TELEMARK

PROGRAMMABLE SWEEP

INSTRUCTION MANUAL

Software version 1.0.18228

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Current version of this manual can be found at
https://telemark.com/e-beam-power-supplies/sweep-controllers/

WARRANTY

This Digital Sweep for electron beam sources is guaranteed against faulty materials, function, and workmanship for a period of 12 months after delivery from Telemark.

This warranty is valid only for normal use where regular maintenance is performed as instructed. This warranty shall not apply if repair has been performed or an alteration made by anyone other than an authorized Telemark representative or if a malfunction occurs through abuse, misuse, negligence, or accident. No charge will be made for repairs made under warranty at Telemark's facilities. Defective parts will be repaired or replaced at Telemark's discretion. Customer is responsible for freight charges to Telemark's facility.

USER RESPONSIBILITY

The user is responsible for proper operation and maintenance of the equipment, following procedures described in this manual, including reference documents. Proper operation includes timely replacement of parts that are missing, broken, or plainly worn. If the user has a reasonable doubt about understanding the use or installation of a component, Telemark or your local representative should be called.

It is vitally important that the user properly installs the equipment as described in Chapter 3 (Installation) of this manual, playing particular attention to the correct grounding methods described.

The Warranty shall be void if the equipment is improperly installed and/or grounded.

CHANGE LOG

1.0.18228

Changed

- Change pocket setup to 9-point pocket setup.

Added

- 45 degree offset for some non-Telemark e-beam sources

0.42.18149

Fixed

- Fixed problem of Sin/Triangle shape not being able to move all the way to the outer edge.

0.41.18123

Added

- Added Calibration to Avatar joystick.

0.40.18110

Added

- Added forced remote mode.

0.36.18023

Changed

- Update internal hardware support.

0.28.18023

Changed

- Changed Background of shape edit to gray and add green crosshairs.
- Changed joystick control to move shapes to edge of available pocket.

0.17.17293

Changed

- Reduced speeds for Rate joystick.
- Added support for Proportional joystick.

0.16.17288

Changed

- Joystick response with Pocket setup - now same as standard sweep.

0.15.17269

Add

- Add BIP output relay response to negative values

TABLE OF CONTENTS

1 UNPACKING 7

2 DESCRIPTION 8

- Specifications 8
  - Sweep Generator 8
  - Control 8

3 INSTALLATION 9

- Sweep Module 9
  - Hand Held Joystick Sweep Remote Control 9
  - Rear Panel 10
- Remote Control Input 10
- Remote Control Output 10

4 CONTROLS AND INDICATORS 14

- Controller 14
- Handheld 15
  - 4-way Momentary switch 15

5 CONFIGURATION 16

- Unlocking 16
- Configure System 16
  - Screen Saver 16
  - Input 17
  - Beam in Pocket (BIP) 18
  - Angle Offset 18
  - Lat/Long Flip 18
  - Factory Service 19
- Remote operation 19
- Pattern Pocket Setup 20
- Copy Pocket Setup 21
- Configure Pattern 21
- Display Tail Length 22
- Profile 22

Pattern Configuration Setup 23
Triangle 23
Sine 24
Figure 8 25
Line 25
Circle 26
Spiral 26
Point 27
Programmable Shape 27
Making Programmable Shapes 28

6 OPERATION 30
General Operation 30
Power-Up 30
Power-Down 30
Pattern Selection 31
Pattern Shift 31
Run On/Off 32
Remote On/Off 33

7 ERRORS AND WARNINGS 34
Error Codes 34
Interlock Fail 34

1

UNPACKING

Your Programmable Digital Sweep is packed into a specially designed double strength box and surrounded with two and a half inches of rigid foam padding. Since packaging the Digital Sweep for safe shipment is otherwise difficult, please save the box in the event that the Digital Sweep ever needs to be returned for servicing. Telemark cannot be held liable for units which are damaged in transit as a result of improper packaging.

Contents of the box are, the Sweep Module, Joystick Module and installation kit. The installation kit includes: cables and an extra set of fuses. Please check the packing list to make sure that no damage has occurred in transit. The sweep is ruggedly built and packaged tightly to prevent damage. In the event of any deficiencies, please report them to your vendor immediately. Also take care to read the warranty regarding the limits of Telemark's liabilities.

2

DESCRIPTION

The Programmable Digital Sweep's most notable features:

The Telemark Programmable Sweep has seven built –in patterns and 32 user programmable patterns; it is intended for use with electron beam (EB) sources such as the Telemark line of EB sources and with other compatible EB sources that use electromagnetic deflection or combinations of electromagnetic deflection and permanent magnet focusing.

The Sweep outputs user adjustable patterns to EB sources. A Sweep is needed for positioning and moving the e-beam around the source's crucible pocket in a defined pattern. The beam movement helps heat (and evaporate) the crucible pocket's material more evenly. Sweeping is accomplished by running current through magnetic coils next to the crucible pocket. An output runs to each of two coils (latitude and longitudinal), which are placed perpendicularly to each other. Their magnetic fields affect the position/motion of the electron beam.

A simple front panel touchscreen color LCD (liquid crystal display) and handheld joystick interface are used to configure and run EB sweep patterns. The LCD display allows for easy visualization of each pattern. The LCD panel prompts the user through the various steps of a normal operation.

Specifications

Sweep Generator

Input voltage: 90-264 volts, 1-phase, 47-63 Hz.

Output current: Dual Channel (Longitudinal and Lateral):

Part number 135-0700-1 Controller: plus or minus 1.5 amps. Maximum into a load with an impedance of less than 15 ohms. (Telemark standard coils)

Part number 135-0700-2 Controller: plus or minus 3.0 amps. Maximum into a load with an impedance of less than 3.8 ohms. (for non-Telemark sources)

Rotational resolution of 360 steps (1deg. Rotational resolution)

Control

Front Panel touchscreen, LCD display 480 x 272

Handheld Joystick

External Pattern Selection:

Binary 1=00000, up to 32 patterns

Binary 1=00001, up to 32 patterns

Individual, up to 8 patterns directly

3

INSTALLATION

Sweep Module

Figure 3-A, Front Panel

The Electron Beam source (EB source) Sweep is designed to be mounted in a standard 19 inch electronic instrument cabinet. Other suitable places on a vacuum system may be used. The installation procedures are described below.

Hand Held Joystick Sweep Remote Control

Figure 3-B, Avatar Sweep Handheld

The Digital Sweep Handheld (Joystick) controls Position and some setup functions. The Digital Sweep handheld plugs into the 9 pin D connector marked **HANDHELD** on the front panel.

Rear Panel

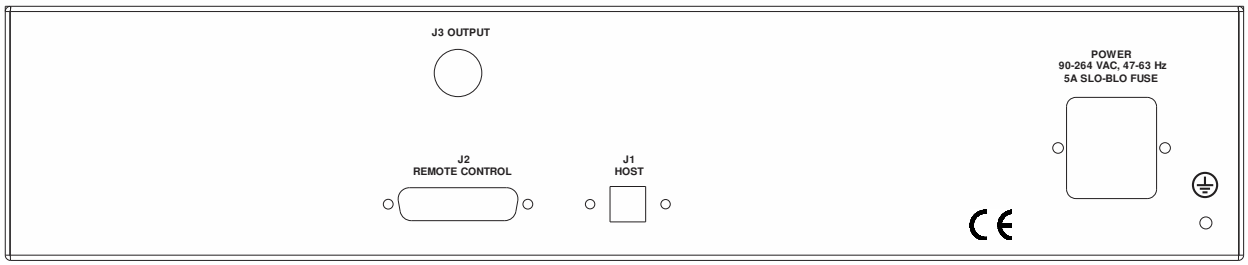


Figure 3-C, Rear Panel

1 **VAC input** - The AC voltage input can be 90-264 VAC and 47-63Hz.

2 **Fuses** - Use only 5A Slow-blow fuses.

3 **Ground** – attach ground to the provided ground screw.

4 **Host, J1** – Factory used USB port to update sweep software. **IF J1 IS CONNECTED TO A PC THE DIGITAL SWEEP WILL AUTOMATICALLY GO IN TO DOWNLOAD MODE.**

5 **Remote Control, J2** - 15-pin male D-sub remote PLC port/Sweep-select jack. (see figure 3-D for connections)

Remote Control Input

(5V maximum compliant)

When in Remote mode and a signal has selected a pattern that pattern will run. If no valid pattern is selected then no pattern is output. The Run indicator and the Remote indicator will turn red when the pattern is being output to the EB Source coils. See chapter 5 for configurations.

Note: Inputs are contact closure to sweep reference. **Input voltages greater than 5VDC may damage the Digital Sweep.**

Force Remote Mode – When this pin is closed to the return pin then the sweep is placed in remote mode.

Remote Control Output

(50V maximum compliant)

Outputs are a contact closure (dry contacts) inside the Digital Sweep.

Sweep Remote – A signal is sent out when the user has put the Digital Sweep in remote mode.

Sweep Run – A signal is sent out when there is output going to the EB source coils.

Sweep Ready – A signal is sent out when the Digital Sweep is ready and operational.

BIP – Beam in pocket signal can be off or lateral or longitudinal. If lateral or longitudinal it can be used as a bias current status relay (for instance for SLOAN sources, AP&T sources, and some JEOL sources). BIP relay is activated when BIP is enabled and the current on the BIP axis greater than + or - 500 mA.

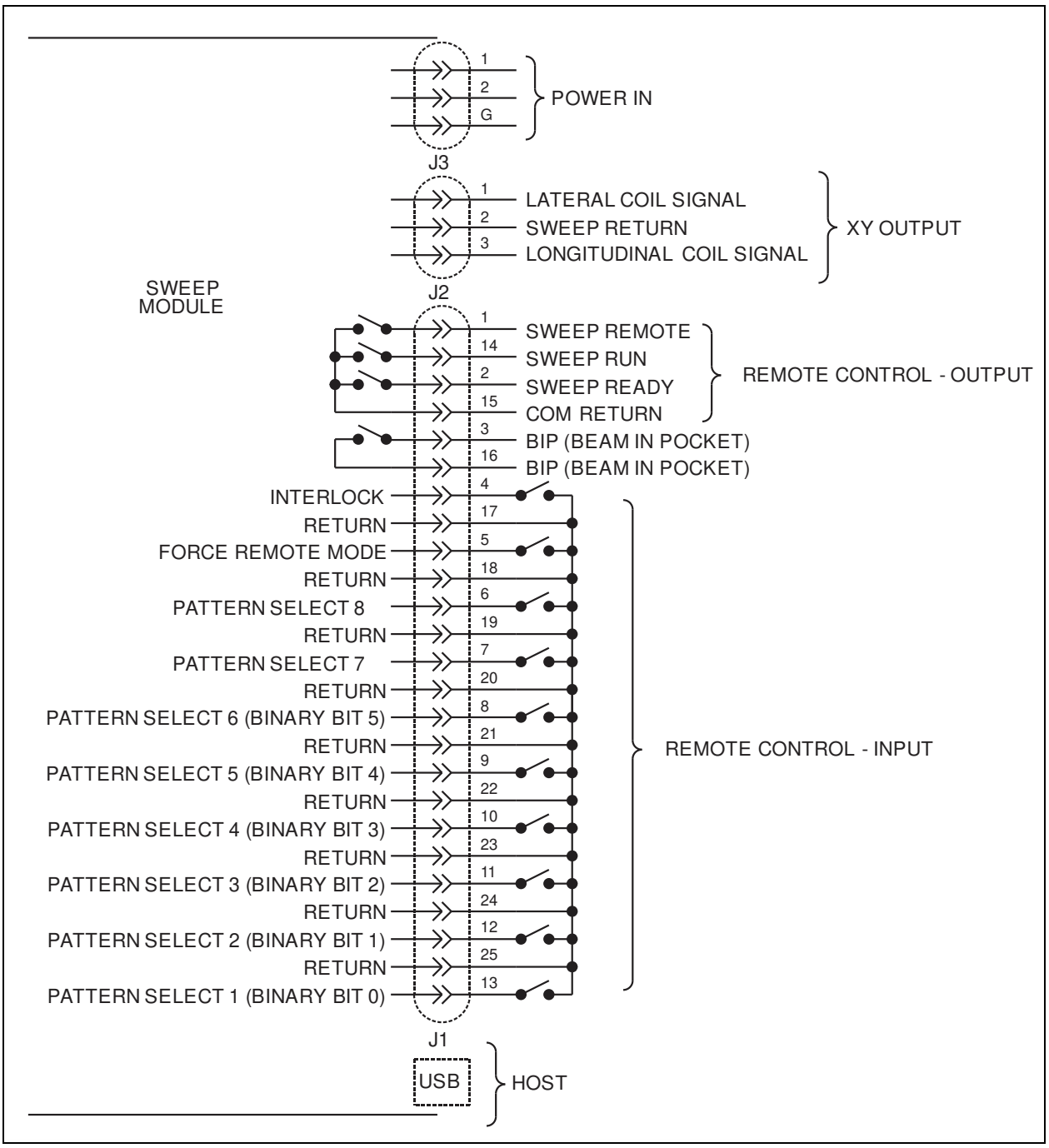


Figure 3-D, Connections

Output, J3 - Connection of the sweep generator to the EB Source is shown in Figure 3-D, 3-E, 3-F, 3-G or 3-H. The horizontal and lateral coils should be brought out of the tank by way of a feedthrough and connected to pins 1, 2, 3 of J3 on the Sweep Module as shown. The interconnecting wire must be capable of passing a minimum of two amperes. The return wire is shared by both longitudinal and lateral coils. The sweep voltage is grounded inside the sweeper. However, you should connect the return wire to ground at the EB source end. To leave the return wire ungrounded could damage the sweeper. Normally one side of each coil is connected to ground at the electron beam source. The return wire is connected to the same spot inside the tank. The Lat and Long direction can be change in the **Config System** menu by pressing **Lat Flip** and or **Long Flip**.

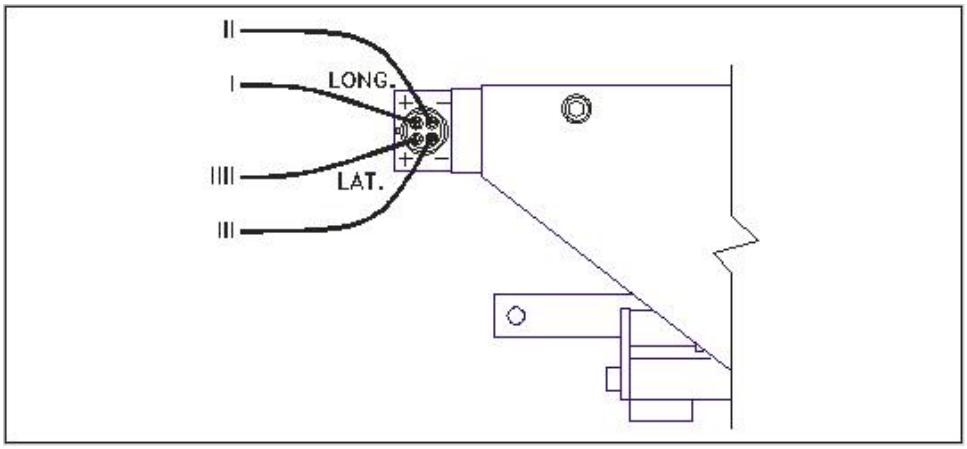


Figure 3-E, Telemark standard Coil Wire Reference Code

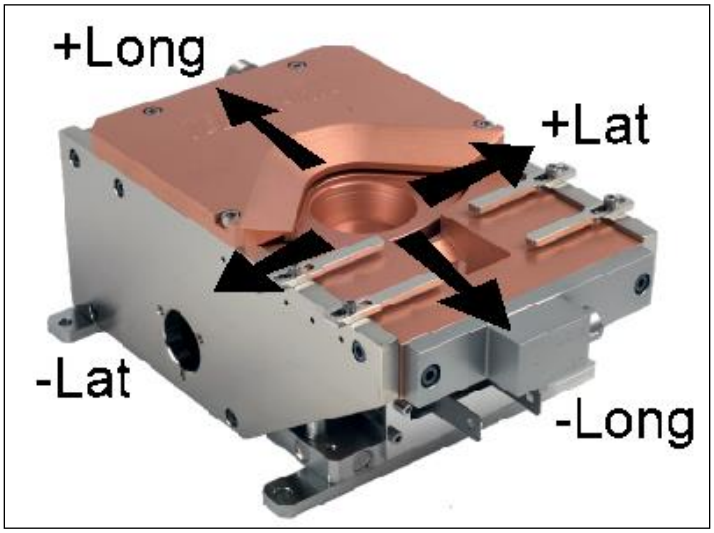


Figure 3-F, Telemark Source Standard Direction Reference

Note: the EB source Latitude and longitude coils can be connected in any manner needed to change the preferred viewing orientation as long as the Sweep Return is connected to ground.

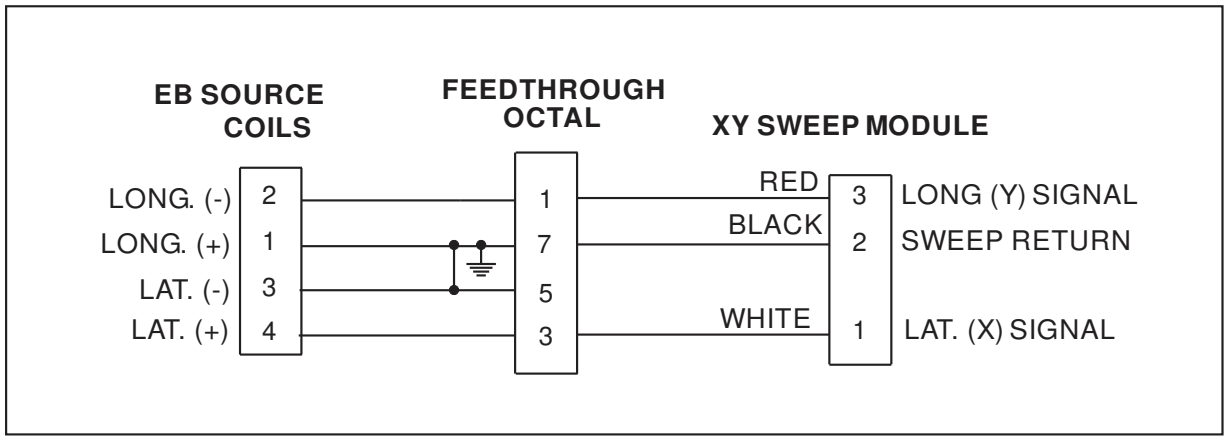


Figure 3-G, Typical 8 pin Sweep/coil Installation

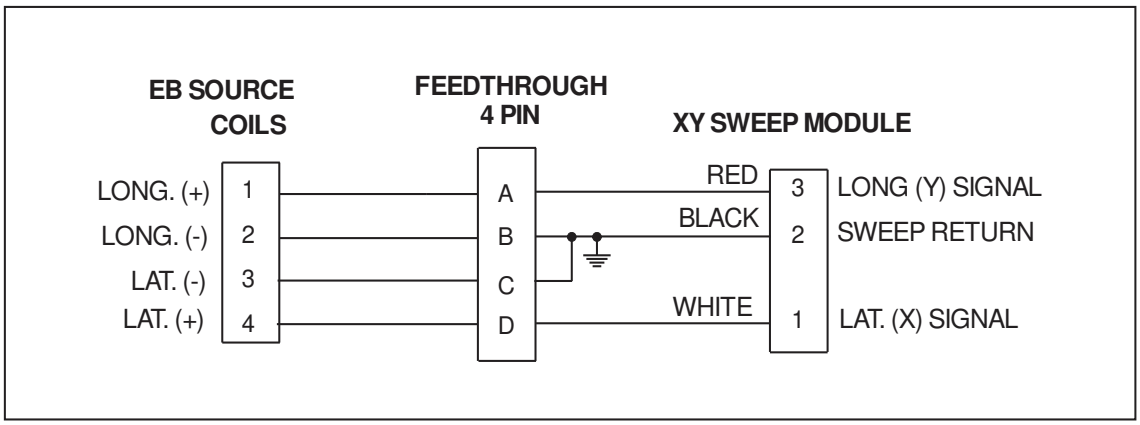


Figure 3-H, Typical 4 Pin Sweep/coil Installation

4

CONTROLS AND INDICATORS

Controller

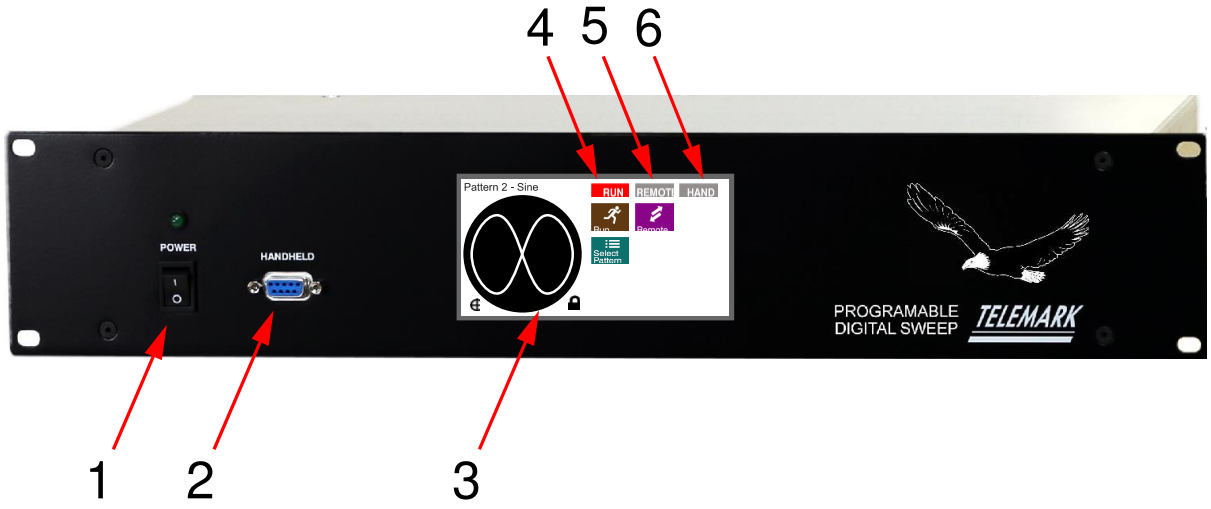


Figure 4-A, Programmable Digital Sweep

1 **POWER** - V.A.C. input power ON/OFF switch.

2 **HANDHELD** - 9-pin female D-sub port for Joystick

3 **LCD touch screen** – Human interface and displays menu choices and displays pattern identification and timings.

4 **RUN Indication** – RUN is indicated in red when a sweep pattern is running.

5 **REMOTE CONTROL Indication** – REMOTE is indicated in red when the unit is being controlled by a remote PLC through J2 on the back panel.

6 **HANDHELD Indication** – HANDHELD is indicated if joystick is plugged in and operational.

Handheld

Figure 4-B, Avatar Sweep Handheld

The Avatar Handheld has two control areas. It is connected to the front panel of the Sweep controller via a 9-pin D-sub Male connector. At the top of the handheld is a 4 way momentary switch with an OK button. The joystick the provides direct 1 to 1 positioning of the beam in the usable area of the source pocket.

The handheld Joystick is required in **Run Off mode** if movement of the e-beam position is desired. It is optional to use in the **Set up mode** because values can also be adjusted via the touchscreen.

4-way Momentary switch

1. **Pocket Location/Size Setup** – The joystick is used to set the center and diameter of the pocket, see configuration chapter for more information.

2. **Pattern Setup** – The joystick can be used to set the sweep Frequency, Amplitude and other variables for each pattern, see configuration chapter for more information.

Avatar Joystick

The joystick controls the latitudinal and longitudinal beam position.

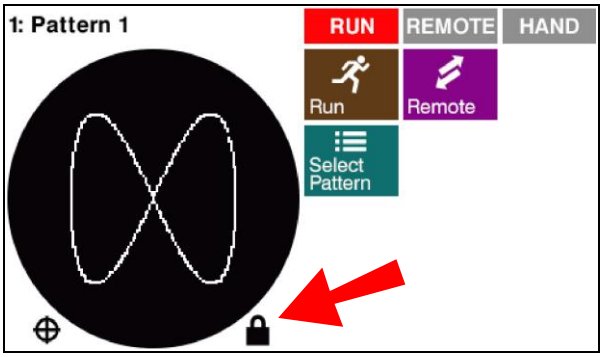
1. **Run Off Mode** – The joystick directly controls the e-beam output position, allowing the user to precondition the material manually. The Joystick lever controls direction of beam: left [-] & right [+] controls the lateral direction; near [-] (as seen from the EB source emitter) & far [+] controls the longitudinal direction.

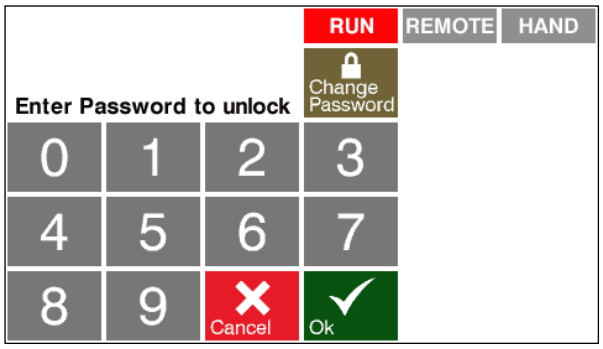
2. **Pattern Shift** – The joystick is used to move the center of the pattern in run mode, see operation chapter for more information.

5

CONFIGURATION

Unlocking

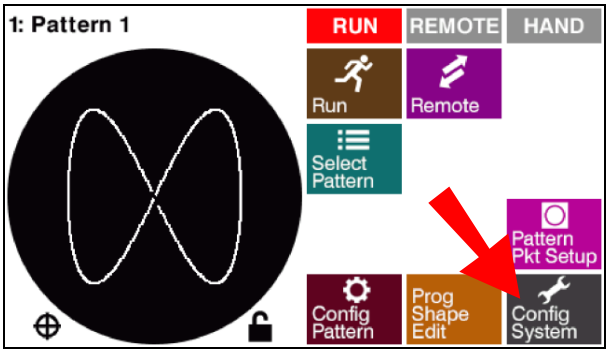


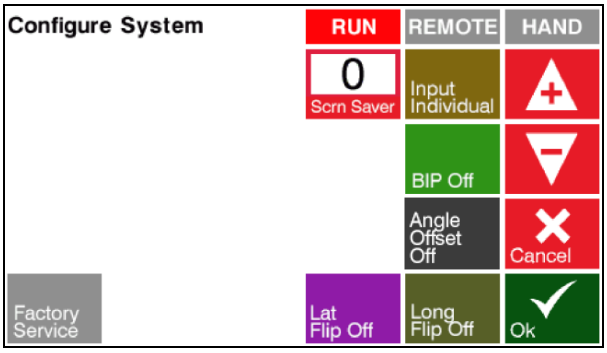


To configure the sweep first it must be unlocked. Press the “lock” to unlock the sweep and enter the password.

The default password is “1234”. The password can be changed at this time by pressing the **Change Password** button. Once the sweep is unlocked it will stay unlocked until it is locked by pressing the **lock** or by turning the power off.

Configure System





Screen Saver

The screen saver can be set to 0 to 300 minutes in 5 minutes increments. Zero is off.

Input

Selecting a pattern from a PLC or other device can be done by one of the three following ways using the inputs on the 25 pin connector, see chapter 3 connections:

1. **Input Binary 1=00000 -** up to 32 patterns
2. **Input Binary 1=00001-** up to 32 patterns
3. **Input Individual -** up to 8 patterns directly

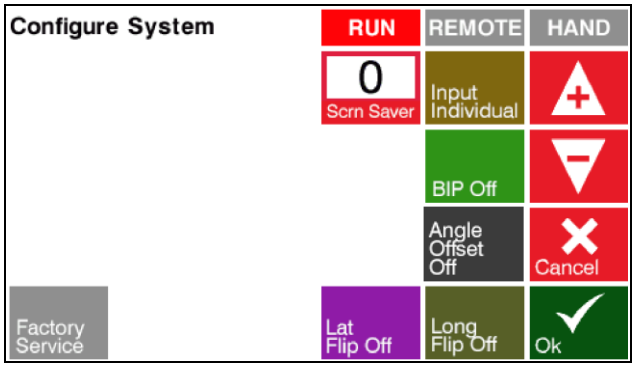
See table below for binary code

"Binary 1=00000" Number	"Binary 1=00001" Number	Binary Bit 5 (J2- 8)	Binary Bit 4 (J2- 9)	Binary Bit 3 (J2- 10)	Binary Bit 2 (J2- 11)	Binary Bit 1 (J2- 12)	Binary Bit 0 (J2- 13)
1	1*	0	0	0	0	0	0
2	1*	0	0	0	0	0	1
3	2	0	0	0	0	1	0
4	3	0	0	0	0	1	1
5	4	0	0	0	1	0	0
6	5	0	0	0	1	0	1
7	6	0	0	0	1	1	0
8	7	0	0	0	1	1	1
9	8	0	0	1	0	0	0
10	9	0	0	1	0	0	1
11	10	0	0	1	0	1	0
12	11	0	0	1	0	1	1
13	12	0	0	1	1	0	0
14	13	0	0	1	1	0	1
15	14	0	0	1	1	1	0
16	15	0	0	1	1	1	1
17	16	0	1	0	0	0	0
18	17	0	1	0	0	0	1
19	18	0	1	0	0	1	0
20	19	0	1	0	0	1	1
21	20	0	1	0	1	0	0
22	21	0	1	0	1	0	1
23	22	0	1	0	1	1	0
24	23	0	1	0	1	1	1
25	24	0	1	1	0	0	0
26	25	0	1	1	0	0	1
27	26	0	1	1	0	1	0
28	27	0	1	1	0	1	1
29	28	0	1	1	1	0	0
30	29	0	1	1	1	0	1
31	30	0	1	1	1	1	0
32	31	0	1	1	1	1	1
-	32	1	0	0	0	0	0

1 = CLOSED, 0 = OPEN

* Note in "Binary 1=00001" mode, 00001 and 00000 both equal one.

Beam in Pocket (BIP)

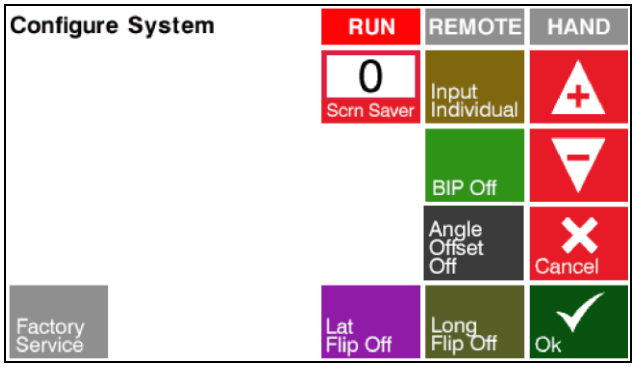


Beam in pocket is used for some non-Telemark e-beam sources that require lateral or longitudinal signal that the beam is in the pocket.

The output BIP contacts close when the current on the BIP axis coil is greater than + or - 500 mA. See chapter 3 for the 25 pin connector connections for the following three modes:

1. **BIP Off** – BIP relay not activated (Telemark E-beam Sources)
2. **BIP Lat** – BIP relay activated when current on lateral axis is greater than + or - 500 mA.
3. **BIP Long** – BIP relay activated when current on longitudinal axis is greater than + or - 500 mA.

Angle Offset

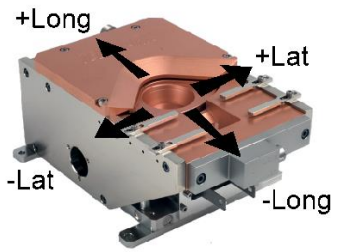


Beam in pocket is used for some non-Telemark e-beam sources that require a +/-45 degree rotation of the output lateral or longitudinal signals to the source.

1. **Angle Offset Off** – normal operation (Telemark E-beam Sources)
2. **+45 degree Angle Offset** – Output rotated clock wise 45 degrees.
3. **-45 degree Angle Offset** – Output rotated counter clock wise 45 degrees.

Lat/Long Flip

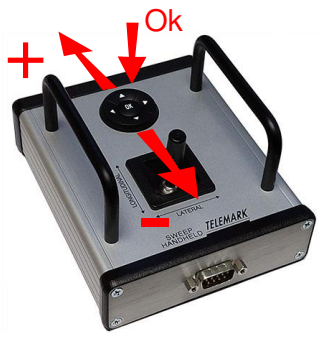
The + and - direction of latitude and longitude output can be changed by pressing the **Lat Flip On/Off** and/or **Long Flip On/Off** button. This is useful to get the beam movement to match the standard Lat/Long directions.



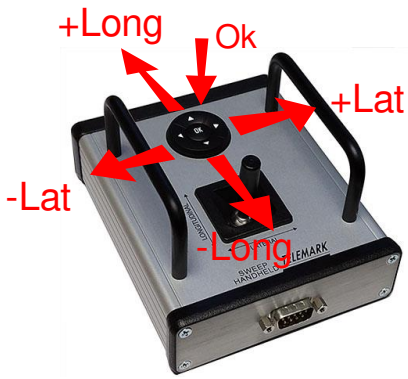
Factory Service

Factory Service is for factory use only.

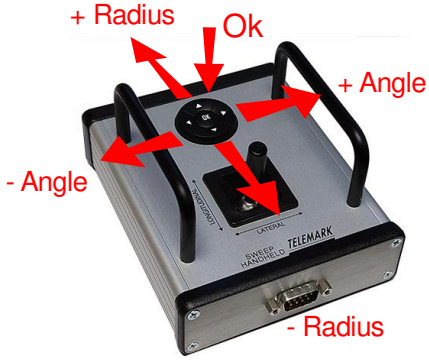
Remote operation



Value Adjust



Pocket Center Adjust



Radius/Angle Adjust

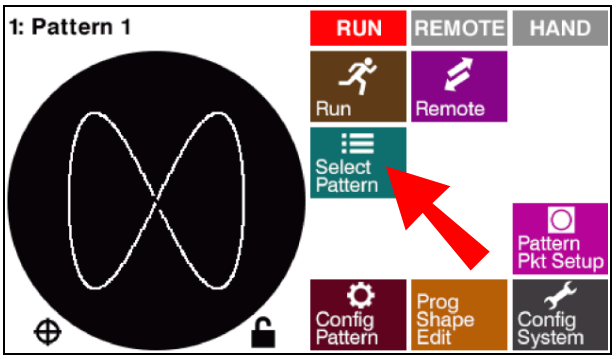
When the remote is plugged in it can function in three ways depending on the state of the screen.

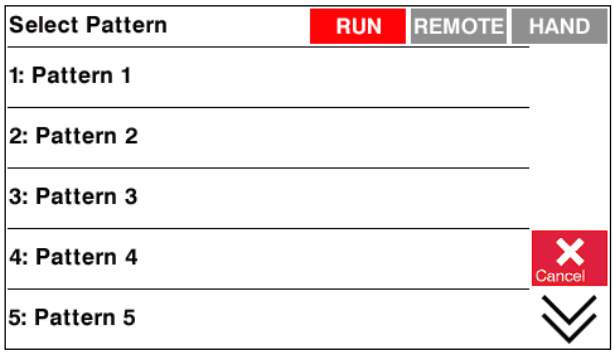
Value Adjust –The Ok button switches the between variables. The Red button is the active variable. Up increases the value and down decrease the value of the button indicated in red.

Pocket Center Adjust – moves the center position in lateral and longitudinal directions. The Ok button cycles between pocket center and the eight radial adjustment points.

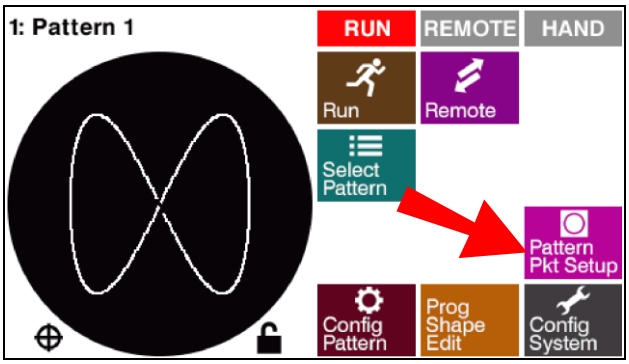
Radius/Angle Adjust – changes pocket point radius and deviation angle +/-22 degrees. The Ok button cycles between pocket center and the eight radial adjustment points.

Pattern Pocket Setup

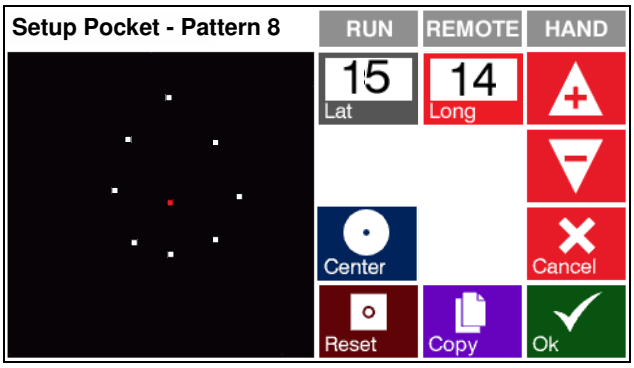


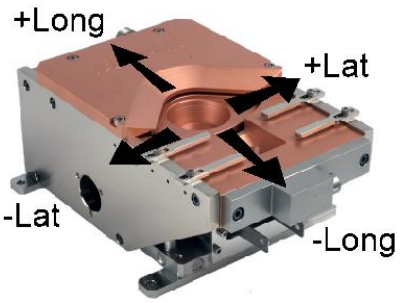


Press the **Select Pattern** button to select the pattern to configure.

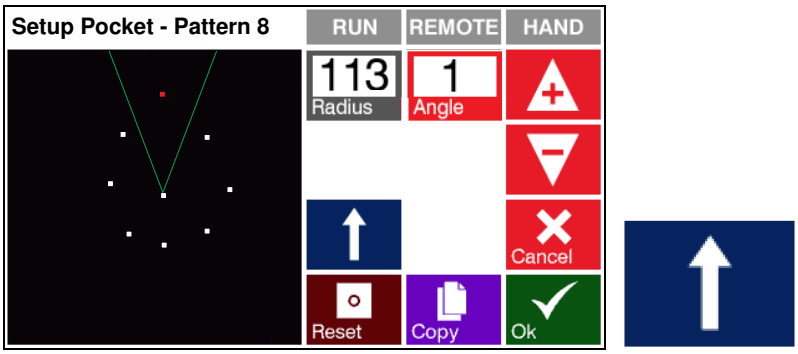


Select the **Pattern Pocket Setup**





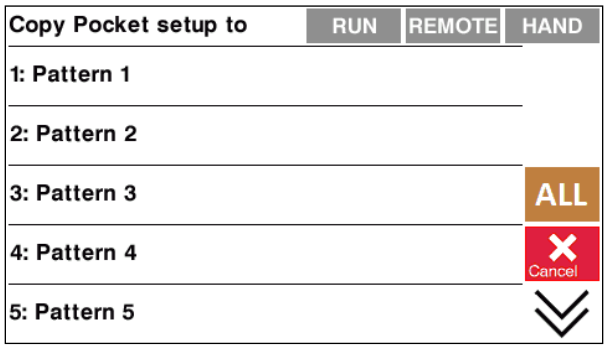
First set the pocket center point. With the e-beam source running at low power and looking at the pocket, observe the beam and position the beam in the center of the pocket using the handheld joystick or touchscreen to control the latitudinal/ longitudinal position. Moving the center point moves all 9 points.



Next set the limits of the pocket with the 8 limit points. The limit points can be selected by pressing the blue arrow button to cycle around the 8 directions. Each time you press the blue direction arrow the sweep will switch to the next setup point. Two green lines are drawn to show the available area. First adjust the distance from center with the radius value. If you need to make a rotational adjustment use the angle adjustment to move +/-22 degrees. When you are satisfied with all five points then push the **Ok** button (Press Cancel to not save changes to pocket setup).

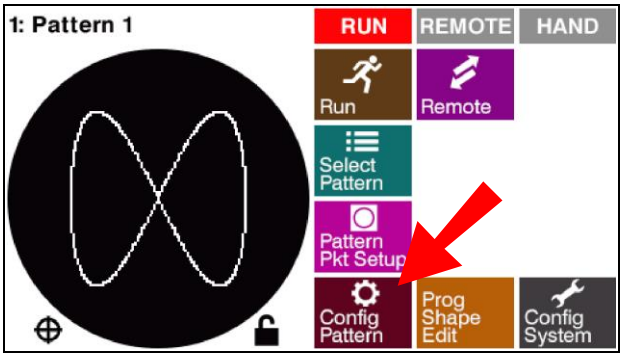
Once the center and limits have been set it is a good idea to make a note of the settings. The **Reset** button will reset all values of the current pocket setup to their minimums. There is a confirmation screen to prevent accidental resetting. The black box is the usable area that defines the maximum output of 1.6 or 3.0 amps (depending on model).

Copy Pocket Setup

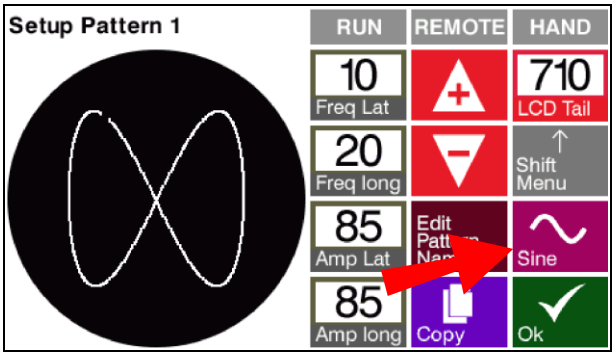


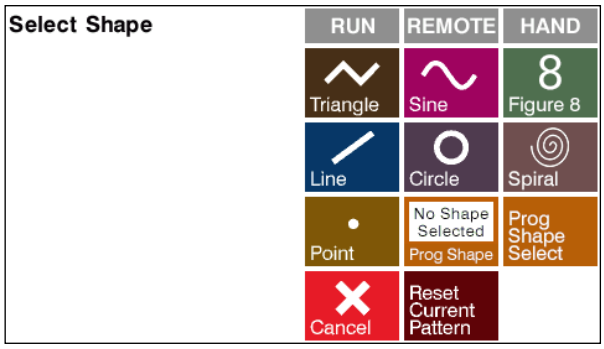
The pocket setup can be copied to other patterns. Normally copying to ALL patterns would be desirable if all the pockets in the e-beam source are the same size.

Configure Pattern



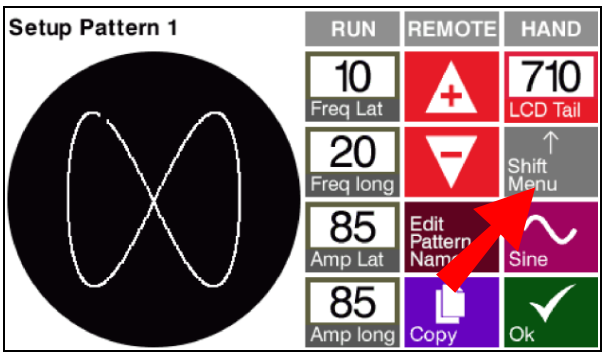
Press the **Config Pattern** (Configure) button.

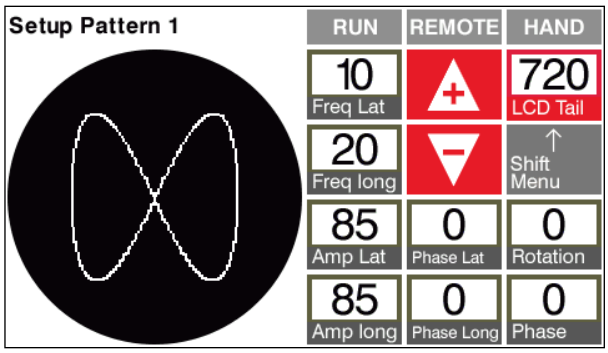




First, select the shape type**, Triangle, Sine, Line, Figure 8, Line, Circle, Spiral, Point or Programmable Shape** by touching the desired Shape button.

Each pattern type stores its setting separately from the other shape types. The **Reset Current Pattern** button will reset the current pattern settings for all shapes to factory defaults.





Press the **Shift Menu** button to access the latitude & longitude amplitude, latitude & longitude phase and rotation and phase. Pressing again will return to first screen.

Adjust the Frequencies and Amplitudes using the **+** and **–** arrows on the touch screen or use the joystick remote, up is **+** and down is **–**. Red highlight indicates the box with the parameter to be adjusted. Click on the remote to switch to adjust the other values or touch on the touchscreen. Latitudinal and longitudinal frequencies are adjustable from 0.1Hz to 80Hz and Collapse and Rotate frequencies are adjustable from -5 to 5Hz.

Display Tail Length

The pattern on the LCD screen maybe difficult to see depending on the Shape, Frequency, and Amplitude of the pattern. Adjusting the **LCD Tail** Length can improve the visibility of the pattern. Changing the LCD Tail length (10-1000) makes the display of the pattern more or less visible. Note: the LCD Tail length has no effect on the actual output to the e-beam source.

Profile

Patterns Line, Figure 8, Spiral or Programmable Shape can have a Profile setting, -10.0 to 10.0. Positive values will spend more time on the edge of the pattern, negative values will spend more time at the center of the pattern. Some materials and patterns can benefit from power profiling by creating a more constant beam energy density as the beam sweeps across the area of the pocket. The heat maps below show the dwell time distortion of the pattern. Brighter colors indicate more time spent. A positive profile is useful for the beam to spend more time away from the center for a more even melt. A profile setting with a negative profile number over -1 is only useful for patterns that avoid the center.

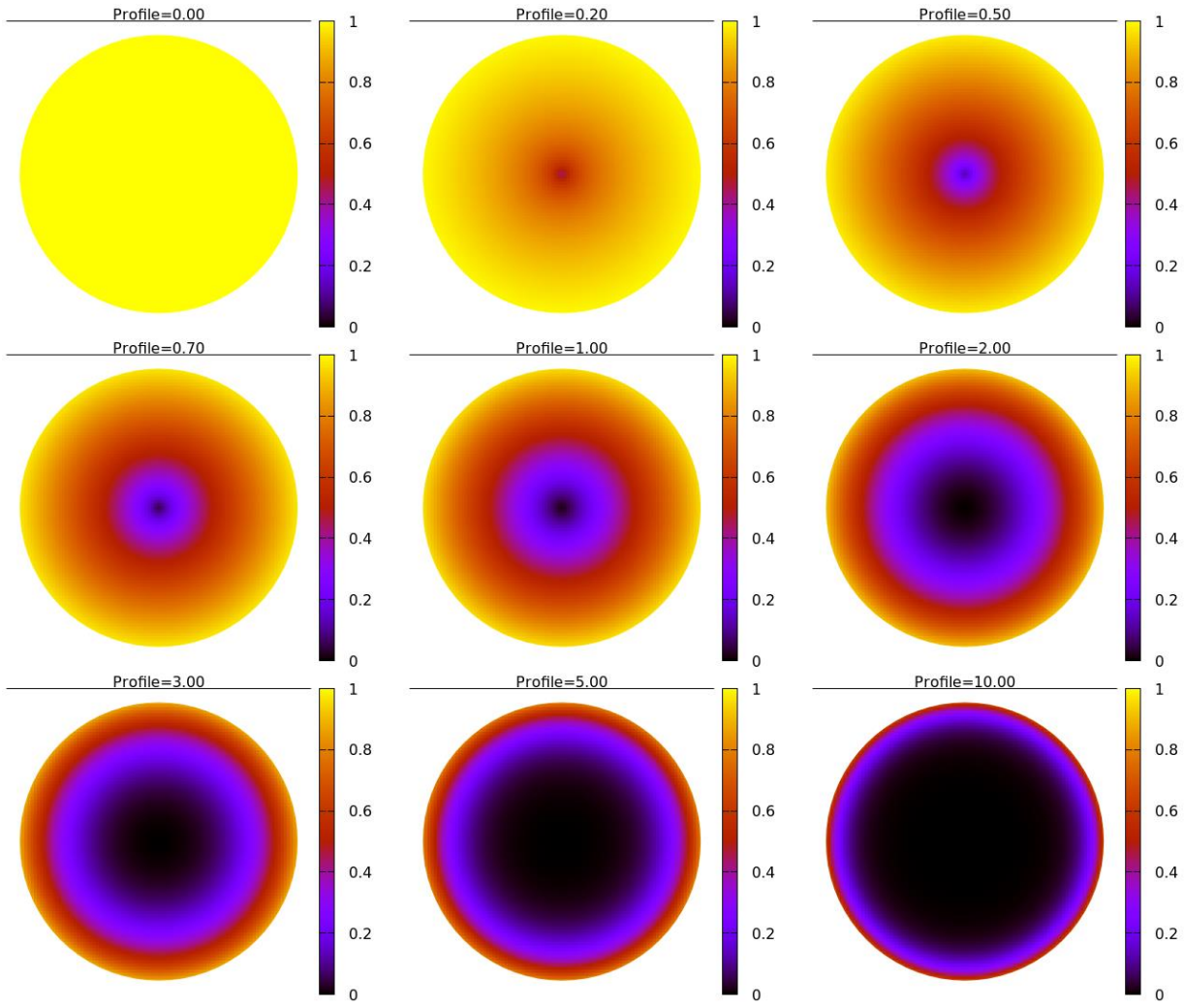
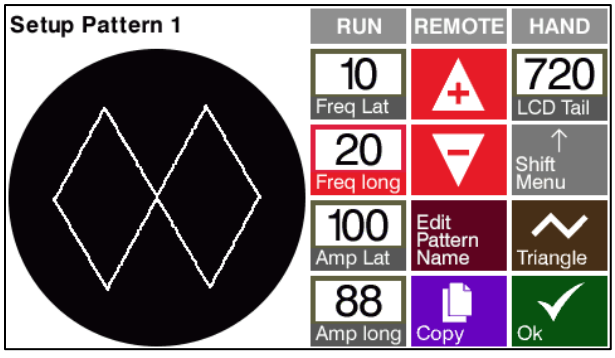


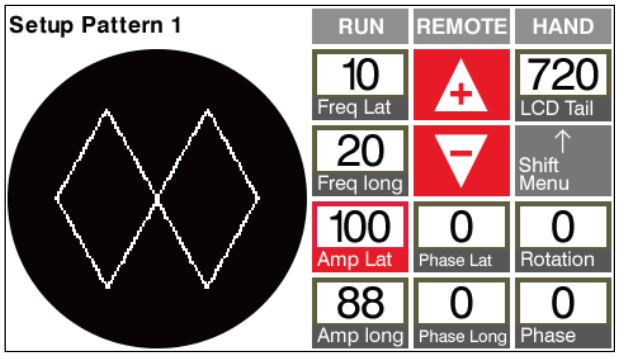
Figure 5-A, Positive Profile Representations

Figure 5-A shows the larger the profile number the less time the beam spends in the center. Negative profile numbers cause the inverse to happen.

Pattern Configuration Setup

Triangle

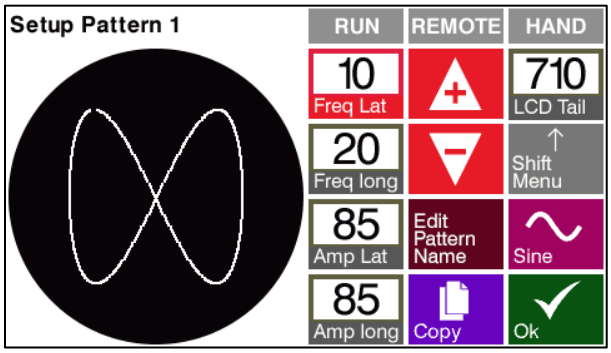


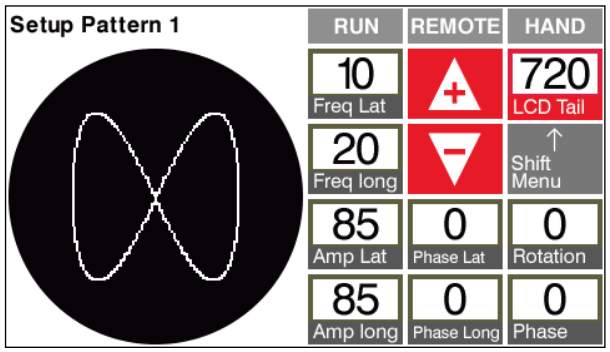


Freq Lat – Frequency Latitudinal 0.1Hz to 80Hz

Freq Long – Frequency Longitudinal, 0.1Hz to 80Hz
Amp Lat – Amplitude Latitudinal, 20-100% of configured maximum pocket
Amp Long - Amplitude Longitudinal, 20-100% of configured maximum pocket
LDC Tail – Display of the history of the pattern, 10 to 1000
Shift Menu
Phase Lat – Relative phase shift of the latitudinal pattern, -359 degrees to 359 degrees
Phase Long – Relative phase shift of the longitudinal pattern, -359 degrees to 359 degrees
Rotation – Rotation speed of the complete pattern, -5Hz to +5Hz, positive values for CCW rotation
Phase – Relative phase rotation of the complete pattern, -359 degrees to 359 degrees

Sine

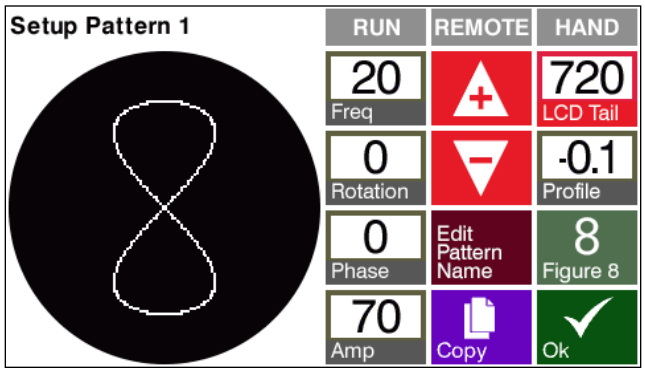




Freq Lat – Frequency Latitudinal 0.1Hz to 80Hz
Freq Long – Frequency Longitudinal, 0.1Hz to 80Hz
Amp Lat – Amplitude Latitudinal, 20-100% of configured maximum pocket
Amp Long - Amplitude Longitudinal, 20-100% of configured maximum pocket
LDC Tail – Display of the history of the pattern, 10 to 1000
Shift Menu
Phase Lat – Relative phase shift of the latitudinal pattern, -359 degrees to 359 degrees
Phase Long – Relative phase shift of the longitudinal pattern, -359 degrees to 359 degrees
Rotation – Rotation speed of the complete pattern, -5Hz to +5Hz, positive values for CCW rotation
Phase – Relative phase rotation of the complete pattern, -359 degrees to 359 degrees

Figure 8

Differs from the Sin by a fixed sine pattern with 2:1 amplitude and frequency ratio. The Figure 8 pattern amplitude can reach the outer limits of the pocket boundary.



Freq – Frequency 0.1Hz to 80Hz

Rotation – Rotation speed of the complete pattern, -5Hz to +5Hz, positive values for CCW rotation.

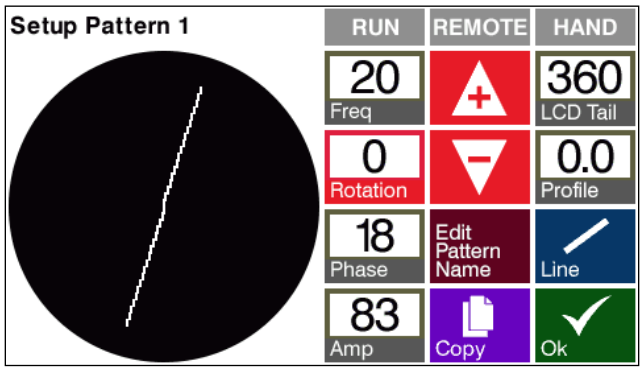
Phase – Relative phase rotation of the complete pattern line (only visible when the rotation is 0), -359 degrees to 359 degrees

Amp – Amplitude, 20-100% of configured maximum pocket

LDC Tail – Display of the history of the pattern, 10 to 1000

Profile - -10.0 to 10.0

Line



Freq – Frequency, 0.1Hz to 80Hz

Rotation – Rotation speed of the complete pattern, -5Hz to +5Hz, positive values for CCW rotation

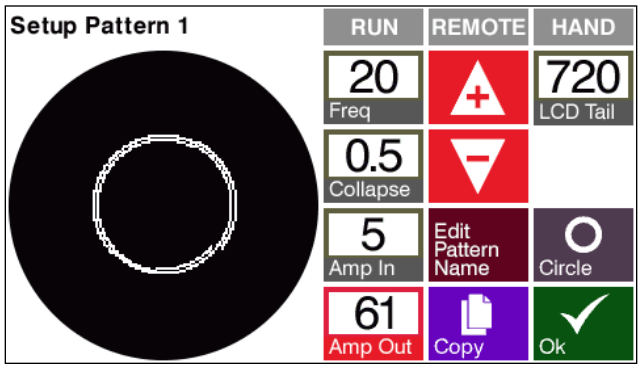
Phase – Controls the angle of the line (only visible when the rotation is 0), -359 degrees to 359 degrees

Amp – Amplitude, 20-100% of configured maximum pocket

LDC Tail – Display of the history of the pattern, 10 to 1000

Profile - -10.0 to 10.0

Circle



Freq – Frequency, 0.1Hz to 80Hz

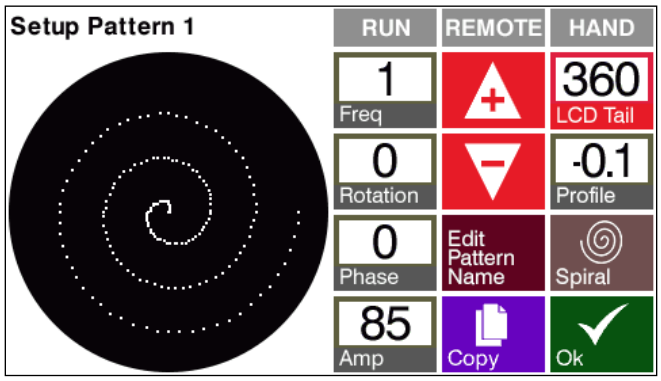
Collapse - Collapse, 0 to 5Hz. (if collapse is 0 then the Amp In is not visible)

Amp In – Amplitude In, 5-100% of configured maxim pocket (only when the collapse greater than 0)

Amp Out – Amplitude Out, 20-100% of configured maximum pocket

LDC Tail – Display of the history of the pattern, 10 to 1000

Spiral



Freq – Frequency, 0.1Hz to 80Hz

Rotation – Rotation speed of the complete pattern, -5Hz to +5Hz, positive values for CCW rotation

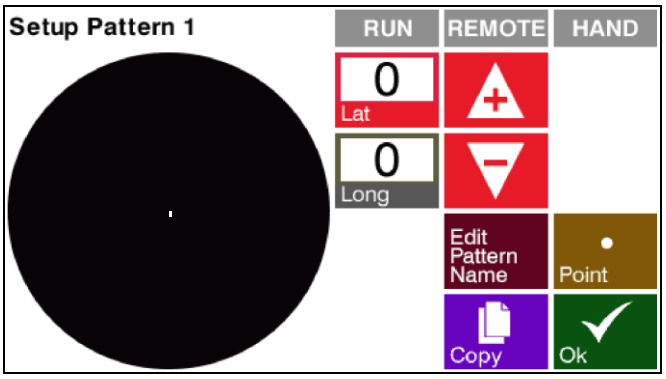
Phase – Controls the angle of the line (only visible when the rotation is 0), -359 degrees to 359 degrees

Amp – Amplitude, 20-100% of configured maximum pocket

LDC Tail – Display of the history of the pattern, 10 to 1000

Profile - -10.0 to 10.0

Point



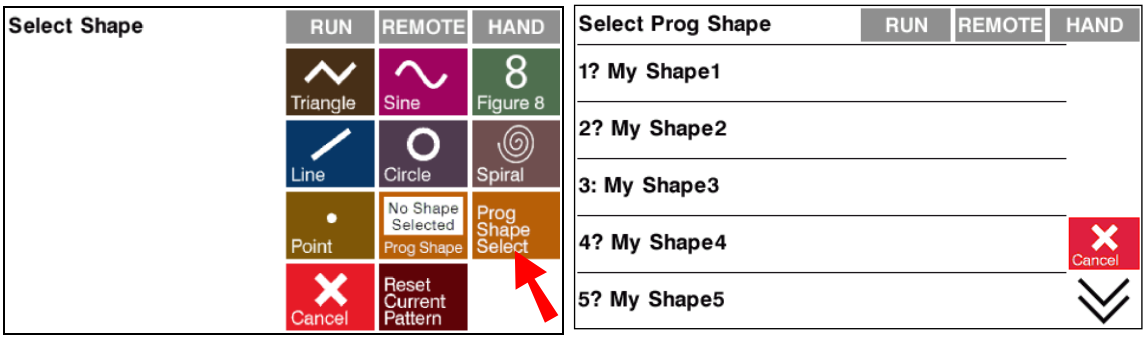
The point pattern is a fixed point and location is a special case. The lat and long numbers displayed are the absolute location numbers. A maximum of 97% of configured pocket maximum in any direction is designed to prevent users from damaging the ebeam source pocket.

Lat – Latitudinal position, -511 to +511 (-97% to +97% of configured pocket maximum)

Long – Longitudinal position, -511 to +511 (-97% to +97% of configured pocket maximum)

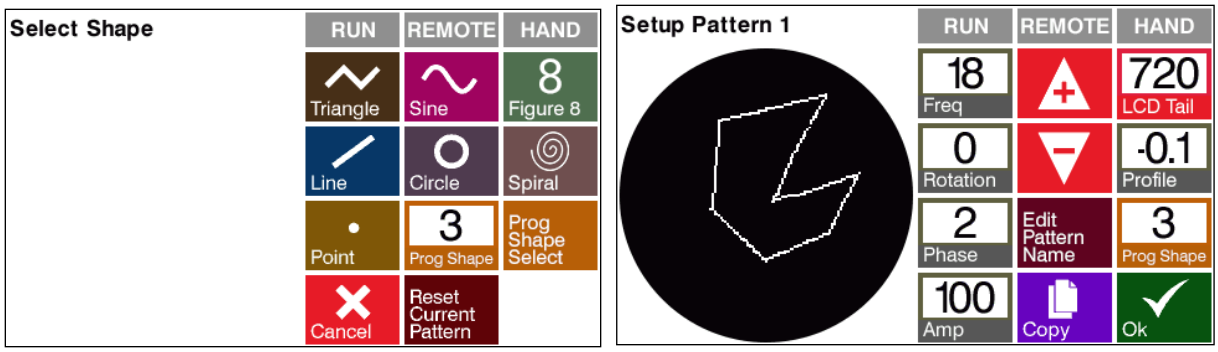
Programmable Shape

If the **Prog Shape** button says “No Shape Selected” press the **Select Prog Shape** button to select a shape from the “Select Prog Shape” list.



“?” next to the shape number means that the shape is not defined and not selectable.

Once a shape is selected and there is a number in the **Prog Shape** button then the **Prog Shape** button can be pressed.



Freq – Frequency, 0.1Hz to 80Hz

Rotation – Rotation speed of the complete pattern, positive values for CCW rotation, -5 to 5Hz.

Phase – Controls the angle of the line (only visible when the rotation is 0), -359 degrees to 359 degrees

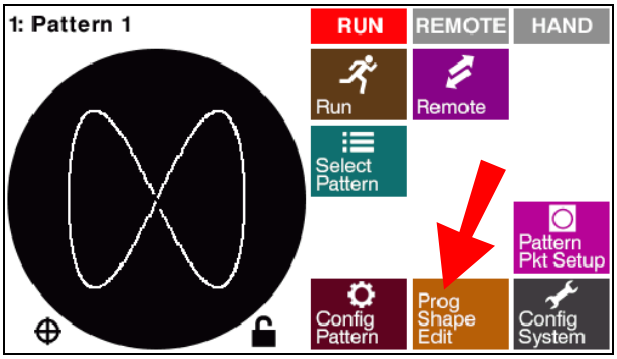
Amp – Amplitude, 25-100% of configured maximum pocket

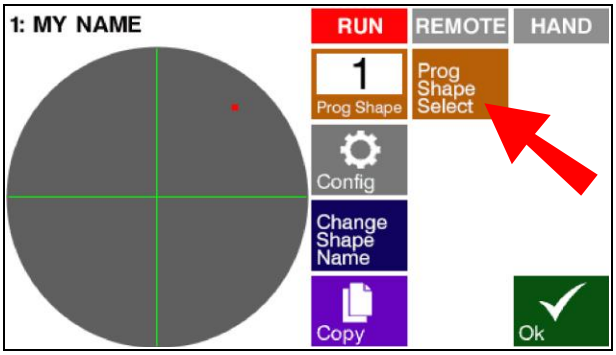
LDC Tail – Display of the history of the pattern, 10 to 1000

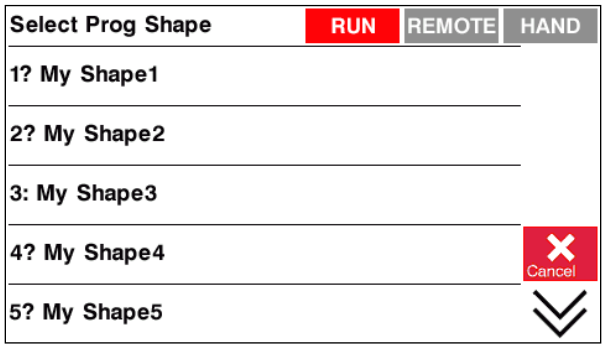
Profile - -10.0 to 10.0

Making Programmable Shapes

To make a programmable shape press **Prog Shape Edit.** Select a shape to edit **Prog Shape Select**

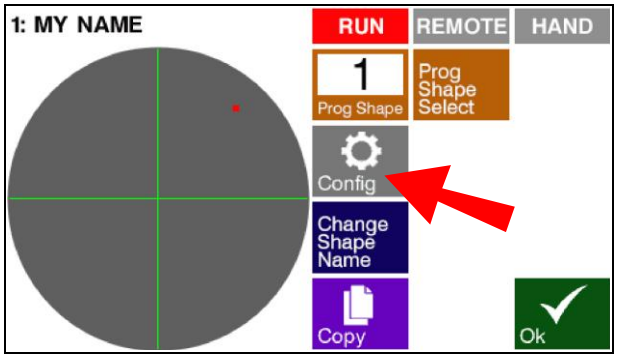


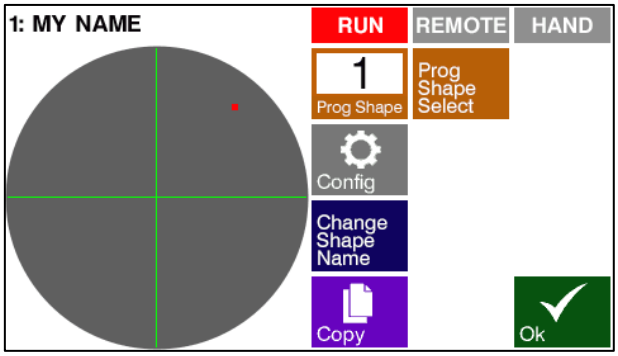




"?" next to the shape number means that the shape has not been defined yet.

Once a shape is selected and there is a number in the **Prog Shape** button then it can be edited by pressing Config. In the Shape edit mode the circle is gray with a green crosshair to help with designing the shape.

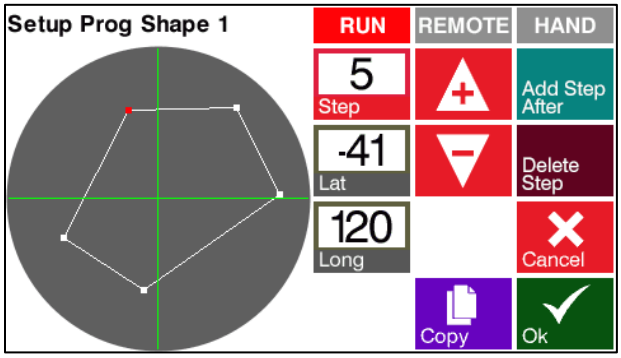




Use **Change Shape Name** to change the name of the shape.

There are two ways to add programmable steps.

1. Press on the round black pocket representation with your finger or a blunt stylus the location where you want to add a step. Fine tune the location by changing the Lat and Long values use + and –.



2. Press **Add Step After,** this will add a step at Lat 0, Long 0. Use + and – to change Lat and Long location. When **Add Step After** pressed again it will add another step after the current step at the same location.

Steps can be edited by changing the step number and then changing the Lat and Long values.

Use **Delete Step** to delete the current step.

Use **Copy** to copy shape to another numbered shape.

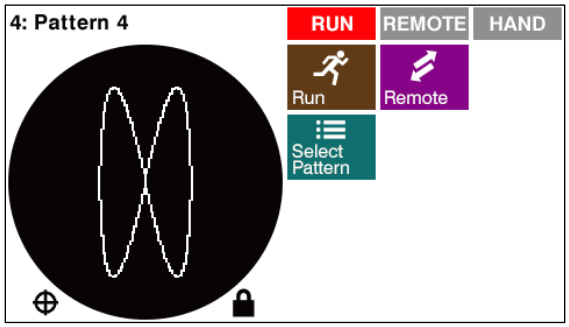
6

OPERATION

General Operation

Power-Up

When the front-panel **POWER** switch is turned on, the fans turn on and the LCD lights and displays the version of the software for 3 seconds then displays the operational screen shown below.

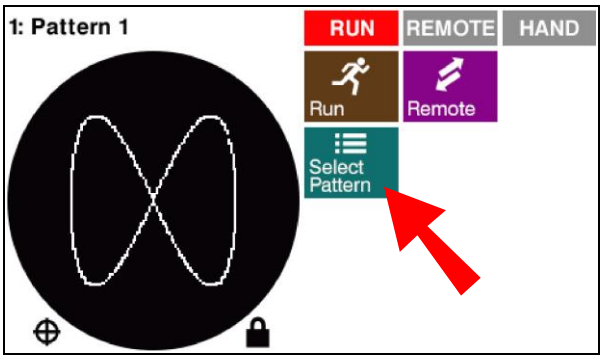


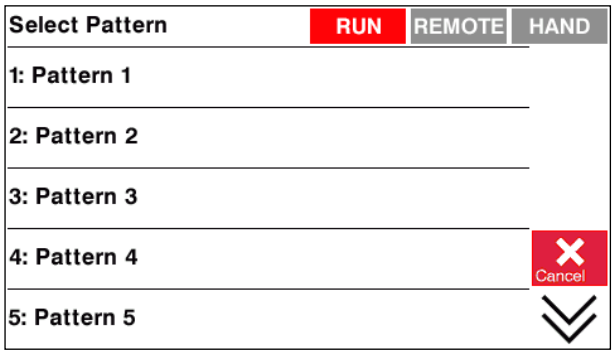
Then turn on the power supply HV & Emission. Set the Hi-Voltage at the level necessary for the material, but set the Emission very low, just enough to barely see a beam. This way the sweep pattern settings can be judged and finalized without affecting the material.

Power-Down

When the front-panel **POWER** switch is turned off, all lights and outputs go off. All patterns are stored in memory; last pattern used will be the current selection when the unit is turned back on.

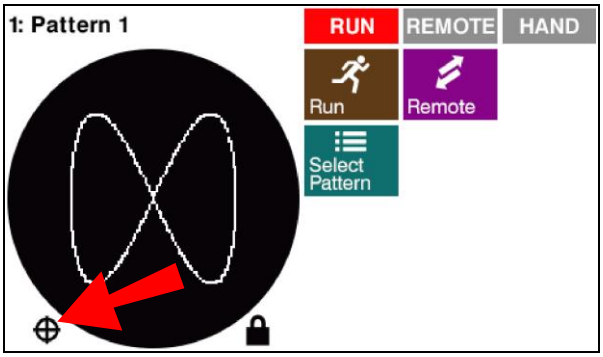
Pattern Selection



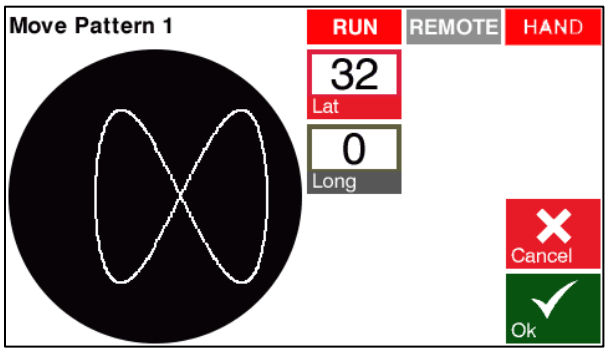


Press the **Select Pattern** button to select a pattern.

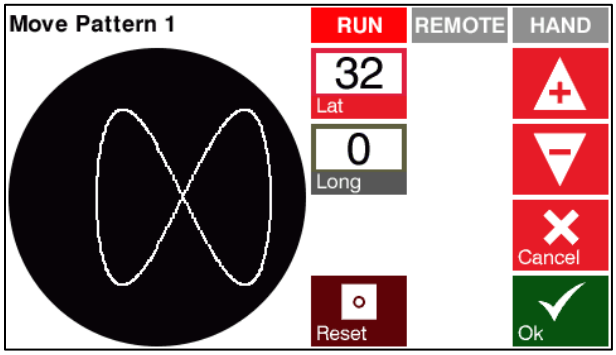
Pattern Shift



Patterns can be shifted in the pocket by pressing the Pattern Shift icon

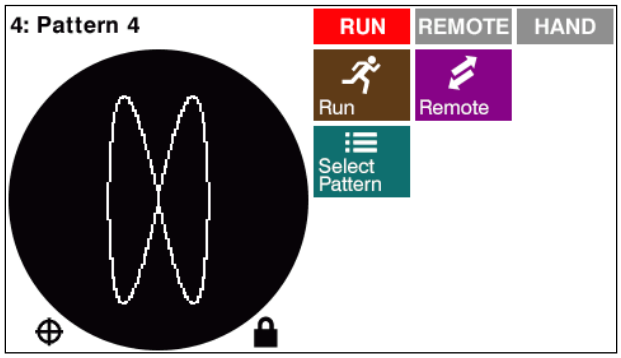


If the joystick handheld is plugged in Latitude and longitude can be adjusted directly by moving the joystick. Pressing ok will save the location. Moving the joystick when not in move mode moving the joystick will have no effect.

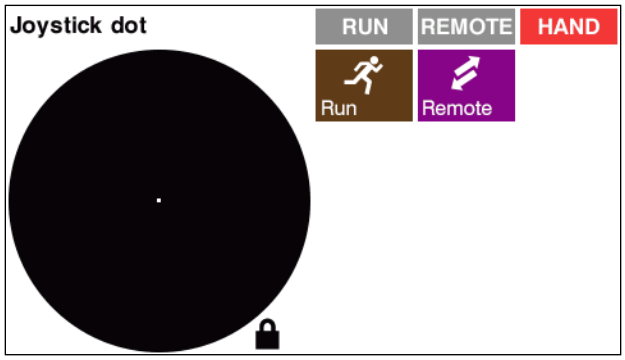


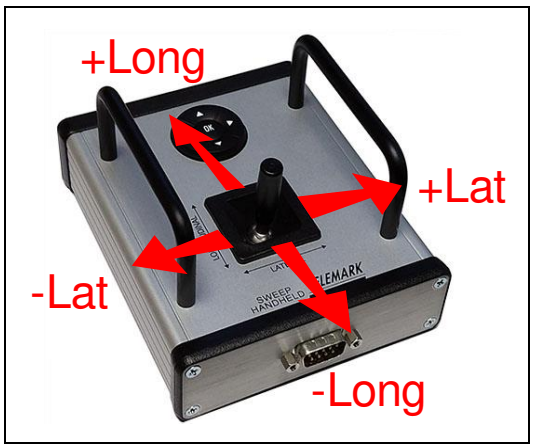
If the handheld joystick is not plug in Latitude and longitude can be adjusted with the + and – arrows on the touchscreen. The pattern can only be moved to the edge of the pocket (the smaller the pattern the more it can move). In **Locked** mode the new location will be stored until the Digital Sweep power is turned off. In **Unlocked** mode the new location will be stored in permanent memory till it is reset or changed. The Reset button will reset Latitude and longitude to 0. If the pattern is changed in configuration mode and the shape exceeds the pocket limit the pattern shift will be reset to 0. Also any changes to the pocket limit will reset the pattern shift to 0.

Run On/Off



When in **Run** is in the on mode the pattern that has been selected the Select Pattern menu is output to the e-beam source.

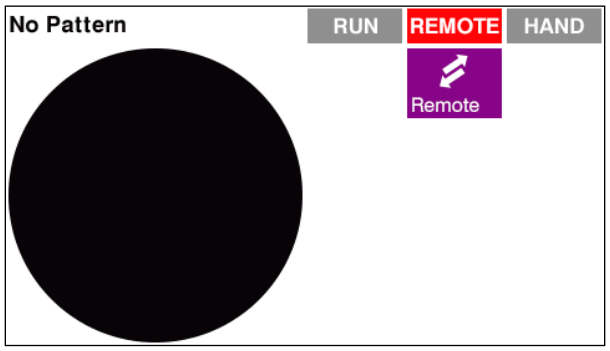




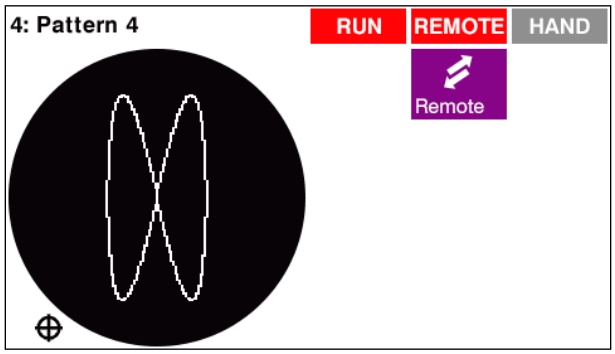
When in **Run** is in the Off mode the joystick directly controls the e-beam output position, allowing the user to precondition the material manually. The Joystick lever controls direction of beam: left [-] & right [+] controls the lateral direction; near [-] (as seen from the EB source emitter) & far [+] controls the longitudinal direction.

Remote On/Off

Remote button toggles between on and off. **Remote On** allows control from a PLC using the remote control input on J2 on the back panel. When remote is **on** the operator can only turn it off, all other operations are disabled. **Remote On** gives full control to the remote and lights up the Remote on the LCD display on the front panel.



If no pattern is selected by the remote then **No Pattern Selected** is shown and there is no output to the coils



If a valid pattern is selected by the remote (contact closed, see chapter 3 for input description) then that pattern and pattern number will be displayed, the Run indication will light up and the pattern is output to the e-beam source coils.

7

ERRORS AND WARNINGS

Error Codes

The Programmable Digital Sweep checks at start up and continually when it is turned on for any errors, if an error is found the sweep output is stopped and **Remote** mode is turned off. The error conditions must be fixed before the Digital Sweep will be operational. Errors may be with the Digital Sweep, the EB source coils, or the connection between the two. The possible error codes are shown below:

+24V failure on Latitude driver

-24V failure on Latitude driver

+24V failure on Longitude driver

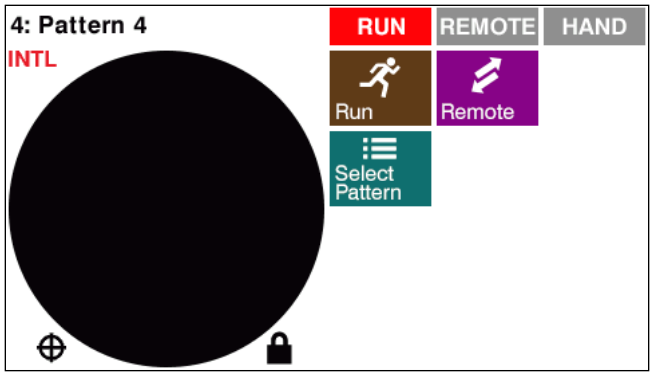
-24V failure on Longitude driver

EEPROM failure - no acknowledge

EEPROM failure - invalid product code

EEPROM failure - write verify

Interlock Fail



When the interlock string is broken a red “INTL” will show in the upper left corner of the screen, the pattern will stop on the screen and the output to the EB sources will stop.

TELEMARK EU Declaration of Conformity

No 03/CE/15

Battle Ground, 18-11-2015

Telemark

1801 SE Commerce Ave

Battle Ground, WA 98604 USA

/manufacturer/

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Commercial name: DIGITAL SWEEP

Generic denomination/function: XY beam sweep control with selectable triangular or sinusoidal waveforms, oscillating circle pattern or rotating line. Programmable center and sweep limits. Stores up to eight sweep patterns which can be remotely selected. Includes hand held remote joy stick control.

The object of the declaration described above is in conformity with relevant Union harmonisation legislation:

EMC DIRECTIVE 2014/30/UE	*DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 2004/108/WE*
STANDARD EN 61326-1:2013	*Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements.*
LVD DIRECTIVE 2014/35/EU	*DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits and repealing Directive 2006/95/WE*
STANDARD EN 61010-1:2010	*Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements*

This declaration is the basis for affixing the CE conformity marking.

This declaration relates exclusively to the machinery in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user.

Battle Ground, 18-11-2015
(place and date of the declaration)

Gerald G. Henderson
President