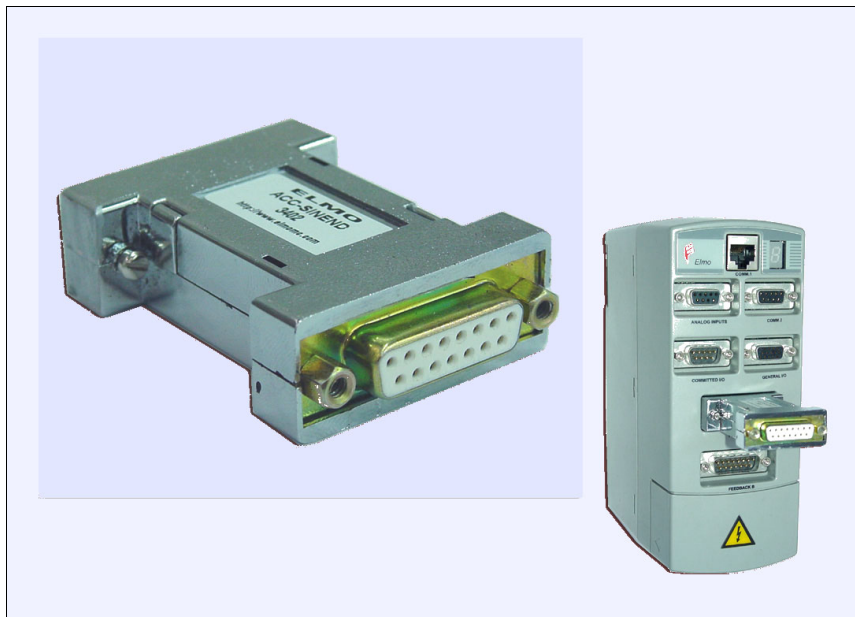


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# Single-ended to Differential Outputs Encoder Converter

## User Guide



November 2002

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- This guide contains proprietary information belonging to Elmo Motion Control Ltd. Such information is supplied solely for the purpose of assisting users of the Single-ended Encoder converter, in conjunction with the Elmo Harmonica, Saxophone, Mini-Saxophone and Clarinet servo drives.
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## 1. Introduction

The Elmo Single-ended to Differential Outputs encoder converter complements the capabilities of Elmo digital servo drives, enabling them to operate with non-differential encoders as well as encoders with differential outputs. The converter receives single-ended signals and converts them to differential signals for input to the drives. The original signal type — whether differential or single-ended — is therefore transparent to the drive.

The Single-ended to Differential Outputs converter connects directly into the appropriate Feedback connector of the drive, using the 15-pin male connector. Connecting the converter is easy: with the Saxophone and Mini-Saxophone drives, you simply plug it into the Feedback A connector. With the Clarinet drive, you plug it into the Encoder connector and with the Harmonica drive, you add a connector cable.



**Single-ended to Differential Outputs Converter, Mounted**

## 2. Pinout

The Single-ended Encoder converter contains two connectors:

- A 15-pin male D-type connector
- A 15-pin female D-type connector

### 2.1 Male D-type Connector

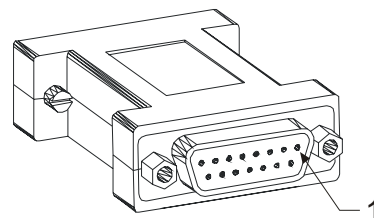
The 15-pin male D-type connector connects directly to the Feedback A connector of the Saxophone or Mini-Saxophone drive or to the encoder connector of the Clarinet, as follows:

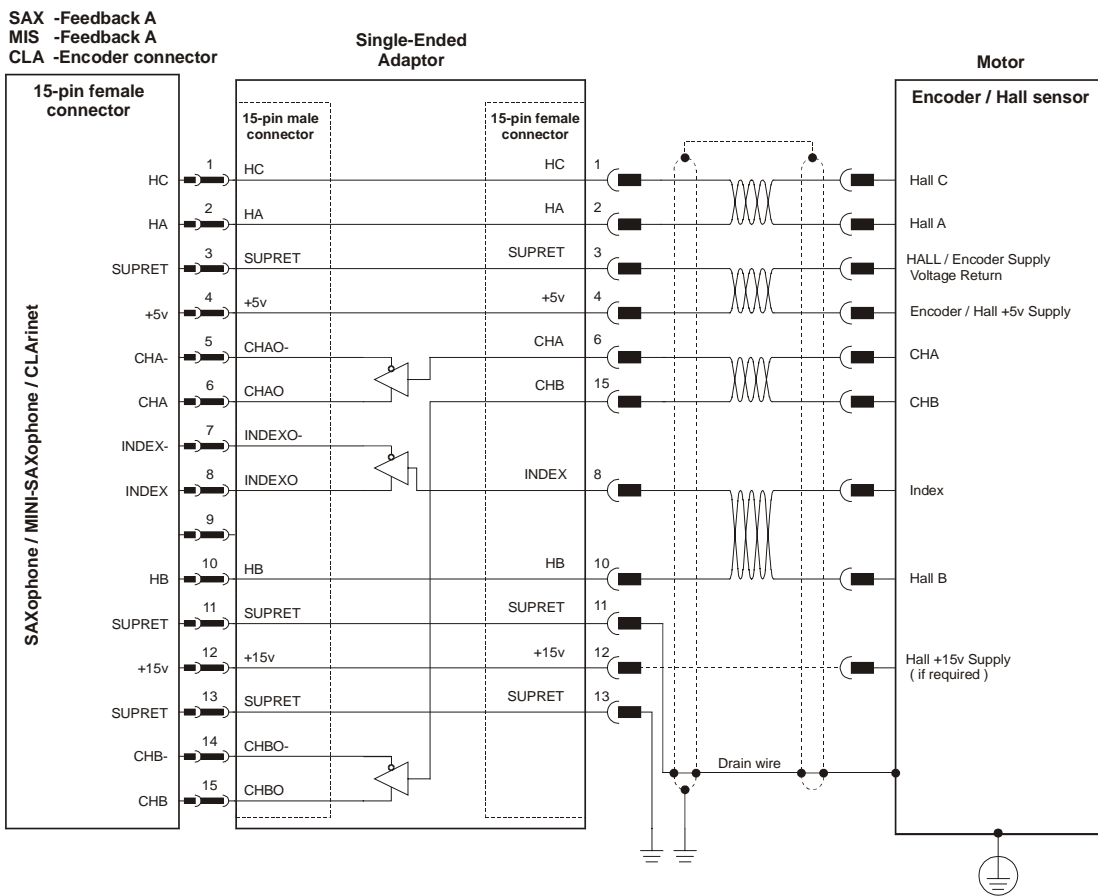
Pin	Signal	Function
1	HC	Hall sensor C output
2	HA	Hall sensor A output
3	SUPRET	Input supply voltage return for Hall sensor / encoder
4	+5V	+5V input supply voltage for Hall sensor /encoder
5	CHAO-	Channel A complement output
6	CHAO	Channel A output
7	INDEXO-	Index complement output
8	INDEXO	Index output
9		
10	HB	Hall sensor B output
11	SUPRET	Supply return
12	+15V	+15V input supply voltage for Hall sensor
13	SUPRET	Supply return
14	CHBO-	Channel B complement output
15	CHBO	Channel B output

## 2.2 Female D-type Connector

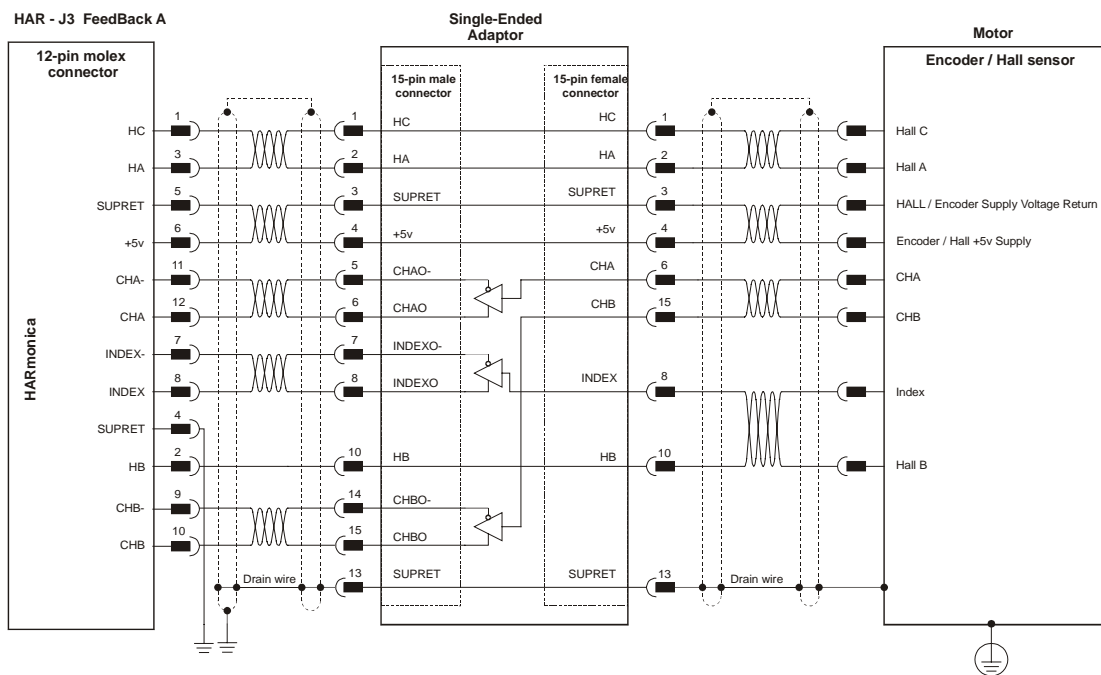
The 15-pin female D-type connector is used for user input, as follows:

Pin	Signal	Function
1	HC	Hall sensor C input
2	HA	Hall sensor A input
3	SUPRET	Output supply voltage return for Hall sensor / encoder
4	+5V	+5V output supply voltage for Hall sensor / encoder
5		
6	CHA	Channel A input
7		
8	INDEX	Index input
9		
10	HB	Hall sensor B input
11	SUPRET	Supply return
12	+15V	+15V output supply voltage for Hall sensor
13	SUPRET	Supply return
14		
15	CHB	Channel B input





**Connection Diagram for Saxophone, Mini-Saxophone and Clarinet**



**Connection Diagram for Harmonica**

### 3. Installation

Connect the Single-ended Encoder converter according to the following table:

Elmo Drive	Connector	Cable	Input Connector
Saxophone	Feedback A	None	15-pin female D-type
Mini-Saxophone	Feedback A	None	15-pin female D-type
Clarinet	Encoder	None	15-pin female D-type
Harmonica	J3 (Feedback A)	Required	12-pin Molex type

With the Saxophone and Mini-Saxophone, the Feedback A connector pins used for other functions are connected with full compatibility to the input connector of the encoder converter so that the pinout and connector type are identical to the Feedback A pinout of the Saxophone or Mini-Saxophone. With the Clarinet, the encoder pins used for other functions are connected in a similar manner to the input connector of the single-ended encoder converter so that the pinout and connector type are identical to the encoder pinout of the Clarinet drive.

## 4. Technical Specifications

Single-ended encoder input interface:

Feature	Details
Encoder type	Quadrature single-ended
Maximum absolute incremental encoder frequency	400 KHz single
Encoder supply voltage	5V $\pm$ 5%
Hall effect supply voltage	5V $\pm$ 5% or 15V $\pm$ 15%
Encoder supply current (pin 4 of Feedback A and B)	300 mA maximum (total for both 5V supplies of Feedback A and Feedback B)
Hall effect supply current	50 mA maximum
High-level input voltage	$2\text{ V} \leq V_{in} \leq 5\text{ V}$
Low-level input voltage	$-1\text{ V} \leq V_{il} \leq 1\text{ V}$
Weight	30 g
<b>Dimensions (W x H x L):</b>	<b>41.5 x 16.0 x 62.0 mm</b> <b>(1.63 x 0.63 x 2.44 in)</b>

