microcut®

Owner's Reference Manual for the
PLUS & COLOR WS Wide Screen
Paper Cutter Automation Systems

C&P microsystems

Date of installation	
Installed by	
Machine manufacturer	
Machine model	
Machine size	
Machine serial number	
microcut serial number	
Extras	
Notes	

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NOTE: Revisions occur as requests are made from operators, supervisors, and others. This manual may be incomplete. Refer to our website referenced on the cover sheet for updated material.

TABLE OF CONTENTS

Due to the similar operator interface and components this manual is for both the PLUS WS and COLOR WS control systems. The unique features on the PLUS WS model are identified here and in the document.

** These features are available only on the **PLUS WS**. They are not applicable to the **COLOR WS** unit.

INTRODUCTION

Thank you for purchasing a **microcut** control system for your paper cutter. Having done so, you have joined tens of thousands of **microcut** users worldwide who are enjoying the benefits of computer-controlled cutting.   **microcut** is a state of the art system for controlling back gauge movement, with an intuitive, easy to use operator interface. After turning the power on and getting started, there are four basic operating methods—

- Manual operation.
- Programming new jobs.
- Reviewing existing jobs.
- Automatic operation using an existing job.

Many of the features you will find in **microcut** have resulted from operator's ideas throughout the world. If you have any suggestions, we encourage your input. Where possible, we will make the revisions and update your unit. Our special thanks to all who have helped make **microcut** the world leader in cutter automation.

Requirements for installation and use:
- ☐ The machine is to conform to present safety requirements in your area.
- ☐ Supplied power is to be 110/220±10% VAC, 50/60 Hz protected by a 15 or 20 amp breaker.
- ☐ The installation is to be performed per the instructions included in this manual.
- ☐ All of the safety elements must remain intact and correctly functional.
- ☐ All nip, pinch, crush, or cutting zones must be properly guarded.
- ☐ A paper cutter can be a dangerous machine. Only properly trained and supervised personnel should operate this equipment.

POWER ON

At power ON the computer will take a minute or so to boot up. The screen will go black for a period as the computer loads the screen drivers. This is normal. Then the Start-Up screen will appear:
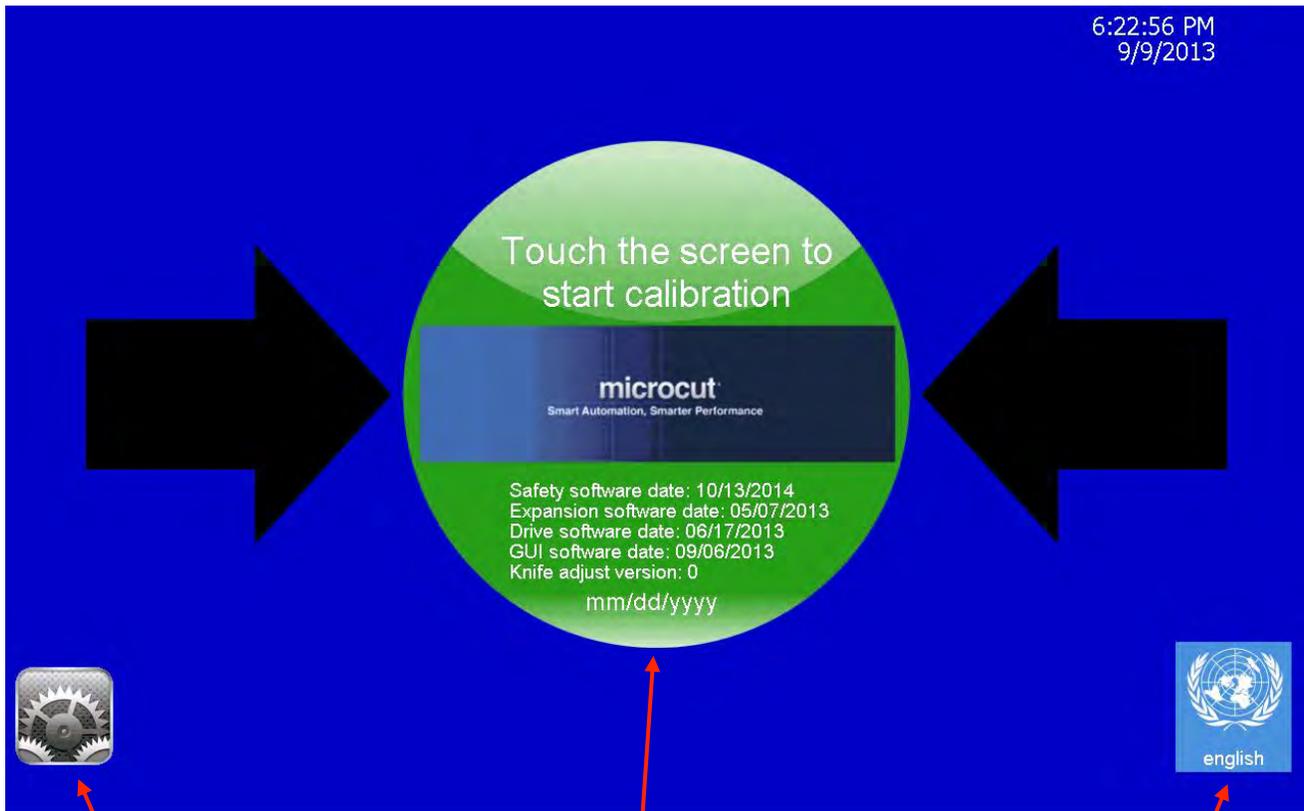
Tap [gear icon] to enter the
Set Up Routine.

See page 25.

Tap [green ball icon] *to start the system.*

Software dates are in lower portion of ball.

Tap [UN globe icon] to change the language.

See page 19.

A [red ball icon] will appear on the screen and the back gauge will drive to the back to calibrate.

Tap [red ball icon] **only for an emergency stop.**
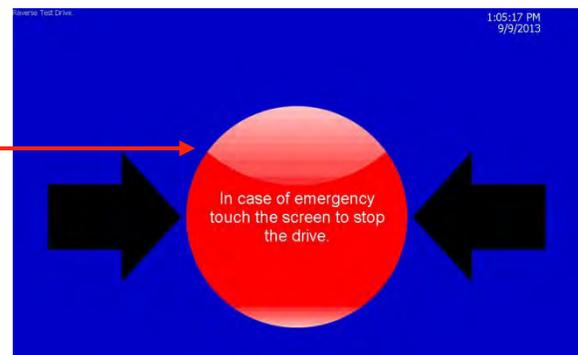
THE SCREEN

The fundamentals of the screen repeat in all operating modes. Tap on different areas of the screen to select various operations:

Back gauge position and units:

- **RED** if operations are disabled.
- **GREEN** if in position and all operations are OK.
- **YELLOW** if operations are OK but no position is defined.
- **WHITE** if only the clamp is enabled.

Tap POSITION area to transfer that number to calculator.
Tap UNITS area to change units.

Relative back gauge position.

Language and Operator Preferences.

Time and Date.

Air table ON if jets are shown.

Tap the table to change.

Knife UP or DOWN.

Red if **DOWN.**

Network Set Up. PLUS WS ONLY

microfacts menu. PLUS WS ONLY

Clamp UP or DOWN.

Red if **DOWN.**

Hand wheel IN or OUT.

Red if **IN.**

Operator Options.

Tap this and then any other part of the screen to get information on any icon.

Maintenance Options.

Air motor ON / OFF.

Tap to change.

MANUAL, **PROGRAM**, **REVIEW** and **AUTOMATIC** modes.

See next page.

Target Data Box shows the programmed targets:
- Icons to the left are the Target options. *See page 9.*
- Icons to the right are the Programming options. *See page 10.*

Calculator keys to enter numbers.

BACK GAUGE drive control:

BACKWARD.

Auto Correct will HOLD position.
MOVE to the keyed in position.

FORWARD.

NOTE: Depending upon the set up of your system, some of the icons shown above may not appear on your screen.

OPERATION

There are four basic operating modes:

MANUAL

Tap [icon] for **MANUAL** mode. This is used to position the gauge one cut at a time. Use [icon] and [icon] **OR** [icon] and [icon] to position the gauge. *See page 22.*

PROGRAM

Tap [icon] for **PROGRAM** mode. This is used to define a job number and program targets to be cycled through in AUTOMATIC mode. The entry screen allows job number selection. The system then advances to the programming screen – virtually the same as the Automatic screen shown below. *See page 8.*

REVIEW

Tap [icon] for **REVIEW** mode. This is used to retrieve previously programmed jobs or data from a USB memory stick or the local network. *See page 13.*

AUTOMATIC

Tap [icon] for **AUTOMATIC** mode. This is used to cycle target to target through the selected job to perform the necessary cutting operations.

*NOTE - To enter **AUTOMATIC** you must have already done one of the following:*

- *Made a new job in **PROGRAM***
- *Selected an old job in **REVIEW***
- *Been in **AUTOMATIC** with a current job.*

PROGRAMMING A NEW JOB

Tap to enter **PROGRAM** mode.
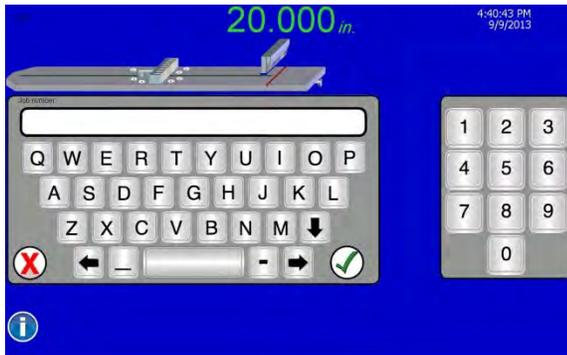
Use to select a job number.

Tap to exit **or** tap to continue.

NOTE: Tap *when the job number line is blank and the computer will assign the lowest available job number.*

The Job Programming screen will appear.

Use to enter data, **or** move the gauge and cut, **or** select options for alternate programming methods.

Refer to Target Options (to the left of the job data box) and Programming Options (to the right of the job data box) on the next two pages for details.

Messages that may appear include:

The system will not let you program a job if the number is already used.

If defined in the Machine Set Up screen to give a warning, the clamp pressure reminder screen will appear.
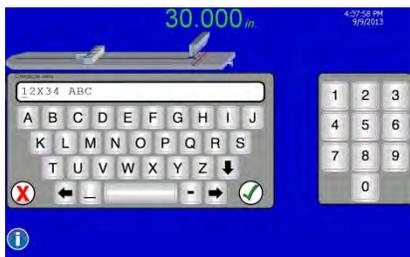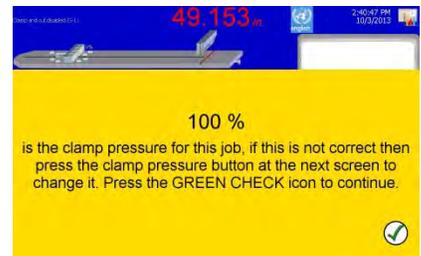
Jobs can be copied or renamed if you want.

Jobs can be protected if desired. If the protection feature is used an operator code will be required before changes can be made. The job can still be copied to another number.
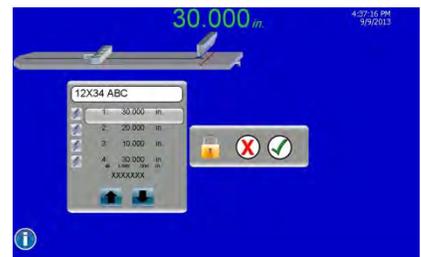
TARGET OPTIONS

When a target type is activated a green box will appear around the icon. Tap an icon to select it. Several target icons may be activated at one time. For instance, a cut could be a quick cut and a cut optimization and an auto waste removal. Tapping an icon may shut off another icon (clamp would shut off all cut options). The available target types are dependent upon the machine and the installation. These are defined in the Set up Routine. Some of the following icons may not appear on your screen.

Target types can only be changed when entering a new target **or** *if you tap* *(Change target).*

	Knife Enabled	Knife **NOT** Enabled	

CUT

The knife will operate normally.

QUICK CUT

So you can release the cut buttons during the cut.

AUTO CUT

After the first cut is started.

CUT OPTIMIZATION

Allows the clamp to stop before going all the way up.

CLAMP TO JOG

Keeps clamp down after cut so you can jog the stock back into position.

AUTO WASTE REMOVAL

Clamps, opens the table, cuts, pushes, closes table, moves to next target.

CLAMP

Clamp is enabled, Knife is not.

AUTO CLAMP

After the first clamp is started.

CLAMP PRESSURE

At this target. If 0, then only the knife will operate during cutting.

LOAD

Clamp is enabled, Knife is not.

PUSH

Goes to the target and then immediately goes to the next target.

Knife is disabled ONLY if your machine is so equipped.

PROGRAMMING OPTIONS

The **COLOR WS** and **PLUS WS** has several options for programming a job. The icons to the right of the job data box allow you to select from a number of choices. These options can be enabled or disabled. Only those options that are enabled will appear on the screen. Some of the below options may not appear on your screen. Refer to the section titled "Selecting Programming Options" in this document for details.

CHANGE

Change a target value.
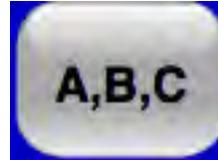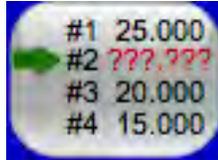
COMMENT

Add a comment under the target.

INSERT

Insert a target BEFORE this location.

JOB PROTECT

Lock a job (protect from changes) or unlock it.

DELETE

Delete a target.
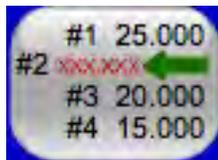
COPY JOB

Copy the job to a different number. *NOTE: To simply CHANGE the number, Tap the job number in the Target Data Box.*

LABELS

Begin a one or two sided label program.

STAR

Mark several cuts for group editing. Press **and hold** for a second to mark ALL of the targets for change.

SHEET DIVIDE

Divide a sheet into equal sizes.

LAY COMP
For one lift ONLY

Adjust all forward moving cuts by the same amount. Available only in AUTOMATIC mode.
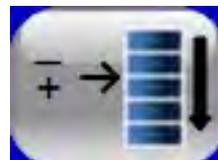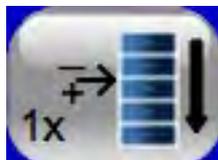
LAY COMP

Adjust all forward moving cuts by the same amount. Available only in AUTOMATIC mode.

LABELS

LABEL mode allows multiple targets to be calculated by entering a few details. Labels can be saved as individual cuts (every target is calculated and saved) or as raw data (start position, number of labels, label size, and trim size). Saved as individual targets, every position can be modified as necessary. Saved as raw data the trim size can be adjusted to compensate for sheet stretch.

The memory available in the **PLUS WS** display is, from practical points of view, limitless. To that end, it does not matter which way you store the label data. Choose the method that works best for your operation and comfort.

Tap [icon] to start programming the labels on **Side 1**. The target type and attributes can be selected from the list on the left side of the display. *For instance, you may opt for AUTO CUT, CUT OPTIMIZE, or AUTO WASTE REMOVAL (which will be programmed at only the trim targets).*
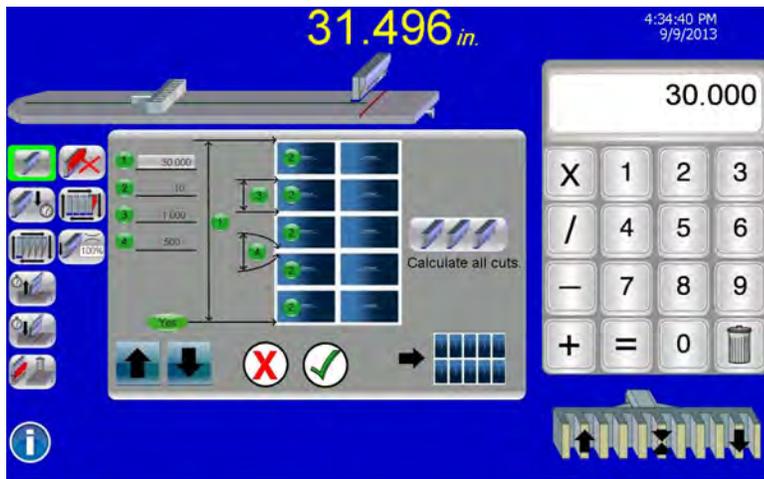
1 Enter the first cut size.

Use [icon] and [=] **OR** position the gauge and make the cut.

2 Enter the number of labels on this side (or strip).

3 Enter the label size.

4 Enter the trim size.

NOTE: After you fill in ANY three lines the remaining line will be calculated automatically. For instance, you might skip the first cut if you did not know it (17 labels of 2+3/64" with a ¼" trim makes the first cut difficult to calculate).

Tap [Yes] to flip it to [No] *(and vice versa)*. This defines if the first cut will be saved in the job or not.
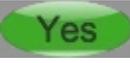
Tap [✓] to complete the label programming **OR** tap [✗] to abort **OR** tap [icon] to go to **Side 2**.

Program **Side 2** in the same way you did **Side 1**.
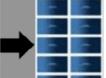
Tap [icon] to go back to **Side 1**.

Tap [✓] to complete the label programming **OR**

Tap [✗] to abort.

SHEET DIVIDE

SHEET DIVIDE will equally divide a sheet into multiple (equal) logs. Tap ▓ to start dividing the sheet. The target type and attributes can be selected from the list on the left side of the display. *For instance, you may opt for AUTO CUT, CUT OPTIMIZE, etc.*
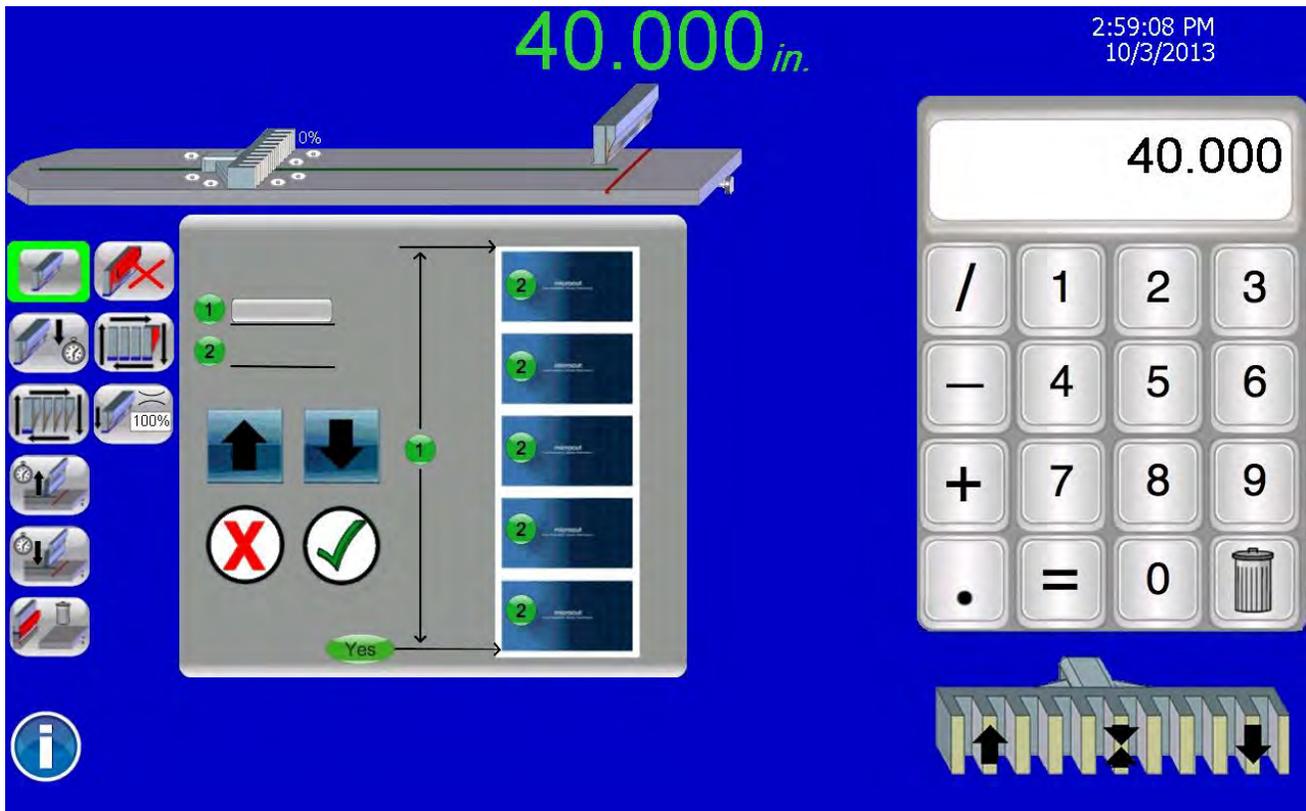
① Enter the sheet size.

Use 🔢 and = **OR** position the gauge and make the cut.

② Enter the number of times you would like to divide the sheet.

Tap **Yes** to flip it to **No** *(and vice versa).* This defines if the first cut will be saved in the job or not.
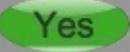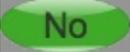
Tap ✓ to complete the SHEET DIVIDE **OR** tap ✗ to abort.

REVIEWING EXISTING JOBS

REVIEW mode allows you to recall jobs on the display drive, USB memory stick, and local area network (network connection required). Tap [icon] for **REVIEW** mode.

This column shows job location.

Tapping this will SUB-SORT via job location.

[house icon]	Cutter
[USB icon]	USB
[network icon]	Network

Tap the **Job number** or **Date** column to SORT by that column.

Sorted column is GREEN.

The PREVIEW area shows the first few targets on the highlighted job.
If the bubble is over an unconverted CIP file (see next page) then you will be advised accordingly.

Tap [icon] for Network setup.

Tap [icon] to Copy selected job(s) to USB.

Tap [icon] to Select one or several jobs. Hold to select all. Can be used for DELETE or COPY.

Tap [icon] to Search within the sorted (GREEN) column (**Job number** or **Date**).

Tap [icon] or [icon] to Highlight the job you want.

Tap [icon] to Delete selected job(s).

Tap [icon] to review the full job. *This transitions you into **PROGRAM** mode so you can view and edit the job as desired.* Also refer to CIP Jobs.

Tap [icon] to use the highlighted job in **AUTOMATIC** mode.

CONVERTING A JDF OR PPF OR CIP3/4 JOB (PLUS WS ONLY)

Files stored in jdf, ppf or CIP3/4 formats can be imported to the computer through either a flash memory stick or through a network system if the computer is connected up for this. *All jobs will be available (local, memory stick, or network).*

Tap [icon] for **REVIEW** mode.

Move the bubble to the desired CIP job to begin the data conversion process and

[icon] (a preview of the job) will appear

Tap [icon] to define the parameters that will allow the cuts to be calculated.

Compare the image on the screen to the printed sheet as it will be loaded into the cutter. The bottom buttons will adjust the screen image.
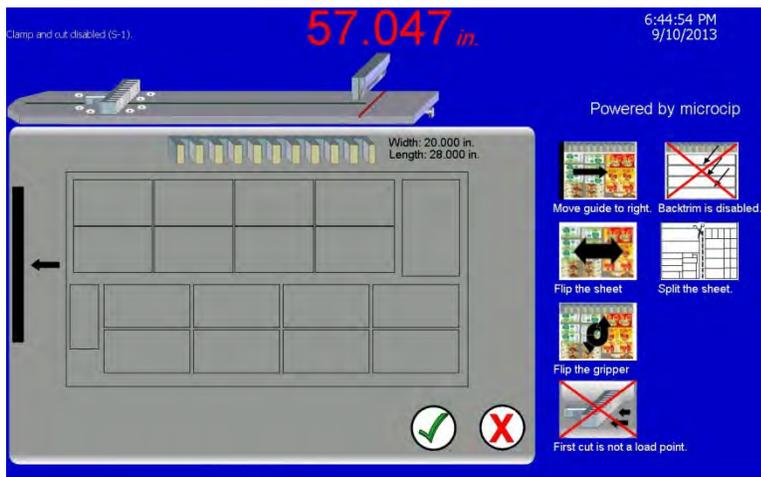
Tap [icon] to move the guide to the other side.

Tap [icon] to flip the sheet over side to side.

Tap [icon] to flip the sheet over top to bottom.

Use the buttons to make the image match the sheet to be cut.

You can opt to have the system program a load point or not. The load point will be positioned so that roughly 12" of stock will be in front of the knife (based upon the parent sheet size specified in the CIP file). You can insert your own load point from the Automatic Screen as well.

You can opt to have the targets programmed to make only cuts that leave the signature behind the knife. Due to the shape of the knife the material to the front of the knife is ripped apart while the material behind the knife is cut. For the highest quality cutting the signature should always be behind the knife. But this will require more turning and manipulation of the stock. For the quickest production you may wish to not require this feature.

You can also split the sheet into two jobs. In some cases you may wish to split the sheet and cut only half of the job at a time (sheet size is too big for the cutter or the job is being transitioned to a different cutter to be completed). In this case Tap [icon].

See the next page.
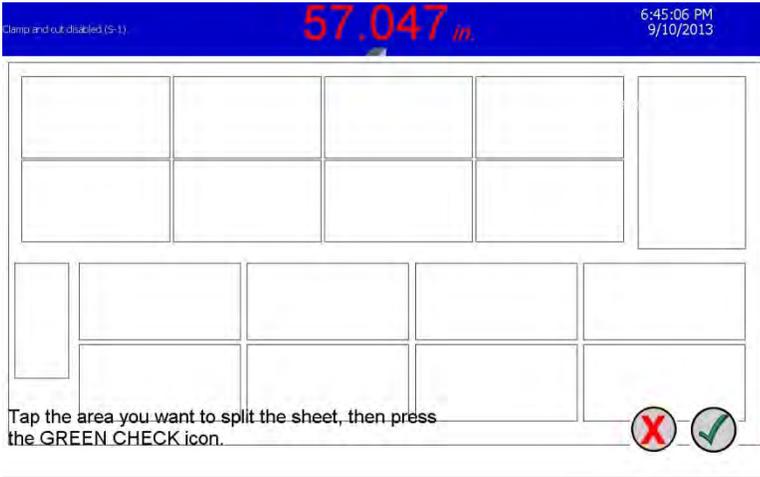
Once you Tap [icon] you can now touch the screen at the location where you want to split the sheet. Assuming that the cut can be made at that point without cutting through a signature, the screen will show the selected splitting line.

Tap [green check] to continue **OR** Tap [red X] to exit.

The screen will change to ask if you want to program one side and then the other, or keep only one of the two sides. Move the bubble to the selection you would like.

Tap [green check] to continue **OR** tap [red X] to exit.
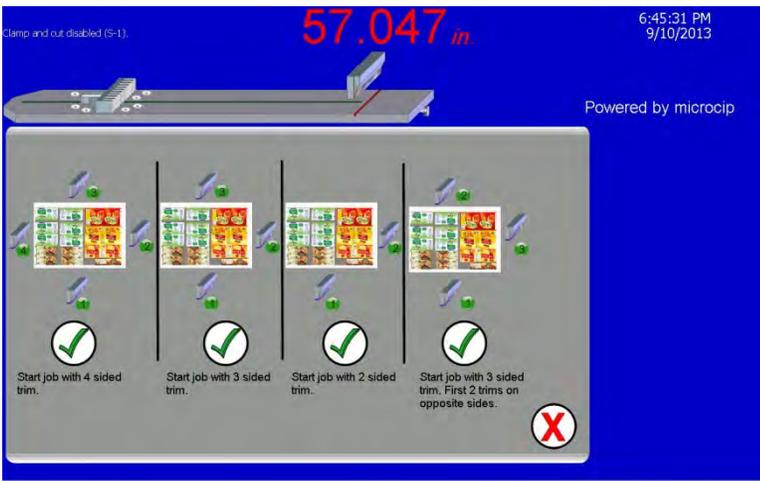
Tap [icon] to trim all 4 sides.

Tap [icon] to trim just the first 3 sides.

Tap [icon] to trim just the first 2 sides.

Tap [icon] to trim 3 sides with a 180 flip.

How you trim will affect the order in which the job must be cut.

Tap [green check] to continue **OR** tap [red X] to exit.

The screen will indicate the job is being created. Then the completed job will be displayed. Each cut will have a comment attached to help guide you through operation. These comments include cut, rotate (left, right, or half), store, ship, and more. The system will proceed to the Program screen allowing you to add, delete, or adjust target values.
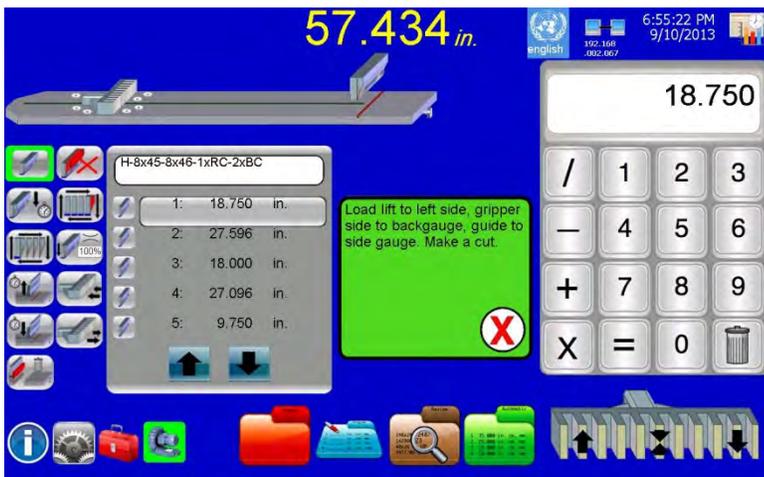
The created job can be modified in the same manner as any other job if revisions are required.

Tap [icon] to use the highlighted job in **AUTOMATIC.**

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BACK GAUGE OPTIONS

Tap [image] for **BACK GAUGE** options.

Use [image] or [image] to highlight what you want to select.

Use [image] and [image] to enter new values.

For options that are ON or OFF use

[image] **or** [image] to adjust the selection.

Tap [image] to exit.

OPTIONS	DESCRIPTION
Auto eject	Pushes paper FORWARD every time back gauge changes to reverse.
Forward speed	Maximum speed of FORWARD moving back gauge.
Reverse speed	Maximum speed of REVERSE moving back gauge.
Push out speed	Maximum speed of FORWARD moving back gauge during a push.
Deceleration rate	How quickly back gauge stops after FORWARD speed.
Tolerance	Allowable window size of target position.
Calibrate Gauge	Make minor adjustments to back gauge position.
Manual drive micro positioning	Tapping [image] or [image] will move the back gauge the minimum increment.
Sideloading	Paper is loaded from the rear of your machine.
Auto advance after sideload	After paper is loaded, the back gauge moves to next target.

CLAMP OPTIONS

Tap ▨ for
CLAMP and **KNIFE** options.

Use ⬆ or ⬇ to highlight what you want to select.

Use ▦ and ▭ to enter new values.

For options that are ON or OFF use ▭ **or** 🗑 to adjust the selection.

Tap ❌ to exit.

Cuts on this knife: 35
Clamp pressure: 100 %
Auto Clamp timeout: .0 sec.
Clamp Lead: 0 sec.
Clamp release time for cut optimization: 5
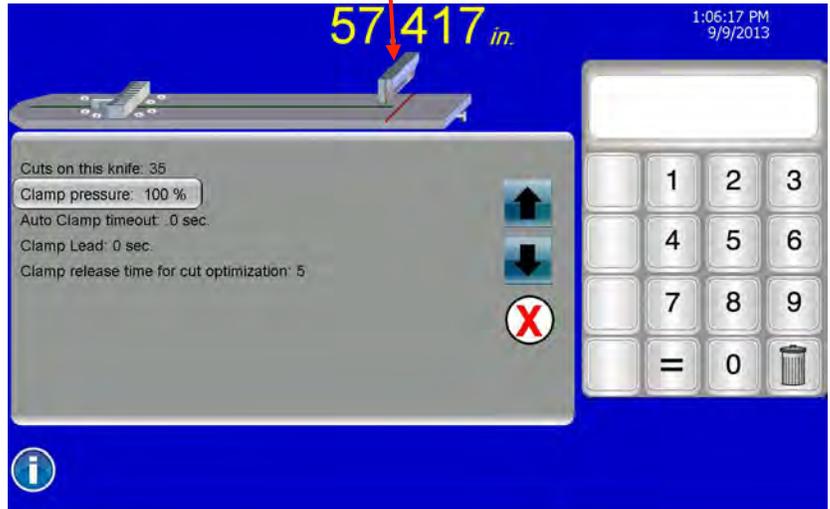
OPTIONS	DESCRIPTION
Cuts on this knife	Knife cycles since last knife change.
Clamp pressure	Adjust clamp pressure. Requires a proportional valve in the clamp hydraulic control and either the Expansion board or the B65 full paper cutter control system.
Auto Clamp timeout	Time clamp is DOWN during Auto Clamp.
Clamp Lead	Time between clamp DOWN and knife start.
Clamp release time for cut optimization	Time of clamp rise after cut. This requires either the Expansion board or the B65 full paper cutter control system as well as a clamp locking / enable valve.

NETWORKING OPTIONS (PLUS WS ONLY)

C**utternet** (software and hardware in the **PLUS WS** system) can connect to your LAN (Local Area Network). *This procedure should ONLY be performed by your authorized computer maintenance person.*

Tap [Network ENABLED icon] *(Network ENABLED)* **or** [Network DISABLED icon] *(Network DISABLED)* to access the network connection features.
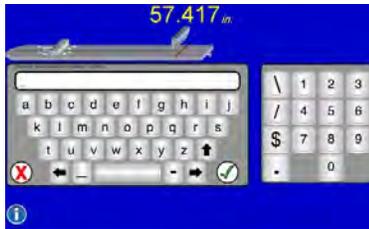
Use [keypad image] to enter your server or workstation name or address.
Tap [X icon] to exit **or** [check icon] to continue.

Use [keypad image] to enter your server or workstation shared directory name.
Tap [X icon] to back up **or** [check icon] to continue.
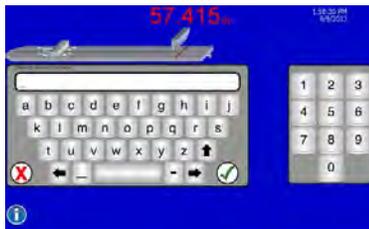
Use [keypad image] to enter your network user name.
Tap [X icon] to back up **or** [check icon] to continue.

Use [keypad image] to enter your network user password.
Tap [X icon] to back up **or** [check icon] to continue.

Tap [X icon] to not enable the network.

Tap [check icon] to enable the network operation.

Use [up arrow] or [down arrow] to locate the bubble over the selection you require.
FTP is File Transfer Protocol and may be required for non-PC type networks. If you require FTP then select the type of FTP you use (active or passive).
NOTE: If you select Active FTP you will be presented with another screen for "Fuji Mode On" or "Fuji Mode Off (Fuji mode is specific to a particular Fuji plant). Select "Fuji mode Off".
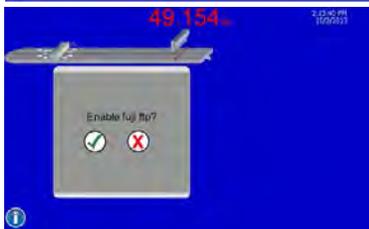
Tap [check icon] to enable this operation.
Tap [X icon] to disable it and program normally.

OPERATOR OPTIONS

The **COLOR WS** and **PLUS WS** display contains several languages.

Tap to change the language.
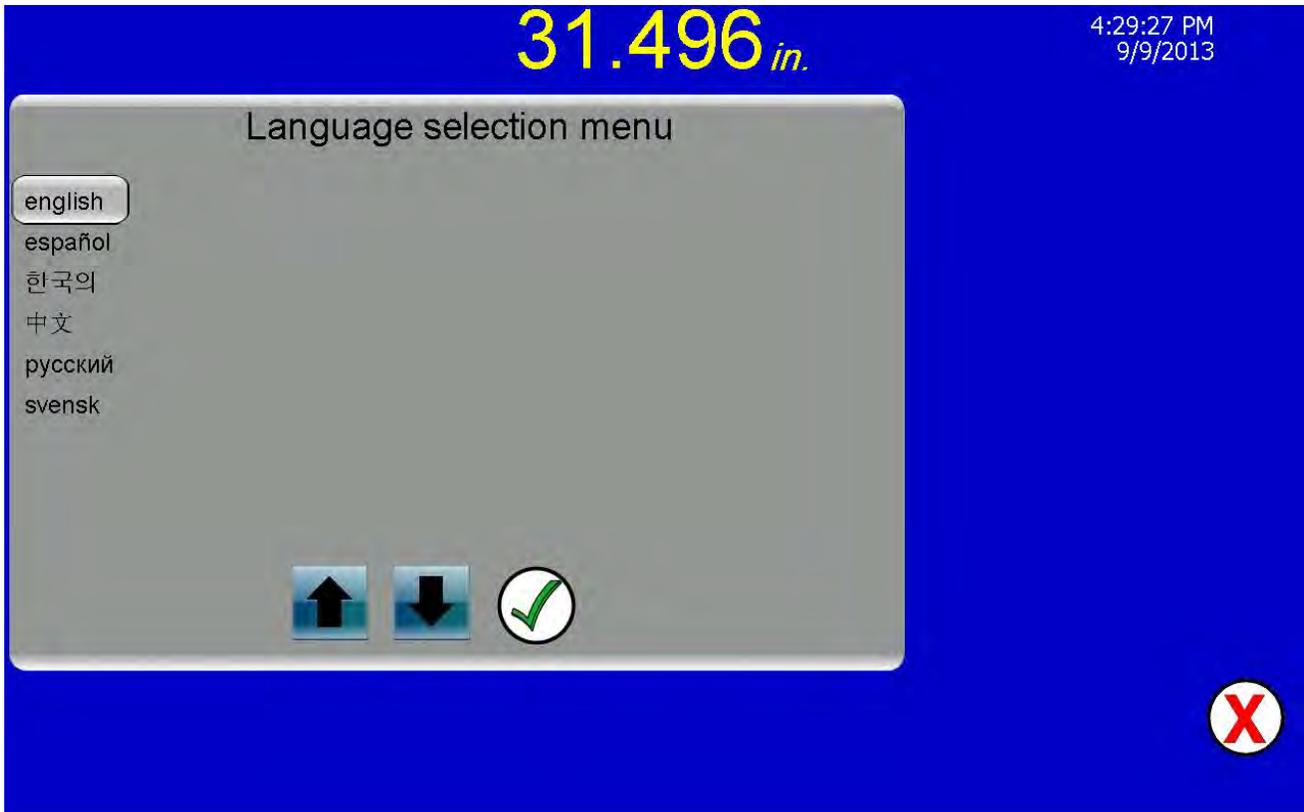
Use or to move the bubble over the language you desire, then tap .

If the **microfacts** time management system is activated the next screen will request Operator Log In.

Otherwise you will return to the operation you were last performing.

SETTING THE TIME CLOCK

The **COLOR WS** and **PLUS WS** display contains a time clock for tracking events.

To change the time and date, tap [12:13:36 AM 12/25/2012] *(the screen area where the time and date is shown)*.
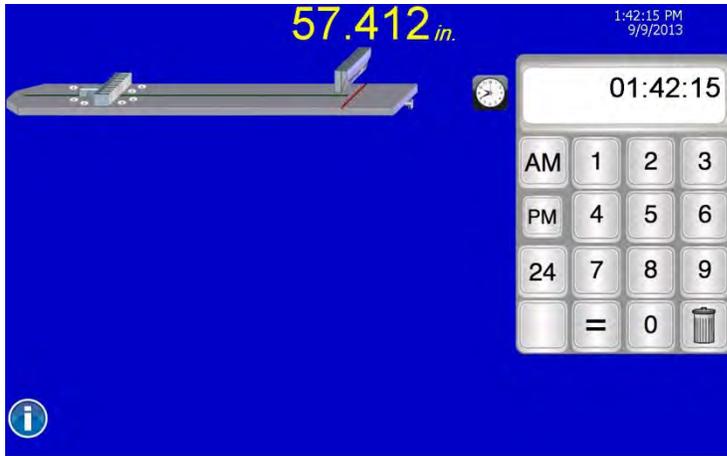
Use [01:42:15 keypad] to enter the correct time.

Select **AM**, **PM**, or **24** (hour) time mode to continue.
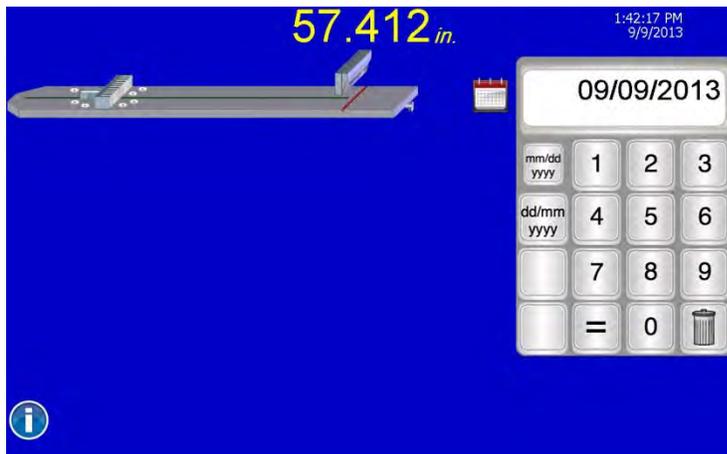
Use [09/09/2013 keypad] to enter the correct date.

Tap **mm/dd/yyyy** (Month / Day / Year) or **dd/mm/yyyy** (Day / Month / Year) for the display method and to exit.

MICROFACTS OPTIONS (PLUS WS ONLY)

The **PLUS WS** display contains software called **microfacts**. This can be used to track many operations of the machine. This is tracked in the background as the operator selects different operating modes and runs through jobs or other procedures. You can also use this feature to limit access to the machine (when Operator Codes are enabled only personnel with valid codes can use the system) or control what features are available to various operators.

To access the **microfacts** features tap .
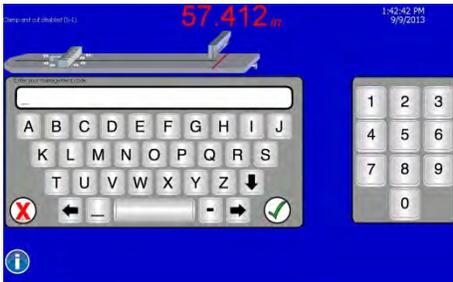
You must have a valid access code to enter the **microfacts** screens.

Use to display your code.

Tap to exit; **or** tap to continue.
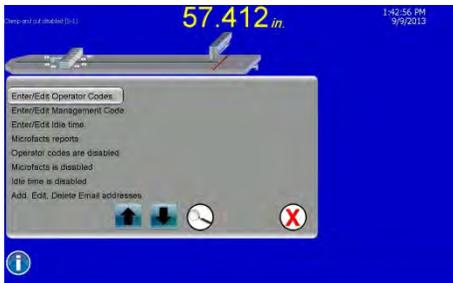
Use **or** to position the bubble on the line you would like to adjust, then tap

OR…..Tap to exit the screen.

NOTE: Exiting this screen implies a new Operator Log In. If the Operator Access Codes are enabled you will need to enter a valid code to continue.

Use to enter your code.

Tap to continue.

Enter/Edit Operator Codes	From here you can enter up to 12 different operators defining access rights to – Back Gauge Options, Clamp & Knife Options, Networking, Time Clock, **microfacts**, Operator Preferences, Toolbox Options, Program Mode, Review Mode, and Automatic Mode. Follow the instructions on the screen to enter each choice.
Enter/Edit Management Code	From here you can modify you **microfacts** management code.
Enter/Edit Idle Time	From here you can define idle time as 5 to 30 minutes as well as select from a group of idle time reasons or key in your own. If no machine use is seen for the idle period a screen of reasons will appear and require that a selection be made before operation can continue.
Microfacts Reports	Use this option to define report filters (none, by operator, by job, or by operator and job), select if the report should be summarized or detailed, and if it should be exported to USB memory stick, network, or via e-mail (which can also be defined on this screen). The report can also be viewed on the display itself. Options will not be shown for non-existent devices.
Microfacts is enabled or not	From here you can determine if you will track the operations of the cutter or not.
Idle Time is enabled or not	From here you can determine if you will activate idle time or not (require reasons for idle time to be entered when the time entered above is exceeded without operation).
Add, Edit, Delete E-mail Addresses	From here you can add, edit, or delete addresses to send the **microfacts** time reports to. You can also define automatic daily reporting from here as well.

SYSTEM OPTIONS

To enable, disable or modify various options, tap [icon] *(MANUAL mode)*.

Tap [icon] to open Operator Preferences.

An **X** over an icon indicates it is disabled. Tap the icon to change the status.
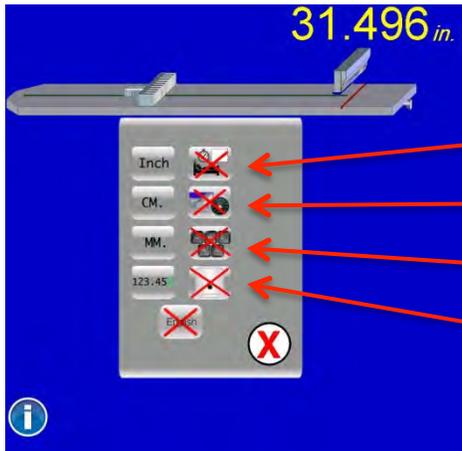
RIGHT COLUMN

Screen saver—OFF to 3 to 5 to 7 to 9 minutes.

Gauge power meter—shown as a % next to the gauge icon.

Keyboard choice—QWERTY or Alphabetical.

Decimal point – Determines method for number entry.

Tap [X] to exit.

Tap [English] to change the icon display to pictures (in all screens).

Tap [English X] to change the icon display to words (in all screens).

LEFT COLUMN
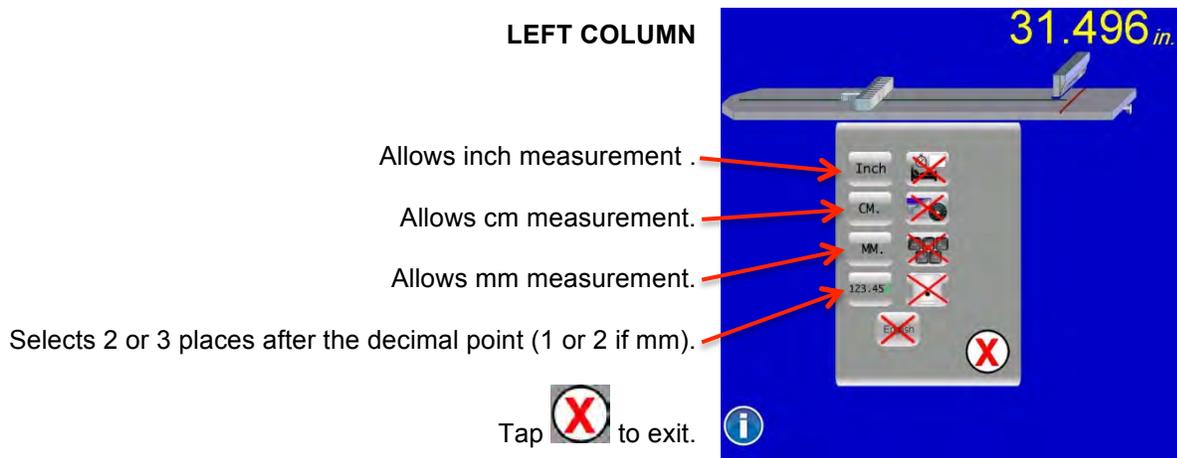
Allows inch measurement .

Allows cm measurement.

Allows mm measurement.

Selects 2 or 3 places after the decimal point (1 or 2 if mm).

Tap [X] to exit.

SELECTING PROGRAMMING OPTIONS

CHANGE

Change a target value.
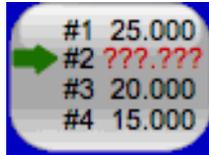
COMMENT

Add a comment under the target.

INSERT

Insert a target BEFORE this location.

JOB PROTECT

Lock a job (protect from changes) or unlock it.

DELETE

Delete a target.
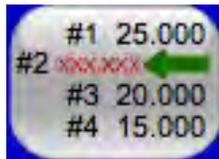
COPY JOB

Copy the job to a different number. *NOTE: To simply CHANGE the number, Tap the job number in the Target Data Box.*

LABELS

Begin a one or two sided label program.

STAR

Mark several cuts for group editing.

SHEET DIVIDE

Divide a sheet into equal sizes.

LAY COMP
For one lift ONLY

Adjust all forward moving cuts by the same amount. Available only in AUTOMATIC mode.
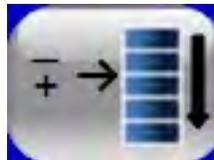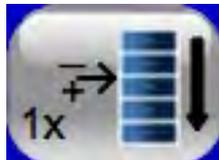
LAY COMP

Adjust all forward moving cuts by the same amount. Available only in AUTOMATIC mode.

From **PROGRAM** and **AUTOMATIC** you can enable or disable various options.

Tap [icon] to open Operator Preferences.

An **X** over an icon indicates it is off and will not appear during operation.

Tap the icon to change the status.

MAINTENANCE OPTIONS

The **COLOR WS** and **PLUS WS** display tracks knife strokes and time to evaluate when maintenance is due. Warnings will appear on the screen as necessary. To perform maintenance items and update the alarm timers tap [image] to select Maintenance (knife) options.

Use [↑] or [↓] to highlight what you want to select.

[=] will appear to select the choices as you move the bubble.

Tap [X] to exit.

OPTIONS	DESCRIPTION
Cuts on this knife	Press to 0 (zero) the cut counter.
Knife down auto stop	Stops knife DOWN. This requires the B65 full paper cutter control system.
Manual hand crank knife change	Allows manual movement of knife. This requires the B65 full paper cutter control system.
Clean knife	Stops knife DOWN and releases clamp UP. This requires the B65 full paper cutter control system.
Knife change	Instructions, if available, for your machine. This requires the B65 full paper cutter control system.
Knife Auto Set	Starts the routine to automatically set the knife height. This requires the B65 full paper cutter control system and the AKS kit.
Knife adjust	Manual adjustment – using Automatic Knife Set system. This requires the B65 full paper cutter control system and the AKS kit.

THE MACHINE SET UP SCREENS

All **microcut** units must be told what type of machine they have been installed on. This routine only needs to be done once, after the installation is physically completed. This will allow the computer to learn about the machine, including how to drive the motor and how to count one for one with the movement of the back gauge. At the first power on:

STEP 1: Power on, select Set Up

Tap [gear icon] to enter the Set Up Screen.
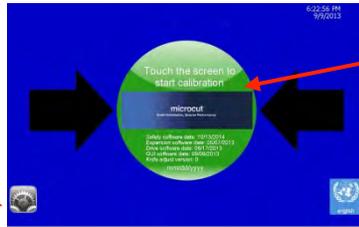
OR…Tap [green icon] for a normal start up. Set Up will be forced if it has not been done already.

OR…Tap [UN flag icon] to change the language.

STEP 2: Select Machine Set Up

Tap [person icon] to enter the Machine Set Up Routine.
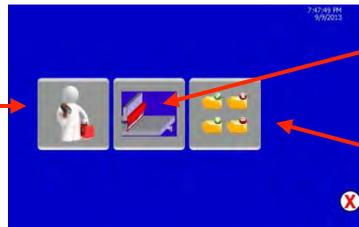
OR…Tap [knife icon] to make adjustments to the CLAMP and KNIFE options.

OR…Tap [envelope icon] for file management, touchscreen calibration, and other options.

STEP 3: Define the machine
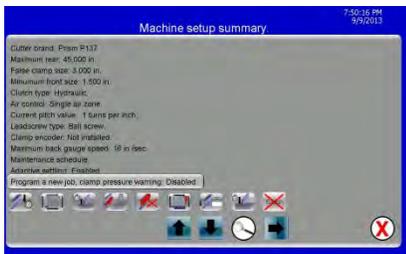
The Machine Definition Screen will appear. Use the [up arrow] **or** [down arrow] to move the bubble over each line.

Tap [steering wheel icon] to select that line to make adjustments.

STEP 4: Name the machine

Position the bubble on the Cutter Brand line. Tap [steering wheel icon].

Move the bubble to the desired cutter.

Tap [green check icon].

If you select a specific cutter the parameters for that machine will transfer to the screen (see the next several steps). **Check these for accuracy and adjust as necessary.**

STEP 5: Define the machine size

Position the bubble over any of the three Machine Size lines. Tap [steering wheel icon]

Use [keypad icon] to enter the machine sizes. Use [up arrow] **or** [down arrow] to move up and down the entry lines. When ALL the sizes are correct tap [green check icon].

The max rear size must be behind the preset value, determined by the location of the Position Sensor.

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STEP 6: Define the clutch type

Position the bubble over the Clutch Type line. Tap ⊘.

Use ⬆ **or** ⬇ to move the bubble over the clutch type on your machine.

Tap ✓.

STEP 7: Define the air control

Position the bubble over the Air Control line. Tap ⊘.

Use ⬆ **or** ⬇ to move the bubble over Single or Dual Air Zone.

Tap ✓.

Dual Zone control implies that you have installed the optional Expansion Board or the B65 System. If you select Single then the output from the H3 drive and the Expansion/B65 board will be the same. Otherwise the H3 will control Zone 1 while Zone 2 is controlled from the Expansion or B65 board.

STEP 8: Define (if possible) the turns of the encoder per inch or cm of movement
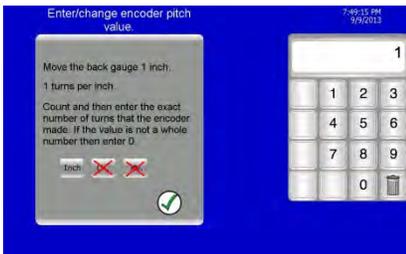
Position the bubble over the Current Pitch Value line. Tap ⊘. Use ⌨ to enter the **exact** number of times the shaft encoder rotates for each inch or cm of gauge movement *(see the NOTE below).* Tap ✓.

NOTE: For many machines the gauge will move an exact number of cm or inches per rotation of the screw. The encoder generally will turn exactly 1 or 2 turns for each rotation of the screw. So it is easy to calculate the turns of the encoder per cm or inch of gauge motion. This is the value that allows the **microcut** computer to count one to one with the back gauge motion. It is imperative that this be accurate to insure high precision. Entering this value directly will eliminate the need to enter exact rear and front reference positions and will lead to a simpler and more accurate Set Up Routine calibration.

If the pitch is not known or it is an uneven number of turns, then enter the value as 0.
You will then be asked to move the gauge to rear and front reference positions later in this routine.

STEP 9: Define the screw type

Position the bubble over the Lead Screw Type line. Tap ⊘.

Use ⬆ **or** ⬇ to move the bubble over the type of lead screw that is on your machine.

Tap ✓.

STEP 10: State if there is a clamp encoder

Position the bubble over the Clamp Encoder line. Tap ⊘.

Use ⬆ **or** ⬇ to move the bubble over the Installed or Not Installed line.

Tap ✓.

The clamp encoder allows paper counting for the **microfacts** MIS system. If you install this it will need to be calibrated – See the section titled "The Clamp and Knife Set Up Screens."

STEP 11: Limit the maximum allowed operator speed input value
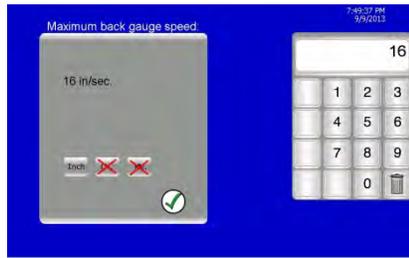
Position the bubble over the Maximum Back Gauge Speed line.

Tap [icon].

Use [icon] to enter the maximum allowed speed for the back gauge *(see the NOTE below).* Tap [icon].

NOTE: While **microcut** allows for very high motor power and speed, there are mechanical limitations that the machine itself presents. Trying to drive the gauge at very high speeds may draw excessive current (hurting the motor) and create other problems such as damaging the machine's transmission components. The **PLUS WS** display has the option of setting an upper speed limit in the Machine Definition Screen at the beginning of the Set Up Routine. In general machines using Acme screws should be limited to 8 inches per second (20 cm per second) while ball screw machines *may* be able to achieve higher speeds. But a word of caution is required here – ball screws can "whip" at high speeds, especially when the gauge is near the limits and there is more unsupported screw to whip. Do not set the maximum speed beyond the machine's abilities. Some machines will start to dynamically bind (as the lead screw pushes on the support bearings at either end of the cutter or on the carriage nuts) before the speeds indicated above.

**STEP 12: Define the maintenance schedule**
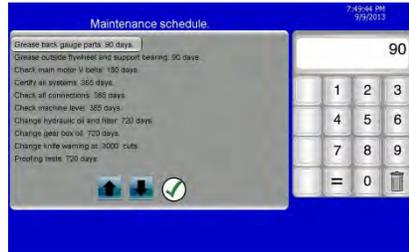
Position the bubble over the Maintenance Schedule line. Tap [icon]. Position the bubble over each line.

Use [icon] to enter the period to allow before the indicated maintenance is required. Refer to the manufacturer's specifications if possible *(see the NOTE below).*

Tap [icon] if you do not wish to track a specific line item.

Tap [icon] to exit when everything is defined.

During operation when maintenance is due a yellow box will appear with the item indicated. If maintenance is bypassed the system will add 10% to the value and wait until that new alarm is reached to warn the operator again.

NOTE: If the manufacturer's schedule is not available then you may wish to use the following values –

➢ Grease back gauge parts: Daily with light oil if Acme screw. 90 days if ball screw.
➢ Grease outside flywheel and support bearing: Twice a year.
➢ Check main motor V belts: Twice a year.
➢ Certify all systems: Annually.[*]
➢ Check all connections: Annually.[*]
➢ Check machine level: Annually.[*]
➢ Change hydraulic oil and filter: After first 6 months and every two years thereafter.
➢ Change gearbox oil: After first 6 months and every two years thereafter.
➢ Change knife: 2500 cuts on single pull machines. 5000 cuts on two arm pull.
  o For high speed steel knives.
  o Carbide knives will last longer unless chipped – not recommended for recycled stock.
➢ Proofing tests: Every 6 months.[**]

[*] To be performed by a qualified trained technician.

[**] These tests may require modification to the machine to perform. They are done to insure any redundant control is operating properly. On the B65 control board built in software allows this testing to be done easily and quickly without any modifications, tools, or training. Refer to the B65 Installation and Reference Manual if you have installed a B65 full paper cutter control with your **PLUS WS**. For other systems contact a trained professional. The 6 month time period is based upon European and British standards. Consult local requirements to the time frame you select.

STEP 13: Define the auto correction operation

Position the bubble over the Adaptive Settling line. Tap .

Tap to allow adaptive settling.   Tap to disable this option.

If **ON**, then if the gauge oscillates around the target (a phenomenon known as dither) the tolerances will open slightly to compensate and allow the motor and brake to stabilize. The original tolerances will be reloaded at the next drive command. If **OFF**, then the gauge will continue to oscillate until the brake holds within the tolerances specified.

NOTE: If oscillation (dither) is a problem you may need a smaller pulley on the motor or a larger pulley on the lead screw.

STEP 14: Decide if the operator needs a reminder to set the clamp pressure

Position the bubble over the Program a New Job Clamp Pressure Warning line. Tap .
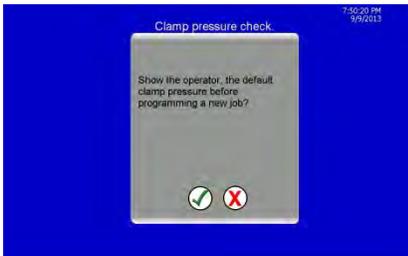
Tap to show the warning each time a new job is started.

Tap to skip the message. *This only matters if you have a proportional control valve on the clamp hydraulics to allow pressures to be programmed from the display. An astute operator may not require the warning. Others may find it beneficial.*

STEP 15: Decide which target types will be available

Target types line – Tap on any target type to place an **X** over the box or not. Refer to the section titled "Target Options" for details.

Certain target types will not work on all machines. Refer to the section titled "Target Options" earlier in this

document for details of what each target type is. Enable or disable as appropriate. Tap to continue on from the Machine Definition Screen.

STEP 16: Define the motor drive direction

This step checks the motor drive direction.

Press **(Reverse)** or **(Forward)** icon and watch the gauge.

Once it moves far enough, and will appear.

Tap if the drive direction was correct **or** tap if it was wrong. Depending upon your answer and the encoder counting direction (seen by the computer) you may be directed to repeat this direction test.

STEP 17: Find the Position Sense to allow calibration

If everything is correct then will appear. Tap to start the calibration drive.
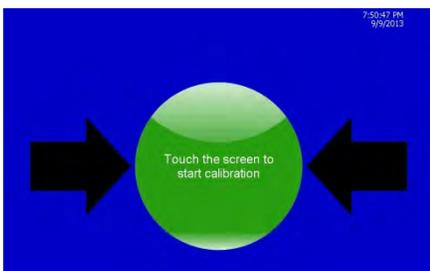
A will appear on the screen and the back gauge will drive to the back to calibrate.

Tap **only for an emergency stop.**

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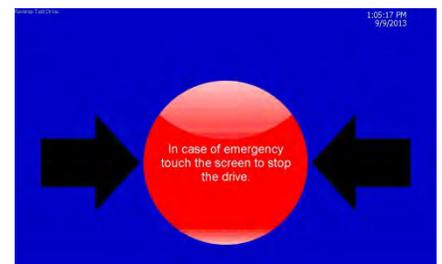
STEP 18: If the encoder pitch was entered (see STEP 8 – it was not 0):
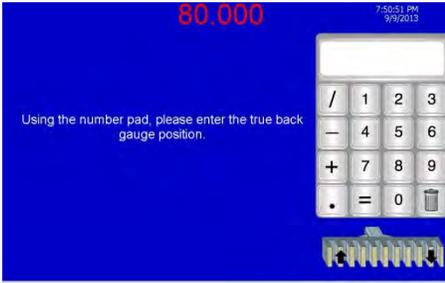
Carefully move the gauge to a known value.

Use ⬆ **or** ⬇ **or** your hand wheel to position the gauge. Use a tape measure to verify.   **BE ACCURATE!!!**

Use ▦ and ▭ to enter this value.

If the computer calculates an error in the calibration value (table sizes) you will be advised on adjustments to make. Otherwise, proceed to Step 19.

OR…STEP 18: If the encoder pitch was not entered (see STEP 8 – it was 0):
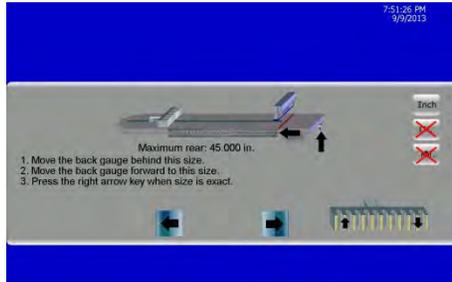
Carefully move the gauge to the **Maximum rear** position you entered earlier as requested on the screen.

Use ⬆ **or** ⬇ **or** your hand wheel to position the gauge. Use a tape measure to verify.   **BE ACCURATE!!!**

Tap ➡ when the gauge is in position.

The system will verify that the gauge is behind the preset value (located at the first shaft encoder zero index behind the Position Sense). If this is not the case an error message will appear. The maximum rear must be behind the preset value but not more than 20 encoder turns behind. If you have not made a measurement error or if you can not move all the way back to the maximum rear then tap ⬅ to back up to the Machine Configuration Screen to enter the correct maximum rear value (see STEP 5). Adjust the location of the Position Sensor if necessary.

STEP 18 continued if the encoder pitch was not entered (see STEP 8 – it was 0):
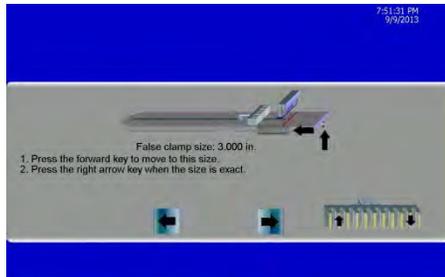
Move the gauge to the **False clamp** position you entered earlier as requested on the screen. Use ⬆ **or** ⬇ **or** your hand wheel to position the gauge.
Use a tape measure to verify.   **BE ACCURATE!!!**

Tap ➡ when the gauge is in position.

NOTE: The numbers in the display will correspond with the numbers you entered in STEP 5. The numbers above (45.000 and 3.000) are shown here for demonstration purposes only.

STEP 19:

Tap ⬤ for a normal start up.
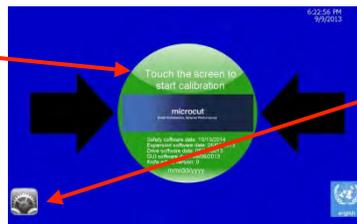
OR…Tap ⚙ to enter the Set Up Routine.

OR…Tap 🇺🇳 to change the language.

Tap ⬤ to start. After calibration, move the gauge cautiously, making sure it is correctly calibrated and the machine sizes do not allow the gauge to crash into either end of the cutter.

Note: If a small adjustment in the size is desired, tap ▱ *and select **Calibrate Gauge**.*

THE CLAMP AND KNIFE SET UP SCREENS

The **COLOR WS** and **PLUS WS** display contains routines for special options for various machine operations and monitoring. Special hardware is required for some of these. Your machine may not be capable of everything that follows. Set up the operations of what is appropriate for you cutter via the following routine:

STEP 1:

Tap [gear icon] to enter the Set Up Screen.
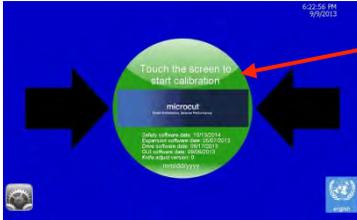
OR…Tap [icon] for a normal start up. Set Up will be forced if it has not been done

OR…Tap [icon] to change the language.

STEP 2:

Tap [icon] to make adjustments to the CLAMP and KNIFE options.
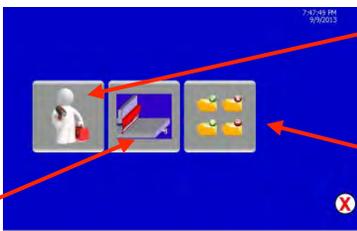
OR…Tap [icon] to enter the Machine Set Up Routine.

OR…Tap [icon] for file management, touchscreen calibration, and other options.

STEP 3:

The Knife and Clamp Set Up Screen will appear. Use the [up arrow] **or** [down arrow] to move the bubble over each line. Tap [clock icon] to select that line to make adjustments.

Special equipment may be required for some of the features in the table – see below.

Clamp Pressure Set Up	Select this to create a voltage output table based on % clamp pressure. This requires that you have a proportional controlled clamp valve to adjust the clamp pressure and either the Expansion or B65 board for interface.
Clamp Encoder Set Up	Select this to allow the computer to calibrate the clamp encoder to the clamp opening, with and without the clamp shoe installed. This requires the B65 full paper cutter control system and a linear encoder attached to the clamp.
In Line Operation	Enable to keep Auto Cycling active from one lift to the next for auto loading and unloading systems. This requires the B65 full paper cutter control system.
Manual Hand Crank Knife	Select this to lock on the knife clutch on for adjustment or manual movement. This requires the B65 full paper cutter control system.
Auto Waste Removal Set Up	Select this to test operations, define the push out distance (to push stock from the cutting stick), and to open, close, raise, or lower the front moveable table. This requires the cutter to have a moveable front table and interface circuitry to control it as well as the B65 full paper cutter control system.
Auto Knife Set Installation	This is used for machines that include motors and sensors on the knife linkage to adjust the knife height. This requires the B65 full paper cutter control system. Follow the on screen instructions to verify motor directions, sensor operations, and calibration.
Proofing Tests	This is used to test hydraulic valves and other components on the machine that are not testing during normal operation. This requires the B65 full paper cutter control system. No special tools are required. Refer to pages in the B65 Paper Cutter Control Installation Guide and Reference Manual for details.

THE UTILITIES SCREEN

The **COLOR WS** and **PLUS WS** display contains routines for file set up and management. Define and control operations as appropriate for you cutter via the following routine:

STEP 1:

OR…Tap for a normal start up. Set Up will be forced if it has not been done already.

Tap *to enter the Set Up Screen.*

OR…Tap to change the language.

STEP 2:

OR…Tap to enter the Machine Set Up

OR…Tap to make adjustments to the CLAMP and KNIFE options.

Tap *for file management, touchscreen calibration, and other options.*
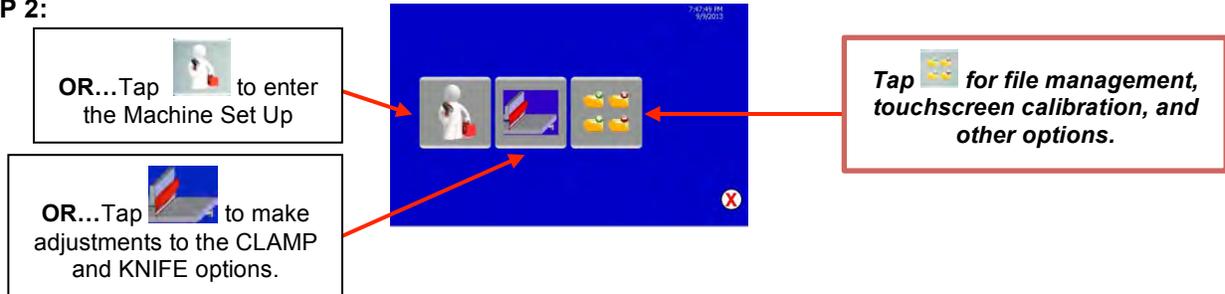
STEP 3:
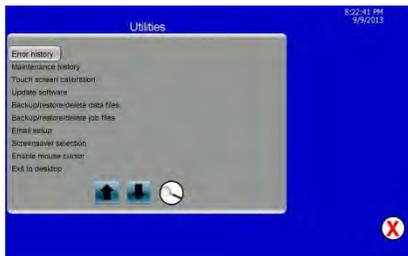
The Utilities Screen will appear. Use the **or** to move the bubble over each line.

Tap to select that line for additional information or to make adjustments.

Refer to the table below.

Error History	Select this to review all fatal errors that have occurred – dates of errors are included.
Maintenance History	Select this to review the dates of all maintenance that has been completed.
Touchscreen Calibration	Select this for a 25 point touchscreen calibration. Follow the instructions on the screen. The visual screen is a bit behind the touchscreen. The ideal calibration for a tall operator may be different than a short operator.
Update Software	Software versions before August 2013 update by placing a USB stick with the new software into the slot after power on and by then pressing the *REVIEW* icon. Newer software requires you enter this routine and follow the instructions as they appear on the screen.
Backup/restore/delete Job Files	Use this routine to manage programmed jobs.
E-mail Set Up	Use this to define e-mail addresses for **microfacts** reports. See the section titled "**microfacts**" for more details.
Screensaver Selection	Use this to select from a number of screen saver options.
Enable Mouse Cursor	If there is ever a problem with the touchscreen you can enable a USB mouse. Connect the mouse to the USB slot before turning power on. At the Green Dot Start Up screen drag the mouse to the far right (this will be blind – the point is to avoid activating the green dot) and press the right mouse button. You can also turn the mouse on at this screen in case you want to go to the desktop for other purposes (see next line).
Exit to Desktop	This will allow you to exit to the Windows CE desktop for special purposes.
Bar Code Reader Set Up	Use this to define a bar code reader to allow direct call up of remotely programmed jobs via a bar code on the job ticket or printed item.
Remote Job Programming	Enter this to get details on the requirements for programming a job off site.

ERROR MESSAGES

The control system is constantly checking to make sure that everything is correct during operation. If anything appears to be wrong, a message will appear on the screen. These can be of three different types—

1. Conditional, just indicating operations as they progress.
2. Minor, where pressing any key will clear the screen and resume normal operation.
3. Major, where the power will have to be turned off and back on again, or repairs may be necessary.

NOTE: Software changes occur that may add or remove messages. Changes in the listing may occur. Error descriptions occur in the display to explain each one independently of the following.

Prompts generated by the display:

Entered value is too small!!!   Check keyed in value to move to
This value cannot be zero!!   Cannot divide by 0
Cut stroke early!!   Wait longer before cutting
Job number already used!   Choose a different number
Job number not found!!   Try another number
Target is out of table range!!   Trying to go too far back or forward
Error in leadscrew values!   Inch, cm mm, sun pitches disagree, setup will be forced
Error in machine sizes!!   Machine sizes are incorrect, setup will be forced

Refer to the following pages for more messages.

STATUS INDICATORS FROM THE H3 DRIVE COMPUTER

The computers track all operations of the machine and send reports to the display constantly. Individual sensors are also monitored and displayed near the top of the screen. LEDs on the H3 Drive PCB allow you to perform additional evaluations. The following table lists error numbers sent from the H3 to the display and their corresponding messages. The first number is in standard form (Base 10). The number in parenthesis is in hexadecimal form (Base 16—for computer counting). JR and BASIC units display the hexadecimal form of the number as well as the message. The PLUS WS unit shows the message followed by the standard (base 10) number.

Status	Drive computer conditions
00	Steady state, no errors
04	In preset drive routine
06	In factory reverse drive test
10 (0A)	In knife change mode (special software required)
15 (0F)	In calibrate gauge routine (momentary flash only)
96 (60)	Waiting for RAM download at power on
97 (61)	Waiting for preset drive (or factory test drive) at power on
98 (62)	AC power check (unused remnant of H1 drive)
99 (63)	In factory forward drive test
100 (64)	In knife change routine stage 2 (special software required)
128 (80)	Target lost
129 (81)	No motion seen (fatal error forced in preset or set up)
130 (82)	Data download time out error
131 (83)	Data download last byte not equal to #5Ah
132 (84)	Data download RB8 not set on last byte
133 (85)	Data download RB8 set before last byte
134 (86)	Data download version of 83h but with RB8 set
135 (87)	Too many over current errors during drive. The speed has been limited. Oil the screw.
138 (8A)	The heat sink on the drive box is too hot to continue driving.
139 (8B)	The back gauge drive motor is too hot to continue driving.
181 (B5)	No motion at preset forward drive
182 (B6)	Position sense error
183 (B7)	No motion at preset reverse drive
184 (B8)	Zero set missing after position sense
185 (B9)	Reverse drive is forward
186 (BA)	No motion at start up reverse test
187 (BB)	Impaired drive at reverse test, lube
188 (BC)	Forward drive is reverse
189 (BD)	No motion at start up forward test
190 (BE)	Impaired drive at forward test, lube
191 (BF)	Duplicated data on last zero set position value lost
192 (C0)	Too many counts without a zero set
193 (C1)	UART time out error—too long without communication from the display

NOTE: A 135, 138, or 139 error may occur if the machine needs to lubricated or the back gauge speed is set too high. If lubrication is not performed or the speed reduced, another error is likely to occur. On European machines with acme screws generally 6 to 8 inches per second (15 to 20 cm per second) is a maximum speed. Anything beyond that will bind the screw and the bearings and result in higher energy use without increased speed.

THE H3 BOARD

Revision 1 H3 boards:

PIN 1 ON EACH TERMINAL IS THE SQUARE PAD

See next pages for details on the LEDs and connectors.

Revision 2 H3 boards:
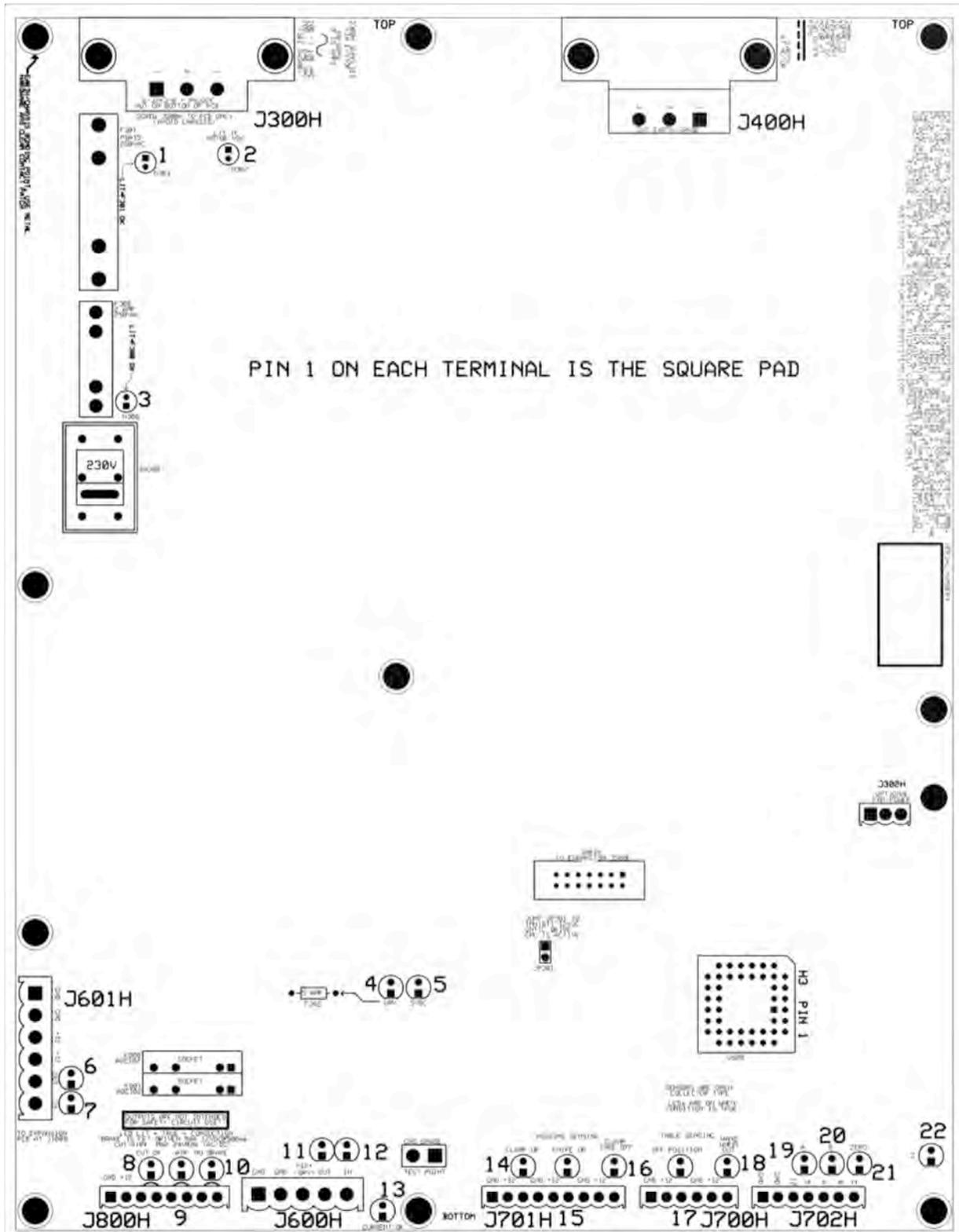
See next pages for details on the LEDs and connectors.

H3 LEDS

Statement is true when led is lit.

Yellow box = inputs

Red box = outputs

Green box = status

Blue box = serial comms
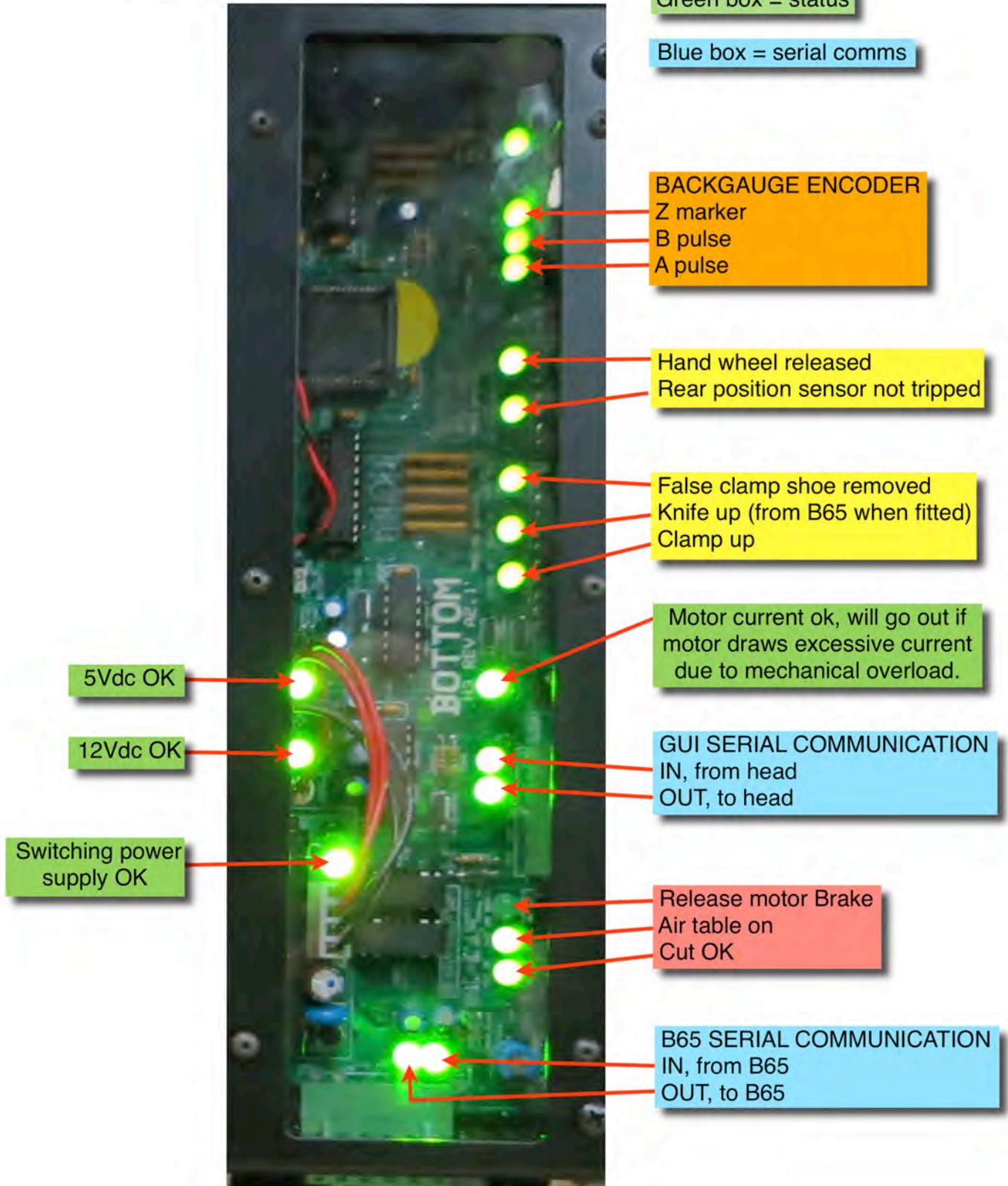
BACKGAUGE ENCODER
Z marker
B pulse
A pulse

Hand wheel released
Rear position sensor not tripped

False clamp shoe removed
Knife up (from B65 when fitted)
Clamp up

5Vdc OK

12Vdc OK

Switching power supply OK

Motor current ok, will go out if motor draws excessive current due to mechanical overload.

GUI SERIAL COMMUNICATION
IN, from head
OUT, to head

Release motor Brake
Air table on
Cut OK

B65 SERIAL COMMUNICATION
IN, from B65
OUT, to B65

The following table defines the purpose of each LED. Refer to the connector table and cabling diagrams as well.

Number	Definition when ON
1	Revision 1: Fuse 301 is OK (20 amp slow blow) Revision 2: Not used
2	Revision 1: Full wave bridge (FWB301) is OK Revision 2: Fuse 300 (20 amp slow blow or circuit breaker) and FWB351 OK (lights slowly at power on)
3	Revision 1: Fuse 300 is OK (2 amp quick blow) Revision 2: Not used
4	Revision 1: Voltage from TRAN302, FWB306, and F302 (5 amp) is OK Revision 2: Fuse 301 (5 amp solder type) and 12VDC switching power supply are OK
5	+5 VDC from U307 is OK
6	UART send from H3 drive computer to Expansion computer is operating
7	UART send from Expansion computer to H3 drive computer is operating
8	The cut operation is being enabled
9	The air table is active
10	The brake is being energized to the not braking state
11	UART send from the H3 drive computer to the display is operating
12	UART send from the display to the H3 drive computer is operating
13	The current through the back gauge drive motor is not excessive
14	The clamp is in the full up position
15	The knife is in the full up position—not active on this PCB, see B65 control PCB
16	The clamp shoe is in its holder rather than attached to the clamp (full forward drive is allowed)
17	The back gauge is in front of the rear position sensor
18	The hand wheel to manually position the back gauge is not pressed in
19	The "A" quadrature signal from the shaft encoder is active
20	The "B" quadrature signal from the shaft encoder is active
21	Flips each time the zero signal is received from the shaft encoder
22	The "ZERO SET" signal from the shaft encoder is active

NOTE: Revisions occur. LED functions and locations may vary. Terminal plugs and features may be added. Refer to labels on the PC Board to verify options and functions.

H3 TERMINAL CONNECTION TABLE

The following table explains the function of the various connectors as well as the individual connections of each. Notes are included as appropriate. The cable diagrams elsewhere may also be beneficial.

Terminal	Pin	Purpose
J300H	1, 2, 3	AC power into the H3 drive—check SW300 for voltage range, center pin is earth (chassis)
J400H	1, 2, 3	Cable for back gauge drive motor, center pin is earth (chassis), also see J800H
J570H	1, 2, 3	Drive motor thermal couple connection to monitor heat and allow shut downs if > 85C
J601H	1	Computer ground to connect to B65 control PCB
	2	Spare ground connection
	3	Computer +12 VDC to connect to B65 control PCB
	4	Spare +12 VDC connection
	5	UART signal from H3 drive computer to Expansion computer
	6	UART signal from Expansion computer to H3 drive computer
J800H	1	Ground for external relay coil connections (see Auxiliary Controls later in this manual)
	2	+12 VDC for external relay coil connections (see Auxiliary Controls later in this manual)
	3	Normally open contact for cut enable control—not used
	4	Normally open contact for cut enable control—not used
	5	Normally open contact for air enable control—see B65 connector J400B
	6	Normally open contact for air enable control—see B65 connector J400B
	7	Ground path to energize the back gauge motor brake
	8	+12 VDC to energize the back gauge motor brake
J600H	1	Spare computer ground for the display power (possible shield connection)
	2	Computer ground for the display power
	3	Unregulated voltage (see LED 4 in previous table) for display power
	4	UART signal from H3 drive computer to display computer
	5	UART signal from display computer to H3 drive computer
J701H	1	Computer ground for the sensor power
	2	+12 VDC for the sensor power
	3	Ground connection from clamp sensor when clamp is full up
	4	Computer ground for the sensor power—not used
	5	+12 VDC for the sensor power—not used
	6	Ground connection from knife sensor when knife is full up—not used
	7	Computer ground for the sensor power
	8	+12 VDC for the sensor power
	9	Ground connection from clamp shoe sensor when clamp shoe is in its holder (not on the clamp)
J700H	1	Computer ground for the sensor power
	2	+12 VDC for the sensor power
	3	Ground connection from position sensor when the back gauge is in front of the sensor
	4	Computer ground for the sensor power
	5	+12 VDC for the sensor power
	6	Ground connection from hand wheel sensor when the hand wheel is released
J702H	1	Computer ground for the encoder shield (optional)
	2	Computer ground for the encoder power
	3	+12 VDC for the encoder power
	4	+5 VDC for the encoder power
	5	"A" quadrature signal from the encoder (driven +12, driven +5, or open collector to ground OK)
	6	"B" quadrature signal from the encoder (driven +12, driven +5, or open collector to ground OK)
	7	"ZERO SET" signal from the encoder (driven +12, driven +5, or open collector to ground OK)

PLUS WS COMPONENT MAP

Microcut interface card

Serial Coms & power From H3 drive box

GUI Celeron CPU card

Coms connection between interface & CPU cards

USB connection

TFT display connection plug

USB front panel socket

Display back light connection

Power connection between interface & inverter cards

Touch screen connection cable

5v & 12v feed to CPU card

High voltage inverter card for back light

2 Ethernet sockets for network etc

Touch screen interface card

Touch screen card to CPU card connection

DIP Switch settings closeup

Display, Touch interface & USB plug closeup
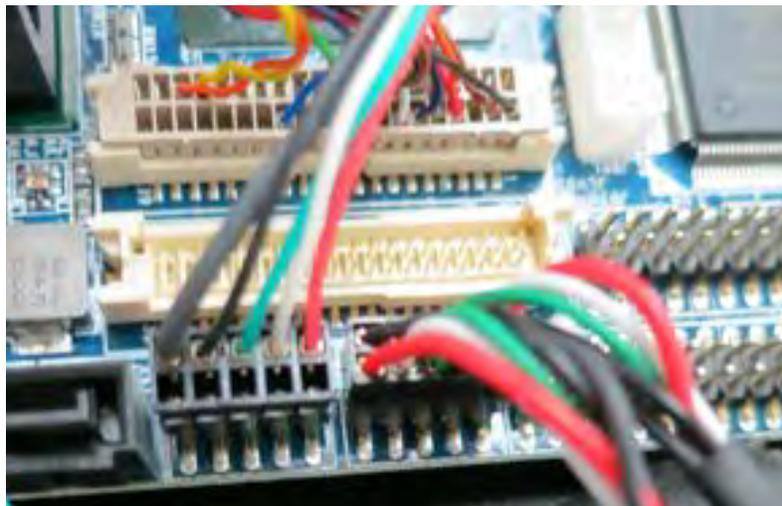
INSTALLATION BASICS FOR THE BACK GAUGE CONTROL SYSTEM

The **microcut** installation is basically mechanical. It involves mounting the display console; the H-drive box; the DC motor to drive the back gauge; the shaft encoder to signal back gauge movement to the computer; and four sensing switches to inform the computer of the machine status (clamp, knife, clamp shoe, and position). All voltage cables are plug-in type. There is an optional input for a hand wheel sense as well as outputs for air table control and cut disable.

The following text gives a conceptual approach toward the installation. Use this manual to learn what each component must do. Mount each component in the fashion best suited to fulfill its purpose.

microcut is a retrofit system so every installation is unique. Install the components for function as well as fit. The brackets are designed with extra holes and slots. They are easily modified, and can be adapted for almost any requirement. Installation variables include the encoder sprockets and motor pulley (Schneider cutters have a flat belt drive). If the lead screw diameter is known at the time of shipment, the lead screw sprocket will be bored to the proper dimension. Otherwise, it may be necessary to have the sprocket bored to size. Check the sprocket before beginning the installation. If it must be bored, take care of this NOW to avoid unnecessary delays later. Cut the sprocket in half to allow easier installation.

Every display console is identical regardless of machine type. A setup routine is resident in the computer to allow simple adaptation to any machine. This routine *must* be completed on every installation in order for **microcut** to know the machine it is installed on and to operate safely and correctly.

Hints—
1. Inspect the machine to insure all operations are correct BEFORE beginning the installation. Fix problems now, not later.
2. The boxes are packed to facilitate the installation. The installation will be easier if the parts are not mixed up. **Box 1** contains the back gauge drive motor. **Box 2** contains the motor drive, encoder, sensors, and various brackets. **Box 3** contains the encoder sprockets, display, mounting bracket, and manual.
3. Lay out the entire installation before beginning, taking care to make sure that there are no interferences, that the cables are long enough, and that there are safe routes to run the cables
4. Use the thinnest drive belt possible to minimize belt flex around the pulley. Use only one belt per pulley. Multiple belts on any pulley will cause slower settling. The H-drive servo control unit works best when the belt is fairly tight.
5. Do not over-tighten the back gauge. If there are nylon gliders supporting the back gauge keep them *loose* to minimize lead screw flex.
6. Use the demonstration mode to allow the operator to learn the system while you are doing the installation. To do this, plug in the cable between the display and the H3 drive box. Remove the communication wire from the H3 to the display (J600H pin 4—see H3 Terminal Connections later in this manual). Wire the H-Drive to line power. Without communications from the H3 drive the display will force demonstration mode when power is supplied.

NOTE: If you are installing an Expansion PCB, refer to the Expansion PCB section at the end of this document.

SYSTEM OVERVIEW
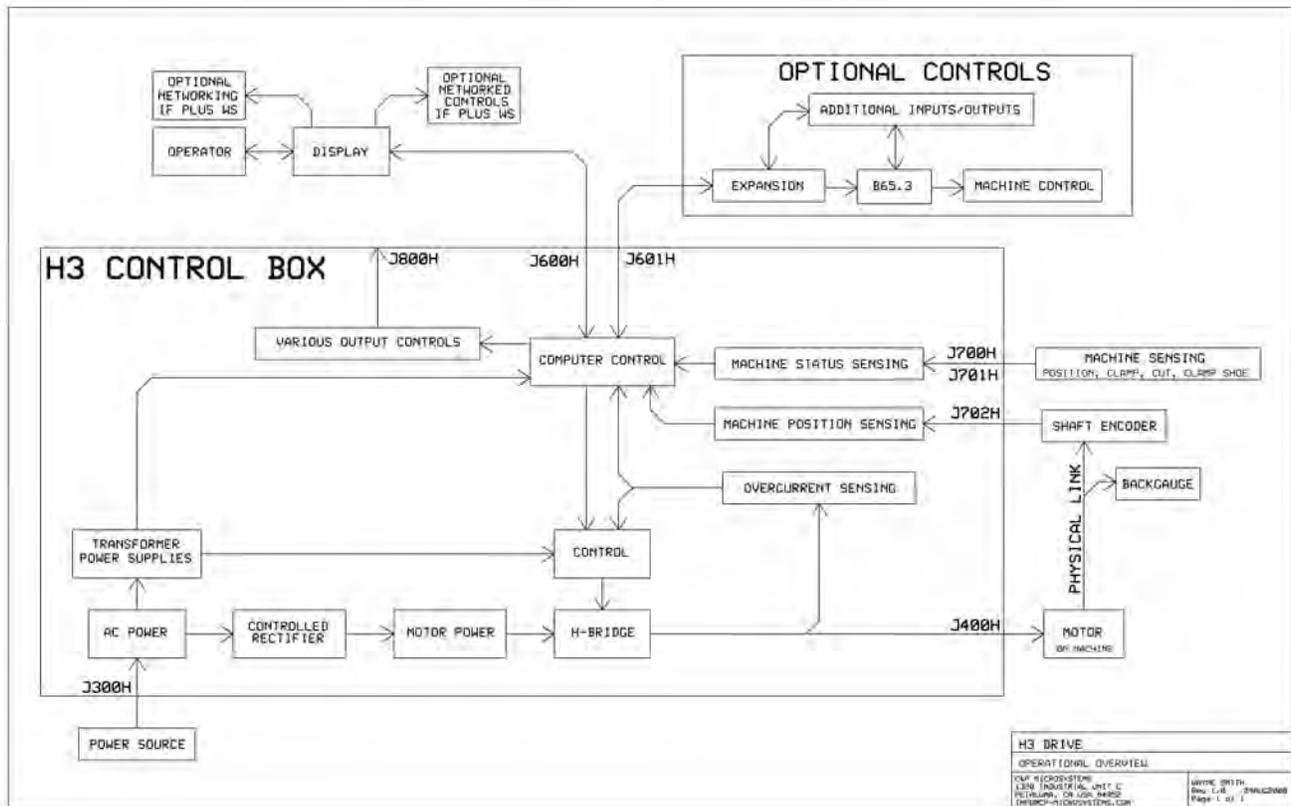
Depending upon the customer's needs the **microcut** installation may include several options:

➤ Auxiliary outputs can be connected for air table and cut disable controls.
➤ When installing a PLUS WS display, an Expansion PCB can be added for side loading, additional I/O, and programmable clamp pressure control – Refer to the connection inputs in information earlier in this Owner's Manual for details on wiring the Expansion board.
➤ A full B65 clamp/cut control circuit can be added – Refer to the B65 Installation Manual for details on installing this full control system.
➤ The display can be supplied in retrofit or OEM panel configuration as well (see the photo on the cover).

Please feel free to contact your dealer, representative, or C&P Microsystems directly for more information.

Notes:

BASIC LAYOUT
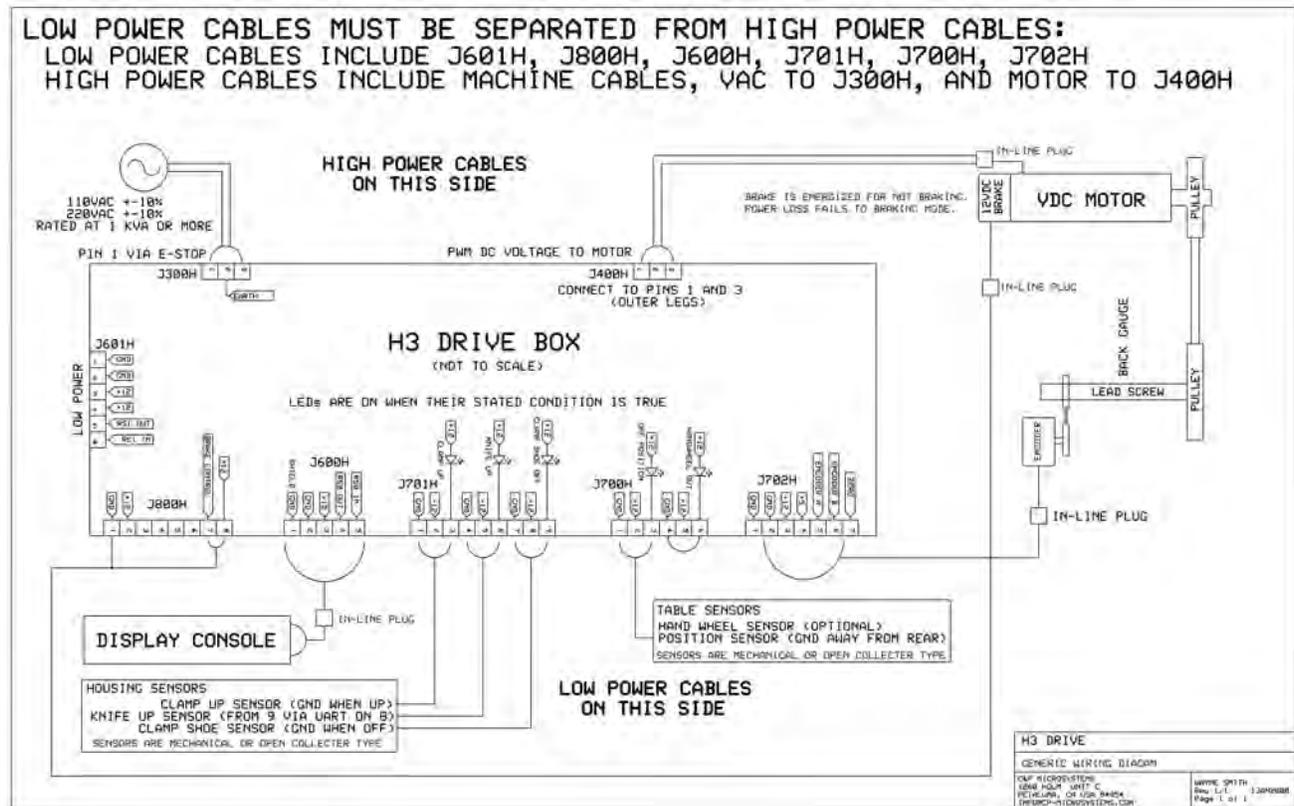
The H3 drive box acts as a junction for all of the parts you will be installing. Mount it in a central location where the various cables can be safely routed. The methods you use to mount each item will depend upon the machine, the additional systems you may require, the physical environment, and the operator's preferences.

The power and main motor cables should be run away from the other cables (the other cables should avoid high power wiring).

Notes:

OPTIONAL AUXILIARY CONTROLS

Auxiliary control outputs may be desired dependent upon the machine and the operator's requirements. These may include air table control or cut disable (to prevent knife operation while the gauge is in motion). There are several options for interfacing these controls. Please note:

1. The above control outputs do not conform to and are not intended to be used as safety devices. All outside circuits must have the integrity to operate on their own.
2. A spike suppressor must exist across the added relay coil to prevent damage to the H-Drive console relay drivers. For DC coils a snubber diode should be added (1N4002 or better). The striped end of the diode goes towards the + side of the relay coil. For AC coils an appropriate RC circuit should be added (100 to 150 ohms with a several uF cap). Failure to install or incorrect installation of a spike suppressor will cause failure of the reed relay (K800 or K801) and subsequent failure in the branch control circuit.
3. Until power on is recognized from the display the power up mode will be forced wherein the air table and cut disable are off. The cut disable is off to allow circuit verification during the start up procedures.

Additional controls can also be added. Refer to Optional Expansion section later in this manual.

Notes:

SAMPLE INSTALLATION DIAGRAM

SAMPLE INSTALLATION DIAGRAM
ACTUAL MOUNTING LOCATIONS MAY VARY

Part locations are for reference purposes only. Every installation will be unique. Mount components for function and form, not necessarily to mimic this diagram.

On some paper cutters, it is not always possible to find space to mount a second motor. It may be necessary to remove the original motor and install the **microcut** motor in the original equipment space. If this is the case, completely insulate any bare wires, label all wires, and pack all mounting hardware with the original motor to facilitate reinstallation of the motor in the event **microcut** is moved to another machine at a later date. The installer should document how the original motor should be refitted. Some machines interlock with the drive motor. The knife and clamp will not operate if the motor is removed. In this case mount the motor on a cross leg or other convenient location and make sure if the pulley turns it is properly guarded.

Notes:

RECOMMENDED TOOL LIST

You may want to adapt this list. Substitute metric drills and taps if you wish to supply your own hardware. The procedures are listed in their order of execution, as well as the tools required to proceed. An installation will be faster if all tasks in a given section are completed before starting the next. If possible, lay out all of the components on the table to help visualize the entire installation.

DETERMINE ALL DRILLING LOCATIONS—Mark all holes that will be drilled to complete mounting of ALL components, including holes to secure tie strap brackets, at the same time.
- Slide T square with level
- Pencil
- Punch

DRILL ALL HOLES—Protect the machine from drill shavings, then drill all holes necessary to mount all components. Use the pilot drill for all holes before increasing drill size to save time. Be careful not to drill any hole too large as the drill size is increased.
- Paper and rags to cover machine surfaces
- Pilot, #7, 5/16" high speed drill bits
- Electric hand drill
- Extension cord

TAP ALL HOLES—Complete all threads for all of the components.
- 6-32, 1/4-20, 3/8-16 taps
- Tap handle (ratchet type is convenient)
- Tapping fluid

CLEAN THE MACHINE—Clean the machine to prevent future damage.
- Brush
- Rags
- Magnet

BOLT AND SECURE ALL PARTS TO THE MACHINE—
- 7/16, ½, 9/16 inch wrenches and sockets
- Phillips screw driver
- Hacksaw and file to saw off excess threaded rod and modify guards

ROUTE THE CABLES—Wire all components. Use tie straps to secure the wiring.
- Side cut pliers
- Wire strippers
- Screwdrivers

THE MECHANICAL INSTALLATION

Display Console – The display console is the operator's interface with the system.

1. The display console should mount on the front of the cutter near the operator. The display rod can mount to the left or the right. This is secured by the Panavise mounting bracket.
2. Mount this bracket to the machine based upon operator preference.

NOTE: The retrofit display is supplied in a small plastic console to facilitate large variations in the mounting. C&P Microsystems does offer an OEM panel for some cutters at an additional cost. Please feel free to contact your dealer, representative, or C&P Microsystems directly for more information.

Shaft Encoder – The shaft encoder sends pulses to the drive to indicate back gauge position.

1. Use the shaft encoder mounting brackets supplied to mount the shaft encoder near the lead screw.
2. Install a sprocket on the encoder shaft that will allow it to turn at least two, but not more than four turns for one inch (25 mm) of back gauge movement.
3. Clamp the sprocket to the lead screw with the hose clamp so that it aligns with the encoder sprocket. Depending upon the machine, the sprocket may need to be bored, or cut in half. It is easier to assure that the sprocket faces align if the chain is wrapped around the sprocket while the hose clamp is tightened. Insure the clamp does not interfere with the chain.
4. Install the chain on the sprockets, making sure both sprocket faces are aligned. Adjust the chain tension so that it is snug but not too tight. The chain can be split and snapped back together to allow for any required length.

Rear mounting option
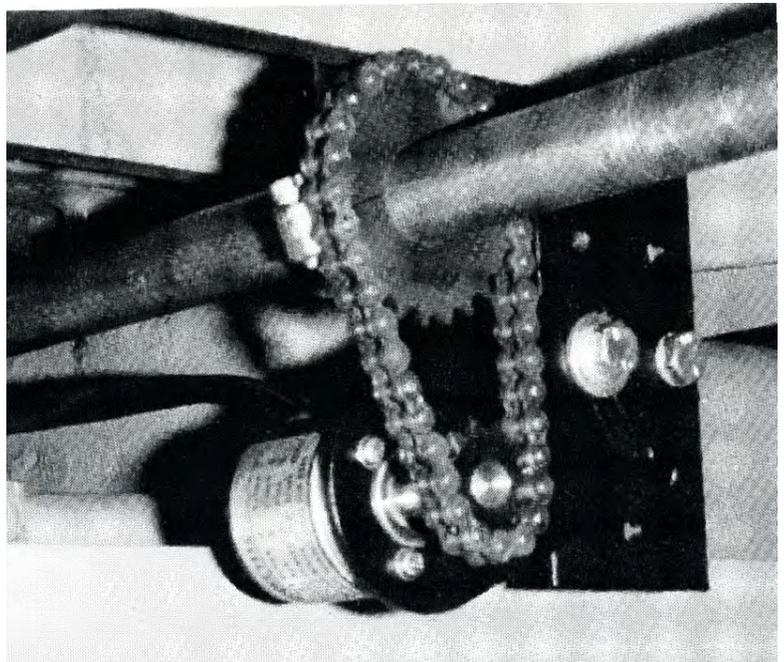
Front mounting option

PROXIMITY SENSORS

The sensors allow the system to know what the cutter is doing. Each sensor cable is labeled and must be installed according to its designation. The open collector type sensors are interchangeable, each containing a normally open and a normally closed contact (selected by the wiring method at the PCB connector). Use any combination of brackets and hardware to install each sensor securely to the machine according to the following criteria:

NOTE: The electrical purpose of each sensor is supplied in case the sensor is replaced with a different type of a switch. Refer to the labeling at the drive console for voltages and sensor inputs. Wiring can be cut to length as required. The optional hand wheel sense supplies ground to allow gauge drive. This is jumpered when not used. The cable wiring colors are blue = ground, brown = +, black = normally open, and white = normally closed.

Position Sensor – supplies ground when the gauge is not near the rear of the table.

1. Move the back gauge to its rearmost position.
2. Mount the position sense so that it will be tripped by the gauge one or two inches (25 to 50 mm) before the back gauge reaches the maximum mechanical rear position.
3. Do not mount the position sensor so far forward that the back gauge may move behind it and allow the sensor to become "untripped" as the gauge is moved to the extreme rear.
4. Do not mount the rear position sensor more than ten full encoder revolutions from the mechanical rear of the cutter.
5. Use the supplied trip plate if the cutter is heavily painted or if the surface to be sensed is not flat.

Above table   **Below table**

Clamp Up Sensor – supplies ground when the clamp is full up.

1. Mount this sensor so that it is tripped only when the clamp is in its full up position. Horizontal mounting of the sensor barrel prevents complications that can arise due to hydraulic sag.
2. Use the supplied trip plate if the cutter is heavily painted or if the surface to be sensed is not flat.
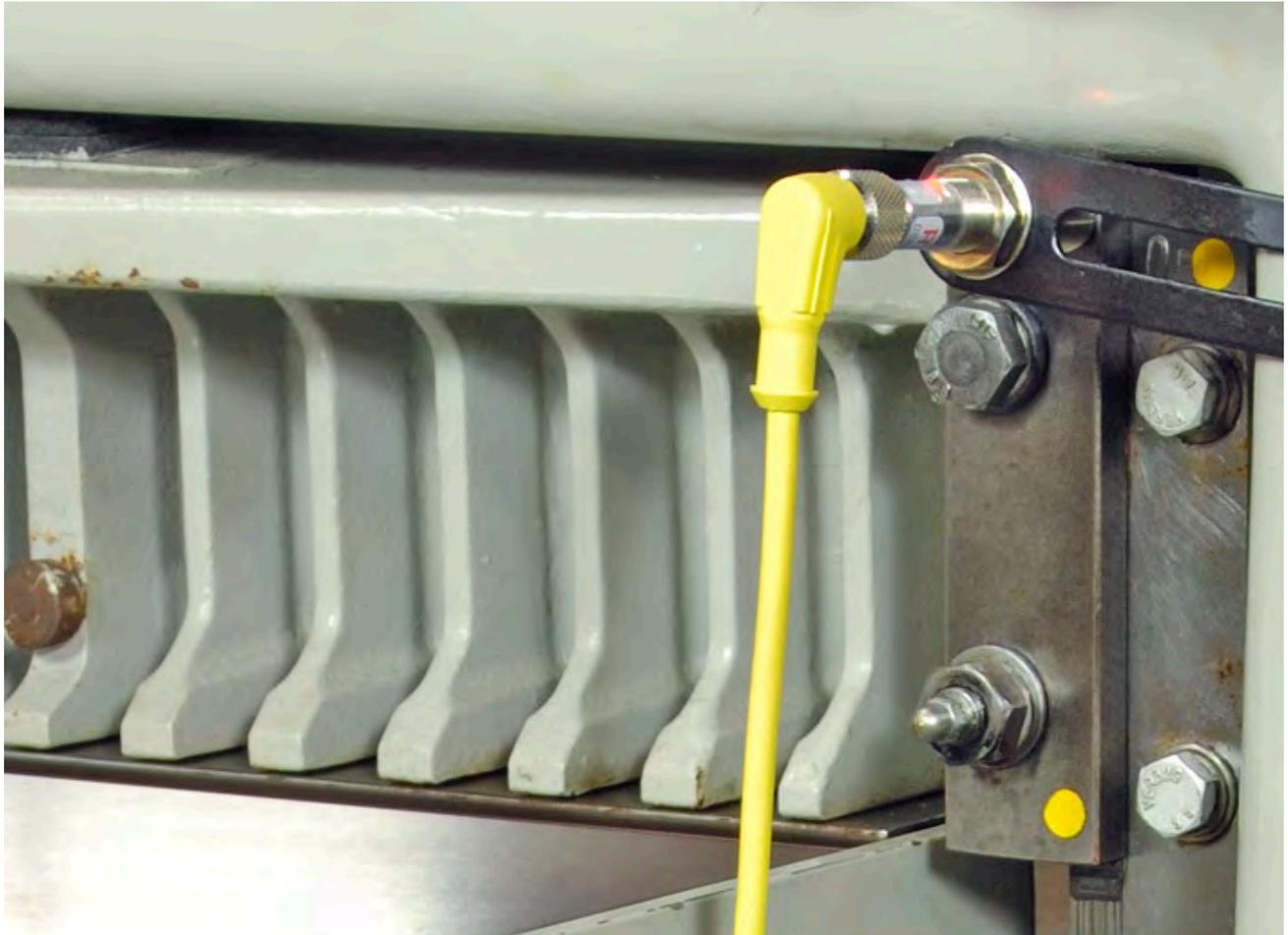
Cut Sensor – supplies ground when the knife is up.

1. Mount this sensor to the side of the opening in front of the knife bar so that it is tripped near the bottom of the knife stroke.
2. This sensor must be tripped for at least 1/4 second during the knife cycle to register a cut.
3. This sensor must only be tripped once per knife stroke. Beware the double-tripping effect that holes, lips, and bolt heads can cause.
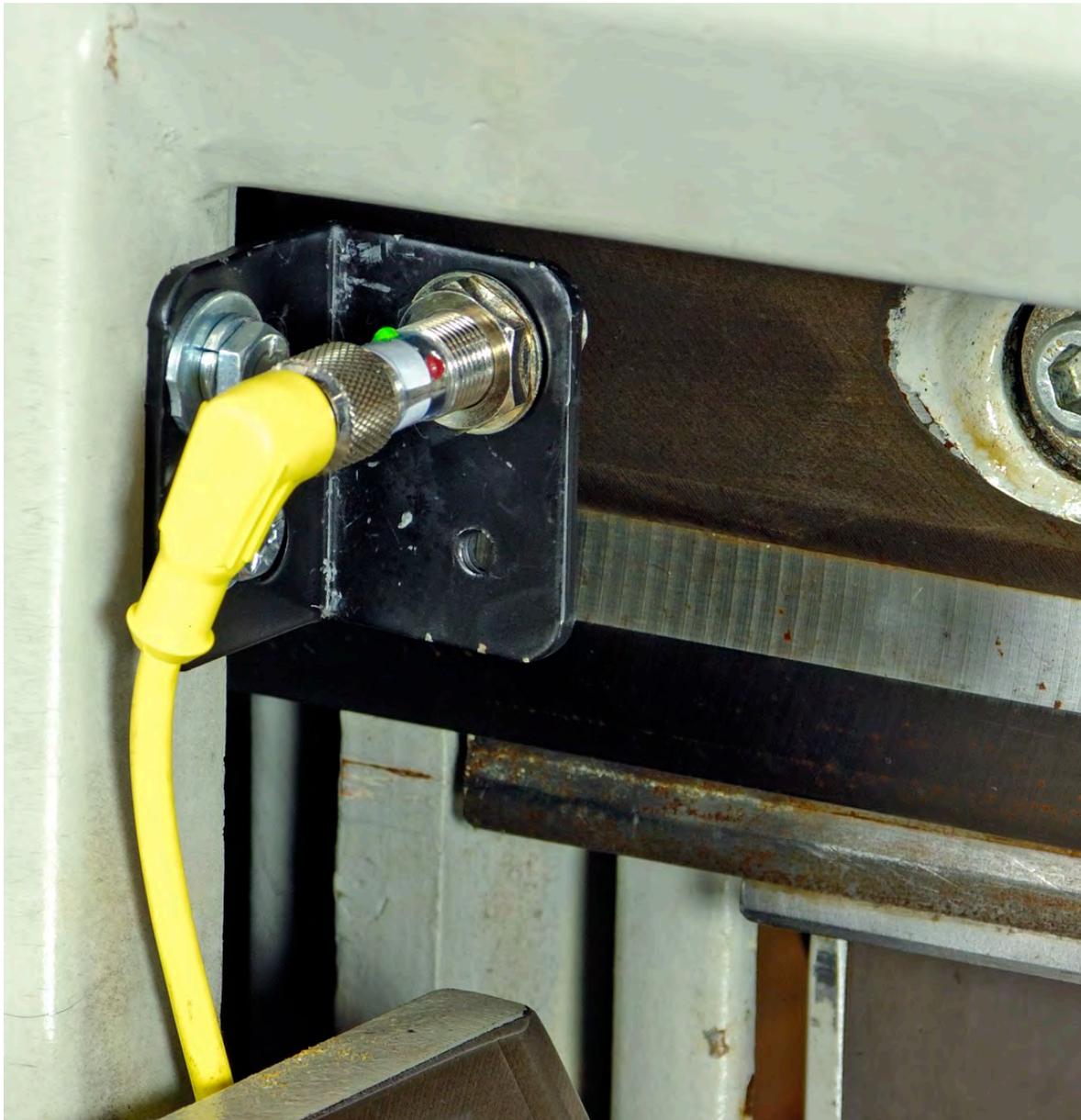
Clamp Shoe Sensor – supplies ground when the clamp shoe is in the holder.

1. Mount this sensor so that it is tripped when the clamp shoe (false clamp or sole plate) is resting in its holder. If there is no clamp shoe holder, use the multi-angled brackets supplied to create one.
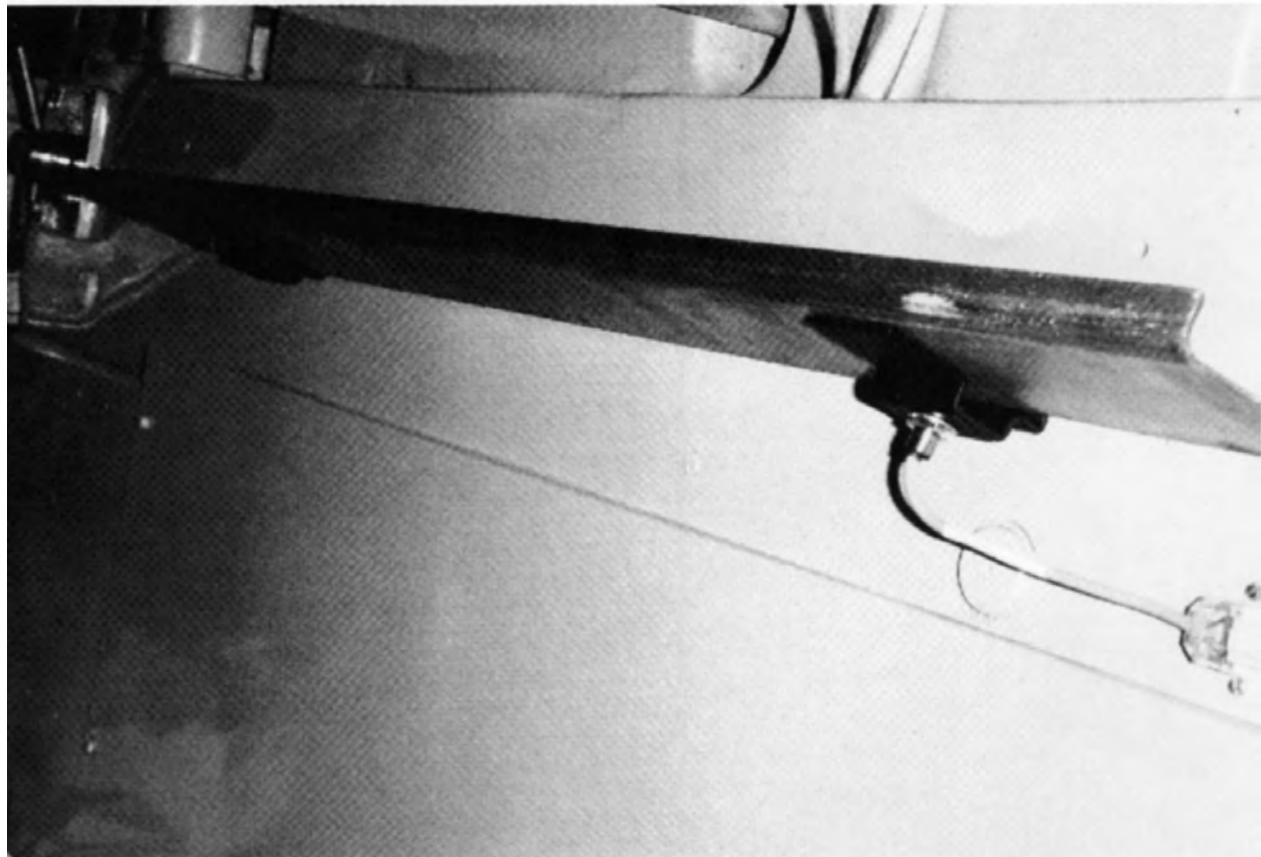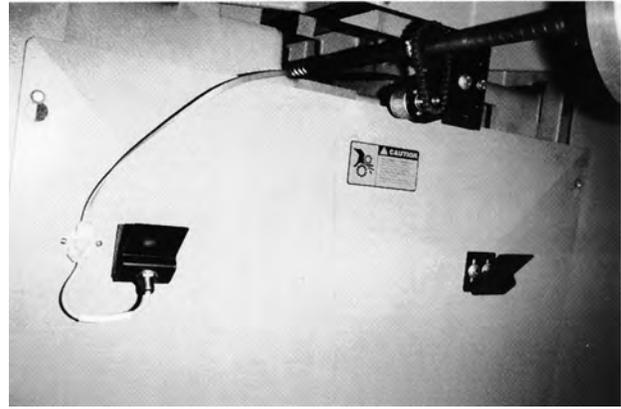
Hand Wheel Sensor – supplies ground when the hand wheel is released. This is normally a jumper wire on the J700H terminal (from pin 4 to pin 6). If your cutter has a retractable hand wheel with a switch, wire this switch into J700H to perform the proper function. You may need to change the contacts on the switch.

DC Drive Motor – The motor turns the lead screw.

1. Use the brackets and 9 by 12 inch plate as needed to mount the motor so that it lines up with the existing lead screw drive pulley. In many cases the same belt can be used for the new motor as was used for the original equipment drive. The motor mounting method must isolate the original drive system to avoid contention between the two.
2. If **microcut** is ordered for a Schneider cutter a one inch wide cog belt pulley will be included with the kit to drive with the original flat belt. If the original motor is removed make sure wires are labeled and taped.
3. On some cutters the brake will have to be disabled and the drive clutch enabled to allow proper operation.

NOTE: The brake on the motor will prevent the back gauge from moving. Install the encoder and any other parts that may require manually moving the machine (to make adjustments) before you install the drive motor!!!


Polar

Harris
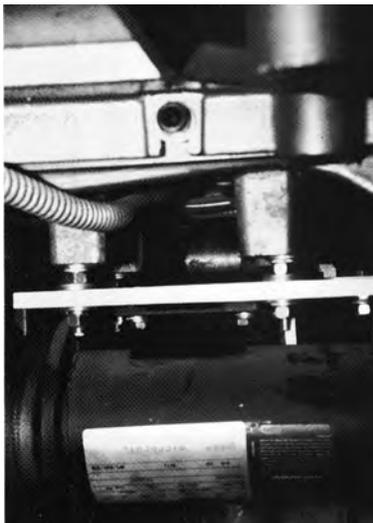
Wohlenberg
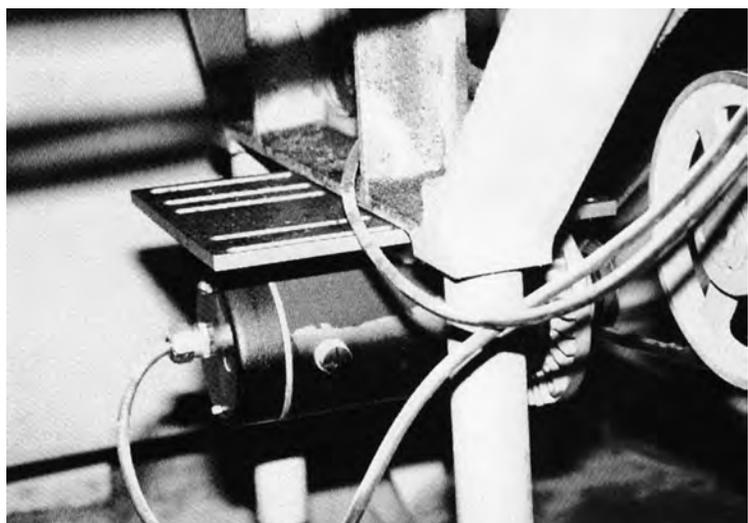
Lawson

H3 Drive Box – The H3 drive box drives the gauge motor and acts as a junction box for the wiring.

1. Use four bolts with flat and lock washers to install this in a central location. Make sure the cables will reach all of the components. Do not mount this box on a moving panel. The AC and motor plugs should exit the top. They can be routed down the back of the drive box. It is best to plug them into the box and route them this way as you install the box. If you know what voltage you will be supplying the selector switch in the box can be set at this time.

WIRING AND POWER

Be sure that the original equipment back gauge motor cannot drive the lead screw. Be certain that the original equipment back gauge brake will not energize during motor drive. If a clutch needs to be locked on (electrically or mechanically) to allow the **microcut** motor to drive, do this now. If any modifications are made completely insulate any bare wires, label all wires, and pack all original parts that were removed. To facilitate reinstallation of the original drive system in the event **microcut** is moved to another machine at a later date, the installer should document how the original wiring and motor should be refitted on the NOTES page at the end of this document. Check the machine for operation in case any of the above modifications may have affected operation.

Refer to the "Basic Layout" page earlier in this manual. Choose cable paths that avoid all moving parts for all machine operations. Secure all cables appropriately. The power and main motor cables should be run away from the other cables (the other cables should avoid high power wiring).

Wire the proximity sensors to the plugs according to function on the color dots on the plugs. The cables can be cut to convenient lengths or the excess can be tied out of the way. The proximity sensor cables are split into two groups—one for housing mounted sensors and one for the table mounted sensors. This facilitates easier moving of the machine in the future in case the table must be removed. The table connector contains the option for a hand wheel sense input if the cutter has such a switch. If this is to be connected remove the jumper and wire according to the "Wiring Diagram" page earlier in this manual.

Plug the cable supplied with the encoder into the drive box. Route this to the encoder and plug it in. The 7 pin connector for the encoder can be wired for either 5VDC or 12VDC encoder operation. This is done at the factory and should not be changed unless a different encoder is supplied at a later date. Refer to the silkscreen on the PCB as well as the "Basic Layout" page earlier in this manual for details.

The motor connects to two different cables. The 3 prong female line cord plug supplies DC drive power from the drive box to the three pin connector at the motor. The 8 pin connector at the drive box contains a cable that attaches to the motor's 12VDC brake. The motor's direction is determined during the set up routine (see the Owner's Manual). The additional connections on the 8 pin plug for the brake are for additional machine control—see the "Auxiliary Controls" page earlier in this manual.

Connect the display console to the drive box with the supplied cable. Route the cable and plug it into the drive box.

If the Expansion board was included as a part of this installation, connect sensors and outputs to that board as required.

Supplied power is to be 110/220±10% VAC, 50/60 Hz. There may be a voltage selector switch in the drive box (Revision A1.x PCBs). Remove the cover and make sure the switch is set correctly for the voltage you will be supplying. If you are removing the plug to hard wire the cord, the center of the plug (yellow wire with green tracer) is the earth connection. The other two lines are for the power. Check the plug to make sure this is correct. Plug the cable into the drive box.

SPECIAL NOTES

The **microcut** control system is available with different displays for different needs. The JR and BASIC units require the set up routine only. The PLUS WS has several configurations that can be defined. Refer to the special notes in various sections of the Owner's Manual for details.

Jumper JP700 on the H3 Drive board can be used to select the motor voltage. You can choose either the 90 or the 180VDC option. The motor must be a permanent magnet type. It should be adequately sized to avoid stalling or overheating. The brake output supplied from the H3 Drive Box is low power (1 amp max) 12VDC. The brake is not mandatory for operation but may help to stabilize the screw.

Jumper JP701 on the H3 Drive board can be used to select hard or soft braking. It is recommended that the soft option be selected for ball screw drives while Acme screws generally work well with hard braking. The system allows you to set the % of braking force to be used as well.

A potentiometer exists on the H3 Drive board to set the maximum current allowed through the back gauge drive motor. If this is set too low then the acceleration may be limited and the obtainable speed may be decreased. If it is set too high, then too much current may be allowed through the motor and the life of the motor may be reduced. A table silkscreened next to the potentiometer offers guidance on the setting. Generally DC motors require a surge of current to get moving. Generally, in the operation of a paper cutter, the motor has long cooling periods between moves. So, generally, this potentiometer is set a bit higher than the motor's specified (constant) current value. The major concern is to not overheat the motor. C&P Microsystems offers an input on the H3 board to monitor the motor temperature (J570H). Please contact us for further information.
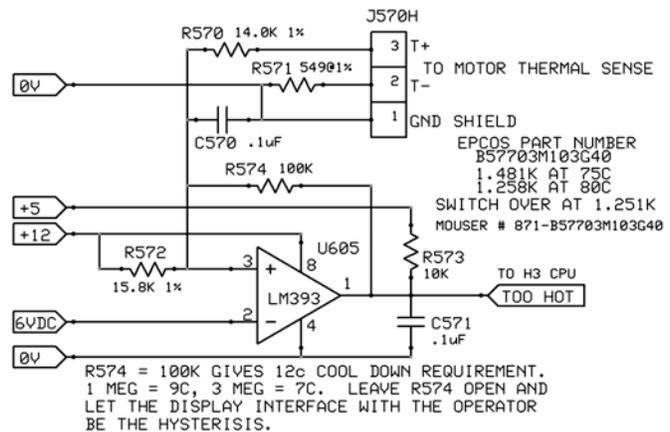
While microcut allows for very high motor power and speed, there are mechanical limitations that the machine itself presents. Trying to drive the gauge at very high speeds may draw excessive current and create other problems such as damaging the machine's transmission components. The PLUS WS display has the option of setting an upper speed limit in the Machine Definition Screen at the beginning of the Set Up Routine. In general machines using Acme screws should be limited to 8 inches per second (20 cm per second) while ball screw machines *may* be able to achieve higher speeds. But a word of caution is required here – ball screws can "whip" at high speeds, especially when the gauge is near the limits and there is more unsupported screw to whip. Do not set the maximum speed beyond the machine's abilities. Some machines will start to dynamically bind (as the lead screw pushes on the support bearings at either end of the cutter or on the carriage nuts) before the speeds indicated above.

FINAL CHECK

Insure that—

- The machine is fully cleaned from the installation.
- All parts are securely mounted to the machine.
- The motor pulley is secure.
- The motor drive belt is correctly aligned and fairly tight.
- The encoder chain is aligned and snug.
- The encoder sprocket clamp does not interfere with the chain or machine.
- All cables are secure and clear of all machine operations.
- All machine operations (cutting, clamping, etc.) are functioning properly.
- All hazard points (pinch, crush, etc.) must be fully guarded.

Review the machine for any areas that could create hazards such as pinch points or exposed parts. Guard as appropriate. Remember **microcut is not intended to control the knife or the clamp on the paper cutter.** *Anything* dealing with the clamp or knife is *not* to be tampered with or adjusted during the installation or operation of **microcut**. *Any* alteration to the knife or clamp safeties, circuits, or operation, or *any* installation technique that compromises the safety of anyone working on or around the machine is STRICTLY FORBIDDEN. **Guarding may need to be altered or added** to offer proper protection when **microcut** parts and assemblies are added to the machine. *Never* operate the machine until *all* guarding is complete. *All* moving parts and hazards must be covered in such a way as to prevent accidental contact of *any* sort. Any nip, draw-in, crush, or shearing hazard must be evaluated and eliminated.

Use the NOTES pages throughout this manual to document all changes that were made to the machine during the installation as well as steps to perform to return to the original operation.

Show the operator the installation, making sure he is comfortable with all mounting locations.

microcut is designed for all machines. When shipped the unit has no idea what type of machine it is on. The Set Up Routine allows **microcut** to understand the machine it has been installed on. This **must** be completed to allow correct operation. Until then motor and counting direction may be wrong and the machine sizes may be wrong. Serious damage may be inflicted on the machine while this is the case. Do not operate **microcut** until the Set Up Routine has been completed. It is a good idea to go through this routine with the operator so that he is familiar with the approach and can select the correct machine sizes and operating parameters. Refer elsewhere in this Owner's Manual for details on the Set Up Routine.

OPTIONAL EXPANSION BOARD CONTROL PACKAGE

The **microcut** control system can be augmented with an Expansion PCB. This is usually mounted directly above the H3 Drive PCB. The Expansion PCB has a variety of inputs and outputs that include:

- ☐ Additional output control for—
  - ○ High pressure clamp enable.
  - ○ Auto cycle operation.
  - ○ Air table (same as the H3 output).
  - ○ Open 1. Defaults to Load enable.
  - ○ Open 2. Defaults to Cut Optimization enabled.
  - ○ Open 3. Defaults to Auto Trim Removal Table Drive enabled.
  - ○ Air motor.
  - ○ Auto cycle enable.

NOTE: The open outputs can be used for operations such as load enable, cut optimization, or trim removal.

- ☐ Additional inputs for—
  - ○ Covers on.
  - ○ Shear bolt 1.
  - ○ Shear bolt 2 (for double arm pull machines).
  - ○ Foot treadle.
  - ○ Auto cycling circuit powered input.
  - ○ E-Stop for complex machine grouping.
  - ○ Air paddle for flipping air on off without affecting program (requires special parts).
  - ○ Auto trim table full in (requires special parts and construction).
  - ○ Oil filter (requires special parts).
- ☐ Side loading monitoring and options.
- ☐ Programmable clamp pressure.

All inputs and outputs have associated LEDs for diagnostic purposes. Refer to the next pages for details.

Input errors will be displayed in the upper left corner of the display or via red STOP SIGN like boxes in the middle of the display.

Since the Expansion PCB blocks the H3 PCB when mounted above it, a ribbon cable sends the H3 LED signals to the Expansion PCB.

NOTE: The **PLUS WS** system can also be interfaced to the C&P Microsystems B65 full cutter control package. Refer to documentation specifically for the B65 control system for details.

THE EXPANSION BOARD

Refer to the labels on the PCB. Green on = true, Red on = false.

See next pages for details on the LEDs and connectors.

EXPANSION LED DEFINITION TABLE

The following table defines the purpose of each LED. Refer to the connector table and cabling diagrams as well.

	Definition when ON
Data In	On if the outside source is communicating to the Expansion CPU (custom software required)
Data Out	On if the Expansion computer is sending data to the outside source
Current OK	The back gauge drive motor is not requiring excessive current
B	The lead screw encoder B signal is active
A	The lead screw encoder A signal is active
Zero	This flips each time a zero indicator is seen from the lead screw encoder
Hand Wheel In	On (red) when the hand wheel is pushed in and prevents back gauge drive or knife operation
At Rear	On if the Position sensor at the back of the machine is being tripped by the back gauge
Shoe On	On if the clamp shoe is attached to the clamp allowing reduced forward drive
Knife Down	On (red) if the knife is down preventing other operations until the stroke is completed
Clamp Down	On (red) if the clamp is down preventing normal forward back gauge drive
Mechanical Load Clear	On if the mechanical loading paddle is clear of the machine (used for side loading operations to insure that the back gauge does not run into the loading equipment)
Optical Load Clear	On if the optical sense indicates that there is nothing in the side loading throat (used for side loading operations to insure the back gauge does not jam stock into the housing)
Drop Gauge Up	On if the retractable side gauge plate is not down (used for side loading applications)
Brake Off	On if the back gauge brake is off (energized to the off state) to allow manual adjustment
Air Off	On (red) if the air table is off
No Cut	On (red) if the knife is disabled (moving, not at target, or other cause)
Oil Filter OK	On when the oil filter is OK or the operator will be reminded occasionally
Trim Table In	In if the trim removal table is in the full in position
Air Paddle Pushed	On if the air paddle is pushed to flip the air table status NOTE: This will not change the programmed status in AUTO operation
OK for Actions	On if all E-Stops are in the OK TO RUN position
Auto Cycle Powered	On if there is power to operate the auto cycle (cut or clamp) circuits NOTE: Additional circuits are required for Auto Cycle Operation
Foot Treadle Down	On if the foot treadle is pressed down
Overload 2 OK	On if the shear bolt 2 (over load on second knife pull down arm) is OK
Overload 1 OK	On if the shear bolt 1 (over load on knife pull down arm) is OK
Guards OK	On if all guards and covers (that are interlocked) are in place to allow machine operation
Auto Enable	On if Auto Cycle Enable is enabled (sets up circuit for Auto Cycle Operate below)
Air Motor	On if the air motor is enabled
Open 3	On if Open 3 is enabled (defaults to auto trim waster removal table enabled)
Open 2	On if Open 2 is enabled (defaults to cut optimization enabled)
Open 1	On if Open 1 is enabled (defaults to load enabled)
Air Table	On if the air table is enabled
Auto Operate	On if Auto Cycle Operate is enabled (requires Auto Knife Enabled above)
Clamp enable	On if the high pressure clamp is enabled
Data from H3	On if the H3 Drive computer is communicating to the Expansion computer
Data to H3	On if the Expansion computer is communicating to the H3 Drive computer

NOTE: Revisions occur. LED functions and locations may vary. Terminal plugs and features may be added. Refer to labels on the PC Board to verify options and functions.

EXPANSION TERMINAL CONNECTION TABLE

The following table explains the function of the various connectors as well as the individual connections of each. Notes are included as appropriate. The cable diagrams elsewhere may also be beneficial.

Terminal	Pin	Purpose
J100E		Connects power and communications between the H3 drive unit and the B65 control board.
	1	0V supplied from H3 drive unit
	2	Spare 0V supplied from H3 drive unit
	3	+12VDC supplied from H3 drive unit
	4	Spare +12VDC supplied from H3 drive unit
	5	Communications to Expansion CPU from H3 drive unit
	6	Communications from Expansion CPU to H3 drive unit
J200E		Connects various external sensors
	1	0V connection to supply a cable shield
	2	+12VDC to supply power to the sensor
	3	0V connection to supply the sensor and return signal
	4	0V return path for when all interlocked covers are on
		The main motor will shut off and all operations disabled if 4 is not at GND.
	5	0V connection to supply a cable shield
	6	+12VDC to supply power to the sensor
	7	0V connection to supply the sensor and return signal
	8	0V return path for when shear bolt 1 is OK
		The knife will not operate if 8 is not at GND.
	9	0V connection to supply a cable shield
	10	+12VDC to supply power to the sensor
	11	0V connection to supply the sensor and return signal
	12	0V return path for when shear bolt 2 is OK (two arm pull machines)
		The knife will not operate if 12 is not at 0V.
	13	0V connection to supply a cable shield
	14	+12VDC to supply power to the sensor
	15	0V connection to supply the sensor and return signal
	16	0V return path for when the foot treadle is not full up
		0V at 16 allows the clamp operation and forces a clamp down status at the H3 drive unit. There are several other subtle functions involved as well.
	17	0V connection to supply a cable shield
	18	+12VDC to supply power to the sensor
	19	0V connection to supply the sensor and return signal
	20	0V return path for when cut is OK with the clamp
		This involves special wiring for high pressure clamping buttons. Refer to the cabling diagrams elsewhere.
	21	0V connection to supply a cable shield
	22	+12VDC to supply power to the sensor
	23	0V connection to supply the sensor and return signal
	24	0V return path for when all E-Stop switches are in the OK TO RUN position
		All operations will be disabled, but the main motor will not shut off, if there is no 0V to 24.
	25	0V connection to supply a cable shield
	26	+12VDC to supply power to the sensor
	27	0V connection to supply the sensor and return signal
	28	0V return path for when air paddle switch is pressed (to flip the air table)
		Each time 0V is supplied to 28 the computer will flip the status of the air table.
	29	0V connection to supply a cable shield
	30	+12VDC to supply power to the sensor
	31	0V connection to supply the sensor and return signal
	32	0V return path for when trim removal table is full in
		Normal back gauge drive will be disabled unless 32 is supplied with a 0V path. Refer to J400B pins 13 and 14. Trim removal is for COLOR units only and, when programmed,

Terminal	Pin	Purpose
		allows the clamp to be lowered, then the trim table extended, then the cut can be made, followed by a small push out to clear the trim, before the table is returned (supplying the 0V to 32).
	33	0V connection to supply a cable shield
	34	+12VDC to supply power to the sensor
	35	0V connection to supply the sensor and return signal
	36	0V return path for when the oil filter is OK
		If 36 does not have a 0V then it is assumed that the oil filter is plugged. Operation can be performed, but the operator will be interrupted occasionally with a warning message.
J201E		Connects to the side (rear) loading sensors. A failure to supply 0V at any of the sense inputs will prevent back gauge drive.
	1	0V connection to supply a cable shield
	2	+12VDC to supply power to the sensor
	3	0V connection to supply the sensor and return signal
	4	0V return path for when the drop gauge is full up
	5	0V connection to supply a cable shield
	6	+12VDC to supply power to the sensor
	7	0V connection to supply the sensor and return signal
	8	0V return path for when the optical loading sense is clear
	9	0V connection to supply a cable shield
	10	+12VDC to supply power to the sensor
	11	0V connection to supply the sensor and return signal
	12	0V return path for when paddle to load the stock is clear of the table
		Input 12 (paddle) can be used to advance the back gauge after the load is complete. The other sensors on this connector are for stopping gauge drive only.
J350E		Clamp pressure control and RS-232 for additional expansion. A 0 to 10VDC input control valve is required for clamp pressure control. 24VDC will be needed for the valve from a different power source.
	1	0V for 0 to 10VDC output to control clamp pressure
	2	0 to 10 VDC output to control clamp pressure
	3	0V reference for communication expansion
	4	RS-232 output signal to outside source
	5	RS-232 input signal from outside source
J400E		Additional control outputs from the Expansion computer. These outputs connect to minimal power reed relays. They are generally used as inputs to a PLC or to control the coils of relays whose contacts can be used for high power operation.
	1	0V connection for the relay controls
	2	+12VDC connection for the relay controls
		The +12VDC supply is rated for 60 watts. This supplies all of the computers, the display, and various sensors. Care should be taken to not over load the supply. The +24VDC supply may be used to control the outputs as well.
	3,4	Output contacts that close when it is OK to high pressure clamp
	5,6	Output contacts that close when auto cycle is OK to operate (external circuitry required)
	7,8	Output contacts that close when the air table is on
	9,10	Output contacts that close when –to be defined (old loading device is to be enabled)
	11,12	Output contacts that close when—to be defined
	13,14	Output contacts that close when—to be defined (old trim removal table is to be activated)
	15,16	Output contacts that close when the air motor is on
	17,18	Output contacts that close when auto cycle is enabled (external circuitry required)

SPECIFICATIONS/LIMITATIONS

Power input: 110/220±10% VAC, 50/60 Hz, 1KVA. Voltage based on position of SW300 on H3 PCB.
Motor output: 0 to 90 VDC (PWM controlled, peak voltage based upon DC bus created from AC input)
Motor type:
     90VDC permanent magnet type up to 1 HP
     Frame size can vary based upon mounting requirements
     RPM can vary based upon full speed requirements
     Power can vary based upon load requirements
Sensors:
     Normally open (clamp up, clamp shoe) open collector type at 12VDC
     Normally closed (position, cut) open collector type at 12VDC
Encoder:
     Incremental type
     5VDC or 12VDC input dependent upon termination at H3 drive box
     500 windows with A and B outputs
     Zero pulse (either normally high or normally low acceptable, gated or not)
     Open collector or driven is acceptable.
Auxiliary I/O: Refer to details elsewhere in this manual
Display: Unregulated input from 12 to 28VDC with RS-232 interface from/to drive box
Climatic considerations:
     Operation (weather protected control rooms or equipment rooms not fully air conditioned)—
          Temperature per Class 3K3— +5C to +40C.
          Relative humidity per Class 3K3— 5% to 85%, $1g/m^3$ to $25g/m^3$.
               No condensation or formation of ice.
          Air pressure per Class 3K3— 86 kPa to 106 kPa.
       Storage—
          Temperature per Class 1K4— -25C to +55C.
          Relative humidity per Class 1K3— 5% to 95%, $1g/m^3$ to $29g/m^3$.
          Air pressure per Class 1K4— 86 kPa to 106 kPa.
       Transportation—
          Temperature per Class 2K3— -25C to +70C.
          Relative humidity per Class 2K3— to 95%, to $60g/m^3$.
               Maximum RH based on—
                    Unit slowly increases temperature by 40C.
                    Unit moves directly from temperatures between -25C and 30C.
                    Unit moves directly from temperatures between 70C and 15C.
               Brief light condensation is acceptable.
          Air pressure per Class 2K3—70 kPa to 106 kPa.

CE DECLARATION OF INCORPORATION

C&P Microsystems, Petaluma, California, USA declares under its own responsibility that the following products:

- **microcut®** in all forms – JR, BASIC, PLUS WS, and OEM flat panel designs.
- Expansion Board added to H3 drive unit for additional I/O.
- B65 full paper cutter control system.
- KPM (Knife Position Monitor) module.
- AKS (Auto Knife Set) board for auto setting knife height.

manufactured during and after December 2009 under an ISO9001 based Quality Assurance Program are intended to be incorporated into machinery without changing that machinery's basic function and when properly installed will comply with all relevant CE Harmonized Standards in affect as of 1 January 2012. Safety functions of the B65 dual channel safety system include a Type III two-hand control for high pressure clamping and cutting with performance level up to a PL_e per ISO 13851:2002 Ed 1, cyclically tested safety curtain inputs, and 1 KHz full monitoring of all critical circuits with automatic fault shut down.

Specific standards that were used in the design of the above products include:

Standard	Description
2006/42/EC 2nd Edition	Guide to application of the Machinery Directive.
BS EN 1010-3:2002+A1:2009	Safety of machinery. Cutting machines.
B65-3:2011 (ISO 12643-3:2010)	Graphic Technology. Safety requirements.
BS EN ISO 12100:2010	General principles for design. Risk assessment and reduction.
BS EN ISO 13849-1:2008	Safety related parts of control systems. General principles.
BS EN ISO 13849-2:2008	Safety related parts of control systems. Validation.
BS EN ISO 13850:2008	Emergency stop. Principles for design.
ISO 13851:2002 Ed 1	Two hand control devices. Functional aspects and design principles.
BS EN ISO 14121-1:2007	Safety of machinery. Risk assessment. Principles.
ISO/TR 14121-2:2007 Ed 1	Safety of machinery. Risk assessment. Practical guidance and examples.
BS EN 60204-1:2006+A1:2009	Electrical equipment of machines. General requirements.
BS EN 61508-1:2010	Functional safety of electrical/electronic controls. General requirements Part 1.
BS EN 61508-2:2010	Functional safety of electrical/electronic controls. General requirements Part 2.
BS EN 61508-3:2010	Functional safety of electrical/electronic controls. Software requirements.
ANSI/UL 508C-2008	Standard for Power Conversion Equipment

For B65 systems incorporating multiple controls VAC power should be supplied via a transformer per BS EN 60204-1:2006+A1:2009 Section 9.1.1. Where the Neutral line is used follow measures detailed in IEC 60364-4-43 Section 431.2.2. Proper power connection, VAC input overcurrent protection, and lock out is the responsibility of the installer.

While inputs and outputs are checked regularly to insure correct operation, certain combinations of redundant hydraulic valves and actuators may not be checked so as not to diminish machine operation. While these redundant items are considered to be reliable, scheduled verification is advised. In these cases it will be necessary to perform scheduled Proofing Tests. Routines are included in the control system to allow these tests to be performed without modifications to the system. Where deemed necessary, details of methods and intervals need to be defined and included as a part of the Machine Manual. These can also be defined within the control to warn the operator of these requirements on a timely basis or to force completion of the testing before continued use of the machine is allowed.

Incorporation of the above product does not assure CE approval. Certification of the machine and documentation as a whole is required for such approval.

C&P Microsystems recommends that all installation procedures contained in our documentation be followed. Refer to the C&P microsystems Specification Sheet for specific environmental, power, and other informational details. Technical assistance for all matters is available at info@cp-microsystems.

Authorized signature:

Jeff Marr
President of C&P Microsystems
January 1, 2012

<u>NOTES</u>

17 July 2012 – Changed format moving Installation Section to back instead of the very front.

30 September 2013 – Conversion to a full Reference Manual.
25 February 2014 – Modified for current updates.
10 March 2014 – Added Color WS edits for multi model use