

# ALLIANCE SENSORS GROUP

A DIVISION OF H.G. SCHAEVITZ LLC

## Utilizing the RS-485 com port of an ASG LVDT signal conditioner July 1, 2014

ASG's LVDT signal conditioners incorporate an RS-485 two-wire multi-drop serial communications interface for up to 16 devices. This port enables half-duplex serial communication by which a module can be set up and calibrated remotely and system data can be read or stored on a PC running an ASCII terminal program like Hyper Terminal with a 2-wire RS-485 converter for the computer's com port or USB port connected to terminals J3-1 and J3-2 of the signal conditioner. The PC's com port parameters are: 9600 bps, no parity, 8 data bits, and 1 stop bit (9600, NP, 8, 1), with echo on and no flow control. Be sure that the RS-485 connection for Data A (*D-*) is connected to J3-2 and Data B (*D+*) is connected to J3-1. **Always follow the data polarity (*D*) indicated above, regardless of the letters for data lines used by the RS-485 converter.**

The 2-wire USB-to-RS-485 converter cable, *USB-RS485-WE-1800*, offered by ASG has an orange wire with a red tip plug, which is Data B (*D+*), and a yellow wire with a tip plug that is Data A (*D-*). Normally no driver is needed for a *USB-RS485-WE-1800* used with MS Windows 7 or later. For Windows XP or earlier, or for MAC or Linux operating systems, driver software can be found on: [www.ftdichip.com](http://www.ftdichip.com). In most cases, the optimum driver for any particular OS is the VCP version.

### RS-485 port user ASCII commands for ASG LVDT signal conditioner modules

Note that all commands must be formatted to begin with **UXX** followed by a space, where XX is the numerical value between 00 and 15 of the module's decimal digital address as set up on DS2, switches 5, 6, 7, and 8 in accordance with Table 1a in the instruction manual, or by following the DIP switch settings diagram shown on the module's left side label.

**Commands in Bold Italic are effective only for ASG signal conditioner modules with Version 2.00 or later firmware.**

**Analog** In *RUN* mode, returns nominal analog output value scaled in electrical units that depend on the setting of DS1.

**Cal** Enters *CALIBRATION* mode; command is same as pressing the FULL SCALE and ZERO pushbuttons simultaneously.

**Config** Lists the module's setup data and displays DIP switch settings and current EEPROM values. Specifically, it shows the module's digital address (00-15), date stamp, serial number, firmware version, any error code, analog output switch setting (1-8), excitation frequency switch settings (1-4), excitation drive jumper (J7) position, output inversion switch *off* or *on*, low frequency filter switch (LF) *off* or *on* and filter cutoff frequency, failure output delay time (FD) and polarity (FOP) *NC* or *NO*, and stored EEPROM values for ADC Lo, ADC Hi, Input pot, and Gain pot. (Log and store all "Config" data names and values by digital address to be able to reconfigure a hot swapped module at a later time).

**Exit** Required to exit any command, and to write any reconfiguration value to the module's EEPROM in *RUN* mode.

**FS** In *CAL* mode, sets the module's full scale output point at the maximum position of the LVDT's core; function is the same as pressing the FULL SCALE pushbutton. Occasionally it may require setting a second time after using **Z** command.

**Help** Lists all user commands available for operation over the RS-485 bus, including some factory-use-only commands.

**LEDs** In *RUN* and *CAL* modes, outputs the status of the 3 green LEDs, displayed in Z-C-F (zero, center, full scale) order, e.g.: - \* 0 means the **S** LED is off, the **E** LED is flashing, and the **P** LED is on.

**Null** In *RUN* mode, displays the Null Output voltage at any core position. Typically used to verify null position of an LVDT.

**Read Error** In *RUN* mode, displays any setup or operations error code(s); for multiple errors, error code sum is displayed.

**Read LF** In *RUN* mode, when DS2-4 is *ON*, shows the status and frequency setting of the supplemental low pass filter.

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**Recal FS** In *RUN* mode, after a calibration has been completed, if the actual full scale output value is within  $\pm 5\%$  of the nominal full scale output value set by DS-1, this command trims the actual full scale output value to match the nominal full scale output value. This command may need to be repeated a second time to get the most precise full scale output value.

**Recal Z** In *RUN* mode, after a calibration has been completed, if the actual zero output value is within  $\pm 5\%$  of the nominal zero output value set by DS-1, this command trims the actual zero output value to match the nominal zero output value. This command may need to be repeated a second time to get the most precise zero output value.

**Reset** In *RUN* mode, produces a "soft" reset of the module's processor so the module restarts as if it is powering on. This command works the same as pressing the FULL SCALE pushbutton for at least one-half of a second three times in a row.

**Reset All** In *RUN* mode, using prefix **U90** instead of **UXX**, performs a simultaneous "soft" reset on all modules connected to the RS-485 bus. Each module on the RS-485 bus then restarts itself as if it is powering on.

**Set ADC Hi** In *RUN* mode, writes a high value for the A / D converter input into module's EEPROM. Command is normally used during a hot swap module reconfiguration to enter ADC Hi value logged from the original module's "Config" command.

**Set ADC Lo** In *RUN* mode, writes a low value for the A / D converter input into module's EEPROM. Command is normally used during a hot swap module reconfiguration to enter ADC Lo value logged from the original module's "Config" command.

**Set FD** In *RUN* mode, sets the delay time from 0 to 900 ms in 100 ms increments before failure warning output activation.

**Set FOP** In *RUN* mode, sets the failure warning output polarity to either Normally Open (default) or Normally Closed.

**Set Gain** In *RUN* mode, writes a Gain pot value into module's EEPROM. Command is normally used during a hot swap module reconfiguration to enter the Gain pot value logged from the original module's "Config" command.

**Set In Pot** In *RUN* mode, writes an Input Pot value into module's EEPROM. Command is normally used during a hot swap module reconfiguration to enter the Input Pot value logged from the original module's "Config" command.

**Set LF** In *RUN* mode, when DS2-4 is *ON*, sets the frequency of the supplemental low pass filter between 0.1 Hz and 10 Hz.

**Ver** In *RUN* mode, returns the version number of the unit's firmware to determine whether certain commands will work.

**Z** In *CAL* mode, sets the module's zero output point at the minimum position of the LVDT's core; function is the same as pressing the ZERO pushbutton. Occasionally it may require setting a second time after using the **FS** command.