AMKASYN
Servo inverter KE/KW
Option card description
Encoder Interface KW-EN1

Version: 2017/37
Part no.: 200981

Translation of the "Original Dokumentation"

About this documentation

Name: PDK_200981_KW_Option_EN1_en

Use:

What has changed:

Version	Change	Subject	Letter symbol
2006/16			
2008/44		first Flare version	Bls
2017/37	Maximum input frequency added	Power supply encoder	StL

Further Documentation:

Target group:

Representation agreement:

Reservation: We reserve the right to modify the content of the documentation as well as the delivery options for the product.

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For fast and reliable troubleshooting, you can help us by informing our Customer Service about the following:

- Type plate data for each unit
- Software version
- Device configuration and application
- Type of fault/problem and suspected cause
- Diagnostic messages (error messages)

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Content

1 Option interface card KW-EN1 „Encoder Interface“

The controller card KW-R03 and KW-R03P from Firmware AE-R03 V03.11 2005/38 (Part No. 201003) and AE-R03 V05.11 2005/38 (Part No.: 201004) supports the option card KW-EN1 „Encoder Interface“.

A second absolute measuring system with additional sine / cosine tracks can be connected via the KW controller card by installation of KW interface option card “Encoder Interface”. Through this direct actual position feedback can be provided e. g. from an absolute coded linear scale. At present only measuring systems with EnDat interface are permissible.

The position controller sampling time is 0.5ms.

On this additional EnDat encoder the functionality “Motor data base” is not used!

Two binary inputs (24V DC, optically isolated) are available on the option card:

The “Touch probe function” related to the second position feedback system is realized through measuring input “TPI” (X87) on the “Encoder interface” card.

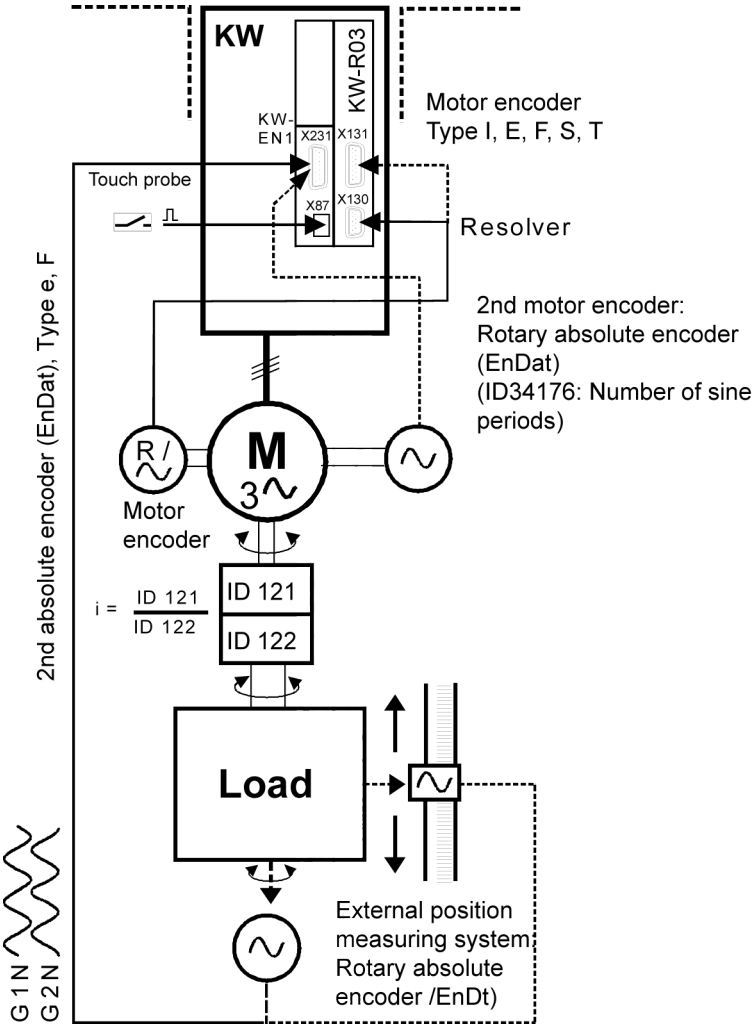
Binary input 2 (X88):Reserved.

Option slot 1 or 2 can be used to install the option card on the KW-R03 controller card.

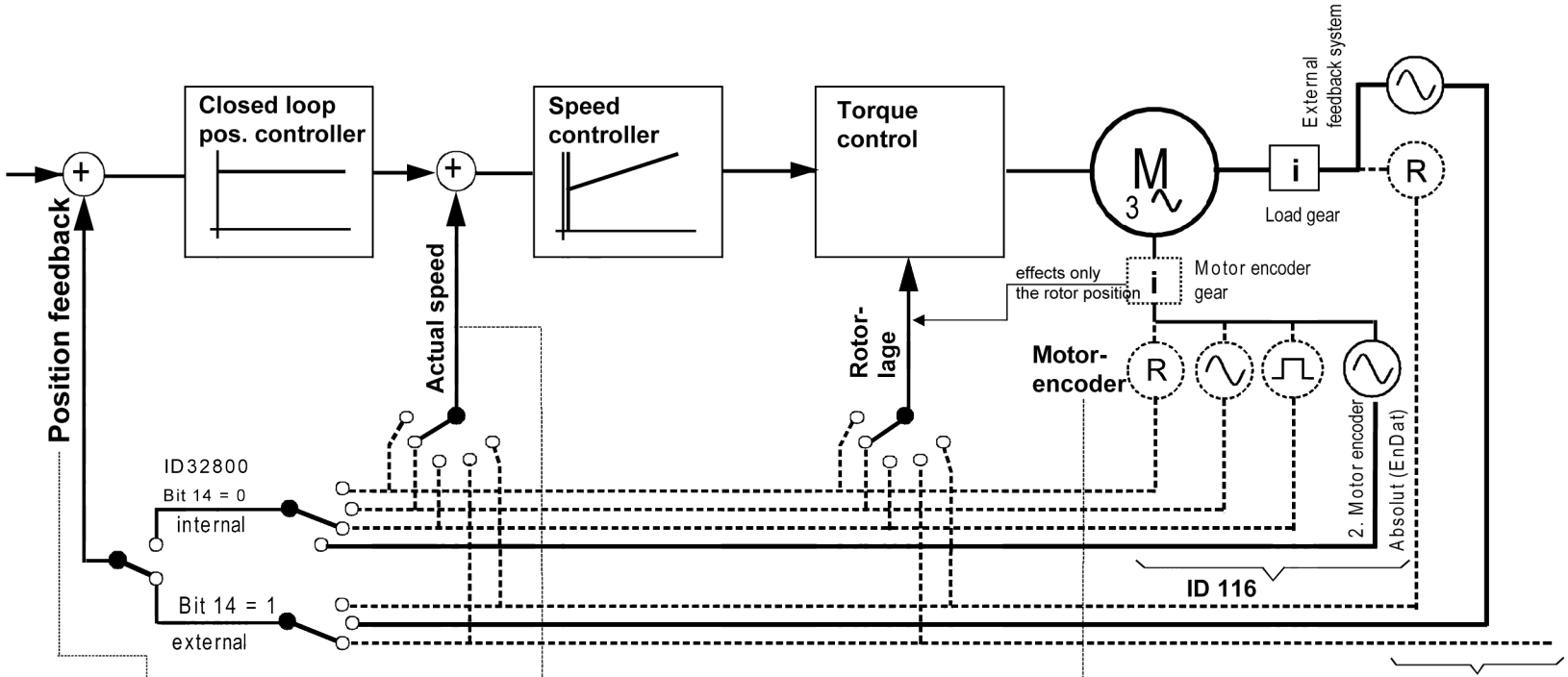
The measuring system connected to the option card must be defined in ID32953, nibble 3 (refer to “Parameter setting”).

In the operating mode parameter internal or external position feed back must be specified depending on the mechanical arrangement of the second measuring system.

1.1 Application of the option card „Encoder interface“:



1.2 Encoders assignment (with option card „Encoder interface“) via ID32953:



ID 32953 :

" Encoder type ", hex value per Nibble

Nibble 3 (Bit 15 ... 12)	Nibble 2 (Bit 11 ... 8)	Nibble 1 (Bit 7 ... 4)	Nibble 0 (Bit 3 ... 0)
Position feedback encoder	**Speed feedback encoder**	**Motor model**	**Motor encoder**
0 : as a motor encoder 1 : 2 : T type encoder (RS485) 3 : reserved 4 : 5 : I type encoder 6 : reserved 7 : S type encoder (RS485) 8 : Resolver 9 : Square wave encoder A : E, F type encoder (EnDat) **B : from option KW-EN1**	0 : as motor encoder 1 : 2 : T type encoder (RS485) 3 : reserved 4 : 5 : I type encoder 6 : reserved 7 : S type (RS485) 8 : Resolver 9 : Square wave encoder A : E, F type encoder (EnDat)	0 : Asynchronuos motor 1 : Synchronous motor DS / DT 2 : U / f - control 3 : Synchronous motor (DS) with field weakening	0 : I type encoder (Default) 1 : 2 : T type encoder (Multi turn, RS485) 3 : reserverd 4 : 5 : I type encoder 6 : reserved 7 : S type encoder (Single turn, RS485) 8 : Resolver 9 : Square wave encoder A : E, F type encoder (EnDat)

1.3 Description / Technical data KW-EN1

1.3.1 Power supply

Electronics:	5V from the KW switch mode power supply through the bus connection on the controller card.
Encoder /: feedback system	+5V; max. 350mA (5V: Pin 7, GND: Pin 8) for second encoder, type E, F, (absolute encoder with Endat interface and additional sine / cosine signals), via 15 pole, female D-SUB connector X231. Maximum input frequency 200 kHz. Additionally the encoder line drop is sensed at pin 13 (5V sensor) / pin 14 (GND sensor). If necessary the encoder supply voltage is re-adjusted. By this the maximum permissible encoder cable length may be 50m. Internally the 5V supply voltage is generated by a voltage controller from the external 24V supply.
Binary inputs, voltage controller:	24VDC, ±15% (approx. 1,7A) At X08 24VDC must be applied from external to supply the voltage controllers (5V EnDat / 9V, prepared for S / T type encoder) and the binary inputs. The binary inputs are connected to connectors X87 and X88. At pin 3 the probe / switch signal is measured each. The probe / switch power supply is provided through pin 1 (GND) and pin 2 (+24V) each. The touch probe must be connected to X87 (three wire connection). X88: Reserved (intended for configurable binary input).

1.3.2 Connectors pin assignment

Supply voltage X08 (external 24VDC, approx. 1,7A)
Phoenix 1 row MiniCombicon, 2 pole, male

PIN	Signal	Typ	Bedeutung
1	GND	IN	Ground
2	+24V	IN	24V extern

Encoder connector X231
15 pole D-SUB, female

Pin	EnDat- signals	Encoder signals (KW)	Meaning
1	-	(G0I)	(Reference pulse, inverted)
2	-	(G0N)	(Reference pulse not inverted)
3	A-	G1I	Sine, inverted
4	A+	G1N	Sine not inverted
5	B-	G2I	Cosine inverted
6	B+	G2N	Cosine not inverted
7	Up	5V	+5V encoder supply voltage (max. 350mA)
8	0V	GND	Ground
9	DATA-	-EN_DAT	EnDat data, inverted
10	DATA+	+EN_DAT	EnDat data, not inverted
11	CLOCK-	-EN_CLK	EnDat clock, inverted
12	CLOCK+	+EN_CLK	EnDat clock, not inverted
13	Up Sensor	5V	5V sensor
14	0V Sensor	GND	Ground sensor
15	-	-	-
Kabelschirm auf Gehäuse			

Binary inputs X87 / X88
Phoenix 1 row MiniCombicon, 3 pole, male

Pin X87 / X88	Signal	Type	Meaning
1	GND	OUT	Ground
2	+24V	OUT	24V (internal, from X08) *
3	X87: TPI X88: reserved	IN IN	Touch probe input (24VDC, ±15%)

* Maximum output current at pin 2: 450mA

1.3.3 Parameter setting

The option card KW-EN1 must be activated as actual position source by entry of „Bhex“ in nibble 3 of ID32953 → Bxxxh.

In ID 32811 “Encoder type option card” the encoder type of the actual position feedback source which is connected to the option card must be specified (at present “Ahex” for EnDat encoders type E, F).

For a rotative absolute encoder the number of sine periods of this encoder must be entered in ID34176 (at present “512” for EnDat encoders).

For an external position feedback system (bit 14 = 1 in ID32800) the relation between linear scale and drive is made by ID123 “Feed constant”

The slide travel per motor turn respectively per gear output turn if additionally a gear is used must be entered in ID123. On a ball screw drive system this corresponds to the ball screw pitch. The gear ratio has to be specified by ID121 “Gear input revolutions” and ID122 “gear output revolutions”.

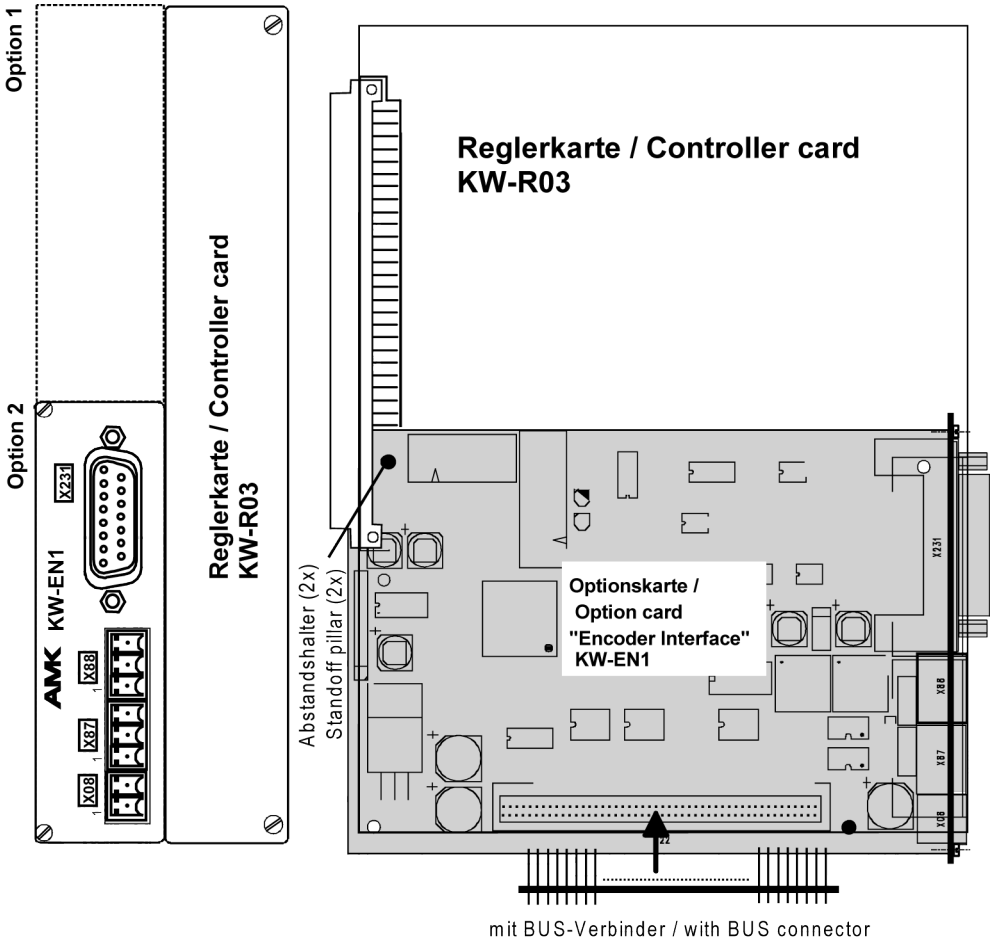
The required internal resolution (ID117) must be selected by the user according to

$$ID117 = \frac{ID123[mm] * 4000}{signal\ \ period[\mu m]} \cdot n, \longrightarrow n = 1...128 \longrightarrow integer$$

The signal period is specified by the linear scale manufacturer as an encoder data.

1.4 Front view and component mounting diagram (on KW-R03 controller card)

(KW-EN1 inserted into slot 2)



1.5 Important notes on handling

Because of possible destruction of components by static discharge, touching the electrical connections and the contacts on the solder and mounting side of the option card must be avoided. For discharge first touch PE before handling the option card!

1.6 Installation instructions for interface option card „Encoder Interface“

NOTICE

Electronic components could be destroyed through static discharge!

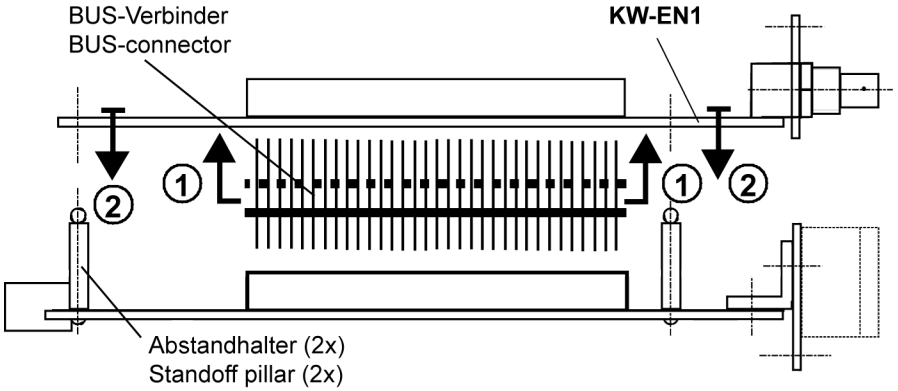
Therefore touching of the electrical connections (e.g. signal and power supply cable or option and controller cards) must be avoided.

Steps to prevent:

- Avoid touching electrical connections and contacts
- During handling the electronic component discharge yourself by touching PE
- Pay attention to the ESD-notes (electrostatic discharge)

The option card „Encoder Interface“ must be inserted in the appropriate slot 1 or 2 on the KW controller card.

1. Ensure that the AMKASYN system is disconnected from the power supply and that the DC BUS capacitors are discharged.
2. Remove blanking plate at the selected slot by loosening the two captive screws.
3. If existing: Loosen the captive screws at the left edge of the option card in the other slot.
4. Loosen the two captive screws at the right edge of the controller card front plate, then unplug the controller card together with the possible option card as one unit carefully. Place the card only on a non-conductive, padded surface.
5. Press the two snap-in plastic standoff pillars in the corresponding holes on the controller card (assigned to the selected slot 1 or 2).
6. Press the BUS connector with the longer pins fully into the socket connector of option card „Encoder Interface“ (BUS connector pins must be flush with socket connector).
7. Insert the BUS connector on the Interface card PROFIBUS-DP with the short pins into the socket connector on the controller card and at the same time snap in the standoff pillars into the holes of the option card „Encoder Interface“.



8. Plug-in the controller card with option card „Encoder Interface“ as a whole carefully into the card shaft until the controller card is plugged securely in the mating connector.
9. Tighten the captive screws at the front panel of the controller card and of the option card(s).

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