into and around the facility.

The forklift needs to be sized at a minimum of 1-1/2 times the machine weight in order to accommodate this load, and some loads may require the use of 2 forklifts. A crane may also be required during the installation for machines that are delivered with the gantry removed.

To check the status of the order, members may contact the local distribution center.

Receiving and Handling

There are several issues that need to be addressed in the receiving and handling of the router. These precautions and requirements are recommended for efficient installation of the router and possible responses to any damages that occur during shipping.

* The member is responsible for removing the router from the delivery truck or van and placing the router in its final location. MultiCam recommends contacting a rigger to facilitate moving the machine and can provide a list of available riggers upon request.
* A forklift is required to remove the router from the delivery truck or van. Some routers may require the use of 2 forklifts so that the second forklift can support the system from the bottom on the opposite side. A crane may also be required for larger machines.
* All components of the machine and the machine itself should be unpacked and inspected. The contents should be checked against the packing list to ensure that all the necessary items have been received according to the order and in the proper condition. Members cannot claim any items from the packing list as not being received after 72 hours following the completed installation.

Any shipping damages should be immediately reported to the carrier. If there are damages, the member should prepare photographs clearly illustrating the type of damage, forward the claim information to the carrier, and maintain copies for the member's records. Once the carrier has been informed, members should also inform the local MultiCam Sales Coordinator of any damages incurred during shipping.

Level Feet should be inserted from the bottom with one nut and washer below the base plate and one nut and washer above the base plate so that the machine is in the lowest position possible. A MultiCam Technician can do the final leveling on-site.

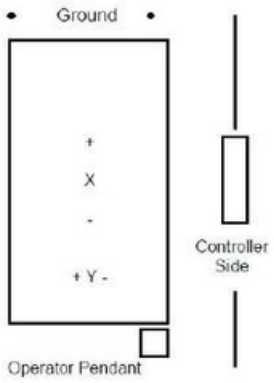
If the router has a separate controller cabinet, then the member will want to anchor the cabinet to the floor in a location where the door can fully open. Controller cabinets typically weigh 500 ± 50 lb (227 ± 23 kg) and are included in the estimated weights.

The vacuum pump is normally positioned near the rear of the machine and should be situated so that the exhaust vents away from the machine and anything combustible. If members choose to situate the vacuum pump at a distance from the machine, then they should keep the use of all 90° elbows to a minimum.

Electrical Requirements

There are several issues that need to be addressed regarding the electrical requirements of the router. These precautions and requirements are recommended for proper electrical connections, grounding, and box size. A current draw reference is available (see Recommendations for Current Draw).

* The MultiCam Distribution Center should be contacted with the actual current and amperage requirements before electrical setup is started since the requirements will vary with the Voltage and Phase of each machine.
* The site power supply should correspond with the voltage indicated on the machine electrical specifications, and the site must be free of electrical noise and/or spikes. Power installation requirements must follow local code. If the supply voltage cannot be maintained within a range of +/- 5%, then a voltage stabilizer will need to be installed at the member's expense. The Voltage Reading at the end of this document should be completed and forwarded to the local distribution center to provide them with verification of consistency.
* The MultiCam Technician is not responsible for making the electrical connection; therefore, it is very important that the electrical disconnect box be wired before the router arrives at the facility and be sized according to the power requirements. Members should ask the electrician to check the local codes for proper placement. A separate disconnect box is required for each router and vacuum pump, if applicable. The disconnect box should be located on the side of the router where the control box is located. Members can refer to the footprint diagram for the location of the control box. The Electrician will need to be called back in to make final connections to the machine disconnect switch and the vacuum pump, if applicable, after the technician has initiated installation. Any additional changes to the location of the installed router after the technician leaves will require the Electrician to return to the site and verify that the router is properly placed per code.
* MultiCam recommend a minimum 5/8" by 10' (16mm x 3m) copper grounding rod to be located within 6' (2m) of the router for high static cutting applications and a reduced servo noise.



* Members should not power up the router once the electrical connection is in place but should contact the distribution center to make the final arrangements for the installation of the MultiCam router.
* According to the National Electrical Code, Section 430.52, any protective device (i.e., circuit breaker, service fused disconnect) must have a rating or setting NOT TO EXCEED 175% of the full load current of the AC wound-rotor squirrel cage motor. These motors can have large starting currents three to five times or more than that of the motors rated full load current. Any protective device used must be designed for high in-rush current and/or motor-rated loads.
* It is suggested that, when a breaker is used, a thermal-magnetic/molded case breaker is to be used with a minimum interrupt current of 25kA @ 460VAC, 50kA @ 230VAC (UL489, CSA C22.2), and 36kA @ 415VAC (IEC 60947-2). When a fused disconnect is used, it should be used with at least dual-element time delay, current limiting fusing, UL Listed (UL248-1) and CSA Certified (C22.2) Class RK5 and RK1, where the available short-circuit interrupt current does not exceed 200,000 RMS symmetrical amperes. These allow for the high in-rush current required by inductive loads, motors, and/or transformers.
* NEC Section 430.110 states that the disconnecting means for motor circuits rated 600V or less must have an ampere rating of at least 115% of the full load rating of the motor. Voltage fluctuations in excess of +/-10% of nominal voltage may damage the machine and void the warranty. It is the responsibility of the customer to supply and arrange connection of the electrical service to the equipment; voltage and ampacity must meet the requirement of the specific model of the equipment, and it must comply with local, regional, and national electrical codes.

Air Requirements

The air used with every router and auxiliary component should be clean, dry, and oil-free (i.e., paint booth quality air). HSD spindles require an introduced compressed air of a purity in accordance with ISO 8573-1, classes 2 4 3. Non-compliance of the below specifications may cause damage to the spindle.

- Class 2: For the solid particles: size of the solid particles < 1µm
- Class 4: For the humidity: dew-point < 3oC (37.4oF
- Class 3: For the total oil: concentration of oil < 1 mg/m3

Users are encouraged to contact an air specialist for filtration. Each air input should be 3/8" (9.5mm) i.d. hose for up to 75' (23m) or 1/2" (12.7mm) i.d. hose for over 75' (23m). Air is required at specific levels if the member has purchased any of the following items:

Additional Item	Air Required
Automatic Tool Changing Spindle	100 psi minimum
Quick-Change Pneumatic Chuck Spindle	100 psi minimum
Automister / Cold Air Gun	20 – 80 psi

The member takes responsibility for air filtering, and all equipment should be considered when the member uses the compressor for determining air usage. Output may be adversely affected if the member uses a compressor that is too small. The supply line diameter is dependent on the machine location relative to the compressor's location.

Chip Removal

MultiCam Routers are available with either a pressure foot or dust collection hood to be used as the auxiliary dust collection system. The electrical outlet that is suitable for vacuum removal should be located near the router, and the CFM should be greater or equal to the diameter of the dust collector port x 400 (i.e., a dust collector with 4" diameter requires 1600 [4 x 400] CFM). The appropriate hoses are shown below.

Item	Recommended System	Hose Size Needed (in/mm)
Pressure Foot	5HP Shop Vacuum	2 / 50.8
Dust Collector	High Flow Dust Removal System	4 / 101.6

Sacrifice Material

Sacrifice material is only required if the router has a vacuum hold-down tabletop and should be available before the technician arrives to install the router. One sheet of ½" MDF measuring 4' x 8' will be supplied with each machine as packing material and can be used as sacrifice material. Members may elect to replace the sacrifice material, or spoilboard, based on the particular application of the router. Recommended replacements for sacrifice material are shown below.

Vacuum Type	Recommended Sacrifice Material
High Flow Vacuum	1/4" Pegboard
Positive Displacement Pump	3/4" MDF or LDF
High Pressure Vacuum	Jig Plate made of MDF or HDF or similar material

Communications Cable

Each member is responsible for supplying and installing the communications cable of sufficient length from the computer location to the machine, and Ethernet is the preferred method of communication. Reasonable efforts should be made to avoid contact with other cables or similar sources of electrical interference during the communications cable installation or any comparable interaction. For example, members should not wire tie the communication cable in line with power cords or conduits.

The communications cable should not be placed in proximity with fluorescent lighting or any high frequency motors of any type as these can degrade the signal quality and cause problems between the router and host computer. If the cable lies on the ground, members should provide protection from floor traffic. Ethernet communication is recommended over serial communication, and a system administrator should be available during installation if Ethernet communication is being used. An Ethernet 10/100 Mhz switch with patch cables is required, and any Ethernet patch cable section longer than 175' (54m) must have an Ethernet switch box between sections.

Ethernet cables are available from MultiCam at an additional cost. Cross-over cables provide connection directly to the computer while patch cables can be used with networking components such as a hub or switch. Members can determine the size requirements and contact the local distribution center with the proper part number as shown below:

Cross-over Ethernet Cable for Direct Connection		Patch Ethernet Cable for Networking Components	
Size (ft/m)	*Part Number*	*Size (ft/m)*	*Part Number*
25 / 7.7	94-00050-00	25 / 7.7	94-00049-00
50 / 15.2	94-00050-01	50 / 15.2	94-00049-01
100 / 30.5	94-00050-02	100 / 30.5	94-00049-02
200 / 61.0	94-00050-03	200 / 61.0	94-00049-03
		300 / 91.5	94-00049-04

Computer Requirements

Any computer that will be operating Coreo should have a minimum of the following:

Operating System: Windows 10 Pro
Processor: i5 – 8th Generation
Ram: 12 GB
HDD: 1 TB (If C drive is a SSD make sure it is at least 500 GB in size)
Graphics: 256MB video graphics card
Needed ports: 1 RJ45 Ethernet port
3 USB ports minimum
Also need 10/100 or 1 GB data switch 4 or 5 ports.

Cat 5 or 6 shielded cables to go from computer to data switch and data switch to the machine.

Training

With the purchase of the router, the member will receive machine training on-site and optional software training at a MultiCam facility. Any additional training or extended training must be paid separately. Any forfeited days of training (e.g., Company paid for 2 days of training but decided that only 1 day was sufficient) cannot be reinstated regardless of any turnover in operators. All additional training after the initial installation demonstration must be purchased.

Members should consider training main operators on the use of the MultiCam Router. Training has been designed for a maximum of 2 trainees, though other personal may observe. Any operators working second or third shift are encouraged to be present for the full operator training. Proper training requires the uninterrupted attention of the operators, who should be available for 8 continuous hours each day allotted for training.

The following is an outline of the MultiCam Router features on which the operators will receive instruction during the training course. Upon completion of the training, the router operator(s) will be proficient in using and understanding the following features:

* Keypad Interface: A description of each key on the keypad and all the menu items
* Step-by-step Setup: A description of how to set up and run a job from start to finish
* MultiCam Software: How to use Coreo
* MultiCam Maintenance Guide: How to properly maintain the machine
* Contacting MultiCam Service/Support

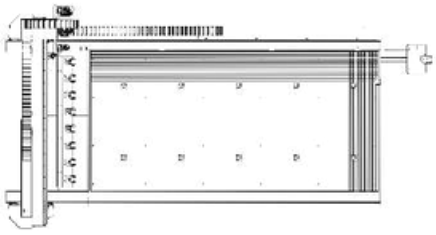
Customer Support

All MultiCam Technicians receive specialized training in electrical, mechanical, and programming areas to provide members with the highest level of technical support available. All MultiCam Technicians are familiar with the User Manual and have the ability to diagnose and resolve electrical, mechanical, and programming issues to the customer's satisfaction in a timely manner. Many issues can be resolved over the telephone at no charge to the customer, and the User Manual has troubleshooting tips relating to many common areas for the member to review before calling for assistance.

Phone Help – Members may contact the local distribution center during regular business hours Monday through Friday, excluding holidays.

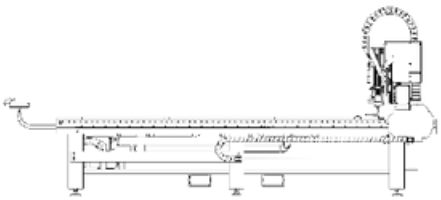
Customer Service – Members may contact Customer Service at the local distribution center during regular business hours Monday through Friday, excluding holidays. Common spare parts are kept on hand, so MultiCam can ship most parts for overnight delivery if requested. Parts that have to be specifically made require a 3- to 5- working day lead time provided that all the materials are available for the assembly. If a request is received before 3:00 pm in most cases, we can arrange the shipment on the same day. Warranty parts will be shipped UPS 2nd Day Air; any overnight shipments will be charged to the member.

Router Specifications—APEX1R



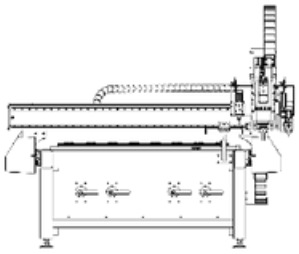
APEX1R Specs (inches)

*Z-axis clearance: 5
*Z-axis travel: 12
*Repeatability: +/- 0.001
*Cutting speed: 1,350 ipm
*Rapid Traverse: 1,900 ipm
*Drive System X,Y axes: Rack and Pinion
*Drive System Z axis: Ball Screw
*Standard Work Surface: 1” Phenolic



APEX1R Specs (millimeters)

*Z-axis clearance: 127
*Z-axis travel: 304
*Repeatability: +/- 0.03
*Cutting speed: 34 m/min
*Rapid Traverse: 48 m/min
*Drive System X,Y axes: Rack and Pinion
*Drive System Z axis: Ball Screw
*Standard Work Surface: 25.4mm Phenolic





Size Chart

Model	W in(mm)	L in(mm)	H in(mm)	Working Area in(mm)	Weight lb(kg)
103-R	81 (2057)	151(3835)	78 (1981)	48x96 (1219x2438)	1700 (771)
204-R	93 (2362)	177.5 (4508)	78 (1981)	60x120 (1524x3048)	2200 (997)
304-R	116 (2946)	177.5 (4508)	78 (1981)	83x121 (2108x3073)	2600 (1179)

Note: Specs are used for reference only and do not include the maximum height of the Z-Axis. Please consult your MultiCam Distributor for the maximum height requirements for your specific machine.

The following information will be completed by the MultiCam Sales Coordinator and is specific to each machine. The member is responsible for making sure the necessary parameters are set up properly before the Technician arrives.

Company Name	Protectolite Composites Inc
Machine Serial Number	1-204-RA1-15229
Machine Voltage	
Machine Amperage	

The machine current draw represents the maximum simultaneous current draw for all of the machine motors and drives. This value should provide a safety factor to use as the disconnect value for the machine since all motors and drives will most likely not pull peak current simultaneously. Recommended Disconnect requirements may vary from area to area, so members should verify the local code requirements. Members are encouraged to review these recommendations with an electrician.

	Amperage	Voltage	Phase
Machine Current Draw	41.8	220V	3
Recommended Machine Disconnect			
Vacuum Pump Current Draw	24.2	575V	3
Recommended Vacuum Pump Disconnect	40		

Total Machine SCFM	15

Notification Memo for Installation Scheduling

TO:		DATE:	
FROM:		Pages:	1

This page must be completed and returned to MultiCam prior to scheduling and installation.

Company Name	
Serial Number	
System Voltage	

A clear understanding and acknowledgment of this document are critical to ensure a prompt and successful installation. Please complete the attached section after reading the Router Pre-Installation document and completing the Voltage Reading, sign below, and fax this page to the number above.
Failure to comply with these requirements may delay the installation of the router and may require the member to pay for extended or additional training.

Section	Date Read	Initials of Contact Person and or Supervision/Owner
Customer Responsibilities		
Space Requirements		
Shipping Information		
Receiving and Handling		
Electrical Requirements		
Air Requirements		
Chip Removal		
Sacrifice Material		
Communications Cable		
Computer Requirements		
Training		
Customer Support		

Disconnect Box Voltage Reading for 3 Days

	Day 1	Day 2	Day 3
Morning 6:00 to 9:00			
Midday 11:00 to 1:00			
Afternoon 4:00 to 6:00			

We are ready to accept delivery of our MultiCam Router.

Authorized by: _____
Print Name: _____
Date: _____

Contact Person: _____
Direct Phone Number: _____

MIKON
MACHINERY

GET IN TOUCH

www.MikonMachinery.com

support@mikonmachinery.com

967 Edgeley Blvd. Vaughan, ON

(905) 738-7954

(844) 579-8398

Support Ticket:
www.MikonMachinery.com/support