

# OPERATING MANUAL FOR CONTROL SYSTEM OF BAG MAKING MACHINE



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**ICON DESCRIPTION:**



To increase “Length” parameter’s value



To decrease “Length” parameter’s value



To increase parameter’s value



To decrease parameter’s value



To Scroll UP the page.



To Scroll Down the page.



To jump on HOME Screen.

## Chapter 1: General

### 1-1 Specification:

**BAGKon- Rainbow** is a controller for sequence control for Bag making machine.

#### ▪ SYSTEM SPECIFICATIONS (Display unit):

##### ➤ Input:

###### Power:

Voltage -- 0-24VDC  $\pm$  2%

Consumption -- 10 VA Max

###### Control:

1. Proximity -- NPN (NO type) 10-30 VDC-50mA Max

2. Limit switches -- NO TYPE

##### ➤ Output:

Digital Output -- 24VDC 100 - 150mA Max.

##### ➤ Environment:

Temperature -- 0°C to 55°C

Humidity -- 5 to 95% RH non-condensing

##### ➤ MECHANICAL DIMENSIONS (Controller)

OVERALL DIMENSION-- Depth X Width X Height

65 mm X 194 mm X 144 mm

PANEL CUTOUT SIZE -- **189mm X 138mm**



Figure 1: Dimension

## Chapter 2: BAGKon Unit

1. **Display Unit:** This is 189mm x 138mm box with 5.7 inch LCD with touch interface & 6 keys keypad on front.
2. **DIGIServo:** This is the drive unit to drive the servo motor.
3. **Cable Set:** There are 4 cables to interconnect Display unit & Servo Drive with each other where one DB-9 serial Cable, one DB-15 to press fit cable, one DB-15 for encoder connection and one motor's power cable.
4. **Transformer:** BAGKon is provided with Transformer with 415VAC input.

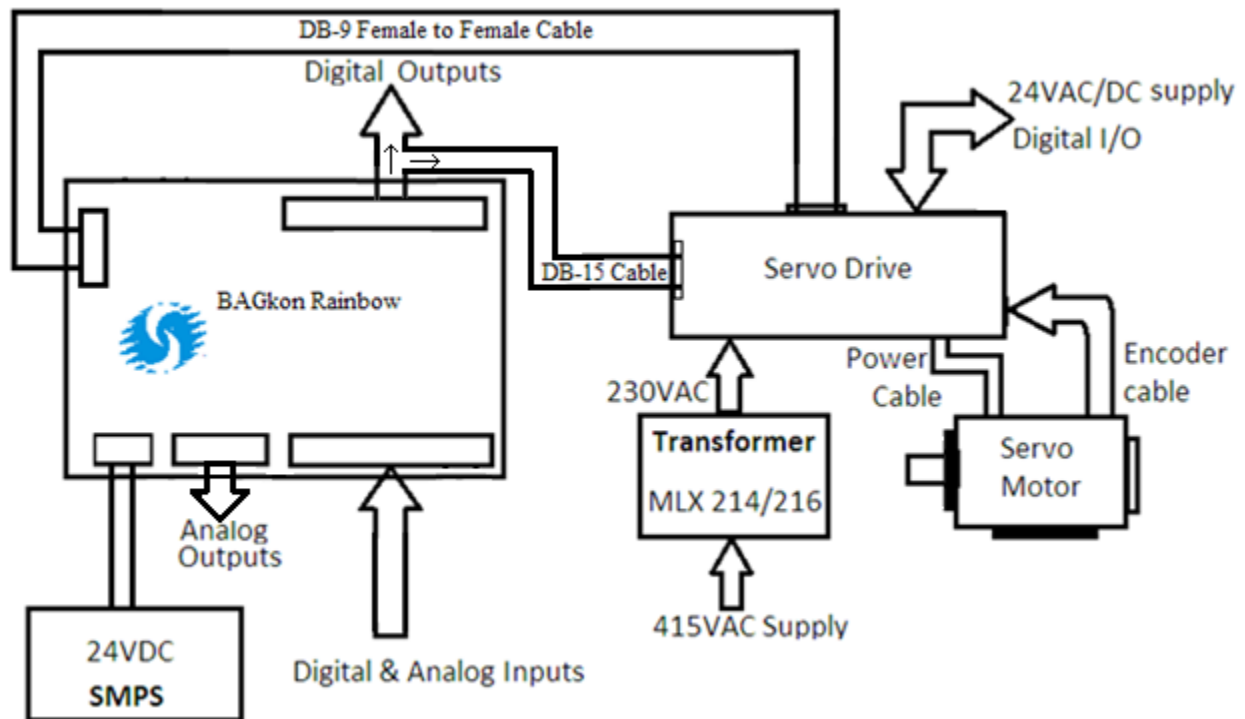
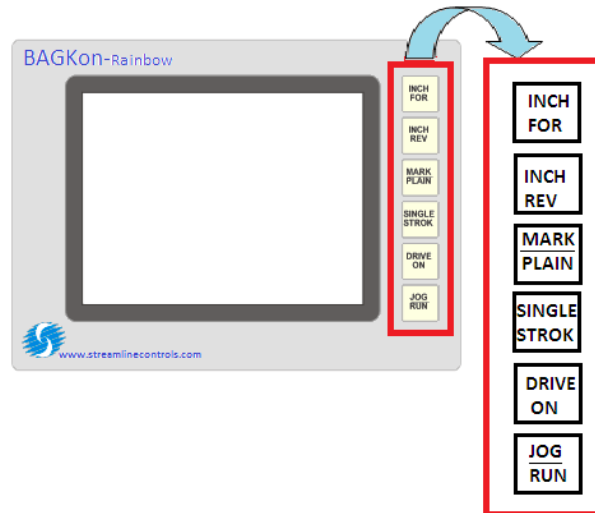


Figure 2: Block Diagram

## Chapter 3: User Interface

### 3-1 Front Keyboard Operation:



**Figure 3: Front View of Controller**

>> BAGKon Rainbow provides Touch User Interface with 6 push buttons for different functionalities. Working function of six keys is described below:

1. **INCH FOR:** This key is used to rotate motor in forward direction.  
This key works in Jog Mode only.  
INCH FOR >> Inching Forward
2. **INCH REV:** This key is used to rotate motor in reverse direction.  
This key works in Jog Mode only.  
INCH REV >> Inching Reverse
3. **MARK/PLAIN:** This key is used to enable or disabled MARK function.  
This key can be use in RUN mode.
4. **SINGLE STROK:** This key is used to rotate motor on set length & set speed for single Stroke only. It works in JOG mode only.  
SINGLE STROK >> Single Stroke
5. **DRIVE ON:** This key is used to Enable or Disable servo drive.
6. **JOG/RUN:** This key is used to toggle between RUN and JOG mode.

3-2 Touch Screen Operation:

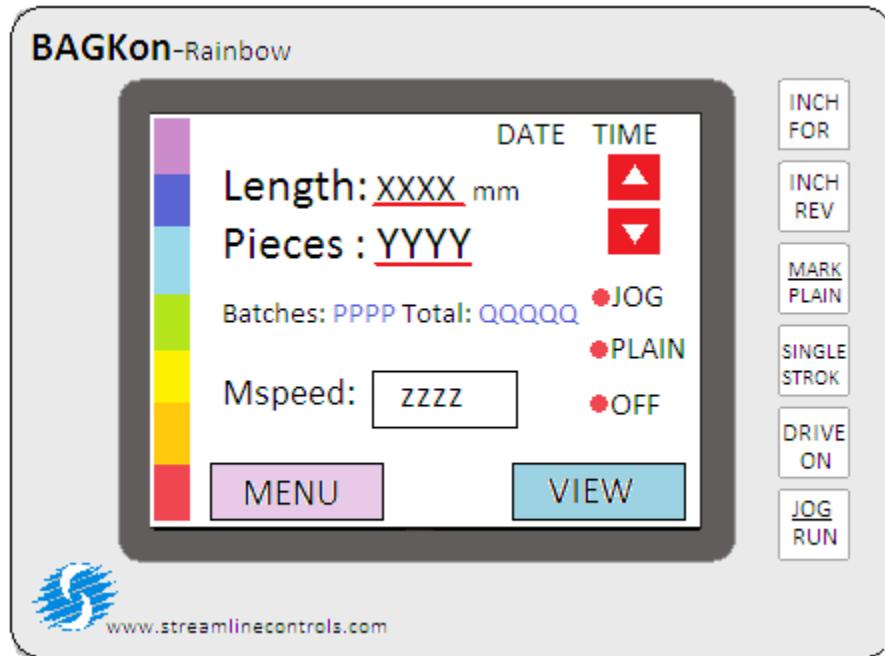




Figure 4: HOME PAGE of HMI

At power ON, LCD shows HOME PAGE as shown in Figure 4.

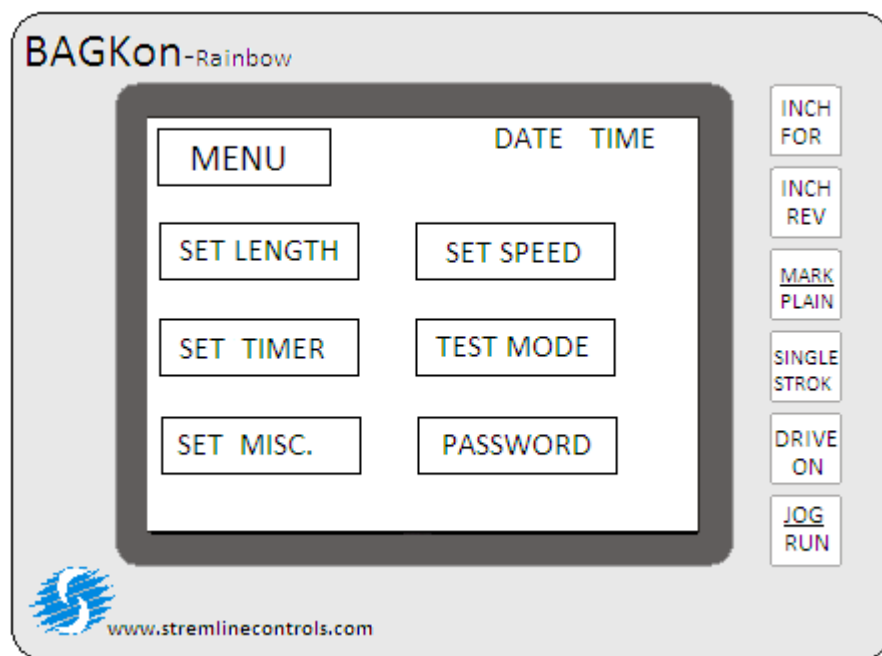
Here,

- DATE** = Date in dd/mm/yy format
- Time** = Time in hh/mm/ss format
- XXXX** = Set Length Value
- YYYY** = Batch Count
- PPPP** = Current Batch
- QQQQQ** = Total number of Batches
- ZZZZ** = Machine speed in strokes/minute
-  = Tap to increase set length value.
-  = Tap to decrease set length value.
- **JOG** = This indicates controller is in JOG mode. When controller is in RUN mode, “JOG” word will be replaced by “RUN” and color of Red DOT will be changed to Green.
- **PLAIN** = This indicates controller is in PLAIN mode. When controller is in MARK mode, “PLAIN” word will be replaced by “MARK” and color of Red DOT will be changed to Green.
- **OFF** = This indicates Servo Drive is off. When Servo Drive goes ON, “OFF” word will be replaced by “ON” and color of Red DOT will be changed to Green.

<b>Mspeed</b>	= This indicates current machine speed in strokes / minute. Tap on “zzzz” to set maximum machine speed.
<b>MENU</b>	= To enter in parameter setting page.
<b>VIEW</b>	= To view current status of I/Os and other miscellaneous data.

### 3-3 MENU:

To set different parameters related to job length, timer, speed or to enter password, misc. parameters you need to enter in MENU page by simply pressing MENU icon on HOME page.



**Figure 5: Menu Page**

<b>SET LENGTH:</b>	Touch this icon to enter in SET <i>LENGTH</i> menu.
<b>SET SPEED:</b>	Touch this icon to enter in SET <i>SPEED</i> menu.
<b>SET TIMER:</b>	Touch this icon to enter in SET <i>TIMER</i> menu.
<b>SET MISC:</b>	Touch this icon to enter in SET <i>MISCELLANEOUS</i> menu.
<b>TEST MODE:</b>	Touch this icon to enter in <i>TEST MODE</i> .
<b>PASSWORD:</b>	Touch this icon to enter <i>PASSWORD</i> .



### ***3-4 Parameter Configurations:***

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There are three security levels in the controller to avoid unintended interruptions in operations.

First level is without password. In this level operator can set different parameters and cannot set some job and/or machine related parameters.

Second level is for supervisor level. In this case machine supervisor can set parameter which are required as per job requirement, but cannot set machine related parameters.

Third level is OEM level. Here machine parameters are to be set by machine manufacturer.

#### **❖ LENGTH Parameter Setting:**

To set different length parameters, tap on SET LENGTH button.

To update particular parameter in SET LENGTH Menu, tap on rectangular box drawn against that parameter, a keypad window will open.

Use clear, numeric digits and OK button to set parameter's value.

Use Esc button to escape from keypad window without changing parameter's value.

**List of Length Parameters is as per mentioned in “List of Programmable Parameters” Table.**

#### **❖ SPEED Parameter Setting:**

To set different speed parameters, tap on SET SPEED button.

To update particular parameter in SET SPEED Menu, tap on rectangular box drawn against that parameter, a keypad window will open.

Use clear, numeric digits and OK button to set parameter's value.

Use Esc button to escape from keypad window without changing parameter's value.

**List of Speed Parameters is as per mentioned in “List of Programmable Parameters” Table.**

#### **❖ TIMER Parameter Setting:**

To set different timer parameters, tap on SET TIMER button.

To update particular parameter in SET TIMER Menu, tap on rectangular box drawn against that parameter, a keypad window will open.

Use clear, numeric digits and OK button to set parameter's value.

Use Esc button to escape from keypad window without changing parameter's value.

List of Timer Parameters is as per mentioned in “List of Programmable Parameters” Table.

❖ **MISCELLANEOUS Parameter Setting:**

To set Date, Month, Year, Hour, Minute, Second and Brightness of screen, tap on SET MISC. button.

To update particular parameter in SET TIMER Menu, tap on rectangular box drawn against that parameter, a keypad window will open.

Use clear, numeric digits and OK button to set parameter’s value.

Use Esc button to escape from keypad window without changing parameter’s value.

To increase/decrease screen brightness, use +/- button respectively.

❖ **TEST MODE:**

To enter in Test Mode, tap on TEST MODE button.

In test mode, user can test upto 15 digital outputs and 4 analog outputs.

To make digital output ON or OFF, tap on particular output. By tapping once on particular output it’s color will be changed.

To increase/ decrease analog output, tap on rectangular box drawn against that output so that its color will be changed from white to green, now use +/- button to increase/decrease its value respectively.

### ***3-5 What is Auto Speed Function & How to Select it?***

- Auto speed is the run speed, which is automatically calculated by controller according to set length, acceleration time, deceleration time and set run speed.

To enable this function set AUTOSPEED parameter to ON status in “SET LENGTH MENU”.

Once the peak speed, acceleration time, deceleration time is set as per machine mechanical parameters, the run speed is calculated as per the set length.

The run speed is calculated so as to keep the running time of servo motor minimum and to have maximum strokes per minute.

## Chapter 4: Functional Description

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System operates in two modes:

1. MANUAL MODE 2. AUTO MODE

### 1. MANUAL MODE:

- At the time of power ON, system stays in MANUAL mode. In MANUAL mode LCD shows '**JOG**' in red color with red dot, on home page.
- In this mode servo motor can be moved either in forward direction or in reverse direction as per input applied by pressing INCH FOR or INCH REV button on MMI

### 2. RUN MODE:

- In RUN MODE system operates in two functional modes:
  1. PLAIN MODE
  2. MARK MODE
- In RUN Mode display shows '**RUN**' in RED color with green dot.
- On applying start signal to proxi-start input, servo motor starts running. Motor moves for set length at set speed.
- If mark sensor input is enabled "MARK" is displayed on display. ( If mark sensor is ENABLED, 'MARK' is displayed and if MARK SENSOR IS DISABLED, 'PLAIN' is displayed.) Servo motor stops as soon as MARK SENSOR input is received. If MARK SENSOR input is not received then motor will stop at set length.
- If mark sensor is disabled then servo motor will stop at set length.
- After stopping of servo motor *CUT*, *D-PUNCH* etc output operates for their corresponding set time in SET TIMER menu.
- After all the output goes off system will wait for next start.
- Now if input configuration is set to '5' then motor restarts after cycle delay set in SET TIMER menu. If input configuration is set to '3' then system waits for start input goes off (proximity switch). For other than '1' & '5' system starts as per explained in programmers guide.

## Chapter 5: Configurable Input & Output

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BAGKon provides configurable inputs and outputs i.e. user can configure any input/output for any purpose.

e.g. If currently cutter output is on output no.1 and D-punch output is on output no. 3 but user wants cutter output at output no. 3 and D-punch on output no.1 then he has to set 0(hex code) in configure output 3 and 2(hex code) in configure output 1.

The list of configurable inputs and outputs are as per listed in "**CONFIGURABLE INPUT and OUTPUT TABLE**".

## Chapter 6: Error Messages

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There are 7 types of error messages viz.:

**1. MARK SENSOR ERROR**

When the MARK SENSOR is enabled and MARK SENSOR input is not received for more than set *MISSING MARK* count continuously in mark window then MARK SENSOR error occurs.

**2. HIGH SPEED ERROR**

When input configuration is set other than 5 and start command is received before servo motor stops for more than high-speed error count continuously then high-speed error occurs.

**3. EMERGENCY**

If any configurable input's value is set to 3(hex code) then this error will generate whenever input is received on that input terminal.

**4. WARNING**

If any configurable input's value is set to 6(hex code) then this error will generate whenever input is received on that input terminal.

**5. SET BATCH OVER**

If "Stop @Total Batch" parameter in LENTH MENU is ON and total batch exceeds "Total Batch" parameter's value then this error will generate.

**6. BUNCHING ERROR**

If any configurable input's value is set to 14(hex code) then this error will generate whenever input is received for more than "Bunching Error Count" parameter's value.

**7. ROLL EMPTY**

If any configurable input's value is set to 18(hex code) then this error will generate whenever input is not received on that input terminal.

## Chapter 7: Commissioning Tips

### 1. How to Set Ratio mm Count as per Drawn Length

#### FIRST METHOD:

1. Set RATIO MM = 2000.
2. SET LENGTH = 200 mm.
3. Run the machine and measure the actual draw length (Here the motor will run for exact one revolution).
4. Multiplying Draw length by 10.
5. Set RATIO MM as per multiplied figure.

#### SECOND METHOD:

1. Measure the roller diameter **D**.
2. Measure the roller pulley ratio **N1**.
3. Measure the motor pulley ratio **N2**.
4. Put the value in below equation & found the ratio & feed it in ratio mm parameter.

$$\text{Ratio mm} = 3.14 \times D \times \frac{N2}{N1} \times 10$$

5. *MARK* sensor must be set such that when *MARK* appears in front of sensor.

The '*MARK*' Led indication in DIGISERVO drive should remain on when the photo sensor is focused on printed mark.

6. Start proxy must be set such that when sensed by object on shaft, the 'Y' letter should be appear at respective input in I/O Status menu.

#### (I) IN HEALTHY CONDITION

1. CPU OK Indication is blinking at the rate of 0.5 sec. ON & 0.5 sec. OFF.
2. In RUN mode A/M indication in DIGI SERVO should be ON
3. When any change in speed or length is made Rx Indication in DIGISERVO blinks once.
4. In MANUAL MODE when INCHING is done motor rotates and INCH FORWARD / INCH REVERSE LED in DIGIServo drive glows.

#### ✓ HOW TO VERIFY MARK SENSOR FUNCTION:

- Set mark sensor enabled in counter menu.
- Set mark sensor outside the job such that *MARK* led in DIGIServo drive remains on
- Run the machine
- Mark sensor error should not appear anytime and the draw length of the job should be (set length) – (MARK window)
- Now set the sensor such that *MARK* led in DIGIServo drive remains off
- Run the machine
- *MARK* sensor error should appear after missing mark count
- The length of the job should be equal to set length