



VTM-01-007
TECHNICAL MANUAL

**VALCOM INCREMENTAL SHAFT ENCODER
(VISE)**

Manufactured by:

**Valcom Limited
Guelph, Ontario, Canada**

PRODUCT DESCRIPTION

The Valcom Incremental Shaft Encoder (VISE) consists of a shaft encoder interfaced with a Valcom designed SDI-12 receiver board contained within in a water resistant enclosure. The dimensions of the VISE, excluding pulley wheel, are 16.5 cm x 17.2 cm x 13.0 cm.

The shaft encoder has a 360° resolution consisting of 400 incremental counts. When paired with a 0.375 meter circumference pulley, the VISE has an accuracy of plus or minus 0.001 meters in the range of -30 meters through to +30 meters range.

The VISE is designed to utilize the SDI-12 protocol. This protocol has the following requirements: minimal power consumption (typically 6 mA) during its sampling operation, low noise on the signal lines and the sensor is powered by a standard 12 VDC. The sampling rate can be programmed by the user to match the necessary sampling conditions, thereby optimizing the power consumption supplied to the VISE. Sampling rates of: a constant, 1, 10, and 100 milliseconds may be selected for operation.

The VISE also allows the operator to program an initial offset level in millimeters and to select the direction for which an incrementing action will occur (clockwise or counter-clockwise).

SDI-12 COMMANDS

SDI-12 SYMBOLS TABLE

SYMBOL	DEFINITION
a	Address
!	Terminates the command
<cr>	Carriage return
<lf>	Line feed

The VISE will always respond to its own device address while treating the “*” character as a wildcard. This permits the operator to determine the current programmed address by sending the *! command to the VISE. The VISE will respond with it’s own programmed address. It should be noted that several other SDI-12 devices employ this undocumented method of determining the programmed device address. The operator must insure that there is only one SDI-12 device connected when the wildcard address is used or a bus contention will arise.

NOTE: In the following descriptions the standard lowercase ‘a’ is used to represent the currently programmed VISE address.

The **M0** command (or **aM!**) along with a subsequent **aD0!** command returns two pieces of data, the first is the current height reading in meters and the second being accumulated errors. Accumulated errors occur when the shaft has moved too fast for the selected sampling rate causing a position count to be missed. If a substantial number of accumulated errors are detected, the operator should consider increasing the sampling rate from the current value. The **aE!** command clears the accumulated errors count.

The **M1** command (or **aM1!**) along with the subsequent **aD0!** command returns two data values, the first is the maximum height reading since the last time the **M1** command was issued, and the second is the minimum height reading since the last **M1** command. This option, when used with the VEDAS II (Valcom Environmental Data Acquisition System), allows the user to program a number of samples using the **M1** command and then obtain maximum and minimum levels which occurred during the sampling period.

The **M2** command (or **aM2!**) along with a subsequent **aD0!** command returns a single value representing the current position in actual encoder counts (400 per revolution). The returned count will range between -32768 to +32768.

EXTENDED SDI-12 COMMANDS

All setup parameters for the VISE are stored in non-volatile RAM thereby insuring the correct operation of the unit after extended periods without power.

Set Device Address

The **aAx!** command allows the operator to adjust the device address of the VISE. Upon acceptance, the VISE returns the new address followed by a carriage return/line feed combination. (example to change the address from the current address of 1 to a new address of 5, type the command: **1A5!**)

Clear Error Count

The **aE!** command first returns the current accumulated error count and then resets the count to zero.

Set Initial Value

The **a0±xxxxx!** command allows the operator to preset the current position to a value in millimeters. The xxxxx represents up to 5 significant digits which represent the initial start level in millimeters.

Set Sampling Rate

The **aS±X!** command allows the operator to select the sampling rate best suited to the operating conditions. Having the X option equal to zero <0> invokes constant sampling, one <1> invokes a 1 ms sampling rate (max speed < 2.5 rev/sec), while option two <2> causes a 10 ms rate (max speed <0.25 rev/sec), and option three <3> a 100 ms rate (max speed <0.025 rev/sec). The ± determines the direction for which an incrementing count will occur. While facing the shaft the <+> option will cause the height to increment with a clockwise motion; the <-> option with a counter-clockwise motion.

COMMAND AND RESPONSE LISTING

COMMAND	RESPONSE
*!	a<cr><lf>
a!	a<cr><lf>
aM! └─▶ aD0!	a0002<cr><lf> a±[meters]+[errors]<cr><lf>
aM1! └─▶ aD0!	a0002<cr><lf> a±[max]±[min] <cr><lf>
aM2! └─▶ aD0!	a0001<cr><lf> a±[count] <cr><lf>
aV! └─▶ aD0!	a0004<cr><lf> a±www±xxx±yyy±zzz<cr><lf>
al!	a10VALCOM VISE V10<cr><lf>
aE!	a+[errors] <cr><lf>
a0±xxxxx!	a±xx.xxx<cr><lf>
aS±x!	a<cr><lf>
aAx!	x<cr><lf>

STANDARD MAINTENANCE

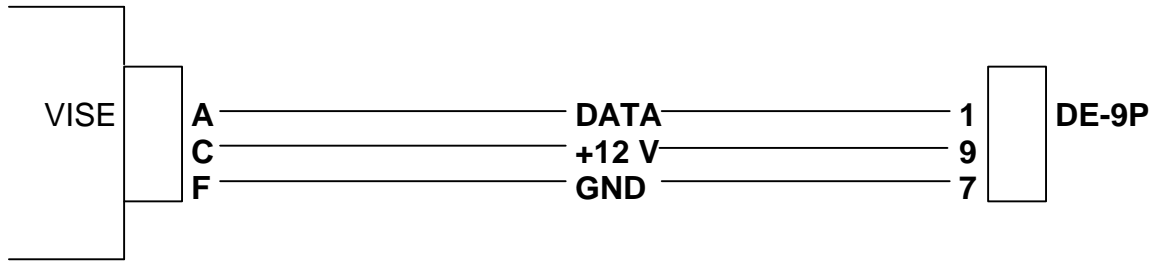


FIGURE 1: CONNECTOR WIRING DIAGRAM

The VISE has the option for an internal backup battery which may require changing every few years throughout the life of the VISE.

Instructions for changing backup battery:

1. Remove the VISE from mount
2. Cut tie wrap and disconnect the battery connector
3. Remove the old battery and install the new battery
4. Install the new tie-wrap and reconnect the battery's connector
5. Remove any silicone from the edge of the housing and apply a fresh bead of silicone along the 6 mm housing edges. Be careful not to fill in the screw holes while adding new silicone.
6. Replace end panel cover with the eight screws. Remove any excess silicone which may have been squeezed out when the end panel was tightened down.
7. Remount the VISE.