

# MDrive Plus / MForce CANopen - Sample Programs

1. Profile Position Mode
2. Profile Velocity Mode
3. Homing Mode

## 1. Profile Position Mode

This program sample demonstrates the different move types supported for position control executed via SDOs.

IMS products support relative and absolute moves to position.

Using either relative or absolute moves, the user can also select (by the control word data) if the target position should be reached before another target position is allowed (finish first) or if the IMS product should execute a newly received target position even if still in motion (immediate).

The below example sets typical motion profile commands a system would configure<sup>1</sup>, enabling the motor power<sup>2</sup> and the four different move types<sup>3</sup> supported in Profile Position Mode using SDOs with Node ID 41h.

*Notes:*

1. Typical motion profile commands could be set each time on power up from host or set using a configuration file and stored to NVM once.
2. Enabling the motor power only has to be done once on power up.
3. The Control Word data selects the move type.

### **Typical motion profile commands and enabling motor power –**

\*\*\*\*\* Typical Motion Parameters \*\*\*\*\*

```
>> Id=0641, Rtr=00, Data= 2F 04 22 00 50 00 00 00 'Set run current to 80%
>> Id=0641, Rtr=00, Data= 23 84 60 00 40 42 0F 00 'Set deceleration to 1M steps/sec^2
>> Id=0641, Rtr=00, Data= 23 83 60 00 40 42 0F 00 'Set acceleration to 1M steps/sec^2
>> Id=0641, Rtr=00, Data= 23 81 60 00 00 D0 07 00 'Set max velocity to 512K steps/sec
```

\*\*\*\*\* Enable motor power – DSP402 state machine \*\*\*\*\*

```
>> Id=0641, Rtr=00, Data= 2B 40 60 00 06 00 00 00 'Ready to Switch on
>> Id=0641, Rtr=00, Data= 2B 40 60 00 07 00 00 00 'Switched on
>> Id=0641, Rtr=00, Data= 2B 40 60 00 0F 00 00 00 'Operation Enable
```

\*\*\*\*\* Set to Profile Position Mode \*\*\*\*\*

```
>> Id=0641, Rtr=00, Data= 2F 60 60 00 01 00 00 00 'Set to Profile Position Mode
```

### **Move Absolute (finish first) –**

```
>> Id=0641, Rtr=00, Data= 23 7A 60 00 30 75 00 00 'Set Target Position to 30K steps
>> Id=0641, Rtr=00, Data= 2B 40 60 00 1F 00 00 00 'Set Control Word bit 4 to 1
>> Id=0641, Rtr=00, Data= 2B 40 60 00 0F 00 00 00 'Set Control Word bit 4 to 0
```

### **Move Absolute (immediate) –**

```
>> Id=0641, Rtr=00, Data= 23 7A 60 00 B8 0B 00 00 'Set Target Pos to 3K steps
>> Id=0641, Rtr=00, Data= 2B 40 60 00 3F 00 00 00 'Set Control Word bit 4 to 1
>> Id=0641, Rtr=00, Data= 2B 40 60 00 2F 00 00 00 'Set Control Word bit 4 to 0
```

### **Move Relative (finish first) –**

```
>> Id=0641, Rtr=00, Data= 23 7A 60 00 A0 86 01 00 'Set Target Position to 100K steps
>> Id=0641, Rtr=00, Data= 2B 40 60 00 5F 00 00 00 'Set Control Word bit 4 to 1
>> Id=0641, Rtr=00, Data= 2B 40 60 00 4F 00 00 00 'Set Control Word bit 4 to 0
```

### **Move Relative (immediate) –**

```
>> Id=0641, Rtr=00, Data= 23 7A 60 00 B8 0B 00 00 'Set Target Position to 3K steps
>> Id=0641, Rtr=00, Data= 2B 40 60 00 7F 00 00 00 'Set Control Word bit 4 to 1
>> Id=0641, Rtr=00, Data= 2B 40 60 00 6F 00 00 00 'Set Control Word bit 4 to 0
```

## 2. Profile Velocity Mode

This program sample demonstrates the ability to move at constant velocity using SDOs.

IMS products support the ability to move in velocity mode. Once in Profile Velocity Mode, any new target velocity will be executed immediately.

The below example sets typical motion profile commands a system would configure<sup>1</sup>, enabling the motor power<sup>2</sup> and sending a new target velocity using SDOs with Node ID 41h.

### *Notes:*

1. Typical motion profile commands could be set each time on power up from host or set using a configuration file and stored to NVM once.
2. Enabling the motor power only has to be done once on power up.

### **Typical motion profile commands and enabling motor power –**

\*\*\*\*\* Typical Motion Parameters \*\*\*\*\*

>> Id=0641, Rtr=00, Data= 2F 04 22 00 50 00 00 00 'Set run current to 80%

>> Id=0641, Rtr=00, Data= 23 84 60 00 40 42 0F 00 'Set deceleration to 1M steps/sec^2

>> Id=0641, Rtr=00, Data= 23 83 60 00 40 42 0F 00 'Set acceleration to 1M steps/sec^2

\*\*\*\*\* Enable motor power – DSP402 state machine \*\*\*\*\*

>> Id=0641, Rtr=00, Data= 2B 40 60 00 06 00 00 00 'Ready to Switch on

>> Id=0641, Rtr=00, Data= 2B 40 60 00 07 00 00 00 'Switched on

>> Id=0641, Rtr=00, Data= 2B 40 60 00 0F 00 00 00 'Operation Enable

\*\*\*\*\* Set to Profile Velocity Mode \*\*\*\*\*

>> Id=0641, Rtr=00, Data= 2F 60 60 00 03 00 00 00 'Set to Profile Velocity Mode

### **Send new Target Velocity –**

>> Id=0641, Rtr=00, Data= 23 FF 60 00 50 C3 00 00 'Target Velocity 50K

### 3. Homing Mode

This program sample demonstrates home method 18 decimal using SDOs.

IMS products support the ability to move in velocity mode. Once in Profile Velocity Mode, any new target velocity will be executed immediately.

The below example sets typical motion profile commands a system would configure<sup>1</sup>, enabling the motor power<sup>2</sup> and executing a homing function using SDOs with Node ID 41h.

#### Notes:

1. Typical motion profile commands and configuring I/O could be set each time on power up from host or set using a configuration file and stored to NVM once.
2. Enabling the motor power only has to be done once on power up.

#### Typical motion profile commands and enabling motor power –

\*\*\*\*\* Typical Motion Parameters \*\*\*\*\*

```
>> Id=0641, Rtr=00, Data= 2F 04 22 00 50 00 00 00 'Set run current to 80%
>> Id=0641, Rtr=00, Data= 23 84 60 00 40 42 0F 00 'Set deceleration to 1M steps/sec^2
>> Id=0641, Rtr=00, Data= 23 83 60 00 40 42 0F 00 'Set acceleration to 1M steps/sec^2
```

\*\*\*\*\* Enable motor power – DSP402 state machine \*\*\*\*\*

```
>> Id=0641, Rtr=00, Data= 2B 40 60 00 06 00 00 00 'Ready to Switch on
>> Id=0641, Rtr=00, Data= 2B 40 60 00 07 00 00 00 'Switched on
>> Id=0641, Rtr=00, Data= 2B 40 60 00 0F 00 00 00 'Operation Enabled
```

\*\*\*\*\* Set to Homing Mode \*\*\*\*\*

```
>> Id=0641, Rtr=00, Data= 2F 60 60 00 06 00 00 00 'Homing mode
```

#### Configure I/O and Homing Method

\*\*\*\*\* Configure I/O - InOut, SnkSrc, Polarity, Type and Filter \*\*\*\*\*

```
>> Id=0641, Rtr=00, Data=22 00 20 01 00 00 00 00 'Set I/O as Inputs
>> Id=0641, Rtr=00, Data=22 00 20 02 00 00 00 00 'Set I/O as Sinking
>> Id=0641, Rtr=00, Data=22 00 20 04 01 00 00 00 'Set I1 Polarity
>> Id=0641, Rtr=00, Data=22 02 20 01 01 00 00 00 'Set I1 as Home Input
>> Id=0641, Rtr=00, Data=22 06 20 01 0A 00 00 00 'Set I1 filter to 10mSec
```

\*\*\*\*\* Set Homing Method, Offset and Speeds \*\*\*\*\*

```
>> Id=0641, Rtr=00, Data= 22 98 60 00 13 00 00 00 'Homing Method 19 decimal
>> Id=0641, Rtr=00, Data= 2F 98 20 00 01 00 00 00 'Apply Home Offset to position counter
>> Id=0641, Rtr=00, Data= 22 7C 60 00 00 00 00 00 'Home Offset value = 0
>> Id=0641, Rtr=00, Data= 22 99 60 01 00 C8 00 00 'Home Speed Fast
>> Id=0641, Rtr=00, Data= 22 99 60 02 00 14 00 00 'Home Speed Slow
```

#### Start Homing

```
>> Id=0641, Rtr=00, Data= 2B 40 60 00 1F 00 00 00 'Start homing
```

after Home switch is toggled

```
>> Id=0641, Rtr=00, Data= 2B 40 60 00 00 00 00 00 'Stop homing
```

Source: [http://www.imshome.com/support/canopen\\_code\\_samples.html](http://www.imshome.com/support/canopen_code_samples.html)



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