

Lexium MDrive CANopen

Manufacturer profile: Encoder Following Mode

Addendum to User's Manual

LMDXA-2018-001

Changelog

01/23/2018 Initial release

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric Motion USA nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

No part of this document may be reproduced in any form or by any means, electronic or mechanical, including photocopying, without express written permission of Schneider Electric Motion USA.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

© 2018 Schneider Electric Motion USA. All rights reserved.

Page intentionally left blank

CANopen Encoder Following Mode

1 Scope

This addendum covers CANopen manufacturer profile: Manual Encoder Input Mode, which allows for the use of an externally supplied encoder signal to be input to the Lexium MDrive inputs 3 and 4 and used in applications requiring encoder following.

1.1 Related documents

This document is to be used in conjunction with the following documents:

- [LM42 CANopen IP20 hardware manual](#)
- [LM42 CANopen IP65 hardware manual](#)
- [LM57/85 CANopen IP20 hardware manual](#)
- [LM57/85 CANopen IP65 hardware manual](#)
- [LMD CANopen DS301/DSP402 Implementation](#)

2 Connection

2.1 Requirements

1. (1) LMD CANopen with NodeID and BAUD rate configured
2. (1) Rotary encoder
3. (2) 0.1 μ F capacitors
4. (2) power supplies (+VDC and +12 to +24 VDC for encoder power)
5. (1) Network connection or USB to CANopen converter such as MD-CC50x-000

2.2 Connecting

Connect the rotary encoder to the Lexium MDrive inputs as illustrated in Figure 1 below:

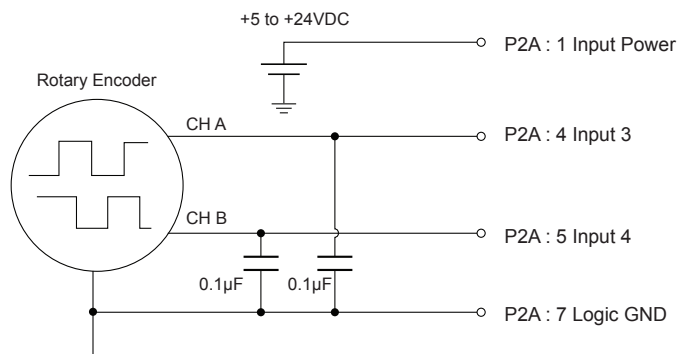


Figure 1 - Connecting a rotary encoder to the Lexium MDrive

3 Profile: Encoder Following Mode

Encoder following mode is a manufacturer Profile for CANopen CiA 402 allowing for motion based upon input from an encoder to inputs 3 and 4 on the Lexium MDrive CANopen products.

Index 2231h holds 8 sub-indexes containing the following mode parameters which are:

1. Direction of rotation
2. Sample rate
3. Target reached delay time
4. Minimum threshold
5. Minimum Move distance per sample
6. Maximum move distance per sample
7. Gain amount
8. Gain rate

3.1 Mode of operation (6060h)

Object description

Index	6060 _h
Name	Mode of operation
Object code	VAR
Data type	Integer8
Category	Optional

Entry description

Sub-index	00 _h
Access	rw
PDO mapping	No
Value	1, 3, 4, 6, 8 or -4
Default value	1

Value	Meaning
1	Profile Position
3	Profile Velocity
4	Torque (closed loop only)
6	Homing
8	Cyclic Sync Position
-4	Encoder Following

3.2 Mode of operation display (6061h)

The Modes of Operation Display shows the current mode of operation. The meaning of the returned value corresponds to that of the Modes of Operation option code (index 6060h).

<i>Object description</i>	Index	6061 _h
	Name	Mode of operation display
	Object code	VAR
	Data type	Integer8
	Category	Optional
<i>Entry description</i>	Sub-index	00 _h
	Access	ro
	PDO mapping	Yes
	Value range	1, 3, 4, 6, 8 or -4
	Default value	1

3.3 Following mode control (2231h)

Index 2231h has 8 sub-indexes which may be used to tune the motor's response to the encoder input. The graph in Figure 2 shows how each sub-index impacts the move profile. Every sample period, a relative move is sent to the controller per Figure 2. Default values shown on graph.

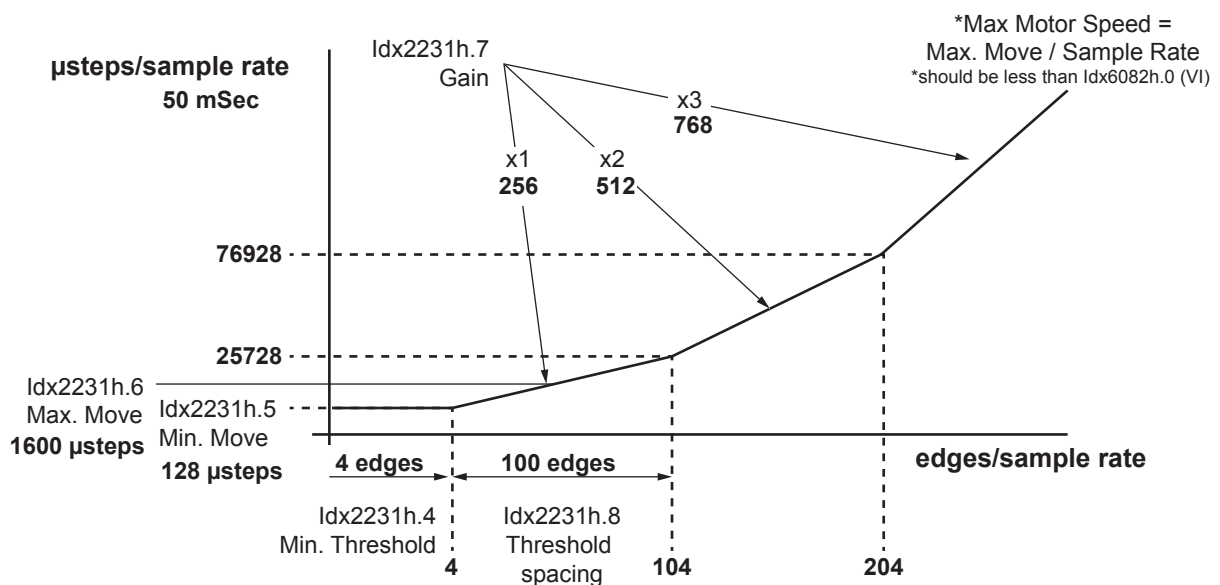


Figure 2 - Index 2231h parameters

<i>Object description</i>	Index	2231 _h
	Name	Encoder following mode control
	Object code	ARRAY
	Data type	—
	Category	Optional
<i>Entry description</i>	Sub-index	00 _h
	Name	Number of entries
	Access	ro
	PDO mapping	—
	Value range	—
	Default value	08 _h
	Sub-index	01 _h
	Name	Direction of rotation
	Description	Sets the default rotational direction of the motor.
	Access	rw
	PDO mapping	—
	Value range	00 _h - CW 80 _h - CCW
	Default value	00 _h
	Sub-index	02 _h
	Name	Sample rate
Description	Sets the time in milliseconds which the input is sampled.	
Access	rw	
PDO mapping	—	
Value range	Unsigned16	
Default value	50 _d	
Sub-index	03 _h	
Name	Target reached delay time	
Description	Sets the time in milliseconds which the Lexium MDrive will delay before triggering the target reached status bit (6041h bit 10).	
Access	rw	
PDO mapping	—	
Value range	Unsigned16	
Default value	1000 _d	

Sub-index	04 _h
Name	Minimum Threshold
Description	Sets the number of encoder counts required to activate x1 gain. At or below this value will result in a minimal move of 4 μ steps/encoder edge.
Access	rw
PDO mapping	—
Value range	Signed16
Default value	4 _d
Sub-index	05 _h
Name	Minimum Move
Description	Defines the minimum distance in μ steps the motor will move provided the encoder count is greater than zero.
Access	rw
PDO mapping	—
Value range	Signed16
Default value	128 _d
Sub-index	06 _h
Name	Maximum Move
Description	Defines the maximum distance in μ steps the motor will move within the specified sample time.
Access	rw
PDO mapping	—
Value range	Signed16
Default value	1600 _d
Sub-index	07 _h
Name	Gain
Description	The gain (μ Steps/Encoder counts) that will occur between the min, and max move values. There are 3 thresholds of gain (x1, x2, and x3). Based on the Encoder In threshold levels, the gain will be incremented for the various thresholds. This gives variable gain potential.
Access	rw
PDO mapping	—
Value range	Signed16
Default value	256 _d

Sub-index	08 _h
Name	Threshold spacing
Description	Sets the various thresholds, in encoder edges, for encoder inputs. Meaning the smaller the number the faster the gain will increase, and in turn the faster you turn the faster the motor will move.
Access	rw
PDO mapping	—
Value range	Signed16
Default value	100 _d

WARRANTY

Reference the web site at www.motion.schneider-electric.com for the latest warranty and product information.

USA SALES OFFICES

East Region

Tel. 610-573-9655
e-mail: e.region@imshome.com

Northeast Region

Tel. 860-368-9703
e-mail: n.region@imshome.com

Central Region

Tel. 630-267-3302
e-mail: c.region@imshome.com

Western Region

Tel. 602-578-7201
e-mail: w.region@imshome.com

EUROPEAN SALES MANAGEMENT

Tel. +33/4 7256 5113 – Fax +33/4 7838 1537
e-mail: europa.sales@imshome.com

TECHNICAL SUPPORT

Tel. +00 (1) 860-295-6102 – Fax +00 (1) 860-295-6107
e-mail: etech@imshome.com

Schneider Electric Motion USA

370 N. Main Street
Marlborough, CT 06447 USA

www.motion.schneider-electric.com

Owing to changes in standards and equipment, the characteristics given in the text and images in this document are not binding until they have been confirmed with us.

Print: Schneider Electric Motion USA
Photos: Schneider Electric Motion USA

Date :01/2018