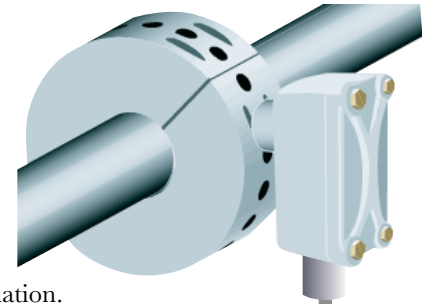


# drive.web<sup>®</sup> Frequency I/O

## dwOption 27 Frequency I/O Installation & Operation Manual

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**CE** and FCC Conformity is pending completion of testing. Please contact us for information.

EMC Standard, EN 61326-1: 2006, Electrical Equipment for Measurement, Control & Laboratory Use.  
Emissions Class A, Commercial Equipment.  
Immunity Table 2, Industrial Equipment.

LVD Standards, EN 61010-1: 2010, Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use and;  
EN 61010-2-030: Particular Requirements for Testing and Measuring Circuits.

**drive.web** Frequency I/O is an industrial device designed for permanent installation by qualified professionals. If it is used in a manner not specified herein the protection provided may be impaired.

This device is designed to comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



**Warning!** It is essential that you read and understand this manual and the entire contents of the **drive.web** device manual, and the **savvy**<sup>®</sup> software, “Help,” menu before proceeding with installation and product configuration. For more information and to download product manuals and software, go to [www.driveweb.com](http://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 before attempting to program or edit a program or connect to any live device. It is also essential that a risk assessment is conducted to identify hazards. Risks must be reduced to tolerable levels.



**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<sup>®</sup> 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.



**Warning!** Avoid permanent damage to your **drive.web** Frequency I/O, never exceed any **min** or **max** values. Do not connect any terminal to mains circuits. See page 2 for I/O ratings.

## drive.web Frequency I/O Description

- Four frequency inputs available, T3, T4, T5 and T6.
- Standard input frequency range is 1Hz to 100kHz. Higher frequencies are also supported. Please contact us for details.
- Two frequency outputs available, T5 and T6.
- Output frequency range is 10Hz to 20kHz.
- Regulated 12VDC supply output, up to 400mA max., for sensors, pulse amplifiers etc.  
Output is protected with auto-resetting fuse.
- Additional function blocks available; **Frequency Edge Counter, Speed Lock, Phase Lock, Status Monitor, High Frequency Input.**



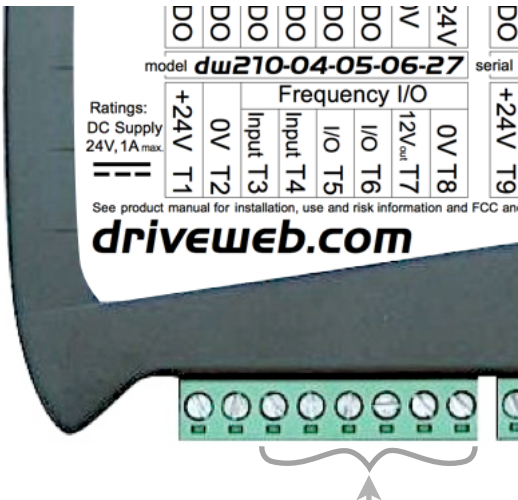
# drive.web Frequency I/O Installation

This option is factory installed in your **drive.web** device. Please refer to the *Installation and Operation Manual* supplied with your **smarty** or **speedy** for environmental and terminal wiring and torque information.

**Wiring Notes** All wiring outside of the metal enclosure should be shielded cable. Ground the shield at only one end. Ground the shield with a 360° clamp where the shield enters your “quiet” metal enclosure. Separate all frequency wiring from RF noise sources and AC power cabling.

**I/O Ratings:** Use shielded cable for runs over 30 meters. Do not connect to any mains circuit. Fast transient over-Voltage to 1kV per EN61000-4-4 (pending).

# drive.web Frequency I/O Connections



Terminal	T3	T4	T5	T6	T7	T8
Function	Input	Input	I/O	I/O	+12V <sub>out</sub>	0V
Max. Voltage	20V	20V	12V	12V	12V	0V

# drive.web Frequency I/O - System Integration

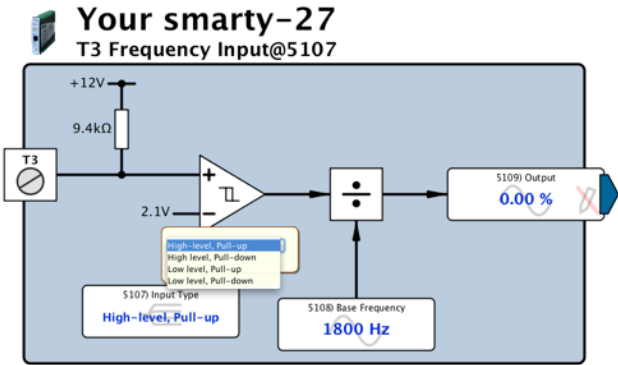
Use **savvy** to complete your installation.

## Frequency Input and High Frequency Input Function Blocks

Determine the input type based on input terminal and sensor type -

Input Term.	Input Type	Internal Resistor	Threshold	Hysteresis	Sensor Type
T3, T4	High-level, Pull-up	9.4kΩ	2.1V	0.7V	Standard open-collector / open drain / sinking output
T3, T4	High-level, Pull-down	4.7kΩ	2.1V	0.7V	Standard line driver / sourcing output
T3, T4	Low-level, Pull-up	9.4kΩ	0.2V	70mV	Low Voltage open-collector / sinking output
T3, T4	Low-level, Pull-Down	4.7kΩ	0.2V	70mV	Low Volt line driver / sourcing / magnetic pickup
T5, T6	Pull-up	9.4kΩ	1.6V	1.0V	Standard open-collector / open drain / sinking output
T5, T6	Pull-down	4.7kΩ	1.6V	1.0V	Standard line driver / sourcing output

Use **Frequency Input** function blocks to setup the **Input Type** for each terminal. Click on the function block and set the **Input Type** parameter -



- Notice the function block diagram changes with different choices of **Input Type**.
- Use **High Frequency Input** function blocks for base frequencies higher than 20KHz.

### Frequency Output Function Blocks

Frequency outputs sink up to **5mA** when enabled. Internal pull-up is 9.4kΩ to 12V.

### Application Example - Speed Follower with Monitor

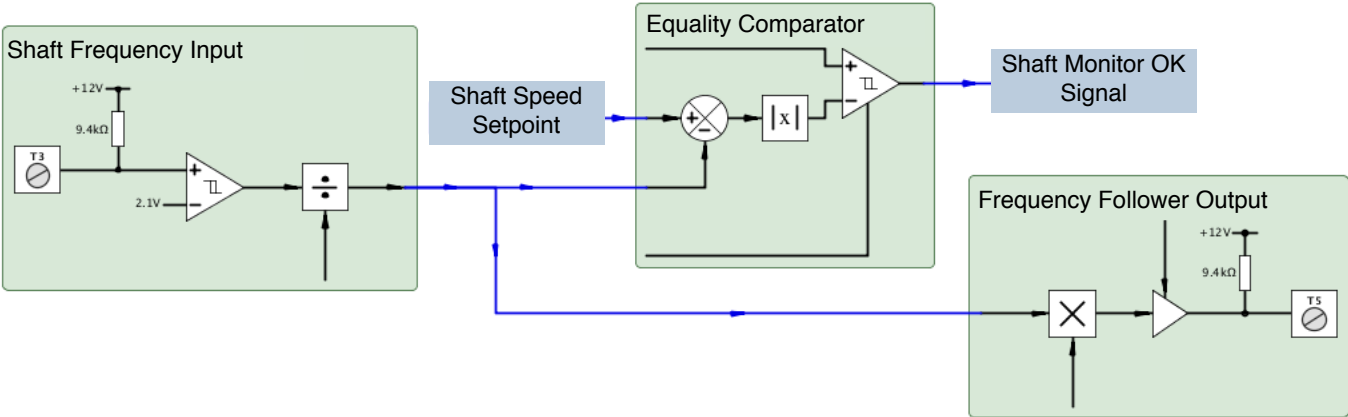
Instantiate **Frequency Input**, **Equality Comparator** and **Frequency Output** function blocks.

Connect the **Output** parameter of the **Frequency Input** block to one input parameter of an **Equality Comparator** block.

Obtain a **Shaft Speed Setpoint** signal from the system controller, motor shaft speed controller or similar. Connect this signal to the second input of the **Equality Comparator**.

Calibrate the frequency signal with the system running by adjusting the **Base Frequency** parameter until the two inputs of the **Equality Comparator** are equal. Set the **Tolerance** parameter to avoid nuisance failures of the **OK** signal.

Connect the **Output** of the **Frequency Input** to the **Input** of the **Frequency Output** block to produce a frequency follower signal output for other system monitors or controllers. Calibrate the frequency with the **Base Frequency** parameter.



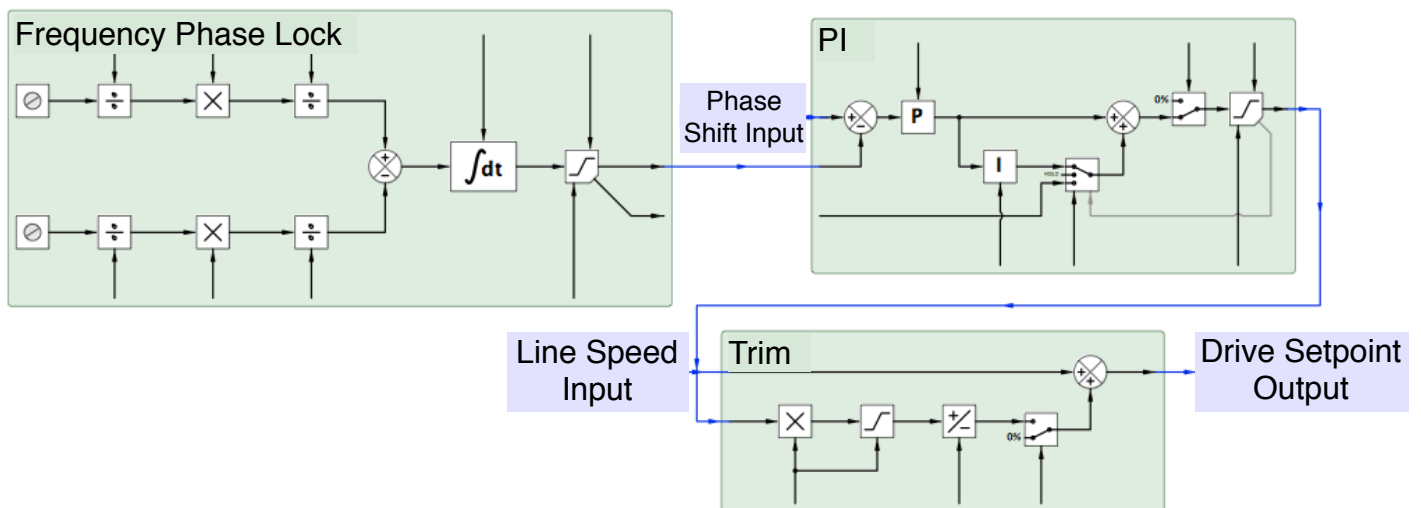
## Application Example - Electronic Line-Shaft, Phase-Lock

Instantiate *Frequency Phase Lock*, *Trim* (dwOption-05) and *PI* function blocks.

Connect *Output* of *Frequency Phase Lock* to the *Feedback* parameter in a *PI* block or similar. Connect the *PI Output* to *Trim Input* in a *Trim* block or similar which controls the follower drive's speed setpoint. Input speed or phase offsets at the *Setpoint* parameter in the *PI* block.

Dual multiplier-divider pairs are available in the *Phase Lock* block for calibrating gearbox ratios etc.

Disable the *Trim* block and watch the speed monitoring parameters in the *Phase Lock* block to verify speed match. Enable the *Trim* block and momentarily reset the *Integrator* in the *Phase Lock* block to run.



### drive.web Resources

Expert help is always available. Call, email [techsupport@driveweb.com](mailto:techsupport@driveweb.com) or browse the help menu in *savvy*.

Explore the full line of *drive.web* products and resources at [driveweb.com](http://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](mailto:training@driveweb.com) or phone +410-604-3400.