

# **USER MANUAL**

#### **Air Cooled Spindles**



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## INTRODUCTION

REDLINE CNC Spindles are the most advanced Plug and Play Spindle Kits on the market today. Featuring a sleek and stylish patent pending design, compact all metal enclosure, a high quality custom made Spindle with four ceramic bearings standard.

In addition, it's the only safety approved Plug and Play Spindle kit on the market today. No other Spindle Kit on the market has the quality, reliability and safety that the REDLINE CNC offers !

## SAFETY RULES

These operating instructions explain the Redline CNC Spindle and the correct handling of the CNC system. Please read these operating instructions and accompanying documents in their entirety before commissioning of the system in order to become familiar with the characteristics and the operation of the product. The improper operation of the Redline CNC Spindle system can lead to

damage to the product and property and can cause serious injuries, electric shock and / or fire. It is imperative to adhere to the safety instructions listed in these operating instructions at all times. Should you have any questions or concerns prior to initial use of the Redline CNC Spindle or the

need for further information, do not hesitateto contact us prior to the commissioning of the Redline CNC Spindle system.

Safety Instructions and Protective Measures: (General Safety Warnings for the Use of Power Tools )

Work Area Safety

NOTICE: Keep work area clean and well lit. Cluttered or dark areas invite accidents.





**Caution:** Do not operate the power tool in explosive atmospheres, such as in the presence of flammable liquids, gases or dust. Power tools create sparks which may ignite the dust or fumes.

**NOTICE:** Keep children and bystanders at a distance while operating a power tool. Distractions can cause you to lose control and can result in accidents.



**Caution:** Operate the spindle only in interior spaces on a solid, horizontal table or workbench.

#### **Electrical Safety:**

Warning: Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with grounded power tools. Unmodified plugs and matching outlets will reduce the risk of electric defects and malfunctions.



Warning: Do not expose power tools to mois-ture. The power tool is only suitable for in door use. Water entering a laser tool will increase therisk of electric shocks.

#### **Personal Safety:**

**Caution:** Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired and/or under the influence of drugs, alcohol or medication. A moment of inattention while

operating a power tool may result in serious personal injury.



**Caution:** Use personal protective equipment. Always wear eye protection. Protective equipment, such as a suitable dust mask or ear protec-tion, reduces the risk of injuries.





**Caution:** This tool is controlled by a computer. During operation, it should not be controlled directly. Lack of caution or expertise as well as program errors can lead to unexpected movements.



**Caution:** Do not touch the insertion tools or motors as they can heat up significantly during operation.



**Caution:** Never place any parts of the tool oraccessories in the mouth as this can lead to serious injuries.

**NOTICE:** All persons who operate the power tool must have read and fully understood all relevant safety and operating instructions. Misunderstanding may result in personal injury.

**NOTICE:** Dress properly. Do not wear loose clothing or jewellery. Pin your hair above your shoulders so that it cannot get caught in the Ball Screws and linear guides or moving parts.

#### Use of the Power Tool:



**Caution:** Do not alter or misuse the tool. Any alteration or modification is a misuse and may re-sult in serious personal injury.



**Caution:** Disconnect the plug from the power source before you make any

adjustments, change accessories, or store the tool. Such preventative safety measures reduce the risk of starting the power tool accidentally.



**Caution:** Store idle power tools out of the reach of children and do not allow persons unfamiliar with the tool or these instructions to operate the power tool. Power tools are dangerous in the hands of untrained users.



**Caution:** Do not touch the bit or collet after use. After usage bit and collet are too hot to betouched with bare hands.



**Caution:** When using the end mills, V-bits or cutters, always have the workpiece securely clamped. Never attempt to hold the work piece with

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your hands while using any accessories. These tools can jam easily in the material, and can kickback, causing loss of control resulting in serious injury.

Caution: If the work piece or bit becomes jammed or bogged down, turn the power tool "OFF" by the switch. Wait for all moving parts to stop and unplug the tool, then free the jammed material. If the switch to the tool is left "ON", the tool could restart unexpectedly causing serious personal injury.

**NOTICE:** Do not allow familiarity gained from fre-quent use become commonplace. Always remember that a careless fraction of a second is suffi-cient to inflict severe injury.

**NOTICE:** Never use dull or damaged insertion tools. Sharp bits must be handled with care. Dam-aged bits can snap during use. Dull bits requiremore force to cut the tool, possibly causing the bit to break.

#### NOTICE: The speed and feed of the bit when carv-ing, routing or cutting is very important. Always observe the recommended speed and feed for the particular bit.

**NOTICE:** Do not leave a running tool unattended, turn power off. Only when tool comes to a complete stop and is disconnected from the mains it is safe.

**NOTICE:** Use the power tools, accessories etc. in accordance with these instructions, taking into account the working conditions and the work to be performed. Use of the power tool for operations different from those intended could result in a hazardous situation with high probability of superficial injury.

**NOTICE:** Do not reach into the area of the rotating insertion tools. The proximity of the rotating tools to your hand may not always be obvious.



#### Care of the Power Tool:

**NOTICE:** Maintain the tools. Check for misalign-ment or binding of moving parts, breakage ofparts and any other conditions that may affect the power tool's operation. If damaged, have the power tool repaired before use. Many accidents are caused by poorly maintained power tools.

#### **Additional Safety Instructions**

**Caution:** Depending on the application field of the machine (private or commercial), observe theapplicable occupational safety and health, safety and accident prevention and environmental regulations.

Caution: Some dust created by cutting, milling or other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are: Lead from nonferrous metals with lead content, carbonate from carbon fibre, arsenic and chromium from chemically treated lumber. Your risk from exposures to these varies, depending on how often you perform this type of work. To reduce your exposure to these chemicals, work in a well ventilated area, and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.

Safely dispose of milling debris — recycle or safely dispose of milling debris and dust, keeping in mind flammability, (potential) spontaneous combustion, and chemical considerations. Even natural materials can have surprising implications for disposing of them, *e.g.*, walnut wood dust is aleopathic (inhibits plant growth) and an irritant to the skin and breathing tract and potentially poisonous to some animals in addition to the typical spontaneous combustion hazard which sawdust poses.

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#### **Personal Protective Equipment:**

When working with the CNC gantry system, the operator has to wear at least the following personal protective equipment and has to be compliant with the below-mentioned safety aspects:

- **Safety googles** for protecting the eyes against flying chips etc.
- Ear protection for protecting the ears against sound and noise.
- No wearing of **clothes which can get caught in the machine**, such as ties, scarves, wide sleeves etc. Additionally, jewelry and especially long necklaces and rings are to be dispensed with.
- Shoulder length or longer hair is to be secured with a **hairnet or a hat** to prevent it from getting caught in the linear guides and / or rotating tools.
- Prior to all adjustments to the machine, its control or system guided tools, such as the Milling Motor, the plug is to be disconnected from the power source.
- Never hold the workpiece to be processed with your hands. It is mandatory that the work piece is securely fixed on the machine table. Other-wise there exists a high risk of injuries!



#### **SPECIFICATIONS**

#### 65mm, 1.5kw, Air-Cooled

- Part Number: RL-VFD-1K5-65-Air
- Material: Stainless steel
- Size: Φ65mm x 270mm
- Power: 1.5KW
- Horsepower: 2hp
- Voltage: 110VAC
- Current: 10A
- Frequency: 0 ~ 400Hz
- Speed: 0 ~ 24000RPM
- Cooling: Air cooled
- Bearing Lubrication: Grease
- Collet size: ER11 Collet
- Shank Sizes: 1/8", 1/4"
- Bearings: Ceramic 2 x 7005, 2 x , .....
- Weight: 2.92kg / 6lbs 7oz

#### 80mm, 1.5kw, Air-Cooled

- Part Number: RL-VFD-1K5-80-Air
- Material: Stainless steel
- Size: Φ80 mm x 195 mm
- Power: 1.5KW
- Horsepower: 2hp
- Voltage: 110VAC
- Current: 10A
- Frequency: 0 ~ 400Hz
- Speed: 0 ~ 24000RPM
- Cooling: Air cooled
- Bearing Lubrication: Grease
- Collet size: ER20 Collet
- Shank Sizes: 1/8", 1/4", 3/8", 1/2'
- Bearings: Ceramic 2 x 7005, 2 x 7002
- Weight: 4.05kg / 8lbs 15oz

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#### 80mm, 2.2kw, Air-Cooled

- Manufacturer Part Number: RL-VFD-2K2-80-Air
- Material: Stainless steel
- Size: Ø80x195(Middle body diameter: 80mm, Length:195mm)
- Power: 2.2KW
- Horsepower: 3hp
- Voltage: 220 VAC
- Current: 10A
- Frequency: 0 ~ 400Hz
- Speed: 0 ~ 24000RPM
- Cooling: Air cooled
- Runout off: Less than 0.005mm
- Bearing Lubrication: Grease
- Collet size: ER20 (6mm)
- Shank Sizes: 1/8",1/4", 3/8",1/2"
- Bearings: Ceramic 2 x 7005, 2 x 7002
- Weight: 4.05kg / 8lbs 15oz



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## FEATURES AND BENEFITS

EMI Shielding:

- All Metal Aluminum Enclosure preventing Electro Magnetic Interference (EMI) traps electrical noise inside of the enclosure.
- All inputs Control signals use shielded cables and input filters for noise free control.
- Shielded Spindle cable with High Frequency noise filter keeps the VFD noise inside the enclosure.
- AC Line filter to keep noise off the power lines.
- Fully wired and programmed VFD with PWM and RS-485 controls
- Some models wired for coolant / vacuum relay
- Remote or Manual speed setting switch to adjust speed.
- Convenient Remote that attaches to your Control monitor.
- Spindle is full grounded for safety back to the chassis.
- Optional Wall mount or Desktop stand with input dust filter to keep the dust out of you VFD.
- Safe inspected by third party with valid inspection decal.

Ceramic Bearings:

Manufacturers prize ceramic bearings because of their speed advantage over their steel counterparts. This benefit stems from their four main characteristics:

- Reduced rolling resistance
- Reduced weight
- Increased durability
- Increased stiffness
- Reduced rolling resistance mainly results from the ceramic balls' increased smoothness, dimensional stability, and increased uniformity over steel ball bearings.

These properties ensure that applied loads are uni-formly distributed over all rolling elements. Additionally, ceramic materials have a significantly lower coefficient of friction (~20–30 times less) than steel ball bearings with standard



seals and lubrication. This reduced friction results in reduced rolling resistance and faster rotational speeds.

The reduced weight of ceramic bearings also contributes to their overall enhanced performance over steel bearings. Ceramic materials can weigh up to 40% less than comparable steel bearings. This reduced weight translates to decreased centrifugal loads exerted on the outer race as the bearing spins.

This reduction of forces allows ceramic bearings to operate up to 20–40% faster than conventional steel bearings while using considerably less energy to maintain their speed. Ceramic bearings are also harder than steel bearings and therefore are more durable. Studies show that ceramic bearings can last anywhere between 5 and 20 times longer. The smoother surface of the ceramics also significantly reduces the risk of bearing seizure with little to no lubrication. Furthermore, ceramic bearings can operate in harsh environments due to their resistance to corrosion and degradation. Finally, their electrical insulation properties eliminate the risk of electrical erosion and pitting of the rolling elements .

#### PLUG AND PLAY

Say goodbye to time consuming and complex Spindle Kit set-ups. REDLINE CNC Spindle Kits are plug and play with your CNC. We do the work of ensuring all the wiring is done properly and goes through a thorough inspection process, so you don't have to.

#### THREE MOUNTING OPTIONS

REDLINE CNC Spindle Kits were design with convenience in mind, that's why we offer three (3) different VDF mounting options.

- Wall Mount
- Desk Top
- Under Table Mount



## COMPONENTS

#### Redline CNC Spindle Kit by Redline CNC-65mm, 1.5 kW Air Cooled 110V



1x 65mm 1.5kw Air Cooled Spindle 1x All Metal 1.5kw 110v VFD with removable display 1x power cord 1x PWM Data Cable or RS-485 control cable 1x Set DRO Cables (Short)(1x 3-Pin & 1x RJ-45) 1x Set DRO Cables (Long)(1x 3-Pin & 1x RJ-45) 1x Spindle to VFD cable 14 gauge flexible shielded 600v wire (8mm) 1x ER 11 collet nut 1x 1/4" collet 1x 1/8" collet 2x spindle wrenches 1x (choice of mount)

#### Redline CNC Spindle Kit by Redline CNC-80mm, 1.5 kW Air Cooled 110V

1x 80mm 1.5kw Air Cooled Spindle 1x All Metal 1.5kw 110v VFD with removable display 1x power cord 1x PWM Data Cable or RS-485 control cable 1x Set DRO Cables (Short)(1x 3-Pin & 1x RJ-45) 1x Set DRO Cables (Long)(1x 3-Pin & 1x RJ-45) 1x Spindle to VFD cable 18 gauge flexible shielded 600v wire (8mm) 1x ER 20 collet nut 1x 1/2 collet 1x 3/8 collet 1x 1/4 collet 1x 1/8 collet 2x spindle wrenches 1x (choice of mount)

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Redline CNC Spindle Kit by Redline CNC—80mm 2.2 kW Air Cooled 220V

1x 80mm 2.2kw Air Cooled Spindle 1x All Metal 2.2kw 220v VFD with removable display 1x power cord with Nema 6/15-p plug for 220v. The VFD requires a 15amp fuse breaker. It's a 3 wire configuration. Single Phase 220. 1x PWM Data Cable or RS-485 control cable 1x Set DRO Cables (Short)(1x 3-Pin & 1x RJ-45) 1x Set DRO Cables (Long)(1x 3-Pin & 1x RJ-45) 1x Spindle to VFD cable 18 gauge flexible shielded 600v wire (8mm) 1x ER 20 collet nut 1x 1/2 collet 1x 3/8 collet 1x 1/4 collet 2x spindle wrenches 1x (choice of mount)



#### Buttons and Connections. FRONT OF VFD



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#### **RIGHT SIDE OF VFD**



#### LEFT SIDE OF VFD

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10A Slow 2.2Kw 220V

× 7



## Digital Readout and Manual Speed Over-ride Front of the Digital Readout



#### **Back of the Digital Readout**



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## COMPONENTS

## Spindle Motor and Connections Water-Cooled





#### COMPONENTS Spindle Motor and Connections Air-Cooled



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## INSTALLATION Installing the VFD Fuse



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#### Mounting the VFD

- · Wall Mounting
- · Desktop Mounting
- · Under Table Mounting

#### WALL MOUNTING

- Screw VFD Mounting Bracket Wall French Cleat to the wall in the location you want the VFD. (Screws not provided)
  - Ensure the mount is level
  - $\cdot$  Use wall anchors if there is no stud
  - $\cdot$  Attach to wall with countersink holes facing away from the wall

VFD Mounting Bracket Wall French Cleat





Screw VFD Mounting Bracket – VFD French Cleat to the back of the VFD using the screws provided. (Screws Provided. 2.5mm Hex Head)
 Attach to the VFD with countersink holes facing away from the VFD

VFD Mounting Bracket VFD French Cleat







 $\cdot$  Slide the VFD onto the Wall French Cleat







#### **DESKTOP MOUNTING**

- · Place the VFD upside down
- Place the Desktop Stand centered on top of the upside down VFD lining up the 4 corner screw holes.
- Insert and tighten 4 mounting screws from underneath. (Screws Provided.
   2.5mm Hex Head)

Note: If using the Desktop Mounting method, the Desktop Mount **MUST** be used to allow air flow through the bottom of the VFD.



#### Desktop Mount





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#### UNDER TABLE MOUNTING

- $\cdot$  Select a location for the VFD under your table.
- Screw the Under Table Mount to the bottom of your table or QCW. (Screws not provided)
- · Remove the 2x top corner screws on both sides of the VFD. (3mm Hex Head)



 $\cdot$  Attach the 2x VFD Table Mounts to the Left and Right of the VFD with the studs facing inward using the replacement long screws provided. (3mm Hex Head)



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VFD Table Mounting Brackets







## INSTALLATION

## Mounting the DRO

DRO Mounting screws will be pre-installed into the VFD for shipping.



# \*Use these DRO mounting screws to mount the DRO to either the VFD or on the MASSO Controller



#### INSTALLATION Mounting the DRO DRO mounted to the VFD

## Use the DRO Mounting Screws to secure the DRO to the VFD



DRO Mounting Screws





#### INSTALLATION Mounting the DRO (Digital Readout) DRO mounted to the a vertical surface

Use M3 screws (not included) to secure the DRO to a vertical surface





#### INSTALLATION Mounting the DRO (Digital Readout) DRO mounted to the MASSO Controller

Use the DRO mounting screws to secure the DRO to the MASSO Controller.



DRO mounting screws



## INSTALLATION

## **Wiring Instructions**

#### Wiring The VFD and Spindle to your Machine Controller Communications Cable (MASSO/PWM)

MASSO/PWM - CNC Controller End





#### Wiring The VFD and Spindle to your Machine Controller Communications Cable (BuildBotics/RS-485)







#### INSTALLATION Wiring Instructions Digital Readout (DRO) Connection / Installation (Connected to VFD)

Use the included DRO Short Cables to plug the DRO into the VFD.









#### Digital Readout (DRO) Connection / Installation (Removed from VFD)

Use the included DRO Long Cables to connect the DRO to the VFD



RJ-485 Connection / 3-Pin Connection



#### Digital Readout (DRO) Connection / Installation (Removed from VFD -Wall Mounted)







#### Digital Readout (DRO) Connection / Installation (Removed from VFD) MASSO Mounted

Use the included DRO Long Cables to connect the DRO to the VFD





#### Wiring The VFD and Spindle to your Machine Spindle Cable Connection





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#### Wiring The VFD and Spindle to your Machine Spindle Cable Connection





## VFD AC Power Connection (110V)









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## VFD AC Power Connection (220V)



**NEMA 6-15P** 

**NEMA 6-15R** 

**NEMA 6-20R** 

MODEL NUM

place Fuse w 12A Slov

nplascer pa

OR

WM I/O

<sup>0</sup> VAC 60Hz 12A 1500 WATTS







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## VFD SETUP

## **Digital Readout (DRO) Controls**

#### **Running State and Unit Display**

**RUN** = When the frequency inverter is at run status, this lamp will be on. **FWD** = The indicator lamp will be on at forward operation and will be off at reverse operation.

V = Indicate voltage
A = Indicate current
Hz = Indicate frequency
V-%-A = Indicate percentage

**A-RPM-Hz** = Indicate rotation speed

#### **Programming Codes**

Your VFD has already been programmed change the programming only if you have experience with programming VFDs.

• Press the Mode button

 $\cdot$  This brings you to the Function Code Menu

- $\cdot$  The flashing number or letter indicates the field currently selected
- Press the Increase or Decrease buttons to scroll through numbers 0-9
- Press the Monitor Data Scroll button to scroll through the different code locations
- Press the **Enter** button when the correct function code you want to change is displayed
- The number currently showing/flashing is the current setting saved into the VFD



- To change the number press the **O** Increase or **Decrease buttons** to scroll to the desired number
- If multiple numbers are required, use the **ENTER Monitor Data Scroll** button to scroll through the different code locations
- Press the **ENTER Enter** button when the correct function code you want to change is displayed
- At any time press the **MODE** Mode button to go back to the previous menu



## **VFD SETUP**

## Programming Codes (MASSO)

DEFAULT CODES:

P0.0.03 = 1 ON/OFF AUTOMATIC COURSE
P0.0.04 = 3 FREQUENCY AUTOMATIC SOURCE
P0.0.05 = 50.0 KEYBOARD FREQUENCY REFERENCE
P0.0.06 = 1 REVERSE MOTOR DIRECTION
P0.0.07 = 0400.0 MAX MOTOR FREQUENCY, HZ
P0.0.08 = 0400.0 UPPER MOTOR FREQUENCY, HZ
P0.0.11 = 0006.0 ACCELERATION TIME
P0.0.12 = 0006.0 DECELERATION TIME
P0.0.14 = 0001.5 MOTOR RATED POWER, 1.5KW
P0.0.14 = 0002.2 MOTOR RATED POWER, 2.2KW
P0.0.15 = 0400.0 MOTOR RATED FREQUENCY, HZ
P0.0.17 = 012.00 MOTOR RATED CURRENT, AMPS - 110v
P0.0.17 = 010.00 MOTOR RATED CURRENT, AMPS - 220v
P0.0.18 = 24000 MOTOR RATED ROTATING SPEED. RPM
P0.1.00 = 8 TERMINAL CONTROLLED FREQUENCY SOURCE
P0.1.01 = 2 KEYPAD FREQUENCY SOURCE
P1.0.23 = 2 TEMP BASED FAN CONTROL
P2.0.00 = 1 RUN FWD (DEFAULT)
P2.0.01 = 2 REVERSE
P2.0.02 = 21 ENABLE KEYPAD ON/OFF SOURCE
P2.0.03 = 18 ENABLE KEYPAD FREQUENCY SOURCE
P5.0.02 = H.0801 LED RUNNING DISPLAY
P5.0.15 = 5.9790 DISPLAY COEFFICIENT
P5.0.16 = 0 ADJUST RPM's DECIMAL PLACE

#### P5.0.19 = 107 ..... Factory Reset



## VFD SETUP

## **Programming Codes (Buildbotics)**

#### DEFAULT CODES:

P0.0.03 = 2 ON/OFF AUTOMATIC COURSE
P0.0.04 = 9 FREQUENCY AUTOMATIC SOURCE
P0.0.05 = 50.0 KEYBOARD FREQUENCY REFERENCE
P0.0.06 = 1 REVERSE MOTOR DIRECTION
P0.0.07 = 0400.0 MAX MOTOR FREQUENCY, HZ
P0.0.08 = 0400.0 UPPER MOTOR FREQUENCY, HZ
P0.0.11 = 0006.0 ACCELERATION TIME
P0.0.12 = 0006.0 DECELERATION TIME
P0.0.14 = 0001.5 MOTOR RATED POWER, 1.5KW
P0.0.14 = 0002.2 MOTOR RATED POWER, 2.2KW
P0.0.15 = 0400.0 MOTOR RATED FREQUENCY, HZ
P0.0.17 = 012.00 MOTOR RATED CURRENT, AMPS - 110v
P0.0.17 = 010.00 MOTOR RATED CURRENT, AMPS - 220v
P0.0.18 = 24000 MOTOR RATED ROTATING SPEED. RPM
P0.1.00 = 8 TERMINAL CONTROLLED FREQUENCY SOURCE
P0.1.01 = 2 KEYPAD FREQUENCY SOURCE
P1.0.23 = 2 TEMP BASED FAN CONTROL
P2.0.00 = 1 RUN FWD (DEFAULT)
P2.0.01 = 2 REVERSE
P2.0.02 = 21 ENABLE KEYPAD ON/OFF SOURCE
P2.0.03 = 18 ENABLE KEYPAD FREQUENCY SOURCE
P5.0.02 = H.0801 LED RUNNING DISPLAY
P5.0.15 = 5.9790 DISPLAY COEFFICIENT
P5.0.16 = 0 ADJUST RPM's DECIMAL PLACE

P5.0.19 = 107 ..... Factory Reset



## SPINDLE CONTROL METHOD

## **Onefinity BuildBotics Controller**

(\*\*\*Must have firmware version 1.6.1 or later\*\*\*)

(\*If using any other Buildbotics Controller other than Onefinity, screen will not look the same and these steps DO NOT apply)

## Step 1. Click the Flyout Menu



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## Step 2. Click on Tool

MOTORS Y+	R	Z+	Axis	Position	Absolute	Offset	State	Toolp	ath	•	
Motor 0			X	Omm	Omm	Ossa	O UNHOMED	🕑 of	к 🔅	•	
Motor 1 XY Motor 2 Origi	in X+	Z Origin	Y	Omm	Orm	0	O UNHOMED	OP OF	ĸ 🔅	٩	
Motor 3 TOOL Y-	N	Z-	z	Omm	0 mm	Omm	O UNHOMED	70 <b>Q</b>	ver 🔅	•	
/0											
	n 10 mm	100 mm		State	READY	Velocity	0 m	n/min	Remainin	g	
General		100 11	1	Message		Feed	0 mm	n/min	ET	A	
Network	_		Displ	lay Units	METRIC ~	Speed	0 (0)	RPM	Lin	e	0
CHEAT SHEET XYZ	Pro	be Z	-	1001	0	LUaus	1.01	2.011	Flogles	5	
<b>ن</b> 100 1 100 100 100 100 100 100 100 100 1											
MD	I Message	s Indicators	3								

## Step 3. Open Tool-Type list

Save CONTROL MACROS	Aachine Infinite Possibilities	Version: v1.6.1 IP Address: 192.168.1.97 WiFi: Onefinity	Rotary	Camera Offline	STOP
SETTINGS	Tool Configu	iration			
MOTORS	tool-type	Disabled	~		
Motor 0					
Motor 1					
Motor 3					
TOOL					
I/O					
ADMIN					
General					
Network					
CHEAT SHEET					
HELP					
Ċ					



Camera Offline

Rotary

## Step 4. Click on Redline VFD

Save		Version: v1.6.1
CONTROL	Machine Infinite Possibilities	IP Address: 192.168.1.97 WiFi: Onefinity
MACROS		in a choming
SETTINGS	Tool Configur	ration
MOTORS	tool type	Disabled
Motor 0	1001-1340	
motor o		Disabled
Motor 1		Router (Makita, etc)
Motor 2		EM60
Motor 3		Redline VED
Mictorio		PWM Spindle
TOOL		Unsupported Tools
1/0		Huanyang VFD
		Custom Modbus VFD
ADMIN		AC-Tech VFD
General		Nowforever VFD
Conorda		Delta VFD015M21A (Beta)
Network		YL600, YL620, YL620-A VFD (Beta)
CHEAT SHEET		FR-D700 (Beta)
		Sunfar E300 (Beta)
HELP		OMRON MX2
		V70



## **Step 5. Ensure the below information matches**

Save		Version: v1.6.1 IP Address: 192 168.	1.97	Camera Offline
CONTROL	Machine Infinite Possibilities	WiFi: Onefinity		
MACROS			Rotary	
SETTINGS	Tool Configur	ation		
MOTORS	tool-type	Redline VED	~ ~	
Motor 0	unchecked			
Motor 1	max-spin	24000	RPM	
Motor 2	max opin	21000	DDM	
Motor 3	min-spin	6000	RPM	
TOOL	tool-enable-mode	disabled	~	Pin 15 O
I/O	tool-direction-mode	disabled	~	Pin 16 <b>O</b>
ADMIN				
General	Modbus Configura	ation		
Network	bus-id	1		
CHEAT SHEET	baud	9600	~	
HELP	parity	None	~	
	Modbus Status			
	mousus otatas			
	connection	Disconnected		
	status	0		
	speed	0	RPM	



## Step 6. Press Save

Simre		Version: v1.6.1		Camera Offline	EMER
CONTROL	Machine Infinite Possibilities	IP Address: 192.168.1 WiFi: Onefinity	.97	A	Ċ
MACROS			Rotary		SI
SETTINGS	Tool Configu	ration			
MOTORS	tool-type	Redline VFD	~		
Motor 0	tool-reversed				
Motor 1	max-spin	24000	RPM		
Motor 2	min-snin	6000	RPM		
Motor 3	test sectores de				
TOOL	tool-enable-mode	disabled	~	Pin 15 O	
I/O	tool-direction-mode	disabled	~	Pin 16 <b>O</b>	
ADMIN					
General	Modbus Configur	ation			
Network	bus-id	1			
CHEAT SHEET	baud	9600	~		
HELP	parity	None	~		
Q	Modbus Status				
	connection	Disconnected			
	status	0			
	speed	0	RPM		
	4				



## **Onefinity MASSO Controller**

## Step 1. Go to F1 Screen

 F1	F2	F3		F4	•	F5		F6
SETUP	DGRAM & MDI	JOG & PR	DBING	TOOLS &	OFFSETS	CONVERSATIONAL	L/ LOA	D FILE
Machine Settings	Inputs	Function	Invert	Status 🚽	Outputs	Function	Inve	rt Status
General Settings	EStop	EStop	No	High	Spindle	CW	No	Low
Homing	Encoder	Signal - A	No	Low	Spindle	CCW	No	Low
Main Spindle	Encoder	Signal - B	No	Low	Output 1		No	Low
Lubrication	Encoder	Index	No	Low	Output 2		No	Low
Tool Changer	MPG	Dial Signal - A	No	Low	Output 3		No	Low
X - Axis	MPG	Dial Signal - B	No	Low	Output 4		No	Low
Y - Axis	MPG	Select X	No	Low	Output 5		No	Low
Z - Axis	MPG	Select Y	No	Low	Output 6		No	Low
A - Axis	MPG	Select Z	No	Low	Output 7		No	Low
Touch Probe	MPG	Select R	No	Low	Output 8		No	
Auto Tool Zero	MPG	Resolution 1	No		Output 10		NO	
Multi-Head	MPG	Resolution 2	No	Low	Output 11	Laser-Engraving (	PWM) Yes	Low
QR Scanner	MPG	Resolution 3	No	Low	Output 12		No	Low
User Account	Analog	Input 1		0.00v	Output 13		No	Low
Save & Load Settings	Analog	Input 2		0.00v	Output 14		No	Low
	Input 1 Go	to Parking Positio	n No	Low	Output 15		No	Low
MASSO Serial No: G3-15396	Input 2	Cycle Stop	No	Low	Output 16		No	Low
Core: v2.04 Software: v5.07	Input 3		No	Low	Output 17		No	Low
www.masso.com.au	Input 4		No	Low	Output 18	Coolant Flood	No	Low
support@masso.com.au	Input 5		No					
Onefinity CNC	Toput 7		No					
Elite Series www.onefinitycnc.com	Input 8		No	Low				
support@onefinityonc.com	Input 9		No	Low				
1 2	3	4	5	6	7	8	9	0
q + w *	e ÷	r =	t /	у -	u	i >	ا ،	p 1
a ! s	@ d	# f 9	6 g	^	h &	j <sup>*</sup> k	(	)
				:			?	
T	×	C						
!#1 -						•	•	

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## Step 2. Double Click on Main Spindle

F1	F2	E3		E4	opcional	F5	F6
SETUP PROG	GRAM & MDI	JOG & PR	OBING	T00L5 & 0	FFSETS	CONVERSATIONAL/	LOAD FILE
Machine Settings	Inputs	Function	Invert	Status 合	Outputs	Function	Invert Status
General Settings	EStop	EStop	No	High	Spindle	CW	No Low
Homing	Encoder	Signal - A	No	Low	Spindle	ccw	No Low
Main Spindle	Encoder	Signal - B	No	Low	Output 1		No Low
Lubrication	Encoder	Index	No	Low	Output 2		No Low
Tool Changer	MPG	Dial Signal - A	No	Low	Output 3		No Low
X - AXIS	MDC	Calact V	NO		Output 4		NO LOW
Z - Axis	MPG	Select V	No		Output 6		No Low
A - Axis	MPG	Select Z	No	Low	Output 7		No Low
B - Axis	MPG	Select A	No	Low	Output 8		No Low
Touch Probe	MPG	Select B	No	Low	Output 9		No Low
Auto Tool Zero	MPG	Resolution 1	No	Low	Output 10		No Low
Multi-Head	MPG	Resolution 2	No	Low	Output 11	Laser-Engraving (PWM)	) Yes Low
QR Scanner	MPG	Resolution 3	No	Low	Output 12		No Low
User Account	Analog	Input 1		0.00v	Output 13		No Low
Save & Load Settings	Analog	Input 2		0.00v	Output 14		No Low
	Input 1 Go	Cude Stop	on No		Output 15		No Low
MASSO Serial No: G3-15396 Core: v2.04	Input 3	Cycle Stop	No	Low	Output 17		No Low
Software: v5.07	Input 4		No	Low	Output 18	Coolant Flood	No Low
support@masso.com.au	Input 5		No	Low			
	Input 6		No	Low			
Onetinity CNC Elite Series	Input 7		No	Low			
www.onefinitycnc.com support@onefinitycnc.com	Input 8		No	Low			
1-888-717-4242	Input 9		No				
1 2	3	4	5	6	7	8 9	0
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a <sup>!</sup> s	@ d	# f	<sup>%</sup> 9	, <sup>^</sup> t	n &	j <sup>*</sup> k <sup>(</sup>	
<b>A</b> 7				, ; ,		n ' m ?	×
!#1 -					•		4



## **Step 3. Ensure the following Information matches:**





## Step 4. Click on Save

Strup         Product to true         Substance         Product to true         Control and to true         Contro and to true         Control and to true<	F1	F2	F3	RING	F4			F	6
Machane Sattings       Inputs       Function       Junction       Junction       Junction       Junction       Junction         General Settings       Excode       Status       Statu	SCIOP PRO		304 6 FR.					COND	TALE
General Settings         EStop         No         Spindle         C//         C//         No         Low           Haan Spindle         Encoder         Signal - A         No         Low         Spindle         C//         No         Low           Lubrication         Encoder         Signal - A         No         Low         No         Low           Lubrication         Encoder         Signal - A         No         Low         Low         No         Low           Tool Changer         MPG         Dial Signal - B         No         Low         Low </th <th>Machine Settings</th> <th>Inputs</th> <th>Function</th> <th>Invert</th> <th>Status</th> <th>Outputs</th> <th>Function</th> <th>Invert</th> <th>Status</th>	Machine Settings	Inputs	Function	Invert	Status	Outputs	Function	Invert	Status
HeatingEncoderSignal - ANoLowMain SpindeEncoderSignal - BNoLowUdrixabinEncoderNoLowTool ChangerMPGDial Signal - BNoLowX - AxisMPGDial Signal - BNoLowV - AxisMPGDial Signal - BNoLowV - AxisMPGDial Signal - BNoLowV - AxisMPGSelect YNoLowV - AxisMPGSelect YNoLowB - AxisMPGSelect YNoLowB - AxisMPGSelect PNoLowRouch ProbeMPGSelect PNoLowMolitabilityMPGSelect PNoLowRecord (Pulses per revolution):DOMoLowRecord (Pulses per revolution):DOMoLowMolitabilityAnalogMadman RPM (at 10 wks):2000NoSeve B Load SettingsAnalogMadman RPM (at 10 wks):2000Seve B Load SettingsAnalogMadman RPM (at 10 wks):Coolart FloodSeve B Load SettingsNoLowNoLowMexical SettingsSeve C CancelNoLowMexical SettingsNoLowNoLowSeve B Load SettingsNoLowNoLowMexical SettingsNoLowNoLowMexical SettingsNoLowNoLowMexical Setting	General Settings	EStop	EStop	No		Spindle	CW	No	Low
Main Spindle       Encoder       Signal - B       No       Low         Lubrization       Encoder       Index       No       Low       Output 1       No       Low         Lubrization       Product       MPG       Dubl Signal - B       No       Low       Output 2       No       Low         X - Axis       MPG       Dubl Signal - B       No       Low       Output 3       No       Low         Y - Axis       MPG       Select X       No       Low       Output 4       No       Low         A - Axis       MPG       Select Y       No       Low       Output 6       No       Low         A - Axis       MPG       Select Y       No       Low       Output 6       No       Low         Touch Probe       MPG       Select Y       No       Low       Output 6       No       Low         Touch Probe       MPG       Encoder (Publes per revolution):       100       No       Low         Ratio Tool Zavo       MPG       Spindle Control Method:       @ VPO       Mo       Low         QCD Social No: Control       MoG       Spindle Axio StocpResume on Feedbald       Coolart Flood       No       Low         Sove       <	Homing	Encoder	Signal - A	No	Low	Spindle	ccw	No	Low
Lubrication         Encoder         Index         No         Low         Output 2         No         Low           Tool Changer         MPS         Dial Signal - A         No         Low         Output 3         No         Low           X - Axis         MPS         Dial Signal - B         No         Low         Output 4         No         Low           Z - Axis         MPS         Select X         No         Low         Output 6         No         Low           A - Axis         MPS         Select Y         No         Low         Output 6         No         Low           A - Axis         MPS         Select Y         No         Low         Output 6         No         Low           A - Axis         MPS         Select Y         No         Low         Output 6         No         Low           B - Axis         MPS         Select Y         No         Low         Output 6         No         Low           B - Axis         MPS         Encoder (Pulses per revolution):         100         Mo         Low           A axis Tool Zero         MPS         Spin UP delay (milliseconds):         Ootput 7         No         Low           QUS Sammer         MPG 4 </td <td>Main Spindle</td> <td>Encoder</td> <td>Signal - B</td> <td>No</td> <td>Low</td> <td>Output 1</td> <td></td> <td>No</td> <td>Low</td>	Main Spindle	Encoder	Signal - B	No	Low	Output 1		No	Low
Tool Changer       NPG       Dell Signal - A       No       Low         X - Auts       NPG       Dell Signal - B       No       Low         Y - Auts       NPG       Select X       No       Low         Qupuk 4       No       Low       Outpuk 4       No       Low         Qupuk 5       No       Low       Outpuk 4       No       Low         Qupuk 6       No       Low       Outpuk 4       No       Low         Qupuk 5       No       Low       Outpuk 6       No       Low         A - Auts       NPG       Select 2       No       Low       Outpuk 7       No       Low         R - Auts       NPG       Spinde Settings       No       Low       Outpuk 7       No       Low         R - Auts       NPG       Spinde Control Method       @ VFD       Mo       Low       No       Low         Nubithad       NPG       Spinde Control Method       @ VFD       Spinde No       Low       No       Low         Nubithad       NPG       Spinde Auto ScupResume on Feedhold       @ VFD       Spinde No       Low         Street 2.00       Inpuk 8       No       Low       No       Low	Lubrication	Encoder	Index	No	Low	Output 2		No	Low
X - Axis       NPG       Dial Signal - B       No       Low       Output 4       No       Low         Y - Axis       NPG       Select X       No       Low       Output 5       No       Low         Z - Axis       NPG       Select Y       No       Low       Output 6       No       Low         A - Axis       NPG       Select Y       No       Low       Output 6       No       Low         B - Axis       NPG       Select Y       No       Low       Output 6       No       Low         B - Axis       NPG       Select Y       No       Low       Output 6       No       Low         B - Axis       NPG       Select Y       No       Low       Output 6       No       Low         B - Axis       NPG       Select Y       No       Low       Output 6       No       Low         Axis Tool Zero       NPG       Select Y       No       Low       Output 7       No       Low         QR Scamer       MPG       Analog       Maxmun RPH (at 10 vols):       2000       No       Low         User Account       Analog       Spinde Axio ScopResume on Feedhold       No       Low       No       Low	Tool Changer	MPG	Dial Signal - A	No	Low	Output 3		No	Low
Y - Auis       MPG       Select X       No       Low       Output 5       Ho       Low         Z - Auis       MPG       Select Y       No       Low       Output 6       No       Low         A + Auis       MPG       Select Y       No       Low       Output 7       No       Low         B + Auis       MPG       Main Spinde Settings       No       Low       No       Low         Aubo Tool Zero       MPG       Encoder (Pulses per revolution):       100       Mo       Low         Aubo Tool Zero       MPG       Spinde Control Method:       © VPD       Ser Engraving (PWM)       Yee :       Low         Aubo Tool Zero       MPG       Spinde Control Method:       © VPD       Ser Engraving (PWM)       No       Low         Sive B Lood Settings       Analog       Masimum RPM (ek 10 volto):       24000       Moo       Low         Sive B Lood Settings       Analog       Input 2       Spin DOWN delay (millsecondo):       6000       Low         Sive B Lood Settings       Input 6       Spin DOWN delay (millsecondo):       6000       Low       No       Low         Moosinum RPM (ek 10 volto):       2000       No       Low       Low       No       Low <td>X - Axis</td> <td>MPG</td> <td>Dial Signal - B</td> <td>No</td> <td>Low</td> <td>Output 4</td> <td></td> <td>No</td> <td>Low</td>	X - Axis	MPG	Dial Signal - B	No	Low	Output 4		No	Low
$2 \cdot Axis$ NPG       Select Y       No       Low       Output 6       No       Low         A - Axis       NPG       Select Z       No       Low       Output 6       No       Low         B - Axis       NPG       Select Z       No       Low       No       Low       No       Low         B - Axis       NPG       Spinde Control Method:       0       NPG       No       Low       No       Low         Auto Tool Zero       NPG       Spinde Control Method:       0       NPG       No       Low       No       Low         Auto Tool Zero       NPG       Spinde Control Method:       0       NPG       No       Low         VBS Scienter       NPG       Spinde Control Method:       0       No       Low       No       Low         Save B Load Settings       Analog       Analog       No       Low       No       Low       No       Low         Save B Load Settings       Analog       Spinde Auto Stop/Resume on Feedhold       Coolant Flood       No       Low         Mode Low       Spinde Auto Stop/Resume on Feedhold       Coolant Flood       No       Low         Method Low       Spinde Auto Stop/Resume on Feedhold       No <td>Y - Axis</td> <td>MPG</td> <td>Select X</td> <td>No</td> <td>Low</td> <td>Output 5</td> <td></td> <td>No</td> <td>Low</td>	Y - Axis	MPG	Select X	No	Low	Output 5		No	Low
A - Axis       NPG       Solect 2: two investigations       Investigations       No       Investigations         B - Axis       NPG       NPG       New Syndle Settings       No       Investigations       No       Investigations         Aubo Tool Zero       NPG       Sondle Control Method:       ® VPD       No       Investigations       No       Investigations         Aubo Tool Zero       NPG       Sondle Control Method:       ® VPD       No       Investigations         Nulti-House       NPG       Sondle Control Method:       ® VPD       No       Investigations         Nulti-House       NPG       Sondle Control Method:       ® VPD       No       Investigations         User Account       Analog       Machmun RPM (at 10 volts):       24000       No       Investigations         NOSO Senial No: G3-15396       Input 3       Son DOWN delay (milliseconds):       6000       No       Investigations         Noso Concert       Input 4       Spindle Auto Stop(Resume on Feedhold       Coolart Flood       No       Investigations         Input 8       Input 9       No       Investigations       No       Investigations       Investigations         Input 8       Input 9       No       Investigations       Investigations </td <td>Z - Axis</td> <td>MPG</td> <td>Select Y</td> <td>No</td> <td>Low</td> <td>Output 6</td> <td></td> <td>No</td> <td>Low</td>	Z - Axis	MPG	Select Y	No	Low	Output 6		No	Low
B + Auis Touch Proble Auto Tool 2ero NHG Auto Tool 2ero NHG Some Auto Scanner NHG Some Auto Scanner Some Concel NHG Some Auto Scanner NHG Some Auto Scanner NHG Some Auto Scanner NHG Some Auto Scanner Some Concel NHG Some Auto Scanner Some Concel NHG Some Auto Scanner Some Auto Scanner Some Auto Scanner Some Auto Scanner Some Auto Scanner NHG Some Auto Scanner Some Auto Scann	A - Axis	MPG	Select 7 Main Snindle Settle	No	Low.	Outruit 7		No	Low
Touch Probe         NPG         Encoder (Publes per revolution):         100         No         Low           Auto Tool Zero         NPG         Spinde Control Method:         ® VPD         No         Low           NublitHead         NPG         Spinde Control Method:         ® VPD         Ver Engraving (PWM)         Yes         Low           QR Scanner         MPG         O STEP/DIR         No         Low         No         Low           Save Buland Settings         Analog         Maximum RPM (At 10 velta):         2000         No         Low           Save Buland Settings         Input 2         Spin LP delay (millesconds):         6000         No         Low           Most Corr         Input 2         Spin DOWN delay (millesconds):         6000         No         Low           Most Corr         Input 7         No         Low         Coolart Flood         No         Low           Must Port Corr         Input 8         No         Low         Coolart Flood         No         Low           Must Port Corr         Input 7         No         Low         Ver 4         Port 5         Ver 4         Port 7         No         Low           Mast Port Corr         Input 8         No         Low	B - Axis	MPG	Treat spe for sexual	49				No	Low
Aubo Tool Zero       MPG       Spindle Control Method: <ul> <li>WPD</li> <li>PWH</li> <li>Ser Engraving (PMM)</li> <li>No</li> <li>Ser Engraving (PMM)</li> <li>No</li> <li>Ser Engraving (PMM)</li> <li>No</li> <li>No</li> <li>No</li> <li>No</li> <li>Ser Engraving (PMM)</li> <li>No</li> <li>Ser Engraving (PMM)</li> <li>No</li> <li>No</li></ul>	Touch Probe	MPG	Encoder (Pulses	per revolut	ion): 100		and the second second	No	Low
Multi-Head       MPG       O PAMI O R Scanner       Ser Engraving (PMM)       Yes       Low         Uber Account       Analog       Maximum RPM (at 10 vals):       24000       No       Low         Save Bulbad Settings       Analog       Maximum RPM (at 10 vals):       24000       No       Low         W0500 Sertel No: C3-15590 Serie: v2.00       Input 2       Spin DPWIN delay (millacconds):       6000       No       Low         Muster: v5.07       Input 3       Spin DPWIN delay (millacconds):       6000       No       Low         Serie: v2.00       Input 4       Spindle Auto Stop[Resume on Feedhold       Coolant Flood       No       Low         Spindle Auto Stop[Resume on Feedhold       Input 7       No       Low       Input 7       No       Low         Spindle Auto Stop[Resume on Feedhold       Input 7       No       Low       Input 7       Input 9	Auto Tool Zero	MPG	Soindle Control I	fethod:		FD		No	Low
QR. Scanner MPG   Uber Account Analog   Seve & Load Settings   Analog   Madmun RPM (at 10 valts):   Seve & Load Settings   Input 1   Good   Input 2   Spin UP delay (milliseconds):   Spin	Multi-Head	MPG			ÖP	MM	ser-Engraving (PWI	1) Yes	Low
User Account       Analog       Maximum RPM (at 10 volts):       24000       No       Low         Sive 3b Load Settings       Analog       Basimum RPM (at 10 volts):       24000       No       Low         MUSSO Setial No: C5-15396       Trput 2       Spin LP datay (milliseconds):       6000       No       Low         MUSSO Setial No: C5-15396       Trput 3       Spin DP OWN delay (milliseconds):       6000       No       Low         Sign LP datay (milliseconds):       Spin DP OWN delay (milliseconds):       6000       No       Low         Mission com.au       Trput 4       Spin DP OWN delay (milliseconds):       6000       No       Low         Input 5       Sign DP OWN delay (milliseconds):       Soore       Concel       No       Low         Input 5       Sign DP OWN delay (milliseconds):       Soore       Concel       No       Low         Input 6       Trput 7       No       Low       Trput 7       No       Low         Input 9       No       Low       Trput 7       No       Low       Trput 7       No       Low         Input 9       No       Low       Trput 7       No       Low       Trput 7       Low       Trput 7       Low       P         q<	QR Scanner	MPG			05	TEP/DIR		No	Low
Sive b Load Settings       Analog       Matual in Priv (K, 10 Vol.5):       24000       No       Low         MSSD Settings       Input 1       Go       Spin LP delay (milliseconds):       6000       No       Low         MSSD Settings       Input 2       Spin LP delay (milliseconds):       6000       No       Low         Movementsol       Input 3       Spin DOWH delay (milliseconds):       6000       No       Low         Movementsol       Input 4       Spindle Auto Stop(Resume on Feedbold       Coolart Flood       No       Low         Input 5       Sove       Cancel       Input 7       No       Low       Input 7       No       Low         Input 6       Input 7       No       Low       Input 9       No       Low       Input 9       No       Low         1       2       3       4       5       6       7       8       9       0         q       W       e       r       f       No       Low       Input 9       No       Low         1       2       3       4       5       6       7       8       9       0         q       W       e       r       f       f       g </td <td>User Account</td> <td>Analog</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>No</td> <td>Low</td>	User Account	Analog						No	Low
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Save & Load Settings	Analog	maximum raym (a	K 10 Yoks)		•		No	Low
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Input 1 Go				_		No	Low
incret: v2.04 incret: v2.04 incret: v3.07 www.massoc.com.au apport@masso.com.au put 4 Spindle Auto Stop(Resume on Feedhold incret: v3.07 incret: v3	ASSO Serial No: G3-15396	Input 2	Spin UP delay (m	miseconds)	6000			No	Low
Activity Child       Input 4       Spindle Auto Stop/Resume on Feedbald       Coolart Flood       No       Low         apport@masso.com.au       Input 4       Spindle Auto Stop/Resume on Feedbald       Coolart Flood       No       Low         apport@masso.com.au       Input 7       No       Cordinaty Child       Input 7       No       Low         Input 8       No       Low       Input 9       No       Low       Input 9       No       Low         1       2       3       4       5       6       7       8       9       0         q       www.condinatyconc.com       Input 9       No       Low       Input 9       0       Input 9       Inpu	Core: v2.04	Input 3	Spin DOWN dela	y (miliseco	nds): 6000			No	Low
apport@masso.com.xi       truet %       Seve       Cancel         Input 6       Input 7       No       Iowr         Input 8       No       Iowr       Input 9       No         1       2       3       4       5       6       7       8       9       0         q       w       e       +       r       t       /       y       -       0       P         a       1       2       3       4       5       6       7       8       9       0         q       w       e       +       r       t       /       y       u       i       o       P         a       1       2       3       4       5       6       7       8       9       0         q       w       e       +       r       t       /       p       u       i       o       P         a       1       2       d       #       f       %       g       h       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i	xetware: v5.07 www.masso.com.au	Input 4	Spindle Auto	Stop/Resu	me on Feedhold		Coolant Flood	No	Low
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	us.mo.ozzan@hoqq.z	Topet S	<b>S</b>	we	Cancel		State of the local division of the		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Input 6			=	-			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Elite Series	Input 7		No	Low				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	www.onefinityonc.com	Input 8		No	Low				
1       2       3       4       5       6       7       8       9       0         q       w       e       r       t       y       u       i       o       p         a       s       e       f       %       g       h       j       k       i       p         a       s       e       f       %       g       h       j       k       i       i         t       z       x       c       v       b       n       m       est       est         i#1       -       -       -       -       .       +       .       +	1-668-717-4242							-	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	1 2	3	4	5	6	7	8	9	0
a     s     d     #     f     %     g     h     k     i       *     z     x     c     v     b     n     m     &       i#1     -     .     -     .     -	q <sup>+</sup> w <sup>×</sup>	e *	r =	t '	у -	u <		•	P
★     z *     c *     b *     n *     €3       I#1     -     .     .     .	als	, @ d	# f %	<sup>6</sup> 9	^ h	&	j k (	1	)
I#1	<b>1</b> 2	2 <sup>-</sup> X	c	• v	: ь		n 'm ?		8
	I#1 ·				1.000	3		+	-



## START-UP

## Spindle Break-In Procedure

Before First Use

Upon receiving your spindle, it is essential to complete the break-in procedure before engaging in any cutting operations. This step is crucial to ensure optimal performance and longevity. If the spindle is to be used in extreme climate conditions (it is recommended to use the spindle in a climate-controlled environment for the best performance), you may need to perform the break-in process again. Extreme temperature fluctuations can affect bearing lubrication, resulting in reduced performance or unusual sounds from the spindle.

#### Break-In Steps

After installing the spindle on your CNC router, remove the collet, collet nut, and any installed bits. Position the CNC gantry so that the spindle is in a safe location, avoiding potential hazards while running the break-in cycle.

The break-in procedure can be performed manually or using G-code commands.

Break-In Procedure:

- 1. Operate at 6,000 RPM for 20–30 minutes.
- 2. Increase the speed to 9,000 RPM and run for another 20–30 minutes.
- 3. Increase the speed to 12,000 RPM for 20–30 minutes.
- 4. Increase the speed to 18,000 RPM for 20–30 minutes.
- 5. Finally, operate at 24,000 RPM for 20–30 minutes.



For ease of use, the following G-code procedure is provided for input via MDI or as part of a G-code file:

M3; spindle rotate CW

S6000; speed 6k RPM

G4 P1200000; pause 20 minutes (20 x 60,000 milliseconds)

S9000; speed 9k RPM

G4 P1200000; pause 20 minutes

S12000; speed 12k RPM

G4 P1200000; pause 20 minutes

S18000; speed 18k RPM

G4 P1200000; pause 20 minutes

S24000; speed 24k RPM

G4 P1200000; pause 20 minutes

M5; spindle stop



## START-UP

## Spindle Warm-Up Procedure

Spindle warm-up differs from the break-in process. While the break-in is generally a one-time operation, the warm-up should be performed at the start of each CNC operation day. This ensures proper lubrication distribution and brings the spindle to optimal operating temperature, enhancing both performance and lifespan. The warm-up duration may vary depending on environmental conditions and user requirements.

Recommended Warm-Up Procedure:

- 1. Operate at 6,000 RPM for 10 minutes.
- 2. Increase to 12,000 RPM for 7 minutes.
- 3. Increase to 18,000 RPM for 3 minutes.
- For convenience, the following G-code warm-up procedure is provided:

M3; spindle rotate CW

S6000; speed 6k RPM

G4 P600000; pause 10 minutes (10 x 60,000 milliseconds)

S12000; speed 12k RPM

G4 P420000; pause 7 minutes

S18000; speed 18k RPM

G4 P180000; pause 3 minutes

M5; spindle stop



## START-UP

#### **Normal Operation**

#### Automatic Mode

Power On the VFD by pressing the **VFD Power** button

- Ensure the VFD is in automatic mode by ensuring the Manual Mode button on the left side of the DRO is **NOT** lit up
- The spindle will now function automatically based on the g-code you set in your CAD (Computer Automated Design) software.

#### Manual Mode

- Power On the VFD by pressing the 🔘 **VFD Power** button
- Ensure the VFD is in manual mode by pressing the **Manual Mode** button on the left side of the DRO and ensure the light around the Manual Mode button is **lit up Green**
- · The spindle is now in Manual Mode.
- · Ensure Stop/Reset Mode
  - The numbers should be blinking, indicating that the spindle is in Stop/Reset mode
- · Adjust RPMs with Manual Speed Dial
  - Turn the Manual Speed Dial located just below the numbers. This dial is used to control the RPMs.
  - · Use the Green e "Run" button to start the spindle motor.
  - · Use the Red **Stop/Reset**" button to stop the spindle motor.
- · Conduct a Simple Test
  - · Rotate the Manual Speed Dial counterclockwise all the way.
  - Press the Green will "Run" button.



• Slowly rotate the Manual Speed Dial clockwise until the dot indicator is pointing straight up (half way position). This position indicates approximately 12,000 RPMs.

Note:

If the displayed numbers do not show approximately 12,000 RPMs, press the **Monitor Data Scroll** button to cycle through the display until it does.

The VFD operates bysending the frequency in Hz to your motor. Higher Hz results in a faster motor speed.

The motor is programmed to recognize that 200Hz equals 12,000 RPMs, which can be displayed by pressing the **Monitor Data Scroll** button.

#### **Stop Spindle Motor**

- · Press the red "**Stop/Reset**" button to stop your spindle motor
- · Observe the digital display until it shows 0.0 and is flashing.
- Once the display reads 0.0 and is flashing, you can safely reach towards the bit area.

#### **INSTALLING A CUTTING BIT**

- · Ensure the Spindle is OFF
- Use the included spindle wrench and collet nut wrench to loosen the collet nut from the spindle
- Ensure you have the correct collet installed for the diameter shank cutting bit you are using and it is pressed so it clicks in place on the collet nut.
- Insert the cutting bit shank end first to the indicator mark the manufacturer has placed on the shaft. If there is no indicator mark:
  - " Insert the bit shank until it reaches the full depth of the collet's gripping area
  - " After fully inserting the bit, pull it back a small amount (usually 1/8 to 1/4 inch) to prevent the bit from being fully seated
  - "This small gap ensures the collet can securely clamp onto the shank without excessive pressure or potential damage



 $\cdot$  Use the included spindle wrench and collet nut wrench to tighten the collet nut onto the spindle

Note: A collet nut should be tightened firmly, but not excessively so;good rule of thumb is to tighten if you feel a solid resistance, then add just a little more pressure with your hand, essentially a "firm hand squeeze" without over doing it; over tightening can damage the collet or bit shank.



## **ADDITIONAL RESOURCES**

Delixi VFD Manual:

Redline uses an EM60 VFD Engine the full Manual is located here