DP-20 PLUS
WEB GUIDE CONTROLLER
USER MANUAL

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INTRODUCTION

DP-20 PLUS General Information

The DP-20 PLUS Web Guide Controller is another Maxcess International advancement in technology that provides superior guiding performance.

This controller is able to operate in a variety of sensor modes, such as Fixed-Sensor Center Guide or Edge Guiding from either edge. Edge of Line or Center of Line Guiding is also supported.

The DP-20 PLUS can be either wall-mounted or panel-mounted with included bezel.

The DP-20 PLUS Web Guide Controller is designed to control one motor, up to and including a 3.5 Amp motor, provided by Maxcess International.

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OPERATOR INTERFACE

Function of the Operator Level Keys

AUTOMATIC - This key initiates the Automatic mode. Correction is applied to the web by moving the guide in response to the output of the sensor(s) selected.
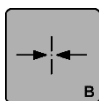
SERVO-CENTER- This key initiates the Servo-Center mode. The guide is centered in its travel in response to the output of the Servo-Center transducer (if installed).
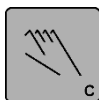
MANUAL - This key initiates the Manual mode. No correction is applied to the guide. This key is also used to abort changes made in the Setup Menus and to exit the Setup Menus.

SENSOR - This key is used to select the sensor(s) for monitoring the web position when the system is in Automatic mode. Sensor selection is allowed in Manual and Servo-Center modes only.

SETUP - This key is used to enter the Setup Menus to configure and adjust the guiding system.

- ARROW - This key is used to jog the guide. The direction of guide movement is configurable. This key is also used during setups to scroll through the setup menus and to adjust setup parameters.
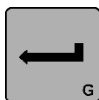
ENTER - This key is not used at the Operator Level. It is used while in the Setup Menus to enter the selected menu and to store modified parameters.
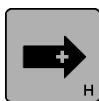
+ ARROW - This key is used to jog the guide. The direction of guide movement is configurable. This key is also used during setup to scroll through the setup menus and to adjust setup parameters.

 Figure Sheet 2-320 A

Features of the LCD Panel

```
[        3A.2.3.1
SETUP (MAN)
GUIDE POLARITY
        +
```
LINE 1 This line contains the menu number. This number may contain 2 or more digits. The first digit indicates the current operation mode. The second digit indicates the current sensor mode. The subsequent digits indicate the current Setup Menu (when applicable).

```
[       X3A.2.3.1
SETUP (MAN)
GUIDE POLARITY
        +
```
LINE 1 When the letter "X" precedes the menu number, this indicates that the selected menu is password protected. When an attempt is made to enter this menu, a password will be requested. T

```
[          2A
   SERVO CENTER
→←  -■■■■■.........+
```
LINE 1 While in Servo-Center mode, the symbol of the current sensor selection is displayed in this line.

```
[]        2C.1.1
SETUP (SC)
→← GAIN
■............... 5.0%
```
LINE 1 While in the setup menus, the symbol of the current sensor selection is displayed in this line.

```
   *         1A
     AUTOMATIC
[  -■■■■■.........+
```
LINE 1 A command present on the Digital I/O is indicated by an asterisk in this line.

```
  (*)        1A
     AUTOMATIC
[  -■■■■■.........+
```
LINE 1 An External Lock command present on the Digital I/O is indicated by an asterisk surrounded by parentheses in this line.

```
   ?         1A
     AUTOMATIC
[  -■■■■■.........+
```
LINE 1 An unrecognized command present on the parallel port is indicated by a question mark in this line.

```
[]       2C.1.1
SETUP (SC)
→← GAIN
■............... 5.0%
```
LINE 1 While in any of the setup menus, a flashing dot *(see arrow)* in this line indicates that a timer is running. The DP-20 PLUS is waiting for a response from the operator. If no response is detected in 3 minutes, the unit will return to the Operator Level. If this dot is not flashing, no timer is active.

```
            1A
     AUTOMATIC
[  -■■■■■.........+
```
LINE 2 While at the Operator Level, this line contains the name of the currently selected Operation mode.

```
[         3A.2.2
SETUP (MAN)
GUIDE POINT
-.........|.+ +20.0%
```
LINE 2 While in the setup menus, this line indicates that a Setup Menu has been selected and indicates the current Operation Mode.

 Figure Sheet 2-320 A

```
                1C
      AUTOMATIC
┌┐ -■■■■■.........+
```

LINE 3   While at the Operator Level, in either Automatic or Manual mode, this line contains the symbol for the current sensor mode and also a bar graph indicating the signal level of the currently selected sensor mode. The sensor symbols are: ┌ indicates Edge Left (X4 port); ┐ indicates Edge Right (X5 port); ┌┐ indicates Center Guiding (both edge sensors, X4 & X5 ports); ⊕ indicates Center of Line guiding (X4 port); and ⊞ indicates Edge of Line guiding (X4 port).

```
┌               2A
    SERVO CENTER
→← -■■■■■.........+
```
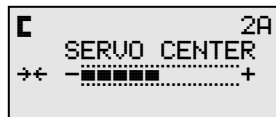
LINE 3 While at the Operator Level, in Servo-Center mode, this line contains the Servo-Center sensor symbol (→←) and also a bar graph indicating the signal level of the Servo-Center sensor.

```
┌              3A.1
SETUP (MAN)
GUIDE POINT
-........i....+ +20.0%
```
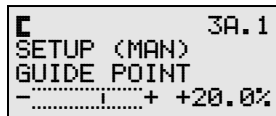
LINE 3 While in the Setup Menus, this line indicates the title of the current menu selection.

```
                1A
      AUTOMATIC
┌ -■■■■■.........+
    GP:  +4.0%
```

LINE 4 While at the Operator Level, this line displays the Guide Point value, if the value is not zero.

```
                1A
      AUTOMATIC
┌ -■■■■■.........+
ASC
```

LINE 4 While at the Operator Level, in Automatic or Servo Center mode, if ASC Control is set to ON, ASC is displayed on this line.

```
                1A
      AUTOMATIC
┌ -■■■■■.........+
ASC ACTIVE
```

LINE 4 While at the Operator Level, in Automatic mode or Manual mode, if ASC Control is set to ON, and if either one of the programmed ASC Limits is reached, this line flashes ASC ACTIVE.

```
┌            3A.2.2
SETUP (MAN)
GUIDE POINT
-........i....+ +20.0%
```
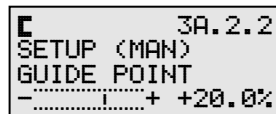
LINE 4 While in the Setup Menus, this line indicates the value associated with the menu as defined in Line 3. If it is possible to modify the value, it will be flashing.

```
                3A
      MANUAL
┌ -■■■■■.........+
NO MOTOR
```
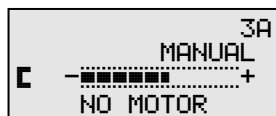
LINE 4 While at the Operator Level, in Automatic mode, Servo Center mode, or Manual mode, if no motor is detected on the Drive connector (X1), NO MOTOR is displayed on this line.

SETUP MENU STRUCTURE

Setup Menu Notes

1. The SETUP key is used to enter the Setup Menus.

2. The ENTER key is used to store changes in the Setup Menus.

3. Pressing the MANUAL key in most Setup Menus will exit the Setup Menus and return to the Operator Level. All changes that were not previously stored will be discarded.

4. In the Setup Menu Structure, at the end of each string of menu selections is an EXIT MENUS screen. Pressing the ENTER key while this screen is displayed will exit the Setup Menus and return to the Operator Level. No values or settings are stored.

5. While in most of the Setup Menus, if no key is pressed within 3 minutes, the system will automatically exit the Setup Menus and return to the Operator Level. While in Automatic Mode or Servo-Center Mode, the Gain and Guide Point changes are stored. While in Manual Mode, all changes that were not previously stored are discarded.

6. While in the Setup Menus, if "FAILED" is displayed, the MANUAL key must be pressed to exit the Setup Menus and return to the Operator Level.

7. If a menu is password protected, the letter "X" will be indicated to the left of the menu number.

8. The Menu Number, located at the right end of line 1 of the LCD Panel, will contain 2 or more digits with the second and subsequent digits separated by dots. The Menu Number is defined as follows;

1A.2.3.4.5	MENU NUMBER
1	OPERATION MODE *
_A	SENSOR MODE/INPUT **
__.2	MENU LEVEL
__._.3	MENU ITEM
__._._.4.5	MENU ITEM SETTINGS

  * **1** = Automatic,   **2** = Servo-Center,   **3** = Manual
** **A** = Edge Left,   **B** = Edge Right,   **C** = Center (both edges)
    D = Line Center, **E** = Line Edge,   **F** = Servo-Center.

Setup Menu Chart

AUTOMATIC MODE

1X.1	1X.2	1X.3	1X.4	1X.5
Gain	Guide Point	Measurement	About	Exit Menus

SERVO-CENTER MODE

2X.1	2X.2	2X.3	2X.4	2X.5
Servo-Center Gain	Servo-Center Guide Point	Measurement	About	Exit Menus

MANUAL MODE
SELECT MENU

3X.1	3X.2	3X.3	3X.4	3X.5	3X.6	3X.7
BASIC	SPECIAL	ADVANCED	LANGUAGE	CUSTOM	ABOUT	Exit Menus

BASIC MENUS

3X.1.1	3X.1.2	3X.1.3	3X.1.4	3X.1.5	3X.1.6	3X.1.7	3X.1.8	3X.1.9
Gain	Guide Point	Guide Polarity	Calibration	Auto Setup	Servo-Center Gain	Servo-Center Polarity	Measurement	Exit Menus

SPECIAL MENUS

3X.2.1	3X.2.2	3X.2.3	3X.2.4	3X.2.5	3X.2.6	3X.2.7	3X.2.8	3X.2.9
Deadband	Set Operation Mode Enable	Set Sensor Mode Enable	Set Jog Enable	Set Jog Polarity	Set Jog Speed	Set Sensor Type	Sensor Voltage	Exit Menus

ADVANCED MENUS

3X.3.1	3X.3.2	3X.3.3	3X.3.4	3X.3.5	3X.3.6	3X.3.7	3X.3.8	3X.3.9
Restore Settings	Backup Settings	Set Password	Set Output Delay Output A	Set Output Delay Output B	Set Loss of Null Output	Digital I/O (X3) Enable/Disable	Test Signals	Exit Menus

LANGUAGE MENU

3X.4.1
Select Language

CUSTOM MENUS

3X.5.1	3X.5.2	3X.5.3	3X.5.4	3X.5.5	3X.5.6	3X.5.7	3X.5.8
LCD Contrast	ASC Control	Set ASC Limits	Set ASC Source	Output Polarity	Set RGPC Speed	X3 Link	Exit Menus

ABOUT MENUS

1X.4.1 2X.4.1 3X.6.1	1X.4.2 2X.4.2 3X.6.2	1X.4.3 2X.4.3 3X.6.3	1X.4.4 2X.4.4 3X.6.4	1X.4.5 2X.4.5 3X.6.5
Serial Number	FW Number	SW Number	SM Number	Exit Menus

MEASUREMENT SUBMENUS

1X.3.1 2X.3.1 3X.1.8.1	1X.3.2 2X.3.2 3X.1.8.2	1X.3.3 2X.3.3 3X.1.8.3	1X.3.4 2X.3.4 3X.1.8.4	1X.3.5 2X.3.5 3X.1.8.5	1X.3.6 2X.3.6 3X.1.8.6	1X.3.7 2X.3.7 3X.1.8.7	1X.3.8 2X.3.8 3X.1.8.8
Sensor Signal Edge L (X4) or Line C (X4)	Sensor Signal Edge R (X5) or Line E (X4)	Sensor Signal Servo-Center (X2)	Motor Type	Tachometer Signal	Motor Current	Digital I/O	Exit Menus

TEST SIGNALS SUBMENUS

3X.3.8.1	3X.3.8.2	3X.3.8.3	3X.3.8.4
Sensor Current	Toggle Outputs	Guide Test Mode	Exit Menus

Notes:
1. The 'X' in the Menu Number may be A, B, C, D, or E, depending on the sensor mode.
2. The highlighted menus can be set for password protection. If a password has been set, the menu line 1 will have an X as the initial character.

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SYSTEM SETUP MENUS
AVAILABLE FROM AUTOMATIC MODE

1X.1, System Gain

1. Press the SETUP key to enter the Setup Menus. The GAIN menu will be displayed on the LCD Panel.
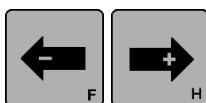
```
[]              1C.1
SETUP (AUTO)
GAIN
■▬▬▬▬▬▬▬  10.0%
```

2. Press the ENTER key to allow adjustment of the System Gain. The current Gain Value will begin flashing on line 4.

```
[]            1C.1.1
SETUP (AUTO)
GAIN
■▬▬▬▬▬▬▬  10.0%
```
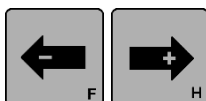
3. Use the ARROW keys to adjust the System Gain to the desired level as indicated on line 4. If an ARROW key is held down, the speed of the Gain change increases. The change is effective immediately, but not stored.
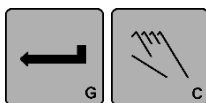
```
[]            1C.1.1
SETUP (AUTO)
GAIN
■■▬▬▬▬▬▬  20.0%
```

4. If desired, press both of the ARROW keys simultaneously to reset the System Gain to 10.0% as indicated on line 4.

```
[]            1C.1.1
SETUP (AUTO)
GAIN
■▬▬▬▬▬▬▬  10.0%
```

5. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
                 1C
        AUTOMATIC
[] -■■■■■▬▬▬+
```
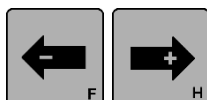
1X.2, System Guide Point

1. Press the SETUP key to enter the Setup Menus. The GAIN menu will be displayed on the LCD Panel.

```
[]              1C.1
SETUP (AUTO)
GAIN
■▬▬▬▬▬▬▬  10.0%
```

2. Use the ARROW keys to scroll until GUIDE POINT is displayed on line 3.
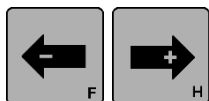
```
[]              1C.2
SETUP (AUTO)
GUIDE POINT
-▬▬▬!▬▬▬+   0.0%
```

3. Press the ENTER key to allow adjustment of the System Guide Point. The current Guide Point value will begin flashing on line 4.

```
[]            1C.2.1
SETUP (AUTO)
GUIDE POINT
-▬▬▬!▬▬▬+   0.0%
```
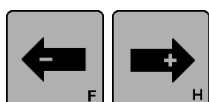
4. Use the ARROW keys to adjust the System Guide Point to the desired position. The LCD Panel is scaled to ±100% from the center of the sensor bandwidth. The default range of the Guide Point adjustment is ±80% of the sensor bandwidth, but this range will be limited if a Deadband above 10% is being used. ASC settings can also limit the Guide Point range. The Guide Point change is effective immediately, but not yet stored.

```
[]          1C.2.1
SETUP (AUTO)
GUIDE POINT
-·········¦···+ +20.0%
```
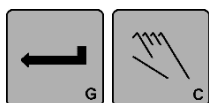
5. If desired, press both of the ARROW keys simultaneously to reset the System Guide Point to the center of the available range, as indicated on line 4.

```
[]          1C.2.1
SETUP (AUTO)
GUIDE POINT
-·········¦···+   0.0%
```

6. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit setup and return to the Operator Level. The Guide Point value (GP) will be displayed on Line 4 if the value is not 0.

```
               1C
          AUTOMATIC
[] -■■■■■·······+
    GP:    +20.0%
```
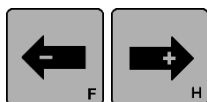
1X.3, Measurement

1. Press the SETUP key to enter the Setup Menus. The GAIN menu will be displayed on the LCD Panel.

```
[]            1C.1
SETUP (AUTO)
GAIN
■·············· 10.0%
```

2. Use the ARROW keys to scroll until MEASUREMENT is displayed on line 3.

```
[]            1C.3
SETUP (AUTO)
MEASUREMENT
```

3. Press the ENTER key to view the Measurement menus. The level of the guiding signal from the Left Edge Sensor (Line Center if a line sensor is being used) is displayed on Line 4. This signal has been scaled by values determined during the Sensor Calibration procedure.
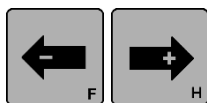
```
[]          1C.3.1
MEASUREMENT
[  SENSOR   (X4)
-■■■■·········+   50%
```
```
φ           1D.3.1
MEASUREMENT
φ   SENSOR   (X5)
-■■■■·········+   50%
```

4. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the Right Edge Sensor (Line Edge if a line sensor is being used). The guiding signal is displayed on Line 4. This signal is scaled by values determined during the Sensor Calibration procedure (see section 6).
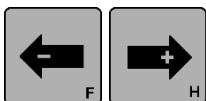
```
[]          1C.3.2
MEASUREMENT
 ]  SENSOR   (X5)
-■■■■·········+   50%
```
```
[          1E.3.2
MEASUREMENT
[   SENSOR   (X5)
-■■■■·········+   50%
```
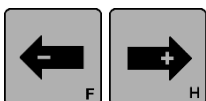
5. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the Servo-Center Sensor. The sensor signal is displayed on Line 4.
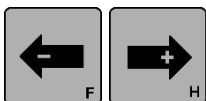
```
┌─┐              1C.3.3
MEASUREMENT
→←  SENSOR   (X2)
-■■■■·······+    50%
```

6. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the MOTOR TYPE. The motor type is displayed on Line 4.

```
┌─┐              1C.3.4
MEASUREMENT
      MOTOR TYPE
0.6A MOTOR 8.66K
```

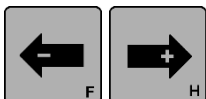**7.** Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the TACHOMETER. The motor tachometer signal is displayed on Line 4. Press the ENTER key to switch between percentage and RPM display modes. The percentage value shown is relative to the maximum speed of the attached motor.

```
┌─┐              1C.3.5
MEASUREMENT
      TACHOMETER
-■■■■■■■■+    +89%
```

```
┌─┐              1C.3.5
MEASUREMENT
      TACHOMETER
-■■■■■■■■+ 1190R
```
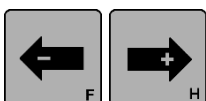
8. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the MOTOR CURRENT. The motor current value is displayed on Line 4. Press the ENTER key to switch between percentage and ampere display modes. The percentage value shown is relative to the maximum current of the attached motor.

```
┌─┐              1C.3.6
MEASUREMENT
 MOTOR CURRENT
-■■■·······+    +50%
```

```
┌─┐              1C.3.6
MEASUREMENT
 MOTOR CURRENT
-■■■·······+   +0.15A
```
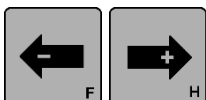
9. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the DIGITAL I/O. The state of the digital outputs and inputs are displayed on Line 4. The order in which the inputs are displayed is shown in the following table.

```
┌─┐              1C.3.7
MEASUREMENT
DIGITAL I/O (X3)
      10000000
```
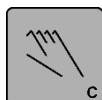
OUT		IN					
A	B	5	4	3	2	1	0

10. If desired, use the ARROW keys to scroll until EXIT MENUS is displayed on line 3. Pressing the ENTER key while this screen is displayed will exit the Measurement Menus and return to the Operator Level.

```
┌─┐              1C.3.8
MEASUREMENT
EXIT MENUS
```

11. Otherwise, press the MANUAL key to exit the Measurement Menus and return to the Operator Level.

```
                      1C
      AUTOMATIC
┌─┐ -■■■■■·······+
```
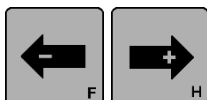
1X.4, About

SETUP E

1. Press the SETUP key to enter the Setup Menus. The AUTO GAIN menu will be displayed on the LCD Panel.

```
[]              1C.1
SETUP (AUTO)
→← GAIN
■............... 10.0%
```

2. Use the ARROW keys to scroll until ABOUT is displayed on line 3.

```
[]              1C.4
SETUP (AUTO)
ABOUT
```
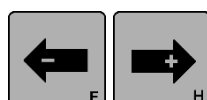
3. Press the ENTER key to view the About menus. The serial number of the DP-20 PLUS is displayed on Line 4.

```
[]            1C.4.1
SETUP (AUTO)
SERIAL NUMBER
SN:01000
```
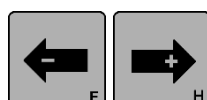
4. Use the ARROW keys to scroll to the desired About menu. Next in the list is the FW NUMBER. The version number of the DP-20 PLUS firmware is displayed on Line 4.

```
[]            1C.4.2
SETUP (AUTO)
FW NUMBER
Ver 2.00
```
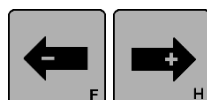
5. Use the ARROW keys to scroll to the desired About menu. Next in the list is the SW NUMBER. The version number of the DP-20 PLUS configuration matrix is displayed on Line 4 or DEFAULT if no special programming is present.

```
[]            1C.4.3
SETUP (AUTO)
SW NUMBER
100123-011
```
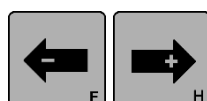
6. Use the ARROW keys to scroll to the desired About menu. Next in the list is the SM NUMBER. The version number of the DP-20 PLUS state machine is displayed on Line 4. This will contain NONE unless special programming is present.

```
[]            1C.4.4
SETUP (AUTO)
SM NUMBER
NONE
```

7. If desired, use the ARROW keys to scroll until EXIT MENUS is displayed on line 3. Pressing the ENTER key while this screen is displayed will exit the About Menus and return to the Operator Level.

```
[]            1C.4.5
SETUP (AUTO)
EXIT MENUS
```
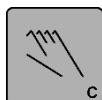
8. Otherwise, press the MANUAL key to exit the About Menus and return to the Operator Level.

```
                  1C
    AUTOMATIC
[] -■■■■■........+
```

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SYSTEM SETUP MENUS
AVAILABLE FROM SERVO-CENTER MODE

2X.1, Servo-Center Gain

1. Press the SETUP key to enter the Setup Menus. The Servo-Center (→←) GAIN menu will be displayed on the LCD Panel.
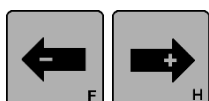
```
                    2C.1
SETUP (SC)
→← GAIN
■.................... 5.0%
```

2. Press the ENTER key to allow adjustment of the Servo-Center Gain. The Gain value will begin flashing on line 4.
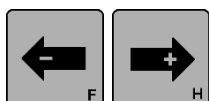
```
                    2C.1.1
SETUP (SC)
→← GAIN
■.................... 5.0%
```

3. Use the ARROW keys to adjust the Gain to the desired level as indicated on line 4. If an ARROW key is held down, the speed of the Gain change increases. The change is effective immediately, but not stored.
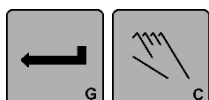
```
                    2C.1.1
SETUP (SC)
→← GAIN
■■................... 15.0%
```

4. If desired, press both of the ARROW keys simultaneously to reset the Servo-Center Gain to 5.0% as indicated on line 4.

```
                    2C.1.1
SETUP (SC)
→← GAIN
■.................... 5.0%
```

5. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
                    2C
    SERVO-CENTER
→← -■■■■■........+
```
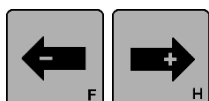
2X.2, Servo-Center Guide Point

1. Press the SETUP key to enter the Setup Menus. The Servo-Center (→←) GAIN menu will be displayed on the LCD Panel.

```
                    2C.1
SETUP (SC)
→← GAIN
■.................... 5.0%
```

2. Use the ARROW keys to scroll until →← GUIDE POINT is displayed on line 3.

```
                    2C.2
SETUP (SC)
→← GUIDE POINT
-.......¦.......+   0.0%
```

3. Press the ENTER key to allow adjustment of the Servo-Center Guide Point. The Guide Point value will begin flashing on line 4.

```
                    2C.2.1
SETUP (SC)
→← GUIDE POINT
-.......¦.......+   0.0%
```
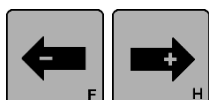
4. Use the ARROW keys to adjust the SC Guide Point to the desired position as indicated on line 4.

```
                    2C.2.1
SETUP (SC)
→← GUIDE POINT
-....¦.........+  -21.0%
```
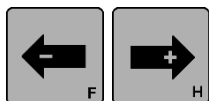
5. If desired, press both of the ARROW keys simultaneously to reset the Servo-Center Guide Point to 0.0% as indicated on line 4.

```
[]            2C.2.1
SETUP (SC)
→← GUIDE POINT
-____!____+    0.0%
```

6. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level. The Servo-Center Guide Point value will be displayed on Line 4 if the value is not 0.

```
[]               2C
   SERVO-CENTER
→← -■■■■____+
   →← GP: -21.0%
```

2X.3, Measurement

1. Press the SETUP key to enter the Setup Menus. The SC GAIN menu will be displayed on the LCD Panel.

```
[]             2C.1
SETUP (SC)
→← GAIN
■_____  5.0%
```

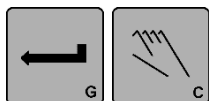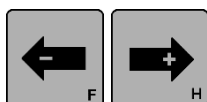**2.** Use the ARROW keys to scroll until MEASUREMENT is displayed on line 3.

```
[]             2C.3
SETUP (SC)
MEASUREMENT
```

3. Press the ENTER key to view the Measurement menus. The level of the guiding signal from the Left Edge Sensor (Line Center if a line sensor is being used) is displayed on Line 4. This signal has been scaled by values determined during the Sensor Calibration procedure (see section 6).
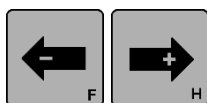
```
[]            2C.3.1
MEASUREMENT
[   SENSOR   (X4)
-■■■■____+    50%
```

```
⊕             2C.3.1
MEASUREMENT
⊕   SENSOR   (X5)
-■■■■____+    50%
```

4. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the Right Edge Sensor (Line Edge if a line sensor is being used). The guiding signal is displayed on Line 4. This signal has been scaled by values determined during the Sensor Calibration procedure (see section 6).

```
[]            2C.3.2
MEASUREMENT
]   SENSOR   (X5)
-■■■■____+    50%
```

```
▦             2E.3.2
MEASUREMENT
▦   SENSOR   (X5)
-■■■■____+    50%
```
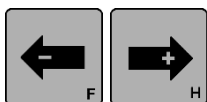
5. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the Servo-Center Sensor. The sensor signal is displayed on Line 4.

```
[]            2C.3.3
MEASUREMENT
→← SENSOR   (X2)
-■■■■____+    50%
```

6. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the MOTOR TYPE. The motor type is displayed on Line 4.

```
[]            2C.3.4
MEASUREMENT
   MOTOR TYPE
0.6A MOTOR 8.66K
```

7. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the TACHOMETER. The motor tachometer signal is displayed on Line 4. Press the ENTER key to switch between percentage and RPM display modes. The percentage value shown is relative to the maximum speed of the attached motor.

```
                    2C.3.5
MEASUREMENT
      TACHOMETER
-■■■■■■■+   +89%
```

```
                    2C.3.5
MEASUREMENT
      TACHOMETER
-■■■■■■■+ 1190R
```

8. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the MOTOR CURRENT. The motor current value is displayed on Line 4. Press the ENTER key to switch between percentage and ampere display modes. The percentage value shown is relative to the maximum current of the attached motor.

```
                    2C.3.6
MEASUREMENT
 MOTOR CURRENT
-■■■.......+    +50%
```
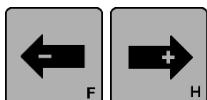
```
                    2C.3.6
MEASUREMENT
 MOTOR CURRENT
-■■■.......+  +0.15A
```

9. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the DIGITAL I/O. The state of the digital outputs and inputs are displayed on Line 4. The order in which the inputs are displayed is shown in the following table.

```
                    2C.3.7
MEASUREMENT
DIGITAL I/O (X3)
     10000000
```

OUT		IN					
A	B	5	4	3	2	1	0

10. If desired, use the ARROW keys to scroll until EXIT MENUS is displayed on line 3. Pressing the ENTER key while this screen is displayed will exit the Measurement Menus and return to the Operator Level.

```
                    2C.3.8
MEASUREMENT
EXIT MENUS
```

11. Otherwise, press the MANUAL key to exit the Measurement Menus and return to the Operator Level.

```
                      2C
   SERVO-CENTER
→← -■■■■■.......+
```

2X.4, About

1. Press the SETUP key to enter the Setup Menus. The SC GAIN menu will be displayed on the LCD Panel.

```
[ ]            2C.1
SETUP (SC)
→← GAIN
■.................   5.0%
```
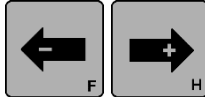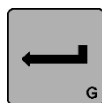
2. Use the ARROW keys to scroll until ABOUT is displayed on line 3.
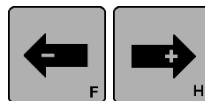
```
[ ]            2C.4
SETUP (SC)
ABOUT
```

3. Press the ENTER key to view the About menus. The serial number of the DP-20 PLUS is displayed on Line 4.
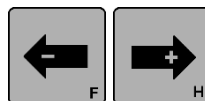
```
[ ]           2C.4.1
SETUP (SC)
SERIAL NUMBER
SN:03251
```

4. Use the ARROW keys to scroll to the desired About menu. Next in the list is the FW NUMBER. The version number of the DP-20 PLUS firmware is displayed on Line 4.
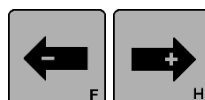
```
[ ]           2C.4.2
SETUP (SC)
FW NUMBER
Ver 2.00
```

5. Use the ARROW keys to scroll to the desired About menu. Next in the list is the SW NUMBER. The version number of the DP-20 PLUS configuration matrix is displayed on Line 4 or DEFAULT if no special programming is present.
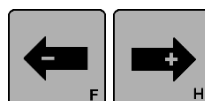
```
[ ]           2C.4.3
SETUP (SC)
SW NUMBER
100123-011
```

6. Use the ARROW keys to scroll to the desired About menu. Next in the list is the SM NUMBER. The version number of the DP-20 PLUS state machine is displayed on Line 4. This will contain NONE unless special programming is present.
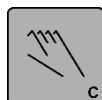
```
[ ]           2C.4.4
SETUP (SC)
SM NUMBER
NONE
```

7. If desired, use the ARROW keys to scroll until EXIT MENUS is displayed on line 3. Pressing the ENTER key while this screen is displayed will exit the About Menus and return to the Operator Level.

```
[ ]           2C.4.5
SETUP (SC)
EXIT MENUS
```

8. Otherwise, press the MANUAL key to exit the About Menus and return to the Operator Level.

```
[ ]            2C
    SERVO-CENTER
→← -■■■■■........+
```

SYSTEM SETUP MENUS
AVAILABLE FROM MANUAL MODE

Basic Menus

3X.1.1, System Gain

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
              3C.1
SETUP (MAN)
SELECT MENU
BASIC
```

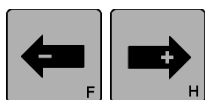**2.** Press the ENTER key to enter the BASIC Menus. The GAIN menu will be displayed.

```
              3C.1.1
SETUP (MAN)
GAIN
■·············· 10.0%
```

3. Press the ENTER key to allow adjustment of the System Gain. The current Gain value will begin flashing on line 4.
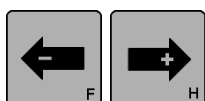
```
              3C.1.1.1
SETUP (MAN)
GAIN
■·············· 10.0%
```

4. Use the ARROW keys to adjust the System Gain to the desired level as indicated on line 4. If an ARROW key is held down, the speed of the Gain change increases. The change is effective immediately, but not stored.
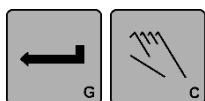
```
              3C.1.1.1
SETUP (MAN)
GAIN
■■············· 20.0%
```

5. If desired, press both of the ARROW keys simultaneously to reset the System Gain to 10.0% as indicated on line 4.

```
              3C.1.1.1
SETUP (MAN)
GAIN
■·············· 10.0%
```

6. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
              3C
         MANUAL
  -■■■■■·······+
```

3X.1.2, System Guide Point

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.
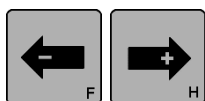
```
              3C.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Press the ENTER key to enter the BASIC Menus. The GAIN menu will be displayed.

```
              3C.1.1
SETUP (MAN)
GAIN
■·············· 10.0%
```

 Figure Sheet 2-320 A

3. Use the ARROW keys to scroll until GUIDE POINT is displayed on line 3.
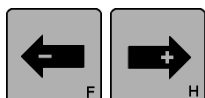
```
[]                3C.1.2
SETUP (MAN)
GUIDE POINT
-..........¦.........+   0.0%
```

4. Press the ENTER key to allow adjustment of the System Guide Point. The current Guide Point value will begin flashing on line 4.

```
[]              3C.1.2.1
SETUP (MAN)
GUIDE POINT
-..........¦.........+  0.0%
```

5. Use the ARROW keys to adjust the System Guide Point to the desired position. The LCD Panel is scaled to ±100% from the center of the sensor bandwidth. The default range of the Guide Point adjustment is ±80% of the sensor bandwidth, but this range will be limited if a Deadband above 10% is being used. ASC settings can also limit the Guide Point range. The Guide Point change is effective immediately, but not yet stored.
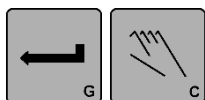
```
[]              3C.1.2.1
SETUP (MAN)
GUIDE POINT
-..........¦.........+ +20.0%
```
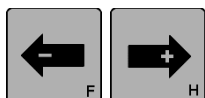
6. If desired, press both of the ARROW keys simultaneously to reset the System Guide Point to the center of the available range, as indicated on line 4.

```
[]              3C.1.2.1
SETUP (MAN)
GUIDE POINT
-..........¦.........+  0.0%
```

7. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
                     3C
               MANUAL
[] -■■■■■..........+
```

3X.1.3, Guide Polarity

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
[]                 3C.1
SETUP (MAN)
SELECT MENU
BASIC
```
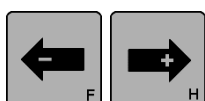
2. Press the ENTER key to enter the BASIC Menus. The GAIN menu will be displayed.
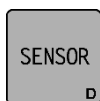
```
[]               3C.1.1
SETUP (MAN)
GAIN
■................... 10.0%
```

3. Use the ARROW keys to scroll until GUIDE POLARITY is displayed on line 3.

```
[]               3C.1.3
SETUP (MAN)
GUIDE POLARITY
   -
```
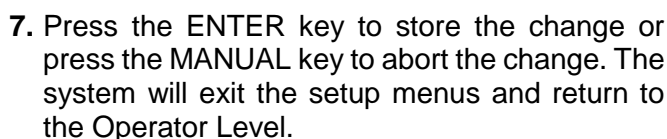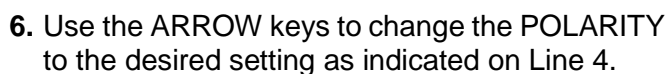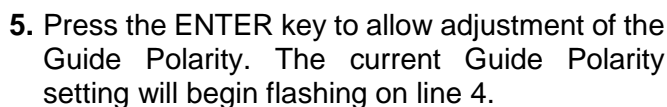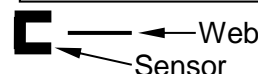
4. If necessary, press the SENSOR key to select the desired sensor mode.

```
[                3A.1.3
SETUP (MAN)
GUIDE POLARITY
   -
```

5. Press the ENTER key to allow adjustment of the Guide Polarity. The current Guide Polarity setting will begin flashing on line 4.

```
┌─────────────────┐
│ C        3A.1.3.1│
│ SETUP (MAN)     │
│ GUIDE POLARITY  │
│        _        │
└─────────────────┘
```

6. Use the ARROW keys to change the POLARITY to the desired setting as indicated on Line 4.

```
┌─────────────────┐
│ C        3A.1.3.1│
│ SETUP (MAN)     │
│ GUIDE POLARITY  │
│        +        │
└─────────────────┘
```

7. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
┌─────────────────┐
│              3A │
│          MANUAL │
│ C -■■■■■■.......+│
└─────────────────┘
```
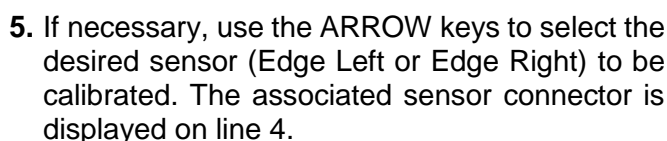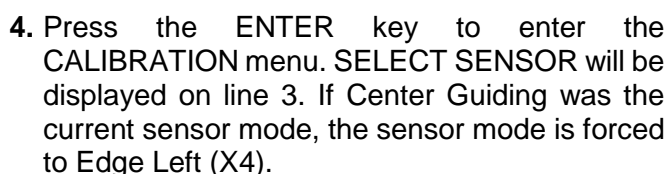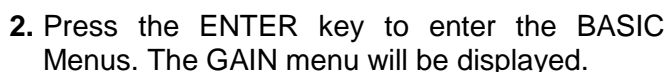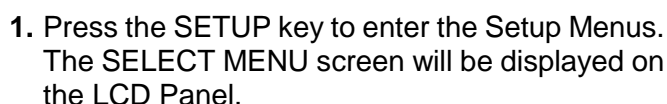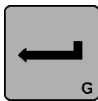
3X.1.4, Calibration, Edge Sensors
CAUTION: Do <u>NOT</u> perform calibration when using SC-100 capacitance sensor with a DP-20 PLUS.

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
┌─────────────────┐
│ C          3A.1 │
│ SETUP (MAN)     │
│ SELECT MENU     │
│ BASIC           │
└─────────────────┘
```

2. Press the ENTER key to enter the BASIC Menus. The GAIN menu will be displayed.

```
┌─────────────────┐
│ C         3A.1.1│
│ SETUP (MAN)     │
│ GAIN            │
│ ■.........  10.0%│
└─────────────────┘
```

3. Use the ARROW keys to scroll until CALIBRATION is displayed on line 3.

```
┌─────────────────┐
│ C         3A.1.4│
│ SETUP (MAN)     │
│ CALIBRATION     │
│                 │
└─────────────────┘
```

4. Press the ENTER key to enter the CALIBRATION menu. SELECT SENSOR will be displayed on line 3. If Center Guiding was the current sensor mode, the sensor mode is forced to Edge Left (X4).

```
┌─────────────────┐
│ C        3A.1.4.1│
│ SETUP (MAN)     │
│ SELECT SENSOR   │
│     (X4)        │
└─────────────────┘
```

5. If necessary, use the ARROW keys to select the desired sensor (Edge Left or Edge Right) to be calibrated. The associated sensor connector is displayed on line 4.

```
┌─────────────────┐
│ C        3B.1.4.1│
│ SETUP (MAN)     │
│ SELECT SENSOR   │
│     (X4)        │
└─────────────────┘
```

6. Press the ENTER key to begin the calibration. UNCOVER SENSOR will be displayed on line 2. Remove all materials from the sensor field of view (see graphic at right). The sensor signal is displayed on Line 3.

```
┌─────────────────┐
│ C        3B.1.4.2│
│ UNCOVER SENSOR  │
│ -..........+  0%│
│                 │
└─────────────────┘
```

◄── Web
◄── Sensor

7. Press the ENTER key. WAIT... will be displayed for a few seconds on line 4 of the LCD Panel. Maintain the web position during this wait period.

```
C        3A.1.4.2
UNCOVER SENSOR
-................+  0%
WAIT...
```
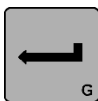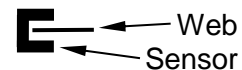
8. Once the delay has ended, COVER SENSOR will be displayed on line 2. Fully cover the sensor field of view with the web material to be guided (see graphic at right). The sensor signal is displayed on Line 3.

```
C        3A.1.4.3
COVER SENSOR
-■■■■■■■■■■+ 95%
```

◄── Web
◄── Sensor

9. Press the ENTER key. If the contrast is sufficient for guiding, SUCCESSFUL will be displayed for a few seconds on line 2, then the unit will automatically exit the menus and return to the Operator Level.

```
C        3A.1.4.4
SUCCESSFUL
-■■■■■■■■■■+ 95%
```

```
C              3A
             MANUAL
 -■■■■■■........+
```

—OR—

10. If the contrast is not sufficient for guiding, FAILED will be displayed on line 2. Press the MANUAL key to exit the setup menus and return to the Operator Level. Repeat this procedure, as necessary.

```
C        3A.1.4.6
FAILED
-■................+  3%
```

3X.1.4, Calibration, Line Sensor, Center of Line Guiding

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.
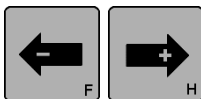
```
⌗            3D.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Press the ENTER key to enter the BASIC Menus. The GAIN menu will be displayed.

```
⌗          3D.1.1
SETUP (MAN)
GAIN
■................ 10.0%
```

3. Use the ARROW keys to scroll until CALIBRATION is displayed on line 3.

```
⌗          3D.1.4
SETUP (MAN)
CALIBRATION
```

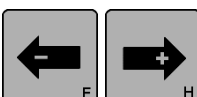4. Press the ENTER key to enter the CALIBRATION menu. SELECT SENSOR will be displayed on line 3.

```
⌗        3D.1.4.1
SETUP (MAN)
SELECT SENSOR
      (X5)
```

5. If necessary, use the ARROW keys to select the Center of Line sensor input. ⌗ will be displayed on line 1.
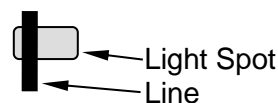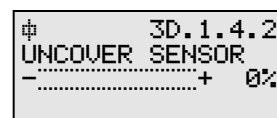
```
⌗        3D.1.4.1
SETUP (MAN)
SELECT SENSOR
      (X5)
```
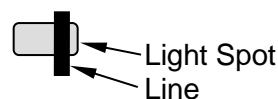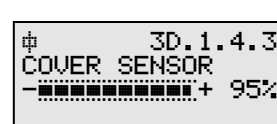
6. Press the ENTER key to begin the calibration. UNCOVER SENSOR will be displayed on line 2. With the sensor light spot correctly focused on the line to be guided, position the sensor such that the line is located within ½ of the light spot (see graphic at right). The sensor signal is displayed on Line 3.

```
⊕           3D.1.4.2
UNCOVER SENSOR
-.................+  0%
```
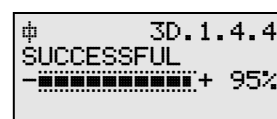
Light Spot
Line

7. Press the ENTER key. WAIT... will be displayed for a few seconds on line 4 of the LCD Panel. Maintain the web position during this wait period.

```
⊕           3D.1.4.2
UNCOVER SENSOR
-.................+  0%
WAIT...
```
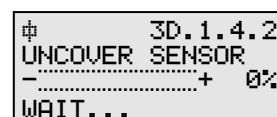
8. Once the delay has ended, COVER SENSOR will be displayed on line 2. Position the sensor such that the line to be guided is located within the opposite ½ of the light spot (see graphic at right). The sensor signal is displayed on Line 3.

```
⊕           3D.1.4.3
COVER SENSOR
-■■■■■■■■■■+ 95%
```

Light Spot
Line

9. Press the ENTER key. If the contrast is sufficient for guiding, SUCCESSFUL will be displayed for a few seconds on line 2, then the unit will automatically exit the menus and return to the Operator Level.

```
⊕           3D.1.4.4
SUCCESSFUL
-■■■■■■■■■■+ 95%
```

```
            3D
        MANUAL
⊕   -■■■■■■.........+
```

—*OR*—

10. If the contrast is not sufficient for guiding, FAILED will be displayed on line 2. Press the MANUAL key to exit the setup menus and return to the Operator Level. Repeat this procedure, as necessary.
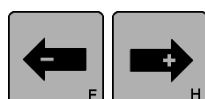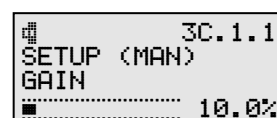
```
⊕           3D.1.4.6
FAILED
-■.................+  3%
```
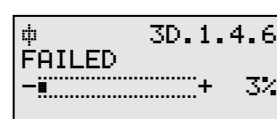
3X.1.4, Calibration, Line Sensor, Edge of Line Guiding

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
⊞           3C.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Press the ENTER key to enter the BASIC Menus. The GAIN menu will be displayed.

```
⊞           3C.1.1
SETUP (MAN)
GAIN
■................. 10.0%
```

3. Use the ARROW keys to scroll until CALIBRATION is displayed on line 3.

```
⊞           3C.1.4
SETUP (MAN)
CALIBRATION
```
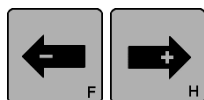
4. Press the ENTER key to enter the CALIBRATION menu. SELECT SENSOR will be displayed on line 3.

```
          3A.1.4.1
SETUP (MAN)
SELECT SENSOR
       (X5)
```
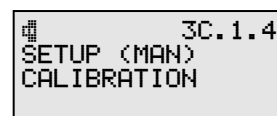
5. If necessary, use the ARROW keys to select the Edge of Line sensor input. X5 will be displayed on line 1.

```
          3B.1.4.1
SETUP (MAN)
SELECT SENSOR
       (X5)
```

6. Press the ENTER key to begin the calibration. UNCOVER SENSOR will be displayed on line 2. With the sensor light spot correctly focused on the material to be guided, position the sensor such that the light spot is located on the background, near the line to be guided, but not on the line (see graphic at right). The sensor signal is displayed on Line 3.

```
          3E.1.4.2
UNCOVER SENSOR
-..................+  0%
```
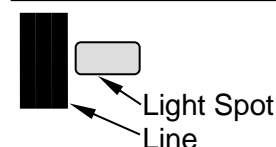
Light Spot
Line

7. Press the ENTER key. WAIT... will be displayed for a few seconds on line 4 of the LCD Panel. Maintain the web position during this wait period.

```
          3E.1.4.2
UNCOVER SENSOR
-..................+  0%
WAIT...
```
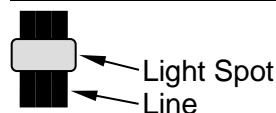
8. Once the delay has ended, COVER SENSOR will be displayed on line 2. Position the sensor such that the light spot is located fully on the line to be guided (see graphic at right). The sensor signal is displayed on Line 3 of the LCD Panel.

```
          3E.1.4.3
COVER SENSOR
-■■■■■■■■■■+ 95%
```

Light Spot
Line

9. Press the ENTER key. If the contrast is sufficient for guiding, SUCCESSFUL will be displayed for a few seconds on line 2, then the unit will automatically exit the menus and return to the Operator Level.

```
          3E.1.4.4
SUCCESSFUL
-■■■■■■■■■■+ 95%
```

```
              3E
          MANUAL
   -■■■■■..........+
```

—OR—

10. If the contrast is not sufficient for guiding, FAILED will be displayed on line 2. Press the MANUAL key to exit the setup menus and return to the Operator Level. Repeat this procedure, as necessary.

```
          3E.1.4.6
FAILED
-■..........+  3%
```

3X.1.4, Calibration, Servo-Center Sensor

(The default calibration for the Servo-Center Sensor should be sufficient, but this procedure may be used, if necessary).

SETUP
E

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.
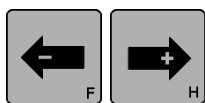
```
            3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Press the ENTER key to enter the BASIC Menus. The GAIN menu will be displayed.

```
            3A.1.1
SETUP (MAN)
GAIN
■............... 10.0%
```

3. Use the ARROW keys to scroll until CALIBRATION is displayed on line 3.

```
            3A.1.4
SETUP (MAN)
CALIBRATION
```
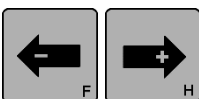
4. Press the ENTER key to enter the CALIBRATION menu. SELECT SENSOR will be displayed on line 3.

```
            3A.1.4.1
SETUP (MAN)
SELECT SENSOR
     (X4)
```

5. Use the ARROW keys to select the Servo-Center Sensor. →← will be displayed on line 1 and (X2) will be displayed on line 4.

```
→←          3F.1.4.1
SETUP (MAN)
SELECT SENSOR
     (X2)
```

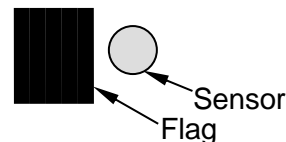**6.** Press the ENTER key to begin the calibration. UNCOVER SENSOR will be displayed on line 2. Position the flag such that it is located away from the surface of the sensor (see graphic at right). The sensor signal is displayed on Line 3 of the LCD Panel.

```
→←          3F.1.4.2
UNCOVER SENSOR
─............+  0%
```
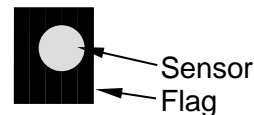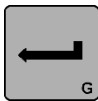
Sensor Flag

7. Press the ENTER key. COVER SENSOR will be displayed on line 2. Position the flag such that it is positioned directly in front of the sensor and is fully covering the sensor (see graphic at right). The sensor signal is displayed on Line 3 of the LCD Panel.

```
→←          3F.1.4.3
COVER SENSOR
─■■■■■■■■+ 95%
```

Sensor Flag

8. Press the ENTER key. If the contrast is sufficient, SUCCESSFUL will be displayed for a few seconds on line 2, then the unit will automatically exit the menus and return to the Operator Level.

```
⇥⇤          3F.1.4.4
SUCCESSFUL
-▪▪▪▪▪▪▪▪▪▪⋯⋯+ 95%
```

```
                    3A
              MANUAL
 ⌐  -▪▪▪▪▪⋯⋯⋯⋯+
```

—OR—

9. If the contrast is not sufficient, FAILED will be displayed on line 2. Press the MANUAL key to exit the setup menus and return to the Operator Level. Repeat this procedure, as necessary.

```
⇥⇤          3F.1.4.6
FAILED
-▪⋯⋯⋯⋯⋯⋯⋯+  3%
```

3X.1.5, Auto Setup

Sensor Calibration should be performed prior to performing Auto Setup. If a line sensor is being used, the icons and screen numbers will correspond to the sensor mode that is selected.
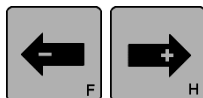
1. Position the edge of the web, or the center or edge of the line in the center of the sensor field of view. (See the appropriate graphic at right). The ARROW keys may be used.

Edge Guiding   Line Center

Center Guiding Line Edge
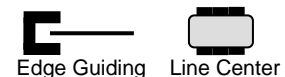
2. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.
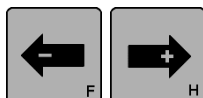
```
⌐              3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

3. Press the ENTER key to enter the BASIC Menus. The GAIN menu will be displayed.

```
⌐              3A.1.1
SETUP (MAN)
GAIN
▪⋯⋯⋯⋯⋯⋯ 10.0%
```

4. Use the ARROW keys to scroll until AUTO SETUP is displayed on line 3.

```
⌐              3A.1.5
SETUP (MAN)
AUTO SETUP
```

5. If necessary, press the SENSOR key to select the desired sensor mode as indicated on line 1 of the LCD Panel.

```
⌐              3B.1.5
SETUP (MAN)
AUTO SETUP
```

6. Press the ENTER key to begin the Auto Setup. If the web is not positioned near the center of the sensor field of view, the LCD Panel will display POSITION WEB IN CENTER OF SENSOR. Once the web is moved to near the center of the sensor field of view, the Auto Setup procedure will continue.

```
⌐              3B.1.5.3
POSITION WEB IN
CENTER OF SENSOR
-▪▪▪▪▪⋯⋯⋯⋯+
```

7. Once the Auto Setup is complete, if it was successful, SUCCESSFUL will be displayed for a few seconds on line 3, then the unit will automatically exit the menus and return to the Operator Level. The Guide Point is set to 0. If a Deadband was stored before Auto Setup was performed, the Deadband setting is restored.

```
┌─────────────────────┐
│▐          3B.1.5.4   │
│SETUP (MAN)          │
│SUCCESSFUL           │
│                     │
└─────────────────────┘
```

```
┌─────────────────────┐
│▐               3B    │
│           MANUAL    │
│ -▪▪▪▪▪▪▪............+ │
│                     │
└─────────────────────┘
```

—OR—

8. Once the Auto Setup is complete, if it was not successful, FAILED will be displayed on line 3. Press the MANUAL key to exit the setup menus and return to the Operator Level. The Guide Point and Deadband are restored to the values stored before the Auto Setup was attempted. Repeat this procedure, as required.

```
┌─────────────────────┐
│▐          3A.1.5.3   │
│SETUP (MAN)          │
│FAILED               │
│                     │
└─────────────────────┘
```

3X.1.6, Servo-Center Gain

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.
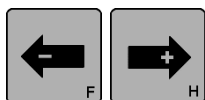
```
┌─────────────────────┐
│ SETUP               │
│                     │
│                 E   │
└─────────────────────┘
```

```
┌─────────────────────┐
│▐               3A.1  │
│SETUP (MAN)          │
│SELECT MENU          │
│BASIC                │
└─────────────────────┘
```

2. Press the ENTER key to enter the BASIC Menus. The GAIN menu will be displayed.

```
┌─────────────────────┐
│        ←┘           │
│                     │
│                 G   │
└─────────────────────┘
```

```
┌─────────────────────┐
│▐              3A.1.1 │
│SETUP (MAN)          │
│GAIN                 │
│▪...........  10.0%   │
└─────────────────────┘
```

3. Use the ARROW keys to scroll until →← GAIN is displayed on line 3.

```
┌─────────────────────┐
│  ⬅       ⮕         │
│    F       H        │
└─────────────────────┘
```

```
┌─────────────────────┐
│▐              3A.1.6 │
│SETUP (MAN)          │
│→← GAIN              │
│▪...........   5.0%   │
└─────────────────────┘
```

4. Press the ENTER key to allow adjustment of the Servo-Center Gain. The current Gain value will begin flashing on line 4.

```
┌─────────────────────┐
│        ←┘           │
│                     │
│                 G   │
└─────────────────────┘
```
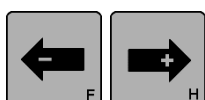
```
┌─────────────────────┐
│▐            3A.1.6.1 │
│SETUP (SC)           │
│→← GAIN              │
│▪...........   5.0%   │
└─────────────────────┘
```
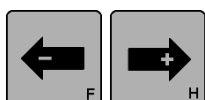
5. Use the ARROW keys to adjust the Gain value to the desired level as indicated on line 4. If an ARROW key is held down, the speed of the Gain change increases. The change is effective immediately, but not stored.
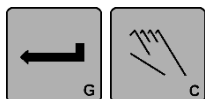
```
┌─────────────────────┐
│  ⬅       ⮕         │
│    F       H        │
└─────────────────────┘
```

```
┌─────────────────────┐
│▐            3A.1.6.1 │
│SETUP (SC)           │
│→← GAIN              │
│▪▪..........   8.0%   │
└─────────────────────┘
```

6. If desired, press both of the ARROW keys simultaneously to reset the Servo-Center Gain to 5.0% as indicated on line 4.

```
┌─────────────────────┐
│  ⬅       ⮕         │
│    F       H        │
└─────────────────────┘
```

```
┌─────────────────────┐
│▐            3A.1.6.1 │
│SETUP (SC)           │
│→← GAIN              │
│▪...........   5.0%   │
└─────────────────────┘
```
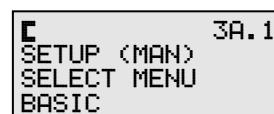
7. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.
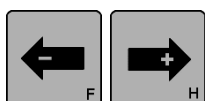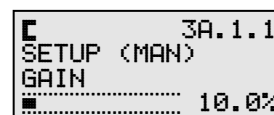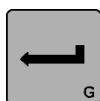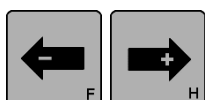
```
                    3A
                MANUAL
  [ -■■■■■.........+
```

3X.1.7, Servo-Center Polarity

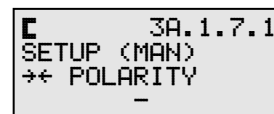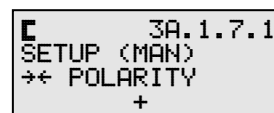**1.** Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed.

```
  [             3A.1
  SETUP (MAN)
  SELECT MENU
  BASIC
```

2. Press the ENTER key to enter the BASIC Menus. The GAIN menu will be displayed.

```
  [            3A.1.1
  SETUP (MAN)
  GAIN
  ■............... 10.0%
```

3. Use the ARROW keys to scroll until ⇥⇤ POLARITY is displayed on line 3.

```
  [            3A.1.7
  SETUP (MAN)
  ⇥⇤ POLARITY
         _
```
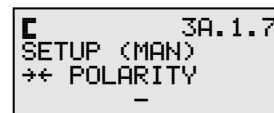
4. Press the ENTER key to allow adjustment of the Servo-Center Polarity. The current Polarity setting will begin flashing on line 4.
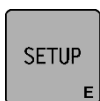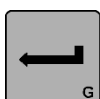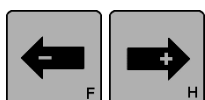
```
  [          3A.1.7.1
  SETUP (MAN)
  ⇥⇤ POLARITY
         _
```

5. Use the ARROW keys to adjust the Servo-Center Polarity to the desired setting as indicated on line 4.

```
  [          3A.1.7.1
  SETUP (MAN)
  ⇥⇤ POLARITY
         +
```

6. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.
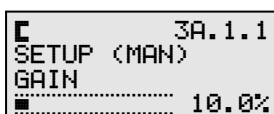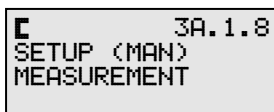
```
                    3A
                MANUAL
  [ -■■■■■.........+
```

3X.1.8, Measurement

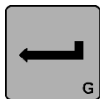**1.** Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
  [             3A.1
  SETUP (MAN)
  SELECT MENU
  BASIC
```

2. Press the ENTER key to enter the BASIC Menus. The GAIN menu will be displayed.

```
  [            3A.1.1
  SETUP (MAN)
  GAIN
  ■............... 10.0%
```

3. Use the ARROW keys to scroll until MEASUREMENT is displayed on line 3.

```
  [            3A.1.8
  SETUP (MAN)
  MEASUREMENT
```

 Figure Sheet 2-320 A

4. Press the ENTER key to view the Measurement menus. The level of the guiding signal from the Left Edge Sensor (Line Center if a line sensor is being used) is displayed on Line 4. This signal has been scaled by values determined during the Sensor Calibration procedure.
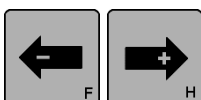
```
    3A.1.8.1
MEASUREMENT
  SENSOR  (X4)
-■■■■.........+   50%
```

```
    3D.1.8.1
MEASUREMENT
  SENSOR  (X5)
-■■■■.........+   50%
```

5. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the Right Edge Sensor (Line Edge if a line sensor is being used.) The guiding signal is displayed on Line 4. This signal has been scaled by values determined during the Sensor Calibration procedure.
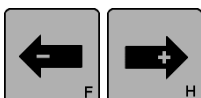
```
    3A.1.8.2
MEASUREMENT
  SENSOR  (X5)
-■■■■.........+   50%
```

```
    3E.1.8.2
MEASUREMENT
  SENSOR  (X5)
-■■■■.........+   50%
```
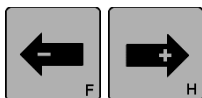
6. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the Servo-Center Sensor. The sensor signal is displayed on Line 4.

```
    3A.1.8.3
MEASUREMENT
→← SENSOR  (X2)
-■■■■.........+   50%
```
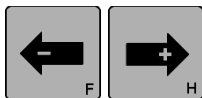
7. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the MOTOR TYPE. The motor type is displayed on Line 4.

```
    3A.1.8.4
MEASUREMENT
   MOTOR TYPE
0.6A MOTOR 8.66K
```

8. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the TACHOMETER. The motor tachometer signal is displayed on Line 4. Press the ENTER key to switch between percentage and RPM display modes. The percentage value shown is relative to the maximum speed of the attached motor.
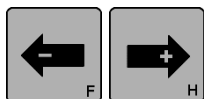
```
    3A.1.8.5
MEASUREMENT
   TACHOMETER
-■■■■■■■■+  +89%
```

```
    3A.1.8.5
MEASUREMENT
   TACHOMETER
-■■■■■■■■+ 1190R
```
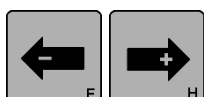
9. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the MOTOR CURRENT. The motor current value is displayed on Line 4. Press the ENTER key to switch between percentage and ampere display modes. The percentage value shown is relative to the maximum current of the attached motor.

```
[              3A.1.8.6
MEASUREMENT
 MOTOR CURRENT
-■■■.........+     +50%
```

```
[              3A.1.8.6
MEASUREMENT
 MOTOR CURRENT
-■■■.........+   +0.15A
```
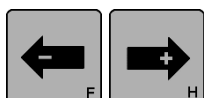
10. Use the ARROW keys to scroll to the desired Measurement menu. Next in the list is the DIGITAL I/O. The state of the digital outputs and inputs are displayed on Line 4. The order in which the inputs are displayed is shown in the following table.

```
[              3A.1.8.7
MEASUREMENT
DIGITAL I/O (X3)
    10000000
```

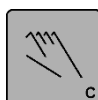| OUT		IN					
A	B	5	4	3	2	1	0

11. If desired, use the ARROW keys to scroll until EXIT MENUS is displayed on line 3. Pressing the ENTER key while this screen is displayed will exit the Measurement Menus and return to the Operator Level.

```
[              3A.1.8.8
MEASUREMENT
EXIT MENUS
```

12. Otherwise, press the MANUAL key to exit the Measurement Menus and return to the Operator Level.

```
[                   3A
             MANUAL
[] -■■■■■■.........+
```

Special Menus

3X.2.1, Deadband

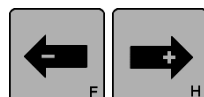**1.** Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
[                 3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until SPECIAL is displayed on line 4.

```
[                 3A.2
SETUP (MAN)
SELECT MENU
SPECIAL
```

3. Press the ENTER key to enter the Special Menus. The DEADBAND menu will be displayed. The current value is displayed on Line 4.

```
[               3A.2.1
SETUP (MAN)
DEADBAND
-.........+    0.0%
```

SENSOR
D

4. If necessary, press the SENSOR key to select the desired sensor mode as indicated on line 1.

```
              3A.2.1
SETUP (MAN)
DEADBAND
-...............+    0.0%
```

↵
G

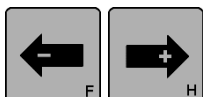**5.** Press the ENTER key to enter the DEADBAND menu. The current value will begin flashing on line 4.

```
              3A.2.1.1
SETUP (MAN)
DEADBAND
-...............+    0.0%
```

←   →
F   H

6. Use the ARROW keys to adjust the Deadband to the desired setting as indicated on line 4. As an ARROW key is held down, the speed of the change increases. The default range of the Deadband adjustment is 80% of the sensor bandwidth, but this range will be limited if a Guide Point Shift above 10% is being used. The Deadband change is effective immediately, but not yet stored.

```
              3A.2.1.1
SETUP (MAN)
DEADBAND
-....■.......+   10.0%
```
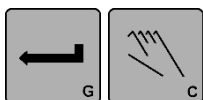
↵   ✍
G   C

7. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
                 3A
             MANUAL
   -■■■■■.......+
```

3X.2.2, Set Operation Mode Enable

SETUP
E

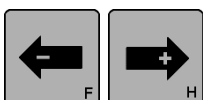**1.** Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
              3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

←   →
F   H

2. Use the ARROW keys to scroll until SPECIAL is displayed on line 4.

```
              3A.2
SETUP (MAN)
SELECT MENU
SPECIAL
```
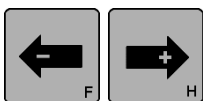
↵
G

3. Press the ENTER key to enter the Special Menus. The DEADBAND menu will be displayed.

```
              3A.2.1
SETUP (MAN)
DEADBAND
-...............+    0.0%
```

←   →
F   H

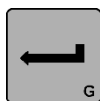**4.** Use the ARROW keys to scroll until SET MODE ENABLE is displayed on line 3. The current selection is displayed on Line 4.

```
              3A.2.2
SETUP (MAN)
SET MODE ENABLE
IAUTOISC   IMAN I
```

↵
G

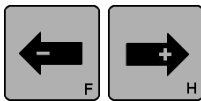**5.** Press the ENTER key to enter the Set Mode Enable menu. The current selection will begin flashing on line 4. The last digit of the menu number will vary according to the current selection.

```
              3A.2.2.1
SETUP (MAN)
IAUTOISC   IMAN I
INO   INO   IYES I
```

6. Use the ARROW keys to scroll to the desired selection as indicated on line 4 of the LCD Panel. YES, indicates that the corresponding operation mode is enabled. NO indicates it is disabled.

```
[          3A.2.2.2
SETUP (MAN)
|AUTO|SC   |MAN |
|NO   |YES  |YES |
```

```
[          3A.2.2.3
SETUP (MAN)
|AUTO|SC   |MAN |
|YES |NO   |YES |
```

```
[          3A.2.2.4
SETUP (MAN)
|AUTO|SC   |MAN |
|YES |YES |YES |
```

7. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
[              3A
         MANUAL
[  -■■■■■.......+
```
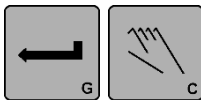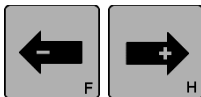
3X.2.3, Set Sensor Mode Enable, Edge Sensors

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
[              3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until SPECIAL is displayed on line 4.

```
[              3A.2
SETUP (MAN)
SELECT MENU
SPECIAL
```
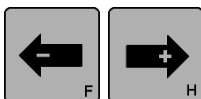
3. Press the ENTER key to enter the Special Menus. The DEADBAND menu will be displayed.

```
[            3A.2.1
SETUP (MAN)
DEADBAND
-..........+   0.0%
```

4. Use the ARROW keys to scroll until SENSOR ENABLE is displayed on line 3. The current selection is displayed on Line 4.

```
[            3A.2.3
SETUP (MAN)
SENSOR ENABLE
| [  | ]  | [] |
```
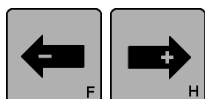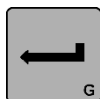
5. Press the ENTER key to enter the Sensor Enable menu. The current selection will begin flashing on line 4. The last digit of the menu number will vary according to the current selection.

```
[          3A.2.3.1
SETUP (MAN)
| [  | ]  | [] |
|YES |YES |YES |
```

 Figure Sheet 2-320 A

6. Use the ARROW keys to scroll to the desired selection, as indicated on line 4 of the LCD Panel. YES, indicates that the corresponding sensor mode is enabled. NO indicates it is disabled.
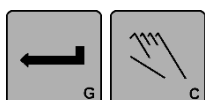
```
        3A.2.3.2
SETUP (MAN)
| [ | ] | [] |
|YES |YES |NO |
```

```
        3A.2.3.3
SETUP (MAN)
| [ | ] | [] |
|YES |NO |NO |
```

```
        3A.2.3.4
SETUP (MAN)
| [ | ] | [] |
|NO | YES |NO |
```

```
        3A.2.3.5
SETUP (MAN)
| [ | ] | [] |
|YES| NO |YES |
```

```
        3A.2.3.6
SETUP (MAN)
| [ | ] | [] |
|NO |NO |YES |
```

```
        3A.2.3.7
SETUP (MAN)
| [ | ] | [] |
|NO |YES |YES |
```

7. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
             3A
          MANUAL
[ -■■■■■............+
```

3X.2.3, Set Sensor Mode Enable, Line Sensor

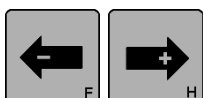**1.** Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
            3D.1
SETUP (MAN)
SELECT MENU
BASIC
```
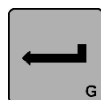
2. Use the ARROW keys to scroll until SPECIAL is displayed on line 4.

```
            3D.2
SETUP (MAN)
SELECT MENU
SPECIAL
```
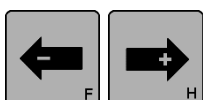
3. Press the ENTER key to enter the Special Menus. The DEADBAND menu will be displayed.

```
            3D.2.1
SETUP (MAN)
DEADBAND
-............+   0.0%
```

4. Use the ARROW keys to scroll until SENSOR ENABLE is displayed on line 3. The current selection is displayed on Line 4.

```
            3D.2.3
SETUP (MAN)
SENSOR ENABLE
| Φ | ▦ |
```

 Figure Sheet 2-320 A

5. Press the ENTER key to enter the Sensor Enable menu. The current selection will begin flashing on line 4. The last digit of the menu number will vary according to the current selection.

```
中        3D.2.3.1
SETUP (MAN)
| 中 | 虫 |
|YES |YES |
```

6. Use the ARROW keys to scroll to the desired selection, as indicated on line 4 of the LCD Panel. YES, indicates that the corresponding sensor mode is enabled. NO indicates it is disabled.

```
中        3D.2.3.2
SETUP (MAN)
| 中 | 虫 |
|YES |NO |
```

```
中        3D.2.3.3
SETUP (MAN)
| 中 | 虫 |
|NO |YES |
```

7. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menu and return to the Operator Level.

```
              3D
         MANUAL
中  -■■■■■..........+
```

3X.2.4, Set Jog Enable

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
[        3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until SPECIAL is displayed on line 4.

```
[        3A.2
SETUP (MAN)
SELECT MENU
SPECIAL
```

3. Press the ENTER key to enter the Special Menus. The DEADBAND menu will be displayed.

```
[        3A.2.1
SETUP (MAN)
DEADBAND
-..............+    0.0%
```

4. Use the ARROW keys to scroll until SET JOG ENABLE is displayed on line 3. The current selection is displayed on Line 4.

```
[        3A.2.4
SETUP (MAN)
SET JOG ENABLE
|AUTO|SC  |MAN |
```
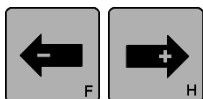
5. Press the ENTER key to enter the Set Jog Enable menu. The current selection will begin flashing on line 4. The last digit of the menu number will vary according to the current selection.

```
[        3A.2.4.1
SETUP (MAN)
|AUTO|SC  |MAN |
|NO  |NO  |NO  |
```

6. Use the ARROW keys to scroll to the desired selection, as indicated on line 4 of the LCD Panel. YES, indicates that the jog is enabled in the corresponding operation mode, as indicated on line 3. NO indicates it is disabled.
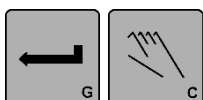
```
         3A.2.4.2
SETUP (MAN)
IAUTOISC   IMAN I
INO   INO   IYES I
```

```
         3A.2.4.3
SETUP (MAN)
IAUTOISC   IMAN I
INO   IYES INO   I
```

```
         3A.2.4.4
SETUP (MAN)
IAUTOISC   IMAN I
INO   IYES IYES I
```

```
         3A.2.4.5
SETUP (MAN)
IAUTOISC   IMAN I
IYES INO   INO   I
```

```
         3A.2.4.6
SETUP (MAN)
IAUTOISC   IMAN I
IYES INO   IYES I
```

```
         3A.2.4.7
SETUP (MAN)
IAUTOISC   IMAN I
IYES IYES INO   I
```

```
         3A.2.4.8
SETUP (MAN)
IAUTOISC   IMAN I
IYES IYES IYES I
```

7. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.
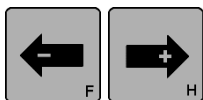
```
             3A
          MANUAL
C  -■■■■■■.........+
```

3X.2.5, Set Jog Polarity

SETUP
E

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
[              3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

← →
F   H

2. Use the ARROW keys to scroll until SPECIAL is displayed on line 4.

```
[              3A.2
SETUP (MAN)
SELECT MENU
SPECIAL
```

↵
G

3. Press the ENTER key to enter the Special Menus. The DEADBAND menu will be displayed.

```
[              3A.2.1
SETUP (MAN)
DEADBAND
-................+   0.0%
```

← →
F   H

4. Use the ARROW keys to scroll until SET JOG POLARITY is displayed on line 3. The current setting will be displayed on Line 4.

```
[              3A.2.5
SETUP (MAN)
SET JOG POLARITY
          +
```

↵
G

5. Press the ENTER key to enter the Set Jog Polarity menu. The current setting will begin flashing on line 4.

```
[              3A.2.5.1
SETUP (MAN)
SET JOG POLARITY
          +
```

← →
F   H

6. Use the ARROW keys to scroll to the desired polarity setting as indicated on line 4.

```
[              3A.2.5.1
SETUP (MAN)
SET JOG POLARITY
          -
```

↵   ✋
G   C

7. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
                 3A
              MANUAL
[ -■■■■■.........+
```

3X.2.6, Set Jog Speed

SETUP
E

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
[              3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

← →
F   H

2. Use the ARROW keys to scroll until SPECIAL is displayed on line 4.

```
[              3A.2
SETUP (MAN)
SELECT MENU
SPECIAL
```

↵
G

3. Press the ENTER key to enter the Special Menus. The DEADBAND menu will be displayed.

```
[              3A.2.1
SETUP (MAN)
DEADBAND
-................+   0.0%
```

← →
F   H

4. Use the ARROW keys to scroll until SET JOG SPEED is displayed on line 3.

```
[              3A.2.6
SETUP (MAN)
SET JOG SPEED
■■■■■.........   50%
```
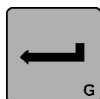
5. Press the ENTER key to enter the SET JOG SPEED menu. The current Jog Speed setting begins flashing on line 4.
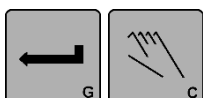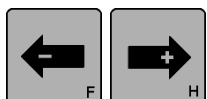
```
[          3A.2.6.1
SETUP (MAN)
SET JOG SPEED
■■■■■.........    50%
```

6. Use the ARROW keys to adjust the Jog Speed to the desired setting as indicated on line 4.

```
[          3A.2.6.1
SETUP (MAN)
SET JOG SPEED
■■■.........      25%
```

7. Press the ENTER key to store the change or press the MANUAL key to abort the procedure. The system will exit the setup menus and return to the Operator Level.

```
              3A
        MANUAL
[   -■■■■■.......+
```
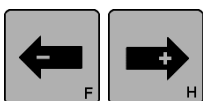
3X.2.7, Set Sensor Type

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
[            3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until SPECIAL is displayed on line 4.

```
[            3A.2
SETUP (MAN)
SELECT MENU
SPECIAL
```
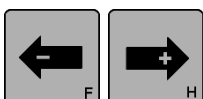
3. Press the ENTER key to enter the Special Menus. The DEADBAND menu will be displayed.

```
[          3A.2.1
SETUP (MAN)
DEADBAND
-.........+    0.0%
```
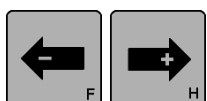
4. Use the ARROW keys to scroll until SET SENSOR TYPE is displayed on line 3. The current sensor type is displayed on Line 4.

```
[          3A.2.7
SETUP (MAN)
SET SENSOR TYPE
EDGE SENSOR    []
```

5. Press the ENTER key to enter the SET SENSOR TYPE menu. The current sensor type begins flashing on line 4.

```
[          3A.2.7.1
SETUP (MAN)
SET SENSOR TYPE
EDGE SENSOR    []
```
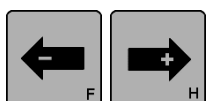
6. Use the ARROW keys to scroll to the desired sensor type, EDGE SENSOR or LINE SENSOR as indicated on line 4.

```
中         3D.2.7.2
SETUP (MAN)
SET SENSOR TYPE
LINE SENSOR   中中
```
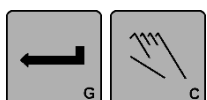
7. Press the ENTER key to store the change or press the MANUAL key to abort the procedure. The system will exit the setup menus and return to the Operator Level.

```
              3D
        MANUAL
中   -■■■■■.......+
```

 Figure Sheet 2-320 A
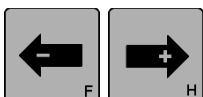
3X.2.8, Sensor Voltage

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
[          3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until SPECIAL is displayed on line 4.

```
[          3A.2
SETUP (MAN)
SELECT MENU
SPECIAL
```

3. Press the ENTER key to enter the Special Menus. The DEADBAND menu will be displayed.

```
[        3A.2.1
SETUP (MAN)
DEADBAND
-............+   0.0%
```

4. Use the ARROW keys to scroll until SENSOR VOLTAGE is displayed on line 3. The current sensor voltage is displayed on Line 4.

```
[        3A.2.8
SETUP (MAN)
SENSOR VOLTAGE
   +12V
```

5. Press the ENTER key to enter the SENSOR VOLTAGE menu. The current sensor voltage begins flashing on line 4.

```
[       3A.2.8.1
SETUP (MAN)
SENSOR VOLTAGE
   +12V
```
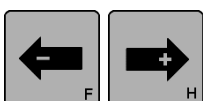
6. Use the ARROW keys to scroll to the desired sensor voltage, +12V or +15V as indicated on line 4. ***See Caution below, before selecting +15V for any sensor.***

```
⊕      3A.2.8.1
SETUP (MAN)
SENSOR VOLTAGE
   +15V
```
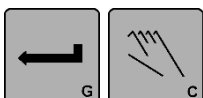
7. Press the ENTER key to store the change or press the MANUAL key to abort the procedure. The system will exit the setup menus and return to the Operator Level.

```
              3D
         MANUAL
⊕ -■■■■■........+
```

Caution: To avoid damage to sensors, do NOT select +15V for any sensor, except those listed below: If not sure about any sensor and specification is NOT available, contact Maxcess technical support.

Sensor	Voltage	Sensor	Voltage
H3109	+15 Vdc	H3188	+15 Vdc
H3333	+15 Vdc	H3144	+15 Vdc
H3218	+15 Vdc	H3662	+15 Vdc
H3194	+15 Vdc	H3303	+15 Vdc
H3111	+15 Vdc		

Advanced Menus

3X.3.1, Restore Settings

SETUP
E

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
                    3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

← →
F   H

2. Use the ARROW keys to scroll until ADVANCED is displayed on line 4.

```
                    3A.3
SETUP (MAN)
SELECT MENU
ADVANCED
```
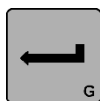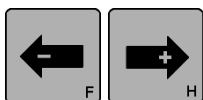
←
G

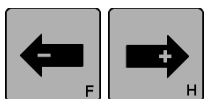**3.** Press the ENTER key to enter the Advanced Menus. The RESTORE SETTINGS menu will be displayed.

```
                    3A.3.1
SETUP (MAN)
RESTORE SETTINGS
```

←
G

4. Press the ENTER key to enter the RESTORE SETTINGS menu. In Line 4 the word YES will begin flashing.

```
                    3A.3.1.1
SETUP (MAN)
RESTORE SETTINGS
SURE?    YES
```

← →
F   H
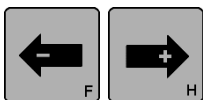
5. Use the ARROW keys to select YES or NO.

```
                    3A.3.1.1
SETUP (MAN)
RESTORE SETTINGS
SURE?    YES
```

←   ∖∖∖
G   C
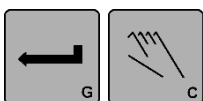
6. Press the ENTER key to restore the Backup Settings (if YES was selected in step 5) or press the MANUAL key to abort the procedure. The system will exit the setup menus and return to the Operator Level.

```
                    3A
            MANUAL
  -■■■■■.........+
```

3X.3.2, Backup Settings

This procedure stores all user configurable settings, except Language, Password, Password Configuration, and Parallel Port Enable/Disable.

SETUP
E

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
                    3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

← →
F   H

2. Use the ARROW keys to scroll until ADVANCED is displayed on line 4.

```
                    3A.3
SETUP (MAN)
SELECT MENU
ADVANCED
```

 Figure Sheet 2-320 A

3. Press the ENTER key to enter the Advanced Menus. The RESTORE SETTINGS menu will be displayed.

```
⊏          3A.3.1
SETUP (MAN)
RESTORE SETTINGS
```

4. Use the ARROW keys to scroll until BACKUP SETTINGS is displayed on line 3.

```
⊏          3A.3.2
SETUP (MAN)
BACKUP SETTINGS
```
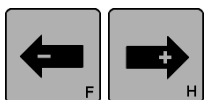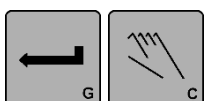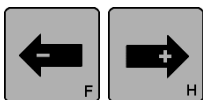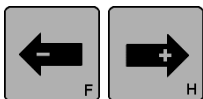
5. Press the ENTER key to enter the BACKUP SETTINGS menu. In Line 4 the word YES will begin flashing.

```
⊏        3A.3.2.1
SETUP (MAN)
BACKUP SETTINGS
SURE?    YES
```

6. Use the ARROW keys to select YES or NO.

```
⊏        3A.3.2.1
SETUP (MAN)
BACKUP SETTINGS
SURE?    YES
```

7. Press the ENTER key to Backup Current Settings (if YES was selected in step 6, DONE! will be displayed for ~5 seconds) or press the MANUAL key to abort the procedure. The system will exit the setup menus and return to the Operator Level.

```
            3A
         MANUAL
⊏ -■■■■■■........+
```

3X.3.3, Set Password, Enter Password

(Use these menu instructions if no password is currently stored).

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
⊏          3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until ADVANCED is displayed on line 4.

```
⊏          3A.3
SETUP (MAN)
SELECT MENU
ADVANCED
```

3. Press the ENTER key to enter the Advanced Menus. The RESTORE SETTINGS menu will be displayed.

```
⊏          3A.3.1
SETUP (MAN)
RESTORE SETTINGS
```

4. Use the ARROW keys to scroll until SET PASSWORD is displayed on line 3. If (NO PASSWORD) is displayed on Line 4, this indicates that no password has been entered.

```
⊏          3A.3.3
SETUP (MAN)
SET PASSWORD
 (NO PASSWORD)
```

5. Press the ENTER key to enter the SET PASSWORD menu. The LCD Panel will display ENTER PASSWORD on line 3.

```
⊏        3A.3.3.2
SETUP (MAN)
ENTER PASSWORD
```

6. Using the proper keys, enter the desired password. The password can be 1 to 6 keys in length. Each key press is indicated by an "*" on Line 4. The MANUAL and ENTER keys are not allowed to be used in passwords.

```
                    3A.3.3.2
SETUP (MAN)
ENTER PASSWORD
        ******
```

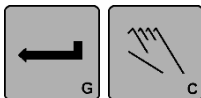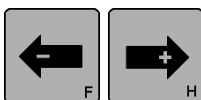**7.** Press the ENTER key to accept the password. The display will then display REENTER PASSWORD on line 3.

```
                    3A.3.3.3
SETUP (MAN)
REENTER PASSWORD
```

8. Using the proper keys, re-enter the desired password. The password must be the same as previously entered. If a different password is entered, "Wrong Password" will be displayed.

```
                    3A.3.3.3
SETUP (MAN)
REENTER PASSWORD
        ******
```

9. Press the ENTER key to store the password or press the MANUAL key to abort the procedure. The system will exit the setup menus and return to the Operator Level.

```
                    3A.3.3.4
SETUP (MAN)
PASSWORD STORED
```

```
                         3A
                     MANUAL
    -■■■■■■.........+
```

3X.3.3, Set Password, Delete Password

(Use these menu instructions only if a password is currently stored).

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
                        3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until ADVANCED is displayed on line 4.

```
                         3A.3
SETUP (MAN)
SELECT MENU
ADVANCED
```
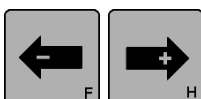
3. Press the ENTER key to enter the Advanced Menus. The RESTORE SETTINGS menu will be displayed.

```
                       3A.3.1
SETUP (MAN)
RESTORE SETTINGS
```

4. Use the ARROW keys to scroll until SET PASSWORD is displayed on line 3. (ENABLED) which is displayed on Line 4, indicates that a password is currently enabled.

```
                      X3A.3.3
SETUP (MAN)
SET PASSWORD
    (ENABLED)
```

5. Press the ENTER key to enter the SET PASSWORD menu. The LCD Panel will display ENTER PASSWORD on line 3.
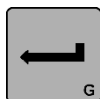
```
                      X3A.3.3
SETUP (MAN)
ENTER PASSWORD
```

6. Using the proper keys, enter the current password. Each key press is indicated by an "*" on Line 4.

```
                      X3A.3.3
SETUP (MAN)
ENTER PASSWORD
        ******
```
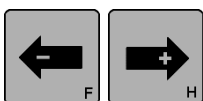
7. Press the ENTER key to accept the password. CHANGE and DISABLE will be displayed on Line 4. CHANGE will be flashing.

```
C          X3A.3.3.1
SETUP (MAN)
SET PASSWORD
CHANGE    DISABLE
```
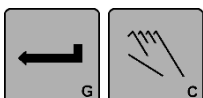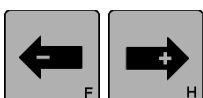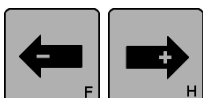
8. Use the ARROW keys to select DISABLE. DISABLE will then begin flashing.

```
C          X3A.3.3.1
SETUP (MAN)
SET PASSWORD
CHANGE    DISABLE
```

9. Press the ENTER key to delete the password or press the MANUAL key to abort the procedure. The system will exit the setup menus and return to the Operator Level.

```
C          3A.3.3.5
SETUP (MAN)

  (NO PASSWORD)
```

```
              3A
           MANUAL
C    -■■■■■      +
```

3X.3.3, Set Password, Change Password

(Use these menu instructions only if a password is currently stored).

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
C              3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until ADVANCED is displayed on line 4.

```
C              3A.3
SETUP (MAN)
SELECT MENU
ADVANCED
```

3. Press the ENTER key to enter the Advanced Menus. The RESTORE SETTINGS menu will be displayed.

```
C            3A.3.1
SETUP (MAN)
RESTORE SETTINGS
```
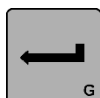
4. Use the ARROW keys to scroll until SET PASSWORD is displayed on line 3. (ENABLED) which is displayed on Line 4, indicates that a password is currently enabled.

```
C           X3A.3.3
SETUP (MAN)
SET PASSWORD
   (ENABLED)
```

5. Press the ENTER key to enter the SET PASSWORD menu. ENTER PASSWORD will be displayed on line 3.

```
C           X3A.3.3
SETUP (MAN)
ENTER PASSWORD
```
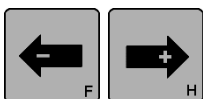
6. Using the proper keys, enter the current password. Each key press is indicated by an "*" on Line 4.

```
C           X3A.3.3
SETUP (MAN)
ENTER PASSWORD
******
```

7. Press the ENTER key to accept the password. CHANGE and DISABLE will be displayed on Line 4. CHANGE will be flashing.

```
C          X3A.3.3.1
SETUP (MAN)
SET PASSWORD
CHANGE    DISABLE
```

8. Press the ENTER key to select CHANGE. ENTER PASSWORD will be displayed on line 3.

```
[        X3A.3.3.2
SETUP (MAN)
ENTER PASSWORD
```

9. Using the proper keys, enter the desired new password. Each key press is indicated by an "*" on Line 4. The MANUAL and ENTER keys are not allowed to be used in passwords.

```
[        X3A.3.3.2
SETUP (MAN)
ENTER PASSWORD
       ******
```

10. Press the ENTER key to accept the password. REENTER PASSWORD will be displayed on line 3.

```
[        X3A.3.3.3
SETUP (MAN)
REENTER PASSWORD
```

11. Using the proper keys, re-enter the desired new password. The password must be the same as previously entered. If a different password is entered, "WRONG PASSWORD" will be displayed.

```
[        X3A.3.3.3
SETUP (MAN)
REENTER PASSWORD
       ******
```
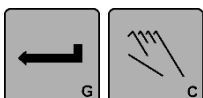
12. Press the ENTER key to store the new password or press the MANUAL key to abort the procedure. The system will exit the setup menus and return to the Operator Level.

```
[        3A.3.3.4
SETUP (MAN)
PASSWORD STORED
```

```
            3A
         MANUAL
[   -■■■■■........+
```

3X.3.4, Set Output A Delay

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
[           3C.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until ADVANCED is displayed on line 4.

```
[           3A.3
SETUP (MAN)
SELECT MENU
ADVANCED
```
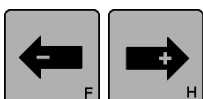
3. Press the ENTER key to enter the Advanced Menus. The RESTORE SETTINGS menu will be displayed.

```
[           3A.3.1
SETUP (MAN)
RESTORE SETTINGS
```

4. Use the ARROW keys to scroll until SET OUTPUT DELAY, OUTPUT A is displayed on line 3. The current delay time is displayed on Line 4.

```
[           3A.3.4
SETUP (MAN)
SET OUTPUT DELAY
OUTPUT A:  0.00s
```
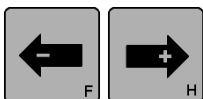
5. Press the ENTER key to enter the SET OUTPUT DELAY menu. The current delay time will begin flashing.

```
[           3A.3.4.1
SETUP (MAN)
SET OUTPUT DELAY
OUTPUT A:  0.00s
```

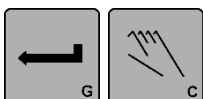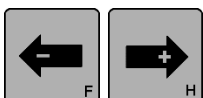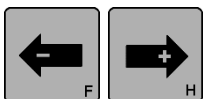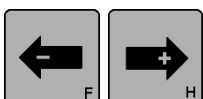**6.** Use the ARROW keys to adjust the delay time to the desired setting (in seconds). If an ARROW key is held down, the speed of the delay change increases. If desired, press both ARROW keys simultaneously to reset the delay to 0.00s.

```
[              3A.3.4.1
SETUP (MAN)
SET OUTPUT DELAY
OUTPUT A:   5.10s
```

7. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.
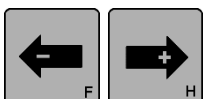
```
[                 3A
           MANUAL
[  -■■■■■■..........+
```

3X.3.5, Set Output B Delay

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
[               3C.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until ADVANCED is displayed on line 4.

```
[               3A.3
SETUP (MAN)
SELECT MENU
ADVANCED
```
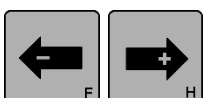
3. Press the ENTER key to enter the Advanced Menus. The RESTORE SETTINGS menu will be displayed.

```
[              3A.3.1
SETUP (MAN)
RESTORE SETTINGS
```

4. Use the ARROW keys to scroll until SET OUTPUT DELAY, OUTPUT B is displayed on line 3. The current delay time is displayed on Line 4.

```
[              3A.3.5
SETUP (MAN)
SET OUTPUT DELAY
OUTPUT B:   0.00s
```

5. Press the ENTER key to enter the SET OUTPUT DELAY menu. The current delay time will begin flashing.

```
[            3A.3.5.1
SETUP (MAN)
SET OUTPUT DELAY
OUTPUT B:   0.00s
```

6. Use the ARROW keys to adjust the delay time to the desired setting (in seconds). If an ARROW key is held down, the speed of the delay change increases. If desired, press both ARROW keys simultaneously to reset the delay to 0.00s.

```
[            3A.3.5.1
SETUP (MAN)
SET OUTPUT DELAY
OUTPUT B:   5.00s
```
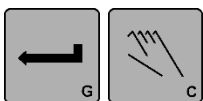
7. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
[                 3A
           MANUAL
[  -■■■■■■..........+
```

3X.3.6, Set Loss Of Null Output Range

SETUP
E

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
                    3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

← F → H

2. Use the ARROW keys to scroll until ADVANCED is displayed on line 4.

```
                    3A.3
SETUP (MAN)
SELECT MENU
ADVANCED
```

↵ G

3. Press the ENTER key to enter the Advanced Menus. The RESTORE SETTINGS menu will be displayed.

```
                  3A.3.1
SETUP (MAN)
RESTORE SETTINGS
```

← F → H

4. Use the ARROW keys to scroll until SET LOSS OF NULL is displayed on line 3. The current Loss Of Null value is displayed on line 4.

```
                  3A.3.6
SETUP (MAN)
SET LOSS OF NULL
OUTPUT:      20%
```

↵ G

5. Press the ENTER key to enter the SET LOSS OF NULL menu. The current Loss Of Null value will begin flashing.

```
                3A.3.6.1
SETUP (MAN)
SET LOSS OF NULL
OUTPUT:      20%
```
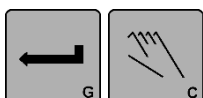
← F → H
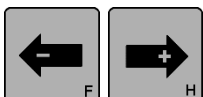
6. Use the ARROW keys to adjust the Loss Of Null to the desired setting. If desired, press both ARROW keys simultaneously to reset the value to 20%.

```
                3A.3.6.1
SETUP (MAN)
SET LOSS OF NULL
OUTPUT:      30%
```

↵ G   ✋ C

7. Press the ENTER key to store the change or press the MANUAL key to abort the procedure. The system will exit the setup menus and return to the Operator Level.
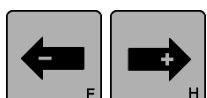
```
                     3A
              MANUAL
  -■■■■■.........+
```

3X.3.7, Digital I/O, Enable/Disable

SETUP
E

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
                    3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

← F → H

2. Use the ARROW keys to scroll until ADVANCED is displayed on line 4.

```
                    3A.3
SETUP (MAN)
SELECT MENU
ADVANCED
```

↵ G

3. Press the ENTER key to enter the Advanced Menus. The RESTORE SETTINGS menu will be displayed.

```
                  3A.3.1
SETUP (MAN)
RESTORE SETTINGS
```
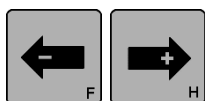
4. Use the ARROW keys to scroll until DIGITAL I/O is displayed on line 3. The current setting is displayed on Line 4.
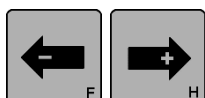
```
[            3A.3.7
SETUP (MAN)
DIGITAL I/O (X3)
        ENABLED
```

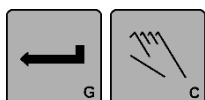**5.** Press the ENTER key to enter the DIGITAL I/O menu. The current setting will begin flashing.

```
[          3A.3.7.1
SETUP (MAN)
DIGITAL I/O (X3)
        ENABLED
```

6. Use the ARROW keys to scroll to the desired setting (ENABLED or DISABLED).

```
[          3A.3.7.1
SETUP (MAN)
DIGITAL I/O (X3)
        DISABLED
```

7. Press the ENTER key to store the change or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
              3A
          MANUAL
[  -■■■■■■.........+
```

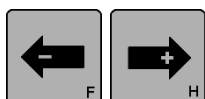### 3X.3.8.1, Test Signals, Sensor Current

This menu is to be used for viewing the raw sensor signals (in mA) with no scaling applied.

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
[            3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until ADVANCED is displayed on line 3.

```
[            3A.3
SETUP (MAN)
SELECT MENU
ADVANCED
```
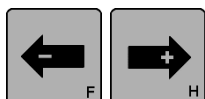
3. Press the ENTER key to enter the Advanced Menus. The RESTORE SETTINGS menu will be displayed.

```
[            3A.3.1
SETUP (MAN)
RESTORE SETTINGS
```

4. Use the ARROW keys to scroll until TEST SIGNALS is displayed on line 3.

```
[            3A.3.8
SETUP (MAN)
TEST SIGNALS
```

5. Press the ENTER key to enter the TEST SIGNALS menu. SENSOR CURRENT will be displayed on line 3.

```
[          3A.3.8.1
SETUP (MAN)
SENSOR CURRENT
```
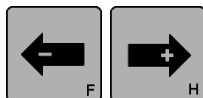
6. Press the ENTER key to enter the SENSOR CURRENT menu. The currently selected sensor is indicated on line 3. The value of the sensor signal is displayed on line 4. This represents the actual sensor signal with no scaling applied. The range of the bar graph and the numerical value is ±20mA.

```
[        3A.3.8.1.1
SENSOR CURRENT
[  SENSOR  (X4)
-··········I··········+   0.8mA
```

7. If necessary, use the ARROW keys to toggle to the desired sensor as indicated on line 3. The value of the sensor signal is shown on line 4.

```
[        3A.3.8.1.2
SENSOR CURRENT
 ]  SENSOR  (X5)
-··········I··········+   0.8mA
```

8. Press the MANUAL key to exit the setup menus and return to the Operator Level. No settings are stored.

```
                    3A
        MANUAL
[  -■■■■■··········+
```

3X.3.8.2, Test Signals, Toggle Outputs

(THIS MENU IS INTENDED FOR A SPECIAL TEST MODE, ONLY).
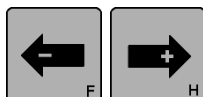
1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
[              3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until ADVANCED is displayed on line 4.

```
[              3A.3
SETUP (MAN)
SELECT MENU
ADVANCED
```
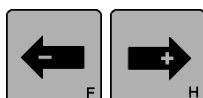
3. Press the ENTER key to enter the Advanced Menus. The RESTORE SETTINGS menu will be displayed.

```
[            3A.3.1
SETUP (MAN)
RESTORE SETTINGS
```
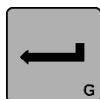
4. Use the ARROW keys to scroll until TEST SIGNALS is displayed on line 3.

```
[            3A.3.8
SETUP (MAN)
TEST SIGNALS
```
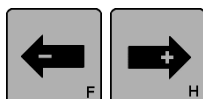
5. Press the ENTER key to enter the TEST SIGNALS menu. SENSOR CURRENT will be displayed on line 3.

```
[          3A.3.8.1
SETUP (MAN)
SENSOR CURRENT
```

6. Use the ARROW keys to scroll until TOGGLE OUTPUTS is displayed on line 3.

```
[          3A.3.8.2
SETUP (MAN)
TOGGLE OUTPUTS
```
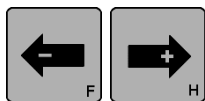
7. Press the ENTER key to enter the TOGGLE OUTPUTS menu. Normal control is disabled. The two outputs (displayed on line 3) can now be controlled by the ARROW keys.

```
[        3A.3.8.2.1
SETUP (MAN)
OUT A       OUT B
 OFF         OFF
```
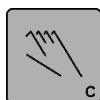
8. Use the left ARROW key to toggle OUT A between ON and OFF. Use the right ARROW key to toggle OUT B between ON and OFF.

```
C            3A.3.8.2.1
SETUP (MAN)
OUT A        OUT B
 ON           ON
```

9. Press the MANUAL key to exit the setup menus and return to the Operator Level. No settings are stored, and control of the outputs is returned to normal.

```
C               3A
         MANUAL
C  -■■■■■■..........+
```

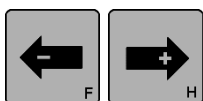### 3X.3.8.3, Test Signals, Guide Test Mode

(THIS MENU IS INTENDED FOR SPECIAL TEST OR APPLICATION MODES, ONLY).

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
C              3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until ADVANCED is displayed on line 4.

```
C              3A.3
SETUP (MAN)
SELECT MENU
ADVANCED
```
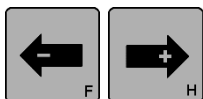
3. Press the ENTER key to enter the Advanced Menus. The RESTORE SETTINGS menu will be displayed.

```
C             3A.3.1
SETUP (MAN)
RESTORE SETTINGS
```

4. Use the ARROW keys to scroll until TEST SIGNALS is displayed on line 3.

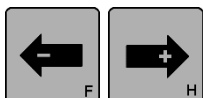```
C   3A.3.8
SETUP (MAN)
TEST SIGNALS
```

**5.** Press the ENTER key to enter the TEST SIGNALS menu. SENSOR CURRENT will be displayed on line 3.

```
C            3A.3.8.1
SETUP (MAN)
SENSOR CURRENT
```

6. Use the ARROW keys to scroll until GUIDE TEST MODE is displayed on line 3.

```
C            3A.3.8.3
SETUP (MAN)
GUIDE TEST MODE
```

7. Press the ENTER key to enter the GUIDE TEST MODE menu. RUNNING will be displayed on line 2 which indicates that the oscillator is running. The currently selected oscillation mode will be displayed on Line 3.

```
C           3A.3.8.3.1
        RUNNING
C  MODE1          1
_...............+ 0.50s
```

SENSOR
D

```
[      3A.3.8.3.1
      RUNNING
[  MODE1        10
-............+ 0.01s
```

8. Use the SENSOR key to change the mode, if desired. After a mode change, the mode designation on line 3 will flash for 20 seconds. If mode 1 is selected, the guide oscillates back and forth within 80% of the bandwidth of the currently selected sensor, simulating instantaneous 80% Guide Point Shifts. If mode 2 is selected, the guide oscillates back and forth within 80% of the bandwidth of the currently selected sensor, simulating 4% steps in Guide Point Shift. If mode 3 is selected, the guide oscillates, switching back and forth between the Guide Point of the left edge sensor and the Guide Point of the right edge sensor (with 0% Guide Point Shift in both sensors). This requires the sensors to be placed at spacing wider than the width of the web. The sensor spacing determines the amplitude of the oscillation.

```
[      3A.3.8.3.2
      RUNNING
[  MODE2         1
-............+ 0.01s
```
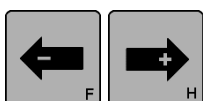
```
[      3A.3.8.3.3
      RUNNING
[  MODE3        10
-............+ 0.01s
```

← F   → H

↵ G

9. Use the ARROW keys to modify the oscillation speed, as displayed on line 4. The left ARROW key decreases the time per direction change (increases speed). The right ARROW key increases the time per direction change (decreases speed). If an ARROW key is held down, the speed of the change increases. If both ARROW keys are pressed simultaneously, the fastest speed is selected, which is 0.01 seconds. Press the ENTER key to store the changes, or if no key is pressed within 20 seconds, the changes will be stored automatically. The counter at the end of Line 3 increments on each direction reversal.
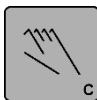
```
[      3A.3.8.3.1
      RUNNING
[  MODE1         1
-............+ 0.50s
```

```
[      3A.3.8.3.1
      RUNNING
[  MODE1        10
-............+ 0.01s
```

C

10. Pressing the MANUAL key while the oscillator is running will pause the oscillation. PAUSED will be displayed on line 2. The unit will remain paused until another command is issued.

```
[      3A.3.8.3.1
      PAUSED
[  MODE1        10
-............+ 0.50s
```

A

11. Pressing the AUTOMATIC key will resume the oscillator action at the point it was paused.

```
[      3A.3.8.3.1
      RUNNING
[  MODE1        10
-............+ 0.50s
```

—OR—

C

12. Pressing the MANUAL key, a second time will exit the oscillator mode and return to the Operator Level.
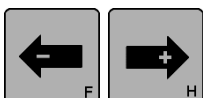
```
[              3A
          MANUAL
[  -■■■■■■........+
```

 Figure Sheet 2-320 A

Language Menu

3X.4.1, Select Language

SETUP
E

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed on the LCD Panel.

```
┓         3B.1
SETUP (MAN)
SELECT MENU
BASIC
```
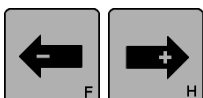
F H

2. Use the ARROW keys to scroll until LANGUAGE is displayed on line 4.

```
┓         3B.4
SETUP (MAN)
SELECT MENU
LANGUAGE
```
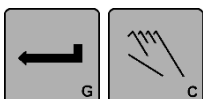
G

3. Press the ENTER key to enter the Language Menu. The current language will begin flashing on line 4.

```
┓       3B.4.1
SETUP (MAN)
SELECT LANGUAGE
    ENGLISH
```

F H

4. Use the ARROW keys to scroll until the desired language is displayed.
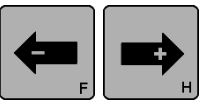
```
┓       3B.4.2
SETUP (MAN)
SPRACHE WAEHLEN
    DEUTSCH
```

G C

5. Press the ENTER key to store the change or press the MANUAL key to abort the procedure. The system will exit the setup menus and return to the Operator Level.

```
         3B
     MANUELL
┓ -■■■■■..........+
```

Custom Menus
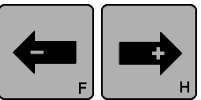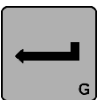
3X.5.1, LCD Contrast

This procedure is used to adjust the LCD contrast.

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed.

```
[                 3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until CUSTOM is displayed.

```
[                 3A.5
SETUP (MAN)
SELECT MENU
CUSTOM
```

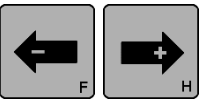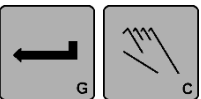**3.** Press the ENTER key to enter the Custom Menus. The LCD CONTRAST menu will be displayed. The current setting is displayed on line 4.

```
[               3A.5.1
SETUP (MAN)
LCD CONTRAST
█████▁▁▁▁▁      50%
```

4. Press the ENTER key to enter the LCD CONTRAST menu. The contents of line 4 will begin flashing.

```
[               3A.5.1
SETUP (MAN)
LCD CONTRAST
█████▁▁▁▁▁      50%
```

5. Use the ARROW keys to adjust the LCD contrast for best viewing.

```
[               3A.5.1
SETUP (MAN)
LCD CONTRAST
██████▁▁▁▁      56%
```

6. Press the ENTER key to store the new setting or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
                   3A
               MANUAL
[  -██████▁▁▁▁+
```

3X.5.2, ASC Control

This procedure is used to set the ASC Control to ON or OFF. This setting is configurable for each sensor mode.

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed.

```
[                 3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until CUSTOM is displayed.

```
[                 3A.5
SETUP (MAN)
SELECT MENU
CUSTOM
```

3. Press the ENTER key to enter the Custom Menus. The LCD CONTRAST menu will be displayed.

```
[               3A.5.1
SETUP (MAN)
LCD CONTRAST
█████▁▁▁▁▁      50%
```

4. Use the ARROW keys to scroll until ASC CONTROL is displayed on line 3. The current setting is displayed on line 4.

```
            3A.5.2
SETUP (MAN)
ASC CONTROL
         OFF
```

5. If necessary, press the SENSOR key to select the desired sensor mode.

```
            3B.5.2
SETUP (MAN)
ASC CONTROL
         OFF
```

6. Press the ENTER key to enter the ASC CONTROL menu. The contents of line 4 will begin flashing.

```
          3B.5.2.1
SETUP (MAN)
ASC CONTROL
         OFF
```

7. Use the ARROW keys to select OFF or ON.

```
          3B.5.2.1
SETUP (MAN)
ASC CONTROL
          ON
```

8. Press the ENTER key to store the new setting or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
               3B
            MANUAL
⌐ -■■■■■■........+
```

3X.5.3, Set ASC Limits

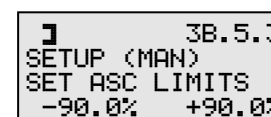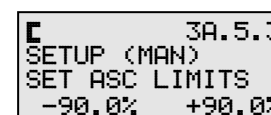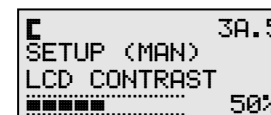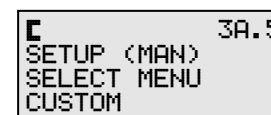*This procedure is used to set the ASC Limits. These limits are configurable for each sensor mode. Use the "ASC CONTROL" menu to enable the ASC function.*

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed.

```
            3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until CUSTOM is displayed on line 4.

```
            3A.5
SETUP (MAN)
SELECT MENU
CUSTOM
```

3. Press the ENTER key to enter the Custom Menus. The LCD CONTRAST menu will be displayed.

```
            3A.5
SETUP (MAN)
LCD CONTRAST
■■■■■........ 50%
```

4. Use the ARROW keys to scroll until SET ASC LIMITS is displayed on line 3. The current ASC Limit values are displayed on line 4.

```
            3A.5.3
SETUP (MAN)
SET ASC LIMITS
 -90.0%   +90.0%
```

5. If necessary, press the SENSOR key to select the desired sensor mode.

```
            3B.5.3
SETUP (MAN)
SET ASC LIMITS
 -90.0%   +90.0%
```
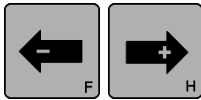
6. Press the ENTER key to enter the SET ASC LIMITS menu. The negative ASC Limit value will begin flashing.
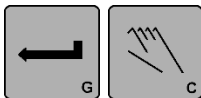
```
┐          3B.5.3.1
SETUP (MAN)
SET ASC LIMITS
 -90.0%    +90.0%
```

7. Use the ARROW keys to adjust the negative ASC limit value, if desired. Press both ARROW keys simultaneously to reset the negative ASC value to the default (-90%), if desired.

```
┐          3B.5.3.1
SETUP (MAN)
SET ASC LIMITS
 -80.0%    +90.0%
```
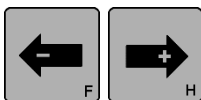
8. Press the ENTER key to switch to the positive ASC limit value or press the MANUAL key to abort the procedure. If the MANUAL key is pressed, any changes to the ASC Limit values will be discarded and the system will exit the setup menus and return to the Operator Level.

```
┐          3B.5.3.1
SETUP (MAN)
SET ASC LIMITS
 -80.0%    +80.0%
```
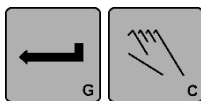
```
                  3B
            MANUAL
┐ -■■■■■········+
```

9. If the ENTER key was pressed in step 8, use the ARROW keys to adjust the positive ASC limit value, if desired. Press both ARROW keys simultaneously to reset the positive ASC value to the default (+90%), if desired.

```
┐          3B.5.3.1
SETUP (MAN)
SET ASC LIMITS
 -80.0%    +75.0%
```

10. Press the ENTER key to store the new ASC LIMITS, or press the MANUAL key to abort the changes. The system will exit the setup menus and return to the Operator Level.

```
                  3B
            MANUAL
┐ -■■■■■········+
```
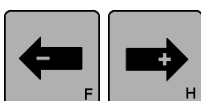
3X.5.4, Set ASC Source

This procedure is used to select the source of the signal that ASC acts on. Only special applications require the ASC Source to be changed from the default settings. The ASC Source is configurable for each sensor mode.

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed.

```
[              3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until CUSTOM is displayed on line 4.

```
[              3A.5
SETUP (MAN)
SELECT MENU
CUSTOM
```

3. Press the ENTER key to enter the Custom Menus. The LCD CONTRAST menu will be displayed.

```
[              3A.5
SETUP (MAN)
LCD CONTRAST
■■■■■·········  50%
```
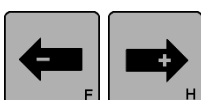
4. Use the ARROW keys to scroll until SET ASC SOURCE is displayed on line 3. The current setting is displayed on line 4.

```
[              3A.5.4
SETUP (MAN)
SET ASC SOURCE
           [
```

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5. If necessary, press the SENSOR key to select the desired sensor mode.

```
            3B.5.4
SETUP (MAN)
SET ASC SOURCE
```

6. Press the ENTER key to enter the SET ASC SOURCE menu. The current setting will begin flashing.

```
          3B.5.4.1
SETUP (MAN)
SET ASC SOURCE
```
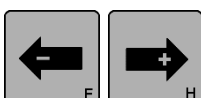
7. Use the ARROW keys to select the desired setting.

```
          3B.5.4.1
SETUP (MAN)
SET ASC SOURCE
```

8. Press the ENTER key to store the new ASC SOURCE, or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
              3B
          MANUAL
```

3X.5.5, Output Polarity

This procedure is used to select the digital A/B output polarity.
THE DIGITAL OUTPUT SIGNALS CAN CHANGE UPON SAVING THIS SETTING

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed.

```
            3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until CUSTOM is displayed on line 4.
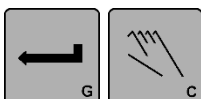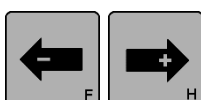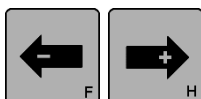
```
            3A.5
SETUP (MAN)
SELECT MENU
CUSTOM
```

3. Press the ENTER key to enter the Custom Menus. The LCD CONTRAST menu will be displayed.

```
            3A.5
SETUP (MAN)
LCD CONTRAST
          50%
```

4. Use the ARROW keys to scroll until OUTPUT POLARITY is displayed on line 3. The current digital output polarity settings are displayed on line 4.

```
          3A.5.5
SETUP (MAN)
OUTPUT POLARITY
A:-    B:-
```

5. Press the ENTER key to enter the OUTPUT POLARITY menu. The current settings will begin flashing.

```
          3A.5.5.1
SETUP (MAN)
OUTPUT POLARITY
A:-    B:-
```
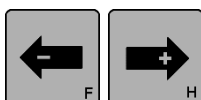
6. Use the ARROW keys to select the desired settings. Use the left ARROW key to change the 'A' output polarity. Use the right ARROW key to change the 'B' output polarity.

```
          3A.5.5.1
SETUP (MAN)
OUTPUT POLARITY
A:-    B:-
```

 Figure Sheet 2-320 A
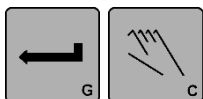
7. Press the ENTER key to store the new OUTPUT POLARITY or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
                        3A
                    MANUAL
  [ -▪▪▪▪▪▪.............+
```

3X.5.6, Set RGPC Speed

This procedure is used to control the shift speed of the RGPC digital inputs.

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed.

```
  [              3A.1
  SETUP (MAN)
  SELECT MENU
  BASIC
```

2. Use the ARROW keys to scroll until CUSTOM is displayed on line 4.

```
  [              3A.5
  SETUP (MAN)
  SELECT MENU
  CUSTOM
```

3. Press the ENTER key to enter the Custom Menus. The LCD CONTRAST menu will be displayed.

```
  [              3A.5
  SETUP (MAN)
  LCD CONTRAST
  ▪▪▪▪▪..........  50%
```

4. Use the ARROW keys to scroll until SET RGPC SPEED is displayed on line 3. The current digital output polarity settings are displayed on line 4.
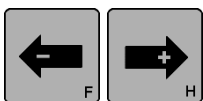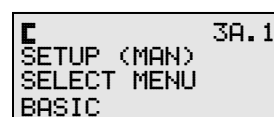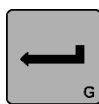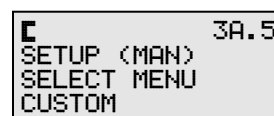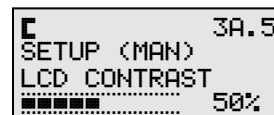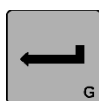
```
  [            3A.5.6
  SETUP (MAN)
  SET RGPC SPEED
  SECS/ADJ:  0.07S
```
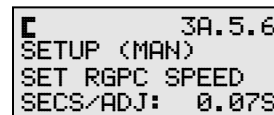
5. Press the ENTER key to enter the SET RGPC SPEED menu. The current setting on line 4 will begin flashing.

```
  [          3A.5.6.1
  SETUP (MAN)
  SET RGPC SPEED
  SECS/ADJ:  0.07S
```
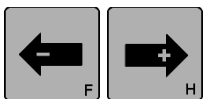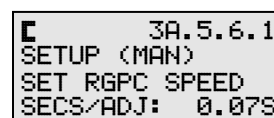
6. Use the ARROW keys to select the desired settings. Changing the setting to a higher number causes a slower RGPC shift. The displayed value represents the amount of time to wait between RGPC shifts. This delay value It is added to a fixed delay of 10ms. The default setting is 0.07 seconds.

```
  [          3A.5.6.1
  SETUP (MAN)
  SET RGPC SPEED
  SECS/ADJ:  0.10S
```
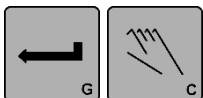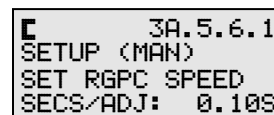
7. Press the ENTER key to store the new RGPC SHIFT SPEED or press the MANUAL key to abort the change. The system will exit the setup menus and return to the Operator Level.

```
                        3A
                    MANUAL
  [ -▪▪▪▪▪▪.............+
```

 Figure Sheet 2-320 A

3X.5.7, X3 Link

This menu is used to up/download information to/from the DP-20 PLUS.
WHILE IN THIS MENU, THE DIGITAL INPUTS AND OUTPUTS DO NOT PERFORM THEIR USUAL FUNCTIONS. THE DIGITAL OUTPUT SIGNALS CAN CHANGE UPON ENTRY TO THIS MENU.

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will be displayed.

```
                   3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until CUSTOM is displayed on line 4.

```
                   3A.5
SETUP (MAN)
SELECT MENU
CUSTOM
```

**3.** Press the ENTER key to enter the Custom Menus. The LCD CONTRAST menu will be displayed.

```
                   3A.5
SETUP (MAN)
LCD CONTRAST
■■■■■           50%
```
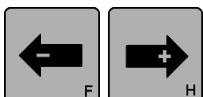
4. Use the ARROW keys to scroll until X3 LINK is displayed on line 3.

```
                 3A.5.7
SETUP (MAN)
X3 LINK
```

5. Press the ENTER key to enter the X3 LINK menu. The DP-20 PLUS inactivity timeout feature is suppressed while in this menu.

```
               3A.5.7.1
X3 LINK
        IDLE
```
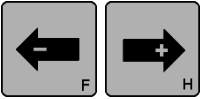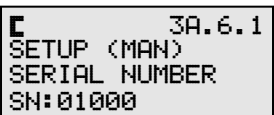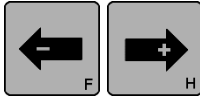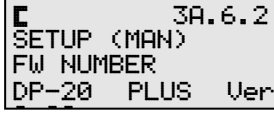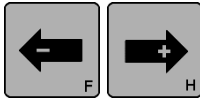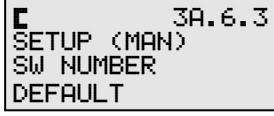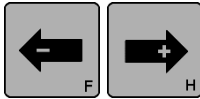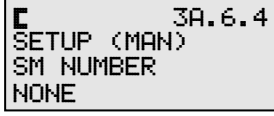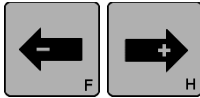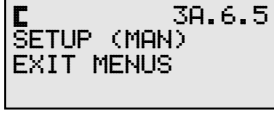
7. Press the MANUAL key to exit from this menu and return to the Operator Level.

```
                   3A
              MANUAL
   -■■■■■■        +
```
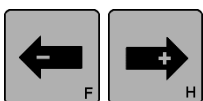
About Menu

1. Press the SETUP key to enter the Setup Menus. The SELECT MENU screen will display BASIC on line 4.
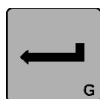
```
[           3A.1
SETUP (MAN)
SELECT MENU
BASIC
```

2. Use the ARROW keys to scroll until ABOUT is displayed on line 3.
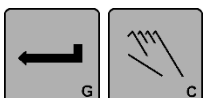
```
[           3A.6
SETUP (MAN)
ABOUT
```

3. Press the ENTER key to view the About menus. The serial number of the DP-20 PLUS is displayed on Line 4.

```
[          3A.6.1
SETUP (MAN)
SERIAL NUMBER
SN:01000
```

4. Use the ARROW keys to scroll to the desired About menu. Next in the list is the FW NUMBER. The version number of the DP-20 PLUS firmware is displayed on Line 4.

```
[          3A.6.2
SETUP (MAN)
FW NUMBER
DP-20  PLUS   Ver
```

5. Use the ARROW keys to scroll to the desired About menu. Next in the list is the SW NUMBER. The version number of the DP-20 PLUS configuration matrix is displayed on Line 4 or DEFAULT if no special programming is present.

```
[          3A.6.3
SETUP (MAN)
SW NUMBER
DEFAULT
```

6. Use the ARROW keys to scroll to the desired About menu. Next in the list is the SM NUMBER. The version number of the DP-20 PLUS state machine is displayed on Line 4. This will contain NONE unless special programming is present.

```
[          3A.6.4
SETUP (MAN)
SM NUMBER
NONE
```

7. If desired, use the ARROW keys to scroll until EXIT MENUS is displayed on line 3. Pressing the ENTER key while this screen is displayed will exit the About Menus and return to the Operator Level.

```
[          3A.6.5
SETUP (MAN)
EXIT MENUS
```

8. Otherwise, press the MANUAL key to exit the About Menus and return to the Operator Level.

```
                3C
            MANUAL
[] -■■■■■........+
```

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PARALLEL MATRIX

Parallel Input Matrix

MODE	INPUTS 5	4	3	2	1	0
EXTERNAL LOCK	-	-	-	-	-	1
AUTOMATIC	-	-	0	0	1	-
MANUAL	-	-	0	1	0	-
SERVO-CENTER	-	-	1	0	0	-
JOG LEFT *	0	1	-	-	-	-
JOG RIGHT *	1	0	-	-	-	-
RGPC LEFT *	0	1	-	-	-	-
RGPC RIGHT *	1	0	-	-	-	-
RGPC RESET *	1	1	-	-	-	-
SENSOR, EDGE L OR LINE CENTER **	-	-	0	1	1	-
SENSOR, EDGE R OR LINE EDGE **	-	-	1	1	0	-
SENSOR, EDGE CENTER **	-	-	1	1	1	-

* Inputs 4 & 5 are used to provide Jogs while in Manual and Servo Center modes, and RGPC functions while in Automatic mode.

** Sensor selection is allowed in Manual and Servo Center modes, only. Sensor selection must be momentary commands. For sensor selection, input 2 must be commanded either simultaneously with, or prior to, inputs 1 & 3.

0 = LOW
1 = HIGH
 - = IGNORE

Parallel Output Matrix

STATUS	OUTPUTS B*	A*
LOSS OF NULL (AUTOMATIC MODE)	-	1
CENTERED (SERVO-CENTER MODE)	1	-

* Parallel outputs are active low.
1 = ACTIVE
 - = IGNORE

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SYSTEM NOTES

1. Disconnect power from the DP-20 PLUS before connecting or disconnecting any cables.

2. All cable connectors must be tightened sufficiently to provide the required connection for the cable shielding.

3. Sensor selection changes are allowed in Manual and Servo-Center modes, only.

4. In Automatic mode, jog commands on the parallel port are not allowed, but jog commands on the keypad are allowed (if enabled in the Set Jog Enable menu).

5. In Automatic and Manual modes, the bar graph in the LCD Panel indicates the signal level of the selected sensor(s).

6. In Servo-Center mode, the bar graph in the LCD Panel indicates the signal level of the Servo-Center sensor.

7. If no motor is detected on the X1 connector, the words "NO MOTOR" are displayed on Line 4 of the LCD Panel.

8. If a motor is disconnected while in Servo-Center mode or Automatic mode, the system automatically switches to Manual mode.

9. When any valid command is detected on the Parallel Port, an asterisk is displayed on line 1 of the LCD Panel. If an invalid command is detected, a question mark is displayed in place of the asterisk.

10. When an External Lock command is detected on the Parallel Port, an asterisk surrounded by parentheses is displayed on line 1 of the LCD Panel.

11. When any Setup Menu is entered, commands on the Parallel Port for Operation Mode and Sensor Mode are disabled to prevent interference with the setup process.

12. If an SE-26A line sensor is to be used, it must be connected to the X5 connector.

13. The optional RGPC-40 (Remote Guide Point Control) connects to the X3 connector.

14. When using the optional RGPC-40 to adjust the Guide Point, the function of the two buttons are as follows. In Automatic mode, the buttons adjust the Guide Point. In Manual and Servo-Center modes, the buttons provide jog functions, unless jogs have been disabled in the Set Jog Enable menu for one or both of these operation modes.

15. When using the optional RGPC-40 to adjust the Guide Point, pressing both buttons simultaneously will reset the Guide Point to the center of the available range.

16. When the Guide Point is changed using the optional RGPC-40, the Guide Point setting is displayed on Line 4 of the LCD Panel and flashes until it is stored. The new setting is automatically stored 20 seconds after the last button is pressed on the RGPC-40. If the operating mode is changed before the 20 seconds has elapsed, the new setting is stored. If the power to the unit is interrupted before the 20 seconds has elapsed, the new setting is discarded.

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TROUBLESHOOTING

Fault Diagnostics – Fault Rectification

An incorrect setting on the DP-20 PLUS is often the cause of incorrect or undesirable guiding characteristics. Faults and the procedures for rectifying the faults are described below.

Fault Description	Probable Cause	Remedy	Reference
Actuator does not move in Automatic mode.	System Gain set too low.	Increase the System Gain.	1X.1, System Gain or 3X.1.1, System Gain
Actuator is unstable in Automatic mode.	System Gain set too high. or Cable connectors are loose.	Decrease the System Gain. Tighten all cable connectors.	1X.1, System Gain or 3X.1.1, System Gain
Actuator moves the wrong direction in Automatic mode.	Guide Polarity is set incorrectly. or Incorrect sensor mode selected.	Change Guide Polarity. Select MANUAL mode, then verify the correct sensor mode is selected. If necessary, press the SENSOR key to select the correct sensor mode.	3X.1.3, Guide Polarity
Actuator does not move in Servo-Center mode.	Servo-Center Gain is set too low.	Increase the Servo-Center Gain.	2X.1, Servo-Center Gain or 3X.1.6, Servo-Center Gain
Actuator is unstable in Servo-Center mode.	Servo-Center Gain is set too high.	Decrease the Servo-Center Gain.	2X.1, Servo-Center Gain or 3X.1.6, Servo-Center Gain
Actuator moves to either end of the stroke in Servo-Center mode.	Servo-Center Polarity is set incorrectly.	Change the Servo-Center Polarity.	3X.1.7, Servo-Center Polarity

Fault Codes

When a fault is indicated on the LCD Panel, the Menu Number on line 1 of the LCD Panel is re-defined as follows;

XX.X.X.X	MENU NUMBER
X	OPERATION MODE
_X	SENSOR MODE
__.0	FAULT INDICATION
__._.XXX	FAULT CODE NUMBER

The faults are as follows;

```
        3A.0.001
 <<< FAULT >>>
FLASH CRC
PRESS ◄─┘
```
FLASH CRC fault (**001**). An error was detected in the flash memory. Press the ENTER key to exit the fault screen. Cycle the power to the unit. If the fault persists, the unit must be reprogrammed.

```
        3A.0.002
 <<< FAULT >>>
+48VDC TOO LOW
POWER DOWN
```
+48VDC TOO LOW fault (**002**). The +48-volt power supply is too low. Remove power from the unit and disconnect all external cables to check for bad cables. Re-apply power. If problem persists, the unit must be repaired.

```
        3A.0.003
 <<< FAULT >>>
+48VDC TOO HIGH
POWER DOWN
```
+48VDC TOO HIGH fault (**003**). The +48-volt power supply is too high. Remove power from the unit and disconnect all external cables to check for bad cables. Re-apply power. If problem persists, the unit must be repaired.

```
        3A.0.004
 <<< FAULT >>>
AC POWER FAIL
POWER DOWN
```
AC POWER FAIL fault (**004**). A failure of the AC Power was detected. The unit will automatically reset. If the fault persists, the unit must be repaired.

```
        3A.0.005
 <<< FAULT >>>
EEPROM CRC
PRESS ◄─┘
```
EEPROM CRC fault (**005**). An error was detected in the EEPROM memory. A configuration setting has changed unexpectedly, causing this fault. Press the ENTER key to exit the fault screen. If it can be determined which configuration setting has changed, correct the setting. Otherwise, if a good Backup has been stored, perform a "Restore Backup" to correct this problem. If the fault persists, the unit must be repaired.

```
        3A.0.006
 <<< FAULT >>>
ILLEGAL MODE
PRESS ◄─┘
```
ILLEGAL MODE fault (**006**). An illegal mode was detected. Press the ENTER key to exit the fault screen and continue using the unit (The unit is forced to Manual mode). If the fault persists, the unit must be repaired.

```
        3A.0.007
 <<< FAULT >>>
EEPROM WRITE
PRESS ◄┘
```

EEPROM WRITE fault (007). An error was detected while writing to the EEPROM. Press the ENTER key to exit the fault screen. Repeat the last performed procedure. If the fault persists, the unit must be repaired.

```
XX      3A.0.008
 <<< FAULT >>>
WATCHDOG RESET
PRESS ◄┘
```

WATCHDOG RESET fault (008). An unexpected watchdog reset was detected. XX at the left end of line 1 is a code that indicates the source of the fault. Press the ENTER key to exit the fault screen and continue using the unit. If the fault persists, the unit must be repaired.

```
        3A.0.009
 <<< FAULT >>>
EXTERNAL DAC
PRESS ◄┘
```

EXTERNAL DAC fault (009). This fault may occur during Sensor Calibration. Press the ENTER key to exit the fault screen. Repeat the last performed procedure. If the fault persists, the unit must be repaired.

```
        3A.0.010
 <<< FAULT >>>
MEMORY ALLOC.
PRESS ◄┘
```

MEMORY ALLOC. fault (010). This indicates that a Memory Allocation error has occurred. Press the ENTER key to exit the fault screen. Cycle the power to the unit. If the fault persists, the unit must be repaired.

```
        3A.0.011
 <<< FAULT >>>
EEPROM BUSY
PRESS ◄┘
```

EEPROM BUSY fault (011). This fault indicates that the EEPROM was busy when a memory write was attempted. Press the ENTER key to exit the fault screen. Repeat the last performed procedure. If the fault persists, the unit must be repaired.

Return Shipment Instructions

If it is necessary to return the DP-20 PLUS to Maxcess International for service, care must be taken to properly package the unit to prevent damage during shipment. If possible, return the unit in its original packaging.

Motor/Valve List

LCD Indication	Current	Motor/Valve	Resistor	Typical Assembly
0.6A –TACH 2.05K	0.6 A	92308-001 Motor, Tachless	2.05K	Tachless Symat 25
1.3A –TACH 3.48K	1.3 A	92309-001 Motor, Tachless	3.48K	Tachless Symat 50
0.6A MOTOR 6.81K	0.6 A	534740-001 Motor	6.81K	PT-200
0.6A MOTOR 8.66K	0.6 A	534736-001 Motor	8.66K	Symat 25
1.3A MOTOR 14K	1.3 A	534738-001Motor 85626-001 Motor	14K	Symat 50
1.3A MOTOR 14K	1.3 A	85627-001 Motor	14K	GAB-1, GAG-2, PT-200
1.6A MOTOR 16.9K	1.3 A*	534734-001 Motor	16.9K	GAB-1, GAG-2, PT-200
0.4A MOTOR 20.5K	0.4 A	66356-001 Motor 66356-002 Motor	20.5K	NarroWeb 25
2.0A MOTOR 24.9K	2.0 A	534737-001 Motor 85627-002 Motor	24.9K	GAG-3
2.6A MOTOR 30.1K	2.6 A	573160-001 Motor	30.1K	LAB-10
3.5A MOTOR 36.5K	3.5 A	44591-001 Motor 85626-002 Motor	36.5K	AB-1, LRA
1.0A MOTOR 44.2K	1.0 A	65315-001 Actuator 65316-001 Actuator	44.2K	NarroWeb 50
50mA HYDR 64.9K	±50 mA	Hydraulic Servo Valve	64.9K	
48V LVALVE 78.7K	0.6 A	Hydraulic Servo Valve and 48 V Lockout Valve	78.7K	
24V LVALVE 95.3K	1.2 A	Hydraulic Servo Valve and 24 V Lockout Valve	95.3K	
10mA MPA 287K	±10 mA	MPA Motor Amplifier	287K	MPA-01/-02/-30
PITTMAN MTR 442K	Pittman #14206C255 Motor		442K	Von Weise #V03798AA62 Motor/Actuator
CUSTOM MTR 825K	Custom Motor		825K	Non-Fife Motor
NO MOTOR	No motor or valve is detected.		None	

*1.3A is applied to the 1.6A motor.

SPECIFICATIONS

General

**Universal Input Line
Voltage Range**   - 90 VAC To 250 VAC

Input Line Frequency   - 50 To 60 Hz

Power consumption   - 180 VA

**Operating Ambient
Temperature**   - 0° to 50°C (32° to 122°F)

Dimensions   - Height 144 mm (5.67")
                            Width   144 mm (5.67")
                            Depth   103 mm (4.06") (without cables attached)

**Approximate
Weight**   - 1.6 Kg (3.5 lbs)

Inputs and Outputs

Electromechanical Actuator - 3.5 A, 46 V maximum

Hydraulic Servo Valve   - ±50 mA
                                With or without Lockout Valve (Max 39 W at 24 V or 48 V)

MPA (with MPA Lockout Signal) - ±10 mA

Servo Center   - Analog Inductive type

**Sensor Input (2) Individually
Programmable**   - Max Input ±20 mA
                            0 to 10 mA (Preferred)

Parallel port   - Six Digital Inputs
                            Low Level: 0 – 0.9 V
                            High level: 4.6 – 24 V, max 6 mA
                            Two open collector outputs connected to ground, max 30 V
                            (NPN open collector) 55 mA at 1.6 V
                            Switchable Logic Polarity
                            +12V / +15V available to port for input reference

Supply to Sensors   +12V or +15V ±5%, 600 mA (+15V for legacy FNA sensors)
Supply to Accessories   + 12V ±5% 100 mA

Certifications and Compatibility with Industrial Environments

Product Certification - CE
UL/CSA/IEC 61010-1

Protection Class - Designed to meet IP 54

Industrial Environments Indoor Use
Altitude <2000 Meters
Relative Humidity up to 95%
Pollution Degree 2

Maximum Cable Lengths

Sensors (Except SE-26A) - 50 m (165 ft)

SE-26A Sensor (SE-26 is not supported) - 25 m (82 ft)

Parallel Port - 50 m (165 ft)

Servo-Center - 50 m (165 ft)

Servo Valve - 50 m (165 ft)

Lockout Valve - 50 m (165 ft)

Actuator - 14 m (46 ft)

Service

If you have any questions about one of our products or need to speak with a Customer Service representative, please use the contact information below