drive.web encoder

Options 40, 42, 45 & 46 Intelligent Incremental Encoder Module Installation & Operation Manual

Warning!

It is essential that you read and understand this manual and the entire contents of the drive.web device manual, and the savvy software, "Help," menu before proceeding with your installation and product configuration. For more information and to download product manuals and software, go to **www.driveweb.com**.

Warning!

Your use of savvy software and drive.web devices may cause motors and machinery to power up with high voltages or start or operate in an unexpected, dangerous or lethal way. It is essential that you are completely familiar with savvy and all of the equipment and the system design you are working with before attempting to program or edit a program or connect to any live device.

Warning!

You are entirely responsible for the configuration or use of any drive.web product. By configuring or using these products you agree to indemnify and hold harmless Bardac Corporation, its' employees, directors, officers, distributors and resellers against the consequences of your configuration or use of the products.

Warning!

Information in this manual is subject to change without notice. You are responsible for verifying the proper operation of your system and Intelligent Encoder module..

Warning!

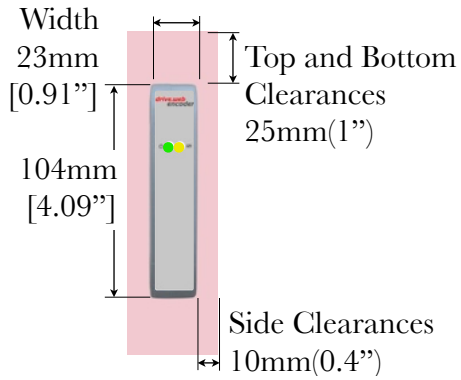
Never Exceed Any Min or Max. values indicated in this manual to avoid permanent damage to your drive.web External Encoder Module.

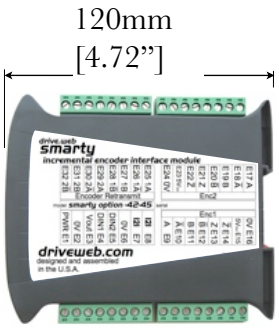
drive.web Intelligent Incremental Encoder Module

- **Note:** This module is for drive.web products with option **16**, **18** or **23**.
- **i2i** Intelligent 2-Wire Interface. Easy, unpolarized, up to 500 feet range.
- Option **40** has one set of encoder inputs, option **42** is for dual encoders.
- Option **45** retransmits channels A and B with EIA(RS)485/422 signals. Option **46** retransmits with ±24V differential signals. Option **45** and **46** are mutually exclusive.
- Built in Voltage regulator accepts wide Power Voltage range, 20VDC to 35VDC max

drive.web Intelligent Encoder Module Installation

Dimensions & Clearances:
Clearances must be provided for adequate airflow.





Weights: Option **40** only - 128g(4.5oz). Option **42** with **45** - 176g(6.2oz)

DIN Rail Mounting. Use standard 35x7.5mm rail per IEC 60715 or EN50022.

Power Requirements (PWR), 20VDC min to 35VDC max, 25mA plus loads.

Environment Clean air, Operating temperature, 0C min. to 50C max. Storage temp, -20 to 70C. Humidity less than 95% non-condensing. Ideally, install drive.web Encoder Module in a metal enclosure with no RF noise sources.

Encoder Receivers are differential, **±2V to ±24V max**, up to 500kHz max.

Z markers and Digital Inputs Used in ***Enc Registration*** and ***Enc Position*** function blocks, drive.web option **11**, Encoder Control Library. Please contact us for availability.

Z Marker Receivers are differential, **±2V to ±24V max**, to 6000 rpm max.

Encoder Digital Inputs, *DIN1, DIN2,* -0.5V min to 25V max, to 50Hz max. Digital input threshold = 8.2VDC ± 7%.

Encoder 5V Supply Output(s), 200mA max each. Outputs are protected with auto-resetting fuses.

OV Reference is Required for proper receiver and retransmit operation. Connect from any 0V terminal with encoders powered from other sources. **Beware of 0V current loops!** If power sources are widely separated, a 100Ω isolation resistor in series with this reference may be appropriate.

i2i Connections Not polarity sensitive. Connect to drive.web device with option **16, 18** or **23** at its two **i2i** terminals. 0V is not required. **i2i** receivers are isolated. Port 2 Receive LED on drive.web device is lit when **i2i** connection is made.

Vout provides regulated 24VDC for reference and supply, 150mA max. If Power Voltage is less than ~26VDC, Vout is less than 24VDC, (~Power - 2VDC).

Wiring Notes All signal wiring should be **twisted-pair**. All encoder power and signal wiring outside of the metal enclosure should be shielded cable with individually shielded twisted-pairs such as **Belden 8163**. Ground the shield at only one end, usually near the signal destination. Ground the shield with a 360° clamp where the shield enters your "quiet" metal enclosure. Separate all encoder wiring from RF noise sources and AC power cabling.

drive.web Intelligent Encoder Module Connections

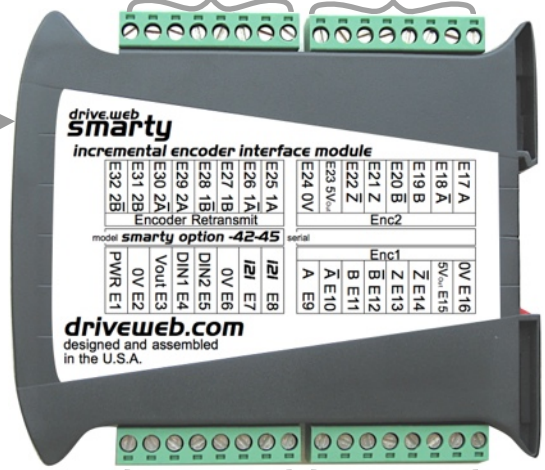
Terminal Wiring: Strip 7mm(0.28") or use ferrules. Use 0.2㎟(AWG24) minimum. One wire, 2.5㎟(AWG12) maximum. Two wires, 1.5㎟(AWG14) maximum. Two wires with ferrules, 1㎟(AWG18) maximum.

Terminal Tightening Torque: 0.5 N·m (4.4 in·lbs)

Options 45,46 Retransmit Outputs

E32	E31	E30	E29	E28	E27	E26	E25
$2\overline{B}$	2B	$2\overline{A}$	2A	$1\overline{B}$	1B	$1\overline{A}$	1A

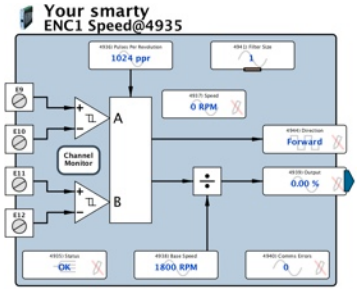
Green Power and Yellow Data Transmit LEDs Both should be lit.



ENC1	ENC2	Funct.
E9	E17	A
E10	E18	$\overline{A}$
E11	E19	B
E12	E20	$\overline{B}$
E13	E21	Z
E14	E22	$\overline{Z}$
E15	E23	5Vout
E16	E24	0V

E1	E2	E3	E4	E5	E6	E7	E8
PWR	0V	Vout	0V	DIN1	DIN2	I2I	I2I

drive.web Encoders - System Integration



- Use **savvy** to complete your installation and integrate encoder signals into your **drive.web** control system.
- Navigate to your **drive.web** device function block engine and find the ***Enc Speed*** function block in the ***I/O*** listing. The ***Channel Monitor*** button will show the actual state of each channel A and B. ***High*** indicates A or B Voltage is higher than its complement, /A or /B.
- The ***Enc Speed*** function block ***Output*** is the percentage of the rpm value indicated in the ***Base Speed*** parameter.
- An adjustable Moving Average Filter is incorporated into the function block to reduce quantization noise. Higher PPR encoders or speeds may allow the filter size and therefore the response time to be reduced. The default 15 size indicates the speed is averaged over a period of 15 · 4.78ms time intervals.

drive.web Encoders - System Integration (continued)

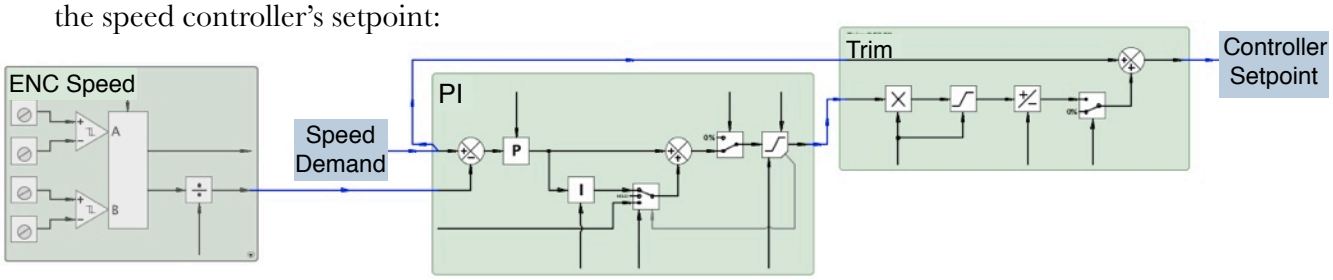
- The ***Status*** parameter must read ***OK*** for proper function. All other indications will result in the speed ***Output %*** = 0.00 %. Channel Faults are detected with the conditions listed below.

Encoder Receiver Fault Conditions
Short Circuit or Open Circuit
-10V < Common Mode Voltage < 13.2V
|Differential Voltage| < 275~475mV

- For critical or sensitive applications, make a connection from the ***Status*** parameter to a fault contingency system.

- If ***Comms Fault*** is indicated or if the ***Comms Errors*** parameter shows increasing values, there may be extreme RF noise coupling to your drive.web device, a wiring fault or a hardware fault. Check the i2i signal wires and ***Wiring Notes,*** page 2 of this manual. Contact us at drive.web for assistance.

- **Outer Loop Speed Control Example:** Connect the ***Enc Speed Output*** to the ***Feedback*** parameter of a ***PI*** block or similar. Connect the speed demand setpoint to the ***Setpoint*** parameter both in a ***PI*** block and in a ***Trim*** block (option **05**) or similar. Connect the ***PI Output*** to the ***Trim*** parameter of the ***Trim*** block. The ***Trim Output*** is connected to the speed controller's setpoint:



drive.web Resources

Expert help is always at hand. Call, email **techsupport@driveweb.com** or browse the help menu in savvy.

Explore the full line of drive.web products and resources at **driveweb.com**.

Free drive.web online training seminars are held every week. They are interactive with the presenter and take about one hour. Learn essential elements:

Design control schemes, configure networks, create drive systems with almost any drive, generate signal flow documentation, configure drives, interface to external products such as operator stations, PLCs, etc. and work with your drives across the Internet.

More extensive online and factory technology training sessions are also available.

To register please contact us; **training@driveweb.com** or phone +410-604-3400.

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