

# Contrac Actuators DTM for Contrac Actuators with PROFIBUS DPV1 Communication



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## Contrac Actuators

### DTM for Contrac Actuators with PROFIBUS DPV1 Communication

#### Print Version

Online Help

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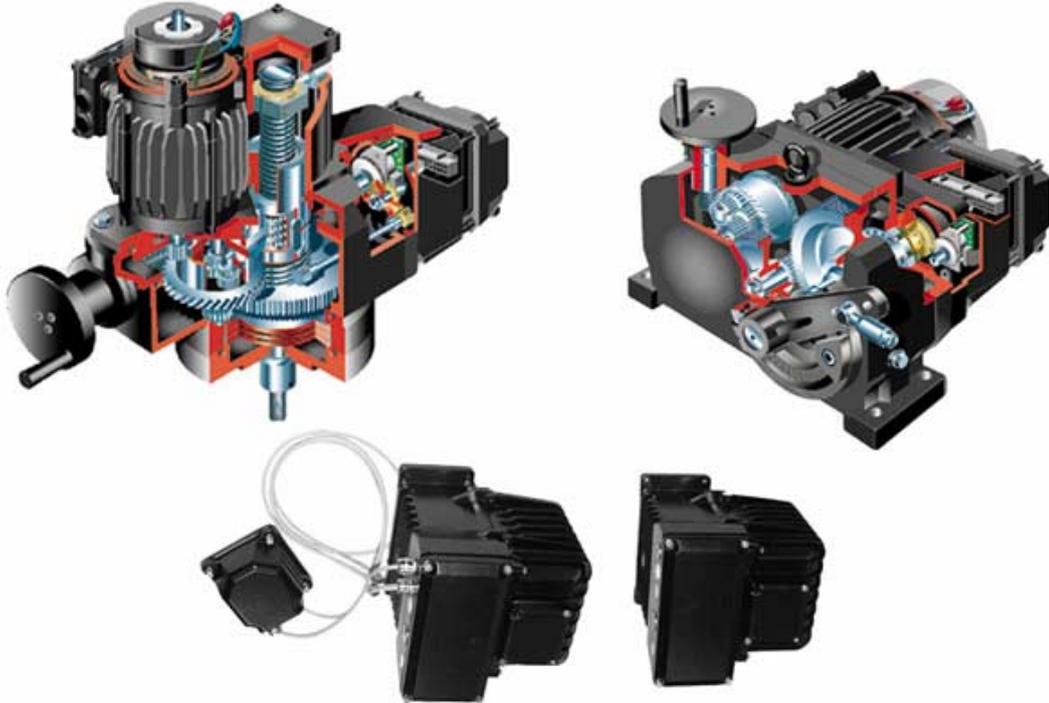
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## 1 Contrac DTM DP/V1

### DTM for Contrac Actuators

Device Type Manager for electrical actuators in the Contrac product line with PROFIBUS DP/V1 communication



The Device Type Manager (DTM) provides the basis for the FDT concept. It is a component supplied by the manufacturer of the smart field device.

The DTM contains information about all device features and limits. It provides all user dialogs, handles device configuration and diagnostics, and creates device-specific documentation.

Users can upgrade to new field devices at any time simply by loading the corresponding DTM.



To ensure data consistency, it is recommended that users do not configure actuators with PROFIBUS DP/V1 communication via an RS232 interface on the electronic unit but use instead acyclic services only.

## Setting the bus address

### 2 Setting the bus address

Contrac supports the “Set Slave Address” service.

The address can be set using a master. With DSV 4.01 use the C server for DSV 4.01 to set the address.

Open the “Search Device” option via the “Device” drop-down menu or by right-clicking on the communication driver. After updating the participant list, the bus address can be set by marking the slave and right-clicking.

The address can then be changed in the DSV 4.01 project tree in project edit mode under "Device". See also the DSV 4.01 online help.

The address can only be changed in the “Out of Service” operating mode.

See also: -> “Operating Mode”

Each address may only be used once in a bus segment. Usually, the address 126 is reserved for a party that needs to be added, and the addresses 1 and 2 are reserved for masters.

### 3 Starting DTM



- Right-click on the relevant actuator and select "more" to initialize the DTM.
- Right-click on the actuator and select "edit". This opens a second window with the device-specific dialogs for setup and configuration.

## **4 File**

### **4.1 Open**

Downloads a data record from the storage medium to the DTM interface. The file names of the data records do not have file extensions.

Select the  button to call up this option.

### **4.2 Save**

Saves all offline windows to the storage media in the default data record.

Select the  button to call up this option.

Download data from the device before selecting this menu item.

See also -> "Load from Device"

### **4.3 Save as**

Saves all offline windows under a specified path and file name. Download data from the device before selecting this menu item.

See also -> "Load from Device"

### **4.4 Data Overview**

Displays all parameters of the actuator in a scrollable window. The data can be saved in HTML format or printed via drop-down menu. Download data from the device before selecting this menu item.

See also -> "Load from Device"

### **4.5 Exit**

Closes the Contrac DTM.

### 5 Edit

#### 5.1 Copy

Copies text highlighted by the mouse cursor to the clipboard.

Use the shortcut Ctrl+C to copy.

#### 5.2 Paste

Pastes the contents of the clipboard.

Use the shortcut Ctrl+V to paste.

## 6 Device

### 6.1 Connect

Establishes a communication link to an online device. The connection can be set up either via drop-down menu or by selecting the  button.

Once connected, users are asked whether they want to download the data from the device. Select “Yes” to download all the settings for the online device to the user interface. If additional windows are opened (e.g., <Configure>, <Operation>), the current device settings and data are displayed in the respective fields.

If “No” is selected, either default data or data from a previously connected device is displayed when new windows are opened. This data is not related to the currently connected device.

### 6.2 Disconnect

Disconnects the communication link to an online device. The connection can be broken either via drop-down menu or by selecting the  button.

### 6.3 Load from Device

Use the menu item or the  button to download data stored in an online actuator to the user interface.

### 6.4 Save to Device

Use the menu item or the  button to save all data updated in the user interface.

### 6.5 Reset

Use this menu item to restart the processor for the actuator (warm start). No settings are deleted. However, the communication link must be established again in the DTM.

See also: -> "Connect"

### 6.6 Load Factory Settings

Factory settings are stored in a read-only memory. If device configuration changes (e.g., accidentally), use this menu item to restore the actuator settings to factory default.

After loading the factory settings, the current data must be downloaded again to the user interface. This option can only be performed in the Out of Service mode.

See also -> "Load from Device"

See also -> "Operating Mode"

## 6.7 Operating Mode

Displays the operating mode for the actuator and allows users to switch between modes.

Operating modes include:

- Automatic (Auto)
- Manual (MAN)
- Remote Cascade (RCAS)
- Out of Service (O/S)

Select "Accept" to switch the actuator to the desired operating mode. The current operating mode is displayed in the "Actual Mode" window.

- Automatic (AUTO)

The actuator is in automatic mode and follows the specified setpoint (setpoint status good).

- Manual (MAN)

Allows users to enter values directly via the Operate/Positioner or Operate/Controller windows for actuators with process controller functionality.

See also -> "Controller"

- Remote Cascade (RCAS)

Enables the Remote Cascade option.

- Out of Service (O/S)

Switches the actuator to the Out of Service mode. In Out of Service mode, the brake engages and locks the actuator in the last position.

If the actuator cannot switch to the desired mode (e.g., setpoint status invalid), the Out of Service mode is activated.



When the actuator is switched on again, it runs in Automatic mode. The actuator must be properly configured without malfunction, and the setpoint status must be valid.

## Device

---

### 6.8 Identification

#### 6.8.1 Device

##### Tag No

Allows users to enter the tag number of the positioner. The tag number is the second value displayed in the DSV401 project tree.

##### Description

Allows users to enter a general description.

##### Communication Tag

Allows users to enter the communication tag of the positioner. The communication tag is the first value displayed in the DSV401 project tree.

##### Bus Address

Displays the PROFIBUS address in the device.

See also: -> "Setting the bus address"

##### Manufacturer

Displays the name of the device manufacturer.

##### Device

Displays the device models, e.g., Contrac.

##### Actuator

Displays the type of actuator, e.g., part-turn or linear actuators.

##### Type

Displays the actuator model, e.g., LME 620 AN or RHD 250.

##### Serial Number

Displays the serial number for the actuator.

### 6.8.2 Additional information

#### Software

Displays the software version for the actuator.

#### Hardware

Displays the version for the actuator hardware.

**PROFIBUS Firmware**

Displays the version for the PROFIBUS firmware.

**Plant Tag**

Allows users to enter individual tag numbers for the following:

- Actuator
- Electronic unit
- Positioner

## **7 Display**

### **7.1 Trend**

The Trend window allows users to record up to 4 values during operation. The information is displayed in a histogram.

The values to be recorded can be specified in the lower half of the window.

This includes:

- Gearing temperature
- Electronics temperature
- Position deviation
- Motor frequency
- Actual Value (%)
- Setpoint (%)

This window displays the max. and min. values as well as the current values for all four selected measurements.

Use the Start button to activate the reporting option; the Stop button interrupts the recording.

The values can be saved by selecting the option CSV report in the combo box.

Enter the desired file name with CSV (comma separated value) as file extension after selecting the option. The resulting file can be opened in Excel.

## 8 Operate

### 8.1 Positioner

The current operating mode is displayed in the "Operating Mode" function block.

See also -> "Operating Mode"

#### Position Setpoint (MAN)

In manual mode, the actuator can be moved into desired position after entering the position under "Position Setpoint (MAN)" and by pressing the "Start" button. The actuator can be stopped at any time by pressing the "Stop" button.

#### Position Setpoint

Displays the position setpoint transmitted via the bus in a running bar display and as a percentage (%).

#### Current Position Value

Displays the current position value in the corresponding function block in a running bar display and as a percentage (%).

#### Position deviation (AUT)

Position deviation is displayed graphically in a running bar display (each max. +/-10%) as well as in a text field (0 ... 100%).

## **9 Diagnosis**

### **9.1 Status**

Displays the device status.

This includes the following status information:

#### **Operating Mode**

Displays the operating mode for the actuator.

See also -> "Operating Mode"

#### **Function**

Depending on device configuration, the positioner mode or, if the process controller option is enabled, the controller is displayed.

#### **Test Mode**

Indicates whether a test function is enabled.

See also: -> "Test"

#### **Simulation Mode**

Indicates whether a device status or actual value simulation is enabled.

See also: -> "Simulation"

#### **Local Operation**

Local operation is indicated when the actuator is in manual mode or out of service. Or by pressing the information and service field for the electronic unit.

#### **Binary Inputs**

Displays the function for the binary entry. (Not available for Actuators with PROFIBUS communication.)

#### **General Alarm**

Indicates whether an alarm or status message is present in the device.

#### **General Malfunction**

Indicates whether a failure message is present in the device.

## 9.2 Messages

### 9.2.1 Current Messages

Displays the current messages for the device. To hide status messages, use the menu item "Configure -> Monitoring -> Device Status Messages". The hidden status messages are no longer displayed in this window.

See also: -> "Device Status Messages"

Device status messages include the following groups:

- Failure
- Alarm
- Maintenance
- Status

Active messages are grouped accordingly and displayed in the window.

Device status groups can be assigned safety functions such as "Move to fail safe position".

See also: -> "Configure / Monitoring"

Use the appropriate buttons to store or print the current device status.

### 9.2.2 Saved Messages

This option is similar to "Current Messages" and can be used to display messages stored in the device. In addition to Print and Save, the Reset button can be used to restore device status to factory default.

Information about all the messages for the device are contained in the device history, including messages hidden via "Configure -> Monitoring -> Device Status Messages". Due to low priority, status information is not displayed in stored messages.

## Diagnosis

### 9.3 Simulation

#### 9.3.1 Device Status

To start the simulation, choose the desired message(s), select the "Simulation Active" option and click "Accept". The device then displays the corresponding status. To simulate another message, select or deselect the message and click "Accept". The simulation does not need to be stopped.

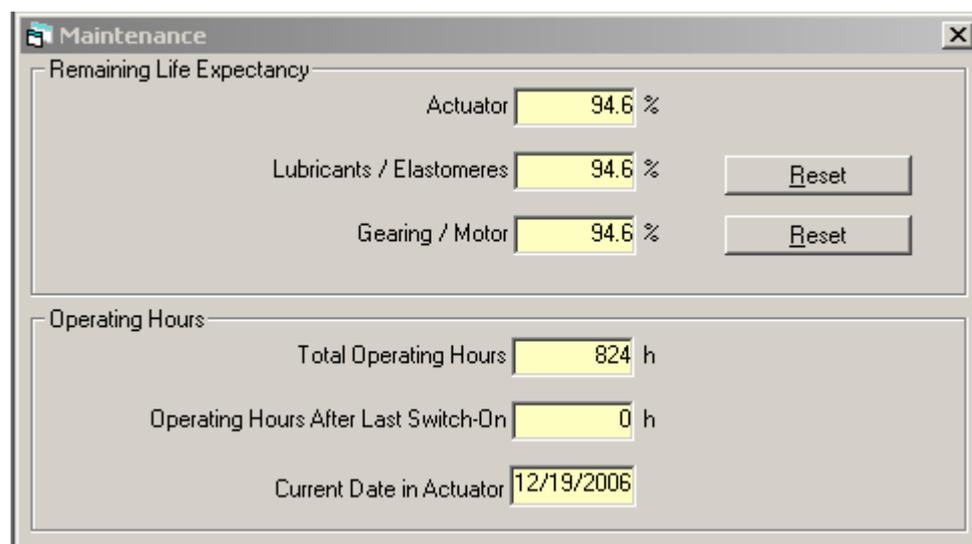
This status is displayed as the current device status. Since the message is simulated, it is not displayed as a saved message.

#### 9.3.2 Current Position Value

This window allows users to simulate the current position value for the device, including device status. The desired current position value and desired status must be entered. Check the "Function active" box and click "Accept" to send the values. To change the current value and status, click "Accept" directly after entering the information. The simulation does not need to be stopped.

### 9.4 Maintenance

Contrac actuators calculate in-service data that is used to determine the life expectancy until the next maintenance. This information is displayed in the "Maintenance" window.



The screenshot shows a window titled "Maintenance" with a close button (X) in the top right corner. The window is divided into two main sections: "Remaining Life Expectancy" and "Operating Hours".

**Remaining Life Expectancy:**

- Actuator: 94.6 %
- Lubricants / Elastomers: 94.6 %
- Gearing / Motor: 94.6 %

There are "Reset" buttons next to the Lubricants / Elastomers and Gearing / Motor values.

**Operating Hours:**

- Total Operating Hours: 824 h
- Operating Hours After Last Switch-On: 0 h
- Current Date in Actuator: 12/19/2006

**Remaining Life Expectancy**

Service-related parameters are analyzed by the microprocessor. It calculates the life expectancy remaining until maintenance is required for the actuator. Depending on in-service factors, the components may be subject to unequal wear. This impacts the remaining life expectancy of the

- Actuator
- Lubricants / Elastomers
- Gearing / Motor

and is displayed in the text fields. The value for the actuator matches the lower value for the lubricants or elastomers and gearing or motor.

All values are estimated values and do not affect the warranty.

In case of repairs or partial overhaul, the remaining life expectancy for lubricants or elastomers and gearing or motor can be reset in 10% increments based on user evaluation.

**Operating Hours**

The total operating hours and the operating hours since last switch-on are displayed in two text fields.

Since time is a stress factor, the current date has to be set in order to display the remaining life expectancy. Enter the date in the proper text field under Configure -> Basic Parameters.

## Diagnosis

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### 9.5 Load

#### Event Counter

Displays the number of motor reversals since commissioning the device.

#### Max. Values

Displays the maximum temperatures for the gearbox and electronic unit since commissioning. The <Reset> button changes both values to the current value for each component.

#### Frequencies

The in-service parameters include:

- Position
- Dynamic
- Torque / Force
- Temperature

The frequency displayed refers to the operating range or temperature.

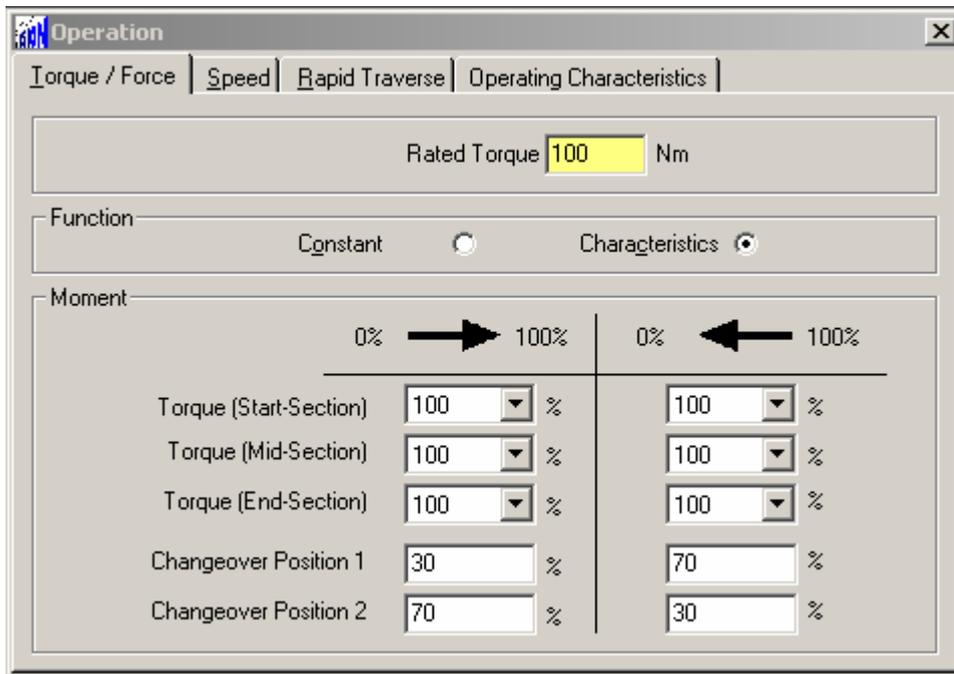
The <Reset> button restores all values to 0.

Save and Print options are also available. The information is saved as an HTML file.

**10 Configure**

**10.1 Operation**

**10.1.1 Torque / Force**



Use the combo box to select whether the actuator runs with a constant upper limit for torque/force or with a deviating upper limit within defined sections of the operating range.

The text field on the right provides the rated value (100%) for the actuator torque or force.

**Constant**

For the 0 ... 100% and 100 ... 0% ranges, select the upper torque or force limit from the proper combo box. Choose from 100%, 75% or 50% of the rated value. The upper limit is valid for the full operating range.

## Configure

### Characteristics

The 0 ... 100% und 100 ... 0% operating ranges can be divided into three sections. Different maximum values for torque/force or speed can be assigned for each of these ranges. The sections are separated using freely selectable changeover values. The following rules must be taken into consideration:

For the + direction: Changeover value 2 > changeover value 1

For the - direction: Changeover value 1 > changeover value 2

The applicable range is:

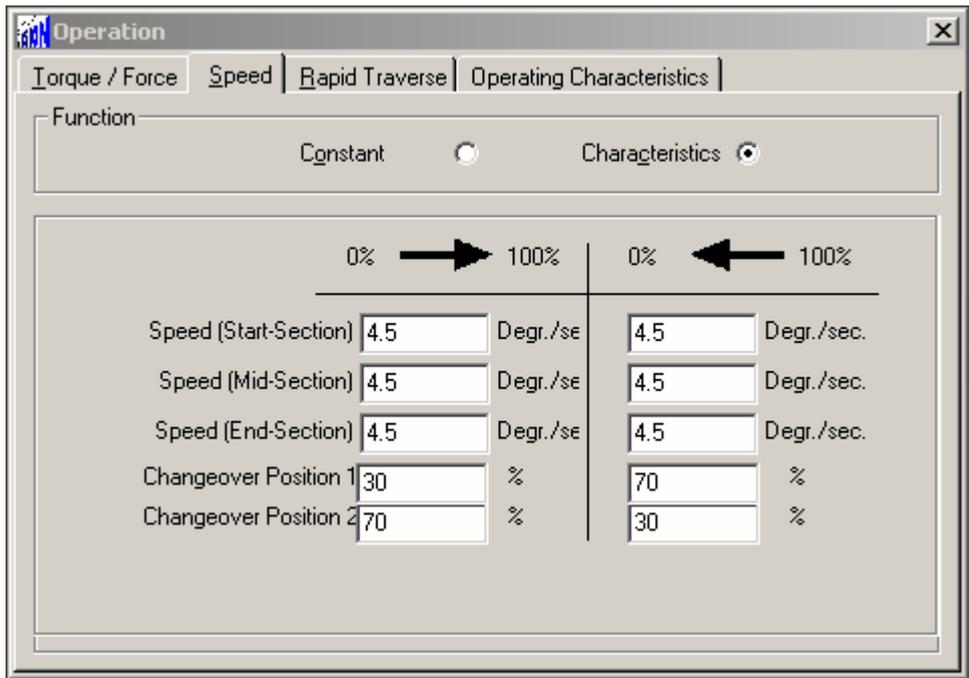
0  100%

	Position range
Torque/force (Start range)	0% to changeover 1
Torque/force (mid-range)	Changeover value 1 to changeover value 2
Torque/force (end range)	Changeover value 2 to 100%

100  0%

	Position range
Torque/force (Start range)	100% to changeover 1
Torque/force (mid-range)	Changeover value 1 to changeover value 2
Torque/force (end range)	Changeover value 2 to 0%

**10.1.2 Speed**



Use the combo box to select whether the actuator runs with a constant maximum speed (constant) or with a deviating upper speed limit within defined sections of the operating range (characteristic).

**Constant**

Enter the upper speed limit in the proper text field for the 0 ... 100% and 100 ... 0% ranges (various selections for automatic mode). The upper limit is valid for the full operating range. The speed entered for the MAN mode (manual speed) applies for both operating directions.

## Configure

### Characteristics

The 0 ... 100% und 100 ... 0% operating ranges can be divided into three sections. Different maximum speeds can be selected for each range.

The sections are separated using freely selectable changeover values. The following rules must be taken into consideration:

For the + direction: Changeover value 2 > changeover value 1

For the - direction: Changeover value 1 > changeover value 2

The applicable range is:

0  100%

	Position range
Start speed range	0% to changeover 1
Medium speed range	Changeover value 1 to changeover value 2
End speed range	Changeover value 2 to 100%

100  0%

	Position range
Start speed range	100% to changeover 1
Medium speed range	Changeover value 1 to changeover value 2
End speed range	Changeover value 2 to 0%

### 10.1.3 Rapid Traverse

The option is only available for actuators that feature analog signal control and acyclic communication restricted to informational and diagnostic purposes.

#### No rapid traverse mode

The actuator moves without rapid traverse mode. Signals to binary inputs 2 + 3 enable the actuator to move at the selected manual speed.

### Rapid traverse with servo motor

Signals to the binary inputs 2 + 3 move the actuator at the specified rapid traverse speed with reduced torque. The rapid traverse speed can be twice as high as the rated speed, with approx. 50% of the rated torque.

In the input/output window or binary inputs, the option "Rapid Traverse" can be enabled by selecting "Function." The actuator is controlled via BE 2 in the + direction and via BE 3 in the - direction (each in rapid traverse mode)

### Rapid traverse with second motor

(Not available for all actuators.)

Specially designed Contrac actuators can be equipped with two motors.

Signals for the binary inputs 2 + 3 must also be set accordingly in the "Input/Output" window. These can be connected via external control modules (e.g., coupling relay), which control the second motor.

Depending on actuator model, the signal input for the external component is stopped prior to reaching the end position in order to avoid dynamic overload.

## 10.1.4 Operating Characteristics

### Behavior at Critical Temperatures

Allows users to select the operating mode for the actuator when a critical temperature is reached. The options include automatic or manual mode. Based on user selection, the specified mode and current mode may be switched.



In the "Manual" mode, the actuator can only be moved via the "Positioner" window.

See also -> "Operating Mode"

See also -> "Positioner"

## Configure

---

### Frequency Selection

Select between the available line frequencies (50 Hz or 60 Hz).

### Anti-condensation Heater

Use the checkbox to activate the anti-condensation heater and prevent condensation due to temperature changes in the motor.

## 10.2 End Position Behavior

### 10.2.1 Driving into End Position

Different end position behavior can be specified for each travel direction (0 ... 100% or 100 ... 0%). Options include:

#### Keeping tight with MD\_F

Torque or force holds the actuator in its end position. The motor is not switched off.

#### Position dependent switch-off

Power is switched off and the brake is set when the actuator reaches the end position. The switch-off value can be up to 20% before end position.

#### Switch-off with 1 x MD\_F

The torque or force of the actuator moves it into end position. The motor and brake switch off. The brake holds the actuator in its end position.

### Switch-off with 2 x MD\_F

The actuator moves via torque/force into end position and increases its torque/force to twice the rated value. The motor and brake switch off. The brake holds the actuator in its end position.

### Position Deviation to Keep Tight

To compensate for inaccurate settings or thermal influences, enter a value between 0% and 5% in the proper text field.

Example:

3% position deviation is selected. If thermal influences affect the valve so that another 2% is necessary to reach the 100% position, the selected setting allows the actuator to overrun the 100% position by up to 3% in order to close the valve completely. The current value would then correspond to the actual position.

### Switch-off Delay

To prevent the actuator from moving out of its end position in the modes "Switch-off with 1 x MD\_F" or "Switch-off with 2 x MD\_F", the brakes are locked before the switch-off delay stops the motor. The maximum switch-off delay is 10 sec.

## 10.2.2 Leaving End Position

### Breakaway Function

Contrac actuators can provide increased force/torque (up to twice the rated value) near end positions. This releases the valves in the event of minor locking in the end position. To provide increased torque/force, the actuator runs at creep speed (< 10% of the rated speed).

Select from the following breakaway options:

- No breakaway
- Breakaway from 0%
- Breakaway from 100%
- Breakaway from 0% to 100%

Enter the effective range in the proper text field (max. 0% ... 5% or 95% ... 100%).

### 10.2.3 Modulation Control Near End Position

#### Close Tight

This option prevents actuator/valve movement close to the end position. Enable the proper checkbox to display the text field "From Position". When the actuator reaches this value, it behaves as specified under "Driving into End Position". This also applies for "Position Dependent Switch-off".

#### From Position

Text field for setting the position value at which the "Close Tight" option is enabled.

### 10.3 Binary Outputs

#### Inputs/outputs

Enables users to assign the signals generated by the actuator software – in addition to the PROFIBUS communication – to three binary outputs. These options are described as follows:

#### Ready to Operate

Signals the device status.

#### Signal End Position 0%

Actuator has reached the 0% position.

#### Signal End Position 100%

Actuator has reached the 100% position.

**Signal Limit Value 1 Rising**

Actuator has reached limit position 1 with rising signal.

**Signal Limit Value 1 Falling**

Actuator has reached limit position 1 with falling signal.

**Rapid Travel + Direction**

Actuator moves with rapid travel speed towards + end position (only available with dual motor model).

**Collective Alert**

Some Contrac parameters have reached values that will likely result in failure (see message under <Diagnosis> <Status>); the actuator is still available.

**Collective Disturbance Alarm**

Actuator is no longer available (see message under <Diagnosis> <Status>).

**Signal Limit Value 1 Rising**

Actuator has reached limit position with rising signal.

**Signal Limit Value 2 Falling**

Actuator has reached limit position 2 with falling signal.

## Configure

---

### Rapid Travel – Direction

Actuator moves with rapid travel speed towards - end position (only available with dual motor model).

### Local Operation

Actuator is operated via local control panel (LCP).

### Position Values

Enables users to define two limit signals for the entire operating range, whose function can be compare via mechanical switches. The action triggered by the signal reaching the specified limit is defined via the binary outputs.

For a unique signal, users must enter a hysteresis.

## 10.4 Setpoint Characteristics

Use this option to select one of four possible setpoint characteristics.

The following options

- Linear characteristic
- Equal percentage (25%)
- Equal percentage (50%)

cannot be configured. The characteristic is displayed once selected.

The programmable characteristic is also displayed. There is a 22-character limit for settings. In addition, the initial value (0% / 0%) and final value (100% / 100%) are predefined and cannot be changed. A programmable characteristic requires at least two additional values. The order in which the value pairs are entered is freely selectable.

To add a new characteristic, select the "Change" button to switch to the Edit mode. In Edit mode, the desired pair of values can be entered via New, Delete or Change.

Save and Print options are also available.

### Split Range

Define individual start and end points to allow more than one actuator to use a common setpoint for positioning. The range between start and end points corresponds to 100% of the positioning range for the actuator.

The start point value must be less than the end point value.

## 10.5 Monitoring

### 10.5.1 Fail Safe

#### Fail Safe Type

Defines the behavior of the actuator when setpoint status is not GOOD.

The following options are available:

- Lock in last position
- Position with last effective setpoint
- Drive to safety position

#### Fail Safe Time

Enables users to enter the time for the actuator to perform the option specified for failure behavior.

#### Fail Safe Value

Defines the position to which the actuator moves when "Drive to safety position" is selected.

#### Behavior in Mode O/S

When the device switches to Out of Service (O/S) mode, the brake engages and the actuator is locked in the current position. The behavior cannot be edited.

See also -> "Operating Mode"

## Configure

### 10.5.2 Device Status Messages

Enables users to define the mode and scope of status messages sent by the device.



Disable the checkbox beside undesired status messages and save by selecting "Save to device".

See also -> "Device Status"

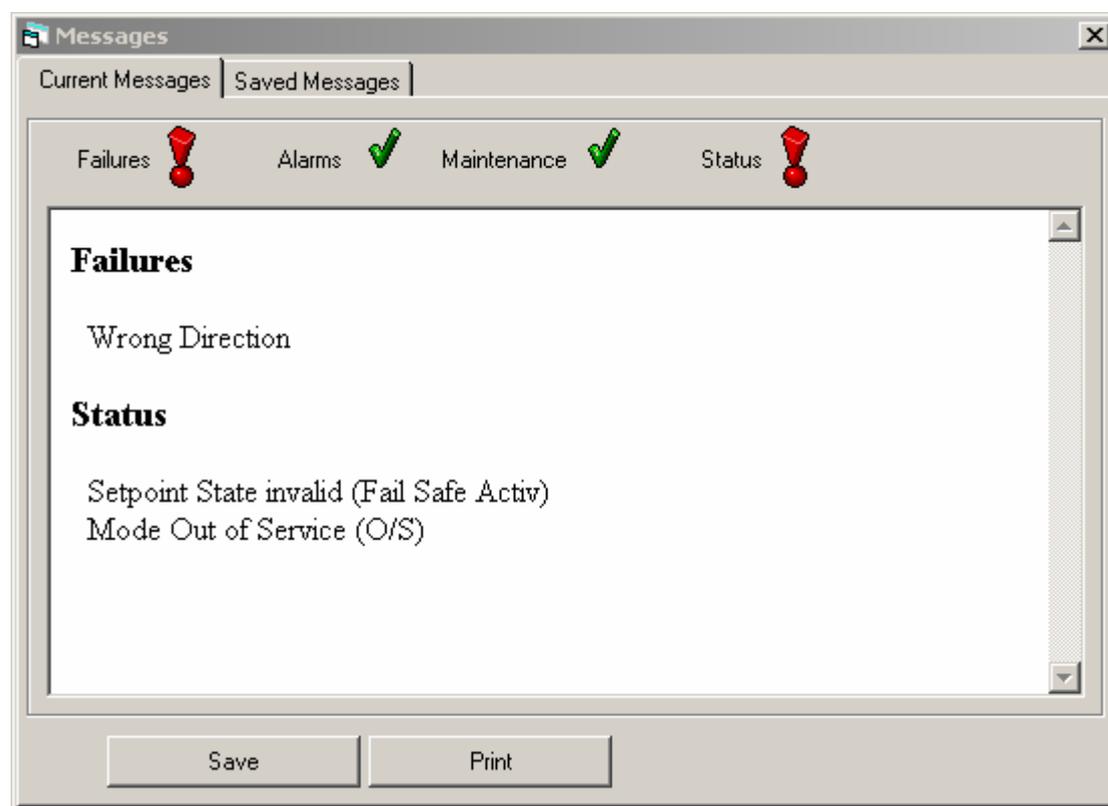
Information about all the messages for the device are contained in the device history, including messages that have been hidden.

### 10.5.3 Positioning Loop Monitoring

This option enables users to monitor actuator function in automatic, manual and rapid traverse modes.

Positioning loop failure is communicated via the bus. The actuator is locked in the last position, and the LEDs for the control panel indicate "Failure".

See also -> "Device Status" and "Device Status Messages"



**Resetting Positioning Loop Failure**

There are a number of options for resetting failure messages from positioning loop monitoring:

- Reset via control panel for the electronic unit
- Reset via graphical user interface
- For a setpoint change > 3%. If the setpoint change is longer than 1 sec, the change is read as a drive command and the actuator moves to the new position.

**Activating the Positioning Loop Monitoring**

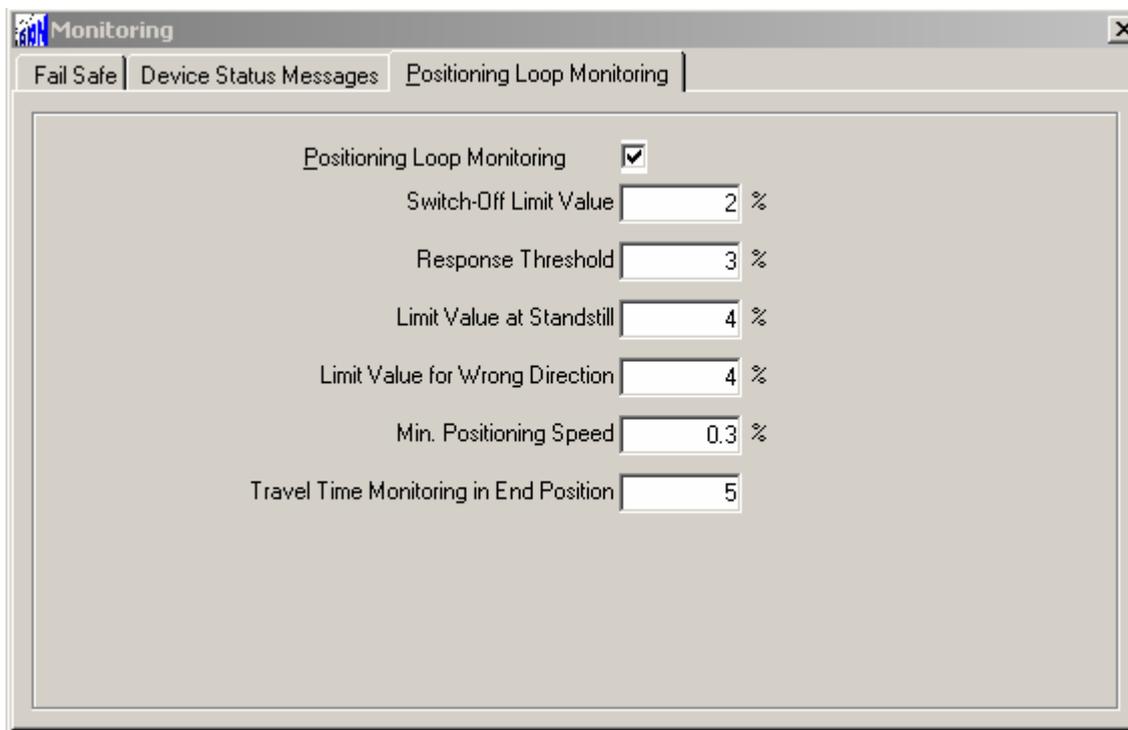
Activate or deactivate positioning loop monitoring via the proper checkbox.

Positioning loop monitoring is deactivated at delivery. For ignition-proof actuators, the option is activated.

In addition, the individual limit value or monitoring threshold can be changed via the user interface.

The default settings for the limit values or monitoring thresholds are identical on all actuators.

The percentage values for the limit values or monitoring thresholds correspond to the percentage of actuator travel.



## Configure

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### Switch-off Limit Value

Near the end position, valve movements may become sluggish. When positioning loop monitoring is switched off, the end position area is no longer monitored.

Actuator function is monitored in the end positions via runtime monitoring.

(See also: Travel Time Monitoring in End Position)

The switch-off limit value defines the range before the end positions, where positioning loop monitoring is inactive and runtime monitoring is active. The value specified applies for both end positions.

The default is 2%. Permissible range is 1 ... 5%.

### Response Threshold

Contrac actuators allow actuator speed to be adjusted for positioning deviation. Since the actuator can also be moved at low speeds, positioning loop monitoring is activated only with larger deviations. The response threshold defines the positioning deviation value for activating positioning loop monitoring when positioning the actuator outside the end positions.

The default is 3%.

### Limit Value at Standstill

The positioning deviation is also monitored when the actuator is at standstill (brake engaged). If the actuator continues to move, a failure message is sent when it reaches the limit value.

The default is 4%.

### Limit Value for Wrong Direction

All operating modes monitor whether the actuator movement corresponds to the drive commands. The default for max. permissible deviation in the opposite direction is 4%.

### Min. Positioning Speed

Contrac actuators allow users to set different speeds for the various operating modes. The different positioning times are calculated in the electronic unit. When monitoring the min. positioning speed, the actuator must cover a specified distance in a calculated period of time.

The default is 0.3%.

### Travel Time Monitoring in End Position

Since actuator movements may become sluggish near the end positions, the actual positioning loop monitoring is switched off near the end positions. Monitoring near the end positions is performed via runtime monitoring. Users can define the end position ranges in which positioning loop monitoring is switched off.

(See also: Switch-off Limit Value)

When a command to travel in the opposite direction is received, the actuator must leave the end position and move into the operating range within a specified period of time. The "standard" positioning loop monitoring is then activated. The time period for leaving the end position includes the startup time, specified end position range, positioning time and a travel time variable.

Use the "Travel Time Monitoring in End Position" option to set this variable.

The default variable is 5.

## 10.6 Controller

The function is only available for actuators that feature analog signal control and acyclic communication restricted to informational and diagnostic purposes.

The integrated controller receives its position value directly from the connected 2-wire transmitter whose threshold monitoring and damping options can be configured in the window under the appropriate tab.

### 10.6.1 Controller Parameter

Click on the "Controller" button to activate the controller.

#### Gain

Sets the amplification for the (P-element) of the controller. Enter a value between 0 and 40 in the text field. At "0" the controller is switched off.

## Configure

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### Integral Action Time

Defines the integration time (I-element) for the controller. Enter a value between 0 and 3600 sec. An integration value < 0.1 sec switches off the I-element of the controller.

### Derivative Time

This option dampens the following step in the D-element with a step at the input. Enter a value between 0 and 40 in the text field. The value "0" switches off the D-element for the controller.

### Decay Time Constants

The decay time constant of the D-element dampens its decrease after a step change at the input that without this variable would otherwise result in a large gradient. The decay time is similar to the reciprocal e-function. Enter a value between 1 and 3600 sec.

### Controller Function

Select either "Normal" (rising) or "Reciprocal" (falling) to set this output option. This setting does not affect the control algorithm but only the characteristic (normal or reciprocal), i.e., the value output by the positioner.

### Behavior in the End Position

Configure the controller behavior in the end positions based on controller deviation. Select "Non-integr.", if the actuator should leave the end position only in case of positioning deviation. The controller then reacts immediately without the delay caused by the I-element.

## 10.6.2 Transmitter

### Monitoring

Enter the upper and lower monitoring thresholds in the proper text fields.

**Damping of Transmitter**

Dynamic actuator damping is not required. Damping is performed via the non-linear filter NIFIL, and is only active if changes are greater than 1/2 the linear range.

Enter values for:

Linear range “Linear range LB for NIFIL” (values between 0 ... 100%) and the

Time constant “Time constant for NIFIL” (values between 0 ... 10 sec).

**10.7 Basic Parameters**

**Write protection**

To protect the device from unintended configuration, a number of write-protect options are available.

			Communication mode	
Write-protect switch Electronic unit	Software function write protect	Operating Mode	RS232	DP/V1
On	ON / OFF	All	Write-protected	Write-protected
Off	On	All	Not write-protected	Write-protected
Off	Off	Automatic	Not write-protected	Write-protected
Off	Off	Manual (MAN)	Not write-protected	Write-protected
Off	Off	Remote Cascade (RCAS)	Not write-protected	Write-protected
Off	Off	Out of Service (O/S)	Not write-protected	Not write-protected

See also -> “Operating Mode” and documentation for electronic unit

**Units**

Tab with options for actuator model and basic units.

**Torque / Force**

Select dimensions for torque/force values. Depending on actuator model selected, the following dimensions for part-turn or rotary actuator

- N
- kN
- Nm
- kNm
- Ft lbs

can be set.

For linear actuators, users can choose between N and kN.

## Configure

---

### Positioning Speed

Depending on actuator model selected, the following dimensions for linear actuators

- Ft/s
- m/s
- In/s
- mm/s

and for the part-turn actuators

- Rad/s
- Deg/s
- Grad/s

can be selected.

### Temperature

Select the temperature dimension.

Possible values: °C; °F; °R; K

## 10.8 Actuator-specific Data

Individual information can be called up or entered for the following components:

- Valve
- Certification
- Spare parts
- Documentation
- Stock of spare parts
- Service life

## 11 Service

### 11.1 Initial Setting



When configuring the device ensure that the actuator can move safely and that the mechanical settings correspond to user documentation.



A direction button pressed in the information and service field during configuration takes priority. The "Reset" button in the LCP must be pressed to continue configuration via the user interface.

When configuring the device, the operating range and the direction of the actuator is defined for the application (valve). The actuator can be positioned in two different ways as follows:

In single-step mode

In run/stop mode

#### Run/stop mode

Checkbox is disabled. The actuator moves when a button is pressed until the Stop button or other another direction button is pressed.

#### Single-step Mode

Checkbox is enabled. The actuator moves only as long as the respective button is pressed.

First click on one of the direction buttons. The actuator then moves in the selected direction. The actuator stops after a short delay when the <STOP> button is selected.

When the actuator reaches the desired position, click on the proper button (<Accept 0%> or <Accept 100%>) to define the position as 0% or 100%.

Click <Finish Adjustment> to save the specified positions.

### 11.2 Test

The test function allows users to obtain information about the status of the actuator, valve or connecting equipment (e.g. coupling rod). Select the function in the proper combo box prior to beginning the test. The actuator is not ready for operation while a test function is active.

The following tests are available:

- Torque/force measurement via 21 test points
- Running time via 21 test points
- Running time via test range
- Test of gearing backlash
- Brake test

The span between "Test Start" and "Test End" must be  $\geq 10\%$ .

The test results can be saved in HTML format or printed accordingly.

**Torque / Force (21 Values)**

Define the test range via the text fields "Test Start" and "Test End". After clicking <Start>, the actuator moves across the range divided into 21 equal sections and determines the force or torque at each point.

By comparing several results over a long period of time, sluggishness or other changes can be identified.

For technical reasons, the first and last values cannot be used in the analysis.

Results are displayed in graphical and table formats.

**Running Time (21 Values)**

Define the test range via the text fields "Test Start" and "Test End". After clicking <Start>, the actuator moves across the range divided into 21 equal sections and determines the time between two test points. Significant deviations between two measurement ranges indicate increased force/torque requirements.

Results are displayed in graphical and table formats.

**Running Time**

Define the test range via the text fields "Test Start" and "Test End". Select the speed at which the actuator should travel through the test range.

Options include:

- AUT
- MAN
- Characteristics
- Rapid Traverse

Click on <Start> to move the actuator into the selected start position and through the specified test range. This calculates the total time used for repeated measurements for purposes of comparison.

**Gearing Backlash**

The test of the gearing backlash provides a dimensionless numerical value. Repeated comparison measurements provide information about mechanical wear in the gearbox. First define the testing position in the proper text field. The position must be within the operating range and outside the limit value selected for possible end position behavior. Click <Start> to move the actuator into testing position. The gearing backlash is determined during a short change of travel direction.

**Brake Test**

This option checks the motor brake for sufficient holding torque. First define the testing position in the proper text field. The position must be within the operating range and outside the limit value selected for possible end position behavior. Click <Start> to move the actuator into testing position. The brake then locks the actuator in place and the motor produces a test torque. For a functional brake, the test result is "Holding force of brake o.k." If insufficient holding torque is detected, maintenance alarms are triggered. The alarms can be reset by a successful brake test.

**12 Window****Cascade**

Function similar to Windows operating system. Arranges the open windows in overlapping format.

**Vertically**

Function similar to Windows operating system. Arranges the open windows side by side.

**Horizontally**

Function similar to Windows operating system. Arranges the open windows above and below each other.

**12.1 ?****Contents**

Opens the online help. The online help can also be called up via F1.

**About CONTRAC**

Displays information about the DTM version.

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