

# PROGRAMMING AND OPERATIONS MANUAL...



## **EASY MARKER**

### **MODEL No.**

### **EM (ALL VERSIONS)**

**SAVE THIS MANUAL  
FOR FUTURE REFERENCE**

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## TABLE OF CONTENTS

WARRANTY .....	3
INTRODUCTION .....	4
COMPONENTS .....	4
GENERAL SAFETY RULES .....	5
SYMBOLS .....	6
FEATURES .....	6
OPTIONAL ACCESSORIES .....	6
CHAPTER 1 - SETUP .....	7
CONNECTIONS .....	7
MARKING PIN SETUP .....	8
CHAPTER 2 – CONTROLLER FEATURES .....	9
MARKING CONTROLLERS FEATURES .....	9
CHAPTER 3 – I/O CONFIGURATION .....	10
I/O BREAKDOWN .....	10
SELECT BITS – BINARY CHART .....	11
MARKER FLOW CHART .....	11
CHAPTER 4 – GETTING TO KNOW YOUR MARKER .....	12
MARKING WINDOW .....	12
HOME POSITION .....	12
CHAPTER 5 – PROGRAMMING YOUR MARKER .....	13
KEYBOARD SHORTCUTS .....	13
INITIAL STARTUP .....	14
CREATING A MARKING PROGRAM .....	15
EDITING A SAVED PROGRAM .....	15
OBJECTS OVERVIEW .....	15
OBJECT SELECTION MENU .....	16
OBJECT PARAMETERS .....	17
OBJECT POSITIONING .....	18
USING THE “TEACH-IN” FUNCTION .....	19
OBJECT CHARACTER SIZES .....	19
SELECT NUMBERS .....	19
OBJECT ANGLE .....	20
CIRCULAR TEXT .....	22
SELECTING A FONT .....	23
CHAPTER 6 – 3 <sup>RD</sup> AXIS SETUP .....	23
INITIALIZING THE 3 <sup>RD</sup> Axis .....	23
CHAPTER 7 – MANUAL MODE .....	24
ENTERING MANUAL MODE .....	24
CHAPTER 8 – SPECIAL FUNCTIONS .....	25
TEMPORARY HOME POSITION .....	25
USING ASCII DATA .....	25
CHAPTER 9 – SYSTEM SETTINGS .....	26
MARKING SETUP .....	26
BASIC SETUP .....	27
START MODE .....	28
SYSTEM SETTINGS .....	28
OUTPUT WIRING DIAGRAM .....	30
START SWITCH WIRING DIAGRAM .....	31
CHAPTER 10 – TROUBLE SHOOTING .....	33
ERROR MESSAGES .....	33
MARKER SYMPTOMS .....	34
NOTES .....	36

## WARRANTY



# COLUMBIA MARKING TOOLS

## Warranty Information

### Limited One-Year Warranty

Columbia Marking Tools warrants hardware products of its manufacture to be free from defects in material and workmanship for a period of 1 year from shipment, unless a different period is otherwise quoted in writing by Columbia Marking Tools. If a hardware Product unit fails during the warranty period, the original Buyer (not other parties which may have physical possession of the hardware) shall notify Columbia Marking tools and request return authorization. The Defective unit shall then be returned to \*CMT's repair center by the buyer or its designate, freight prepaid, together with a failure report. It will either be repaired or replaced, at the behest of Columbia Marking Tools and returned to the buyer or its designate, freight prepaid. Columbia Marking Tools is not responsible for providing replacement hardware during the repair period. The foregoing warranty shall not apply to the defect resulting from the following (i) Improper or inadequate maintenance by the Buyer. (ii) Operation outside of the environmental specifications of the Product improper site; (iii) preparation and maintenance. All services shall be performed in a professional manner and in conformance with industry standards. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED INCLUDING WARRANTIES OF MERCHANTABILITY OR FIRNESS FOR A PARTICULAR PURPOSE. ALL SOFTWARE IS PROVIDED "AS IS".

Damage due to shipping the products to you is covered under this warranty. Otherwise, this warranty does not cover damage due to external causes, including accident, abuse, misuse, problems with electrical power, servicing not authorized by Columbia Marking Tools, usage not in accordance with product instructions, failure to perform required preventive maintenance, and problems caused by use of parts and components not supplied by \*CMT.

This warranty does not cover any items that are in one or more of the following categories: software; external devices (except as specifically noted); accessories, parts or components added to a Columbia system after the system is shipped from \*CMT; accessories, parts or components that are not installed in the Columbia Marking Tools factory or associative companies; or accessories, parts or components that are sold with an expressed specific warranty in place of being covered under this warranty.

Columbia will repair or replace products covered under this limited warranty that are returned to Columbia's facility. To request warranty service, you must call Columbia's Return Material Authorization or Service Department within the warranty period. If warranty service is required, Columbia will issue a Return Material Authorization Number. You must ship the products back to Columbia in their original or equivalent packaging, prepay shipping charges, and insure the shipment or accept the risk of loss or damage during shipment. Columbia will ship the repaired or replacement products to you (freight prepaid) if you use an address in the continental U.S., where applicable. Shipments to other locations will be made freight collect. Columbia Marking Tools will not take responsibility for the cost of transportation required for the unit to be returned to the purchaser/owner.

**NOTE: Before shipping the product(s) to Columbia, back up the data on the hard-disk drive(s) and any other storage device(s) in the product(s). Remove any removable media, such as diskettes, CDs, or PC Cards. \*CMT does not accept liability for lost data or software.**

\*CMT owns all parts removed from repaired products. Columbia Marking Tools will use new and reconditioned parts made by various manufacturers in performing warranty repairs and building replacement products. If Columbia repairs or replaces a product, its warranty term is not extended.

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These provisions apply to \*CMT's limited one-year warranty only. For provisions of any service contract covering your system, refer to your invoice or the separate service contract that you will receive.

Contact \*CMT for a Return Materials Authorization Number: (RMA) prior to shipping product to Columbia Marking Tools. \*CMT must receive the product(s) for repair prior to the expiration of the warranty period in order for the repair(s) to be covered by the warranty.

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Columbia Marking Tools 1-800-469-6275

## INTRODUCTION

The EASY MARKER system is equipped with many features for making the use of this machine very easy and safe. Safety, performance and dependability have been given top priority in the design of this product making it easy to maintain and operate. This document will provide the necessary information required to maintain your marker as well as the information needed to operate it.

The rear sections of this document will contain technical data as well as trouble shooting guides. This manual was written specifically for the marker on the front cover and should not be used for any other machine/product that Columbia Marking Tools Offers.

The characters to be marked may be entered using only the keyboard and controller or through the use of a PC as you will learn later in this manual. Operation is very user friendly and can be easily learned. You are guided through each operation by the LCD-display or through the use of our user friendly Windows® based software.

The EASY MARKER allows for quick and efficient generation of character sequences such as fixed text, date, time and numbering which can be positioned, aligned and sized within the applicable marking area. Even circular and a variety of angular marks can be achieved with ease.

## COMPONENTS

The EASY MARKER operates on a combination of linear rails, ball screws and stepper/servo motors. All drives are free of any play and backlash that is commonly found with other drive systems thus providing the highest marking accuracy available. In addition the EASY MARKER is virtually maintenance free.

The EASY MARKER can effortlessly mark steel and non-ferrous metals as well as plastics and composite materials. It's marking stylus can compensate for up to 0.20 in. (5mm) of variation in marking surface. There is only 1 type of marking stylus.



This is the single shaft C2 carbide Marking Pin. It is commonly used in several of the programmable marking machines that CMT offers. This pin is designed to be placed in a steel housing with an internal spring to allow the oscillation which produces a mark. This is the only type of pin it is offered in 2 different configurations. The piston on the backside of the pin can be fitted in either the Steel or Aluminum configuration. The standard machine comes fit with the steel, the aluminum however can offer a marker where a heavy mark will be too powerful for the material.



The Controller is the device which drives this machine and provides the user interface for programming. Located on the front of it is a Green backlit LCD where the computer will accept commands and prompts you for inputs. Inside this are also the driver boards and motion controllers that are connected directly to the motors. On the reverse side is a Discrete I/O connection for PLC communication; however this device can be fitted with Device Net® as well as a Profibus® Module. Each controller is uniquely programmed to the machine it's operating.



## GENERAL SAFETY RULES

### **WARNING:**

**Read and understand all instructions.** Failure to follow all instructions listed below may result in electric shock, fire and/or serious personal injury.

#### **WORK AREA**

- **Keep your work area clean and well lit.** Cluttered benches and dark areas invite accidents.
- **Do not operate machines in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.**
- **Keep bystanders, children and visitors away while operating a marking machine.** Distractions can cause you to lose control.

#### **ELECTRICAL SAFETY**

- **Check supply voltage.** Be sure to supply the marker with the correct voltage in the power supply. The marking controller can be switched from 110~ to 220~.
- **Do not pinch cabling.** Always be sure that the cords and cables provided with the machines are secured with wire ties and laid safely in wire track.
- **Keep connectors loose.** Allow plenty of slack when wiring up your marker to make sure that there is little to no tension on the cord connectors. This is very important to keep your marker working well.
- **Do not abuse the cords.** Never pull directly on the cord to disconnect. Keep cord away from heat, oil, sharp edges, or moving parts. Replace damaged cords immediately.

#### **PERSONAL SAFETY**




- **Stay alert, watch what you are doing and use common sense when operating a machine. Do not use marker while tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating machinery may result in serious personal injury.
- **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.

#### **TOOL USE AND SAFETY**

- **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one machine may create a risk of injury when used on another machine.
- **Maintain pins with care. Keep marking pins sharp.** Properly maintained pins with sharp tips are less likely to break and are better for the marking machine. If a pin chips or bends **DO NOT** attempt to straighten it. Replace the pin with a new one to avoid further damage to the marking machine. Attempting to straighten will also cause poor marking quality.

## SYMBOLS

**Important:** Some of the following symbols will be used in the documents following. Please study them and learn their meaning. Proper interpretation of these symbols will allow you to operate the machine better and safer. Improper use of them could result in damage to the machine or possible injury.


SYMBOL	NAME	DESIGNATION / EXPLANATION
V	Volts	Voltage.
A	Amperes	Current.
Hz	Hertz	Frequency (cycles of electricity per second).
min	Minutes	Time Value.
HID	Human Interface Device	This refers to the Green LCD on the controller.
~	Alternating Current	Type or a characteristic of current.
≡	Direct Current	Type or a characteristic of current.
	Safety Alert Symbol	Indicates danger, warning or caution. It means attention!!! Your safety is involved.
	Eye Protection Required	Always wear safety goggles or safety glasses with side shields when operating this machine.
	Tip	This is the author's way of helping the user to better use the EASY MARKER system by providing tips.

## FEATURES

The EASY MARKER Marking system is equipped with many features for making the use of this product very easy and safe. Safety, performance and dependability have been given top priority in the design of this product making it easy to maintain and operate.

## OPTIONAL ACCESSORIES

In addition to the complete EASY MARKER marking system, Columbia Marking Tools offers a variety of different attachments to improve your marking capabilities. Most of these attachments can simply be bolted onto the marker with no additional modifications to the machine whatsoever. Below is a list of some of the accessories for the EASY MARKER system.

	EM-RO-80	<p><b>EASY MARKER 80mm Rotator.</b> The EASY MARKER can be fitted with an 80mm rotator to mark rounded parts. This can have a wide variety of different part holding fixtures as well as hand operated valves for a pneumatic chuck.</p>
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## CHAPTER 1 - SETUP

The EASY MARKER marker can be used in a variety of different applications. It is most often integrated into an existing assembly line or the other common application is a simple Stand-Alone marking station.

All of the cables and connectors for the EASY MARKER are correctly labeled with a wire tag for the name of the connector they're intended for. Use the diagrams below to help with the connections.

### CONNECTIONS

**Step 1:** Place the controller on a stable table top or mounting fixture.

**Step 2:** Identify the connections from the marking head to the controller. (see diagrams below)

(Main Controller)



Number	Name/Description
0	~110/220v Power connection
2	Discrete Input 25 pin connector
4	Round 5 pin Connector for Complete Signal
6	Com1 Connector for PC Control Software
8	PS2 Keyboard Input

Number	Name/Description
1	Discrete Output 25 pin connector
3	Round 5 pin Connector for Remote Start
5	External Monitor Connector ****
7	Main Connector to Marking Head

Legend	
*	
**	Optional or Per Machine Type
***	Servo Model Only
****	Not Normally Used

See Wiring Diagrams on Page 34 for Start and Output Connections (3 and 4 above).

**Step 3:** Make all the necessary connections.

**TIP:** Some connections are keyed to prevent inserting improperly into their controllers. Be sure to tighten down all connections and lock all collars to avoid damaging the system.

**Step 4:** Secure the Marking Machine.

On three sides of the marker are 4 (or sometimes more) M8 tapped holes (**max screw depth 3/8"**)

## MARKING PIN SETUP

For any type of marking system there are optimal setup conditions to give you the best result, the marking pin is probably the most important of these. Depending on the type of marking pin you are using there are different setups for each.

The main thing they have in common is something we call an entry point. This is what happens when the pin is too far away from the marking surface. The pin has enough time to build up a good amount of inertia and when it impacts into the part it creates a large dot at the entry point.



The optimal setup distance is between a range from .060 to .125 in. The further away you are from the part when you start will increase the size of this entry dot created. Pressure should be set to no more than 80 PSI before damage may occur.

## CHAPTER 2 – CONTROLLER FEATURES

The EASY MARKER marking controller does not have any external adjustments which allow you to control the marking, they are however controlled in the software and can be accessed using the Marking Setup menu found on page 27.

### MARKING CONTROLLERS FEATURES



Number	Name/Description
0	LCD Display A.K.A. HID

Number	Name/Description
1	

## CHAPTER 3 – I/O CONFIGURATION

Located on the back of the Main EASY MARKER controller are 2 discrete I/O connections. One designated to Input and the other to Output. These are isolated +24vDC Discrete connections that require their own power source and 0v connection. All signals coming into and going out of this controller will be a +24vDC Pulse. Not all connections are required in order for the marking controller to work. There are a few which **MUST** be connected and others that are **Recommended** to be used.

### I/O BREAKDOWN

#### OUTPUT 1



PIN Number	Action/Control
1	+24vDC Required
2	+24vDC Required
3	+24vDC Required
4	+24vDC Required
5	+24vDC Required
6	+24vDC Required
7	0v Required
8	
9	
10	
11	
12	
13	
14	Marking Complete (8ms long)
15	Camera Trigger Output
16	Servo Controller On
17	Ready For Start
18	Marking in Progress
19	System Ready
20	Marker Reached Wait Point
21	Reserved
22	
23	
24	
25	

#### INPUT 1



Pin Number	Action/Control
1	Selection Pin No.3
2	Selection Pin No.4
3	Selection Pin No.5
4	
5	0v Required
6	0v Required
7	0v Required
8	0v Required
9	0v Required
10	0v Required
11	0v Required
12	0v Required
13	Selection Pin No.2
14	X Axis Home
15	Y Axis Home
16	Data Valid
17	Start Marking
18	Servo Controller On
19	Emergency Stop
20	Reset
21	Stop (Feed Hold)
22	Home Pneumatic Axis
23	Stop Wildcard Z Axis
24	Continue from Wait Position
25	Selection Pin No. 1

#### Recommendations:

There are a few recommendations that CMT would like to make which will better assist the customer with integrating the marking controller into their work area. They are as follows.

#### Emergency Stop:

The Emergency Stop signal on input pin 19 must be held on HIGH the entire time you are in Auto Mode. When you wish to activate an E-Stop sequence, change it to low.

**Input Pin 17 (Start):** Hold this signal on for the duration of the marking sequence until Output 14 comes on. This will eliminate the possibility of the PLC not seeing the complete signal because it is so short. Holding the Start signal **HIGH** will cause the output to stay on until the Start has been released. See Flow Chart on page 11.

**Input Select Bits:** When using a Select Bit to select a specific object/part number, this signal must be turned on HIGH prior to the Start signal (pin 17) and it must remain on for the duration of the marking sequence. It can be left on between cycles as well. Refer to the Binary Selection Chart on page 12 for programming.

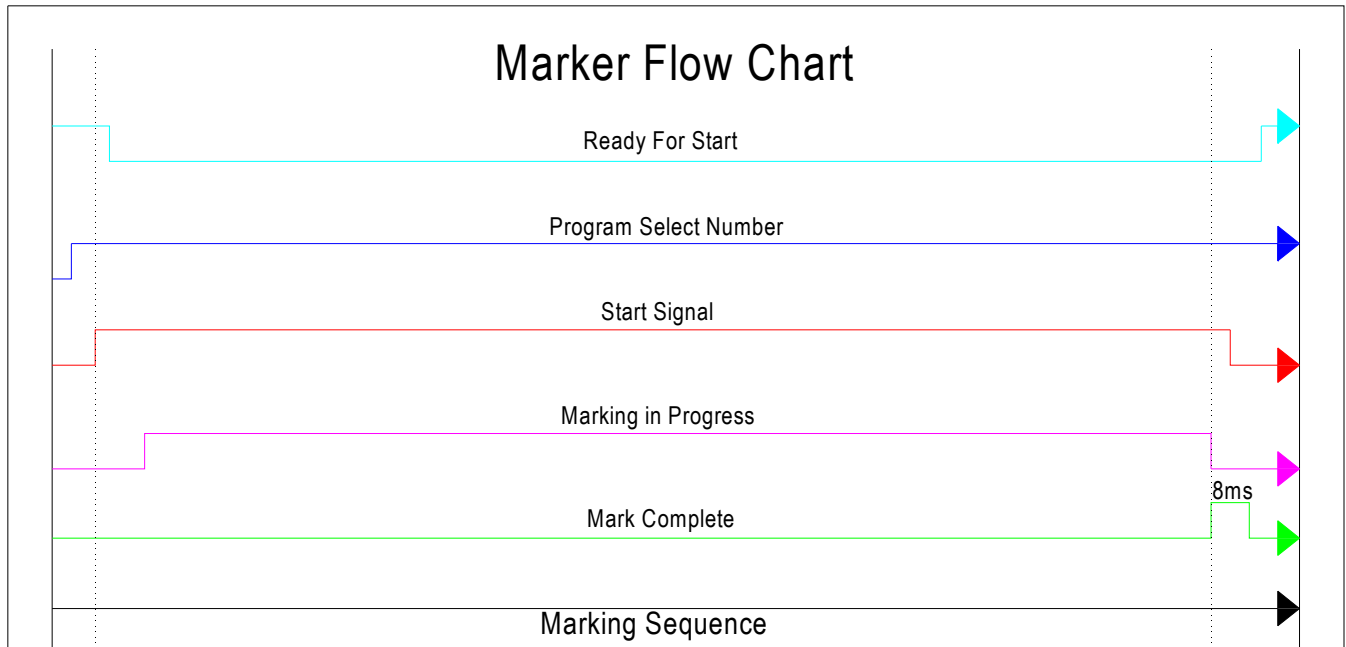
## SELECT BITS – BINARY CHART

Select Number	Pin #25	Pin #13	Pin #1	Pin #2	Pin #3
0	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF
5	ON	OFF	ON	OFF	OFF
6	OFF	ON	ON	OFF	OFF
7	ON	ON	ON	OFF	OFF
8	OFF	OFF	OFF	ON	OFF
9	ON	OFF	OFF	ON	OFF
10	OFF	ON	OFF	ON	OFF
11	ON	ON	OFF	ON	OFF
12	OFF	OFF	ON	ON	OFF
13	ON	OFF	ON	ON	OFF
14	OFF	ON	ON	ON	OFF
15	ON	OFF	ON	ON	OFF
16	OFF	OFF	OFF	OFF	ON



*To achieve the select number desired give +24vDC to the appropriate pins that has an **ON** value in their cell. Example: Select number 15 = +24vDC to pins 25, 1, 2.*

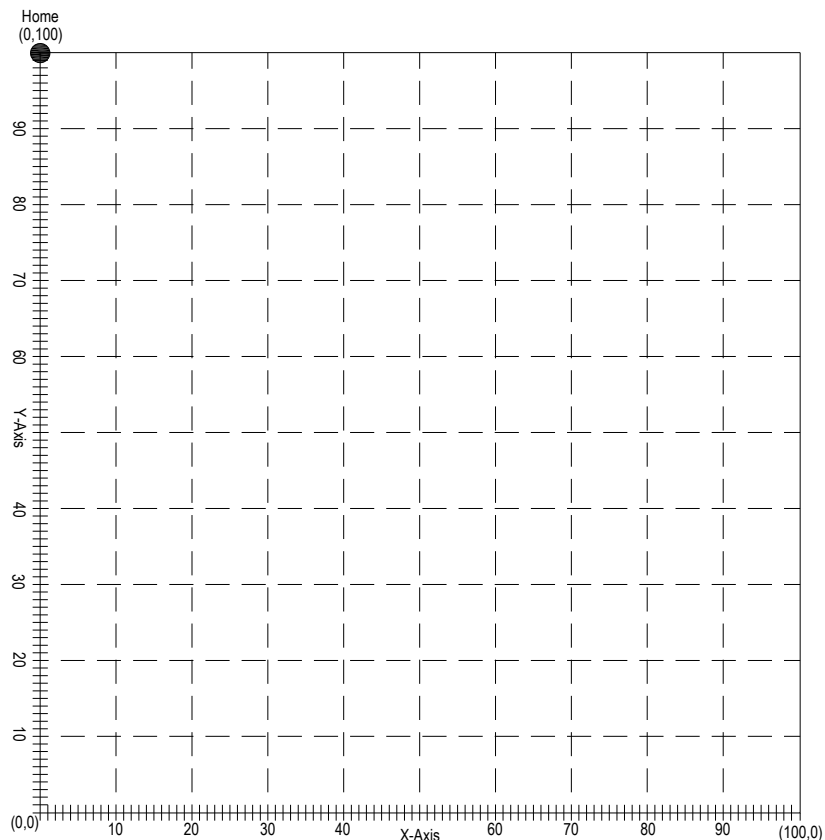
## MARKER FLOW CHART



## CHAPTER 4 – Getting to Know Your Marker

Built directly into the EASY MARKER Marking Controller is a computer designed off the DOS 3.2 platform. Developed for programming and operation of the EASY MARKER, its interface software is called **Unimark**. Unimark runs off of the marking controller's computer and the HID is where it displays all the programming interface and system status messages. Programming will require the use of a Standard PS2 keyboard plugged into input number 18 on the back of the standard EASY MARKER Controller. (pg. 7)

### MARKING WINDOW



Shown above is the marking window for the EASY MARKER. The marking window is 100mm (X) by 100mm (Y). The marking window size will vary depending on the model of EASY MARKER you have. Notice that the home position starts at the top of the marking window located at (0,100). As the Y-axis comes away from home the Y-Axis coordinate decreases. The Unimark program can mark 360° within the mechanical limits as long as the text does not exceed the marking window.

### HOME POSITION

Mounted directly to the EASY MARKER Marking Head, are two proximity switches which identify the marker as being in the home position. The marker will be equipped with a position sensor for each additional axis. There are several times in the normal operation of the marker where it returns to these position sensors. When the marker turns on for the first time during the power cycle it must return home to identify that all mechanics are working properly as part of the initial system check.

At the beginning and ending of each marking sequence the EASY MARKER will return to home again. By doing this the X and Y coordinates reset to their default position. This allows the marker to travel out to the location programmed each time for 100% accuracy.














The location of the position sensors are accurately placed to allow the total amount of travel for the different axis. Adjusting or changing these positions would limit the amount of travel designed for your particular marker and is NOT recommended. A temporary software home position may be programmed if your situation would require it. Instructions for this operation can be found on page 27.


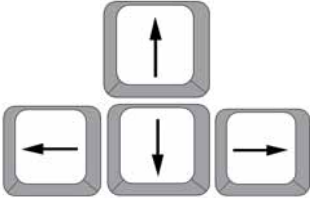





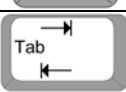

## CHAPTER 5 – Programming Your Marker

Be sure that you have read carefully through the first 4 chapters before continuing on. The next few chapters and sections are dedicated to the Programming of your EASY MARKER. It will include instructions on how to setup the machine as well as instructions on setting up your Marking Layouts.

### KEYBOARD SHORTCUTS

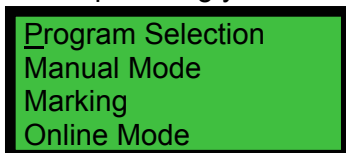
These are keyboard shortcuts that will be used while operating your EASY MARKER Controller Software. Each button will indicate in the description where it is allowed to be used.

KEYS	DESCRIPTION OF SHORTCUT
	Help Screen – This can be used anywhere in the Unimark program for assistance with the particular area you are in.
	Save – When editing your marking layout, it is recommended to Save as often as possible. Also can be used in the Settings Menus after a change has been made. <b>(Movement by .01mm)</b>
 + 	Save As – While in the Program Selection Menu, you can press this combination of keys to save the highlighted marking layout under a different name than the present.
	Start Marking – When editing your marking layout, you can press F3 to enter directly into the Marking Mode. <b>(Movement by 1.0mm)</b>
	Modify – When editing your marking layout, press F4 to Edit the highlighted object. <b>(Movement by 10.0mm)</b>
	New – This button is used to create a New program at the Program Selection Menu. It is also used to insert a New object in your Marking Layout.
	Optional Axis – When your Marker is equipped with a third axis, you can press this button inside of your marking layout to specify the parameters for the third axis.
 + 	Start Position – When you are inside your marking layout you can change the start position of your particular program. Pressing this combination of keys will bring you to a submenu where you can set your starting position.
	Program Search – You can press this button to search for an already saved marking layout when you are in the Program Selection menu.
	Settings Menu – This is a sub menu where you access all of the setup options available for your marker. This includes marking styles, speeds, date and time, automatic startup and much more can be accessed at any time.
	No Function

	Home – When in the “Teach” mode for your object positioning, you can press F10 to return your marker to the hardware home position. This can also be done when in the Manual Mode.
	Arrow keys – Used for navigating through your menus. Used in conjunction with the <b>ALT</b> key can be used to “Teach” positions under your objects’ properties.
	Marking Pin Retract – When in the Manual Mode option, you can turn the marking pin OFF.
	Marking Pin Extend – When in the Manual Mode option, you can turn the marking pin ON to test its functionality.
	Z-Axis Up – When in the manual mode option, this button will be used to jog the Z-Axis upwards. Also in conjunction with the Alt key can be used to teach in a Z-Axis Position.
	Z-Axis Down – When in the manual mode option, this button will be used to jog the Z-Axis downwards. Also in conjunction with the Alt key can be used to teach in a Z-Axis Position.
	Delete – This key is used to delete programs in your Program Selection list as well as objects in your marking layout.
	Tab – The Tab key will be used most often to index to the next input field when you are inside the menus of the Unimark Program.
	Shift + Tab – With this combination of keys you can move backwards inside of the Unimark Menus.

## INITIAL STARTUP

When powering your controller on for the first time you will arrive at the “Program Selection Menu”.



All navigation on this main screen will be done by the cursor under the first option. Use your arrow keys on your keyboard to navigate.

### Program Selection:

This section of the software is what allows you to create and save new programs, as well as call up previously saved programs for marking/editing.

### Manual Mode:

This useful tool is a screen that gives us the ability to manually jog the markers’ axis as well as test the marking pin. This will be used at a later time for troubleshooting mechanical and electrical problems with your marker. (pg 25)

### Marking:

Selecting this will activate your marking system into the marking mode that has been configured for this system. (See *Basic Setup*).

### Online Mode:

This mode is an active link between your marking controller and a Windows based software called Signumeric designed for your marking system. If your marking project has to include a 2D-Matrix mark you **MUST** use this Windows based software to achieve it.

## CREATING A MARKING PROGRAM

Make sure that the navigation cursor is under the Program Selection option as shown on the previous page and press **Enter** to select. This will bring you to a list of already created Marking Layouts where you can open them to edit or create a new one.

```
NONAME.PRG →  
Test.PRG
```



*The program at the Top of the list with the arrow to the right of it indicates that it is the active Program for marking. When you open up another program it will change automatically.*

To create a new Marking Layout, on your keyboard press **F5**. This will bring up a blank prompt asking for you to give this new program a name. For this example we called this program Columbia.

```
[ _ ] →  
Test.PRG
```

```
Columbia.PRG →  
Test.PRG
```

Using your keyboard, give this new program a name less than 8 characters and press **Enter**. After you do this, Unimark will add the new program to the list of created programs in your controller.

## EDITING A SAVED PROGRAM

Make sure that the navigation cursor is under the Program you wish to edit in the list of created Marking Layouts. Press **Enter** to select it which will open the program for you to edit or mark.

```
Columbia.PRG →  
Test.PRG  
Engineers.PRG  
Example.PRG
```

## OBJECTS OVERVIEW

Located in your marking layout is a series of individual data elements that have their own properties which we call Objects. Each object is completely independent of the others to maximize functionality and marking abilities. There are a number of available object types that can be programmed into your marking layout. We will identify them and their functions in this section. What is also important to remember, not only can objects look different and contain different text but they can also be dynamic as well as Static. When inside your marking program, press **F5** to open the Object Selection menu.

We are going to make an example program that we will be referring to for instructions. The example program will be illustrated in a different format than the other screens in this guide, it will look like this.



## OBJECT SELECTION MENU

Object Selection

Press **F5** to Access Object Menu

Text  
Date  
Incrementing Number  
Graphic  
Place Holder  
Wait Point

The menu on the right was stretched to show Entire List of Objects. Normally you will need to scroll down with your Arrow Keys to the Next page.

For our example program we're going to create a Fixed Text field first. Put the cursor under the "Text" option and click **Enter**. Now Unimark will display a blank screen with a cursor. Input your static text as you want it to be marked. Let's type in "Columbia". The standard characters available are as follows.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z  
a b c d e f g h i j k l m n o p q r s t u v w x y z  
. , ; + - \* / < > # ! ? = " ~ @ ( ) \ & % \$ % [ ] { } μ  
1 2 3 4 5 6 7 8 9 0

**Text:** This is an object which displays a static text. This will always stay the same unless the programmer edits this object.

**Date:** This object has multiple selections to it. When you TAB down to this you will see them pop up next to the Date label as shown below.

Text  
Date DD/MM/YY  
Incrementing Number  
Graphic

Using your arrow keys left and right you can scroll through the available Date options. *(See Below)*

DD/MM/YY = 2 digit Date / 2 digit Month / 2 digit Year	Ex: 25/12/06 Christmas
MM/DD/YY = 2 digit Month / 2 digit Date / 2 digit Year	Ex: 12/25/06 Christmas
CW/YY = Calendar Week / 2 digit Year	50/06 (Christmas Week in 2006) 52 weeks
MM/YY = 2 digit Month / 2 digit Year	12/06 (December 2006)
DDD = Julian Date	Ex: 365 (#day of year)
YY = 2 digit Year	06 (for 2006)
MM = 2 digit Month	12 (for December)
DD = 2 digit Day	25 (for 25 <sup>th</sup> of the month)
CW = Calendar Week Number	50 (week 50 of 52 in a year)
Y = 1 digit Year	Ex: 6 (for 2006)
HH:mm = Time in Military	Ex: 22:30 (for 10:30 PM)
HH = 2 digit Hour	22 (10PM in military time)
mm = 2 digit Minute	30 (30 minutes of the hour)
ss = 2 digit Seconds	15 (15 Seconds of 60 in a minute)
SHIFT = Predefined Shift Code for Plant	Shift code programmed by the user (pg.31)
W = 1 digit day of the week	1 (Sunday which is day 1 of 7)

**Incrementing Number:** The simplest way to explain this is as a Counter. When you select this object it will bring you to a blank curser. The program is waiting for you to set the parameters for the incrementing number. The first thing you need to set is its **Starting Number**. Separate this and the next value with a /. The next value we need to enter is the **Final Number**. Again add a / to the code. Then set the incrimination value to 1, 2 or 3 or any whole number. This will determine what number this counter will be counting by.

Finally there are a few more options we can add to this code to make the Unimark Software save and reset the incrementing number on its own. If you desire to have a 6 digit number but you are starting at 1, you can type **/N** at the end of your incrementing number string to make the controller add 0's where there are none yet. So ultimately your incrementing number will look like this "000001" as opposed to "1". If you want the incrementing number to save its value after each mark (in case of sudden power loss) type **S** in addition to the incrementing number. Lastly, we have provided the option to reset the counter at 12:00am (midnight) so that it will be congruent with the next day. Type a **T** as well to cause the counter to reset after 24 hours.

**Example of fully programmed Incrementing Number: 1/999/1/NST**  
**(start / stop / index by / leading zeros? , save after each mark? , reset at 24:00?)**

**Incrementing gl. number:** This object is almost exactly like the Incrementing number, its only difference is that no matter which program is open and running, any gl numbers will automatically index as well. So if you for example have 4 programs created and inside these programs you have some text and a date and an incrementing gl number, no matter which program you have open and marking with all of the gl numbers in all 4 programs will index every time the marker completes a cycle. Likewise if you have the options NST programmed into these gl numbers they will ALL automatically save reset and fill the zeros for you simultaneously.

**Graphic:** The Unimark program has the capability to mark a graphic in the .plt format. The graphic can be any vector based drawing usually done with AutoCAD or comparable 2D CAD program. The .plt file must be created using HPGL plot drivers which can be found in AutoCAD 14 or by contacting CMT for a conversion program. The European standard "CE" logo comes pre-loaded into the controller. CMT has a library of other logos that can be sent to you on request, as well as Windows based software to download the logo to the markers controller via the Serial Port (*Com2*).

**Placeholder:** One of the alternative methods of marking data is using the placeholder function. On the backside of the controller is a serial port labeled Com2. This is used in collaboration with the placeholder object, and will allow the operator to send the marker controller an ASCII String of data. It can be customized also using the standard *object parameters*. Refer to more instructions on pg. 27.

**Wait Point:** This is a unique object that does NOT come standard in the Unimark software but the option is left in. This object does not leave a mark on the part, instead it is a coordinate that the marker will drive to and wait until the controller receives a signal over the I/O to continue (*Pin 24 Input Card*).

## OBJECT PARAMETERS

After creating your object, Unimark will add the newly created object to the bottom of the list of already created objects. If it is your first object it will appear at the top. Now you need to modify the parameters of the particular object. Make sure your cursor is below the Object whose parameters you wish to modify and press **Enter**. **TAB** through the options to modify these parameters. (*see below*)

Xp= 0	Select	N
Yp= 0	Angle	0
H = 3	Horz.	
W= 2	Rad	0

<b>Xp:</b> X Axis Coordinate	<b>Select:</b> I/O Select Number (Page 21)
<b>Yp:</b> Y-Axis Coordinate	<b>Angle:</b> Angle of marking 0-359 degrees (Page 22)
<b>H:</b> Character Height	<b>Horz.:</b> Preset selectable printing directions (Page 21)
<b>W:</b> Character Width	<b>Rad:</b> Radius Marking characters in circular pattern (Page 22)

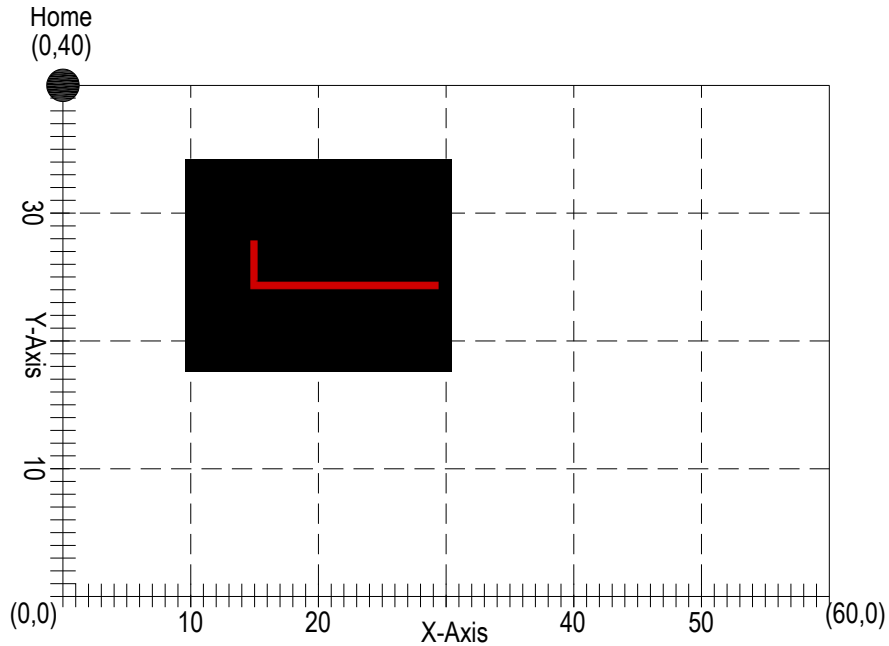
Depending on the type of marker you have and the version of software loaded on the controller, some of the controllers that support a 3<sup>rd</sup> (Z) Axis have a second page of Object Parameters. When you reach the bottom right option "Rad" press **TAB** key once more to continue onto the 2<sup>nd</sup> page of options. (*see next page*)

Zp= 0

Zp: Z-Axis Coordinate

### OBJECT POSITIONING.

The first set of parameters you see in the menu is the coordinates for your object. There are a few different ways that we can set the position of this particular object, however before we do that it helps first to know how Unimark actually interprets the coordinates of the marker for printing purposes.




This text in the marking area is static text that was created for example purposes. Notice that in this example there are 2 red lines that intersect. The point of where they intersect is the lower left-hand corner of the object. This is where the controller will be using the coordinates for the object. Usually for any object it will be the same idea where the lower left-hand corner is where you teach your objects' coordinates. In this case the objects position is at **X=15 Y=25**.

Xp= 15	Select	N
Yp= 25	Angle	0
H = 3	Horz.	
W= 2	Rad	0

*Objects' coordinates shown here in our example program*

There are a few different ways that we can achieve this coordinate. The first and probably the least useful is to measure and count the dimensions. Using your markers home position as a reference you can measure how far you want your object to be away from the home and mathematically calculate the coordinate. Remember that X axis starts at 0 and gets larger the further away from home. Where Y axis starts at the maximum value of the marker itself for our example of the EASY MARKER this will be 40mm and decreases the further away from home it gets.

## USING THE “TEACH-IN” FUNCTION

 Another way we can input the coordinates of the object and probably the most used is to utilize the Teach-In function. When you are in the Object parameters menu, at any time hold down **Alt + Arrow Keys** to manually position the marker to teach in the coordinates again to the lower left hand corner of the object. Just align the tip of the marking Stylus to where you want it to start printing. If your marker is equipped with a 3<sup>rd</sup> (Z) Axis, again while holding down **Alt** press **PgUP** and **PgDN** to move it. Simultaneously while you are jogging the marker into the position the coordinates of the object will be updating Real Time.



*You can change the distance the marker moves every time you press a direction by selecting **F2, F3, or F4** on the keyboard. (**F2 = .10mm**) (**F3 = 1.0mm**) (**F4 = 10.0mm**) the default is 1.0 mm per increment.*

## OBJECT CHARACTER SIZES

The next step in setting up the object parameters is the Character Sizes. The size of your characters can make all the difference for some marking applications. The standard size will come as **H = 3, W = 2**. These values are set default in the Metric standard but can be changed if you desire to the Inch Standard (Pg. 29) The set character separation is **1mm**. This number can not be changed.

The value you enter to the H and W fields does not need to be a whole number; you can use a decimal value if your application requires it. When positioning your text it is good to keep in mind the height and width of your object so you can calculate/estimate the amount of room required for the particular object. A good example of this would be a Tag. Usually a tag has certain fields that need to be entered and they are limited in how large of characters can be put into them. It is important to set the size of your object to fit into these fields.

So now that we know how to set the character size we will set ours to **H = 5** and **W = 3** for our example program.

Xp= 15	Select	N
Yp= 25	Angle	0
H = 5	Horz.	
W= 3	Rad	0



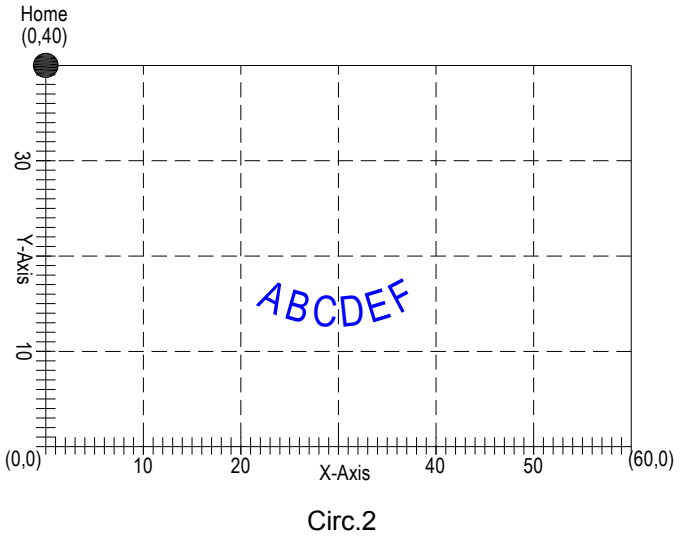
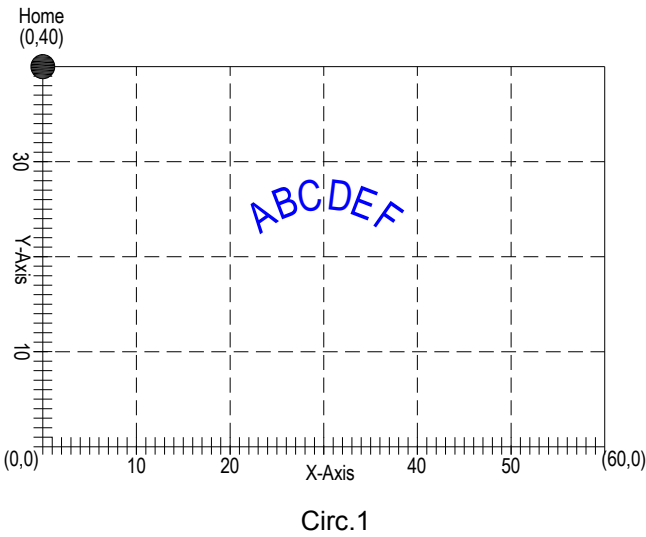
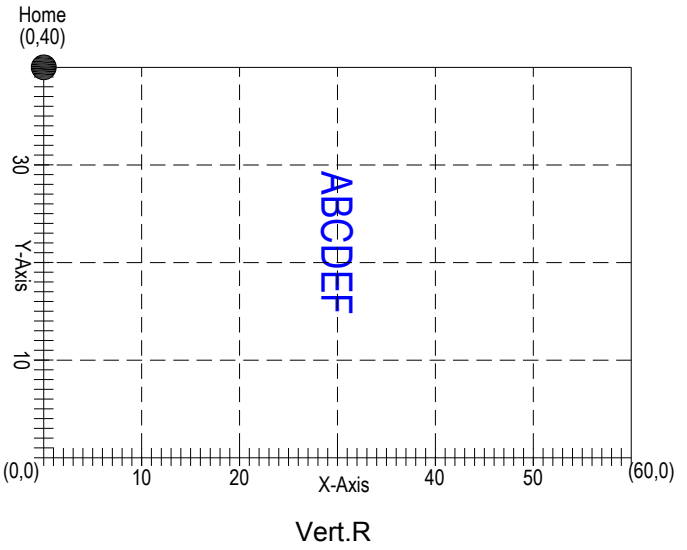
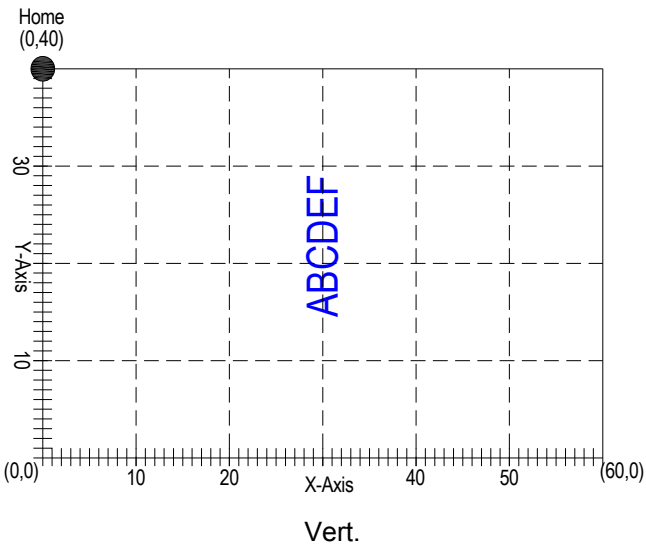
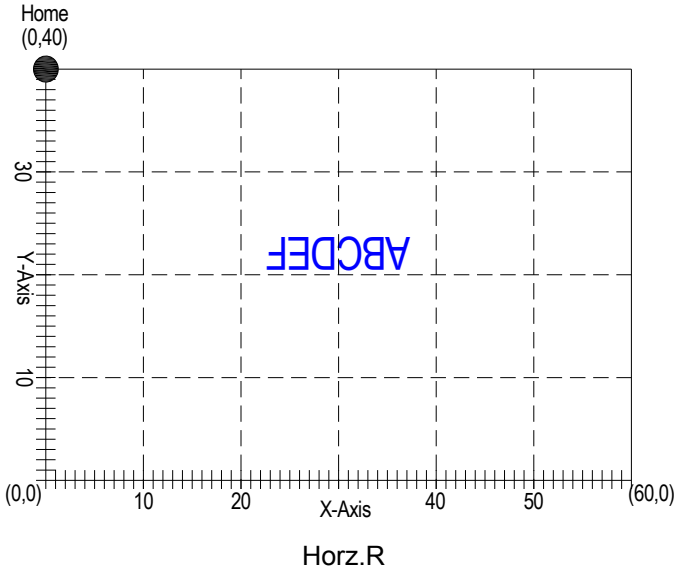
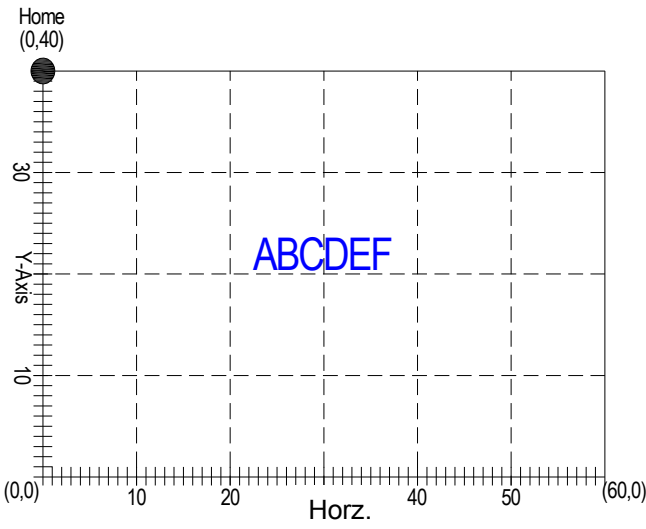
*The size of your characters can also have a bearing on the speed at which you are marking. Naturally if you have to draw very large characters it is going to take considerably longer than small ones.*

## SELECT NUMBERS

The Select number is an optional tool used in conjunction with I/O control. If your application allows the marking controller to be connected to a PLC or some other I/O device, this function will give you the ability to select certain objects within a program. A program is capable of containing 20 different objects. These objects do not all have to be marked at the same time. Using the select function, you can turn on which objects you wish to mark by assigning them a “Select Number”. You can create different groups of Select numbers to essentially have different programs within a program. The objects do not have to be in any particular order for the select number to work. When the Input is given for a particular Select number, all objects with that assigned to them will be marked from Top to Bottom in the program.

See Page 11 for more information about the Select feature.

# OBJECT ANGLE

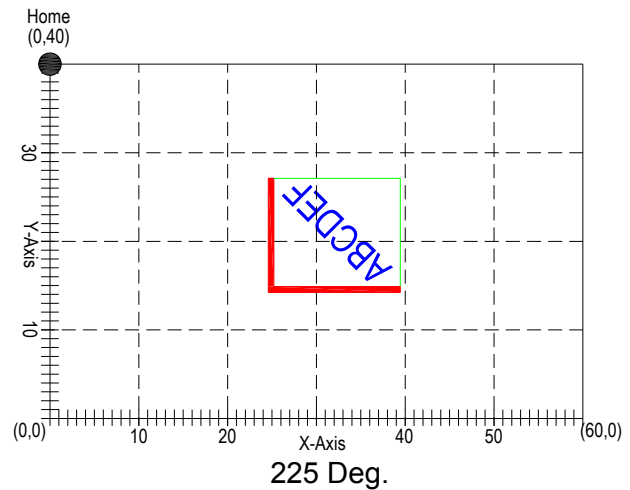
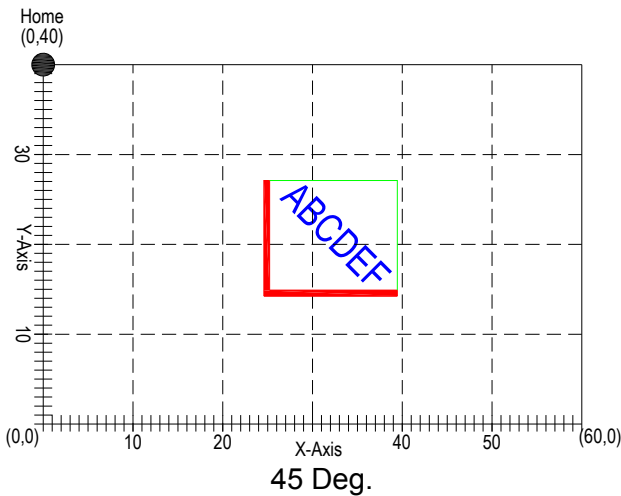


The previous page has 6 examples of the predefined orientation options inside your Object Parameters.

Xp= 0	Select	N
Yp= 0	Angle	0
H = 3	<u>Horz.</u>	
W= 2	Rad	0

With your cursor under the highlighted selection, you can use your arrow keys **Left** and **Right** to select one of the pre-defined directions. If you noticed in the examples you can see that just as before where the 2 red lines intersect is where you are positioning your coordinates to. No matter what the orientation is you are always going to position it to the lower left hand corner. The only exception to this rule is the Circular text option.

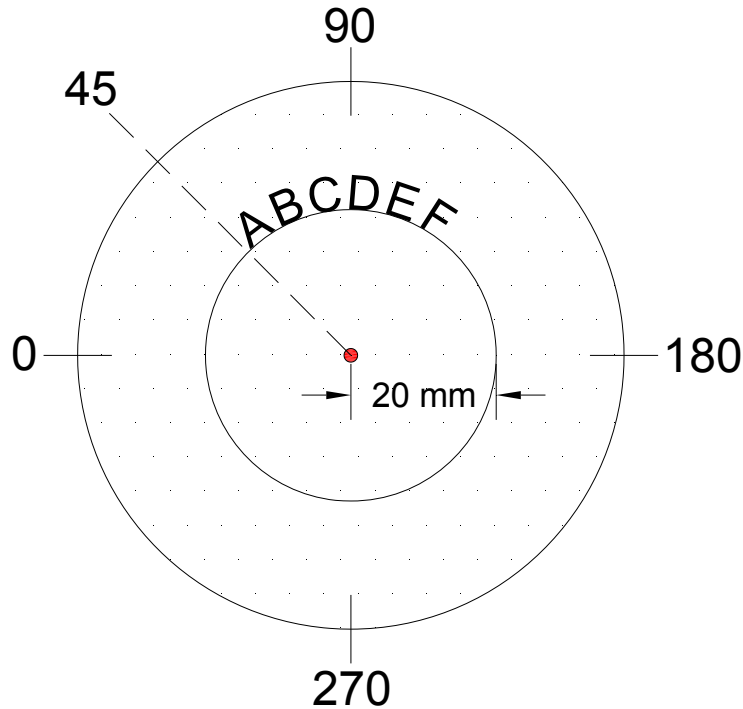
There is another option to mark using a "Free Angle". This is listed as just Angle in the Object Parameters menu. With this option, Unimark uses the coordinates entered as an anchor to the object as the object rotates around inside of the area allowed. The program creates invisible walls on the X and Y coordinates that the object cannot go past. So the object will rotate within these boundaries. See examples below to better understand



As you can see the coordinates where the 2 red lines intersect do not change. The text however spins inside of an invisible box to the desired angle.

## CIRCULAR TEXT

One of the available options for your text orientation is the Circular Text. There are 2 different versions to this option. "Circ.1 and Circ.2" On the previous page are illustrations of what the differences between them are. As noted in the previous section, these 2 text directions are the only exception to the positioning rule. These 2 unique text options must be positioned according to the Center of the Radius. Notice in the examples that there is a cross to replace the 2 joining lines. This represents the absolute center of the diameter of the part you are marking.



*TIP: You can change the starting degree of your circular text by specifying the "Angle" setting of your Object Parameters. Just as shown in the display below.*

Xp= 0	Select	N
Yp= 0	Angle	45
H = 3	Circ.	1
W= 2	Rad	20

Keeping it simple, we are going to use a basic setup for our example program that we are making.

Xp= 15	Select	N
Yp= 25	Angle	0
H = 5	Horz.	
W= 3	Rad	0

After you are satisfied with the settings you have made for your object, just press **Enter** on your keyboard to confirm the settings. At this time it is a good idea to press **F2** to save your current progress for your program. Continue to create the program you want by using the same procedures for any of the other objects listed on pages 16-17.

## SELECTING A FONT

Unimark gives us the ability to change the fonts we are using for marking the programs. There are a variety of different ones installed in the memory of the controller that you can try and pick for your marking application. For instructions on how to do this, see Page 32.

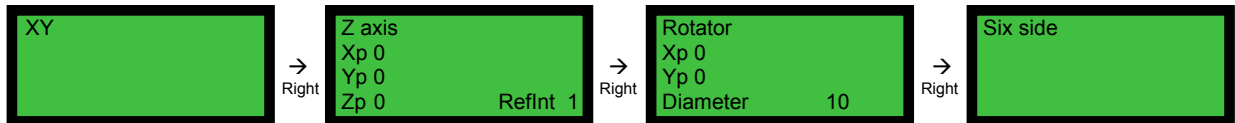
## CHAPTER 6 – 3<sup>rd</sup> Axis Setup

After you have created your marking program, it would be a good time to setup a 3<sup>rd</sup> axis component of your marker. Assuming that you have purchased one for your machine, please continue to read this section to learn how to enable the 3<sup>rd</sup> axis as well as how to configure it. If you do NOT have a 3<sup>rd</sup> axis for your machine, please feel free to skip this chapter.

One of the most common 3<sup>rd</sup> axis components purchased for your marker is a Z-Axis. This is mounted directly to the Y Axis of the EASY MARKER. Whether it is a stepper, servo or even a pneumatic model, this section will tell you how to initialize it for your marking program. The newer systems (*v5.45 and greater*) have a second page in the Object Parameters which contains a Z-Axis coordinate specific to each object in the program. (**See Page 18**) Some of the older systems however do not have this function; they simply have a single taught Z-Axis position for the entire program

## INITIALIZING THE 3<sup>rd</sup> Axis

Inside your marking program, go to the Object Selection menu where you can see a list of all of the Objects in your marking program. At this time press the **F6** key to bring up the 3<sup>rd</sup> axis menu.



The example boxes above show the different options available using the 3<sup>rd</sup> axis menu. You can cycle through these different modes using the arrow keys and press enter to select this option for your program.

**XY:** This is the standard 2 axis operational mode. This comes up by default with all new programs.

**Z Axis:** This machine is not applicable with a Z axis (**IGNOR THIS OPTION**).

**Rotator:** If you purchased an additional rotator axis, this would be where you can program its starting location for your marking program. You must also specify the diameter of the part as well.

**Six side:** This is also a rotator option that will mark a hex stock evenly with Six Sides to it. It has pre-programmed rotational degrees so that it will always mark exactly in the right spot.

## CHAPTER 7 – MANUAL MODE

Earlier in this manual we described one of the functions programmed into Unimark is the “Manual Mode”. This useful tool is a screen that gives us the ability to manually jog the markers’ axis as well as test the marking pin.

### ENTERING MANUAL MODE

Depending on where you are at in the Unimark program, you may have to press the ESC several times to get back to the main menu. Once at the Main menu, position your cursor under “Manual Mode” and press **Enter**.

```
Manual Mode  S 1 mm
  Y+      X 5      OFF
  X-      X+ (Y) 40
  Y-
```

This screen displays quite a bit of information. Shown here are all possible axis movements and their coordinates. Let’s break down all of the elements displayed here. In the top row we see an “S 1 mm” on page 15 the keyboard shortcuts for **F2**, **F3** and **F4** have (Movement by) in their description what this does is sets the distance the marking axis moves by each time you press the directional button. Shown in this display is 1 mm (This is the default setting). By pressing the F2, 3 and 4 buttons will change them from 0.1 to 1 to 10mm.



*This also works when using the “Teach-IN” function while positioning your objects.*

In this menu you can press the directional arrows to jog the marker in the direction you want it to move. Press the Down Arrow to bring the Y-Axis out away from home. When you do this you will see the coordinate update on the Y=40 area. If you notice there are parenthesis surrounding the Y axis label. This is indicating that the Y-axis has reached the home position sensor. When you travel away from home it will remove the ( )’s.

Also here you see where “OFF” is displayed. This is referring to the marking Pin. By pressing the **Home** and **End** keys you can turn the marking pin off and on.

In cases where you have a 3<sup>rd</sup> axis you can press the **PgUP** and **PgDOWN** buttons to jog the 3<sup>rd</sup> axis. Finally when you press the **F10** key, the marker will return all axis to the home position.

## CHAPTER 8 – SPECIAL FUNCTIONS

While you have the capability to create many different types of programs using the designed objects, you are also not limited to them. We have the capability to make some special changes to marking programs as well and get data from sources other than what is pre-entered. Reading through this chapter you'll learn about another marking method for entering data as well as how to by-pass the hardware home position sensors and use your own.

### TEMPORARY HOME POSITION

Although the marking system is equipped with proximity switches for a hardware home, Unimark will allow us to set a temporary home position for our marking program. This can be useful to decrease cycle time by staying close to the starting point of your program or by moving out of the way when reaching home is just not possible. To set this position, while in your marking program hold **Alt** and press **F6**.

Start Position

Xp: 0

Yp: 35

Zp:

Just like in your Object Parameters, you have to set the coordinates you want the Start Position to be at. Once you have them set for all of your axis, press **Enter** and Unimark will prompt you if you want to save the new settings. Then press **Y** to agree.



*Temporary home positions stay only with the program they have been set for. You can setup new positions for each program desired.*

### USING ASCII DATA

As mentioned earlier in this manual, the EASY MARKER controller has the ability to receive data from a source using the COM port to mark. The standard type of serial data recognized is ASCII. There are a few steps required to enable this function as well as a special Object in your marking program. Let's start by first listing the criteria of the ASCII transmission. Here is an example string of what should be received by the EASY MARKER controller.

**002h ASCII DATA 003h**

Without going into too long of a definition about what some of these are, let me break it down for you. The first part of this string is a hexadecimal code 002. 002 is a serial command that means "Start of Transmission" (**STX**). Then next in the string is the ASCII Data you wish to mark followed by a 003. 003 is hex for "End of Transmission" (**ETX**). There are spaces in the string above so that you can see the type more clearly however there do not need to be any spaces in the transmission unless you wish for that to be part of your mark.

Use the following Parameters for the serial transmission

**Speed= 9600, Data Bits= 8, Parity= None, Stop Bits= 1 and Flow Control= None.**

## CHAPTER 9 – SYSTEM SETTINGS

Pressing **F8** anywhere in the Unimark software will bring you to the system settings. Listed here are 4 basic sub-menus with multiple setup options and customizations for your marking application.

```
Marker Setup
Basic Setup
Start Mode
System Settings
```



*After any changes have been made, press F2 to save them to the controller.*

## MARKING SETUP

In the Marking Setup menu, you will find the most commonly accessed settings for the actually marking process. It is in this menu that you will specify the speeds and positioning rates for the marker. With the cursor under the Marker Setup, press **Enter** to view this sub-menu.

```
Vm 10      Vh 10
Vp 10      Vf 10
Ton 10
Toff 10    Ref Int. 1
```

Let's breakdown once again what we see in this sub-menu. Listed above are 7 different variables we can set to make the marker perform to its best abilities.

**Vm:** V is the abbreviation for Velocity. This setting controls on a scale of 1-10 the marking speed.

**Vp:** This setting allows us to control again from 1-10 how fast we position from home to start.

**Vh:** This setting gives us the option to change how quickly the marker will return to home after.

**Vf:** This setting gives us the ability to change the speed it moves between objects in the program.

When the marker reaches its desired coordinates, it requires a time delay for the pin to stroke out and touch the part before the marker begins to draw the object. This will eliminate an incomplete mark.

**Ton:** Is a millisecond delay timer when the marker reaches the coordinates before it moves again.

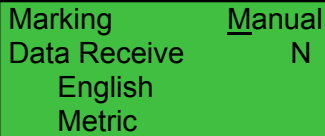
**Toff:** Is a millisecond delay timer when the marker finishes drawing the object before it moves on.

If you have a stepper motor driven marker, there are certain properties of a stepper motor that would hinder the marking if we do not control them. When a stepper motor is given a set of coordinates to drive to, it does not have any feedback from the motor indicating if it has reached its desired position. The other hindrance is that if the stepper motor does not return to a home position (0,0) which will allow the software controlling it to reset its stepping counts, occasionally we can get some drifting in the mechanics so the marker will begin to move further away from where it was intended to go. This happens gradually but it can be very bad if not accounted for. To eliminate this we have put in place the hard Home Position sensors.

In some cases however we allow the programmer to use a "Temporary Home Position" instead of the hardware home switches to decrease cycle time or just because the part being marked has an obstruction preventing it from going home constantly. So when we use this option, the marker will begin to drift further away from the desired coordinate. To counter this, we have put in place the "**Ref Int.**" setting. This setting is the number of marking cycles allowed before the marker **MUST** return to the Hardwired Home Position Sensors. While we do give you the chance to customize this, anything greater than 20 usually is where we start to see a drifting occur. Keep this number at 1 if you do not plan on using the Temporary Home Position. (Page 28)

## BASIC SETUP

In the Basic Setup menu, you can change the environment of the controller as well as what is controlling the marking. Also listed is a special function for using an ASCII String to control the data which is being marked in your program.



```
Marking      Manual
Data Receive  N
English
Metric
```

**Marking:** This setting is what tells the Unimark Program how it should expect a Start Marking Command. The default option is Manual which would require an operator to press either an external button hooked up to the start switch, or by pressing F3 on the keyboard when prompted to. There are a few other settings for this field and they are as follows.

**Manual:** Requires operator to give start signal

**Auto:** This enables the I/O signal for starting.

**AutoDB:** In specialty versions of the Unimark program, we have a Profibus module installed.

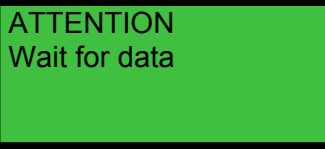
**AutoJR9:** Is a special function editor to use the Controller as a PLC as well. It can be programmed to control cylinders, sensors and other 24v devices.

The **Data Receive** line contains the option to use an ASCII String to populate date fields called "Placeholders" in our program. By turning this option on we tell the controller to look for the ASCII Data on the serial port in the beginning of the marking sequence. There are 3 different settings available here that we can enable to customize the marking environment. The first and default setting is

**N:** Simply put, this means NO

**Y:** When in this mode, the Unimark software will require a start signal either in manual mode or in any of the Auto modes. After the start has been given, it will prompt you on screen to give the data required for marking.

**S:** This option works very similar to Y although in this mode we do not require a start signal to be given. The controller is always ready to start and simply receiving the ASCII String input will give Unimark the command to Go. For more info on ASCII Marking see Page 28.



```
ATTENTION
Wait for data
```

NOTE: This is what the screen will display when Data Receive is on.

This next setting is pretty self-explanatory. There are 3 different language options available for Unimark, 2 of them are loaded into the program (**English** and *Deutsch or German*).

Lastly the **Metric** field is brought to our attention. We realize that not everyone uses the same standards of measure in this world and to accommodate as much as we can, we have implemented the ability to change between Metric and Inch. Upon changing this setting, every unit of measure including the coordinates and sizes will instantly be converted to the opposite standards equivalent.



*Even previously saved programs will change automatically to the other standard of measure.*

*NOTE: it is easier to make adjustments when in the metric setting because of their avid use of Whole Numbers. If you do not have a preference, leave it in Metric (you'll find it's a lot easier!).*

## START MODE

In the Start Mode menu, you will be able to dictate what happens when the controller powers up. Normally when the controller starts it will take you directly to the main menu. We can change this rule by setting up some of the parameters in this menu.

```
Current  
columbia.STD  
Quick start      File
```

Taking a look at the screen, the top line is just simply a heading. The 2<sup>nd</sup> line tells us which program is going to be the active program when the controller powers up. The only way we can set which program this is, is to have it open when we enter these settings. After you configured this menu, you must press F2 to save the settings. Doing this will set the currently active program, to startup when Unimark loads.

From here you can set the mode you want the controller to start up with under the “Quick Start” heading. There are only 3 available settings for this option.

**FILE:** Will open the saved program automatically for editing when the controller starts

**Auto:** Again the saved program will start in Automatic mode waiting for the start signal. This should be used when programming the controller for integration.

**N:** When this option is selected, the controller will not boot to a configuration, it will simply load to the Main Menu and wait for you to set it up.

## SYSTEM SETTINGS

Entering this menu will bring you to 3 other Sub-Menu’s which contain information which most of the dynamic objects refer to for their data.

```
Date Time Setup  
Shift Setup  
Fonts Setup
```

The top menu Date Time Setup is where you set the accurate time and date just as you would for your computer at work or home. Press Enter to see this menu.

Shown here are the current settings for the Controllers Time and Date. You can tab your way through these fields and use the arrow keys up and down to increment the numbers to their correct setting. Notice that Unimark does give you the format to follow above each field to set.

```
DD:MM:YYYY  
25:12:2007  
HH:mm  
16:30
```



*Unimark does NOT adjust for daylight savings time automatically. You must change them when the time comes.*

Next is the Shift Setup. The “Shift” refers to a shift that is used in your facility. Some places are open 24 hours a day and there are usually 3 shifts of people to operate the machinery. These shifts start at different times throughout the day and are given different values to refer to them.

Start	Ident
E: 06:00	F
L: 17:00	M
N: 22:00	N

Here we have a sub-menu which allows us to setup the different shifts that would be available in your facility. The left column under the "Start" is the Military time for the beginning of the shift. "Ident" is the character that will be marked to identify the current shift upon the time of marking. Just like before, **Tab** your way through these fields and use the arrow keys to adjust these settings.

Along with a slew of other available options in the Unimark program, we also offer the ability to change the marking font. The font which comes pre-loaded as the default font is called Font\_Std. This is a vector based font that utilizes the least amount of movements to create the character resulting in a faster marking time. However if cycle time is not your issue and you're going for look, then we have many more fonts to offer.

Once a font has been selected, it is chosen for every marking program that is going to be or has already been created. The active font will be marked and does not change unless manually set to a different font. There are also a few specialty fonts that we've created for custom marking applications. In some cases the customer wants to mount the marking head 180 deg. so the stylus is pointing upwards and marking in this direction. We have created a font just for this which mirrors all marking so that the result will be perfectly legible.

To access this Font Selection area, press **F8** on your keyboard to enter the system settings.

Marker Setup
Basic Setup
Start Mode
<u>S</u> ystem Settings

Put your cursor under the "**System Settings**" option and press **Enter** to access this menu.

Date Time Setup
Shift Setup
<u>F</u> onts Setup

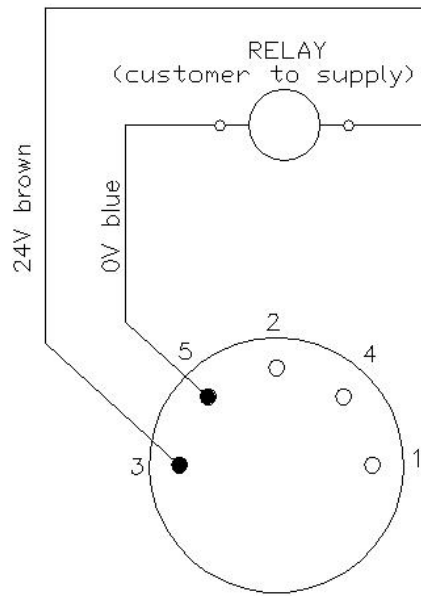
Move down to the "**Fonts Setup**" option and press **Enter** again.

[FONT_STD.DEF]
<u>D</u> in1451.DEF
Din1451B.DEF
Font.DEF

Much like the Program Selection menu, the Active font is listed at the top of the screen and surrounded by brackets. Scroll through the list and try out each font to see which one meets your application best.

To set the active font, put your cursor under the font name and press **Enter**. In order for the changes to take effect you must restart your controller immediately following the change. This will set the active font to the newly selected one.

## OUTPUT WIRING DIAGRAM

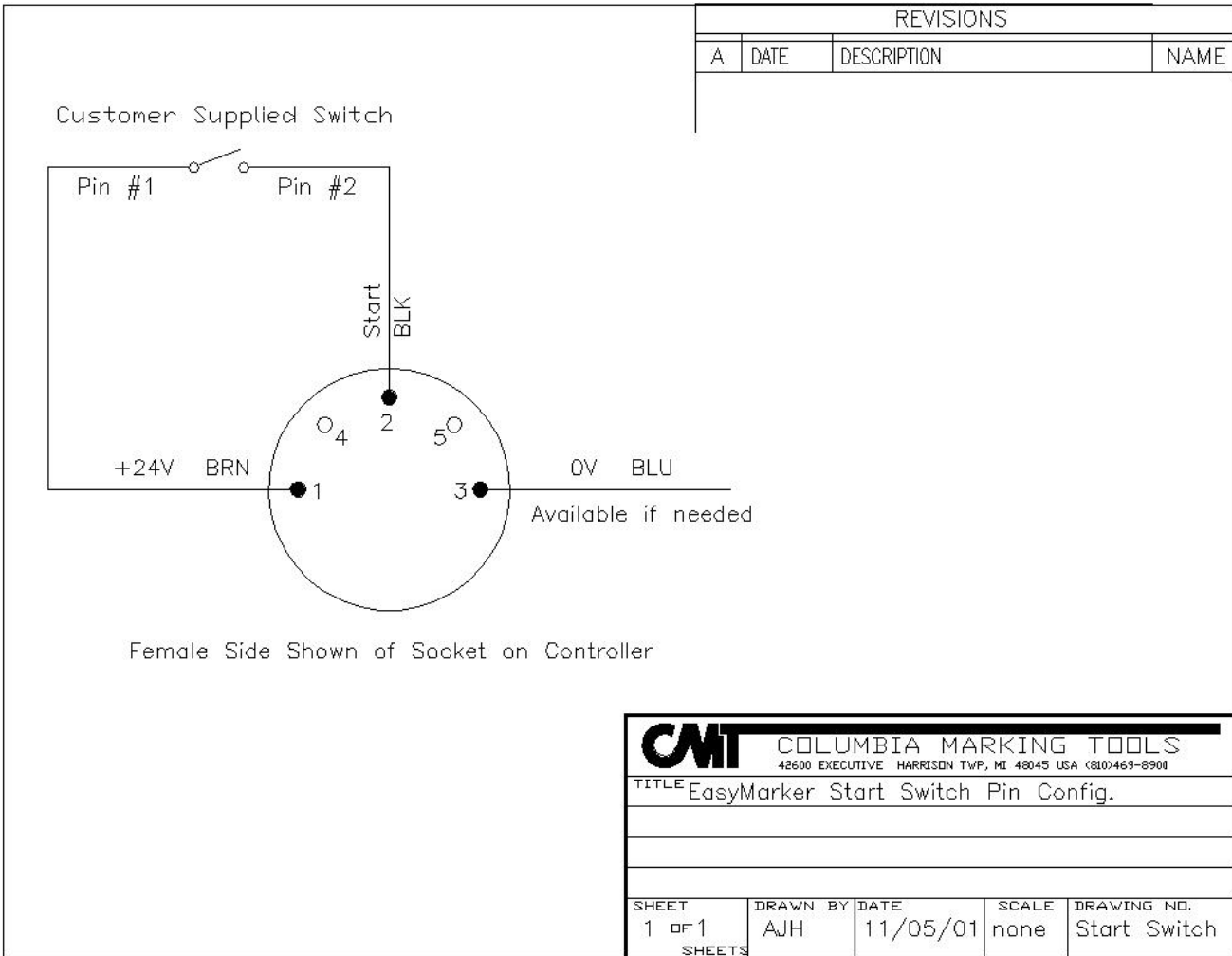


Female Side Shown of Socket on Controller

<b>CMT</b> COLUMBIA MARKING TOOLS 42600 EXECUTIVE HARRISON TWP, MI 48045 USA (810)469-8901				
TITLE EASYMARKER OUTPUT SWITCH PIN CONFIG				
SHEET	DRAWN BY	DATE	SCALE	DRAWING NO.
1 OF 1 SHEETS	kad	09/20/04	NONE	OUTPUT SWITCH

Above is the wiring diagram for the Output Connector on the Easy Marker controller. You can get a connector that works with this outlet from H.H. Barnum: using **Part Number: Lumberg SV50**  
 The output from this switch comes on at the ending of the marking cycle when it has finished marking its last object. (See page 11 for sequence timing chart)

# START SWITCH WIRING DIAGRAM



Above is the wiring diagram for the Output Connector on the Easy Marker controller. You can get a connector that works with this outlet from H.H. Barnum: using **Part Number:** Lumberg SV50.

**TIP:** The 0vdc is provided in case your device you are trying to connect to requires it. It is not necessary to have this connected.

The input from this start switch can work in any of the Auto or Manual modes. They will replace the action of pressing F3 to start as well as replace the input from a PLC.

## Preventative Maintenance Schedule

The Following P.M. Tasks are to be performed according to the Recommended Time Schedules for best results and life expectancy.

### MARKER CONTROLLER:

Time Frame Item	Location of Item	Description of Process
*1 Month Fan Filter	Bottom of Marker Controller	Remove the cover for the particle filter and clean off the built up debris with air pressure or wash or replace.
*1 Month Cooling Fan	Bottom of Marker Controller	After removing the cover for the filter, examine the fan. Ensure no vibration or grinding rather it freely spins
*6 Months Cables/ Connectors	Bottom Exterior of Cabinet	Be sure cables are tight and free from strain or excessive tension. Ensure pins inside cabinet are seated. Check cables for burned or melted spots on shielding.

### MARKING HEAD:

Time Frame Item	Location of Item	Description of Process
*1 Month Cables/ Connectors	Ends of Marker and Top of Head	Be sure cables are tight and free from strain or excessive tension. Ensure locking collars are secured, Cables intact.
*1 Month Marking Pin Pin Shaft	End of Marking Head in Pin Housing Pin Housing screws onto this	Inspect the diamond for chip, be sure the pin has not been bent or over flexed pin should be rigid and straight. Pin Shaft should not have lateral movement when testing. Make minor tighten to set screw on backside of head if loose
*1 Month Solenoid	Inside Marker Head cable connected	Remove rear cap from head 2x 5mm S.H.C.S. and inspect solenoid for carbon debris or burn smell. Replace if carbon debris in marker head.
*6 Months Bellows	Top of X and Y Axis	Inspect for Weld Flash burns or wear. Replace every 6 months.
*6 Months Ball screw & Nut	X and Y Axis	Remove Bellows from Axis, Clean and inspect Ball Screws and Ball Nut. Should move freely when power OFF. Grease with a Teflon Grease.
*6 Months Rail & Bearings Bearing Blocks	X and Y Axis End of Ball screws X and Y Axis	Inspect rails for damage or chips. Clean and re-lubricate with Teflon Grease. If marker has play front to back with Power ON the marker, bearing blocks need to be loosened, moved closer and retightened to remove excess play.
*6 Months Marker Exterior Prox & Limit Switch	Entire Marking Head Outside on Bracket and Inside Axis	Inspect the Marker for any physical damage to Axis and Connectors as well as pin damage. Inspect the Limit switches to ensure working properly. Should "Click" when lever depressed. Check wires for damage and sheath for cuts. Check exterior prox switches for tightness and distance to Dog Block.
*18 Months Cables	Cables and Connectors	Every 18 Months replace cables sets for marking system. ALL cables.

Columbia Marking Tools is recommending that at least once a year the marking heads to be sent into CMT to be disassembled, cleaned, inspected, lubricated, reassembled and thoroughly tested. Keeping a spare marking system in stock would allow one Unit to return to CMT at a time without affecting production marking. Pins should also be replaced at least once per year or as needed.

\* DISCLAIMER: Depending on the environment of the marking unit, some harsher environments may warrant a more frequent examination of items listed.

## CHAPTER 10 – TROUBLE SHOOTING

Contained in this chapter is a Trouble Shooting guide to help the operator better understand any errors that might occur and what can be done to resolve them. There will be a few different sections, some by the actions the marker is performing and others by error messages shown on the HID Display.

### ERROR MESSAGES

**EMERGENCY STOP  
ACTIVE, RELEASE  
EMERGENCY STOP**

This is one of the most common error messages, especially when you are setting up the Marker for the first time. This message depending on what system you have, could mean that the E-Stop signal on the Input has been dropped.

To correct this, verify that the circuit has been remade or that the signal on pin 21 (page 11) has been restored to a High 24v again.

**EMERGENCY STOP  
RELEASED, RESET  
EMERGENCY STOP**

After you have restored the Emergency stop signal, it is required that you issue a Reset Signal to the controller. Send +24vdc to pin 20 on the input card to do this (page 11).

**ERROR  
Y-Axis  
limit switch  
Not Reached!**

This message could mean a lot of things. The basic idea behind it is that during the homing sequence of the marker, the particular axis was un-able to make it to the home position. This could be cause by several things. Let's take a look at the possibilities of what might cause this.

- 1.) Cable is not connected or has a loose fit connection.
- 2.) Pin contacts inside of the cable are loose or missing.
- 3.) The Proximity switch located inside of the marking head are not adjusted correctly to pick up the prox. dog when the marker is in the home position. Adjust it to be 2mm away from prox. dog.
- 4.) The motor is burned out. You will be able to tell this because when there is power to the head and it should be operational, on that particular axis there will be no resistance when you physically try to move it.
- 5.) Cable has a short, if the cable has a short particularly in the Servo systems, the motor that is connected to it will be RED HOT! The motor is vibrating back and forth constantly trying to locate the encoder position. If the cable is bad it will not get any response indicating a position so it will continue to look and become very hot.
- 6.) The Drive card located in the markers controller is burned out. This is obvious when the RED LED on the drive card itself is not illuminated. To locate which drive card belongs to which axis, follow the cable from the connector to the drive board.

**Attention  
Wait for data**

This message occurs if the "Data Receive" option in Basic Setup is set on. What is happening is that the Serial port on the back of the controller is waiting for ASCII data to be sent in

**Ready for  
Start  
Signumeric**

When in the "Online" mode and you trigger the marker to start through the I/O, sometimes the signal that comes from the Controller which goes to a PC running Signumeric does not reach the computer. This will result in the following error message which is indicating that the controller is now waiting for the marking data to come from Signumeric. Press the Start Button on the Signumeric program to begin marking. If the problem persists it is because the software on the controller does not match the software version of Signumeric. Call Tech support at CMT with the versions of each for help.

**Marking area to the  
right exceeded!!**

When programming or teaching in the position of your objects, if your objects position will result in it printing outside of the marking area it will give you the error message shown here. Notice in the error message it shows which direction the over travel will occur. (RIGHT). To correct this, either re-teach or adjust your coordinates in the opposite direction of the over travel. You can also see the directions, Up, Down, Right and Left.

## MARKER SYMPTOMS

### **PIN NOT WORKING:**

If your marking pin is not functioning properly verify the following items.

- 1.) There is pressure to the marking head.
- 2.) PSI is turned up high enough to bypass internal resistive spring pressure (20 PSI)
- 3.) Cables are connected from controller to marking head and are not shorted out.
- 4.) 4 amp fuse on the upper left hand corner on the backside of the marking controller is not blown.
- 5.) Check that pin is freely moving by hand. Remove from head and depress piston to check spring is working and pin is free.

### **EMERGENCY STOP ACTIVATED:**

If the Emergency Stop message is on and you can't figure out why, check these items.

- 1.) There is an active +24v to pin Number 21 on the Input Connector and all of your 0v connections are made. Reference these connections on (Page 10)
- 2.) 4 amp fuse on the upper left hand corner on the backside of the marking controller is not blown.

### **AXIS IS NOT MOVING:**

If one of the marking axes is working when the other(s) is not, perform these checks.

- 1.) When Power is on the marker and the E-Stop circuit is activated, physically move the marking head from one side to the next to verify that the motors have power. If NO resistance, perform steps listed under A else B.  
**A-**
  - 1.) *Verify the cables are connected properly and terminated at both ends into their appropriate outlets.*
  - 2.) *Try to jog the axis in Manual Mode (Page 26).*
  - 3.) *Open the controller cover by removing the 4 screws on the top section. There are 2 drivers inside and they should have a green light on them indicating power and a good connection. If there is NO green light, call CMT for more information.*  
**B-**
  - 1.) *Verify that there are no obstructions to the axis moving.*
  - 2.) *Check depth of insertion of mounting screw (NO MORE THAN 3/8" DEPTH).*
  - 3.) *Try to jog the axis in Manual Mode (Page 26).*

For any other questions or errors you may be having, please contact the Technical Support at CMT.

Tech Support:  
Columbia Marking Tools  
27430 Luckino Drive,  
Chesterfield, MI. 48047

Monday – Friday  
7:00 AM – 4:30 PM EST  
1 (586) 949-8400



