

# RS100 PRO Assembly & Quick Start Manual

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### **To Our Customers**

Thank you for purchasing an *RS1000 Pro* router system from *Next Wave CNC*! The *RS1000 Pro* opens up a world of creative possibilities for your ideas and designs. Following the step-by-step instructions, your *RS1000 Pro* will be up and running in no time.

Whether you're new to CNC technology or a seasoned expert, your *RS1000 Pro* provides a lot of flexibility for programming and operation. Our specially designed *LCD Color Touch Screen Pendant* features easy, hands-on control of many of the functions of the *RS1000 Pro*. These include precise manual control of the router bit height and the position of the fence.

#### **System Requirements**

The *RS1000 Pro* plugs into a standard 110v, 15-amp receptacle for power. We strongly recommend using an outlet with surge suppression.

The RS1000 Pro comes with a standard router plate measuring 9-1/4 x 11 3/4 x 3/6 thick. It also comes with a

set of plate levelers that allow you to precisely level the plate with your router table surface. The Plate fits most standard router table cutouts. Your router table must have a flat and stable top. This helps ensure accuracy for consistent routing operations. Additionally, the top must accommodate a  $\frac{3}{4}$ "-thick router table insert plate measuring 9- $\frac{1}{4}$ " x 11- $\frac{3}{4}$ " (235mm x 298mm). Finally, check to make sure there is enough space below the table to accommodate the *RS1000 Pro* router lift with router installed. The lift will fit most standard sized 3- $\frac{1}{2}$ " body routers.

The *RS1000 Pro* fence replaces your router table's fence. Install the *RS1000 Pro* lift so the center of the router bit is 12" from the rear of the table. This provides 6" of fence travel (plus about ¼" clearance). The *RS1000 Pro* fence mounts to the router table with bolts, nuts, and washers into holes you drill through the tabletop. To attain the full 12" of fence travel, a 6" shop-built table extension must be added to the back of the typical table. A deeper custom table top can also be an option to achieve the maximum fence travel.

This manual covers assembly and basic app information for the *RS1000 Pro*. For complete information on the Apps, download the *RS1000* Apps manual at *www.nextwavecnc.com/rs1000-pro* 

You will also find videos and other RS1000 Pro resources at that web page.

### **Please Read This Manual Carefully**

This manual provides important setup and operational information for your *RS1000 Pro* system. Using your *RS1000 Pro* requires experience and the technical knowledge to safely operate power tools.

*Next Wave CNC* warrants your new *RS1000 Pro* to be free from defects in material and workmanship for TWO YEARS from the date of purchase. The warranty applies only to the original retail purchaser of the *RS1000 Pro* when purchased from an authorized *Next Wave CNC* distributor. This warranty covers the parts and labor to correct the defect. It does not cover the cost of shipping the machine and/or parts to *Next Wave CNC* for evaluation or repair. This warranty does not apply to problems arising from normal wear and tear, misuse, abuse, negligence, accidents, unauthorized re-



pairs, alterations, or lack of maintenance. This warranty is void if the *RS1000 Pro* or any portion of it is modified without the prior written permission from *Next Wave CNC*, or if the machine is located or has been used outside of the country where the machine was purchased.

Please contact *Next Wave CNC* to take advantage of this warranty. If *Next Wave CNC* determines that your *RS1000 Pro* is defective in material or workmanship, *Next Wave CNC* will, at its expense and upon proof of purchase, send replacement parts to the original retail purchaser necessary to cure the defect. *Next Wave CNC* will repair your *RS1000 Pro* provided the machine or affected components under the following conditions:

- 1. Components are returned to Next Wave CNC (if the system is within the warranty period)
- 2. Cost of shipping to Next Wave CNC must be prepaid
- 3. Proof of purchase is included with the shipment

*Next Wave CNC* disclaims all other express or implied warranties, including fitness for a particular purpose. *Next Wave CNC* shall not be liable for death, injuries to persons or property, or incidental, consequential, contingent or special damages arising from the use of the *RS1000 Pro CNC*.

Lifetime Technical Support is provided to the original purchaser.

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### **Contact Us**

If you need technical assistance with your *RS1000 Pro CNC* or software, please visit our Support webpage at:

*NextWaveCNC.com/support* or email Customer Support at: Support@NextWaveCNC.com.

Please include your product model number, date of purchase, and other pertinent information associated with the issue: screen captures or photos of either your setup or the problem.

Support Email: support@nextwaveCNC.com Available: 9 am – 5 pm (ET) Monday-Friday

#### Serial Number and Information:

For easy reference and record keeping, enter your *RS1000 Pro* information at right. To locate the information, refer to the page 12.

Pendant Serial Number

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Pendant Unlock Code

(page 12)\_\_\_





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This manual covers assembly and basic app information for the *RS1000 Pro*. For complete information on the Apps, download the *RS1000* Apps manual at *www.nextwavecnc.com/rs1000-pro* 

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You will also find videos and other *RS1000 Pro* resources at that web page.

### **Machine Overview**

See the Assembly Overview illustration below to get familiar with all of the parts of your RS1000 Pro.

Before assembling and using your *RS1000 Pro*, we strongly recommend viewing the series of unboxing videos with detailed instructions at *https://www.nextwavecnc.com/rs1000-pro* 



### **Assembly Overview**

There are three primary components included with your *RS1000 Pro*. The router lift attached to the router table insert plate controls the height of the lift in increments of 0.XXX." On a CNC machine, this would be considered the Z-axis. In similar fashion, the router fence moves forward and backward to precisely position the workpiece the desired distance from the router bit, or the Y-axis. The *Pendant* provides an easy-to-use interface for controlling these operations. The *Pendant* also features preprogrammed routines for creating a variety of joints.

The miter gauge, an optional accessory, provides a solid foundation for the workpiece during the routing operation. The T-tracks on the miter gauge fence allow easy attachment of clamps, stop blocks, and other accessories. The head of the miter gauge features a solid steel base precisely machined to maintain squareness with the router tabletop. The laser-etched angle markings take the guesswork out of setting the angle of the fence. The bracket of the miter gauge fits over a rail on top of the fence. This ensures smooth, consistent cuts.





### **Mounting the Positioner**

The *RS1000 Pro* fence fits onto a mechanical assembly (positioner) containing the motor and electronics necessary to move the fence based on input from the *Pendant*. Mount the positioner at the rear of the router table. The illustrations below provide an overview of the process.

Start by lightly marking the side-to-side centerline of the

router tabletop with a pencil. Place the positioner at the rear of the router table, keeping the mounting plate flat on the tabletop. Align the centerline of the mounting plate with the table's centerline and mark the location of the four mounting holes. Set the positioner aside while you drill the mounting holes in the table. Finally, install the positioner using the included hardware.





#### **Attach the Fence**

After the positioner is secure, you'll attach the fence next. The fence assembly consists of the aluminum extrusion, two MDF fence faces, and studded knobs to tie it all together.

Start by setting the fence along the front of the positioner with the four socket-head screws visible through the fence opening. The studded, four star knobs used to

slide the fence until the four socket-head scews are

visible through the fence opening.

attach the two MDF faces to the fence also secure the fence to the positioner. Insert the longer knobs through the slots in the positioner, aligning them with the threaded inserts in the back of the fence faces. Use a short knob to secure the faces at each end of the fence. The slots in the fence allow you to adjust the width of the opening between the fence faces.



Insert the star knobs through the slots in the fence and into the threaded inserts on the back of the fence faces.

### **Router Lift Assembly**

The router lift assembly moves the router up and down to adjust the height of the router bit above the table. The two motors at the bottom of the lift connect to the router plate. The phenolic router plate supports the lift and secures it to the router table.

Start by replacing the MDF shipping plate with the supplied phenolic plate, and install the plate levelers to the corner of the plate opening in the router table. Next slide the router through the mount until ½" of the router body extends above the top edge of the clamp. The position of the router in the mount can be be adjust up or down to accommodate different routers and bit lengths, but ½ above the mount is good starting point. Secure the router using the two supplied M6 bolts and lock nuts. Tighten the clamp until the router is secure.

The router table insert plate should fit flush with the top of the router table. The plate levelers serve two purposes. One is to help level the plate flush with the table top. Do this by raising or lowering the setscrews on each leveler until the plate is flush. Then, after the plate is leveled, secure the plate to the table using the included bolts screwed into the levelers. This ensures the plate does not move while routing, which can affect the quality of the cut.



### **Router Lift Installation**



Insert the router body through the bottom of the mount until it extends  $\frac{1}{2}$  above the mounting clamp.



Level each corner of the plate until it is flush with the table top all around, then secure it with the four flat-head machine screws.

### **Hooking up the Cables**

#### IMPORTANT NOTE: DO NOT PLUG POWER SUPPLY into your 115V outlet until all of the control cables are connected or you may damage the electronics.

The cable junction box for the Pendant, positioner, and the power supply is located at the bottom of the router lift. The Pendant and the positioner cables connect to the bottom, and the power supply connects to the right sideThe cable ends from the positioner and *Pendant* will only fit in one of the two plugs on the controller. After making the connections, tighten the thumbscrews to secure the plugs to the controller, positioner, and *Pendant*. The last thing to do here is to determine where to locate the *Pendant* to avoid interfering with routing operations. The <sup>1</sup>/<sub>4</sub>"-20 threaded mount on the back of the pendant creates a lot of options for mounting the *Pendant* at a convenient location without it getting in the way.



### **Pendant Mounting Options**



*Pendant* attaches to any common <sup>1</sup>/<sub>4</sub>"-20 camera mount - available online or from your local camera dealer.



Mount the *Pendant* to a shop-built bracket or shelf on the side of the base.

### Adding the Optional Miter Gauge

The optional miter gauge is an ideal upgrade for your RS1000 Pro. It allows unprecedented positioning and control of the workpiece during routing operations.

The T-tracks on the miter gauge fence make it easy to attach a variety of accessories using T-slot nuts and screws. The miter gauge works in tandem with the RS1000 Pro fence. As a matter of fact, the two are connected with a metal bracket, guide rail, and precision bearings to allow the miter gauge to slide easily along the fence without play.

The miter gauge assembly consists of fence, miter head, and a bracket for attaching the gauge to the RS1000 Pro router fence. Start assembly by sliding the linear motion

on the fence, then tighten the cap screws just until the rail is secure.

Install the sliding bracket by first removing the two knobs from the bearing block. Position the bracket over the bearing block holes and reinstall the knobs, tightening them snugly.

Install the T-track fence to the face of the bracket using a pair of T-slot nuts and socket head screws. Leave about 1/16" between the end of the miter gauge fence and the face of the RS1000 Pro fence.



### **Attaching Miter Gauge to Fence**



Install the sliding bracket by first removing the two knobs from the bearing block. Position the bracket over the threaded holes and reinstall the knobs.



Install the T-track fence to the face of the bracket using a pair of T-slot nuts and socket head screws.



### **Pendant Registration**

Before continuing the setup of your *SHARK RS1000 Pro*, register your machine online by navigating your web browser to *NextWaveCNC.com*. Click on the PRODUCT REGISTRATION tab at the top of the screen (see above).

Once you complete the registration, create a customer account and follow the instructions to generate a unique code to unlock your *Pendant*. You will also receive the code in your email inbox. Use the number keys on the *Pendant* to enter your Unlock (Access) Code. Press Submit. This unlocks the Pendant.

Your SHARK RS1000 Pro is now unlocked and ready to use.

**Serial Number and Software License Information:** For easy reference and record keeping, enter your *SHARK Pendant* and *Controller* information below.

Pendant Unlock Code

**Pendant Serial Number** 

## **Registering the Pendant**



Unlock the *Pendant* by entering the unlock code you received upon registration.



After successfully unlocking the *Pendant*, you're ready to control your *RS1000 Pro*.

### **Our 10 Golden Rules for Safety**

**1.** Read and follow all safety and operating instructions before using the *RS1000 Pro*.

**2.** Understand that the fence and lift move during use, and take the time to orient yourself to the *RS1000 Pro* and the workflow steps.

**3.** When using the APPs, practice running them with the router off to become familiar with the fence and lift movements, your movements, and to make sure that the material is secure. A few "rehearsals" of the process will help you safely and effectively operate the *RS1000 Pro*.

**4.** When setting up jigs, clamps, changing router bits or rehearsing an APP, make sure to unplug your router.

**5.** Always wear hearing and eye protection when operating your *RS1000 Pro* system.

**6.** Keep miscellaneous equipment off the router table. This includes the area behind the fence.

7. Do not overfeed the router. Use a series of small incremental steps to achieve the full depth of cut, particularly when using dense hardwoods.

**8**. Do not climb cut when using the RS1000 *Pro*, which means in most cases you should feed the stock from right to left.

**9.** Always use good power tool safety protocol. Never attempt to make changes, clear debris, or be distracted while the router is running.

**10.** For added safety and convenience, connect your *RS1000 Pro* to a 110-115V surge-protected power strip with an on/off switch. This provides an additional way to turn off the machine in case of an emergency.



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### **Quick Guide to Basic Pendant Function Keys**

**Inch/Metric** – Pressing this key switches the units between imperial, fractional, and metric.

**Jog Speed** – Press this key to change the jog speed of the fence and lift (fast, medium, slow). **Step Key** – Press to change the distance the fence or lift incrementally moves when using the jog function.



### **Getting Started with the RS1000 Pro**

To unlock the potential of the RS1000 Pro and access its extensive library of joint making apps it is necessary to first create a "baseline" for your machine. This is done by calibrating the fence to the router bit and the router bit to the top of the table.

Begin by pressing on the Apps key on the Main screen and opening menu. Select Touch Plate Calibration and press run. Before running any app there is information

that needs to be entered. The first step in the calibration sequence is to enter the bit diameter. Open the Bit Diameter screen (Figure 1), press on the display and enter the bit diameter in the edit screen (Figure 2).

The Motor Speed setting controls the speed of the Lift and Fence during the calibration routines (Figure 3). The default setting works fine, but you can adjust it up or down using the keypad screen (Figure 4).

(3)



Open the Bit Diameter parameter by selecting it in the Touch Plate Calibration menu.



The speed that the Lift and Fence move during calibration can be changed usgin Motor Speed setting.

SHARK' x 0.250 Run Fence Calibration -7 8 9 4 5 6 Loc 2 3 1 0 30 NEXT WAVE 10

Enter the bit diameter in the edit screen. Press OK to exit. Hint – not all bits are their stated diameter.



To change the speed of the Fence and Lift, enter a value between 1-6. Press OK to save and exit.

### **Calibrate Bit to Fence**

Before using the *RS1000 Pro*, the fence and router bit need to be calibrated with the touch plate accessory, as illustrated in Figure 1. Calibrating the fence establishes the zero point for the fence in relation to the router bit.

To begin the fence calibration process, plug the cable on the touch plate into the Pendant. Then attach the magnet ground lead from the touch plate to your installed bit. (Figure 1). Select Run Fence Calibration from the Apps menu then Press Run (Figure 2). The screen in Figure 3 reminds you to plug the touch plate into the Pendant. The next screen has several requests: Verify that the bit diameter is entered into the system. With the router off, rotate the router bit until one cutting edge is oriented toward the fence. Position the touch plate against the fence and press OK (Figure 4). After pressing OK, you're asked to confirm the connection and instructed to perform a test touch (Figure 5). Do this by moving the touch plate to contact the router bit.





Press the APPS button on the Main screen to access the option to calibrate the fence.



The Controls button opens the Main Screen and allows you to move the lift or fence.

#### 

Plug the cable on the touch plate into the Pendant before proceeding.



To confirm a proper connection, move the touch plate until it contacts the router bit.

With a proper connection, the screen will turn red, as in Figure 6. Place the touch plate against the fence as shown in Figure 1. The *Pendant* display switches to the start screen to begin movement (Figure 7). Hold the touch plate lightly against the fence without impeding the fence's movement then press OK. The screen turns red to indicate movement (Figure 8). When the touch plate contacts the router bit, the fence will automatically retract and show the fence position at the top of the *Pendant* screen. The last screen asks if you want to accept these results (Figure 9).



### **Calibrate Bit to Table**

Similar to the fence calibration on the previous pages, you'll need to calibrate the router bit height using the touch plate (Figure 1). This establishes the zero height of the bit.

To begin the router bit calibration process, make sure the touch plate cable is connected to the *Pendant* (Figure 1). Select Run Bit Calibration from the Apps menu then Press To Run (Figure 2). The screen in Figure 3 reminds you to plug the touch plate into the *Pendant*.

Attach the magnet from the touch plate to the bit and press OK (Figure 4). After pressing OK, you're asked to confirm the connection and instructed to perform a test touch (Figure 5). Do this by moving the touch plate to contact the router bit.





Press the APPS button on the Main screen to access the option to calibrate the router bit height.



Make sure the magnet is attached to the router bit before pressing OK.

### **Run Bit Calibration**



Plug the cable on the touch plate into the *Pendant* before proceeding.



To confirm a proper connection, move the touch plate until it contacts the router bit.

With a proper connection, the screen will turn red, as in Figure 6. Place the touch plate flat on the router table over the opening in the insert plate, as shown in Figure 1. The Pendant display switches to the start screen to begin movement (Figure 7). Press OK. The screen turns red to indicate bit movement (Figure 8). When the touch plate contacts the router bit, the bit will automatically retract and show the bit position at the top of the Pendant screen. The last screen asks if you want to accept these results (Figure 9).



### **Pendant Guide to Setup and Apps**



On the main screen of the *Pendant*, pressing the Position fields open a numeric keypad. The left Position field sets and displays the height of the router bit. The right Position field sets and displays the fence position. These numeric entry screens also serve as handy calculators with their math function keys.

- a. Lift Position Display Field: Pressing this opens up the Lift Position Edit Screen (Figure 1)
- b. Lift Positive Movement Key: Moves the router lift up.
- c. Lift Negative Movement Key: Moves the router lift down.

- **d. Fence Position Display Field**: Pressing this opens up the Lift Position Edit Screen (Figure 2)
- e. Fence Positive Movement Key: Moves the fence away from the bit.
- f. Fence Negative Movement Key: Moves the fence closer to the bit
- **g. Format Key:** Press this button to toggle between the metric, decimal inch, and fractional inch displays
- h. Fast, Medium, Slow Key: Sets the jog speed
- i. Step Key: Sets the incremental jog distance for the fence and lift

### **Setup Menu**



**Setup Menu Screen:** Pressing the Setup button on the Main Control screen displays the Setup screen. The Setup menu contains options for controlling specific *RS1000 Pro* functions. Press a menu item to open the settings screen for that option. To return to the Main Control Screen, press the X in the upper right corner.



**Bit Diameter:** This option provides another way to set the diameter of the router bit. Pressing the



value field in the upper right displays a numeric keypad to edit the diameter value.



**Reference Bit:** This option establishes the zero, or home, of the fence position relative to the bit's geometry using a value of 0, 1, or 2. Use a value of 0 to reference from the center of the bit. A value of 1 references from the front edge of the router bit



and a value of 2 references from the back edge of the router bit. The reference position you choose is up to you and, in most cases, is a personal preference based on how you think of the bit location with regard to the fence.



**Jog Speed Fast:** This parameter sets the speed for the Fast jog Speed button between 1 (slow) and 14 (fast). Press the display position field in the



upper right to enter the desired speed, then press OK. The Medium and Slow jog speeds are adjusted in the same manner.



**LCD Brightness:** Change the brightness of the Pendant's LCD screen by selecting this option. Enter a value between 1 (minimum brightness) and 8 (maximum brightness) and press OK.



**Beep Sound:** Set the volume of the beep sound using this option.



**Touch Plate Thickness:** The Touch Plate Thickness option sets the thickness of the touch plate.



**Custom Step:** The custom step function allows you to add a custom increment to the step key in the main window (see page 21).



**Clear Faves Memory:** This option clears all previous favorite setups from Faves menu.



**Factory Restore:** Use this to restore the default settings in the Setting and App screens.



**Unregister Pendant:** This option removes the unlock code from the Pendant.

### **Apps Quick Start Guide**

Your *RS1000 Pro* comes preprogrammed with a number of apps that make it easier to complete a variety of useful functions. For example, there are apps for calibration, making decorative cuts like fluting, and cutting a wide variety of joints. After entering some basic parameters into each app,

the system does all the math and moves the fence and router lift as needed to complete the task. The following pages run through the basic setup for one of the apps; making dado cuts. For detailed infomration about the rest of th Apps visit *www.nextwavecnc.com/rs1000-pro* 

#### The following apps are included with your RS1000 Pro

Run Touch Plate Calibration Run Bit Calibration Biscuit Slots Box Joints Dado Cut Dado Repeating Half Blind Dovetail Joints Sliding Dovetail Joints Through Dovetail Joints Dovetail Test Fit Fluting Key Holes Pocket Holes Step & Plunge Step & Repeat Tongue & Groove Joints Locking Miter Joints



**Apps Menu Screen:** Press the Apps button on the Main Control screen to open the Apps screen. The Apps menu contains options for controlling specific *RS1000 Pro* functions. Press a menu item to open the settings screen for that option. To return to the Main Control Screen, press X in the upper right corner.



One of the most common joints in woodworking is a dado joint. The *RS1000 Pro* includes an app



specifically for cutting dadoes and grooves.

Select Dado Cut from the Apps menu, then Press To Run. At the screen shown in Figure 1, enter the dado parameters, including router bit width, dado width, and offset from the edge of the workpiece.





If you wish to reset the parameters for the app, press Clear Parameters, then Press to Clear.



Select Bit Height to establish the depth of the dado. Press the value button.



Press OK to reset the parameters to factory defaults.



Enter the bit height (dado depth) using the numeric keypad and press OK.

### Dado Cut Setup continued



Select Start Offset to set the location of the dado from the edge of the workpiece. Press the value button on the upper right.



Next, select Dado Width to set the width of the dado. Press the value button on the upper right..



Select Bit Diameter from the menu, then press the value button on the upper right.



Enter the offset distance on the numeric keypad and press OK.



Enter the dado width on the numeric keypad and press OK.



On the numeric keypad, verify the bit diameter and press OK.

### **Run Dado Cuts**



With the parameters set, press Run Dado Cut, then Press to Run to start the app.



The screen displays the location of the router lift and fence. Press OK to move them to their starting positions.



Turn the router on and make the first pass. Press OK to move the fence into position for the next pass and repeat.



Acknowledge the instruction regarding the orientation of the workpiece by pressing OK.



This screen appears when the lift, fence, or both are moving and allows you to quickly stop the movement.



After the last pass, the App Complete screen appears. Press OK to exit.

### Maintenance

#### Lift

Clean off dust and debris from the guide tubes and lift components. Every 6 months use a dry lubricant on the shafts and lead screws. Check that router is secure by tightening bolts. Also check to make sure all connections are secure.

#### Fence

Check to make sure the fence faces are flat, in good condition, and that each half of the fence faces aligns with each other. Replace as needed. You can make replacement fences by carefully copying the dimensions and insert locations of the old fences. Hardwood or laminate covered MDF are good choices. The inserts are ¼-20 and available from woodworking retailers and hardware stores.

#### Pendant

The *Pendant* is a durable and trouble-free tool for controlling your *RS1000 Pro*, but the dust created by the router can sometimes cause problems.

To keep the *Pendant* operating trouble-free, it's important to keep it clean. To clean the *Pendant* case and screen, use canned air to blow off dust. Sometimes larger pieces of sawdust can lodge between the LCD screen and the plastic housing. To remove these bits of sawdust, fold a small piece of paper and run it around the perimeter of the screen as shown.

**TIP** - To reduce problems from dust, mount the *Pendant* on a stand. The bottom of the *Pendant* case features a <sup>1</sup>/<sub>4</sub>-20 thread you can use to mount the *Pendant*.



Wipe the Pendant screen with a soft cloth and remove sawdust buildup between the case and screen with a folded piece of paper.

Sometimes it is necessary to recalibrate the *Pendant* screen so that the keys are responsive and work properly. To do this, first turn off the controller. Next, hold your finger on the screen and restart the controller. This activates a series of steps that take you through the process of recalibrating the *Pendant* LCD screen.

#### **Firmware Updates**

Updates are available via the *Ready2Update*-Firmware app, which can be download from your Next Wave CNC User Account. Or visit https://portal.nextwavecnc.com/ Portal/Login. Find more maintenance and setup tips and answers at:

www.nextwavecnc.com/frequentlyaskedquestions.

For a complete guide to all the apps avaiable on your RS1000 Pro, go online to www.nextwavecnc.com/appguide or scan the QR code at right.







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