Description

The HD25A is a rugged absolute encoder designed for heavy duty industrial use. This absolute encoder is a non-contacting optical rotary position sensor which reports the shaft angle within a 360 range. The HD25A can be used for automation, motion control and robotic applications. As opposed to incremental encoders, the HD25A reports the absolute position rather than just the change in position. The HD25A is a true absolute encoder over one revolution, and also has a multi-turn mode. When powered up, it does not require a home cycle, even if the shaft was rotated while the power was off. In multi-turn mode, it tracks the position in a 32-bit counter as long as the power supply is maintained. Internally, an infrared LED flashes through a circular bar code onto a linear array sensor. The microcontroller decodes the image into a unique position. All user programmable parameters such as resolution, origin, direction, and mode are permanently stored in an internal EEPROM.

The interface of the HD25A has 2 separate outputs, one utilizes our digital SEI (Serial Encoder Interface) bus and the other is an analog output. The SEI bus is a simple, quick, convenient network of devices interfacing to a RS232 serial port. The SEI bus supports 1 to 15 devices on a single cable up to 1000 feet long (RS-485 like). The analog output provides an analog voltage proportional to the angular position, with 12-bit resolution.

The AD2B adapter provides an interface to an RS-232 port and the SEI-USB provides an interface to a USB port. One of these products is required in order to interface the HD25A to a PC via our SEI bus. The wall-mount PS-12 power supply furnishes the power for all devices on the SEI bus.

Our absolute encoders may be used in many stand alone applications that do not require a PC interface. For these applications we provide detailed communications protocols for all of our absolute products (see the SEI Absolute Encoder Communications Protocol page).

US digital provides software free of charge for all products which require software for operation. The software can be used as is or it can serve as an example for creating your own custom application. The absolute encoder software utilizes our SEI Explorer software to configure and communicate with the product from a PC platform.

Analog Output:

The HD25A has a 12-bit DAC and 2 dedicated analog output line (Analog+, Analog-). This DAC has a full range of 0 to 4.095V, which is 1mV per bit. The value which the internal microcontroller sends to that DAC is the same as the digital value that it sends to the host. Since the resolution (which represents the number...

Features

- NEMA size 25 package
- Anodized milled aluminum housing with O-ring housing seal
- 3/8" diameter shaft
- Up to 15 devices on a single 6-pin telephone-type cable
- 12-bit accuracy
- Update rate is 4 milliseconds
- EEPROM stores downloadable parameters
- Field programmable resolution (2 to 4096 CPR)
- Remotely updatable firmware

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Description (Continued)

... of codes per revolution) is field programmable, the range of the DAC will also follow that setup. Our default resolution is 3600 CPR which yields 1 count per tenth of a degree. This makes the DAC output equal to 1mV per tenth of a degree or 0 to 3.599V. When the DAC needs to have the full range to 4.095V, the single turn resolution should be set to 4096. This is easily done with the available software which runs on a PC. See referenced documents information on the AD7 HD25A Breakout Box.

Available Options:

- Shaft seal to protect the encoder from liquids. Note that this option adds about 3.5 in-oz. of shaft drag.
- 3/8" diameter shaft with or without flat.

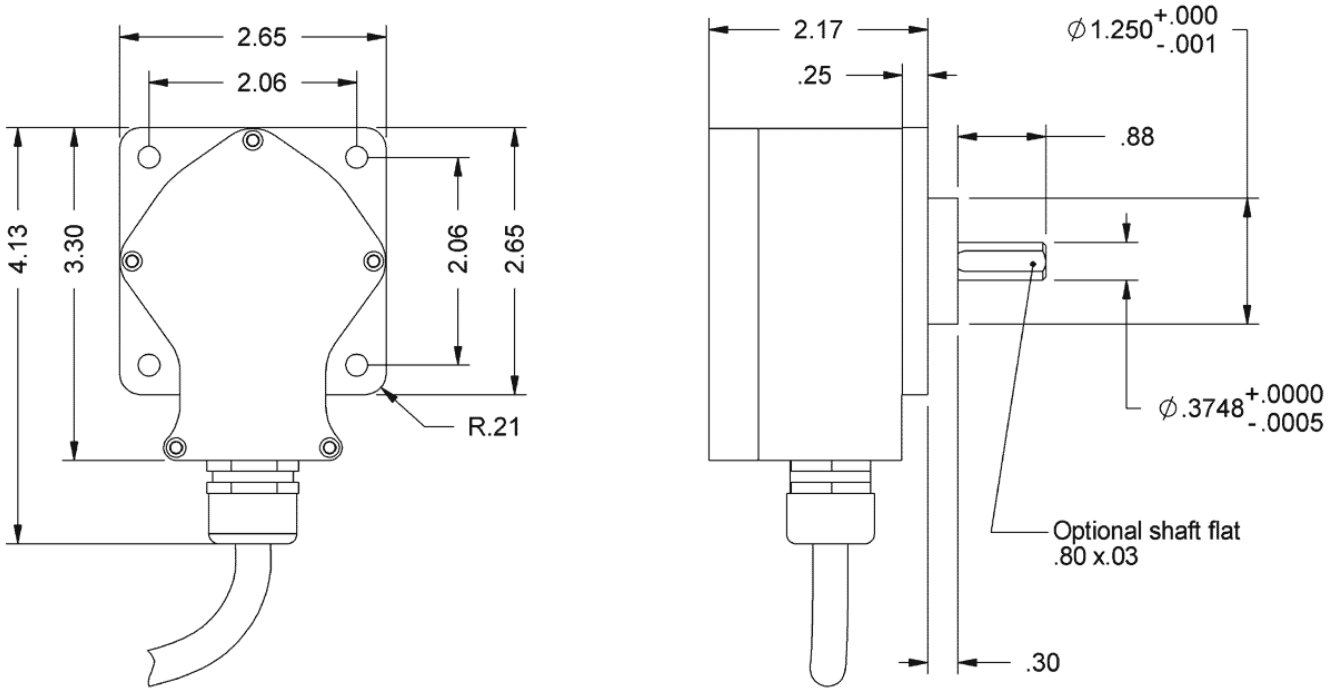
Notice:

In applications where a failure could result in an unacceptable loss, we recommend that your system be designed to include two redundant encoders with the outputs from both continuously compared to make sure that they agree. If there is a discrepancy, the system should be designed to automatically shut down as a fail-safe measure to minimize the risk of damage or danger. This product is not certified for applications where a failure could result in a costly, dangerous, or life threatening situation.

Software

- www.usdigital.com/support/software/sei
- www.usdigital.com/assets/USDProducts.zip (.zip file with installer)

Mechanical Drawing



Environmental

Parameter	Value
Operating Temperature	-25C to 70C
Storage Temperature	-40C to 100C
Humidity Non-sealed Sealed	 98% non-condensing 100% condensing (NEMA IP65)
Vibration (5 to 2kHz)	20G
Shock, 11 mSec	60G

Mechanical

Parameter	Value
Size	NEMA size 25
Housing and Cover Material	Anodized aluminum
Weight	16.91 oz.
Shaft Material	Stainless steel
Shaft Diameter	0.3748 in. (+0.0000 in. -0.0003 in.)
Shaft Optional Flat Size	.80 in. long x .03 in. deep
Max. Acceleration	100000 rev / sec²
Max. Shaft Speed Non-sealed (mechanical) Sealed (mechanical)	 15000 rpm 6000 rpm
Max. Shaft Torque Non-sealed Sealed	 < 0.5 in-oz 3.5 in-oz typical
Max. Shaft Load Axial Radial	 40 lb. 35 lb.
Max. Shaft Total Indicated Runout	0.0003 in.
Bearing Life in Millions of Revs.	(124 / load in lbs.) ^3
Bearing Life @ 4 Pound Load	2.3 x 10^9 revolutions
Moment of Inertia	2.8 x 10 ^-4 oz-in-sec²
Technical Bulletin TB1001 - Shaft and Bore Tolerances	Download

Electrical

- Specifications apply over entire operating temperature range.
- Typical values are specified at Vcc = 12V and 25C.

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Parameter	Min.	Typ.	Max.	Units
Supply Voltage	5.5	12	16	V
Supply Current Active Sleep		14	18.5 1.5	mA
Analog Output Impedance	950	1000	1050	Ohms
Zero Scale Analog Voltage	0	0.0005	0.003	V
Full Scale Analog Voltage	4.079	4.095	4.111	V
Output Noise (Analog version)		10		mVrms
Differential Nonlinearity	-1.0		1.0	LSB
Absolute Accuracy (SEI interface version)		0.18	0.25	Degrees
Angle tracking speed Single-turn mode Multi-turn mode			3600 1800	rpm
Position Update Rate (1)			7	msec.

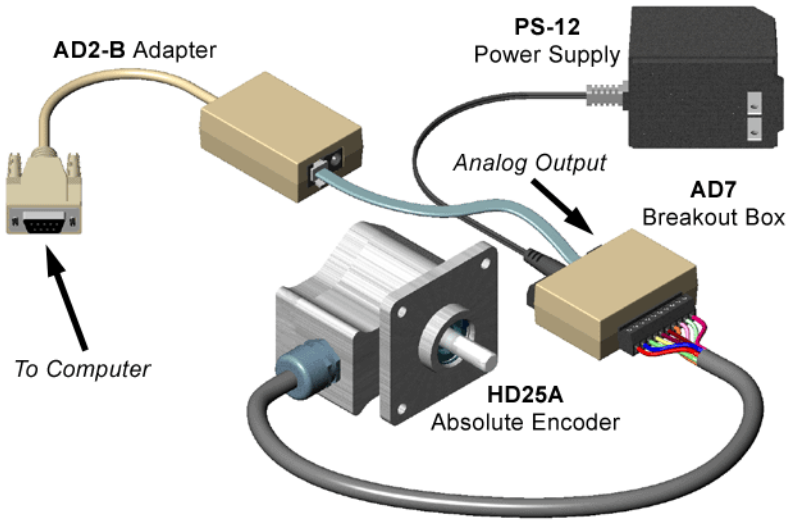
(1) The internal microcontroller takes a snapshot of the disk every 7 msec. and stores the position in memory. It responds immediately to a "report position request" by sending this value which is always the most current position.

Default Settings

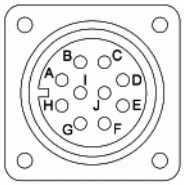
Parameter	Default value	Volatile?
SEI address	0	Non-volatile
Resolution	3600	Non-volatile
Origin offset	0	Non-volatile
Baud rate	9600	Volatile
Mode	0	(1)

(1) Mode is always restored from non-volatile EEPROM on power-up; however, there are separate SEI commands for setting the RAM copy only, or both the RAM copy and the non-volatile EEPROM copy.

SEI Network



Pin-outs



Pin	Description	Color
A	DataH	Blue w/ White stripe
B	Busy+	Brown w/ White stripe
C	Analog+	Orange w/ White stripe
D	Power	Green w/ White stripe
E	NC	Gray w/ White stripe
F	Common	White w/ Gray stripe
G	Case Ground	White w/ Green stripe
H	DataL	White w/ Blue stripe
I	Busy-	White w/ Brown stripe
J	Analog-	White w/ Orange stripe

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Ordering Information

HD25A - [ ] - [ ]

Flat	Seal
N =*Non-Flat Shaft*	N =*Non-Sealed*
F =*Flat Shaft*	S =*Sealed*

Notes

- Cables and connectors are not included and must be ordered separately.
- US Digital warrants its products against defects in materials and workmanship for two years. See complete warranty for details.

Base Pricing

Quantity	Price
1	$414.75
10	$351.75

For volume discounts, please contact us at sales@usdigital.com or 800.736.0194.

- Add $45.00 per unit for **Seal** of Sealed

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