

MKS Servo 42D documentation

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0 Table of contents

| | | |
|----------|-----------------------------------------|----------|
| 0 | Table of contents | 1 |
| 1 | MKS servo 42D UART used commands | 2 |
| 1.1 | Read parameter commands | 2 |
| 1.2 | Set parameter commands | 3 |
| 1.3 | Rotation control | 3 |
| 2 | My functions | 4 |

1 MKS servo 42D UART used commands

Typical frame:

| STM to MKS | | | |
|---------------|---------|------|------|
| 0 | 1 | ... | last |
| Slave address | command | data | CRC |

| MKS to STM | | |
|---------------|------|------|
| 0 | ... | last |
| Slave address | data | CRC |

Where CRC is control sum of other bytes.

1.1 Read parameter commands

Read encoder value (Command 0x30)

| STM to MKS | | |
|---------------|------|-----|
| 0 | 1 | 2 |
| Slave address | 0x30 | CRC |

| MKS to STM | | | | | | | |
|---------------|--------------------|---|---|-------------------------|---|---|-----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Slave address | rotations (int32t) | | | encoder value (uint16t) | | | CRC |

Angle calculation:

$$\theta = v * \frac{360^\circ}{2^{16} - 1}$$

v - encoder value

θ - angle

Read motor rotation (Command 0x36)

| STM to MKS | | |
|---------------|------|-----|
| 0 | 1 | 2 |
| Slave address | 0x36 | CRC |

| MKS to STM | | | | | |
|---------------|-------------------|---|---|---|-----|
| 0 | 1 | 2 | 3 | 4 | 5 |
| Slave address | position (int32t) | | | | CRC |

Angle calculation:

$$\theta = v * \frac{360^\circ}{2^{16} - 1}$$

v - encoder value

θ - angle

Read difference between expected and real angle (Command 0x39)

| STM to MKS | | |
|---------------|------|-----|
| 0 | 1 | 2 |
| Slave address | 0x39 | CRC |

| MKS to STM | | | |
|---------------|---------------------|---|-----|
| 0 | 1 | 2 | 3 |
| Slave address | difference (int16t) | | CRC |

Angle calculation:

$$\theta = v * \frac{360^\circ}{2^{16} - 1}$$

v - encoder value

θ - angle

1.2 Set parameter commands

Calibrate (Command 0x80)

| STM to MKS | | | |
|---------------|------|------|-----|
| 0 | 1 | 2 | 3 |
| Slave address | 0x80 | 0x00 | CRC |

| MKS to STM | | |
|---------------|-----------------|-----|
| 0 | 1 | 2 |
| Slave address | Status (uint8t) | CRC |

Status meaning:

0x01 - Calibration success

0x02 - Calibration fail

1.3 Rotation control

Enable move (Command 0xF3)

| STM to MKS | | | |
|---------------|------|--------------------|-----|
| 0 | 1 | 2 | 3 |
| Slave address | 0xF3 | isEnabled (uint8t) | CRC |

isEnabled meaning:

0x00 - disable (can't move)

0x01 - enable (can move)

| MKS to STM | | |
|---------------|-----------------|-----|
| 0 | 1 | 2 |
| Slave address | Status (uint8t) | CRC |

Status meaning:

0x00 - set failed

0x01 - set success

Rotate (given only speed) (Command 0xF6)

| STM to MKS | | | |
|---------------|------|-------|-----|
| 0 | 1 | 2 | 3 |
| Slave address | 0xF6 | speed | CRC |

| MKS to STM | | |
|---------------|-----------------|-----|
| 0 | 1 | 2 |
| Slave address | Status (uint8t) | CRC |

Speed table:

| Speed bytes | |
|-------------|------------------|
| 0 | 1-7 |
| dir | value (unsigned) |

Status meaning:

0x00 - set failed

0x01 - set success

Rotate (given angle and speed)(Command 0xFD)

| STM to MKS | | | | | | | |
|---------------|------|-------|--------|---|---|-----|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Slave address | 0xFD | speed | pulses | | | CRC | |

| MKS to STM | | |
|---------------|-----------------|-----|
| 0 | 1 | 2 |
| Slave address | Status (uint8t) | CRC |

Speed table:

| Speed bytes | |
|-------------|------------------|
| 0 | 1-7 |
| dir | value (unsigned) |

Pulses calculation:

$$\theta = p * \frac{3200}{360^\circ}$$

p - pulses

θ - angle

Status meaning:

0x00 - set failed

0x01 - set success

Stop rotation (Command 0xF7)

| STM to MKS | | |
|---------------|------|-----|
| 0 | 1 | 2 |
| Slave address | 0xF7 | CRC |

| MKS to STM | | |
|---------------|-----------------|-----|
| 0 | 1 | 2 |
| Slave address | Status (uint8t) | CRC |

Status meaning:

0x00 - stop failed

0x01 - stop success

2 My functions