



Domaille Engineering LLC



Domaille Engineering LLC

**APM MODEL
HDC-5200
OPTICAL FIBER
POLISHING
MACHINE

USER'S GUIDE**

Domaille Engineering, LLC
7100 Dresser Drive NE
Rochester, MN 55906
Phone 507.281.0275 • Fax 507.281.5694
www.DomailleEngineering.com



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7100 Dresser Drive NE
Rochester, MN 55906
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Company Information:

Domaille Engineering, LLC is an precision manufacturer distinguished by the accuracy of our products and services. One of our critical goals is to provide excellent customer service. Please contact us for service, support or input on how we can improve our service to you.

Domaille Engineering, LLC
7100 Dresser Drive NE
Rochester, MN 55906
(507) 281-0275
www.DomailleEngineering.com

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Welcome

Congratulations on selecting the APM HDC-5200, the premier fiber optic connector polishing machine.

This User's Guide will assist you in the set up, operation, and maintenance of the APM HDC-5200 machine to maximize the use and life of this equipment.

Overview

The APM HDC-5200 is designed to address the need to efficiently polish a large volume of connectors while maintaining a consistent high level of quality.

The APM HDC-5200 allows you to program your processes through an easy-to-use touch-screen panel. The panel displays your programmed settings for speed, time, pressure, polishing film used, lubricant type and pad durometer. In addition, the user can program specific ramp up speed and pressure setting, set maintenance intervals and program polishing film counters. Operators need minimal training to follow the touch-screen prompts of your programmed processes.

The number of processes that can be defined and stored within the HDC-5200 machine is only limited by the amount of internal memory. This means hundreds of processes can be stored on a single machine. Additionally, the HDC-5200 provides you with total flexibility in the number of steps you define within each of your polishing processes

The APM HDC-5200 provides the capability to store your processes in machine memory as well as on a USB storage device. A USB storage device can be used to backup your defined processes and to copy processes from one machine to another. This not only saves process setup time for each machine, but also ensures consistent process settings.



LIMITED WARRANTY

Domaille Engineering, LLC ("Domaille") products are warranted by Domaille to be free from defects in workmanship and materials for a period of one-year from the original purchase date. This warranty covers defects in materials or workmanship only and does not include damage due to abuse, misuse, problems with electrical power, problems with compressed air supply, servicing not authorized by Domaille, failure to properly care for and maintain the products, or normal wear and tear. In addition, use of parts, components, or accessories not supplied or approved by Domaille will void this warranty.

Domaille's sole liability arising from any use of its products and this warranty is limited to repair or, at Domaille's sole discretion, replacement of defective products or defective component parts thereof. To request warranty service, you must contact Domaille at 7100 Dresser Dr. N.E., Rochester, MN 55906, USA. If warranty service is required, Domaille will issue a Return Material Authorization Number (RMA#). You must ship the products back to Domaille in their original or equivalent packaging, pre-pay shipping charges, and insure the shipment or accept the risk of loss or damage during shipment. Along with your RMA # include your name, telephone number, return address, proof of original purchase date, and a description of the claimed defect. If shipping the APM HDC-5200 for warranty repair, back up process data to the memory card, referring to User's Guide for process transfer instructions. Remove and retain memory card, as Domaille will not accept liability for lost data. If the defect is covered by this limited warranty, Domaille will repair or replace (at its option) the product or the defective component part(s) and ship them freight prepaid to an address in the continental U.S. Shipments to locations outside of the U.S. that are not the original shipped to location will be made freight collect or will be shipped to the original shipped to location, at the discretion of Domaille.

NO WARRANTY OTHER THAN THE ABOVE LIMITED WARRANTY IS MADE, EITHER EXPRESS OR IMPLIED. ALL EXPRESS AND IMPLIED WARRANTIES FOR THE PRODUCT, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE ONE YEAR LIMITED WARRANTY PERIOD. DOMAILLE SHALL HAVE NO LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES RELATING TO ITS PRODUCTS.

SOME STATES (OR JURISDICTIONS) DO NOT ALLOW LIMITATIONS ON THE DURATION OF IMPLIED WARRANTIES, OR EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR CERTAIN PURCHASERS, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE (OR JURISDICTION TO JURISDICTION).



CE Notice (European Union)

Marking by the symbol CE indicates compliance of the APM HDC-5200 to the following directives of the European Union:

- 2004/95/EC Low Voltage Directive
- 2004/108/EC Electromagnetic Compatibility Directive
- 2006/42/EC Machine Directive

EMC Test Standard

EMC Directive 2004/108/EC

EN 61000-6-4:2007

EN 61000-6-2:2005

EN 61000-4-2:1995 + Amendments A1:1998 + A2:2001

EN 61000-4-3:2006 + Amendments A1:2008

EN 61000-4-4:2004 + Corrigendum 2006

EN 61000-4-5:2006

EN 61000-4-6:2009

EN 61000-4-8:2010

EN 61000-4-11 Second Edition:2004

Safety

IEC 60204-1 (FIFTH EDITION) + A1:2009

EN 60204-1:2006 +A1:2009

Year of CE Marking: 2011

Tests performed by:

EMC test report 1	TUV	WC1101098
EMC test report 2	TUV	WC1101098.1
Safety test report	TUV	092—1101099-00

Getting Started

Unpacking & Setup

NOTE: Due to the weight of the APM HDC-5200, it is recommended that two people lift it from the shipping case.

1. Remove all loose components from machine area in shipping case.
2. Remove the plastic bag from around the Overarm to provide access to the Overarm.
3. Use the Overarm as a lifting handle by grabbing as close to the Overarm pivot point as possible.

Lift the machine straight up while firmly holding the case down on the outside edges. If the machine is lifted at an angle, it will cause binding in the case.

Gently place the machine on a suitable, stable work surface.

4. Remove remaining plastic wrapping from machine and touch screen panel.
5. Inspect the machine for any damage that may have occurred in shipping.
6. Remove the blue Koby Air Filter from the shipping case. Remove plastic cap from air supply fitting on back of machine. Connect plastic air line provided by pushing line firmly into fitting. Connect other end of air line to black capped end of Koby Air Filter.
7. Using the proper air supply fittings, connect the red capped end of the Koby Air Filter into your compressed air system. The inlet of the Koby Air Filter is 1/4" NPT pipe thread. The compressed air requirements are: 80-120 pounds per square inch (5.5—8.5 bar), clean, dry, oil-free air.
8. Remove Cable Management Bracket located in side compartment of shipping case. Remove the two thumb screws on back of machine.

Attach Cable Management Bracket by sliding the base tabs into the slots provided on the machine. Reattach screws to secure.

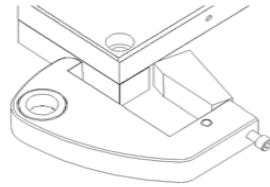
A 1/4" (6 mm) rod can be inserted through the holes on the cable management system to extend its width.



9. Connect Drain Hose provided to Drain Hose Fitting on back of machine. Route Drain Hose to a collection container.
10. **In order to raise and lower the Overarm, you must release the Overarm locking mechanism. Press the Overarm Quick-Release button located at the front of the Overarm and lift up. Releasing the Quick-Release button will allow the Overarm to lock in one of three fixed positions.**

Remove foam placed under the Overarm shaft by raising the Overarm to the vertical position and locking in place.

11. Remove Drip Tray and Drip Tray Bracket. The Drip Tray can be attached on either the left or right side of the machine. This diagram illustrates how the Drip Tray Bracket slides onto the back right corner of the machine (when facing machine). Place the bracket snug against the corner and firmly tighten the bracket screw. Slide the Drip Tray rod into the bracket hole.



Precautions

For safe, effective operation of the HDC APM-5200 Polishing Machine, please observe the following:

- Keep hands, jewelry, hair and loose clothing away from the rotating Platen while the machine is in operation.
- Keep all surfaces of the machine clean at all times. Confine water and slurry to Platen area.
- **WARNING: Do not use an air hose on or around the Platen. This forces water and contaminants into the wear surfaces and mechanical drive unit, potentially causing machine failure. Damage caused by air hose use is not covered under warranty.**
- Do not attempt to repair or service any components inside the APM HDC-5200 machine. Contact Domaille Engineering, LLC if service is required.
- Use only the stylus provided or fingers when touching screen panel. Do not use sharp objects.

Service & Support

Technical Specifications

Machine Height:	17.25 inches (438 mm)
Machine Width:	12.00 inches (305 mm)
Overall Width (with drip tray):	14.50 inches (368 mm)
Machine Depth:	21.50 inches (546 mm)
Power Requirements:	2 amps; 100-240VAC; 50/60 Hz.
Air Requirements:	80-120 psi clean, dry air (5.5-8.5 bar)
Machine Weight:	70 lbs (31.75 kg)
Shipping Weight:	120 lbs (54.43 kg)
Speed Range:	20-200 rpm
Pressure Range:	0-10 lbs. Force (0-4.54 kg)
Temperature Range:	41°F - 104°F (5°C - 40°C)
Maximum Altitude:	6000 feet above sea level (1828M)
Maximum Humidity:	20-85% non-condensing
Noise Emission Level:	Less than 70.0dBA

In the event of malfunction, or when other maintenance is required beyond the steps documented in this manual, service must be done by a qualified Domaille Engineering technician. There are no user serviceable parts inside the case. Do not remove sealed screws. Evidence of tampering will void warranty. For assistance, contact Domaille Engineering, LLC, USA.

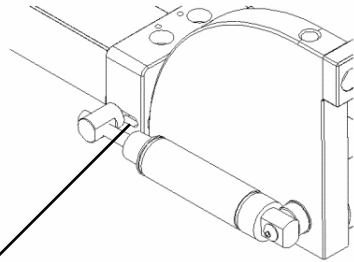
Both USA and European Standard power cords sets are available from Domaille Engineering, LLC. Please contact our office if an additional set is needed.



Polishing Machine Overarm Lock Pins

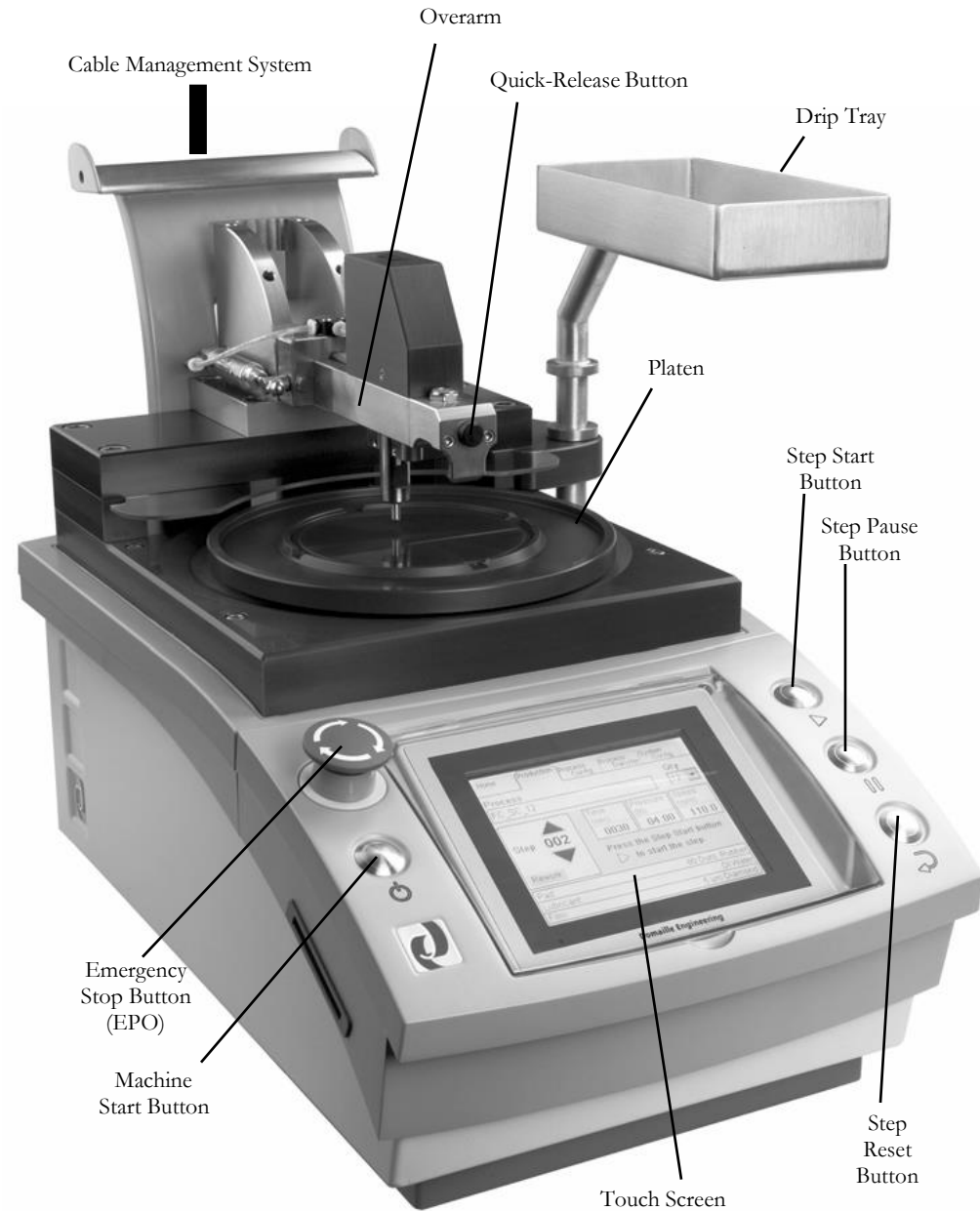
Lock pins are located on either side of the Overarm near the support bracket. These pins lock the Overarm in one of three positions, vertical, horizontal, or at 45-degrees.

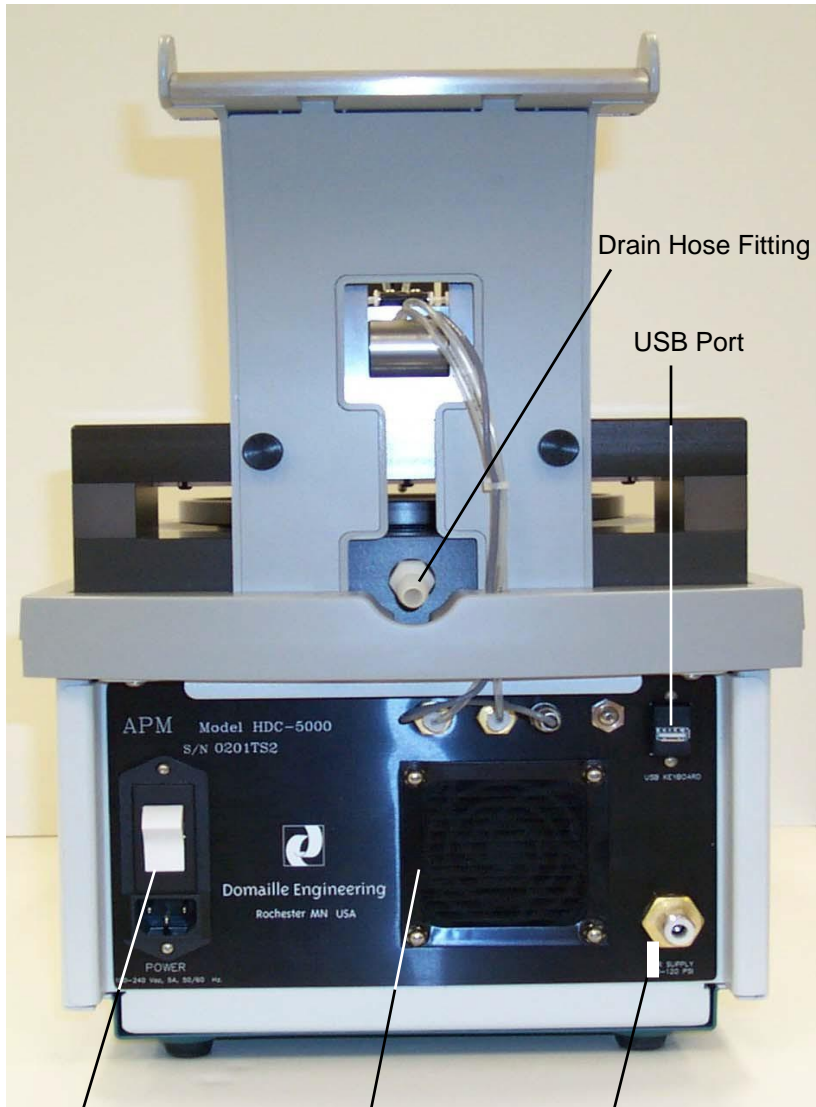
Using light machine oil, lubricate lock pins on both sides of the Overarm, placing a drop in each slot as shown below.



Lubricate Here

Right Side View





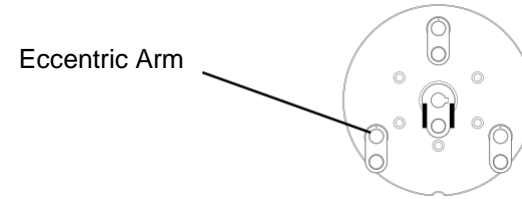
Power Switch

Fan Filter

Air Supply Fitting



- Reinstall Platen by lining up the eccentric arms to point in the same direction as shown below. By moving to eye level with the Platen area of machine, place Platen on top of pins in eccentric arms.



- Line up pins with holes in bearings in bottom of Platen. When pins are lined up, Platen will slide on pins about 1/2 way. Push straight down to seat Platen on wear ring. Verify that Platen is level before turning on machine. When fitted properly, no light will be visible between the Platen and wear ring.



Monthly

Disconnect the polishing machine from the power source before doing any maintenance work.

Polishing Machine Fan Filter

Inspect Fan Filter on back of machine. Vacuum to clean or remove and clean with compressed air.

Polishing Machine Platen

The Platen should be removed and greased at least once a month. If the machine is heavily used, more frequent greasing is required.

To maintain Platen:

1. The platen can be removed by placing your fingers around the underside of the Platen. Gently break the seal between the Platen and the machine. Pull straight up.

Do not use any tools (pry bars, screwdrivers, etc.) to remove Platen as the Platen and plastic wear ring under the Platen may be damaged.

2. Clean all of the old grease and contaminants from the bottom of the Platen and from the plastic wear ring. Clean both Platen and wear ring with alcohol and a clean, lint-free tissue or cloth to remove any trace of grease.

Do not grease the Platen bearings. They are pre-lubricated and sealed; therefore, lubrication is not required.


3. Wipe any grit off the o-rings and apply a drop of light oil on each o-ring. This helps protect and lubricate the o-rings, making it easier to replace the Platen.
4. Fill holes in wear ring with grease. Put a small bead of grease on wear ring between holes. Use Platen Grease supplied with APM-HDC-5200 machine or call Domaille Engineering at (507) 281-0275 to order more.

Machine Setup

Initial Setup

Before operating the APM HDC-5200, you must configure the system and define your processes.

Plug the power cord into the back of the machine and into a properly grounded outlet—100-240VAC, 50/60Hz. If your power cord is equipped with a large yellow plug, you **MUST** push the reset button on the plug to supply power to the machine.

1. Turn on power switch located at the back of the machine.
2. Lift screen cover. (Note: screen cover should be down when machine is operating.)
3. The touch screen will default to the home tab screen. If the red emergency screen is displayed, reset by turning the Emergency Stop button clockwise.
4. Press Machine Start button. 

System Configuration

System Configuration allows you to set the following:

1. Load cell calibration
2. Process variables
3. User rights and process control settings
4. Maintenance Schedule

Two interface methods are available for entering system configuration data, (1) the touch screen keypad, or (2) a Windows CE USB keyboard.. If using a keyboard, plug the USB connection into the port at the back of the machine **AFTER** the machine and program have powered up.



The following keyboards and keyboard adapters have passed compatibility testing with the APM HDC-5200:

StarTech PS/2 to USB Keyboard Adapter USB2PS2

Allows use of a standard Windows PS/2 keyboard.

Microsoft Natural Keyboard E06401COMB

Has a PS/2 to USB adapter for USB use included.

Samsung Multimedia Keyboard SEM-M2A

Has integral two port USB hub. No support for the multimedia keys.

Load Cell Calibration

The APM HDC-5200 load cell has been calibrated at Domaille Engineering prior to shipment. Recalibration is not typically necessary. However, recalibration of the machine to your own master load cell can be done using the following steps:

1. Remove the polishing fixture from the Overarm and the pad from the top of the Platen.
2. Clean top of Platen to remove any water, grit or dirt to ensure that the master load cell will be set on a clean, dry surface.
3. Place the master load cell on the Platen and center it under the Overarm plunger.
4. On the touch screen, select the System Config. tab, then select Load Cell Calibration in the "Configuration" box, using the down arrow as necessary.
5. Raise the Overarm just enough for plunger to clear the master load cell, then press the "Tare" button on the touch screen, checking to see if master load cell meter is at 0.
6. Lower Overarm onto master load cell, release lock button and press "Apply Pressure" button on the touch screen to apply a test pressure of 12.00 pounds. Press the "Increase" or "Decrease" button on the touch screen until the master load cell meter reads 12.00 pounds or matches the pressure readout on the touch screen.
7. Recalibration is complete. Press the "Span" button on the touch screen to save the calibration.

If you wish to cancel the calibration at any time during setup, press the "Cancel" button on the touch screen.



Machine Maintenance

Proper care and handling of the polishing fixtures and APM HDC-5200 machine is critical to maintain polishing accuracy. If the machine or polishing fixtures are damaged in any way, contact Domaille Engineering for advice or repair.

There are no user serviceable parts inside the machine case. Do not remove sealed screws. Evidence of tampering will void warranty.

Daily or More Often as Required

Polishing Fixtures

Although polishing fixtures manufactured by Domaille Engineering are made of stainless steel, all traces of water and slurry should be removed after each step in the polishing process. This will ensure that the next step in the process is not contaminated by elements in the previous process.

Polishing Machine

1. Clean top of Platen, Overarm top plate, Overarm rest pad and bottom of Overarm. **The accuracy of this machine is dependent on keeping these areas clean.**
2. Clean all residue, water and slurry from top of entire machine and from touch screen panel cover. Do not contaminate touch screen area.

WARNING: Do not use an air hose on or around the Platen. This forces water and contaminates into the wear surfaces and mechanical drive unit, potentially causing machine failure. Damage caused by air hose use is not covered under warranty.



Select Step

If the machine has been configured to allow the operator to run any step in the process at any time (see Machine Setup/System Configuration/User Rights & Settings/Enable Step Selection), use the up and down arrows positioned above and below the step number in the Step box to select the step to run.

Cancel Polishing Process

To cancel a polishing process and select another, press the Home tab to return to the Process Selection box. From the Home screen you can now select another process or shut down the machine.

Machine Shut Down

The following procedure should be used to shut down the APM HDC-5200. Using the power off switch before using this shut down procedure may result in loss of data.

To shutdown the machine:

1. Select the Home tab.
2. In the lower right corner of the Home screen, press the “Shut Down” button.
3. Press the “Yes” button when prompted.
4. Turn off the power.



A “Default Calibration” button appears if the factory calibration has been changed. Pressing this button will reload factory calibration.

Process Variables: Setting & Copying/Backup Procedures

The APM HDC-5200 allows you to define valid variables that can be used in the definition of your polishing processes. These variables include (1) a list of polishing films, (2) a list of types of polishing pads, (3) a list of lubricants that can be defined for polishing processes, (4) Film Change Interval settings. A maximum quantity of connectors (Max Quantity) setting is displayed, but not modifiable at this time.

To modify process variables, first select the System Config. tab, then select Process Variable Settings in the “Configuration” box, using the down arrow as necessary.

Maximum Quantity Setting:

- This variable has been pre-set to 36 and is not modifiable at this time.

Film Settings:

1. Select “Film” in the “Select Setting” box, using the down arrow as necessary.
2. Touch the “New” button to access the keypad.
3. Type in a film name for your polishing processes.
4. Select “OK”.
5. Repeat the above for all films used in all polishing processes.

The film name can be up to 32 characters in length.

To delete a film name, highlight the name, then touch the “Delete” button.

Pad Settings:

1. Select “Pad” in the “Select Setting” box, using the down arrow as necessary.
2. Touch the “New” button to access the keypad.
3. Type in a pad name for use in your polishing processes.
4. Select “OK”.
5. Repeat the above for all pad types used in all polishing processes.



The pad name can be up to 16 characters in length.

To delete a pad name, highlight the name, then touch the “Delete” button.

Lubricant Settings:

1. Select “Lubricant”, using the down arrow in the “Select Setting” box as necessary.
2. Touch the “New” button to access the keypad.
3. Type in a lubricant name for use in your polishing processes.
4. Select “OK”.
5. Repeat the above for all lubricant types used in all polishing processes.

The lubricant name can be up to 16 characters.

To delete a lubricant name, highlight the name, then touch the “Delete” button.

Film Change Interval Settings:

1. Select “Film Change Interval”, using the down arrow in the “Select Setting” box as necessary.
2. Touch the “New” button to access the keypad.
3. Type in a number from 0 to 99 for number of polishing cycles between polishing film changes.
4. Select “OK”.
5. Repeat the above for all Film Change Interval number used in all polishing processes.

The Film Change Interval number can be up to 2 characters (0-99).

To delete a Film Change Interval number, highlight the name, then touch the “Delete” button



10. The blue “Maint OK” box will change to a red “Maint Needed” when the programmed maintenance values are reached. **THIS WILL NOT STOP THE MACHINE FROM POLISHING THE NEXT STEP.**
11. After performing the required maintenance, to Reset the scheduled maintenance press the “System Config” tab at the top of the screen. Select Maintenance Schedule from the drop down box. Press the red Reset button. This will change the (Accum) hours to zero and change the red Reset to blue. The production screen will change from red “Maint Needed” to blue “Maint OK”
12. Repeat Steps 6 and 7 until final step has been completed.
13. When the final step is complete, the screen will reset back to the first step in the process.

Pre-defined Rework Start Step

If rework is required after the polishing process is complete, press the “Rework” button in the Step box. The polishing process will automatically take you to the pre-defined rework start step and continue through each step until the final step in the process is complete. Upon completion, the program will return to step #1.

Pause Step

Step Pause Button

If there is a need to stop the process mid-step, press the Step Pause Button on the right side of the front panel. This will temporarily release the pressure, stop the rotation of the Platen, and pause the time.

To restart the step at the exact point it was paused, press the Step Start Button.


Reset Step

Step Reset Button

While a process step is running or while the machine is paused mid-step, the Step Reset Button can be pressed to cancel the timer and return to the step’s original time value. You can now restart the step by pressing the Step Start Button.



Polishing Process Selection and Polishing Procedure

1. At Home tab, select the desired polishing process definition by touching the down arrow in the Process Selection box and then touching the desired process.
2. Select Production tab.
3. In the lower section of the screen, refer to the pad, lubricant, and film boxes for pre-defined variables for this process. Place specified pad and film on Platen. See section titled Polishing Pad and Film Placement for instructions on placing pad and film on Platen.
4. Pressing the blue “More Info” box will access Pressure Ramp Time (Sec), Pressure Ramp Remaining (Sec), Speed Ramp Time (Sec), Speed Ramp Remaining (Sec) and Step Notes. Press the “Return to Production Screen” tab to toggle back to Production Data Screen.
5. Ensure proper polishing fixture has been installed and that connectors have been properly seated. See section titled Polishing Fixture Installation for instructions.
6. Press the Step Start Button  to begin polishing.
7. When step has completed, the screen will load pad, lubricant, and film data, as well as time, speed, and pressure for the next step in the process. Load indicated pad and film and use lubricant as indicated for the next step in the process.
8. F.C.I. is Film Change Interval. When enabled (see section titled System Configuration for instructions), the numeric value to the right is this is the programmed interval for this process step. The F.C.I. count is the actual number times the current step film has been used. The Film Use will be highlighted in Blue with Film OK until FCI count matches FCI limit.
9. When the FCI count reaches the programmed FCI interval, the box will change to flashing red with “Change Film”. THIS WILL STOP THE MACHINE FROM POLISHING THE NEXT STEP. After changing the polishing film, press the blue “Reset” directly below the “Change Film”. This will reset FCI Count to zero, change to blue “Film OK” and allow the machine to polish the next step.



Copy/Backup Procedure

Once your variable settings have been established, they can be copied to a USB data storage device. This allows process variable data to be transferred to other APM-HDC-5200 machines as well as providing backup and retrieval capability.

A USB flash drive has been included with the shipment of your APM HDC-5200.

To save process variable data to a USB:

1. Insert USB storage device into USB slot at back of machine.
2. Select System Config. tab, then select Process Variable Settings.
3. Copy settings by selecting “Machine Memory to Memory Card”. You will be prompted if process variable data already exists on the memory card. (See **NOTE:** below for important information.)

NOTE: If the USB storage device already contains variable data, copying the machine memory to memory card will overwrite the variable settings on the card. To add process variable data to an already existing file on a USB storage device, use the following procedure:

1. **BEFORE** defining process variable data in the machine memory, copy **Memory Card to Machine Memory** so that all of your USB storage settings are contained in the machine memory.
2. Add additional process variable settings as required.
3. Copy from **Machine Memory to Memory Card**.

User Rights & Settings

The User Rights & Settings screen allows you to define four machine specific parameters, including (1) a password, (2) enablement of connector quantity adjustment by the operator, (3) enablement of process step selection by the operator, and (4) the display of pressure in pounds or kilograms.

To modify User Rights & Settings, touch the System Config. tab, then select User Rights & Settings in the “Configuration” box, using the down arrow as necessary.



Password Setting

A one to four digit password can be used to password protect the Process Configuration, Process Transfer and System Configuration tabs. One password can be activated per machine.

When the “Password” box is blank, no password protection is in effect. To activate password protection and reset the password:

1. Touch “Password” box until large checkmark appears. Current password will appear in the box to the right.
2. Touch the box with current password in it to access the keypad.
3. Type in a 1 to 4 character password.
4. Select “OK”.

To disable password protection touch “Password” box to un-checkmark box.

Enable Quantity Adjustment

Checking the “Enable Quantity Adjustment” box allows the machine operator to change the QTY value on the Production tab screen. When this value changes, the APM HDC-5200 adjusts the pressure in proportion to the original process pressure value to account for the change in the number of connectors being polished.

For example, if the original process pressure is set at 1.00 lb. and the default number of connectors for that process is set at 12, and the operator only loads 8 connectors into the polishing fixture and sets the QTY value on the Production tab screen to 8, the pressure will automatically be adjusted to 0.67 lbs.

This pressure adjustment due to the change in the QTY value is maintained for one complete run of the process and then returns back to the original process definition setting. The change in QTY and Pressure is noted by the yellow highlight of these values on the Production tab screen.

Touch the “Enable Quantity Adjustment” box to enable and disable this function.

Enable Step Selection

Checking the “Enable Step Selection” box allows the machine operator to start



Polishing Pad and Film Placement

Polishing films must be placed on rubber pads, glass or ceramic plates. To place polishing film:

1. Raise Overarm (See Unpacking & Setup instructions, Step 10, for raising Overarm. You must have compressed air connected to raise and lower Overarm.)
2. Place polishing pad or plate on the Platen, following the manufacturer's recommendations regarding adhesive backing to hold pad or plate in place.
3. Lower the Overarm to the full horizontal position. (See section titled Polishing Fixture Installation, Step 5, for instructions on lowering Overarm.)

Machine Operation

Power Up

If the machine has not been powered up, check that the following steps have been completed:

1. Plug the power cord into the back of the machine and into a properly grounded outlet—100-240VAC 50/60Hz. If your power cord is equipped with a large yellow plug, you **MUST** push the reset button on the plug to supply power to the machine.
2. Turn on power switch located at the back of the machine.
3. Lift screen cover. (Note: screen cover should be down when machine is operating.)
4. The touch screen should default to the Home tab screen. If the red emergency screen is displayed, reset by turning the Emergency Stop button clockwise.
5. Press Machine Start button.





Machine Operation

Polishing Fixture Installation

This procedure should not be performed when a cycle is running or the Platen is moving.

To install a polishing fixture on the Overarm shaft follow these steps:

1. Raise the Overarm to the full vertical position, locking the Overarm in place. (See Unpacking & Setup instructions, Step 10, for raising Overarm. You must have the compressed air hose connected to raise and lower Overarm.)
2. Ensure Overarm shaft and fixture bore are clean before proceeding.
3. With Fixture Retaining Screw facing upward, place fixture on the shaft and slide it up until it rests on the keys. Loosen screw, if necessary, to accomplish this.
4. Tighten Fixture Retaining Screw on the fixture. The screw allows the fixture to slide on the shaft without falling off.
5. Lower and lock the Overarm into the full horizontal position by pushing and holding the Quick Release Button and holding the fixture up against the keys as you lower the Overarm. Release button and slowly lower fixture onto Platen. This technique should be used whenever moving the Overarm with a fixture in place to protect both the fixture and the Platen.
6. Drape cables extending from fixture over Cable Management Bracket.



polishing at a step other than the first step in the process or to run process steps out of sequence. If the “Enable Step Selection” box is unchecked, the program requires that all process steps be run sequentially.

Touch the “Enable Step Selection” box to enable and disable this function.

Pounds or Kilograms

Pressure can be displayed in either pounds (lb) or kilograms (kg). Touch the “Display Kilograms” box to toggle between these units. A checked box will display pressure in kilograms and an unchecked box will display pressure in pounds.

Maintenance Schedule

The maintenance screen allows you to define six specific maintenance parameters including Platen Grease, Fan Filter, Lubricate Lock Pins, Replace Koby Filer, Replace Rubber Pad and Annual Maintenance. This section is also used to reset values after set parameters are reached.

Setting Platen Grease maintenance schedule

The Platen Grease maintenance is tied to the amount of hours the platen is rotating. To set the Platen Grease maintenance interval:

1. Use stylus to press the number located under “Hour Interval” tab. This will access the key pad for data entry.
2. Use key pad to set hours of use before changing platen grease. The recommended interval is 400 hours. This can be modified as needed based

Setting Fan Filter maintenance schedule

The Fan Filter maintenance is tied to the amount of hours the machine is powered on. To set the Fan Filter maintenance interval:

1. Use stylus to press the number located under “Hour Interval” tab. This will access the key pad for data entry.
2. Use key pad to set hours of use before cleaning the Fan Filter. The recommended interval is 600 hours. This can be modified as needed based on actual working conditions.



Setting Lubricate Lock Pins maintenance schedule

The Lubricate Lock Pins maintenance is tied to the amount of hours the platen is rotating. To set the Lubricate Lock Pins maintenance interval:

1. Use stylus to press the number located under “Hour Interval” tab. This will access the key pad for data entry.
2. Use key pad to set hours of use before lubricating the Lock Pins. The recommended interval is 400 hours. This can be modified as needed based on actual working conditions.

Setting Replace Koby Filter maintenance schedule

The Replace Koby Filter maintenance is tied to the amount of hours the platen is rotating. To set the replace Koby Filter maintenance interval:

1. Use stylus to press the number located under “Hour Interval” tab. This will access the key pad for data entry.
2. Use key pad to set hours of use before replacing the Koby filter. The recommended interval is 5000 hours. This can be modified as needed based on actual working conditions.

Setting Replace Rubber Pad maintenance schedule

Replacing the Rubber Pad maintenance is tied to the amount of hours the platen is rotating. To set the replace Rubber Pad maintenance interval:

1. Use stylus to press the number located under “Hour Interval” tab. This will access the key pad for data entry.
2. Use key pad to set hours of use before replacing the Rubber Pad. The recommended interval is 3000 hours. This can be modified as needed based on actual working conditions.

Setting Annual Maintenance schedule

The Annual Maintenance is tied to the amount of hours the platen is rotating. . To set the Annual Maintenance interval:

1. Use stylus to press the number located under “Hour Interval” tab. This will access the key pad for data entry.
2. Use key pad to set hours of use before performing Annual Maintenance. The recommended interval is 5000 hours. This can be modified as needed based on actual working conditions.



Deleting Processes

Processes in machine memory and/or residing on a USB data storage device can be deleted on the Process Transfer screen.

To delete processes in machine memory:

1. Select Process Transfer tab.
2. Highlight the name of the process in the “Machine Memory” list that you want to delete.
3. Select “Del” button under “Machine Memory” list.
4. Touch “Yes” button when prompted to delete.

To delete all processes in machine memory, select “Delete All” button under “Machine Memory” list and then touch “Yes” when prompted.

To delete processes on a USB data storage device:

1. Select Process Transfer tab.
2. Highlight the name of the process in the “Memory Card” list that you want to delete.
3. Select “Del” button under “Memory Card” list.
4. Touch “Yes” button when prompted to delete.

To delete all processes on a USB data storage device, select “Delete All” button under “Memory Card” list and then touch “Yes” when prompted.



Inter-Machine Process Transfer

The APM-HDC-5200 is equipped with a USB data storage slot. This feature allows machine-stored processes to be copied onto a USB data storage device, thus allowing duplication of process definitions across multiple APM-HDC-5200 machines. This feature significantly reduces multiple machine set up time and assures consistency in the definition of polishing processes.

This process transfer feature can also be used as a backup and retrieval tool.

To copy from machine memory to a USB data storage device:

1. Insert USB flash drive into the USB slot.
2. Select Process Transfer tab.
3. Highlight the process name on the “Machine Memory” list that you want to copy to the memory card.
4. Touch the “<<” button to copy to the USB data storage device.

All processes in machine memory can be copied to the USB storage device by selecting the “<All” button.

To copy from a USB data storage device to machine memory:

1. Insert USB flash drive into the USB slot.
2. Select Process Transfer tab.
3. Highlight the process name on the “Memory Card” list that you want to copy to machine memory.
4. Touch the “>>” button to copy to machine memory.

All processes on the USB data storage device can be copied to machine memory by selecting the “>All” button.

To copy process variable settings refer to the System Configuration section in this guide. The process variables settings reside in a separate file.



To re-set a maintenance schedule

Once a maintenance task has reached its set interval, an alarm will be triggered in the production screen (Maint OK will turn from blue to red). The user will be able to continue polishing even if the maintenance is not reset. To re-set the maintenance:

1. Go to System Config tab in the menu system.
2. Select Maintenance Schedule from configuration drop down box.
3. All maintenance intervals needing re-set will be highlighted in red.
4. With stylus, press the red re-set tab.
5. The re-set tab will change from red to blue. The hours accumulated (Accum) will revert to zero hours upon a successful re-set.

Process Setup

The number of processes that can be defined and stored on the APM HDC-5200 is only limited by the amount of internal memory. Hundreds of processes can be stored on a single machine. Additional processes can be stored on a USB data storage device, thus allowing an unlimited number of processes to be pre-defined and readily available for use.

To define a process:

1. Select the Process Config. tab.
2. A new process can be setup in two ways.
 - Select the “New” button to define a process from scratch.
 - To begin with a copy of an existing process, select the process you want to copy using the down arrow in the “Process” selection box to display a list of processes stored in machine memory. Select the desired process to copy and then touch the “Duplicate” button.
3. Enter a new process name as prompted. The process name can include up to 16 alphanumeric characters and will not allow spaces, dashes and punctuation. Select “OK”.
4. Select the quantity (QTY) of connectors that will be polished for this process using the down arrow to display a valid range of numbers. If you have chosen to allow the machine operator to change the quantity on the Production



screen (based on the number of connectors actually loaded into the fixture), the maximum connectors the operator can select is based on the number selected on this screen.

NOTE: Processes can only be deleted under the Process Transfer tab.

Defining steps within a process:

Index tab “A” allows you to define Time, Speed, Speed Ramp Up, Pressure and Pressure Ramp Up for each step in the process. Index tab “B” allows you to select Pad, Lubricant, Film, Film Change Interval and Step Notes for each step.

1. Select tab “A”.
2. Touch the “Time” box to access the keypad. Enter the number of seconds to run this step. Select “OK”.
3. Touch the “Speed” box to access the keypad. Enter the RPM's desired in this step. Select “OK”.
4. Touch the “Speed Ramp Up (Sec)” box to access the keypad. This feature will slow start the platen. Enter the number of seconds desired from zero RPM to the programmed speed. The maximum value is 20 seconds. Select “OK”.
5. Touch the “Pressure” box to access the keypad. Enter the pressure in pounds or kilograms, depending on the unit selected in System Config. and displayed in this box. Select “OK”.
6. Touch “Pressure Ramp Up” box to access keypad. This feature will slow start the pressure. Enter the number of seconds desire to go from zero pressure to programmed pressure. The maximum value is 20 seconds. Select “OK”.
7. Select tab “B”. The parameters under tab “B” are used to communicate to the operator the pad, lubricant, film, film change interval and step notes.
8. Touch the “Pad” down arrow. Select the desired pad for this step in the process.
9. Touch the “Lubricant” down arrow. Select the desired lubricant for this step in the process.
10. Touch the “Film” down arrow. Select the desired film for this step in the process.



11. Touch “Film Change Interval” box to access keypad. Enter the numeric value of the number of cycles the film is used for that polishing step. The APM-HDC-5200 will track the number of uses of the film and send an alarm message when the film needs to be re-set. The maximum numeric input for the film change interval is 99. Select “OK”.
12. Touch “Step Notes” box to access key pad. The text box is used to convey process information to the users. Enter in pertinent information as needed. Select “OK”.
13. Select “New” or “Copy” in the Step definition area to define the next step. Repeat the above instructions for all steps in a process. See Copy Function below to begin a new step based on a previously defined step within the same process.

Testing During Process Setup: To test a process set while in Process Setup mode, select the step and press the Step Start Button. This allows you to run and test an individual step without having to access the process under the Production tab.

Rework: The “Rework” box allows an operator to restart the polishing process from a predefined point. The number selected is the step in the process where rework will begin. The rework program will then execute this step plus all remaining steps. Upon completion, the program will return to step #1.