DATA SHEET

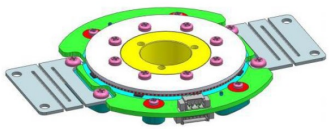
PAM7943

Axial 360 degree absolute Encoder

The axial encoder system PAM7943 consists of a 360 degree absolute encoder and a two-track axial magnetic disc which are assembled in a packaged, which can be mounted directly.
This system offers a true-power-on position measurement system with an resolution up to 24 bit.

Due to it's axial magnetic disc and the compact, very flat sensor module the system is ideally suited for use in robot joints or flat motors.

With the proven MR-sensor technology and integrated correction algorithms the PAM is a very robust and reliable solution with a high accuracy and repeatability.



Product Overview

Article Name	Description
PAM7943UUT-DA-KA	Axial 360 degree absolute encoder

Quick Overview

Symbol	Parameter	min.	typ.	max.	Unit
V_{CC}	Supply voltage	4.7	5.0	5.4	V
I_C	Current consumption	100	115	130	mA
Res	Resolution Singleturn	-	24	-	bit
Acc	Accuracy	14	-	40	arcsec
T_{amb}	Operating temperature	-40	-	+105	°C

Features

- Singleturn absolute
- Up to 24 bit resolution
- Calibration algorithms
- True-power-on
- Wide temperature range from –40°C up to +105°C
- BiSS, SSI, SPI, RS485 protocol interfaces

Advantages

- Very flat design (axial)
- High accuracy
- Robust and reliable

Applications

- Off-axis applications
- Robotic joints
- Automated Guided Vehicles
- Flat electro motors

ESD

Electrical Data

T_{amb} = 25°C, V_{CC} = 5.0 V; unless otherwise specified

Symbol	Parameter	Conditions	min.	typ.	max.	Unit
V_{cc}	Supply voltage		4.7	5.0	5.4	V
F_{Pos}	Position Refresh Rate		-	18.0	-	kHz
I	Current	V_{CC} = 5.0 V	100.0	115.0	130.0	mA
t_{Start}	Start time		-	100	-	ms
T_{op}	Operating temperature		-40	-	+105	°C
$T_{storage}$	Storage temperature		-40	-	+105	°C
ESD_{HBM}	ESD tolerance according to HBM	HBM; 100 pF discharge @1.5 kΩ	-	-	2000	V

Mechanical Data [1)]

T_{amb} = 25°C; unless otherwise specified

Symbol	Parameter	Conditions	min.	typ.	max.	Unit
D_{out}	Outer diameter of the module		-	67.0	-	mm
D_{in}	Inner diameter of the module		-	17.0	-	mm
H	Height of the module		-	14.6	-	mm

[1)] more details in Fig. 1

Performance Data

T_{amb} = +25°C, V_{CC} = 5.0 V, unless otherwise specified

Symbol	Parameter	Conditions	min.	typ.	max.	Unit
Acc	Accuracy [2)]		14.0	-	40.0	arcsec
Rep	Repeatability		-	-	1.0	arcsec
Res_{Single}	Resolution Singleturn		-	24	-	bit
Hys	Hysteresis		-	-	2.0	arcsec
Speed	Maximum speed		-	10000	-	RPM

[2)] after self-calibration routine

Absolute Maximum Ratings

The ratings do not imply opening conditions; functional operation is not guaranteed. Beyond these values damage may occur.

Symbol	Parameter	Conditions	min.	max.	Unit
V_{CC}	Supply voltage	Referenced to GND		5.4	V
ESD_{HBM}	ESD tolerance according to HBM	HBM; 100 pF discharge @1.5 kΩ	-	2000	V

Environmental Data

Symbol	Conditions	min.	typ.	max.	Unit
Vibration resistance		-	-	785	m/s^2
Shock resistance		-	-	980	m/s^2
Pressure		-	-	600	bar
External magnetic field		-	-	±20	mT
Humidity		-	-	70	%

Pinout of the sensor module

Pad	Symbol	Parameter
1	V_{CC}	Supply Voltage
2	GND	GND
3	A_+	Signal connection
4	B_-	Inverted signal connection

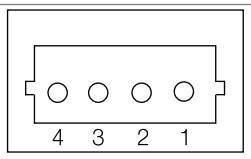
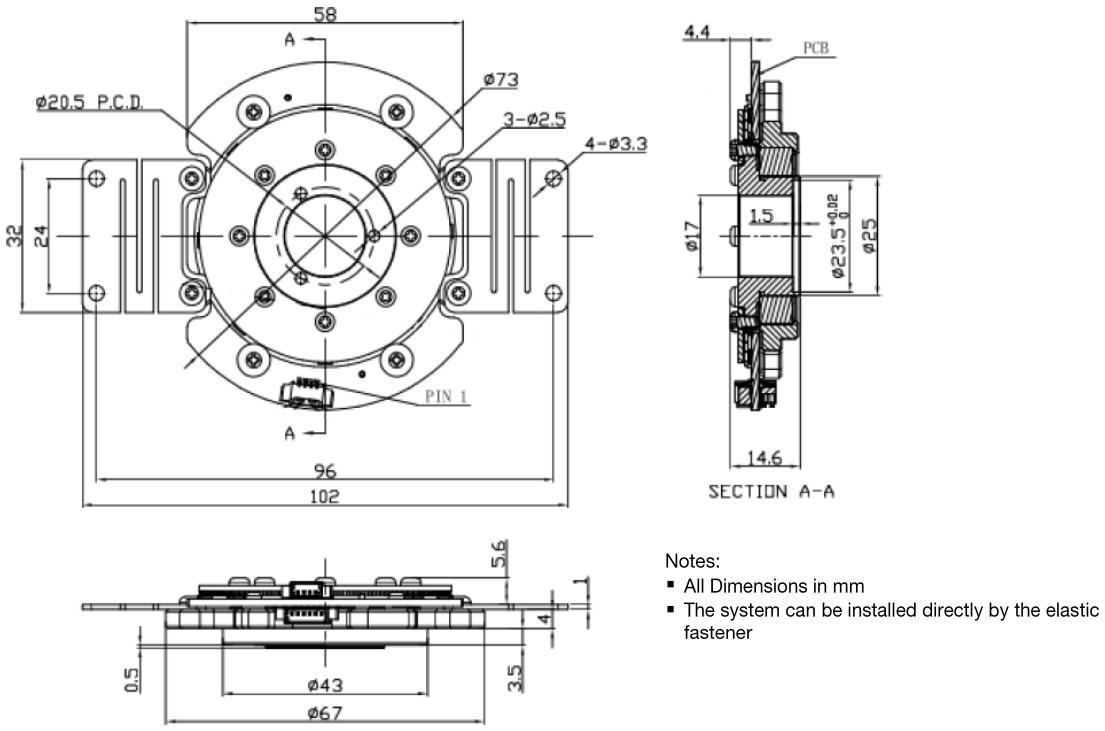


Fig. 1: Pinout of the PAM7943 connector

Dimensions



Notes:
- All Dimensions in mm
- The system can be installed directly by the elastic fastener

Fig.2: Dimensions of PAM7943.

RS485 interface

The following chapter describes how the RS485 interface is working and how it is possible to receive the position information of the sensor.

Communication parameters

Baud rate	2.5M
Byte length	8 bits
Even-odd check	Not have
Stop bit	1
Flow control	Not have
Request pass, letter mode	Passive and corresponding communication

Frame format

Request command	0x02					
Transmission data from encoder	1 Byte	2 Byte	3 Byte	4 Byte	5 Byte	6 Byte
	Request command	Status field	Position data			CRC

General Information

Product Status

Article	Status
PAM7943UUT-DA-KA	The product is under development.
Note	The status of the product may have changed since this data sheet was published. The latest information is available on the internet at www.sensitec.com.

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General Information

Application Information

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These products are not qualified for use in life support appliances, aeronautical applications or devices or systems where malfunction of these products can reasonably be expected to result in personal injury.

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Changelist

Version	Description of the Change	Date
PAM7943.DSE.00	Original (pp. 1-5)	06/2024

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