



MDT-4000 REST API

Date: 8/30/2023

Rev: 1.1

Contents

INTRODUCTION

TOP-LEVEL ENDPOINTS

[/api/sys_info](#)

[/api/angle](#)

[/api/turns](#)

[/api/status](#)

MOTION COMMAND ENDPOINTS

[/api/cmd/step_cw](#)

[/api/cmd/step_ccw](#)

[/api/cmd/jog_cw](#)

[/api/cmd/jog_ccw](#)

[/api/cmd/goto_cw](#)

[/api/cmd/goto_ccw](#)

[/api/cmd/home_cw](#)

[/api/cmd/home_ccw](#)

[/api/cmd/stop](#)

OTHER COMMAND ENDPOINTS

[/api/cmd/set_user_zero](#)

[/api/cmd/enable_motion](#)

[/api/cmd/save_configs](#)

[/api/cmd/reset_configs](#)

CONFIGURATION ENDPOINTS

Jog Configuration Endpoints

[/api/config/jog/slow_speed/current](#)

[/api/config/jog/slow_speed/limits](#)

[/api/config/jog/slow_time/current](#)

[/api/config/jog/slow_time/limits](#)

[/api/config/jog/acceleration/current](#)
[/api/config/jog/acceleration/limits](#)
[/api/config/jog/max_speed/current](#)
[/api/config/jog/max_speed/limits](#)

Step Configuration Endpoints

[/api/config/step/step_size/current](#)
[/api/config/step/step_size/limits](#)
[/api/config/step/acceleration/current](#)
[/api/config/step/acceleration/limits](#)
[/api/config/step/max_speed/current](#)
[/api/config/step/max_speed/limits](#)

Goto Configuration Endpoints

[/api/config/goto/angle/current](#)
[/api/config/goto/angle/limits](#)
[/api/config/goto/acceleration/current](#)
[/api/config/goto/acceleration/limits](#)
[/api/config/goto/max_speed/current](#)
[/api/config/goto/max_speed/limits](#)

System Configuration Endpoints

[/api/config/system/max_torque/current](#)
[/api/config/system/max_torque/limits](#)
[/api/config/system/home_mode/current](#)

Other Configuration Endpoints

[/api/config/name/current](#)

Introduction

This documentation describes the different REST API endpoints used by the MDT-4000's web interface. The only REST methods used by the interface are GET and POST.

Top-Level Endpoints

/api/sys_info

GET-only endpoint describing the system information of the turntable in JSON.

REST Methods

GET

Returns a JSON-formatted string containing the following information:

Serial Number

Model

Firmware Version

Manufacturing Date

Sample Response

```
{
  "serial_number": "0800000001",
  "model": "MDT-4000",
  "firmware_version": "v1.0",
  "manufacture_date": "1/1/2020"
}
```

/api/angle

GET-only endpoint describing the turntable's current angle.

REST Methods

GET

Returns a number describing the turntable's angle within the current revolution with a resolution of 0.1 degrees. This value matches the one displayed on the front panel's display.

Sample Response

```
273.4
```

/api/turns

GET-only endpoint describing the current number of revolutions of the turntable.

REST Methods

GET

Returns a signed integer describing the turntable's current number of turns. This value matches the one displayed on the front panel's display.

Sample Response

```
-3
```

/api/status

GET-only endpoint describing the current status of the turntable.

REST Methods

GET

Returns one of the following strings describing the current status of the turntable:

"Idle"

"Jogging"

"Homing"

"ERROR: Motor Stall"

"ERROR: E-Stop Asserted"

Sample Response

```
Idle
```

Motion Command Endpoints

/api/cmd/step_cw

Endpoint for the “Step Clockwise” motion command

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

1

POST

Accepted Inputs

1 - Engages the “Step Clockwise” motion command.

0 - Stops any motion command in progress.

/api/cmd/step_ccw

Endpoint for the “Step Counter-clockwise” motion command

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

1

POST

Accepted Inputs

1 - Engages the “Step Counter-clockwise” motion command.

0 - Stops any motion command in progress.

/api/cmd/jog_cw

Endpoint for the “Jog Clockwise” motion command

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

1

POST

Accepted Inputs

1 - Engages the “Jog Clockwise” motion command.

0 - Stops any motion command in progress.

/api/cmd/jog_ccw

Endpoint for the “Jog Counter-clockwise” motion command

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

1

POST

Accepted Inputs

1 - Engages the “Jog Counter-clockwise” motion command.

0 - Stops any motion command in progress.

/api/cmd/goto_cw

Endpoint for the “Go To Clockwise” motion command

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

1

POST

Accepted Inputs

1 - Engages the “Go To Clockwise” motion command.

0 - Stops any motion command in progress.

/api/cmd/goto_ccw

Endpoint for the “Go To Counter-clockwise” motion command

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

1

POST

Accepted Inputs

1 - Engages the “Go To Counter-clockwise” motion command.

0 - Stops any motion command in progress.

/api/cmd/home_cw

Endpoint for the “Home Clockwise” motion command

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

1

POST

Accepted Inputs

1 - Engages the “Home Clockwise” motion command.

0 - Stops any motion command in progress.

/api/cmd/home_ccw

Endpoint for the “Home Counter-clockwise” motion command

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

1

POST

Accepted Inputs

1 - Engages the “Home Counter-clockwise” motion command.

0 - Stops any motion command in progress.

/api/cmd/stop

Endpoint for the “Stop” motion command

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

1

POST

Accepted Inputs

1 - Engages the “Stop” motion command.

0 - Stops any motion command in progress.

Other Command Endpoints

`/api/cmd/set_user_zero`

Command used to set the turntable's current position to 0.0°.

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

`0`

POST

Accepted Inputs

`1` - Sets the reference 0.0° position to be the current position.
This reference 0.0° position will be maintained across power cycles.

`0` - Resets the 0.0° position to align with the chassis' zero mark.
This reference 0.0° position will be maintained across power cycles.

/api/cmd/enable_motion

Command used to re-enable the turntable's motion after an error

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

0

POST

Accepted Inputs

1 - Re-enables motion.

/api/cmd/save_configs

Command used to save the current configuration values as the power-on defaults.

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

0

POST

Accepted Inputs

1 - Saves the current configuration values.

/api/cmd/reset_configs

Command used to factory reset the configuration values of the turntable.

REST Methods

GET

Returns an integer describing the Boolean state of the command.

Sample Response

0

POST

Accepted Inputs

1 - Factory resets the configuration values.

Configuration Endpoints

Jog Configuration Endpoints

/api/config/jog/slow_speed/current

Endpoint for the current configuration value of “Jog Slow Speed.”

REST Methods

GET

Returns a decimal describing the current configuration value to one decimal place.

Sample Response

1.6

POST

Accepted Inputs

All floating-point values within the range specified by /api/config/jog/jog_slow_speed/limits will be accepted. The turntable will round all inputs to this endpoint to one decimal place.

Sample Input

2.7

/api/config/jog/slow_speed/limits

GET-only endpoint describing the limits of the “Jog Slow Speed” configuration value.

REST Methods

GET

Returns a JSON-formatted string containing the limits of the configuration value.

Sample Response

```
{
  "maximum":5.0,
  "minimum":0.5,
}
```

/api/config/jog/slow_time/current

Endpoint for the current configuration value of “Jog Slow Time.”

REST Methods

GET

Returns an integer describing the current configuration value.

Sample Response

2

POST

Accepted Inputs

All floating-point values within the range specified by /api/config/jog/jog_slow_time/limits will be accepted. The turntable will round all inputs to this endpoint to an integer.

Sample Input

3

/api/config/jog/slow_time/limits

GET-only endpoint describing the limits of the “Jog Slow Speed” configuration value.

REST Methods

GET

Returns a JSON-formatted string containing the limits of the configuration value.

Sample Response

```
{
  "maximum":20,
  "minimum":1
}
```


/api/config/jog/acceleration/current

Endpoint for the current configuration value of “Jog Acceleration.”

REST Methods

GET

Returns an integer describing the current configuration value.

Sample Response

1

POST

Accepted Inputs

All floating-point values within the range specified by /api/config/jog/jog_acceleration/limits will be accepted.

The turntable will round all inputs to this endpoint to an integer.

Sample Input

2

/api/config/jog/acceleration/limits

GET-only endpoint describing the limits of the “Jog Acceleration” configuration value.

REST Methods

GET

Returns a JSON-formatted string containing the limits of the configuration value.

Sample Response

```
{
  "maximum":45,
  "minimum":1
}
```

/api/config/jog/max_speed/current

Endpoint for the current configuration value of “Jog Max Speed.”

REST Methods

GET

Returns an integer describing the current configuration value.

Sample Response

1

POST

Accepted Inputs

All floating-point values within the range specified by /api/config/jog/jog_max_speed/limits will be accepted. The turntable will round all inputs to this endpoint to an integer.

Sample Input

4

/api/config/jog/max_speed/limits

GET-only endpoint describing the limits of the “Jog Max Speed” configuration value.

REST Methods

GET

Returns a JSON-formatted string containing the limits of the configuration value.

Sample Response

```
{
  "maximum":18,
  "minimum":1
}
```

Step Configuration Endpoints

[/api/config/step/step_size/current](#)

Endpoint for the current configuration value of “Step Size.”

REST Methods

GET

Returns a number describing the current configuration value to one decimal place.

Sample Response

```
5.0
```

POST

Accepted Inputs

All floating-point values within the range specified by [/api/config/step/step_size/limits](#) will be accepted. The turntable will round all inputs to this endpoint to one decimal place.

Sample Input

```
12.3
```

/api/config/step/step_size/limits

GET-only endpoint describing the limits of the “Step Size” configuration value.

REST Methods

GET

Returns a JSON-formatted string containing the limits of the configuration value.

Sample Response

```
{
  "maximum":359.9,
  "minimum":0.5
}
```

[/api/config/step/acceleration/current](#)

Endpoint for the current configuration value of “Step Acceleration.”

REST Methods

GET

Returns an integer describing the current configuration value.

Sample Response

2

POST

Accepted Inputs

All floating-point values within the range specified by [/api/config/step/step_acceleration/limits](#) will be accepted.

The turntable will round all inputs to this endpoint to an integer.

Sample Input

12

/api/config/step/acceleration/limits

GET-only endpoint describing the limits of the “Step Acceleration” configuration value.

REST Methods

GET

Returns a JSON-formatted string containing the limits of the configuration value.

Sample Response

```
{
  "maximum":45,
  "minimum":1
}
```


/api/config/step/max_speed/current

Endpoint for the current configuration value of “Step Max Speed.”

REST Methods

GET

Returns an integer describing the current configuration value.

Sample Response

10

POST

Accepted Inputs

All floating-point values within the range specified by /api/config/step/step_max_speed/limits will be accepted.

The turntable will round all inputs to this endpoint to an integer.

Sample Input

5

/api/config/step/max_speed/limits

GET-only endpoint describing the limits of the “Step Max Speed” configuration value.

REST Methods

GET

Returns a JSON-formatted string containing the limits of the configuration value.

Sample Response

```
{
  "maximum":18,
  "minimum":1
}
```

Goto Configuration Endpoints

[/api/config/goto/angle/current](#)

Endpoint for the current value of the target angle used by the [goto cw](#) and [goto ccw](#) motion commands.

REST Methods

GET

Returns a floating-point value describing the current target angle with a resolution of 0.1 degrees.

Sample Response

```
274.9
```

POST

Accepted Inputs

All floating-point values within the range specified by [/api/config/goto/angle/limits](#) will be accepted. The turntable will round all inputs to this endpoint to the nearest 0.1.

Sample Input

```
344.6
```

/api/config/goto/angle/limits

GET-only endpoint describing the limits of the target angle used by the used by the [goto cw](#) and [goto ccw](#) motion commands.

REST Methods

GET

Returns a JSON-formatted string containing the limits of the configuration value.

Sample Response

```
{
  "maximum":359.9,
  "minimum":0
}
```

[/api/config/goto/acceleration/current](#)

Endpoint for the current configuration value of “Goto Acceleration.”

REST Methods

GET

Returns an integer describing the current configuration value.

Sample Response

2

POST

Accepted Inputs

All floating-point values within the range specified by [/api/config/goto/goto_acceleration/limits](#) will be accepted.

The turntable will round all inputs to this endpoint to an integer.

Sample Input

12

/api/config/goto/acceleration/limits

GET-only endpoint describing the limits of the “Goto Acceleration” configuration value.

REST Methods

GET

Returns a JSON-formatted string containing the limits of the configuration value.

Sample Response

```
{  
  "maximum":45,  
  "minimum":1  
}
```

/api/config/goto/max_speed/current

Endpoint for the current configuration value of “Goto Max Speed.”

REST Methods

GET

Returns an integer describing the current configuration value.

Sample Response

10

POST

Accepted Inputs

All floating-point values within the range specified by /api/config/goto/goto_max_speed/limits will be accepted.

The turntable will round all inputs to this endpoint to an integer.

Sample Input

5

/api/config/goto/max_speed/limits

GET-only endpoint describing the limits of the “Goto Max Speed” configuration value.

REST Methods

GET

Returns a JSON-formatted string containing the limits of the configuration value.

Sample Response

```
{  
  "maximum":18,  
  "minimum":1  
}
```


System Configuration Endpoints

[/api/config/system/max_torque/current](#)

Endpoint for the current configuration value of “Max Torque”

REST Methods

GET

Returns an integer describing the current configuration value.

Sample Response

6

POST

Accepted Inputs

All floating-point values within the range specified by [/api/config/system/max_torque/limits](#) will be accepted. The turntable will round all inputs to this endpoint to an integer.

Sample Input

10

/api/config/system/max_torque/limits

GET-only endpoint describing the limits of the “Max Torque” configuration value.

REST Methods

GET

Returns a JSON-formatted string containing the limits of the configuration value.

Sample Response

```
{
  "maximum":20,
  "minimum":3
}
```

/api/config/system/home_mode/current

Endpoint for the current configuration value of “Home Mode”

REST Methods

GET

Returns an integer enumerator describing the current configuration value. These integers map in the following way:

0 – Directional to Nearest Zero

1 – Direction-Independent Unwind to User Zero

Sample Response

0

POST

Accepted Inputs

This endpoint will only accept the integer values 0 and 1, as they correspond to the only valid homing modes.

Sample Input

0

Other Configuration Endpoints

/api/config/name/current

Endpoint for configuring the current friendly name of the turntable.

REST Methods

GET

Returns a string containing the current friendly name of the turntable.

Sample Response

```
"Testing Chamber 1"
```

POST

Accepted Inputs

All strings longer than 0 characters and no greater than 20 characters are accepted by this endpoint.

Sample Input

```
"Testing Chamber 2"
```

Document history

Version	Date	Changes
1.0	6/15/22	Initial document.
1.1	8/30/23	Update the step_size limit values.