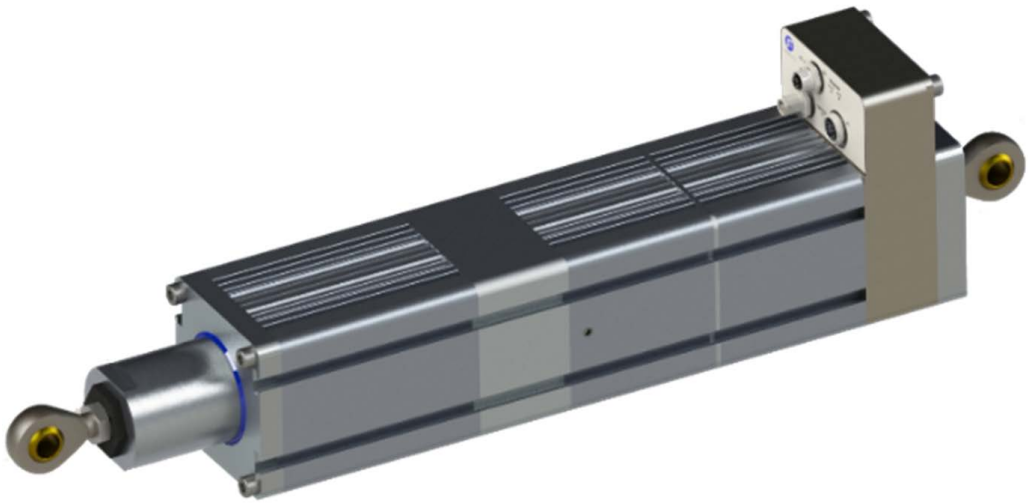
FIFE GUIDING SOLUTIONS

A MAXCESS BRAND

FIFE SMARTDRIVE ACTUATOR

User Manual



EN

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1 INTRODUCTION

Copyright Information

Periodically there will be updates to this manual. The latest version is available at www.maxcessintl.com or by calling your regional office. See the back page for phone numbers.

These actuator devices must not be installed or used in a machine or system that does not comply with the machinery directive 2006/42/EC.

These actuator devices were designed and manufactured to be installed as Partly Completed Machinery into a machine or partly completed machine.

The instructions must be read and used by all persons who have the responsibility of installing and maintaining these actuator devices.

These instructions must be retained and incorporated in the technical documentation for the machine or partly completed machinery into which the actuator device is installed.

Language

These are the original instructions, written in English.

Einführung.fm

Theory of Operation

The SmartDrive Actuator is a fully integrated controller, drive, and motor and is designed for an all-in-one solution for automated web guiding in converting, laminating, and printing applications. It is typically installed in a web guide to provide lateral steering of the web in critical areas such as winding, rewinding, or any important mid-stream process. The SmartDrive Actuator may also be used to move a rewind or unwind stand to provide web guiding. It is not uncommon to find multiple web guides steering the same web at different locations of web travel. Guiding a web is accomplished by applying several concepts with each directed at a particular part of the task. The basic concepts are:

→ Sense the lateral position of the web edge, line and center guiding (sensors).

→ Generate a correction signal proportional to the error (signal processor).

→ Apply forces to the web to non-destructively move it to the desired location (motor-controlled mechanical pivoting rollers).

Sensing

Sensing the lateral position of the web edge can be done by a variety of sensing technologies with the most common being infrared or ultrasonic. The sensing technology employed in any given application is driven by the respective web properties in combination with the amount of sensor proportional band that is needed. For optically opaque webs, infrared sensors are common, but for webs that are highly transparent, ultrasonic methods are more successful.

Infrared Sensing

Infrared sensors direct infrared light from a transmitter through the sensing gap to the opposing receiver. In this arrangement, web lateral position is determined by the amount of light that arrives at the receiver. Modulation techniques and infrared filtering are commonly used to combat interference from ambient light sources.

Ultrasonic Sensing

Ultrasonic sensors work similar to infrared methods except they use high frequency sound waves instead of light.

Correction Signal

The sensor information is provided to a signal processor that can provide many types of signal conditioning, including amplification, guide point offset compensation, etc. The final result however, is simply a motor drive signal of the proper polarity to cause web movement to the desired web position. Additional provisions are present in the signal processor to control manual guide positioning, select from multiple sensor inputs, perform automatic guide centering, and remote-control support.

Web Guiding

For a steering or offset pivot guide, the output of the signal processor is fed to a motor that is coupled to a set of pivoting rollers. To ensure enough friction exists between the moving web and the guide rollers, the web path and location of the guide rollers are designed to ensure a certain amount of surface area contact with the roller surface. Under these conditions, the pivoting roller set in combination with web movement over the rollers, provides the forces needed to control lateral web displacement. For a roll shifting stand, the output of the signal processor is fed to a motor coupled to a movable roll stand which moves the stand to displace the web laterally.

As a system, these concepts work together to sense the web lateral position and generate a motor drive signal of proper polarity to cause the web to move toward the desired location. This cycle is repeated continuously thus forming a closed loop control system.

2 SAFETY INSTRUCTIONS

Instructions for Use

To ensure safe and problem free installation of the SmartDrive Actuator, the actuator must be properly transported and stored, professionally installed and placed in operation. Proper operation and maintenance will ensure a long service life of the device. Only persons who are acquainted with the installation, commissioning, operation and maintenance of the system and who possess the necessary qualifications for their activities may work on the actuator.

NOTE: The safety information may not be comprehensive.

Please note the following:

- The content of these operating instructions
- Any safety instructions that are printed on the unit
- The requirements of the machine manufacturer
- Applicable national, state and local requirements for accident prevention and environmental protection

Information about safety instructions

The safety instructions and symbols described in this section are used in these Operating instructions. They are used to avoid possible dangers for users and to prevent material damage.

SIGNAL WORD
Source of danger and its results.

⇨ Avoiding dangers

The signal word **DANGER** indicates an immediate danger of serious injury or death.

The signal word **WARNING** indicates a possible danger which could lead to serious injury or death.

The signal word **CAUTION** refers to a possible danger which could lead to slight to moderate injury.

The signal word **ATTENTION** refers to a possible danger which could lead to material damage.

Symbols Used

General Danger:
Reference to general hazards that may result in bodily injuries

Crushing:
Refers to danger of injury caused by crushing

Cutting:
Refers to danger of injury caused by cutting

Electric Shock:
Refers to danger of injury caused by electric shock due to voltage

Hot Surfaces:
Refers to danger of injury caused by burning

Additional markings

- Bulleted list
- Instructions

1. Instructions which must be processed in the specified order

2. End of the instructions

→ Reference or cross-reference

► additional information

Note:
Reference to important information.

Sicherheit.fm

Basic Safety Information

Proper Use:

- The SmartDrive Actuator is intended to be used to provide controlling and guiding functions for:
  - → Steering and offset pivot guide control
  - → Positioning and slave guidance
- Other applications include the control and positioning of:
  - → Unwind/Rewind Rolls
  - → Blades/Cutter bars
  - → Cutting tables
  - → Turn bars, etc.

The SmartDrive Actuator must be used indoors. See environmental specifications in Section 6-1 of the SmartDrive Actuator Installation and service manual, Figure Sheet 1-946.

Use of the SmartDrive Actuator should not present any hazards as defined by EU Directive 2006/42/EC.

Note: The modules of the SmartDrive Actuator system must not be opened. If a module is opened, no claims under the warranty will be honored.

Customer-specific programming and different sensors make it possible to adjust the SmartDrive Actuator system to a wide variety of applications.

Improper Use:

- Do not operate the SmartDrive Actuator outside the technical specifications.
- Do not operate the SmartDrive Actuator in an Ex-area or hazardous area.
- Do not used the SmartDrive Actuator as a safety component. The actuator does not hold the position if power fails.
- Do not use the SmartDrive Actuator outdoors.
- The SmartDrive Actuator must not be used to raise and lower loads.
- Any other use than the proper use shall be deemed inappropriate.

Installation and Commissioning:

Any SmartDrive Actuator which is damaged must not be installed or put into service.

Only perform installation, maintenance, or repair tasks on the SmartDrive Actuator when the machine has been stopped and is secured from being turned on.

Only perform installation, maintenance, or repair tasks on the SmartDrive Actuator when there is no electrical power in the system.

The SmartDrive Actuator must be securely assembled into the customer application before being placed in operation.

Only replacement parts obtained from Fife may be used.

No modifications may be made to the SmartDrive Actuator.

Do not place electrical cables under mechanical strain.

The ball screw nut must not be removed from the ball screw.

WARNING - Death or injury can result from static electric shock.

Moving webs of material can produce large static voltage potentials. Protect against electric shocks by installing a conductive connection between the PE conductor of the Smart Drive Actuator and the PE circuit of the building or machine.

WARNING - Danger of injury from crushing.

The Smart Drive Actuator contains moving parts which could cause injury due to crushing. Appropriate protective guards must be installed by the user according to his use of this product.

WARNING - Death or injury can result from unexpected movement.

Protect against unexpected movement by removing electrical power from the SmartDrive Actuator and the machine into which the SmartDrive Actuator is being installed.

Operation:

WARNING - Danger of injury from crushing.

The SmartDrive Actuator contains moving parts which could cause injury due to crushing. Do not touch anything on or in the vicinity of the moving parts. Appropriate protective guards must be installed by the user according to his use of this product.

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Maintenance and Repair:

WARNING - Death or injury can result from unexpected movement.

Protect against unexpected movement by removing electrical power from the SmartDrive Actuator and the machine into which the SmartDrive Actuator is being installed.

WARNING - Danger of injury from crushing.

The Smart Drive Actuator contains moving parts which could cause injury due to crushing. Appropriate protective guards must be installed by the user according to his use of this product.

Decommissioning:

The SmartDrive Actuator must be disposed of in accordance with all the applicable national, state and local regulations.

Residual risks

The SmartDrive Actuator may be remotely controlled via a net control. As with any remotely controlled device, when remote control of the device is implemented, there is the possibility of movement of the actuator and attached structure when remote commands are issued. Therefore, any time personnel are near the actuator or attached structure, it is recommended that standard safeguards be taken to prevent injury. During servicing of the equipment, to prevent injury to personnel, it is recommended that standard Lockout/Tagout procedures be used.

The Operator Interface should not be installed in a location which does not protect the operator from injury due to moving material or machinery. This can be accomplished by either surrounding the Operator Interface with a safety screen, or by mounting the Operator Interface in a safe location.

3 DISPLAY DEFINITIONS

Control Panel Safety

The Guideline OI (Operator Interface) has a touch screen that supports Edge, Line and Center guiding sensors for Operator command inputs ans status displays.

Different screens are available depending on what kind of sensor is connected.

CAUTION - Danger of damaging the touch screen with pointed and/or hard objects (such as pens or screwdrivers).

-The touch screen must only be operated with a finger or suitable touch screen stylus.

CAUTION - Danger of the touch screen being operated accidentally by falling objects.

-The operator interface must be protected against falling objects.

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Control Panel

Figure 3.1:CONTROL PANEL - Line/Center Guiding

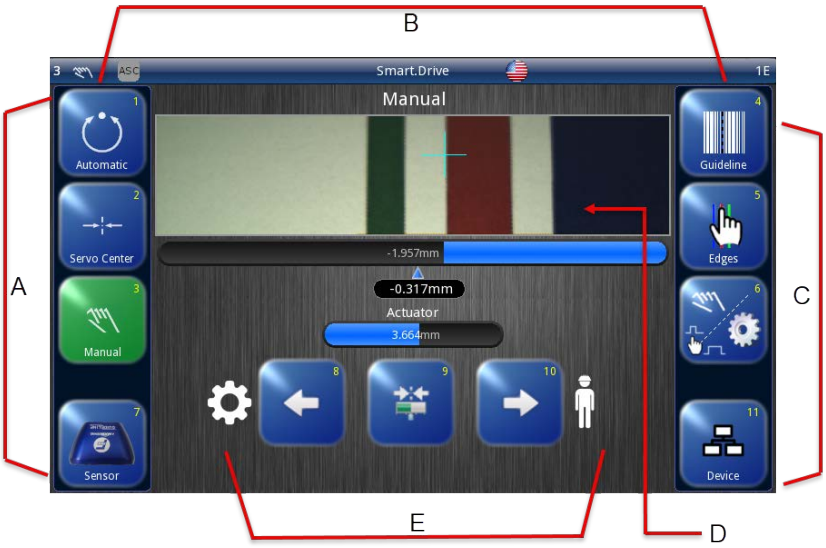


Figure 3.2:CONTROL PANEL - Edge Guiding

Control Panel Definitions

This Control Panel is divided into five sections of information for which brief descriptions follow. Refer to Figure 1 for the button locations in the Control Panel.

a. The vertical section on the left side contains the Operation Mode selection buttons (Automatic, Servo Center, Manual) that indicates the current Operation Mode selection by displaying the corresponding button in a green color. (Other buttons are blue). Sensor button is available for Guideline sensor only.

b. The horizontal section at the top, above the line, contains the status bar which always contains the screen number. It may also indicate statuses, errors, and active language selected.

c. The vertical section on the right side contains the Sensor Selection and Setup buttons and indicates the current Sensor Mode selection by displaying the proper sensor symbol in the Sensor Select button. Edges button is available for Guideline sensor only. Network Selection Button toggles between devices in the network.

d. Camera image display. This is only for Guideline Sensor. This area will be just blue background for other sensors. The selected sensor signal level in a bar graph, and the position of the system guide point is located below the area.

e. The lower middle section contains the Left and Right Jog buttons. This section also contains buttons for Guide Point Shift and Guide Point Reset. Gear Side and Operator Side Buttons appear here.

Button Functions and Definitions

AUTOMATIC
Initiates the Automatic mode. Correction is applied to the web by moving the actuator in response to the output of the sensor(s) that have been selected.

SERVO-CENTER
Initiates the Servo-Center mode. The actuator is centered in its travel which has a default location to the center of the stroke.

MANUAL
There is no guiding of the web course. The settings of SDA can be changed. The bar graph represents the position of the material web in the sensor's field of view.

SENSOR
Camera settings for Guideline Sensor. This is only visible for Guideline sensor.

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

EDGES
Use to select the Edge or Line of the web for guiding. For Guideline Sensor only.

SETUP
Short Press Use to enter the Setup Menus for configuring and adjusting the guiding system.
Long Press Takes you to other setup other than the guiding system configuration.
*This image changes depending on the current Operation Mode. Some buttons may not be available at other modes.

DEVICE
Used to operate various devices present in the network (SmartDrive Actuators or Guideline Sensors that are present) Click to cycle between the controllable devices in the network.

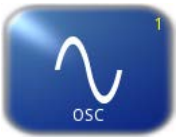
ARROWS
Use these buttons to jog the actuator. The direction of actuator movement is configurable.

GUIDE POINT CONTROL
Use the two arrow buttons to adjust the System Guide Point while in Automatic Mode or Manual Mode. Use the center button to reset the System Guide Point to the default value, which is 50% of the sensor bandwidth. The slider control indicates the guide point position.

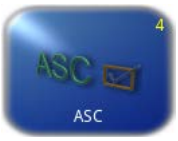
GUIDE POINT CAPTURE
This button sets the guide point of the active sensor mode to the current web location. This allows guiding to begin at the current web location when the Automatic mode is initiated.

GEAR SIDE
Indicates the Gear Side of the Actuator. This is configurable by the customer.

OPERATOR SIDE
Indicates the Operator Side of the Actuator. This is configurable by the customer.



OSC
You can use the OSC menu to select the optional oscillator “OSC” of the SDA system.
The oscillator “OSC” is only present in a job of the SDA if the software has been programmed accordingly.



ASC
You can use the ASC menu (Automatic Sensor Control) to
- activate and deactivate the ASC parameter
- set up ASC threshold 1 or 2. These thresholds control when the ASC function is activated to prevent actuator movement.

AUTOSETUP
Used to calibrate parameters Gain and Polarity (page 6) automatically for "Automatic" mode.

GUIDEPOINT
The optional Guidepoint menu is used to adjust the guide point of the active job.
The default guide point is zero which guides at the center of the selected sensor(s).
If it is necessary to enter another value, the process is described in “Supplementary Operating Instructions” and is included in the system documentation.

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DEADBAND
Use to define a range around the guide point within the sensor field of view in which guiding is reduced or is not active in the “Automatic” operation mode.

GAIN
Use to adjust the guide correction response sensitivity

POLARITY
Use to set direction the guide will move relative to the polarity of the error signal for the active job while in “Automatic” mode.

ACTUATOR SPEED
You can use the Actuator Speed menu to set the maximum correction speed of the motor.

SENSOR SETUP
Use to calibrate the sensors to the properties of the web material.

BACK
Use this menu navigation button to return to the previous menu level.

SMARTDRIVE
Use to leave the Guideline screen and return to the SDA Main screen.

SAVE
Use to save a changed value and return to the previous screen.

CANCEL
This button is used to discard a changed value and return to the previous screen.

ABOUT
This screen provides firmware version information for the OI and SDA.

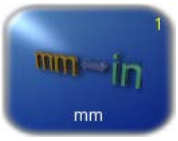
CONTROL OPTIONS
Provides access to additional submenus such as units, hardlock, and jog direction control.

NETWORK
You can use these menus to view network settings and make changes to them.

ACTUATOR LIMITS
To establish limits inside the normal stroke.

SERVICE
Provides access to maintenance screens. The service submenu is available in all operation modes.

HARDWARE
This section contains a description of menus that can be used to view and set up the properties of the connected input and output devices.



MM/IN
Change the units (mm, in)

HARDLOCK
Optional. When the operating mode switches to “Manual” the position of the drive is actively maintained Power is normally turned off to the drive in “Manual” mode. The de-energized drive may be moved by an external force in the case of unfavorable conditions in the client's system. The drive can be actively maintained at its position in “Manual” mode to prevent movement due to external forces.

LEFT/RIGHT KEYS
Use to swap the jog direction (left and right reactions) based on the Gear and Operator Side set up.

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Status Bar Definitions

The status bar located horizontally across the top of the Operator Level screen remains visible at all times. The number on the left side of the status bar contains the numerical address of the connected device and it should always be 0 when not on a network. When on a network, this will be the Maxnet number assigned to the networked device. The number on the right side of the status bar indicates a hierarchical screen number. The first numerical value indicates the operation mode (1=Manual, 2=Servo-Center, 3=Automatic). The second alphabetic character indicates the sensor mode (A=S1, B=S2, C=S1-S2). This screen number uniquely identifies each screen of the operator interface. The status bar also displays various icons which are described below.

Servo-center mode is active.

Manual mode is active.

Automatic mode is active.

Operator interface login level 1. (not implemented yet)

Operator interface login level 2. (not implemented yet)

Operator interface login level 3. (not implemented yet)

Operator interface login level 4. (not implemented yet)

ASC is enabled.

ASC is enabled and guide in locked.

Actuator is at maximum outward stroke limit.

Actuator is at maximum inward stroke limit.

The external lock signal is active and guide is locked.

Motor voltage is below 20VDC.

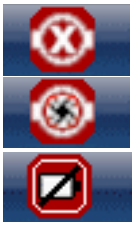
Motor is too hot.

General motor fault condition (stalled).

General SDA communication error.

Encoder Calibration Error.

Encoder Battery low.



Motor communication error.

Motor encoder error.

Encoder Battery bad.

Operating the SmartDrive Acuator

User Level

All the functions required for normal operation of the SDA systems are available on the user level.

Buttons

1. Select operating mode “Automatic”
2. Select operating mode “Servo-center”
3. Select operating mode “Manual”
4. Select available jobs (sensors)
5. Sensor settings. For Guideline Sensor Only.
6. Press and release - Use to enter the Setup Menus for configuring and adjusting the guiding system.
   Press and hold - Provides access to more advanced settings depending on the operating mode.
7. Guideline Sensor Settings. This button is visible only when a Guideline sensor is used.
8. and 10. “Manual” and “Servo center” operating mode: move actuator.
   “Automatic” operating mode: move the guidepoint in the sensor field of view.
9. “Automatic” Operating mode: resetting the guidepoint.
   “Manual” Operating mode: turn guidepoint on/off.
   Turning off guidepoint will use the default guidepoint which is the center of sensor field of view.
10. See #8.
11. Guideline OI can be used to operate various devices present in the network (SmartDrive Actuator or Guideline Sensor that are present) Click to cycle between the devices in the network you want to operate.

Select Operating Modes

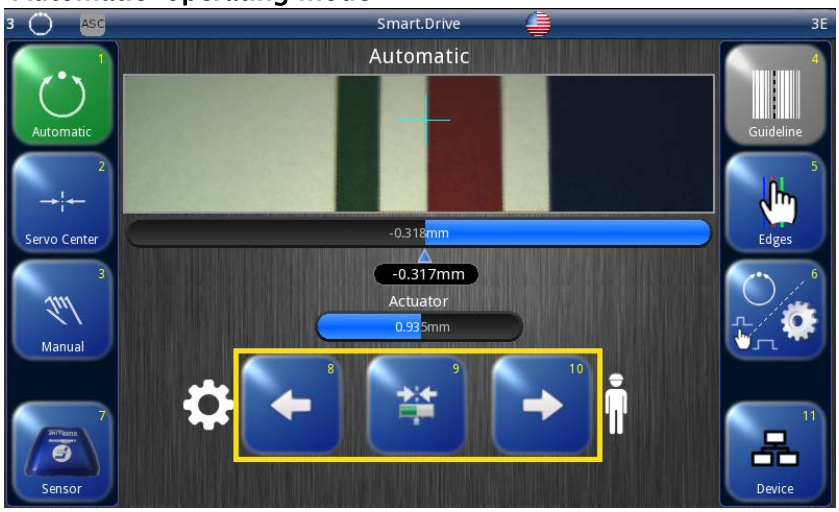
AUTOMATIC
The web course is guided by an actuator based on sensor information.
The bar graph represents the position of the material web in the sensor's field of view.

SERVO-CENTER
The actuator is moved to the center of the configured stroke.
The bar graph indicates the current position of the actuator in relation to the available actuator stroke.

MANUAL
There is no guiding of the web course. The settings of SDA can be changed.
The bar graph represents the position of the material web in the sensor's field of view.

Shift Guide Point

"Automatic" operating mode



The guide point can be shifted within the sensor's field of view during on-going operation.

-Move the guide point to the desired position using the arrow buttons 8 and 10.

-A marker appears in the display at the location to which the guide point was moved, together with a numeric value representing the position in the sensor field of view.

-Press button 9 to reset the guidepoint.

"Manual" Operating Mode

-Press button 9 to set the guide point alternately to 0 or pre-set it to the current position of the web so the transition to automatic will begin guiding at the current web location.

The actuator can be moved in "Manual" operation mode.

-Move the actuator to the desired position with arrow buttons 8 and 10.

Menu Level

The parameters of the SmartDrive Actuator can be set for the relevant customer application in the menu level. They have been combined to form the following menu groups:

- Job menus
- Servo-center menus
- Setup menus

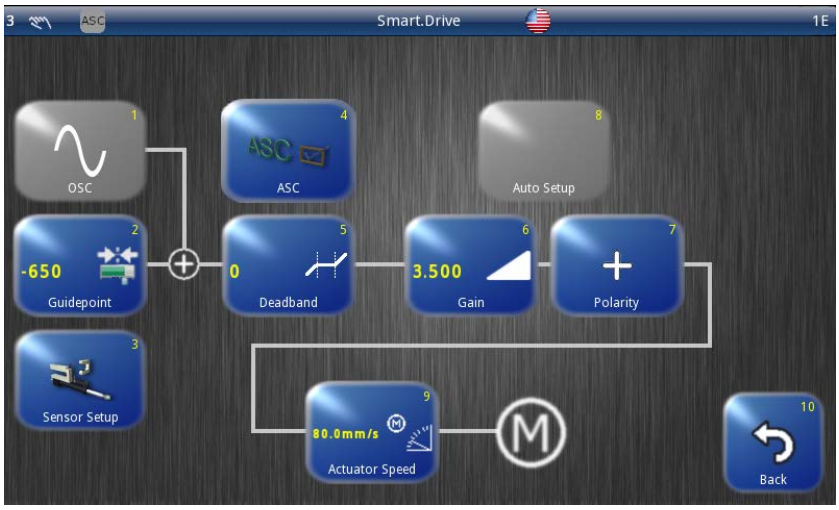
6 Job Menu (Press and Release)

Precondition: “Manual” or “Automatic” operation mode is selected.

- Press and release button 6 on user level. Menus are available for setting up the parameters of the selected job.

Note: Not all menus are available in the “Automatic” operation mode.

Manual



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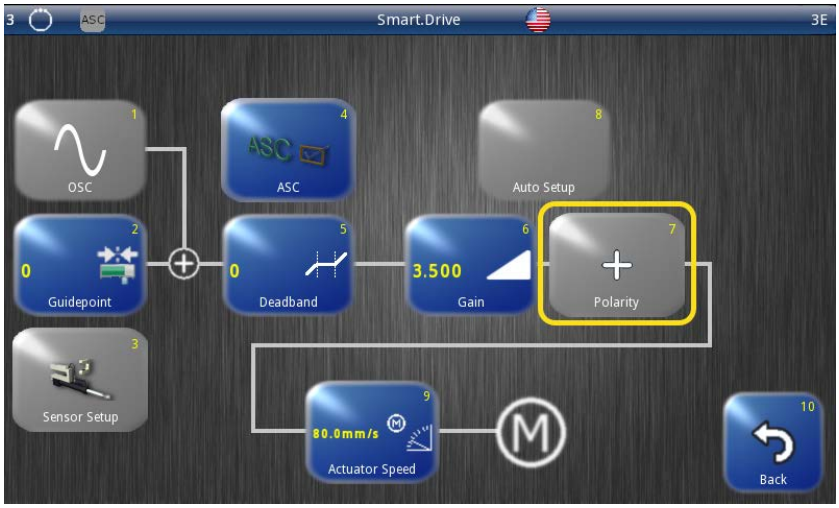
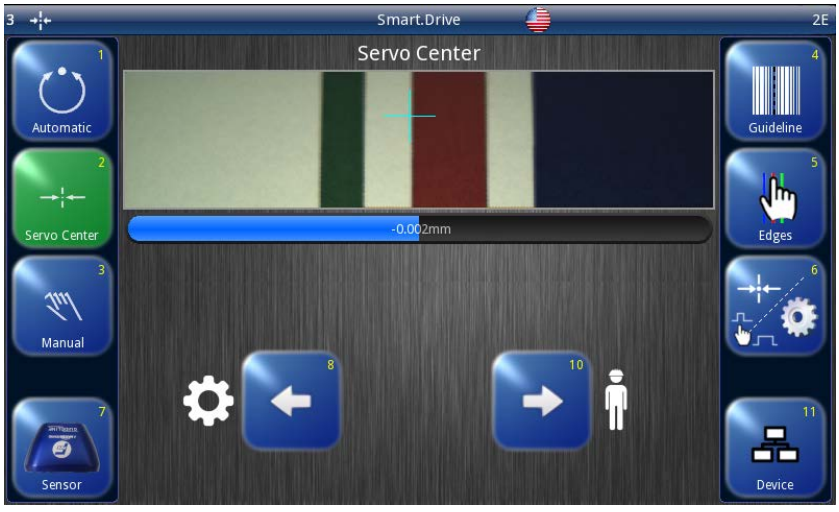
Automatic



Buttons

1. OSC
2. Guidepoint
3. Sensor Setup
4. ASC
5. Deadband
6. Gain
7. Polarity (not available in Automatic operation)
8. Auto Setup
9. Actuator Speed
10. Exit Menu

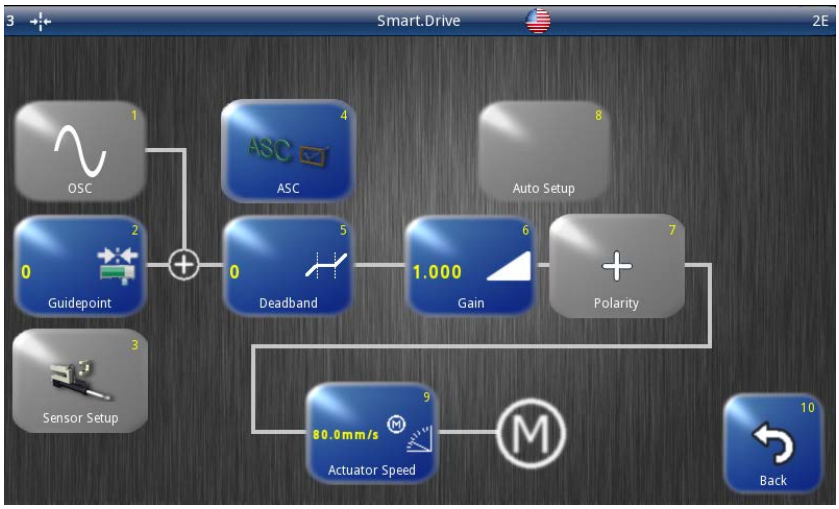
Servo-Center Menu



Precondition: “Servo-Center” operation is selected.

- Press and release button 6 on user level. Menus are available for setting up the parameters of the Servo-Center transducer.

Note: Not all menus are available in the “Servo-Center” operation mode.The Polarity and Gain menu will not be available in Servo-center mode as they are only internally controlled and will not be user accessible.



1. Deadband
2. Actuator Speed
3. SC Center Tuning (available soon)
4. Exit Menu

6 Job Menu (Long Press)

- Press button 6 in the operator level for more than 2 sec. Menus are available for setting up the parameters of the selected job.

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Buttons

1. About
2. Control Options
   mm/in
   Hardlock
   Left/Right Keys
3. Network
   Maxnet and TCP/IP Settings
4. Actuator Limits
5. Service
6. Exit Menu

6-B-1 About

This screen provides firmware version information.

6-B-2 Control Options

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1. mm/in

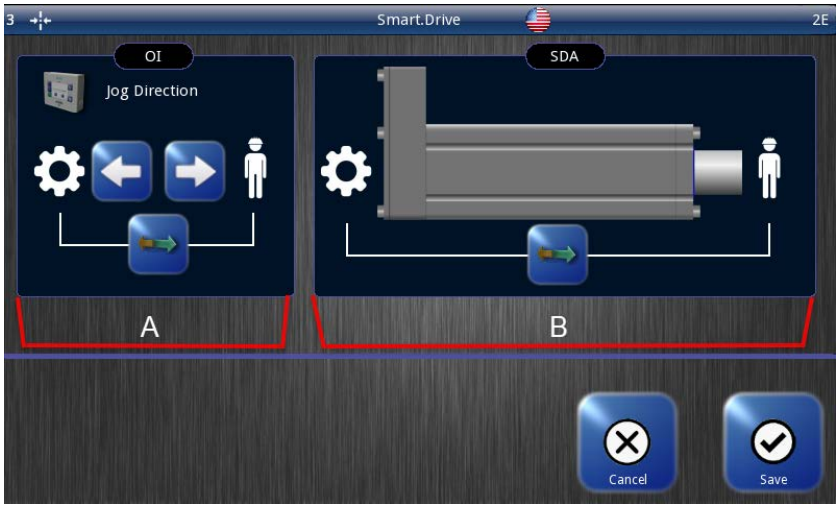
Change the units (mm, in)

2. Hardlock

Activate or deactivate the Hardlock function.
The Hardlock menu is used to actively maintain the actuator's position in “Manual” mode.
Power is normally turned off to the drive in “Manual” mode. The de-energized drive may be shifted by an external force in the case of unfavorable conditions in the client's system. The drive can be actively maintained in its position in 'Manual' mode to avoid such circumstances.

3. Left/Right Keys

Use to set the working direction of the buttons. The direction of guide movement is configurable through this menu.



The jog buttons are used to manually position the actuator. The use of operator and gear symbols are provided to assist with jog direction. The jog buttons for the OI and the actuator orientation are separately configurable so the direction of actuator movement can be matched with the actuator's installed orientation within the machine.

a. OI Jog Direction
The jog direction setting for the OI is provided so the jog direction can be set based on its location on the machine. This setting is stored inside the OI since it is dependent on the OI's location on the machine.

b. SDA Jog Direction
The direction setting for the actuator is provided to set the mounting orientation of the actuator inside the machine. This setting is stored in the actuator and is used by the OI to match jog direction.

6-B-3 Network

Use this to view devices in a network and make changes to their network settings.


3
ASC
Smart.Drive
1E
Network
1
OI
2
SDA
3
Back

1. OI 

Modify Operator interface's network settings.

2. SDA 

Modify SmartDrive Actuator's network settings.

a. Maxnet settings
Display and change the network setting for Maxnet.
-Maxnet ID is used for addressing of individual SDA system devices.
-Cluster ID is used to operate identical systems in a network and to operate more than 30 devices in a network.
(1 cluster can have up to 30 active devices)

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MAXNET ID	Cluster ID	Use
Cannot be edited	Not visible	A system distributed over several devices and present once in the network
Cannot be edited	Visible and can be edited	A system distributed over several devices and present several times in the network
Can be edited	Visible and can be edited	Grouped independent drives (more than 30 are possible)
Can be edited	Not visible	Independent drives (maximum of 30 possible)

Note: The Maxnet ID/Cluster ID is only to be changed in accordance with the appropriate instructions in “Supplemental Operating Instructions” (see system documentation) or following consultation with a member of staff at Maxcess.

b. Customer Settings
   -Display and change the network settings for TCP/IP
   -Show the MAC ID of SDA

6-B-4 Actuator Limits

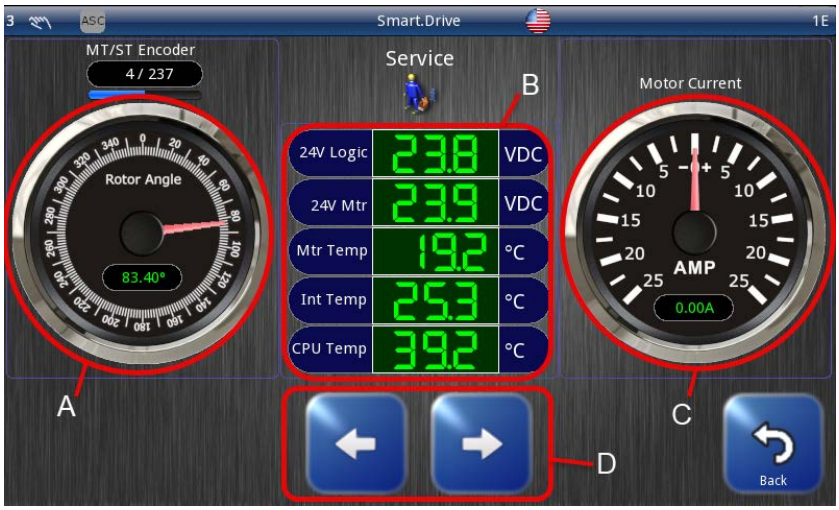
Use to establish limits inside the normal actuator stroke.

1. Set Limits - Move the actuator to new limits then click the corresponding buttons to set each limit.

2. Clear Limits - Clicking the arrows to turn them blue will clear the set limits and will revert back to default limits which is the normal stroke.

6-B-5 Service

Displays the diagnostics of SDA.



a. MT/ST Encoder
   - MT Multi-turn count
   - ST Singlr-turn count

b. Temperatures
   24V Logic: Controller Voltage Supply
   24V MTR: Motor Voltage Supply
   Mtr Temp: Motor Temperature
   Int Temp: PCBA Housing internal temperature
   Color Code for values:

Green: OK
Red: Above Maximum
Yellow: Below Minimum

c. Motor Current
Display of motor current

d. Jog Buttons
Actuator can be jogged while in Manual operation. These buttons are disabled while in Automatic and Servo center modes.

6-B-6 Hardware

Use the Hardware button to view and set up the properties of the connected input and output devices.

Sensor Calibration
Used to calibrate sensors to the properties of the web material.

SDA supports up to 3 DSE-style sensors. Not all DSE sensors support calibration so the “Calibrate” button will only be available for sensors that support it.

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Sensor Calibration

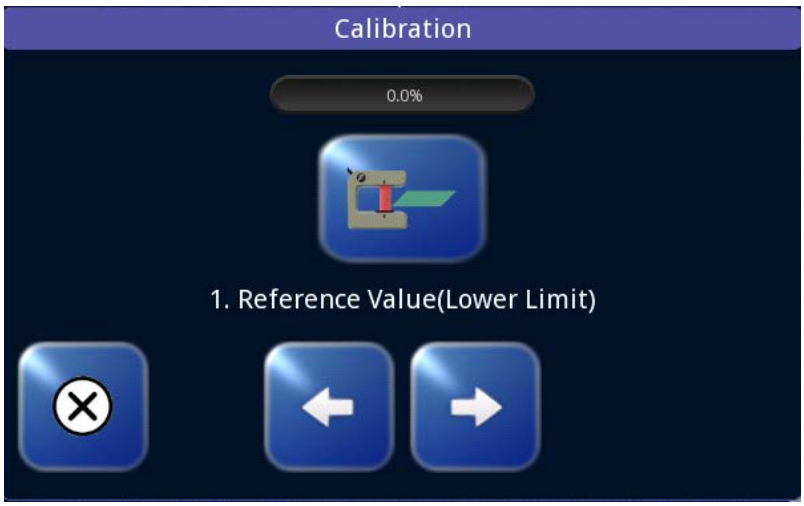
The sensor setup menu is used to calibrate the SmartDrive Actuator to maximize sensor signal sensitivity when used with webs that are not totally opaque or a different output range. This procedure involves teaching the SmartDrive Actuator using a sample of the web material. The jog buttons are available during calibration so the guide can assist with the uncovered and covered steps if applicable.

Note: It is essential to follow the instructions for the installation of the sensor in the corresponding operating instructions.

WARNING – To calibrate a sensor, it may be necessary to move the material web inside the sensor's field of view by hand. here is a risk of being cut by the web and crushed against the actuator.

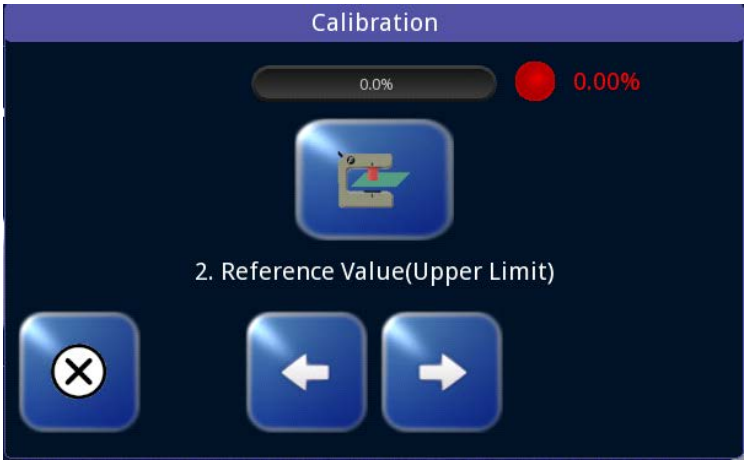
Do not touch edges of the material web.

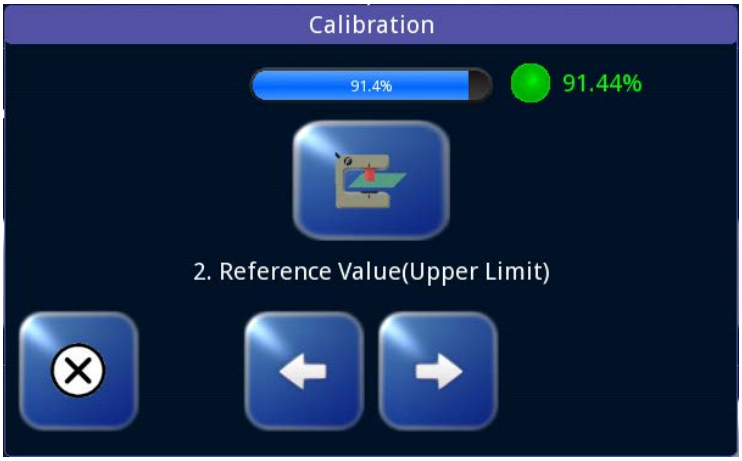
Perform the calibration operation only when the machine has been stopped and secured to prevent restart.



1. The reference value for the Uncovered sensor must be determined. To do this, remove the material web completely from the sensor's field of view.

   Click this button: 

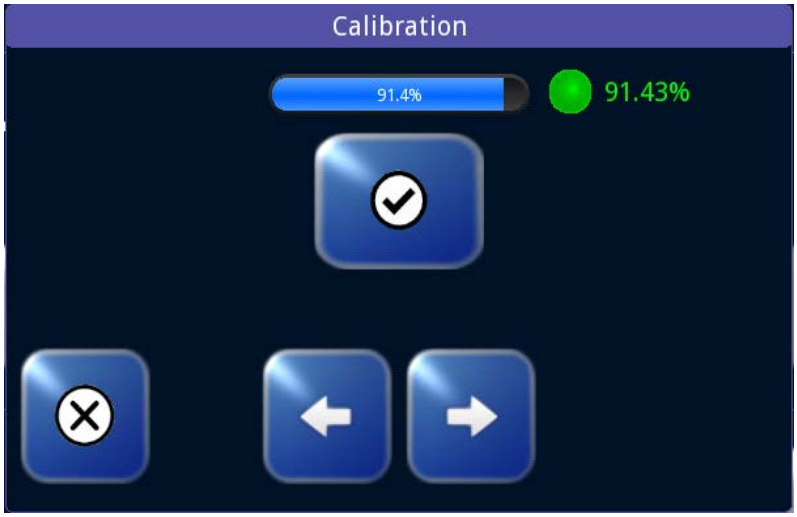




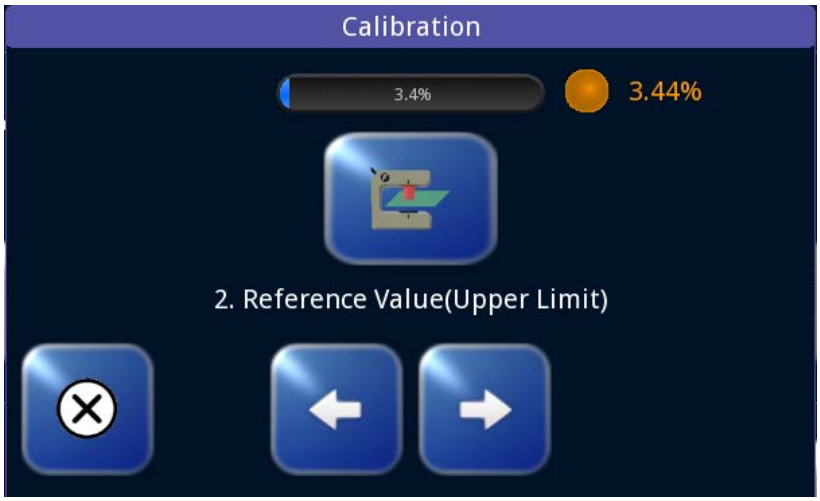
2. The reference value for the covered sensor must be determined. To do this, the sensor's field of view must be completely covered by the material web. The LED color indicator and percentage value provides feedback about

when signal contrast is acceptable.

Click this button: 



3. The result of the calibration is displayed and can be saved.

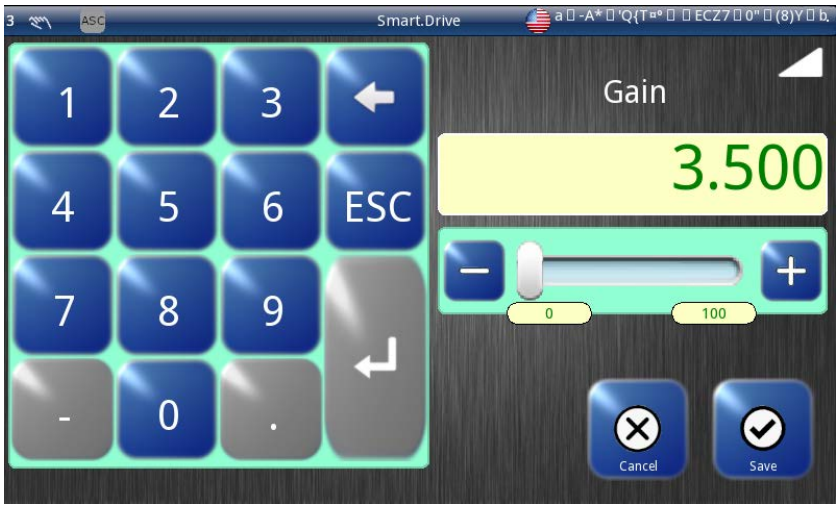


Note: The contrast LED will be orange to signal low contrast. Calibration will likely be functional under these conditions but this signals low contrast between the covered and uncovered states.

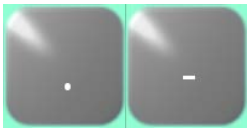
Web adjustment may be necessary.

Keypad Operation

All of the menu screens that require numeric entry use a common keypad control. An example of the Gain entry screen is shown below.



New values are entered using the numeric keypad buttons. Entry format similar to data entry using a calculator where new values appear on the right and shift existing data left. The exception to this is when the first button is pressed, the displayed value is cleared first.



Some entries accept a decimal point and polarity. When editing values that do not accept decimal points or signed entry, these buttons will be disabled.

The ESC button erases the current entry.

Use the CANCEL button to close the edit window without saving any changes.

The ENTER button checks the value according to the maximum and minimum limits and applies the new value if it is within acceptable range. If the entered value is outside either of the applicable limits, the entered number and the violated limit are marked in red as shown in the example below.

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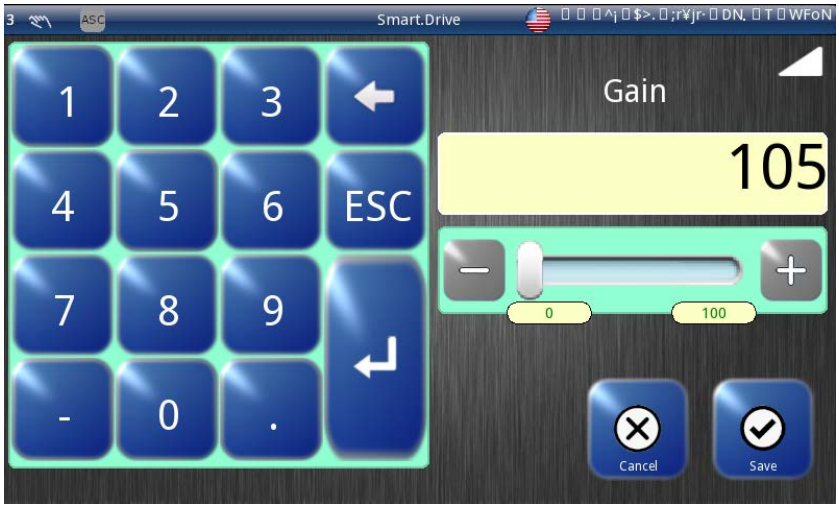

If this occurs, the ESC button may be used to erase the entry and try again, or the CANCEL button will cancel the editing operation and close the window.

4 MENU DESCRIPTIONS

Language

The operator interface supports multiple languages. Use this selection to choose from the supported list of languages.

You can access the Language menu at the top portion of the screen on the status bar.

The active language will always be visible at the top and will let you change the language at any screen you are in at that moment by clicking at that language icon

The language screen opens.

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Press the desired language and press save. The screen will then return to the Operator Level screen.

Press CANCEL button to exit without saving changes and return to the previous screen.

Menu identification

Commissioning	
Before commisioning	The following assembly and electrical connection tasks must be performed before commissioning: - SmartDrive Actuator must be assembled properly. - SmartDrive Actuator must be properly connected to the power supply and integrated into the “EMERGENCY STOP” circuit of the customer's system - The sensors and Operator Interface(s) must be properly connected to SmartDrive Actuator. - It is also important to become familiar with the basic operation of the operator interface.
Commissioning	Once all assembly and connection tasks have been checked and are in proper condition, SmartDrive Actuator can be placed into operation.
  	WARNING: Before commissioning, ensure that: - Commissioning of the SmartDrive Actuator is performed while the web is stopped. - No one is in the danger zone of the moving parts. The SmartDrive Actuator has been preset to the customer application and checked before it leaves the factory. However, this does not apply to individual or replacement part deliveries. WARNING: There is a risk of crushing and cutting injuries on the web material itself and/or due to the motion of the web. Do not grasp moving parts (rollers, web, etc.) or anything close to them during commissioning. Do not touch the edges of the material web.

To commission the SmartDrive Actuator System, make the basic setting selections described in the following steps.

Note: When the system is turned on, the last operating mode to be selected is active.

1. Turn on the Electrical Power
2. Select the Language
   - It may be necessary to change the language for menu guidance on the operator interface.
3. Select Manual
   - Switch the SmartDrive Actuator into Manual mode with button 3 on the operator interface.
   - There is no guiding of the web course in Manual mode. The SmartDrive Actuator's control parameter can now be configured.
4. Calibrate Sensor(s)
   - Calibrate the connected sensor(s) if the web material does not provide adequate sensing.
5. Calibration (Absolute Encoder Position). The SmartDrive Actuators are calibrated at the factory and will not need to be calibrated by the customer unless a service was done to it. Any disassembly done to the SmartDrive Actuator will require re-calibration to ensure the encoders are properly calibrated.
6. Select Job
   - Select the job with the parameters to set with button 4.

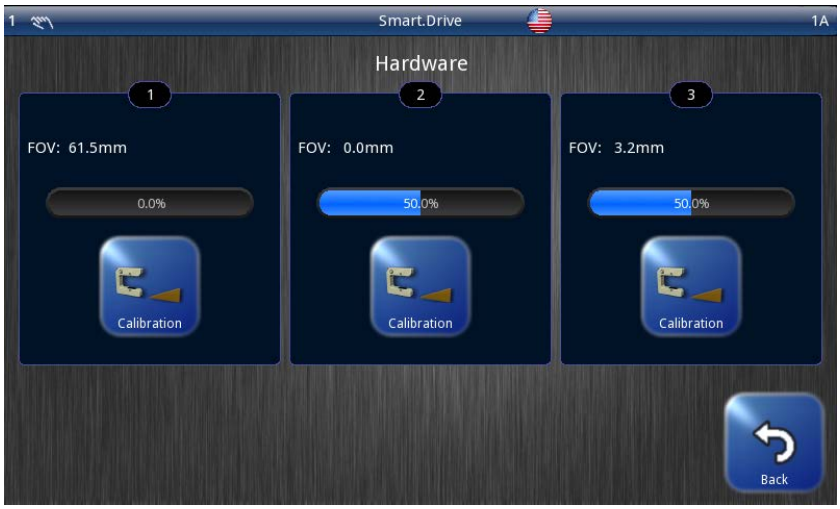
Decommissioning

1. Turn off the electrical power to the SDA (SmartDrive Actuator) system.
2. Remove all cables from SDA system.
3. Disassemble the devices of the SDA system.
4. Devices of the SDA system can be stored according to the specified ambient conditions.
5. The Smart Drive Actuator must be disposed of in accordance with all the applicable national, state and local regulations.

Sensor Setup

The factory sensor settings are for webs that are 100% opaque using DSE sensors. The sensor setup menu is used to calibrate the SmartDrive Actuator to maximize sensor signal sensitivity when used with webs that are not totally opaque or a different output range. This procedure involves teaching the SmartDrive Actuator using a sample of the web material.

The SmartDrive Actuator stores separate calibration data for the S1, S2 and S3 sensor inputs so the procedure should be done on each sensor input that will be used.



See Sensor Calibration section.

5 TROUBLESHOOTING

Fault Diagnostics - Fault Rectification

An incorrect setting on the SmartDrive Actuator is often the cause of incorrect or undesirable guiding characteristics. Faults and the procedures for rectifying the faults are described on the following table Disconnect power from the SmartDrive Actuator before connecting or disconnecting any cables.

Fault Diagnostics/Rectification

Faulty behavior	Possible cause	Remedy	Reference
Actuator does not move in Automatic mode.	System Gain set too low. or Sensor Calibration is not correct.	Increase the System Gain. Perform Sensor Setup.	System Gain or Sensor Setup
Actuator is unstable in Automatic mode.	System Gain set too high or Cable connectors are loose or Sensor Calibration is not correct.	Decrease the System Gain. Tighten all cable connectors. Perform Sensor Setup.	System Gain or System Gain Sensor Setup
Actuator moves the wrong direction in Automatic mode.	Guide Polarity is incorrect or Incorrect Sensor mode selected or Sensor Calibration is not correct.	Perform Autosetup or change the guide Polarity manually. Select MANUAL mode, then verify the correct sensor mode is selected. If necessary, press the SENSOR key to select the correct sensor mode. Perform Sensor Setup.	Autosetup Configuration, Autosetup or Manual Configuration, guide Settings Sensor Setup

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LED on smartDrive Actuator

LED	Status	Indicates
Error messages		
E1	Off	No ethernet connection
	Green, blinking	Ethernet communication
E2	Off	No ethernet connection
	Orange	Ethernet link on
Controller	Off	No power
		Driver board software problem
	Green, Yellow or Red	Controller status (see LED codes)
Motor	Off	No power
		Driver board software problem
	Green, Yellow or Red	ADC parameters status (see LED codes)
Serial	Off	Corrupted file system no code loaded
	Green, Yellow or Red	Boot process (see LED codes)

LED Codes

Error messages are incorporated on the LED (Controller/Motor) using two blink codes as shown below:

Motor LED Blink Codes

Issue	1st Blink - Slow	2nd Blink - Fast	Color
Unit not calibrated	2	2	Red
Low battery	2	3	Yellow
Motor is hot	2	4	Red
Endcoder error	3	3	Red
Battery (no battery	3	4	Red

Controller LED Blink Codes

Issue	1st Blink - Slow	2nd Blink - Fast	Color
Driver controller boards communication problem	3	2	Red

Motor LED Color Codes

Parameter	Green	Yellow	Red
24V Motor supply	OK	Motor power down (*2) Motor voltage low	-
24V Logic supply	OK	-	Too high/Too low
Motor itemperature	OK	-	Too high/Too low
Internal temperature (PCB housing)	OK	-	Too high/Too low
CPU temperature	OK	-	Too high/Too low

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Controller LED Color Codes

Parameter	Green	Yellow	Red
External lock	Lock is inactive	External lock is active	-
Stroke limit	Within stroke limits	At either stroke limit	-
Motor status	No motor error	-	Motor is blocked/ stalled

Serial LED Color Codes

Parameter	Green	Yellow	Red
Program status	OK	Start-up error	Start-up error

These errors will also be shown at the Operator Interface status bar. These codes will be helpful if Operator Interface is not connected to SDA at the time of the error.

Note: *1- These parameters can also be monitored through the service screen on the Operator Interface and actual measurement values are visible.

Note: *2- When emergency stop is active.

6 SYSTEM NOTES

Important information

1. Disconnect power from the SmartDrive Actuator 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 Control Panel indicates the signal level of the selected sensor(s).
6. In Servo Center mode, the bar graph in the Control Panel indicates the signal level of the Servo Center sensor.
7. When any command is detected on the Digital Input Port, a down arrow icon is displayed at the top of the display.
8. The External Lock command is used to temporarily disable all motor commands while in Automatic mode, and when the External Lock is removed, the system reverts back to normal Automatic guiding operation. The External Lock command is not to be used as an E-Stop.

7 SERVICE

Return Shipment Instructions

If it is necessary to return the SmartDrive Actuator to Fife for service, care must be taken to properly package the unit to prevent damage during shipment. If possible, use the original shipping containers.

Requests for Service

When requesting service, please have a copy of the order confirmation ready with the order number.

When ordering replacement parts, please indicate, (where possible) Part Number, Drawing Number and Model description.

Please be careful to keep all documents accompanying the product in a safe place. This will allow us to help you more quickly in the event that service is required.

Contact Details

Fife-Tidland GmbH

Max-Planck-Straße 8
65779 Kelkheim
Deutschland

Siemensstraße 13-15
48683 Ahaus
Deutschland

Products / Accessories / Spare Parts / Returns

Phone: +49 - 6195 - 7002 - 0
E-mail: sales@maxcess.eu
Web: www.maxcess.com
Shop: mymaxcess.eu

For **repairs / returns**, you will receive a **return note** after consultation. Please send the products with the return note to the address indicated on it.

Technical service

Phone: +49 - 6195 - 7002 - 0
E-mail: service@maxcess.eu