OPERATING INSTRUCTIONS
IC .25, .5, 1, 2, 3, 4, 5 & 6 INTELLICUT®
COMBINATION SERVO PULLER/CUTTER Ver. 5.1xx

"CAUTION"
"DO NOT OPERATE MACHINE WITH GUARD REMOVED"

UNCRATE AND INSPECT

This machine has been carefully crated to assure safe arrival to your plant. It is important that you immediately inspect the equipment upon arrival at your plant and report any possible damage incurred in transit to the trucker.

It is suggested that you uncrate the equipment as soon as possible so that any concealed damage may be discovered.

Compare the packing list with items received and in turn cross check the items with your purchase order and report any discrepancies immediately to RDN MFG. CO. INC. at the address or phone number listed above.

If the puller belts have been loosened up for shipping there will be a Tag on the puller stating this. It will also state how much to adjust screws to bring the belts back to operational tension.

START-UP PREPARATIONS

The Puller/Cutter should be aligned with other extrusion accessory equipment and adjusted to the proper center height.
The encoder for the cut-to-length control is mounted on the belt puller with the encoder drive wheel riding on the puller belt. An alternate mounting position is upstream of the puller with the encoder drive wheel riding on the extrudate. *NOTE:* If equipped with an encoder it must be rotating clockwise when viewing face of wheel.

ELECTRICAL INSTALLATION

All RDN extrusion accessory equipment is generally regarded as portable machinery and therefore, it is not required to have a fused disconnect switch. If your local electrical code requires fused disconnects, we suggest that you provide one on a wall conveniently located in relation to the equipment, if the machine is not so equipped. The RDN Cutter is supplied with a twist lock plug and should be plugged into a properly grounded socket.

Make sure that the equipment is properly wired for the voltage, phase and cycle supplied at your plant. Should there be any questions regarding the electrical connection, please do not hesitate to contact us.

DESCRIPTION OF BASIC OPERATION

As the operator stands facing the front of the machine the direction of rotation of the bottom belt is counter-clockwise and the direction of the top belt is clockwise for right to left operating machines. The belts are reversed from the above on left to right machines.

Adjustment of belt opening is controlled by a single handwheel located at the top in the top of the puller. Turning the handwheel clockwise will increase the opening between belts and turning it counterclockwise will decrease opening.

This machine was designed to pull plastic rod, tubing and profiles. If you want to test this machine, use the material for which it was designed.

The belts on this machine have positive gripping action and do not slip, but do flex. They are taut on the pull side and slack on the far side. Therefore, if you mark the tube and belt, do not expect these lines to stay aligned.

The machine is mounted on swivel casters for portability. Adjusting the center height is accomplished by raising or lowering the leveling screws at each corner of the machine.

CUTTER UNIT

This unit utilizes a cutter blade that rotates to cut in response to a signal from the electronic counter in THE ON-DEMAND mode, rotates continuously in the CONTINUOUS mode. An encoder driven by the puller motor or a 12" circumference wheel typically driven by the upper belt transmits pulses to the electronic counter. When the number of pulses corresponds to the counter setting the controller activates the cutter servo motor, rotating the cutter blade one revolution. Cutting occurs between two steel bushings with 0.001 inch clearance on each side of the blade. Bushings are secured in a aluminum bushing holder assembly.

Cutting capacity of the model (see below) is thin wall tubing or cross section that can be inscribed in the same diameter. Normal clearance between the extrudate and ID of the bushing should be 0.020 inch.
IC.5 is 1/2 inch diameter,
IC1 is 1 inch diameter,
IC2 is 2 inch diameter,
IC3 is 3 inch diameter,
IC4 is 4 inch diameter.
IC5 is 5 inch diameter.
IC6 is 6 inch diameter.

A round bushing may be used to cut profiles, but a shaped bushing may be necessary to prevent distortion.

It is imperative that the cutting edge of the blade is in dead center, or angular cuts may result. The knife may be honed to correct this condition. Blade life may be increased by additional honing.

TOOL TYPE MANUAL BLADE CHANGE

To change a blade, do the following steps: Cutter blades are very sharp use caution.

1. Stop Cutter.
2. Turn off Cutter switch.
3. Open blade guard.
4. Loosen or remove screws as required.
5. Replace the blade.
6. Reverse procedure.

TOOL LESS QUICK BLADE CHANGE
Not available on IC.5, IC1, IC5 & IC6 Models

To change a blade, do the following steps: Cutter blades are very sharp use caution.

1. Stop Cutter.
2. Turn off Cutter switch.
3. Open blade guard.
4. Slide cover plate down - away from the blade.
5. Cautiously remove the blade.
6. Set a new blade in holder.
7. Slide cover plate back up. *DO NOT FORCE!* The centrifugal force of the knife arm will hold the slide tight.

NOTE: Use only .025ò thick blade with slide lock A11226

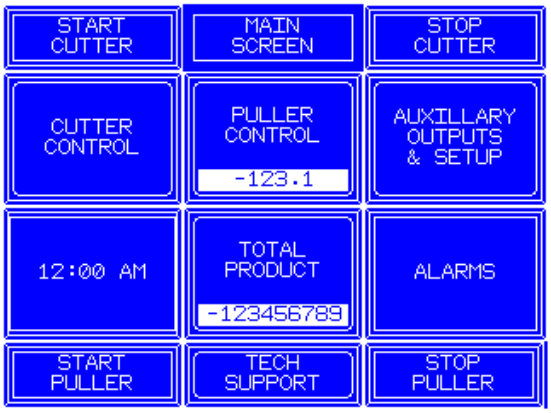
Use only .042ò thick blade with slide lock A11263

TOUCH SCREEN OPERATION

On power up you will see the **RDN INTELLICUT™** logo.

When controller is finished booting the main screen will appear.

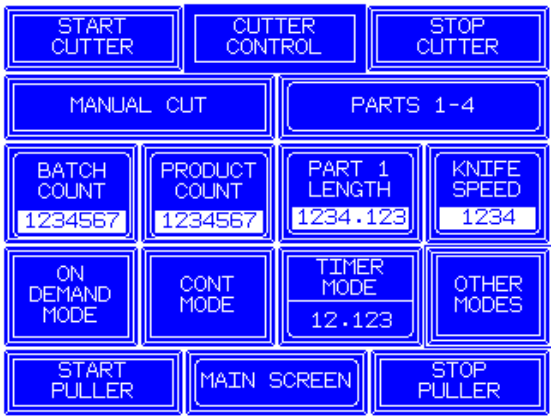
MAIN SCREEN



From the main screen you can:

- **Cutter Control** - From the Main Screen press the CUTTER CONTROL button. The Cutter Control screen will appear.

CUTTER CONTROL SCREEN



From the Cutter Control Screen you can select:

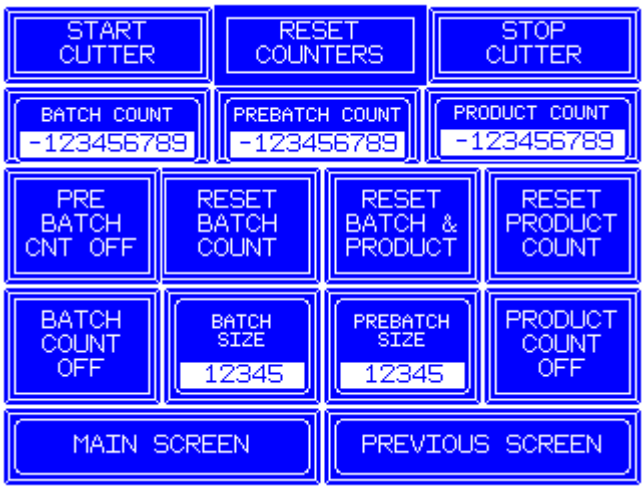
- **START CUTTER** - This will start the cutter.

- **STOP CUTTER** - This will stop the cutter.

- **MANUAL CUT** - This will rotate the knife arm one revolution at preset knife speed. You may make a manual cut while the cutter is started or stopped. If the cutter is stopped, pressing the MANUAL CUT button for the first time homes the knife arm, then rotates the knife arm one revolution at preset knife speed.

- **PRODUCT / BATCH COUNT -** Shows the Product and Batch counters current value. They will increase in count each time the knife completes a cut cycle. To turn either on/off, reset the counters or set the batch output value press the BATCH COUNT or PRODUCT COUNT button. The reset counters screen will appear.

RESET COUNTERS SCREEN



The Counters can be turned on/off by pressing the toggle buttons.

Example: To turn on product counter press the PRODUCT COUNTER OFF button its state will then change to read PRODUCT COUNT ON, to turn off touch again.

To reset the counters, pick which reset button you need and simply press it.

To set the batch size press SET BATCH SIZE button and a number pad will appear. Enter desired value, anywhere from 1 to 99999, press **Enter** to set and DONE to return to last screen.

One batch consists of the number of part lengths with a preset number greater than ñ0.ò When the number in batch size is reached, it will reset to ñ0ò and turn on the BATCH OUTPUT for preset on time up to 9.99 seconds. To set the Batch output duration see AUXILIARY OUTPUTS.

PRODUCT COUNT , this counts each cut and keeps going up forever, until you reset it.

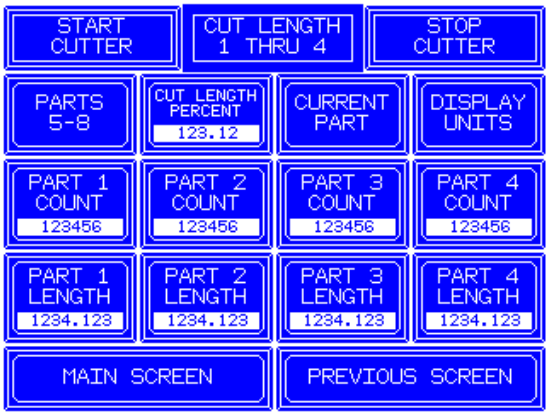
PREBATCH COUNT, this counts up to the value set in PREBATCH SIZE, then turns on the PREBATCH OUTPUT.

BATCH COUNT, this counts up to the value set in BATCH SIZE, then turns on the BATCH OUTPUT and resets the BATCH COUNT AND PREBATCH COUNT to zero

- **PART 1 LENGTH** - This button is used when only 1 consecutive cut length is required. Press **Part 1 Length**, a number pad will appear. Enter desired value, anywhere from 0.10 to 9999.99, press **Enter**. The value is now set. Press **Done** to return to the last screen.

- **PARTS 1 - 4** - From the Cutter Control screen press PARTS 1 - 4. The cut length 1 - 4 screen will appear. Cut lengths are used for the On Demand mode only. Up to eight (optional) different part lengths can be set in series. To select the length of the product to be cut press the corresponding PART number. A number pad will appear. Enter the desired value, anywhere from 0.10 to 9999.99, press ENTER. The value is now set. Press DONE to return to last screen. *NOTE*: If you put a ñ0ò in any part length - all part lengths after that will be shut off.
  Use **Part Count** to set the amount of parts per cut length. Press **PART (press the corresponding part count button 1 -8) COUNT**. A number pad will appear. Enter the desired value, press **ENTER**. The value is now set. Press **DONE** to return to last screen.

CUT LENGTH 1-4 SCREEN



- **CUT LENGTH PERCENT -** This function is used to adjust the actual cut length by a percentage factor from 80% to 120%.

- **CURRENT PART** - From the cut length 1-4 screen press, **CURRENT PART** the correct part screen will appear. This screen is used when making multiple cuts.

- **RESET PART/COUNTER** - This button sets the multiple cuts back to part 1 with a count of ó0ô.

- **SET CURRENT COUNT** - this button sets the product counter for the current part to any given #.

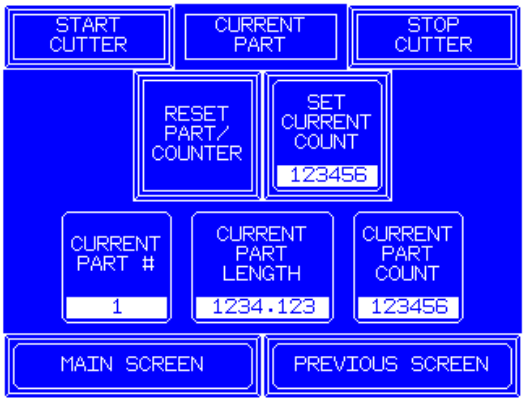
Example: You are on part # 2, set to 12ò with Part 2 Count set to 500pc, you took 20pc for samples and need 20 more, the current count is on 100pc you can set it to 80 to reach the 500 that you need.

- **CURRENT PART #** - Displays the part # that is currently being cut.

- **CURRENT PART LENGTH** - Displays the set length of the part that is currently being cut.

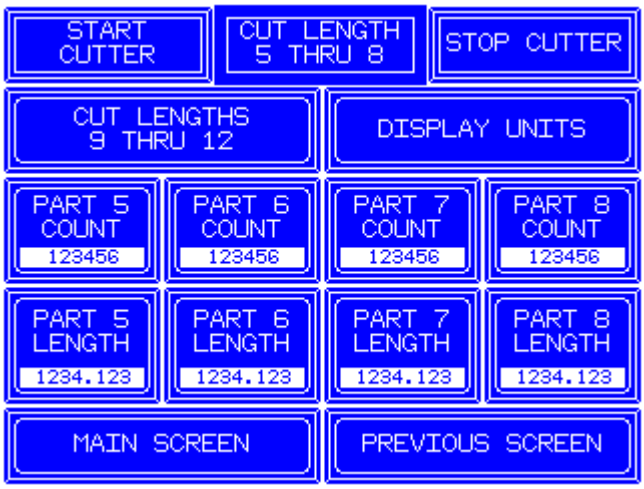
- **CURRENT PART COUNTER** - Displays the count up to preset of the part that is currently being cut.

CURRENT PART SCREEN



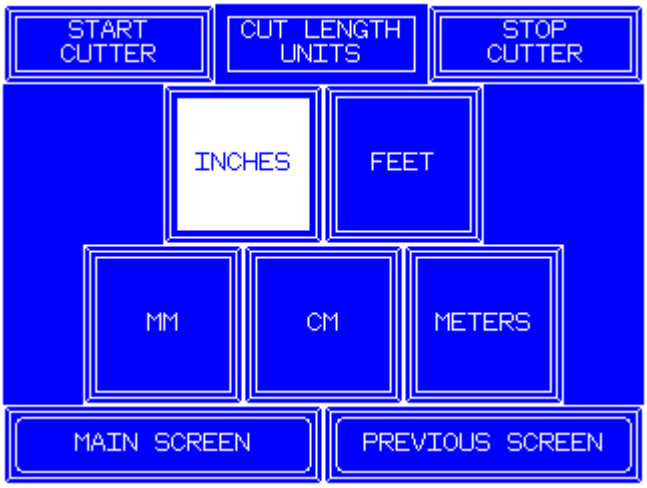
- **PARTS 5 - 8 (Optional all models)** Press the PARTS 5-8 button and the Parts 5-8 screen will appear.

5-8 PART CUT LENGTH SCREEN



- **DISPLAY UNITS** - Press the DISPLAY UNITS button. The cut length units screen will appear. A cut length unit changes the count to inches, feet or (optional) centimeters and millimeters. *NOTE:* When changing units, the controller automatically will convert all part lengths to the newly chosen unity type.

CUT LENGTH UNITS SCREEN



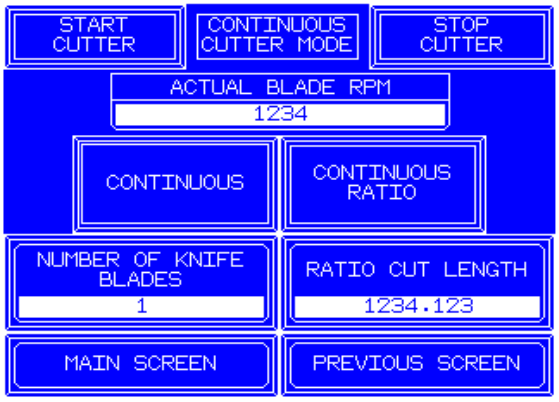
- **KNIFE SPEED** - Sets the velocity that the blade will cut the product in On Demand Mode, Continuous Mode, Timer Mode, and Photo Cut Mode. In Continuous Mode the set point will affect the length of the product per line speed.

- **ON DEMAND MODE** - Pressing ON DEMAND MODE button changes the operating mode to on demand. In this mode the controller is operating off of the encoder that is mounted on a puller or the extrudate. When the encoder wheel rotates the pulses from the encoder are fed into the controller, one revolution of the wheel equals one foot or twelve inches. The cutter blade rotates one revolution when the set cut length is reached.

NOTE: The encoder must be rotating in the correct direction for this mode to work.

- **CONTINUOUS MODE** - Press the CONT. MODE button. The CONTINUOUS CUTTER MODE screen appears.

CONTINUOUS CUTTER SCREEN



NOTE: This mode was designed to allow cut rates values that exceed On Demand capabilities.

Pressing CONTINUOUS button changes the operating mode to continuous. This rotates the blade continuously at the preset knife speed. The knife speed set point will affect the length of the product. When you increase the speed of the knife you will decrease the length of your part. Conversely, when you decrease the speed of the knife you will increase the length of the part.

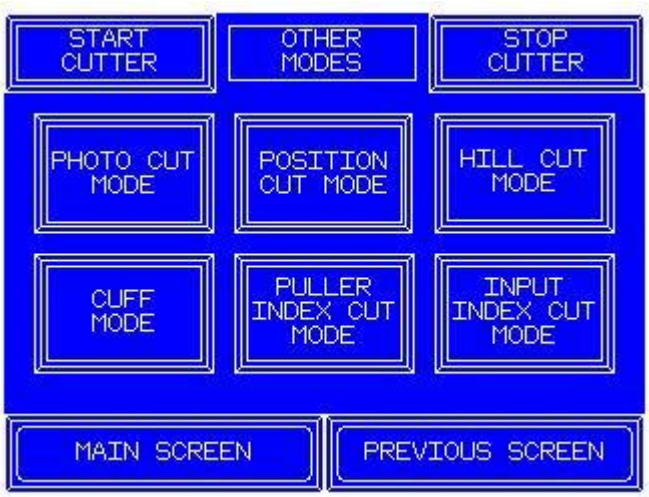
Note: a low rpm value may not be suitable for cutting certain products.

Pressing CONTINUOUS RATIO button changes the operating mode to CONTINUOUS RATIO. This mode looks at the encoder input, the RATIO CUT LENGTH and the NUMBER OF KNIFE BLADES then calculates the rpm required to achieve the entered cut length. This value is displayed on the screen as the CALCULATED RATIO RPM. *The encoder must be hooked up and turning to use this mode.*

Note: a low rpm value may not be suitable for cutting certain products.

- **TIMER MODE** - Pressing the TIMER MODE button changes the operating mode to timer. This rotates the knife arm one rotation per the set time interval. Time is set in seconds with a maximum of 99.99 seconds.

OTHER MODES SCREEN



- **PHOTO CUT MODE** ï Also known as a external input cut mode. Pressing the PHOTO CUT MODE button changes the operating mode to photo cell. Every time an external solid state input is activated to the controller the knife arm rotates one rotation. Refer to cutter schematic.

- **PHOTO CELL OPTION PACKAGE** - A beam sent through a fiber optic cable is broken. This detects the end of the extrudate and causes the knife arm to complete a cut. The fiber optic source and receiver are mounted on a bracket which is positioned to adjust the cut length. To position the fiber optics; loosen the bracket mounting screws, turn the handwheel to position the bracket for the desired cut length and then tighten the mounting screws. Each time the extrudate blocks the light beam, the solid state output of the photo cell amplifier switches on the controller which in turn activates the knife arm for one revolution. See additional cuff cutter document for more information.

- **POSITION CUT MODE** ï This mode does not cam the cutter motor (blade) to the puller encoder. It cycles the blade when the cut length is reached. This mode has limited cuts per minute about 200 to 250 CPM. This mode is used when the puller is run at very low speeds. It is also better to use for off-line cutting.

- HILL CUT MODE (OPTIONAL) ï If purchased, see additional operating instructions.

- CUFF MODE (OPTIONAL) ï If purchased, see additional operating instructions.

- PULLER INDEX CUT MODE (OPTIONAL) ï If purchased, see additional operating instructions.

- INPUT INDEX CUT MODE (OPTIONAL) ï If purchased, see additional operating instructions.

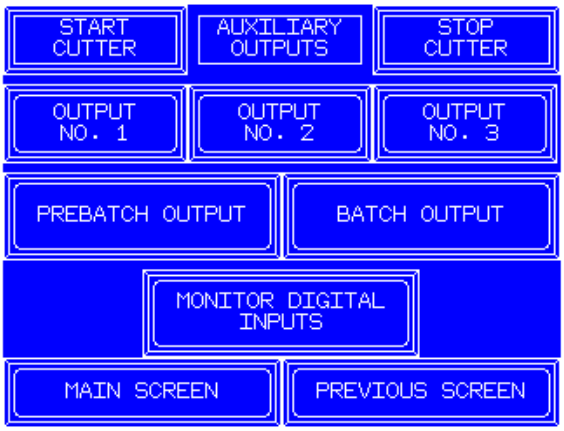
- **Previous Screen** - brings you back to the previous screen.

- **AUXILIARY OUTPUT** - From the Main Screen press AUXILIARY OUTPUTS & SETUP. The Outputs & Setup screen will appear.

- Straight Blade & Curved Blade Home (OPTIONAL) ï If purchased, see additional operating instructions.
- Flaw Input Mode (OPTIONAL) ï If purchased, see additional operating instructions.
- Belt Gap Axis (OPTIONAL) ï If purchased, see additional operating instructions.

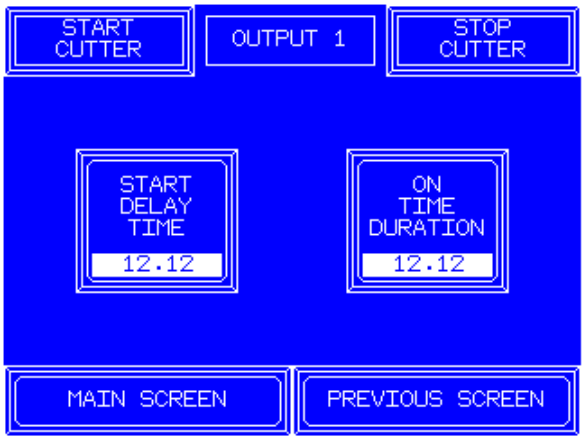
Press the AUXILIARY OUTPUTS button and the auxiliary output screen will appear.

AUXILIARY OUTPUT SCREEN

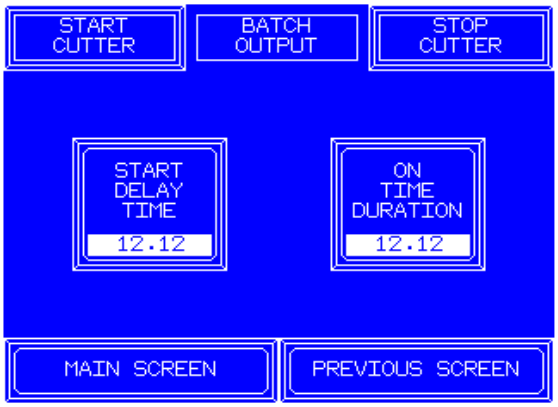


From the aux. output screen you can select which output, 1, 2, 3, Pre-Batch or Batch to configure. Or view digital inputs. The selected screen appears.

OUTPUT CONFIGURATION SCREEN



BATCH OUTPUT CONFIGURATION SCREEN



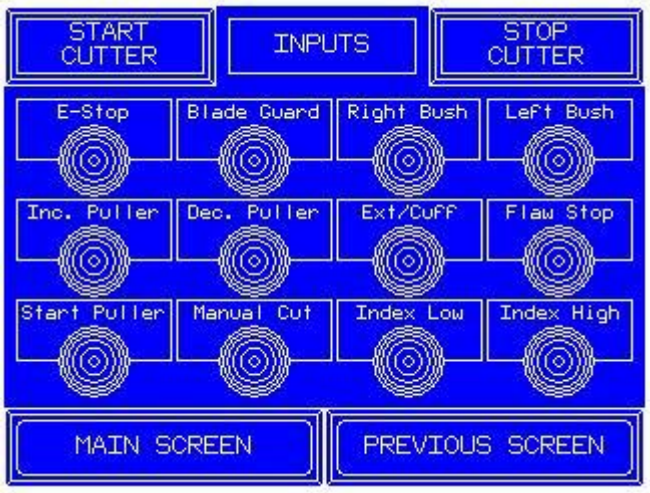
Outputs 1, 2, 3, Pre-Batch and Batch are 24VDC sinking digital outputs with a max. load of 100 MA. For wiring refer to cutter schematic. The outputs turn on every time the knife cycles one cut.

- **START DELAY TIME** - This is the amount of time in seconds, after the cut, that the output will wait till it turns on.

- **ON TIME DURATION** - This is the amount of time, in seconds, that the output will stay on once turned on.

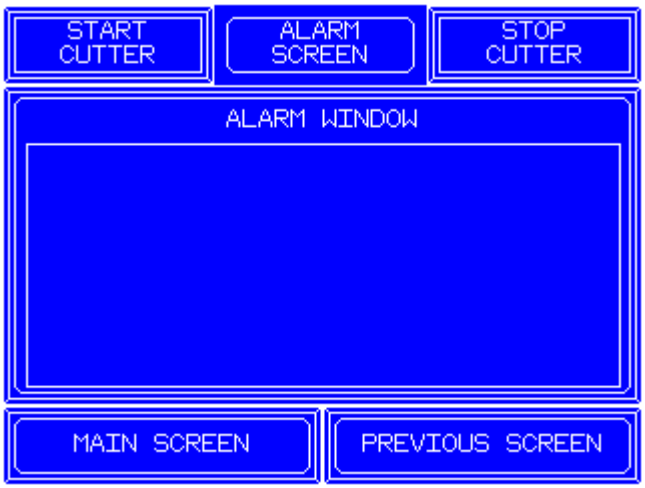
- **MONITOR DIGITAL INPUTS** - From this screen you can view digital inputs. If they are highlighted they are on. If not highlighted they are off. Depending upon which options are purchased not all of the inputs may be wired in.

DIGITAL INPUTS

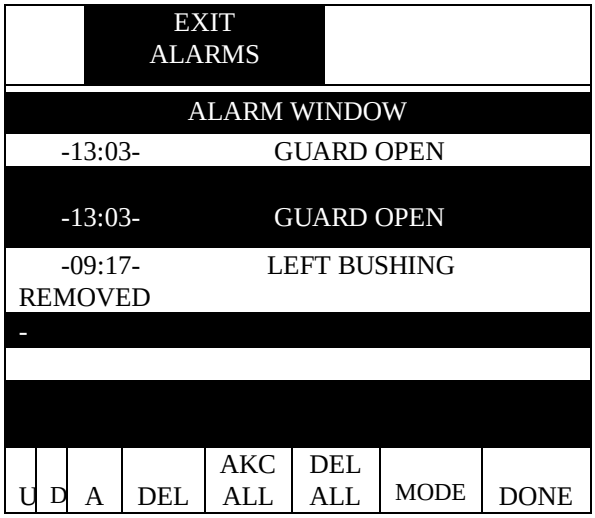


ALARMS - From the Main Screen press ALARMS. The alarm screen will appear. The alarm screen is for viewing alarms sent by the cutter controller. To view, press ALARMS button.

PANEL: ALARM

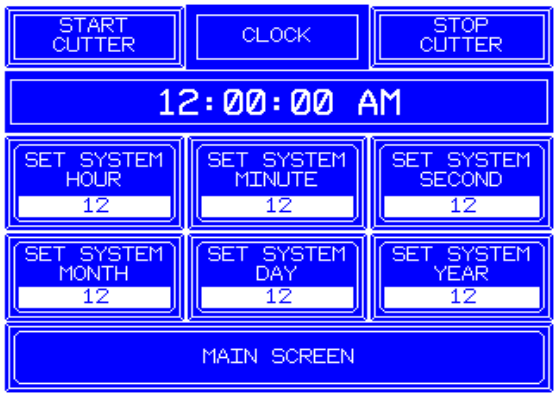


- To delete an alarm, press in the middle of the screen. A menu will appear at the bottom of the screen. Press MODE. Press DELETE. Press DONE. Exit Alarms. *NOTE:* When machine is powered down all ALARMS are lost. There is no memory for past alarms.



- **CLOCK** - From the Main Screen push on the button displaying the time. The CLOCK SCREEN will appear. *NOTE:* Time must be entered in MILITARY TIME fashion, 0900, 1300, 2300, etc. The clock will then display the correct AM or PM in standard time fashion.

CLOCK SCREEN



NOTE: To adjust the contrast of the screen, simultaneously touch both upper screen corners. A contrast bar will appear on the bottom of the screen. Press the desired setting then press anywhere on the screen to remove the contrast bar.

CUTTER MAINTENANCE INSTRUCTIONS

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1. All bearings are sealed and do not require lubrication.
2. Clean the bearing rails and apply a light coat of oil or grease once each month or sooner if necessary. If the slide bearing are equipped with grease fittings give a shot of grease once a month.
3. High Torque Option - Periodically inspect timing belt for tension and wear. Tighten by moving motor or replace as necessary.

PREVENTIVE MAINTENANCE

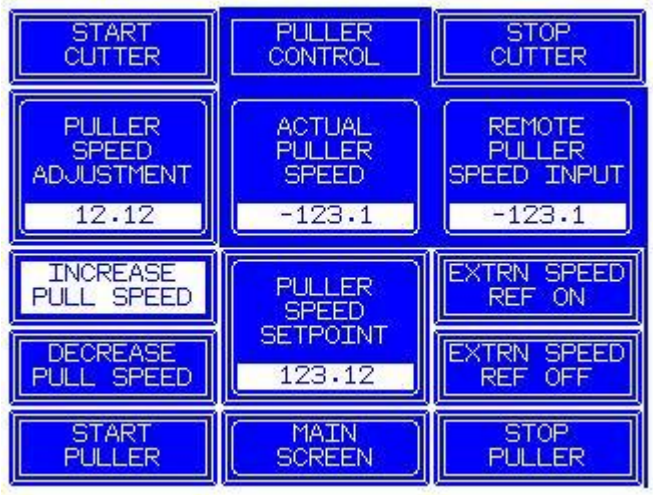
These machines require little preventive maintenance. However, because they do vibrate, it is advisable to check all fasteners and wire terminals on a quarterly basis.

PULLER UNIT

The puller and cutter are mounted on a common base when supplied as a Puller/Cutter Combination Unit. The cutter is mounted on rods with linear bearings. This allows the cutter to be moved away from the puller during the time the line is being set up. After the extrudate is fed through the cutter bushings, the cutter should be moved to it's operating position close to the puller. A lock bolt holds the cutter in the desired position.

- **PULLER** - From the main screen press the PULLER CONTROL button. The puller screen will appear.

PULLER SCREEN

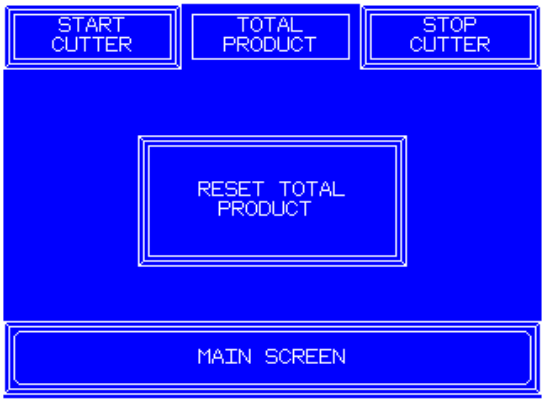


From the Puller Screen you can select:

- **START PULLER** - This will start the puller.
- **STOP PULLER** - This will stop the puller.
- **PULLER SPEED SET POINT** - Sets the speed that the puller will run.
- **PULLER SPEED ADJUSTMENT** - Sets the amount that increase and decrease set point buttons and Inc. Puller and De. Puller inputs will change the puller setpoint.
- **INCREASE PULLER SET POINT** - Increases the speed of the puller by .1 every time the button is pressed.
- **DECREASE PULLER SET POINT** - Decreases the speed of the puller by .1 every time the button is pressed.
- **EXTERNAL SPEED REFERENCE ON** - Turns on a relay to accept an external 0-10V DC speed reference supply by the customer.
- **REMOTE PULLER SPEED INPUT** ï Displays conversion of the 0-10vdc signal in FPM. Where; 0vdc = 0FPM; 10vdc = Puller Max Speed.
- **EXTERNAL SPEED REFERENCE OFF** - Turns off the relay and restores back to the internal speed set point (KEYPAD).
- **ACTUAL PULLER SPEED** - This readout, calculated from the encoder, in feet per minute or (optional) meters per minute.

- **TOTAL PRODUCT** - From the Main Screen push the TOTAL PRODUCT button. The total product screen will appear. This screen displays the actual count of total feet of product since the last reset.

TOTAL PRODUCT SCREEN



MAINTENANCE AND LUBRICATION

- This puller was designed for continuous operation with a minimum amount of maintenance. Keep the machine cleaned and lubricated, and it will remain in good working condition.

- Facilities should be made to remove water from the extrudate before it reaches the puller. Water will corrode the machine and reduce its useful life. Also, water on the belts will reduce traction.

- The pulleys are aluminum Poly V groove, which eliminates all tracking problems. If dirt or a piece of plastic should stick to one of the pulleys, it could cause a variation in the precision extrusion. Stop the machine and clean off pulley with knife or scraper.

- To obtain good traction, the belts should be kept taut. New belts may stretch a bit. If adjusting of belts is required, this may easily be accomplished by taking up on the bearing block positioning screw, located at the entrance end on each side of the belt frame assembly.

- If a belt needs to be changed, it may be accomplished by:
    1. Loosening bearing block positioning screws and slacking off belt.
    2. Removing the old belt and putting on the new one.
    3. Taking up on the bearing block positioning screw and adjusting tracking as described above.

- Give ball bearings a shot of grease once a month.

- Keep a coating of light oil on all shafting.

- **Optional,** The RDN take-up frame spur gearbox is filled to the center of the sight glass with Mobil brand SHC634 synthetic gear oil. Check and maintain this level. This is a fully synthetic oil and should not need to be changed however because of possible contaminates and gear wear, RDN recommends it be changed every 12 months.

Procedure for removable & reinstallation of the RDN gearbox.
Remove the front take up frame bearings and front plates.
Remove the drive pulleys.
Remove the RDN gearbox.

Re-install;
Gearbox leave (4) mounting bolts loose.
It is recommended to install an new front shaft seal. Oil shaft to protect seal when sliding on.
Install the drive pulleys.
Install the front take up frame bearings and front plates and tighten.
This will pull the gearbox into alignment with the take-up assemblies.
Tighten RDN gearbox.
Install back door and tighten.
It is recommended to install a new door shaft seal. Oil shaft to protect seal when sliding on.
Before you install the rear pillow block bearing;
    If you have one, use a dial indicator to read the height of the lower shaft height. Call the height zero.
    Install the bearing spacer and mounting tube. Tighten the bolts to achieve the zero and install jamb nuts.

Note: AC vector and AC Servo motors are designed to run hot. It is not uncommon for the motor temperature to reach 180-200f, depending upon ambient temp.

TROUBLESHOOTING GUIDE

CUTTER PROBLEM	POSSIBLE CAUSES	SOLUTION
Display blank. Cutter panel does not power up.	• Incorrect power supply. • Loose wiring.	• Check for proper voltage and phasing from your source, check serial tag on machine for power information. • Take a voltage reading on the back of the touch screen controller. It should be 24VDC across (+) & (-).
Display locks up or freezes periodically	• Noise on power on ground lines.	• Check for a good earth ground to the cutter, use wire for the grounding and not the electrical conduit pipe. • Check that the cutter is on a clean power line. A power line that has welding equipment or equipment that needs a lot of power requirements is a poor choice. • Make sure that there is no electrical noise producing equipment in the area, RF or Sonic welders.
Display is locked up or frozen.	• Communication lost with controller.	• No reaction when STARTUP screen or any button is pressed. Check communication cable from Touch Screen to controller.
Will not cut in ON DEMAND.	• Incorrect mode. • Encoder not spinning or not hooked up.	• Check that the mode selected is ON DEMAND. • Check alarms for ñEncoder running backwardsò ñEncoder not runningò ñEncoder running to slowò • Inspect encoder cable and connector for a short or open wire(s).

TROUBLE SHOOTING CONTINUED…

CUTTER PROBLEM	POSSIBLE CAUSES	SOLUTION
Cut length not consistent. ON DEMAND MODE	• Encoder not on flat of belt.	• Check for a slipping encoder wheel, wheel to moving surface or inspect setscrew from wheel to encoder shaft.
	• More than 1 part length entered.	• Check control panel program to insure that P1 is the only length entry, make sure that P2, P3 and P4 have zero entered in for the cut length.
	• Incorrect encoder. Bad spot on encoder.	• Check the Speed Display verse Actual Speed of puller.
Cut length not consistent. PHOTOCELL MODE	• Out of adjustment.	• Check for dirty or misaligned photo eye cables.
	• Loose connection.	• Check photocell unit for a loose or faulty output relay or a bad connection between output relay and control panel.
A Diagnostic screen appears	• Upper left hand corner of Touch- Screen was pressed within 15 seconds after power up	• Press RUN to return to Program Screens

Note any checking/testing requiring opening of the enclosure, should only be done by a qualified electrician.

ALARM GUIDE

PROBLEM	POSSIBLE CAUSES	SOLUTION
ALARM - Guard Open	• The blade guard is open.	• Close the blade guard. • Check wiring to guard limit switch. Go to diagnostics screen and check input.
ALARM - Left bushing removed	• Bushing not installed • Bushing not steel • Proximity switch bad	• Install bushing. • Bushing cannot be Plastic. • Go to diagnostics screen and check input.
ALARM - Right bushing removed	• Bushing not installed • Bushing not steel • Proximity switch bad	• Install bushing. • Bushing cannot be Plastic. • Go to diagnostics screen and check input.
ALARM - Cutter Could Not Home	• Motor Rotates and Home input not received by amp. • Motor Does not rotate (move) Also see Alarm - Cutter Error	• Check gap of proximity switch to pick up bolt on knife arm. Setting should be .020ò. • If gap is OK check that bolt has not been changed from steel to other material. • If equipped: With Prox. and bolt lined up, check for 5VDC on output of prox. • If above check out - replace proximity switch with RDN part #A3065. • Confirm the amplifier control power (24vdc) is on and the MPU LED is steady on. If not check for 24vdc at J17. Reference electrical drawing.

Note any checking/testing requiring opening of the enclosure, should only be done by a qualified electrician.

PROBLEM	POSSIBLE CAUSES	SOLUTION
ALARM - Cutter Error	• Trying to cut too thick a product.	• Heat may be needed to help cut the product. If necessary, send a sample product to RDN for a determination if the machine is capable of cutting the desired thickness.
	• Knife arm has restriction	• Open blade guard to make sure that the bushings are properly spaced so the knife is not sticking between them or stuck in extrudate. OR - With power OFF - spin knife arm by hand and check for obstruction.
	• Blade dull	• Change blade.
	• Too many cuts per minute	• Use continuous mode or slow down the puller.
	• Cooling fan obstructed	• Remove obstruction • Clean Fan
	• Cooling fan inoperative	• Replace as necessary
ALARM - Cut length too short	• Trying to cut too short a piece	• Adjust the, puller speed to accommodate the cut size desired. • Increase cutter blade speed • Use continuous mode
ALARM - Cutter RPM too fast	• Trying to cut too short a part in Continuous Ratio Mode	• Change to 2 blades
ALARM - Cutter RPM too slow	• Trying to cut too long a part in Continuous Ratio Mode	• Use On Demand Mode