FIFE GUIDING SOLUTIONS

MAXCESS

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FIFE D-MAX / OI-TS

Operating Instructions

EN

D-MAX Controller with Operator Interface OI-TS
from firmware version 002

MI 5014 1

When requesting service or spare parts, please have ready the following reference number.

Bitte halten Sie bei Service- oder Ersatzteilanfragen die folgende Referenznummer bereit.

Pour toute demande d'intervention ou de pièces détachées merci de nous communiquer la référence suivante.

Si prega citare il seguente riferimento in caso di richiesta di assistenza tecnica o parti di ricambio.

Para cualquier petición de servicio o repuestos le rogamos nos comunique la siguiente referencia.

MENUS 7-1

1 INSTRUCTION

About these operating instructions

These operating instructions describe the commissioning, operation and maintenance of the D-MAX system with an operator interface OI-TS and provide important instructions for proper use.

These operating instructions are intended for both the system construction master as well as the operator who uses the D-MAX system in production. The Operating Instructions must be read and applied by everyone who is responsible for commissioning, operating or maintaining the D-MAX systems.

The Operating Instructions must be carefully kept and must always be available throughout the service life of the D-MAX system.

Note:
These Operating Instructions describe basic operation of the D-MAX systems. Additions and customer-specific adaptations are found in Supplementary Operating Instructions in the system documentation.

If the customer's system consists of multiple D-MAX Controllers and/or operator interfaces, the instructions in these Operating Instructions must be performed separately for each module.

Translation of the original Operating Instructions:
This Operating Instructions is a translation. The original Operating Instructions was composed in German.

Proper use

The D-MAX System is used to control systems such as:

- Control roller systems
- Unwind and rewind systems
- Slitting systems
- Tool positioning systems

The D-MAX system works in different functions:

- Edge guiding
- Center guiding
- Line guiding (edge or center guiding on printed lines).

The D-MAX system must only be used in accordance with its intended purpose and must be in flawless technical condition. Unauthorised conversions or changes to the D-MAX system are not permitted.

Any other use of the D-MAX system requires the prior approval of Fife-Tidland GmbH.

Note:
The modules of the D-MAX system must not be opened. If a module is opened, no claims under the warrantee will be honoured.

Options

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

Improper use

- Operation outside of the technical specifications is not permitted.
- Operation in areas where there is a danger of explosions is prohibited.
- Any use other than the designated use is not permitted.

Operating principle

The D-MAX system consists of various modules that can be combined depending on the specific application.

Modules

Figure 1.1: D-MAX Controller

Figure 1.2: Operator interface

D-MAX Controllers

- integrated into a guiding system or for wall mounting
  - D-MAX 1 Controller:
    for the drive of a control loop
  - D-MAX 2 Controller:
    For the drive of two independent control loops
    or
    one control loop with automatic sensor positioning

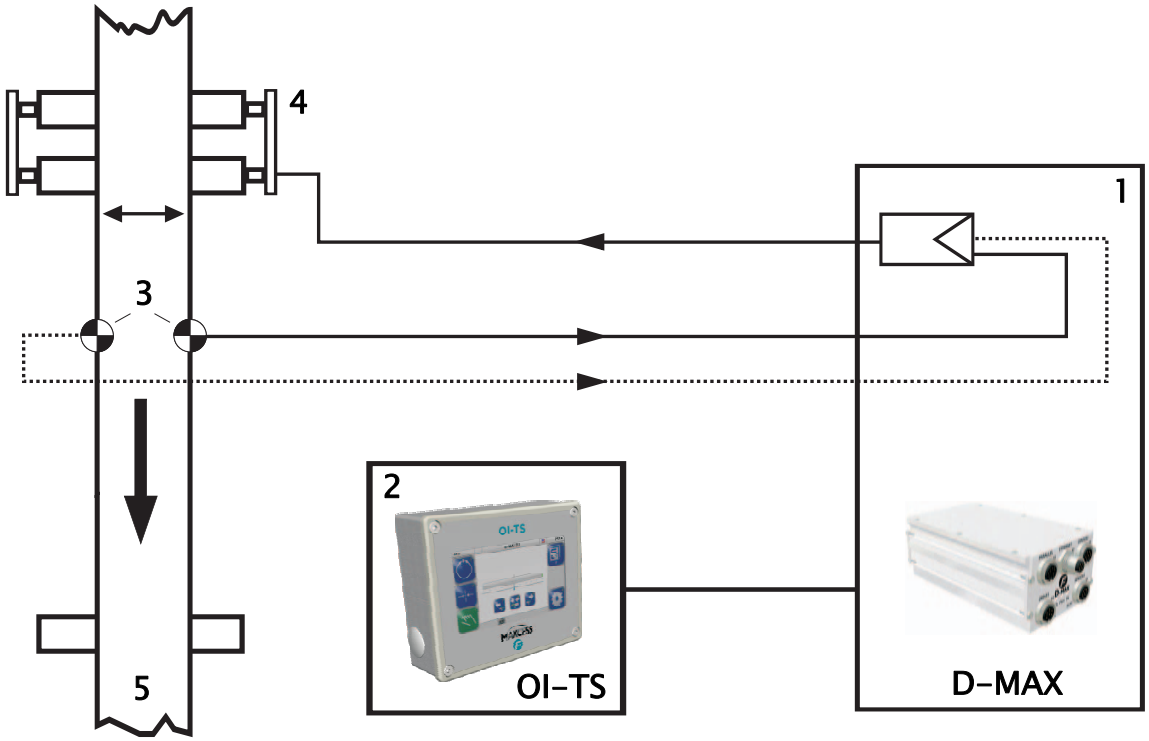
D-MAX Operator interfaces

- Operator interface OI-S for desk installation or wall mounting:
  for operating of D-MAX controllers or sensors
- PC-based virtual operator interface

Operating principle

Figure 1.3 shows an example of edge guiding (optionally center guiding) with a D-MAX system.The D-MAX system consists of a D-MAX 1 Controller (1) and an operator interface OI-S (2).

A sensor (3) senses the web edge of a material web and determines the current position of the web. The D-MAX 1 Controller receives this information and guides the material web (5) by means of an actuator (4) so that it is always in the desired target position.



1 D-MAX 1 Controller
2 Operator interface OI-TS
3 Sensor(s)
4 Actuator (offset pivot guide)
5 Material web
--- optional

Figure 1.3: Operating principle of a control loop with modules of the D-MAX system

2 SAFETY INSTRUCTIONS

Important information

Problem-free and reliable operation of the D-MAX system requires that the D-MAX system

- properly shipped and stored,
- properly mounted and placed in operation,
- properly used and carefully maintained.

Proper operation and careful maintenance will ensure a long service life for the D-MAX system.

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 D-MAX system.

Please note the following:

- The content of these operating instructions
- The safety instructions printed on the unit
- The requirements of the machine manufacturer
- 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 **WARNING** refers to the danger of moderate to sever bodily injuries.

The signal word **CAUTION** refers to the danger of slight to moderate bodily injuries or material damage.

Symbols

Warning/caution - dangerous area
Reference to general hazards that may result in bodily injuries or damage to the device

Warning/caution - danger due to crushing
Refers to danger of injury caused by crushing

Warning/caution - danger due to cutting
Refers to danger of injury caused by cutting

Additional symbols

- This endash is followed by an enumeration.
- This dot is followed by a prompt to do something.

Note:
Reference to important information.

Preventing hazards

Installation and commissioning

- Damaged modules of the D-MAX system must not be installed or placed in operation.
- Assembly work must be performed while the machine is stopped and protected against being turned on again.
- All assembly tasks must only be performed when there is no electrical power in the system.
- The D-MAX system must only be placed in operation if all components are securely assembled.
- Electrical connections on the modules of the D-MAX system must only be made or disconnected when the electrical power is turned off. Failure to follow these instructions may result in damage to the D-MAX system.
- The parameters specified in Section *Technical Data* must be observed.

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- Only replacement parts that have been approved by Fife-Tidland may be used.
- No changes may be made to the D-MAX system.
- Electrical lines must not be subjected to any mechanical loads.

Operation

- Danger of injury by crushing
  ⇨ Do not place your hands on or near moving parts (rollers, material web, etc.) during operation.

- Danger of injury due to cutting on the edge of the material web
  ⇨ Do not place your hands on the edge of the (moving) material web during operation.

- D-MAX system modules damaged during operation must be decommissioned.

Maintenance

- Danger of injury by crushing
  ⇨ Maintenance work must only be performed on the D-MAX system when the power is turned off, the machine is stopped, and it is protected against being turned back on.

3 INSTALLATION

Transport and storage

- Modules of the D-MAX system must be secured to prevent them from slipping during transport.
- The modules must be kept cool, clean and dry.
- Operator interfaces OI-TS must not be stored close to powerful magnetic fields. The electronic components of the device could be damaged.

Scope of delivery

- D-MAX Controller
  The model designation, serial number, and the firmware and software numbers are on the rating plates on the housing.
- Operating Instructions

Option

- Operator interface OI-TS
  The model designation and the serial number are on the rating plates on the housing. The firmware and software numbers are affixed to the side of the housing (see *figure 3.3, page 3-4*).
- Fastening materials for wall mounting
- Fastening material for installation in panel

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Mounting

WARNING

⇨ All assembly tasks on the D-MAX system must be performed when there is no electrical power in the system.

⇨ Assembly tasks and mechanical settings must only be performed when the machine has been stopped and secured from being turned on again.

Installation location of D-MAX Controller

- Protection class: IP54
- Operating temperature: 0°C ... 60°C
- Relative humidity: 10% to 90% non condensing
- Operating altitude above sea level: maximum 3000m
- On a fixed machine part or on a wall
- Not in places where there is a risk of explosions.

Mechanical fastening of D-MAX Controller

- Built into a guiding system or
- With an assembly bracket (optional) for wall mounting (see *figure 3.1*) or

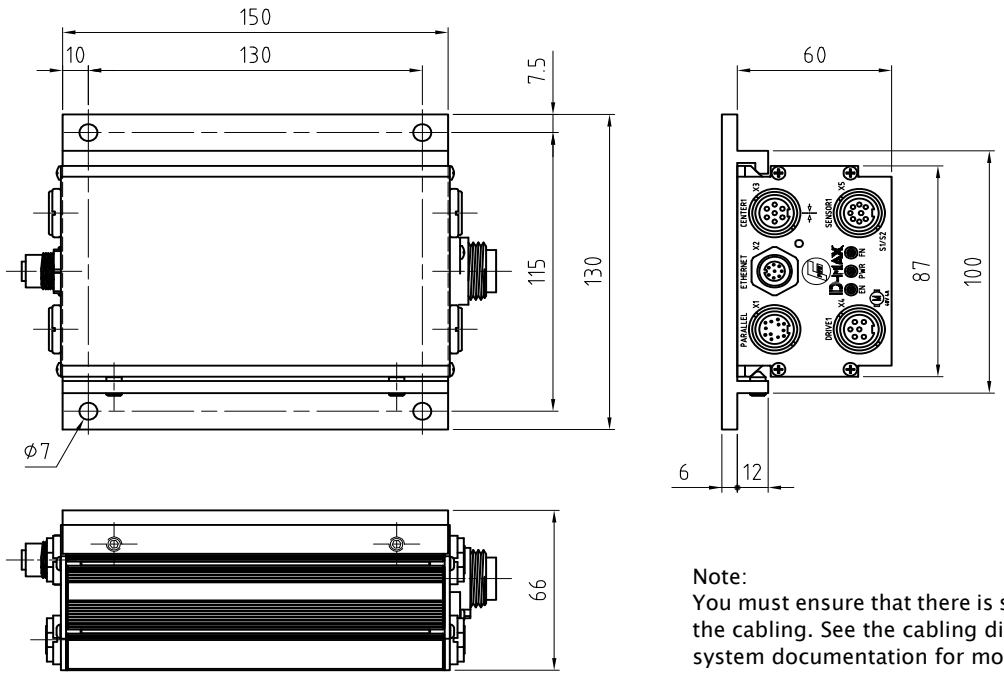
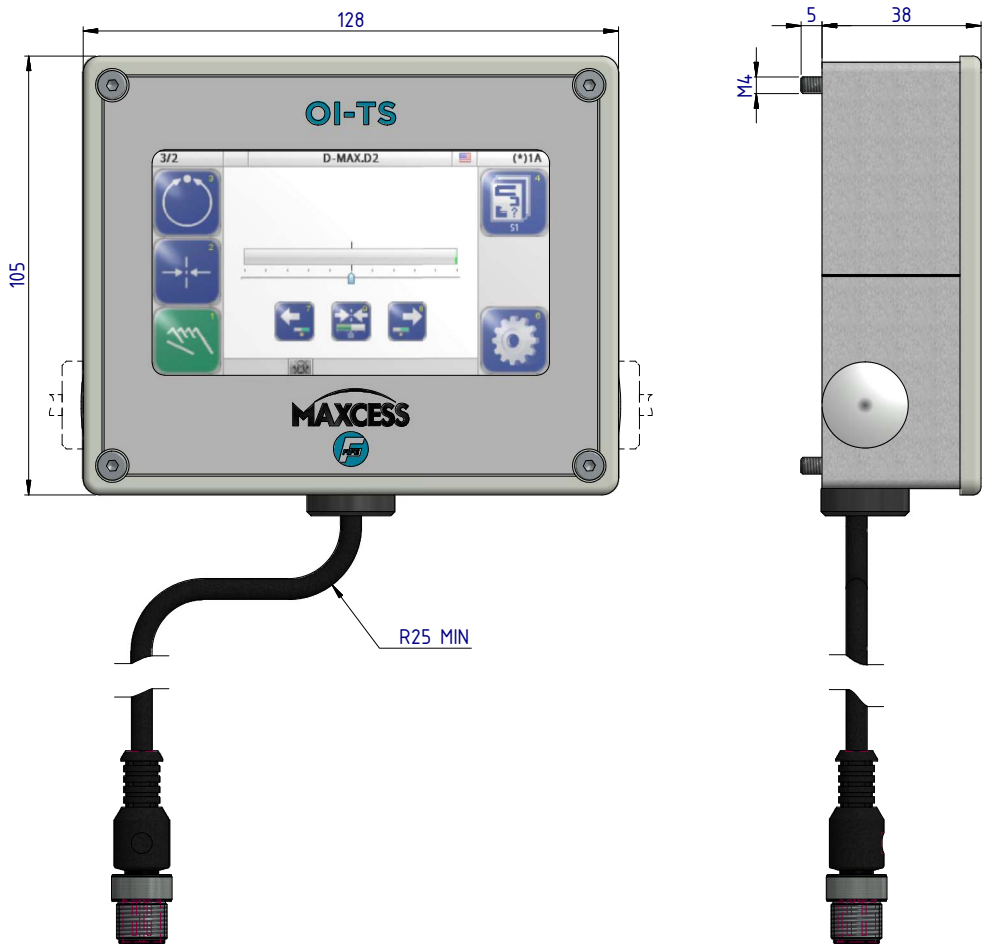


Figure 3.1: Dimensions of the D-MAX Controller with assembly plate

Installation location of D-MAX operator interface OI-S

- Protection class: IP64
- Operating temperature: 0°C ... 60°C
- Relative humidity: 10% to 95% non condensing
- Operating altitude above sea level: maximum 3000m
- On a fixed machine part or on a wall
- Protect from vibrations
- Do not place close to powerful magnetic fields:
  The electronic components may be damaged.
- Protect from falling objects:
  The operator interface can be damaged or an unintended switching process may be triggered.



- Cable output optionally right or left
- Cable length: 360mm

Figure 3.2: D-MAX operator interface OI-S for wall mounting

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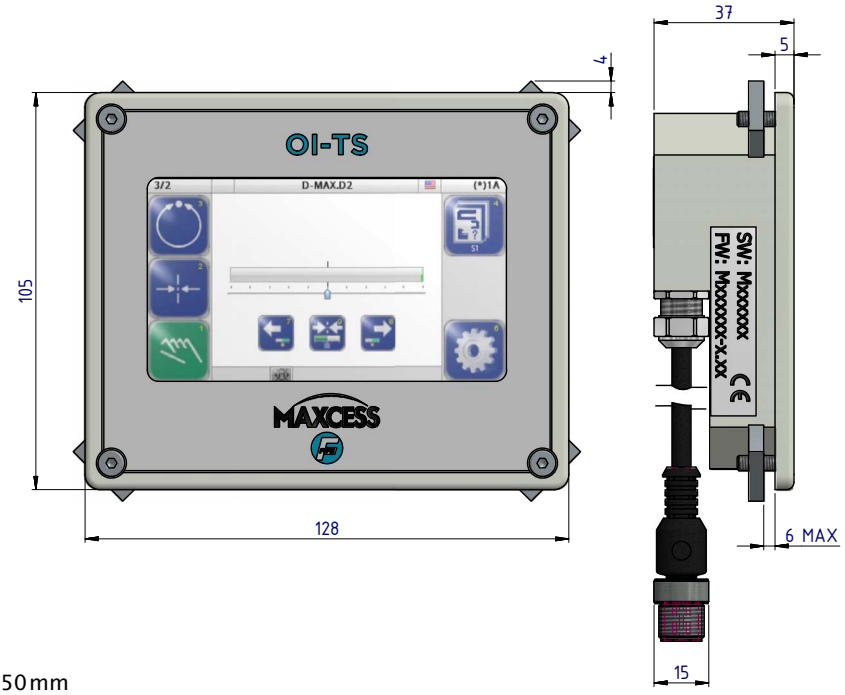


- Cable length: 450 mm
- minimum bending radius of the cable: 25 mm

Figure 3.3: D-MAX operator interface OI-S for desk installation

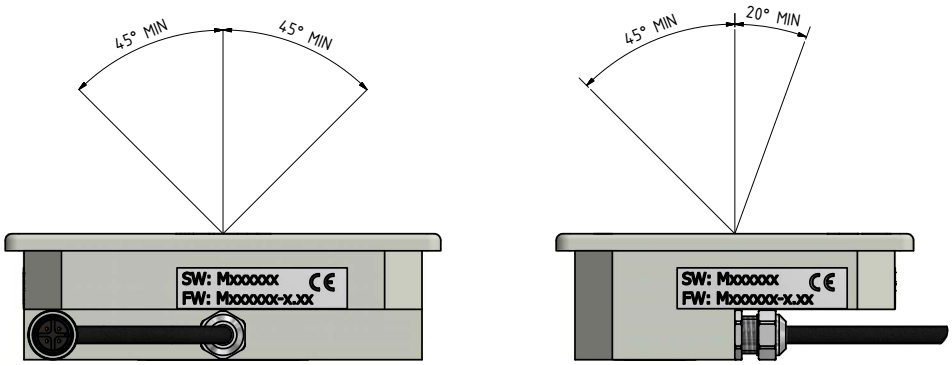
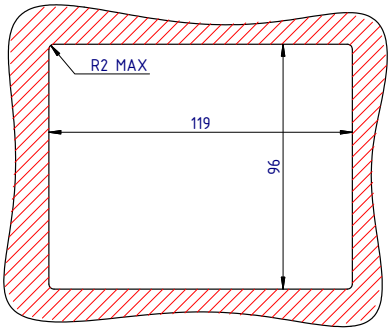


Figure 3.4: Angle of view for the D-MAX operator interface OI-TS

Mounting cut-out for desk installation



Drilling pattern for wall mounting

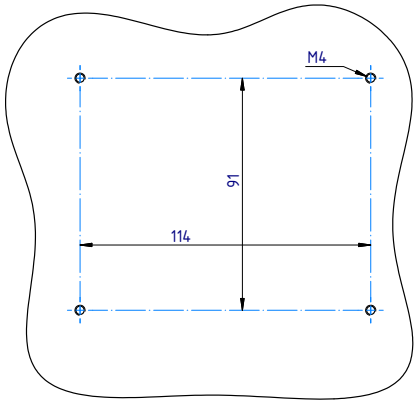


Figure 3.5: Mounting of the D-MAX operator interface OI-TS

Electrical connection

CAUTION:
Electrical connections on the D-MAX system should always be made or disconnected while there is no electrical power in the system.

⇨ Failure to follow these instructions may result in damage to the D-MAX system.

Emergency Stop

The „D-MAX Supplementary Operating Instructions - Safe shut-off of electromechanical actuators driven by a D-MAX Controller" in the system documentation must be observed.

Power supply of D-MAX Controller

The D-MAX Controller has no power switch. Because of this, the power supply of the D-MAX Controller must be linked in to turn the flow of current to the machine on and off.

The D-MAX Controller must be connected to the power supply according to the information supplied at connector X6 of the controller (see *figure 3.7* and *figure 3.8*).

Power supply of D-MAX operator interface OI-TS

The power supply for the D-MAX operator interface OI-TS is via the signal cable, which is connected to the web guide controller at connector X6.

Connecting the sensors/ drives

- Only sensors and drives approved by Fife-TidlandGmbH may be used.
- The technical data for sensors and drives must match the connection data for the D-MAX system (see *Technical Data, page 11-1*).
- Relevant operating instructions must be observed for installation and operation of sensors and drives.
- Sensors and drives must be connected to the D-MAX system according to the system diagram in the system documentation.

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Note:
Ensure that two wires from the power supply line are connected to the D-MAX controller with a power supply in the permitted range from 24V to 48V.

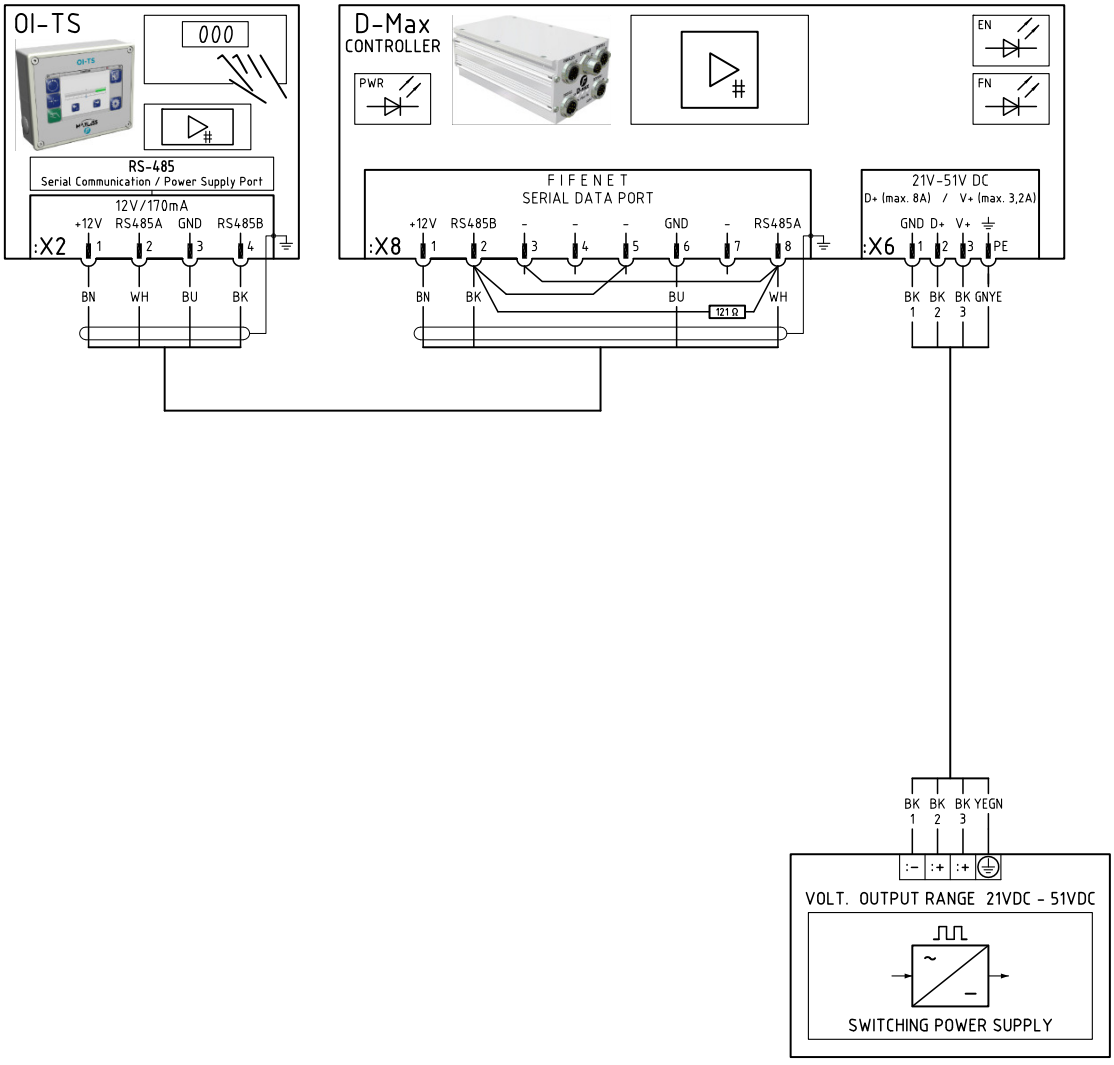

Figure 3.6: Power supply of D-MAX modules

Connections on the D-MAX 1 Controller

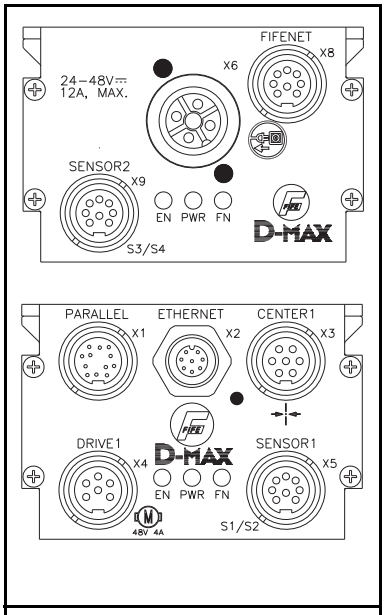

Figure 3.7: D-MAX 1 Controller

Connection	Designation
X1	Parallel inputs/outputs
X2	Ethernet
X3	Servo-center transducer 1/Encoder 1
X4	Drive 1
X5	Sensor 1 (S1/S2)
X6	Power supply voltage
X8	FifeNet/ OI-TS
X9	Sensor 2 (S3/S4)

For technical details and additional information, please consult Section *11 Technical Data* .

Connections on the D-MAX 2 Controller

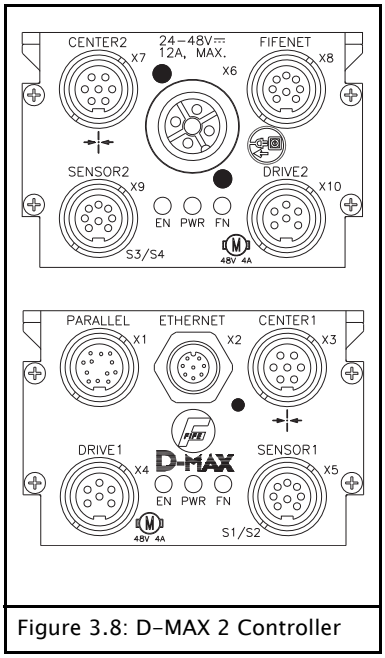

Figure 3.8: D-MAX 2 Controller

Connection	Designation
X1	Parallel inputs/outputs
X2	Ethernet
X3	Servo-center transducer 1/Encoder 1
X4	Drive 1
X5	Sensor 1 (S1/S2)
X6	Power supply voltage
X7	Servo-center transducer 2/Encoder 2
X8	FifeNet/ OI-TS
X9	Sensor 2 (S3/S4)
X10	Drive 2

For technical details and additional information, please consult Section *11 Technical Data* .

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LEDs on the D-MAX Controller

LED	Status	Indicates
EN	Off	No Ethernet connection
	Green or Green flashing	Ethernet connection detected
	Yellow	Either a 10mbps connection or a half-duplex connection is recognised
PWR	Off	No power supply
	Red	Power supply voltage too low, internal voltage outside tolerance or internal temperature too high
	Green	Power supply and temperature OK
	Yellow	No motor voltage
FN	Off	No external device is connected to connection X8
	Green	External device recognised at connection X8 (e.g. an operator interface OI-TS)

Additional information about error messages that are displayed may be found in Section *Troubleshooting, page 10-1*.

4 OPERATOR INTERFACE OI-TS

OI-TS description

The OI-TS operator interface has a touch screen.

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.

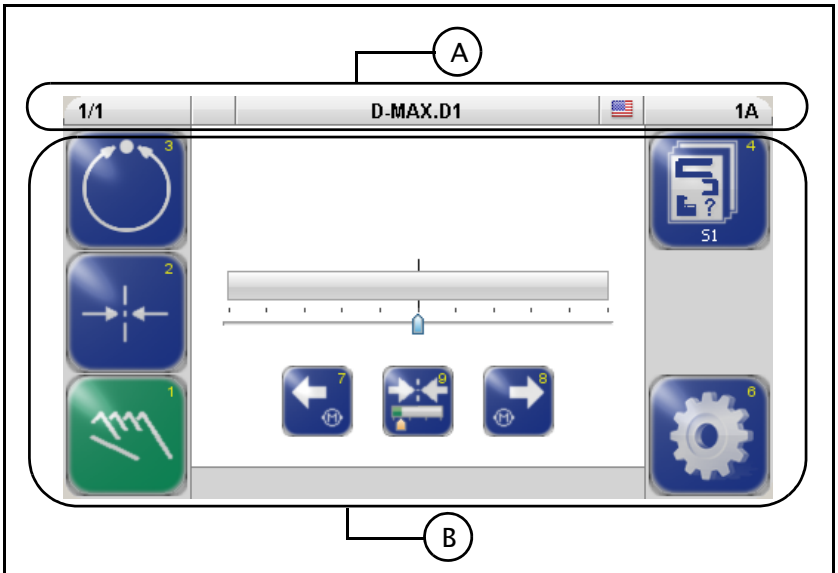


Figure 4.1: D-MAX operator interface OI-TS

A Header
- See *Header, page 4-3*

B Control area
- Contains all the keys and displays needed to operate the D-MAX system
- Changes depending on the menu selected (user level, menu level -> see *Operating the Controller, page 5-1*)

OI-TS bedienen.fm

Keys and Displays

The entry in a menu is accepted

The entry in a menu is rejected

Return to the previous menu level

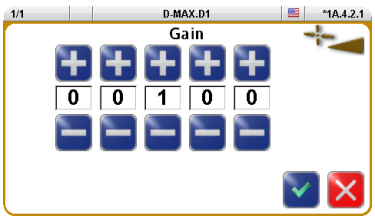
or

Switch between the pages of a menu

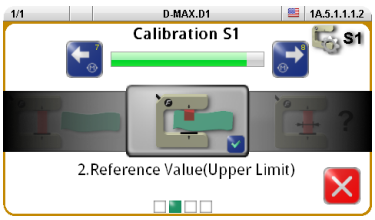
or

Keys represented in colors can be operated in the current operation state.
Keys represented completely in gray cannot be operated in the current operation state.

Fields filled in with white show information and cannot be operated.



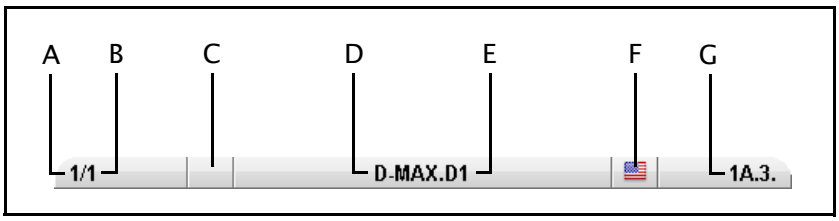
To enter numbers, set the desired value with the + and - keys.



Sequences are a defined succession of menus to be processed by the user step by step.
The next step can be reached by pressing the key in the middle of the display.

Header

The header contains complete information about the D-MAX system. It is always available in this form.



A Shows the currently selected hardware e.g. a D-MAX Controller

B Shows the currently selected device of the D-MAX system if it is present in the D-MAX system:
1 - Drive 1,
2 - Drive 2,
3 - Customer-specific system menu CM
5 - Gateway
7 - SE-46 Line Sensor
8 - SE-45 Ultrasonic Sensor
9 - DAC-005 Diode Line Camera

C Not assigned

D Shows the name of the currently selected hardware e.g. D-MAX Controller (can be edited, see *Name, page 7-18*)

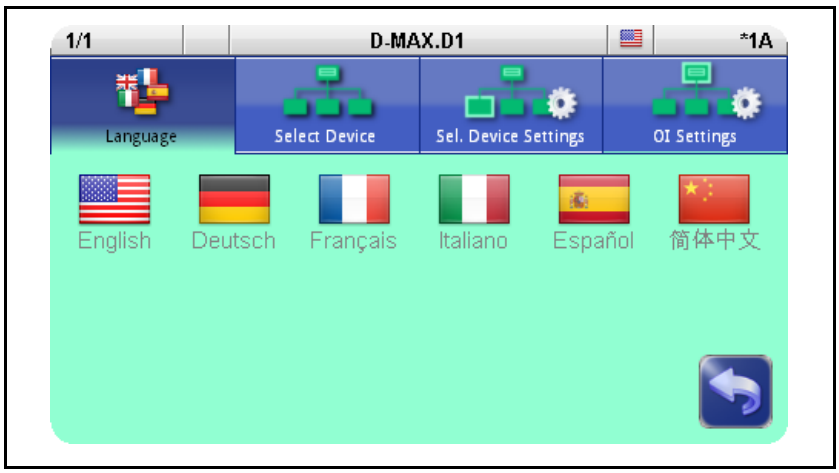
E Shows the name of the selected device (can be edited, see *Name, page 7-18*)

F Language selection

G Menu identification
Each menu has its own identification. This makes it possible to retrace every step in the control tree of the D-MAX system precisely.

Select operator interface

- Touch the header



1 Language

Select the language for menu labels

2 Select Device

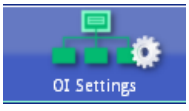
In the list of devices select the one you want to operate with the OI-TS

3 Select Device Settings

Set up the parameters of the selected device for the display

Parts of the display are mirrored, for example the bar graph or the Right and Left keys

Display not mirrored



4 OI Settings

Set up the parameters of the OI-TS

Calibration of the touch screen
Calibration is required if the activity of the keys is not synchronous with the location that is displayed. The user is prompted to touch the screen at two points. Use of a suitable touch screen stylus is recommended to improve the accuracy of the calibration.

Test of the touch screen

Display of the OI-TS serial number

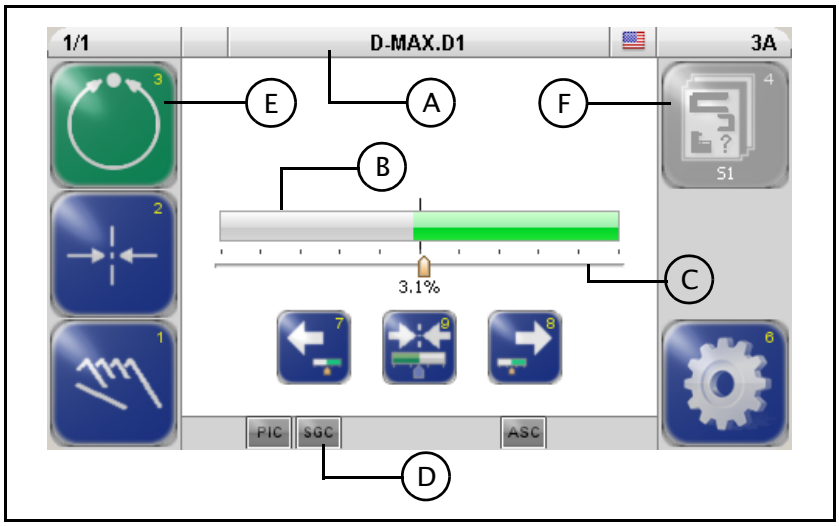
Display of the OI-TS firmware number

Change between the US and British flags for display

5 OPERATING THE CONTROLLER

User level

All the functions required for normal operation of the D-MAX systems are available on the user level.



Keys

1 select operating mode „Manual“

2 select operating mode „Servo-center“

3 select operating mode „Automatic“

4 Select available jobs (controller types)

5 Available for special applications only

6 Press and release: Open the *Job* menu for the current job
Press and hold: Open the *Setup* menu

7 and 8 „Automatic“ operating mode: Move the guide point in the sensor field of view
„Manual“ and „Servo-center“ operating mode: move drive

9 „Automatic“ operating mode: resetting the guide point
„Manual“ operating mode: set the guide point

A Header: select devices/drives

Legend

A Header: Information about the D-MAX system

B Bar graph
„Automatic“ and „Manual“ operating mode: signal level of the active sensor
„Servo-center“ operating mode: signal level of the servo-center transducer

C Guide point display
Operating mode „Automatic“ and „Manual“: Guide point offset of the active sensor

D Status line
Symbols see *Appendix B - Symbols, page 13-1*

E Green marked key
Identifies the currently selected operation mode

F Gray marked key:
This key has no function in the current system status.

Select devices/drives

The OI-TS can be used to operate various devices present in the network (D-MAX controllers and their drives, any system menus or gateways that are present).

- Touch the header and select menu *2 Select Device*
- Select the device you want to operate with the OI-TS

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 mechanical center position depending on the servo-center transducer. Then the control rollers are aligned parallel to the rollers of the customer system. The bar graph indicates the current position of the actuator in relation to the servo-center transducer.

Manual

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

Select jobs

Jobs are types of controllers that, in principle, are available in a D-MAX system.

From the large number of possible controller types, customer-specific programming selects the controller types that have the required functionality for the customer's application and makes them available (see *Jobs, page 11-4*).

Existing jobs can be *2 Jobs, page 7-15* limited or extended in the menu.

It is only possible to select another job on the user level in "Manual" and "Servo-center" operation modes.

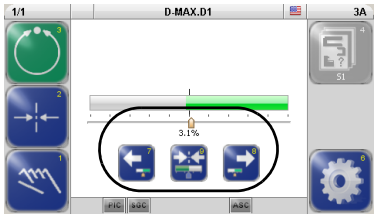
Shift guide point

Note:
This parameter can also be set with menu *Job* (see page *7-2*).

„Automatic“ operating mode

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

Note:
This is only possible if the parameter has been set up appropriately in menu *1 Jog Enable, page 7-15* .

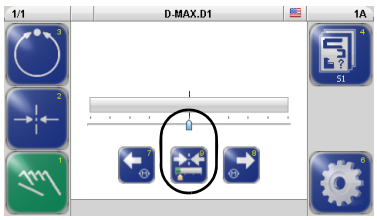


- Move the guide point to the desired position using the arrow keys 7 and 8

A cursor appears in the display at the location to which the guide point was moved, together with a numeric entry.

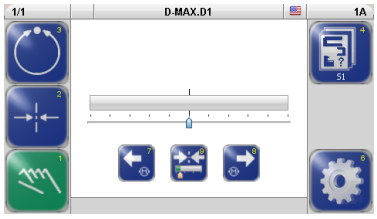
- Press key 9 to reset the guide point

"Manual" operating mode



- Press on key 9 to set the guide point alternately
  - to 0 or
  - pre-set it, so that it takes the value of the selected sensor and enables an bounce-free transfer to 'Automatic' mode.

Moving the Drive



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

- Move the drive to the desired position with arrow keys 7 and 8

Menu level

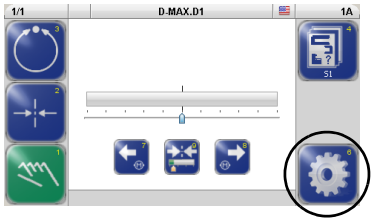
The parameters of the D-MAX system can be set for the relevant customer application in the menu level. They have been combined to form the following menu groups:

- *Job* menus (page *5-5*)
- *Servo-center* menus (page *5-6*)
- *Setup* menus (page *5-7*)

For an explanation of the menus for the individual parameters see section *Menus, page 7-1*.

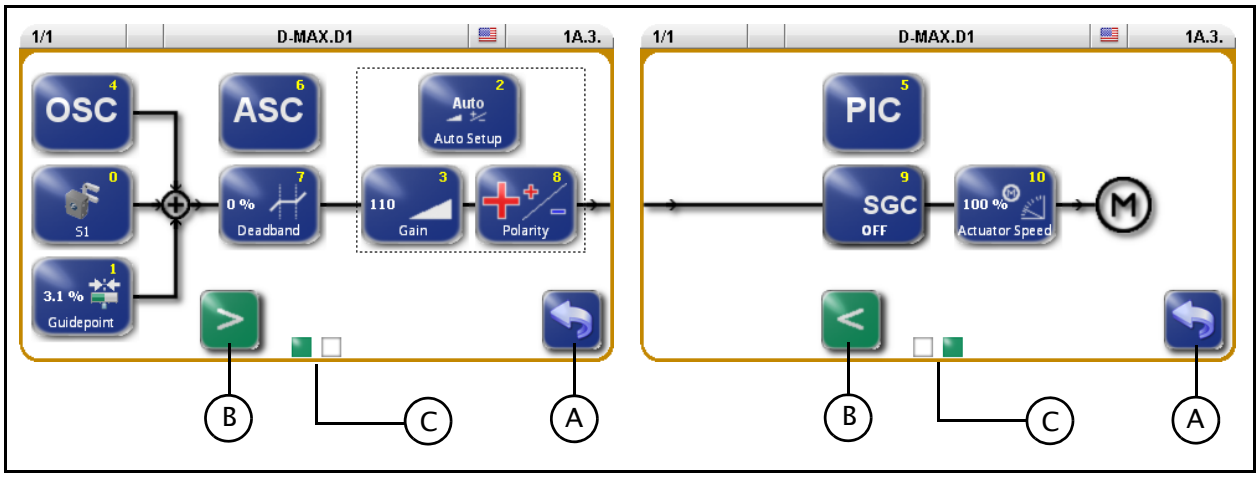
Job menu

Precondition:
"Manual" or "Automatic" operation mode is selected



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

Not all menus are available in the "Automatic" operation mode.



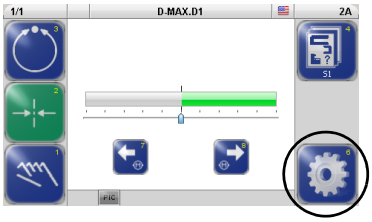
Keys

0 Calibrate sensor
1 Guidepoint
2 Auto Setup
3 Gain
4 OSC (oscillator)
5 PIC
6 ASC (Automatic Sensor Control)
7 Deadband
8 Polarity
9 SGC (Speed Gain Control)
10 Actuator Speed

Legend

A Exit menu
B Change page
C Page display

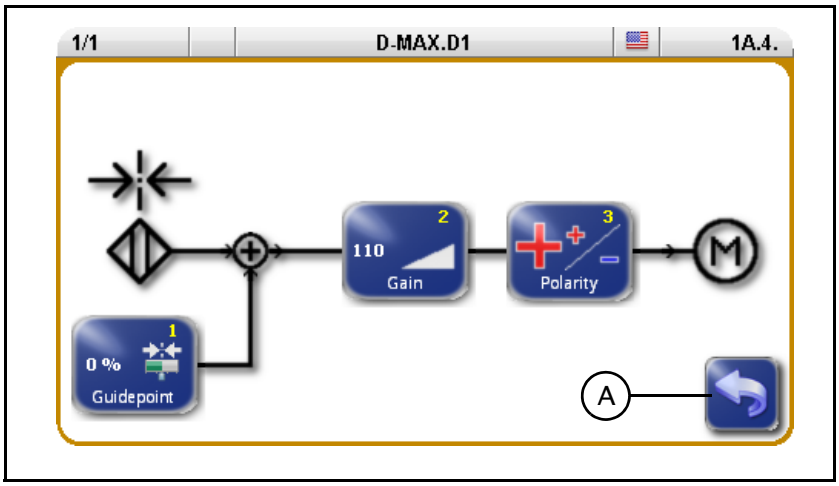
Servo-Center menu



Precondition:
"Servo-Center" operation mode is selected

- Press and release key 6 on the user level
  Menus are available for setting up the parameters of the servo-center transducer.

Not all menus are available in the "Servo-Center" operation mode.
The *Polarity* menu is only available if the *Setup* menu is selected in the "Manual" operation mode and then *4 Servo-Center* is selected.



Keys

1 Guidepoint
2 Gain
3 Polarity

Legend

A Exit menu

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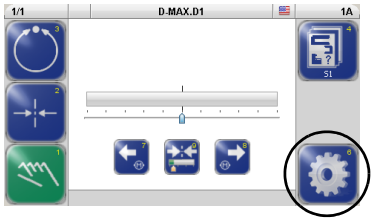
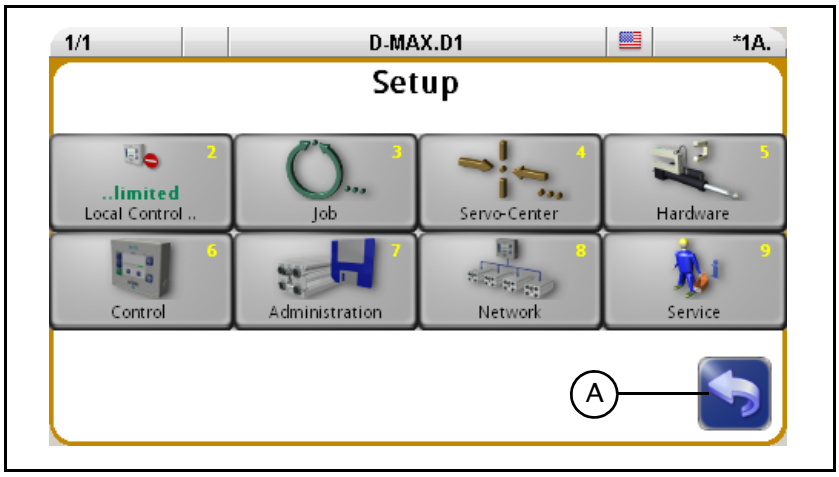
Setup Menu



- Press key 6 in the operator level for *more than 2 sec*
  Menus are available for setting up the parameters of the selected job or D-MAX system.

Not all menus are available in the "Servo-center" and "Automatic" operation modes or in restricted local operation. Only the menus that can be operated in the current system status are displayed.



Keys

2 Local Control

3 Job
Switch to the Job menu (see page *5-5*)

4 Servo-Center
Switch to the Servo-center transducer menu (see page *5-6*)

5 Hardware
1 Sensors
2 Actuator
3 Digital Inputs
4 Digital Outputs

6 Control
1 Modes
2 Jobs
3 Left/Rifht Keys
4 Local Control
5 Unit
6 Hardlock

7 Administration
Labels
Serial Number
Backup and Restore
Device Names

8 Network
Maxnet Settings and Distributed System
Customer Settings

9 Service
1 Measurements
2 Simulate Outputs

Details regarding the menus are explained in section *Menus, page 7-1* .

Legend

A Exit menu

6 COMMISSIONING

Before commissioning

The following assembly and electrical connection tasks must be performed before commissioning:

- The modules of the D-MAX system must be assembled properly.
- The modules of the D-MAX system must be properly connected to the power supply and integrated into the 'EMERGENCY STOP' circuit of the customer's system.
- The sensors and actuators must be properly connected to the D-MAX system.
- It is also important to become familiar with the basic operation of the operator interface OI-TS.

Commissioning

Once all assembly and connection tasks have been checked and are in proper condition, the D-MAX system can be placed in operation.

WARNING:
Before commissioning, ensure that:

⇨ Commissioning of the D-MAX system is performed while the web is stopped.

⇨ No one is in the danger zone of the moving parts.

Note:
The D-MAX system 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 D-MAX system, make the basic settings described in the following steps.

Note:
If the system documentation contains "D-MAX Supplementary Operating Instructions" with a chapter on Commissioning, the commissioning sequence given there must be followed for the specific application.

1. **Turn on the electrical power**
   When the system is turned on, the last operating mode to be selected is active.
2. **Select the language**
   It may be necessary to change the language for menu guidance on the operator interface.
   → see menu *1 Language, page 4-4*
3. **Select drive (device)**
   → see menu *2 Select Device, page 4-4*

Note:
Each drive must be set separately.

4. **Take over *Local Control***
   If the parameter *Local Control* is set to "...limited", it needs to be set to "...taken over".
   → See menu *2 Local Control, page 7-1*

5. **Select Manual mode**
   Switch the D-MAX system into Manual mode with the key 1 on the operator interface.
   There is no guiding of the web course in Manual mode. The D-MAX System control parameter can now be configured.
6. **Set the sensor type**
   Check and set the type of the connected sensor(s).
   → see *2 Type, page 7-9*
7. **Calibrate sensor(s)**
   Calibrate the connected sensor/sensors.
   → see *1 Calibration, page 7-8*
8. **Calibrate *LineSpeed***
   If the LineSpeed parameter is being used, this parameter must be calibrated.
   → see menu *5 Line Speed, page 7-10*

9. **Set the *Polarity* for the Servo-Center operation mode**
   → see menu *3 Polarity, page 7-6*

10. **Set the *Gain* for the Servo-Center operation mode**
    → see menu *2 Gain, page 7-6*

11. **Calibrate the *Encoder/motor encoder***
    If an encoder or motor encoder is used, it must be calibrated.
    → see menu *1 Calibration, page 7-11*

12. **Select job**
    Select the job with the parameters to set with key 4.
    → see *Select jobs, page 5-3*

13. **Turn off the *OSC/PIC***
    If the optional parameters 'OSC' or 'PIC' are found in the selected job, these parameters must first be switched to the OFF state (see also the Operating Instructions "D-MAX/OSC" or "D-MAX/PIC").

14. **Set *Polarity***
    → see menu *8 Polarity, page 7-5*

15. **Set *Gain***
    → see menu *3 Gain, page 7-3*

Note:
Instead of steps 14 and 15, an Auto Setup can also be performed.
→ see menu *2 Auto Setup, page 7-3*

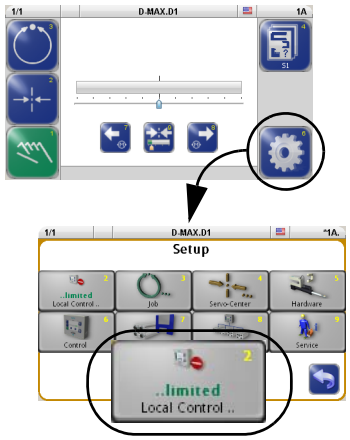
16. **Turn on the *OSC/PIC***
    If the optional parameters 'OSC' or 'PIC' are present, these parameters must be correctly set. To do this, perform the commissioning sequence as described in the relevant Operating Instructions.

17. **Set up additional jobs**
    Steps 12 to 16 must be performed for each job.

18. **Limit *Local Control***
    If the parameter *Local operation* has been set to "...taken over" (see Item 4), it now needs to be re-set to "...limited".
    → See menu *2 Local Control, page 7-1*

7 MENUS

2 Local Control



The *Local Control* menu can be used to block control signals which are a hindrance during initial operation or an error search. Control signals can be:

- a parallel interface (connector X1)
- an application in a "distributed system" that administers various components at the same time
  → see menu *Distributed System, page 7-21*
- a Gateway to external fieldbus systems

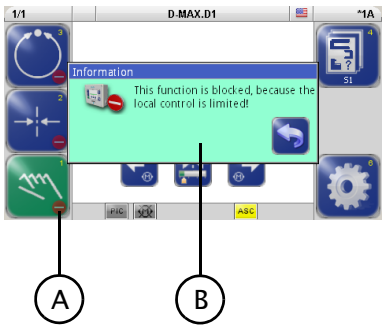
Note:
This menu is only available if control signals are at hand from the aforementioned sources.

An * (asterisk) appears before the menu identification to indicate that local operation is limited. The menu identification is in the header at the far righ.

* Local Control was taken over.

(*) Other control signals are active. However, these control signals are blocked when local control is applied.

If there is no * against the menu identification, no other control signals are available.



A Keys which are blocked by an active control signal are marked.

B Information appears if a user attempts to operate a locked key.

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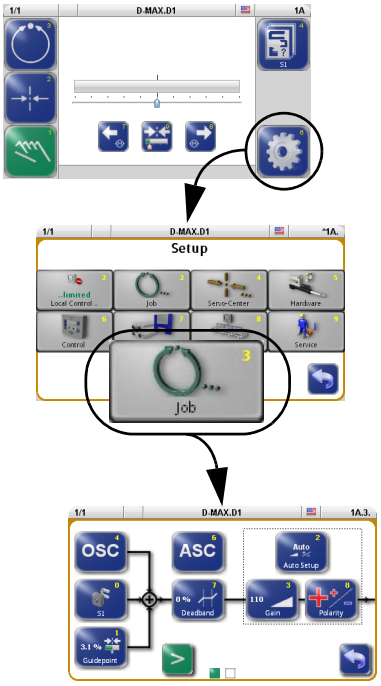
3 Job



This section is a description of menus that are used to set up the parameters of a job. A similar set of parameters is available for each job in the system. The settings of this job apply to "Automatic" mode.

However, the number of available parameters that can be set for a job depends on customer-specific programming of the D-MAX system.

Each job is marked with a capital letter on the right-hand side in the menu identification in the header.

"Manual" mode:

- All keys are available.

"Automatic" mode:

- Only selected keys are available.

"Servo-Center" mode:

- These keys cannot be set.

Precondition

- the correct device / the correct drive is selected
  Check: Check the display in the header
- the correct job is selected
  Check: Check display on Key 4

0 Calibrate sensors

The menu for calibrating the sensor that is used can be called directly.
→ see *1 Calibration, page 7-8*

1 Guidepoint

The guidepoint of the selected job can be adjusted for the corresponding drive with the *Guidepoint* menu.

Note:
The *Offset* parameter can also be set directly with keys 7 and 8 in "Automatic" operation mode on the user level.
→ see *Regelpunkt verschieben, page 5-14*.

2 Auto Setup

The *Auto Setup* menu is used to calibrate parameters Gain (page *7-3*) and Polarity (page *7-5*) automatically for "Automatic" mode of the selected drive.

WARNING:
The drive moves during automatic setup.

⇨ There is a danger of body parts being crushed against the actuator.

Note:
The sensors must be calibrated before the automatic setup.

3 Gain

You can use the *Gain* menu to adjust the guide sensitivity of the selected drive.

4 OSC

You can use the *OSC* menu to select the optional oscillator 'OSC' of the D-MAX system.

The oscillator 'OSC' is only present in a job of the D-MAX system if the software has been programmed accordingly. Commissioning and operation are described in separate operating instructions.

5 PIC

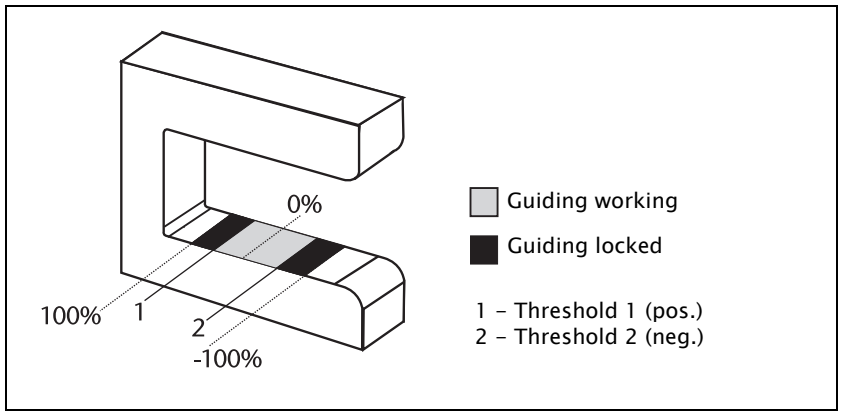
The *PIC* menu allows the user to control the web course even if there is no direct feedback available from the drive to the sensor.

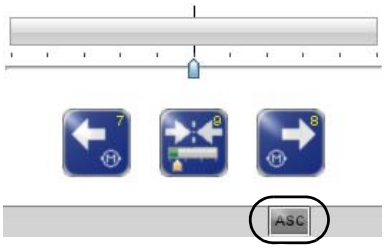
The 'PIC' controller is only present in a job of the D-MAX system if the software has been programmed accordingly. Commissioning and operation are described in separate operating instructions.

6 ASC

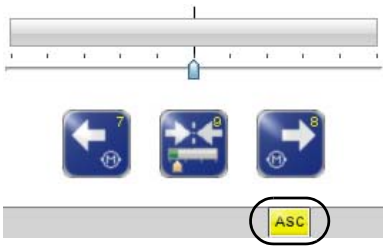
You can use the *ASC* menu (Automatic Sensor Control) to

- activate and deactivate the ASC parameter and
- set up ASC threshold 1 or 2. These thresholds restrict the outward visual range of the sensor.





If the D-MAX system is in "Automatic" mode and the ASC parameter is activated, the web is guided as long as it is within the restricted field of view of the sensor. This is indicated by the gray “ASC“ icon in the status line.



If the web leaves the limited field of view of the sensor, guiding is blocked. This is indicated by the yellow “ASC“ icon in the status line.

1 Turn ASC on or off

The *ASC* parameter is activated or turned off.

2 Enter the limit value 1

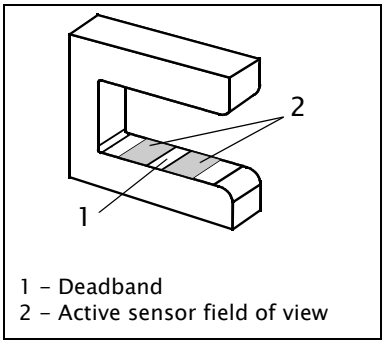
The value that is entered must be positive.
Standard value = 90%

3 Enter the limit value 2

The value that is entered must be negative.
Standard value = -90%

7 Deadband

You can use the *Deadband* menu to define an area around the guidepoint inside the sensor's field of view in which guiding is not active in "Automatic" mode.



1 - Deadband
2 - Active sensor field of view

- If the web edge is in the deadband (1), no guiding will be performed.
- If the web edge is in the area of the active field of view of the sensor (2), guiding is performed.

Standard value = 0%

A value of 0% means no active deadband is present.

A value of 90% means that almost all the sensor's field of view is defined as a dead zone.

8 Polarity

The *Polarity* menu is used to set the guiding direction of the selected drive for "Automatic" mode.

9 Speed Gain Control

The *Speed Gain Control* menu is used to determine whether web speed will affect how guiding is performed.

The *Speed Gain Control* menu is only present in a job of the D-MAX system if the software has been programmed accordingly.

If the *Speed Gain Control* parameter is activated, guiding depends on web speed. This is indicated by the gray “SGC“ icon in the display.

This icon flashes when the web speed is too low and no guiding is being performed.

10 Actuator Speed

You can use the *Actuator Speed* menu to set the maximum speed of the motor on the selected drive.

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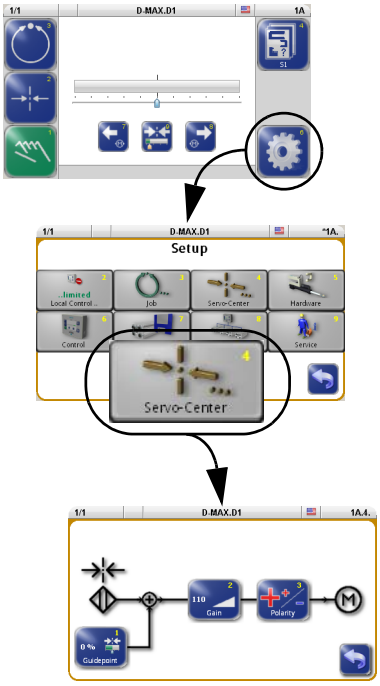
4 Servo-Center



This section describes menus that are used to set up the properties for "Servo-Center" mode.

The availability of the "Offset" parameter depends on the customer-specific programming of the D-MAX system.

"Manual" mode:

- All keys are available.

"Servo-Center" mode:

- Only selected keys are available.

"Automatic" mode:

- These keys cannot be set.

1 Guidepoint

The optional *Guidepoint* menu is used to adjust the servo-center transducer guide point for the selected drive to requirements in the client's system.

If this information is not required for the relevant customer application, the parameter should be set to the default value=0. If it is necessary to enter another value, the process is described in "Supplementary Operating Instructions" and is included in the system documentation.

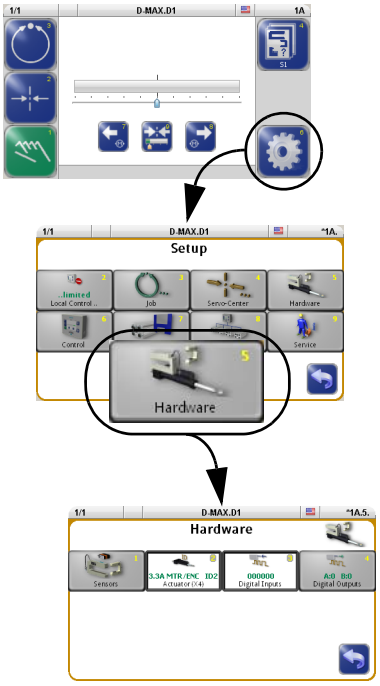
2 Gain

The *Gain* menu is used to set the guide sensitivity of the servo-center transducer for the "Servo-Center" operation mode on the selected drive.

3 Polarity

The *Polarity* menu is used to set the guide direction of the servo-center transducer for the "Servo-Center" operation mode on the selected drive.

5 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.

"Manual" mode:

- All keys are available.

"Servo-Center" mode:

- All keys are available.

"Automatic" mode:

- Only selected keys are available.

1 Sensors

The analog sensors present in the system must be calibrated. Each sensor in the system must be calibrated on the controller to which the sensor is connected.

1 Sensor S1 X5/1

...

4 Sensor S4 X9/2

The sensors connected to connections S1 X5/1 to S4 X9/2 can be calibrated.

Note:
It is possible that special sensors are used in the customer's system, for example a capacitive sensor or a camera. Sensors of this type cannot be calibrated with the procedure described here. The information required for a calibration is available in a set of special operating instructions for the sensor or in "Supplementary Operating Instructions“ in the system documentation.

Note:
There can be menus for all sensor connections even if not all the connections are assigned. Therefore the connections that are used must be correctly selected.
Additional information may be found in the system diagram of the system documentation.

1 Calibration

The *Calibration* menu is used to adapt the sensors to the properties of the web material.

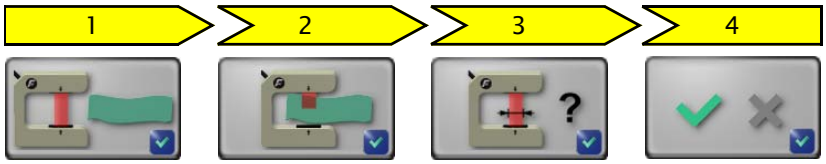
WARNING:

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

⇨ Do not touch the edges of the material web.

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

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



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.
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.
3. Optional:
   The connected sensor's field of view is entered.
   You will find more details about the field of vision in the 'Supplementary operating instructions' or in the overview in the system documentation.
   If the value is not known, the system can accept the suggested value.
4. The result of the calibration is displayed and can be saved.

Note:
If an error occurs during calibration, the error will appear in the menu and calibration must be repeated.

2 Type

The *Type* menu specifies which sensor type is connected in the D-MAX system in use. Menus can be adapted to the sensor type and the analogue entries are set.

Type	Sensor type	Analogue sensor inputs	Effect on operation
SE-46	SE-46 line sensor	Set to 0-10 mA	If it is detected that the required parameters are set incorrectly, a message box appears when the Job menu opens with the option of setting those parameters correctly.
SE-26	SE-26 line sensor	No change	A special sequence for calibration is provided in item *0 Calibrate sensor* of the Job menu
---	All other sensors	No change	No special effects

3 Field of View

You can use the menu to scale the field of view of the connected sensor.

4 Sensor Supervision

You can use the *Sensor Supervision* menu to turn this parameter on and off.

Note:
This parameter's functions are only of use if the sensor features a output signal of 4 .. 20mA.

The parameter is used to detect a faulty connection between the D-MAX Controller and a connected sensor. This parameter can only be evaluated if corresponding customer-specific programming is present.

5 Current Range

The *Current Range* menu shows in which range the sensor input on the D-MAX controller was configured according to the last valid sensor calibration.

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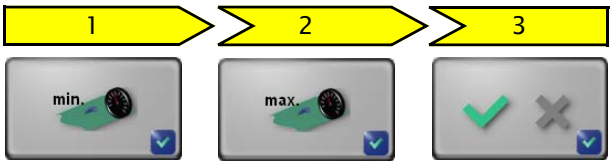
5 Line Speed

The *Line Speed* menu is used to calibrate the analog Line Speed signal. This signal affects the guiding sensitivity of the drive. If appropriate customer-specific programming is present, this signal can also be used in other ways.



1. The reference value for the minimum web speed must be determined.
   To do this, the material web with the relevant application must be running at minimum web speed in the customer system.
2. The reference value for the maximum web speed must be determined.
   To do this, the material web with the relevant application must be running at maximum web speed in the customer system.
3. If the result determined from the reference values for web speed-dependent guiding can be used, the display shows "Successful!".

Note:
If the result for guiding is too low, an error appears in the menu and the calibration must be repeated.

7 Encoder

...

8 Motor Encoder

An incremental position transducer (encoder/motor encoder) can be connected to each drive on the D-MAX to record positions. This makes position monitoring and evaluation possible.

In most applications, the encoder is used together with a sensor positioning system.

Note:
Generally the encoder is already preset when it ships from the factory. Therefore a resetting is required only when replacement parts are installed.

Note:
The menus for the motor encoder are not present unless a corresponding motor is present on the selected drive.

1 Calibration

You can use the *Encoder* menu to calibrate a connected incremental position transducer (encoder/motor encoder) for the selected drive. The servo-center transducer assigned to this drive determines the reference position of the travel path.

WARNING:
The selected drive must be moved to calibrate the encoder.

There is a risk of being cut by the web and crushed against the actuator.

⇨ Do not touch the edges of the material web.

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

CAUTION:
Changing the encoder limits may result in danger of crushing or could damage the mechanical stops.

Note:
The servo center transducer must be positioned within the restricted travel path before it is possible to approach the servo-center position in "Servo-Center" mode.

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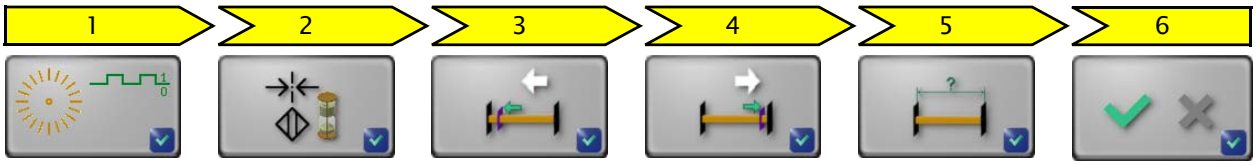

1. The drive first moves to the servo-center position.
2. The drive moves to the servo-center position.

Note:
If the center position is not reached, the servo-center transducer itself must first be checked. The parameters of the *4 Servo-Center, page 7-6* must then be checked and reset, if required.

3. The value for the first limit must be determined. To do this move the drive with the arrow keys to the position of the first limit.
4. The value for the opposite limit must be determined. To do this move the drive to the position of the opposite limit.
5. The menu displays a recommended distance between the two limits. This value is to be checked and corrected if necessary.
6. The calibration of the encoder was successful and the settings can be saved.

2 Field of View

The *Field of View* menu is used to correct the calibrated travel path of the encoder.
The measured distance is to be entered into this menu.

Note:
The encoder must be calibrated before this parameter can be set

3 Search Reference

You can use the *Search Reference* menu to recover lost thresholds without having to perform a calibration again. Limit values can be lost for example because the encoder was adjusted with the electrical power turned off.

WARNING:
The drive moves while the reference search is active.

⇨ The actuator poses a crushing hazard.

4 Clear Limits

You can use the *Clear Limits* menu to delete limits that are present for the selected encoder.

CAUTION:
Deleting the encoder limits may result in additional danger of crushing or could damage the mechanical stops.

2 Actuator

Shows the motor that is connected to the selected drive (see table on page *11-5*)

3 Digital Inputs

Display of the 6 digital inputs

4 Digital Outputs

Configuration of the physical properties of digital outputs A and B

1 Digital Output A
...
2 Digital Output B

The outputs are automatically set to 'Set' or 'Cleared' depending on the configuration and current operating state.

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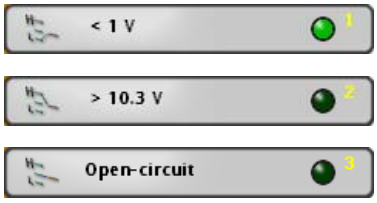
A delay time can be defined for the transition from 'Cleared' to 'Set'.

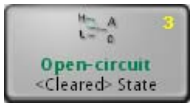
To adjust the digital outputs for each of the components connected to them, the physical properties of the relevant state ('Set'/'Cleared') can be defined for each output A or B.

You can select individually for each state between:



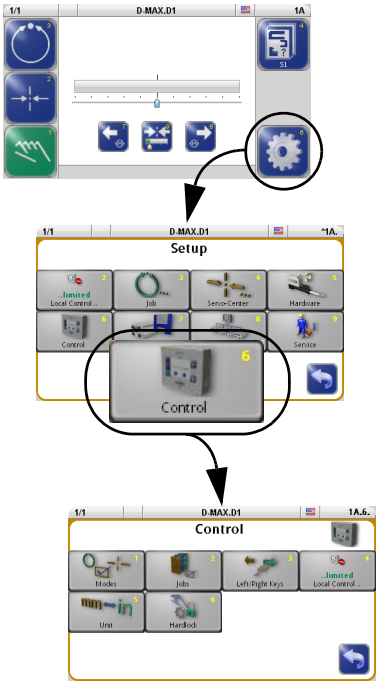
1 Delay

2 <Set> State



3 <Cleared> State

6 Control



This section includes information about menus that contain basic properties for operating the D-MAX Controller.

"Manual" mode:

- All keys are available.

"Servo Center" and "Automatic" mode:

- Only the *Local Control* key is available.

1 Modes

Activate or deactivate the "Automatic" and "Servo-Center" operation modes

Note:
"Manual" mode cannot be deactivated.

2 Jobs

Activate or deactivate jobs (see table *Jobs, page 11-4*)

3 Left/Right Keys

Define different properties of the Right/Left keys

1 Jog Enable

2 Jog Direction

3 Jog Speed

4 Jog Soft Start

4 Local Control

Apply or restrict *Local operation* (also see (see also *2 Local Control, page 7-1*)

5 Unit

Setting up the desired length unit

Note:
Rounding errors may occur when the unit changes.

6 Hardlock

The *Hardlock* menu is used to set up three parameters. When the operating mode switches to "Manual" the position of the drive is kept active at that time by these three parameters.

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.

Note:
This parameter can only be used if an encoder is available for the selected drive.

1 Hardlock

Turn the Hardlock parameter on and off

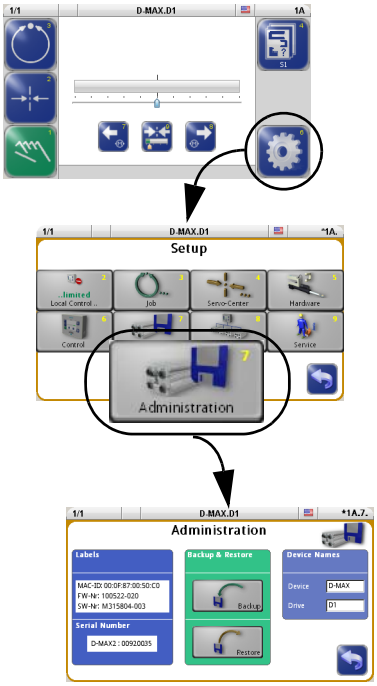
2 Gain

Set the gain for the Hardlock parameter

3 Polarity

Set the polarity for the Hardlock parameter

7 Administration



This section includes a list of menus containing information about the D-MAX Controller. This information is required when ordering replacement parts or for service inquires.

"Manual" mode:

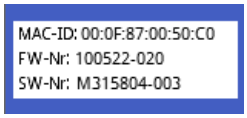
- All keys or input fields are available for use.

"Servo Center" and "Automatic" mode:

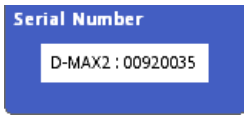
- Only selected keys or input fields are available for use.

Nameplate

This screen contains the details on the nameplate which is affixed to the D-MAX Controller housing.



- MAC ID,
  firmware number and
  the D-Max Controller software number



- D-Max Controller serial number

Backup & Restore

Note:
On a D-MAX 2 Controller, "Manual" operation mode must be selected on both drives.

7 Backup

You can use the *Backup* menu to save all current user settings of the D-MAX Controller to a backup copy in the module.

If a backup has already been saved, the old values will be overwritten by the current ones.

Note:
On a D-MAX 2 Controller, a drive is selected from which the settings for Drive 1 and 2 are also saved. Therefore 2 backups are not required.

8 Restore

You can use the *Restore* menu to set all settings of the D-MAX Controller to the values of a backup copy.

Note:
On a D-MAX 2 Controller, a drive is selected from which the settings are saved simultaneously for Drives 1 and 2. Therefore 2 backups are not required.

Note:
On a D-MAX 2 Controller, "Manual" operation mode must be selected on both drives.

1 .. from previous backup

The settings from a backup saved by the customer are restored.

Note:
If no backup has been performed yet in the D-Max system, this menu is not available.

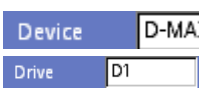
2 .. factory settings

The factory settings are restored.

Note:
This process must only be performed when it has been requested after consultation with an employee of Fife-Tidland GmbH.

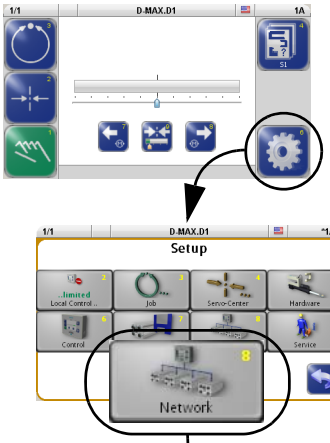
Note:
If nothing appears in the operator interface display after a restart, select a device with the header
Then commissioning of the D-MAX Controller must be performed.

Name



- The device name and
- the drive name can be changed.

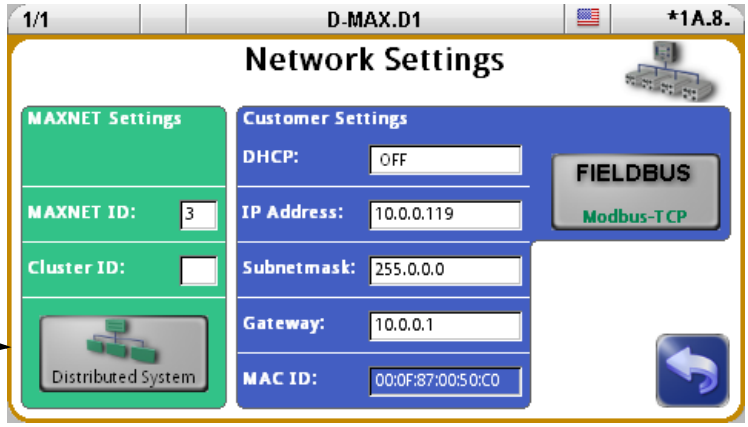
8 Network



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

Operating modes:

- The keys and input fields are available in all operational modes.



Customer Settings

- Display and change the network settings for TCP/IP
- show the MAC-ID of the D-MAX controller
- optional:
  Display of the fieldbus type and its properties

MAXNET Settings

Display and change the network settings for MAXNET:

- The MAXNET ID is used for addressing of individual D-MAX devices.
- The Cluster ID is used to
  - operate identical systems in a network.
  - operate more than 31 devices in a network

MAXNET address	MAXNET cluster	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 31 are possible)
Can be edited	Not visible	Independent drives (maximum of 31 possible)

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Note:
The MAXNET address/the MAXNET cluster address is only to be changed in accordance with the appropriate instructions in "Supplementary Operating Instructions" (see system documentation) or following consultation with a member of staff at Fife-Tidland GmbH.

Note:
If nothing appears in the operator interface display after a restart, select a drive with the header.

Distributed System

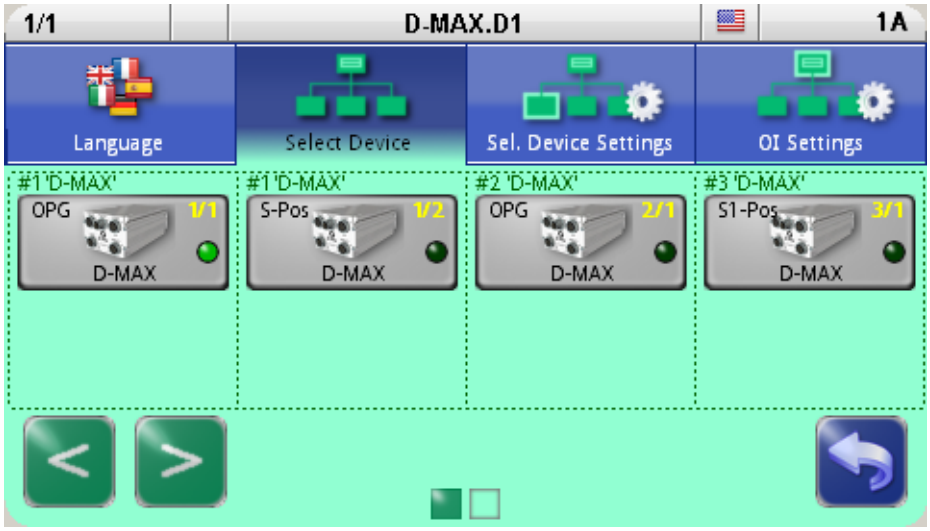
The parameters under the *Distributed System* menu are used to group the devices connected to a common network and their menu structures depending on how they are used and to display them selectively on a D-MAX operator interface.

Note:
These parameters have no effect on how the connected devices operate. They are evaluated by the operator interfaces only to provide clearer display.Applications that are not set up or are assigned incorrectly have no effect on the functionality of devices.

Figure 7.1 shows an example of a distributed system consisting of three D-MAX Controllers and a SE-46 sensor. Each individual element of the distributed system has its own menu structure. These elements must be operated from a separate operator interface OI-TS.

All devices present in the distributed system can be selected in operator interface OI-TS.

- Touch the header and select *Select Device*
  All the devices of the distributed system that are present in the network are displayed.



#1/1: D-MAX Controller with address 1/Drive 1: Guiding (e.g. offset pivot guide)
#1/2: D-MAX Controller with address 1/Drive 2: Sensor positioning
#2/1: D-MAX Controller with address 2/Drive 1: Guiding (e.g. offset pivot guide)
#3/1: D-MAX Controller with address 3/Drive 1: Sensor positioning
#3/2: D-MAX Controller with address 3/Drive 2: Sensor positioning (on the second page of the display)
#16/7: SE-46 Sensor (on the second page of the display)

Figure 7.1: Example of a distributed system - non structured display

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To be able to navigate effectively within such a complex network, individual "devices" and the corresponding menu structures are combined to form applications. Thus an application consists of several menu structures in a distributed arrangement (see *Figure 7.2*).

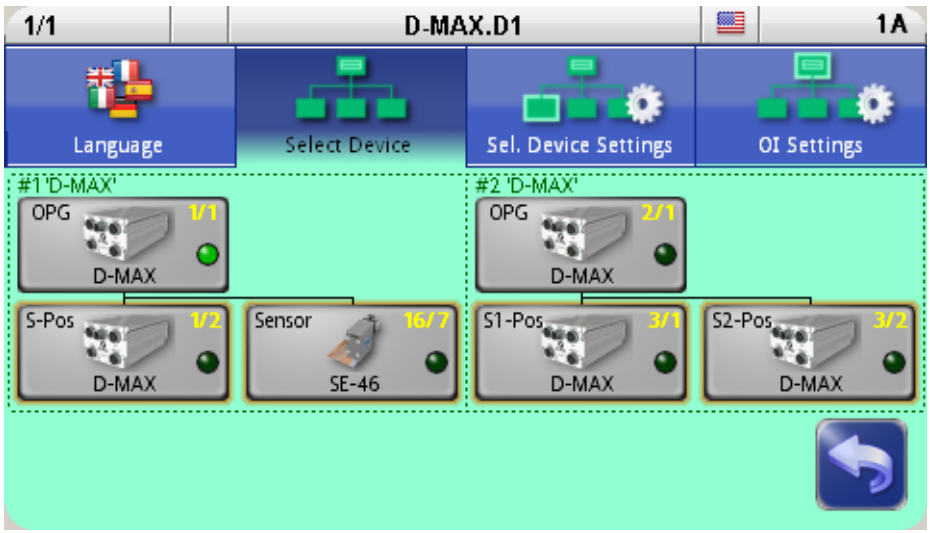
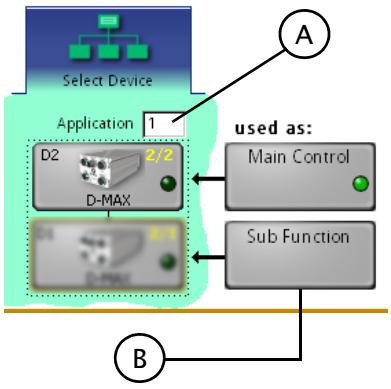


Figure 7.2: Example of a distributed system



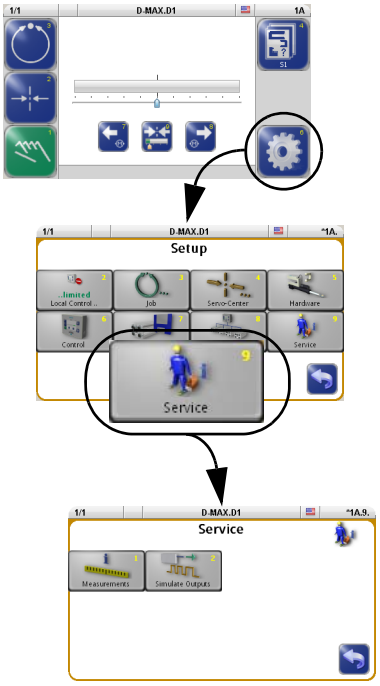
A: Application

The *Application* menu provides an orderly summary and names for the menu structures with distributed arrangement (n = 1 ... 99).
All the devices that belong to an application have the same number n.

B: used as

Every device inside an application has a subfunction with its menu structure.
A menu structure for each structure is marked as the *Main Control* . All other menu structures are *Sub Function*.

9 Service



The purpose of these menus is to show information about settings of the D-MAX system that is important for Customer Service.

"Manual" mode:

- All keys are available.

"Servo Center" and "Automatic" mode:

- Only selected keys are available.

1 Measurements

Display of values of the D-MAX system

1 Sensors

2 Encoder

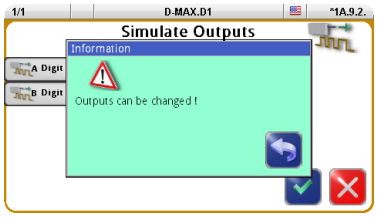
3 Digital Inputs (Connection X1)

7 Measured Values

9 Sensor Current

2 Simulate Outputs

Used to test components connected to the digital outputs



CAUTION:

Actions may be initiated in the connected components!

8 MAINTENANCE

WARNING:
Danger of injury by crushing

⇨ Maintenance work must only be performed on the D-MAX system when the power is turned off, the machine is stopped, and it is protected against being turned back on.

Maintenance work

No maintenance work is required on the D-MAX Controller or operator interface.

To clean the display on the operator interface:

Depending on how dirty the environment is, carefully wipe off the operator interface display at regular intervals with a soft dry cloth.

If the display becomes very dirty, a moist cloth can be used to clean it.

Note:
Do not use any solvents or aggressive cleaning agents to clean the display. Doing so could damage the display.

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9 DECOMMISSIONING

Decommissioning

1. Turn off the electrical power to the D-MAX system.
2. Remove all cables from the modules of the D-MAX system.
3. Disassemble the modules of the D-MAX system.
4. Modules of the D-MAX system can be stored according to the specified ambient conditions (see *Transport and storage, page 3-1*).

   OR

   The modules of the D-MAX system must be disposed of according to national requirements.

10 TROUBLESHOOTING

Troubleshooting Procedure

The D-MAX system is capable of detecting errors as they occur and displaying them. The system also makes information available that may help exclude possible errors.

Display possibilities

The following display possibilities are available on modules of the D-MAX system:

- LEDs on the front sides of the D-MAX Controller
- Icons in the display of the D-MAX operator interface

Procedure

1. **Check the LEDs on the individual modules of the D-MAX systems**

   → see table *page 10-2*

2. **Check the icons that appear in the display of the D-MAX operator interface**

   → see table *page 10-4*

3. **Check possible causes for faulty behaviour.** Frequent causes are connections or settings on the D-MAX system

   → see table *page 10-6*

4. **Check the faulty behaviour and possible causes.** Often the cause is incorrect parameter settings

   → see table *page 10-9*

Note:
The Operating Instructions of other components (e.g. sensors and actuators) should also be consulted for troubleshooting purposes. If there is any customer-specific programming, refer to the "Supplementary Operating Instructions" as well.

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LEDs on the D-MAX Controller

While the device is being turned on, the LEDs on the D-MAX Controller are lit red briefly. This makes it possible to check their functionality. The LEDs indicate errors and/or show information about normal operation of the D-MAX Controller.

LED	Status	Indicates	Remedy
Error messages			
EN	Off	No Ethernet connection	Check plug and cable
	Yellow	10mbps connection or half-duplex connection	Check switch and cable
PWR	Off	No power supply	Are the power supplies correctly connected to the X6? see *Electrical connection, page 3-5*
	Red	Power supply voltage too low, internal voltage outside tolerance or internal temperature too high	Check voltages and/or temperature see *7 Measured Values, page 7-23*
	Yellow	No motor voltage	Check motors voltages see item 2 in *7 Measured Values, page 7-23*
Information			
EN	Green or Green flashing	Ethernet connection detected	
PWR	Green	Power supply and temperature are OK	
FN	Green	External device was recognised (e.g an operator interface OI-TS)	

D-MAX operator interface OI-TS

Faulty behavior	Possible cause	Remedy
Incorrect actions are performed or none at all	The touch screen is calibrated incorrectly	Test the touch screen (see *Test of the touch screen, page 4-4*) Recalibrate if necessary (see *Calibration of the touch screen, page 4-4*)

Icons in the display of the D-MAX operator interface

The icons in the display of the D-MAX operator interface provide information about system states. These system states are not necessarily errors; they may also be intended operating states.Therefore these icons must be evaluated individually for troubleshooting to determine whether what seems to be an error may actually be a normal operating state of the D-MAX system.

Icon	Indicates	Possible error remedy
Error messages		
	No motor volta	Is the power supply correctly connected to X1? Note: Two power supplies must be connected to the D-MAX Controller! see *Electrical connection, page 3-5*
	Power feedback through the motor (generator function of the motor)	Are external forces acting on the motor? Eliminate the external forces
		Is the motor under heavy load? This message appears briefly when heavy loads are being braked.
	Short circuit in the motor cable or motor	Check the motor cable or motor
	No motor detected or no motor connected	If a motor is connected, check the motor and/or cable.
	Error display An error has been detected on the selected drive.	Check the voltages see *7 Measured Values, page 7-23*
	A threshold of the travel path has been reached. It is only possible to move in one direction - away from this limit.	If this message appears even though no threshold has been reached, the thresholds have been moved. To restore the basic values, switch to "Servo-center" mode and approach the servo-center position. If the error persists, check the parameters in *2 Gain, page 7-6* and *3 Polarity, page 7-6*.
 Flashing	The web speed for web speed-dependent guiding is equal to 0.	However, if the web speed is not equal to 0, check the signal for web speed.

Icon	Indicates	Possible error remedy
Error messages		
 and 	The ASC function on the selected drive has been activated and triggered and the motor is locked.	If locking was not intended, check the sensor signal and ASC thresholds. see *1 Sensors, page 7-23* and *6 ASC, page 7-3*
	The motor is locked because of an external signal (e.g. PIOX, fieldbus, application control).	If you did not intend for the motor to be locked, check the digital inputs. It is possible that external locking is active see *3 Digital Inputs (Connection X1), page 7-23* If there is customer-specific programming, refer to the "Supplementary Operating Instructions" in the system documentation for information about the X1 parallel interface.
 or 	The D-MAX system is expecting commands from external devices.	The devices may not be connected to the network. Check whether these devices are correctly connected to the network.

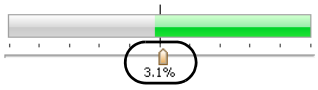
Faulty behaviour and setting errors

Often the cause of incorrect or undesirable guiding behaviour is an incorrect setting on the D-MAX system. These errors can easily be eliminated by changing the appropriate settings on the D-MAX system.

Possible causes for faulty behaviour

Errors caused by connections or settings on the D-MAX system can result in many kinds of faulty behaviour in the system. Often it is difficult to deduce the cause directly from a faulty behaviour. You should therefore check the possible causes in the following table and eliminate any that are present.

Possible causes for faulty behaviour	Remedy	Reference
No response on the desired drive. Wrong drive selected?	Select "Manual mode" and check whether the correct drive is selected.	*Select devices/drives, page 5-2*
 An asterisk "(*)" appears in the header before the menu identification. Local Control has been taken over.	Limit Local Control. Local Control must be limited to ensure that the system can run as a whole.	see item *2 Local Control, page 7-1*
Is activation by means of the digital inputs possible?	Check the digital inputs.	see item *3 Digital Inputs (Connection X1), page 7-23* in section *5 Hardware*
Is activation by means of a fieldbus possible (e.g. Profibus) ?	Den Feldbusstatus überprüfen.	see *8 Network, page 7-19*
	Check the fieldbus data.	see *8 Network, page 7-19* For more information about fieldbus data, refer to the "Supplementary Operating Instructions" in the system documentation.
Are the digital outputs being used?	Check the status (set/deleted) of the digital outputs.	see item *4 Digital Outputs, page 7-13* in section *5 Hardware*

Possible causes for faulty behaviour	Remedy	Reference
Sensors	Check the signals of the connected sensors (range ±32767).	see item *1 Sensors, page 7-23* in section *9 Service*
	It may be necessary to recalibrate the sensors.	see item *1 Calibration, page 7-8* in section *5 Hardware*
	See also the Operating Instructions for the relevant sensors	
Are encoders being used?	Check whether the encoders are 'counting'.	see item *2 Encoder, page 7-23* in section *9 Service* For more information about the encoders, refer to the "Supplementary Operating Instructions" in the system documentation.
Are you using the correct motor?	Check the motor	see item *2 Actuator, page 7-13* in section *5 Hardware* and table *Drives, page 11-5* For further information about the motor refer to the system diagram in the system documentation.
 A cursor appears below the bar graph at the location to which the guide point was moved, together with a numeric entry.	Is the offset of the guidepoint set the way you want it? Correct the guidepoint if necessary.	*Shift guide point, page 5-3*

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Possible causes for faulty behaviour	Remedy	Reference
Incorrect results in displays or with web width measurements.	The measurement range is not set or is set incorrectly. Check the measurement range of the sensors and/or encoders you are using.	see item *3 Field of View, page 7-9* (Sensor) or item *2 Field of View, page 7-12* (Encoder) in section *5 Hardware* For further information see the "Supplementary Operating Instructions" in the system documentation.
	The length unit is set incorrectly. Check the length unit.	see item *5 Unit, page 7-16* in section *6 Control*

Faulty behaviour

The table below shows examples of faulty behaviour, causes, and how to remedy the fault. Often the cause is incorrect parameter settings.

Faulty behaviour	Reason	Remedy	Reference
The drive is moving too fast or too slow.	The motor speed is not set correctly.	Adjust the motor speed	see item *10 Actuator Speed, page 7-5* in section *3 Job*
The drive does not move in "Automatic" mode.	The gain is set too low.	Increase the gain	see item *3 Gain, page 7-3* in section *3 Job*
	The drive is mechanically locked.	Free the drive and clean the area.	
The drive vibrates in the Automatic operating mode..	The gain is set too high.	Reduce the gain	see item *3 Gain, page 7-3* in section *3 Job*
	Cable connections are loose.	Check all cable connections to make certain they are securely fastened.	
The drive moves in the wrong direction in "Automatic" mode.	The polarity is set incorrectly.	Reverse the polarity	see item *8 Polarity, page 7-5* in section *3 Job*
	Wrong job selected.	Select "Manual: mode and check whether the correct job is selected.	see *Select jobs, page 5-3*
The drive does not move in "Servo Center" mode.	The gain for the servo-center transducer is set too low.	Increase the gain	see item *2 Gain, page 7-6* in section *4 Servo-Center*
	The drive is at the stop because the polarity is set incorrectly.	Reverse the polarity for the "Servo-center" operation mode.	see item *3 Polarity, page 7-6* in section *4 Servo-Center*
The drive vibrates in the "Servo-center" operating mode.	The gain for the servo-center transducer is set too high.	Decrease the gain	see item *2 Gain, page 7-6* in section *4 Servo-Center*

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Faulty behaviour	Reason	Remedy	Reference
The drive does not reach the servo-center position in "Servo Center" mode.	The polarity for the servo-center transducer is set incorrectly.	Reverse the polarity	see item *3 Polarity, page 7-6* in section *4 Servo-Center*
	The servo-center transducer is not receiving a signal.	Check the distance between the servo-center transducer and the measuring point. **WARNING:** It may be necessary to move the actuator to adjust the servo-center transducer. There is a risk of cutting injuries on the web and crushing injuries on the actuator. ⇨ Do not touch the edges of the material web. ⇨ Perform the adjustment only when the machine is stopped and protected against being turned on. Type: Switching Distance ISCT-03: about 1 mm ISCT-20: about 1.5 mm ISCT-21: about 2 mm ISCT-22: about 5 mm ISCT-23: about 10 mm	

11 TECHNICAL DATA

General information

D-MAX Controller

Power supply

24 - 48V nominal
21V minimum - 51V maximum

Maximum power consumption

D-MAX Controller - connection for control
50W maximum
D-MAX Controller - connection for drive
200W maximum at 24V or
400W maximum at 48V

Dimensions

Length: 184mm (without cables)
Width: 87mm
Height: 60mm

Weight

1,0kg

Protection class

IP54 according to DIN EN 60529

Ambient conditions

Ambient temperature: 0°C to 60°C
Relative humidity: 10% to 95% non-condensing
Altitude above sea level: maximum 3000m

Maximum output current

4,0A/drive

D-MAX operator interface OI-TS

Power supply

12 - 24V nominal
10V minimum - 30V maximum

Power consumption
2W

Dimensions

Wall mounting: 128 x 105 x 38mm
Desk installation: 128 x 105 x 33+5mm

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Weight

0.6kg (only the OI-TS, without mounting accessories)

Protection class

IP64 according to DIN EN 60529

Ambient conditions

Ambient temperature: 0°C to 60°C
Relative humidity: 10% to 95% non-condensing
Altitude above sea level: maximum 3000m

Inputs and outputs of the D-MAX Controller

Communication interface

based on Ethernet - 100Mbps full duplex

Electromechanical drive

maximum 4A/drive

Hydraulic servo-valve

±50mA
with or without lock valve (24V or 48V, maximum 4A)

Motor Power Amplifier MPA

±10mA
with MPA locking signal

Servo-center transducer

Analog, inductive servo-center transducer

Sensor input

maximum ±20mA
Preset range 0 to 10mA
Sensor inputs can be calibrated individually

Line Speed

0 - 10mA
optional 0 - 20mA possible

Power supply for accessory devices

+12V ± 5%, 600mA*

-12V ± 5%, 150mA*

+5V ± 5%, 800mA* (can be used for the lamp of a line sensor)

* Total current

Parallel interface

6 digital inputs

Low-Pegel: 0 - 0,9V
High-Pegel: 3,6 - 24V; maximum power consumption 6mA to ground

2 outputs

Optionally switching to positive or ground
Positive switching: 10.3V at 200mA (open commutator)
Ground switching: 1.0V at 500mA (open commutator)
Maximum voltage: 30V
Overcurrent and short-circuit protection

+12V available as auxiliary voltage

Parallel input matrix

Because of the option for customer-specific programming, there may be some deviations in the parallel input matrix. Customer-specific software adjustments of this type are described in the "Supplementary Operating Instructions" for the D-MAX system and are included in the system documentation.

Mode	Inputs					
	5	4	3	2	1	0
Locking, external	-	-	-	-	-	H
Automatic	-	-	L	L	H	-
Manual	-	-	L	H	L	-
Servo Center	-	-	H	L	L	-
Move drive left*	L	H	-	-	-	-
Move drive right*	H	L	-	-	-	-
RGPC left*	L	H	-	-	-	-
RGPC right*	H	L	-	-	-	-
RGPC RESET*	H	H	-	-	-	-

L = Low level (<= 0,9V or blank)

H = High level (3,6V - 24V)

Empty field = not relevant for the specific command

* Inputs 4 and 5 for moving the drive in "Manual" and "Servo Center" modes
RGPC functions in "Automatic" mode

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Parallel output matrix

Status	Outputs	
	B*	A*
LOSS OF NULL (Automatic mode)	-	1
Drive servo-centered (Servo-Center mode)	1	-

* Parallel outputs are active Low
1 = Active
- = Either

Jobs

	Job	Connection	Type of Guiding
A	S1	X5/1	Edge guiding*
B	S2	X5/2	Edge guiding*
C	S3	X9/1	Edge guiding*
D	S4	X9/2	Edge guiding*
E	S1 - S2	X5/1&2	Center guiding or slave guiding
F	S3 - S4	X9/1&2	Center guiding or slave guiding
G	S1 - S3	X5/1 & X9/1	Center guiding or slave guiding
H	S2 - S4	X5/2 & X9/2	Center guiding or slave guiding
J	X5	X5/2	Line center guiding
K	X9	X9/2	Line center guiding
L	X5	X5/1	Line edge guiding
M	X9	X9/1	Line edge guiding

* It is possible that the sensor being used is already returning a center signal. In this case, center guiding will be performed.

Note:
Because of the possibility of customer-specific programming, individual jobs cannot be present or cannot be used differently than listed in the table. Customer-specific software adjustments of this type are described in the "Supplementary Operating Instructions" for the D-MAX system and are included in the system documentation.

Drives

Display content*	Current	**Nom. voltage	Motor / Valve	ID	Typical modules
1.3A MTR/ENC ID0	1,3 A	24 VDC	M352553 Motor encoder	Serien-ID 00	DS-25
2.0A MTR/ENC ID1	2,0 A	24 VDC	M332325 Motor encoder	Serien-ID 01	DS-70B
3.3A MTR/ENC ID2	3,3 A	24 VDC	M281466 Motor encoder	Serien-ID 02	DAB-1
3.3A MTR/ENC ID3	3,3 A	24 VDC	M352554 Motor encoder	Serien-ID 03	DLAB-3-6
0.8A MTR/ENC ID4	0,8 A	24 VDC	M348471 Motor encoder	Serien-ID 04	DPT-200
4.0A MTR/ENC ID6	4,0 A	24 VDC	M352554 Motor encoder	Serien-ID 06	DLAB-10
0.4AMTR/ENC ID7	0,4A	24 VDC	M280791 Motor encoder	Serien-ID 07	DPT-150
0.6AM/ENC(EGH) ID8	0,6A	48 VDC	M388282 Motor encoder	Serien-ID 08	DPT-200
0.6A NO TACH 2,05K	0,6 A	48 VDC	M352555 Motor (tachless)	2,05K	Tachless Symat 25
1.3A NO TACH 3,48K	1,3 A	48 VDC	M351418 Motor (tachless)	3,48K	Tachless Symat 50
0.2A NO TACH 5,11k	0,2 A	24 VDC	M319177 Motor (tachless)	5,11K	PT 150
0.6A MOTOR 6,81K	0,6 A	48 VDC	M136114 Motor	6,81K	PT 200
0.6A MOTOR 8,66K	0,6 A	48 VDC	M136109 Motor	8,66K	Symat 25
8.0A MOTOR 11K	8,0 A	36 VDC	M137384 Motor	11K	AG-11, AB-12
1.3A MOTOR 14K	1,3 A	48 VDC	M136112 Motor	14K	Symat 50, Symat 70B
			M126687 Motor		Symat 50, Symat 70D
1.3A MOTOR 14K	1,3 A	48 VDC	M126688 Motor	14K	GAB-1, GAG-2, PT-200
1.6A MOTOR 16,9K	1,3 A***	48 VDC	M136103 Motor (1,6 A)	16,9K	GAB-1, GAG-2, PT-200, LAB-1A, Symat-KR, Symat-KTR, Symat-200
0.4A MOTOR 20,5K	0,4 A	48 VDC	M352556/ M352557 Motor	20,5K	NarroWeb 25
2.0A MOTOR 24,9K	2,0 A	48 VDC	M136111 Motor	24,9K	GAG-3, LAB-3A
2.6A MOTOR 30,1K	2,6 A	48 VDC	M146716 Motor	30,1K	LAB-10, LAB-10A

Display content*	Current	**Nom. voltage	Motor / Valve	ID	Typical modules
3.5A MOTOR 36,5K	3,5A	48 VDC	M126246 Motor M126687 Motor	36,5K	AB-1 LRA
1.0A MOTOR 44,2K	1,0 A	48 VDC	M352559 Motor M352560 Motor	44,2K	NarroWeb 50
50mA HYDR 64,9K	±50 mA	24 VDC	Hydraulic proportional valve	64,9K	
48V LVALVE 78,7K	0,6 A	48 VDC	Hydraulic proportional valve and 48 V locking valve	78,7K	
24V LVALVE 95,3K	1,2 A	24 VDC	Hydraulic proportional valve and 24 V locking valve	95,3K	
50mA HYDR AXC 121K	±50 mA	24 VDC	Hydraulic servo-valve	121K	Zero-overlapped valve
48V LVALVE AXC 154K	0,6 A	48 VDC	Hydraulic servo-valve	154K	Zero-overlapped valve with 48V locking valve
24V LVALVE AXC 205K	1,2 A	24 VDC	Hydraulic servo-valve	205K	Zero-overlapped valve with 24V locking valve
10mA MPA 287K	±10 mA	24 VDC	MPA Motor driver	287K	MPA-01/-02/-30
CUSTOM MTR 825K	Adjusted motor			825K	Not a motor from Fife
_	No motor or valve detected.			None	

* see *2 Actuator, page 7-13*

** The maximum possible mains power voltage on the D-MAX Controller is 51VDC. The D-MAX Controller regulates the voltage down to the necessary level required by the connected motor/valve.

*** 1,3A is used for the 1.6A motor.

Cable lengths

Connection	Cable lengths (maximum)
Sensors (except SE-26/-26A)	50m
Sensor SE-26	15m
Sensor SE-26A	25m
Parallel interface	50m
Servo-center transducer	50m
Servo-valves	50m
Locking valve	50m
Drive	14m
RGPC-50	100m
Ethernet	100m
Operator interface	50m

Standards

Modules of the D-MAX system have been engineered according to the standards and guidelines of the European Union. A declaration of conformity is available on file.

Modules of the D-MAX system are in compliance with the following standards:

EN 61326-1	Radiated Emissions	Class A
	Conducted Emissions	Class A
FCC 47 CFR Part 15		Class A
ANSI C63.4		Class A
EN 61000-4-2		4kV/8kV
EN 61000-4-3		10Vrms
EN 61000-4-4		2kV/1kV
EN 61000-4-5		2kV/1kV
EN 61000-4-6		3Vrms

Accessories (optional)

Input devices

RGPC-50/51

External input device for moving the guidepoint

RCAL-20

External input device for easier sensor calibration of edge sensors

RCAL-26

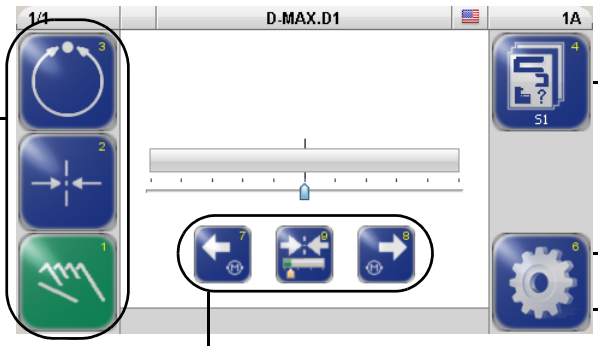
External input device for easier sensor calibration of line sensor SE-26/SE-26A

Assembly accessories

Wall bracket for D-MAX Controller

Wall bracket for operator interface

12 APPENDIX A – OVERVIEW



Select operating mode:
3 Automatic
2 Servo Center
1 Manual

Select job

press more than 2sec

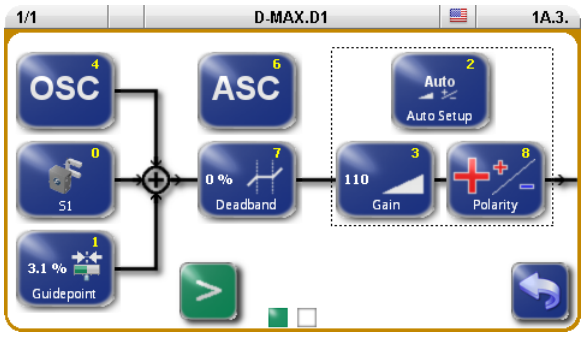
press short

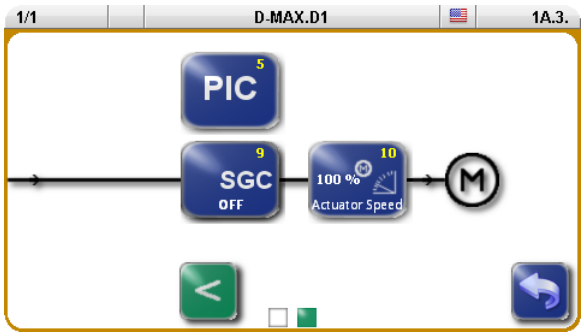
Keys 7 and 8:
Manual, Servo Center: move drive
Automatic: shift guidepoint
Key 9 only in Manual: set guidepoint

User level

Menu level

Job*/Servo center transducer** menu





* Operating mode Manual/Automatic
0 Calibrate sensor
1 Guidepoint
2 Auto Setup
3 Gain
4 OSC
5 PIC
6 ASC
7 Deadband
8 Polarity
9 SGC (Speed Gain Control)
10 Actuator Speed

** Operating mode Servo Center
1 Guidepoint
2 Gain
3 Polarity

Setup menu***

2 **Local Control**
3 **Job**
Switch to Job menu
4 **Servo-Center**
Switch to Servo-Center transducer menu
5 **Hardware**
1 Sensors
2 Actuator
3 Digital Inputs
4 Digital Outputs
6 **Control**
1 Modes
2 Jobs
3 Left/Right Keys
4 Local Control
5 Unit
6 Hardlock
7 **Administration**
1 Labels
2 Serial Number
3 Backup & Restore
4 Device Names
8 **Network**
MAXNET Settings
Customer Settings
9 **Service**
1 Measuring Points
2 Set Digital Outputs

*** the set of menus depends on the selected operating mode and/or on the programming

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13 APPENDIX B - SYMBOLS

Symbols	Description
	Error display - This icon appears if an error is detected on the selected drive.
	The selected drive is expecting MAXNET data from a device, but does not receive any data. The device that should send MAXNET data is either not connected or not turned on.
	The selected drive expects data from a Gateway, but does not receive any data, since no data can be received on the Gateway.
	No motor was detected or no motor is connected.
	The motor current supply is outside the valid range.
	Motor backfeed overvoltage (generator function of the motor) or short circuit in the motor cable.
	The motor is locked
	The motor works at maximum motor current.
	The motor is actively locked in "Manual" mode (hardlock).
	The limit values of the encoder have been reached.
	RCAL is active on the selected drive. This symbol appears between the time when the first and second key on the RCAL-20/26 (optional device) is pressed.
	The optional oscillator 'OSC' is available in the selected job.
	The optional controller 'PIC' is available in the selected job.
	SGC: Guiding depends on the web speed.If this symbol is flashing, the web speed is equal to 0 and no guiding is being performed.
	ASC (Automatic Sensor Control) is activated.
	ASC is triggered. This icon appears if the ASC function has been activated and triggered on the selected drive.
	ASC is triggered. These icons appear if the ASC function has been activated and triggered on the selected drive and the motor has been blocked.

14 APPENDIX C - TERMS

ASC (Automatic Sensor Control)

If the web is outside of the defined range of the sensor's field of vision, guiding is stopped.

Automatic

Operating mode
The web course is automatically corrected by an actuator based on sensor information.

Automatic calibration

The Gain and Polarity parameters are calibrated automatically.

CM (Customised Menu)

Customer-specific system menu
This system menu is only present if the D-MAX controller has been programmed accordingly.

Deadband

A range is defined within the sensor's field of vision within which guiding is not active in "Automatic" mode.

Device

Devices refer to the drives on the D-MAX Controllers present on the network as well as any customer-specific CM system menus or Gateways.

Drive

The drive may be the motor of an actuator, for example, which provides the necessary correction within a control loop.

Encoder

Incremental position transducer to record positions

Hardlock

The Hardlock parameter allows you to maintain the drive active in its position in "Manual" mode.

Job

Jobs are types of controllers that are in principle available in a D-MAX system.

LS (Line Speed)

Designation of the web speed signal which is supplied to X1.

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Manual

Operating mode
There is no guiding of the web course.

OI (Operator Interface)

Designation of an operator interface.

OSC

Designation of an optionally available oscillator.

PIC

Designation of an optionally available controller.

RCAL

Designation of an external input device for sensor calibration

RCAL

Designation of an external input device for sensor calibration.

RGPC (Remote Guide Point Control)

Designation of an external activation system for offset of the guidepoint.

SC (Servo Center)

SC is the abbreviation for the "Servo Center" mode.

Servo Center

Operating mode
The actuator is moved to the mechanical center position depending on the servo-center transducer.

Servo-center position

Then the control rollers of the actuator are aligned parallel to the rollers of the customer system.

Servo-center transducer

Assigns the servo-center position for "Servo Center" mode

SGC (Speed Gain Control)

Guiding depends on web speed.

Supplementary Operating Instructions

Customer-specific software adjustments of the software are described in the "Supplementary Operating Instructions" for the D-MAX system and are included in the system documentation.

Web / strip

The web / strip is the customer's material, which is affected in its direction of movement as it is guided by the D-Max system.

For simplicity sake, these Operating Instructions will refer only to the web.

15 SERVICE

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 (see *page 3-1*) an.

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.

Addresses

To request service, or if you need replacement parts, please contact one of the following addresses.

Fife-Tidland GmbH

Max-Planck-Straße 8
65779 Kelkheim
Deutschland

Siemensstraße 13-15
48683 Ahaus
Deutschland

Telefon: +49 - 6195 - 7002 - 0
Fax: +49 - 6195 - 7002 - 933
E-Mail: service@maxcess.eu
Web: www.maxcess.eu

Fife Corporation

Post Office Box 26508
Oklahoma City, OK 73126, USA
Telefon: +1 - 405 - 755 - 1600
Fax: +1 - 405 - 755 - 8425
E-Mail: service@maxcessintl.com
Web: www.maxcessintl.com