

# ELECTRIC MOTOR DRIVER MODULE



## ***About the EOH (Electric over hydraulic) Module***

Hydraulic Motor Driver (EOH) modules are a type of variable rate device available with the Drill Manager System. EOH modules provide control over variable rate electric motors. Five variable rate devices can be installed. Each EOH module also

has two mini-DIN inputs for connecting additional sensors.

## **1. Installation (Aftermarket units only)**

Before installing the EOH module, install the Monitor Head, Switch Box and Power module. Included below is a list of tools, mounting and connection procedures needed to install an

### ***Mounting Tools***

***5/16 hex drive or socket***  
***1/8" drill bit***

***Drill***  
***Wire cutters***

### ***Mounting***

Select a flat metal mounting location within three feet of the electric motor. Remove any dirt or grease from the flat mounting surface. A clean, flat surface is needed to dissipate heat through the metal plate. Using a 5/16 inch hex-driver and the provided self tapping screws, secure the module to the mounting location. Drilling a 1/8 inch pilot hole will make installation easier.

### **1.3. Connections**

Connect a module cable

Route the module cable to the PWM valve and tach sensor. Plug the two wire lead into the PWM valve and the three wire lead into the tach sensor. Using cable ties, secure the cable to the equipment chassis.

### **1.4. SHOW INSTALL ?**

Enter the SHOW INSTALL menu, and use the Plus and Minus buttons to locate this message:

### **# VR EOH**

Where # is the number of installed EOH modules. If this message is displayed, the EOH module has been successfully installed.

## 2. Calibration

There are six calibration menus for the EOH module, but not every menu is required. Only the menu needed for immediate operation is described below. For any other menus, see the **Operation** section.



### 2.1. VR CALIBRATION ?

This menu is used to set the application rate, determine the weight output per revolution of the meter, and calculate the ground speed limit. When selected, this message is displayed:

#### **PRODUCT #1**

The PRODUCT label is given the same number as the EOH module associated with it. With multiple EOH modules, use the Plus and Minus buttons to select the desired PRODUCT label. Press the OK button to make the selection, and this message is displayed:

#### **ENTER SEED RATE then RATE# 0.0 LB/AC**

Where # is the number of the selected EOH module. Use the Plus and Minus buttons to set the application rate in pounds per acre or kilograms per hectare, and press the OK button to complete the change. This message is displayed:

#### **TURN OUT PRODUCT then ROTATIONS 0.0**

Get a receptacle to collect the product from the metering box. Set the Calibrate switch on the EOH module to *Calibrate*. The motor will begin turning the metering shaft. As the meter turns, the number beside ROTATIONS will accumulate in tenths of a rotation. Once a sample has been collected, switch the Calibrate switch to *Operate* to stop the motor. This message is displayed:

#### **WEIGHT O G**

Weigh the product and record the weight.

**NOTE: MAKE SURE TO READ THE KILOGRAM SIDE OF THE SCALE AND MULTIPLY BY 1000 TO OBTAIN THE NUMBER OF GRAMS. FOR EXAMPLE 4.6 ON THE SCALE IS 4600 GRAMS.**

Use the Plus and Minus buttons to set the product weight, and press the OK button to complete the change. This message is displayed:

#### **SPEED RANGE then #.# min - #.#max MPH**

Where #.#<sub>min</sub> is the minimum speed, and #.#<sub>max</sub> is the maximum speed needed to provide the set application rate. The application rate, product weight and speed range has now been set.

### 3. Operation

For the EOH module to function, the Calibrate switch must be in the *Operate* position. When the switch is in the *Calibrate* position, the electric motor will activate, an audible alarm will sound, and this message is displayed:

#### **CAL SWITCH # ON!**

Where # is the number of the EOH module. The meter motor remains active, and the alarm continues until the Calibrate switch is set to *Operate*. The switch is used as a manual override.

Variable Rate mode is used to view the operation of the EOH modules. With an EOH module installed, various modes and menus are changed. Listed below are the operating instructions for the various modes of operation and menus.



#### **3.1. Variable Rate Mode**

This mode is used to display the actual and set application rates of the EOH modules. When selected, this message is displayed:

#### **R 1 ### LB/AC 0.0**

Where ### is the set application rate of the first EOH module (R1). When the Master switch is turned on, the actual application rate is displayed in the 0.0 position. Use the Variable Rate mode button to scroll through multiple EOH modules. The Plus and Minus buttons can be used to change the set application rate.

The EOH module will not operate until the VR CALIBRATION is complete. If the calibration procedure was not done, this message is displayed when Variable Rate mode is selected:

#### **CAL REQUIRED**



### 3.2. *Speed Mode*

Selecting Speed mode, in addition to displaying the ground speed, also displays the application rate of the first variable rate device. When Speed mode is selected, this message is displayed:

**0.0 MPH- 1 0.0**

Where 1 is the first variable rate device, and 0.0 is current application rate (in pounds per acre or kilograms per hectare). When using multiple variable rate devices, use the Plus and Minus buttons to scroll through the application rates. When scrolling through, the number will change from 1 to 5.

A speed range is calculated from the application rate, and the physical limits of the motor. If at the current speed the motor attached to the first EOH module was unable to turn slow enough to supply the set application rate, this message is displayed:

**SPEED TOO SLOW!! and PRESS KEY TO ACK**

Likewise, if at the current speed the motor attached to the first EOH module was unable to turn fast enough to supply the set application rate, this message is displayed:

**SPEED TOO FAST!! and PRESS KEY TO ACK**

An audible alarm will accompany these messages. Press any button on the Monitor Head to acknowledge the alarm condition, and adjust the ground speed accordingly.



### 3.3. *Area Mode*

Selecting Area mode displays an applied product weight total for the installed EOH modules. These counters are labeled PROD, and each is given the same number as the EOH module associated with it. Use the Plus and Minus buttons to scroll through the product counters. The product weight is displayed as shown:

**PRODUCT 1 \_\_\_ LBS**

Each product counter can be reset to zero. To reset a counter to zero, press and hold the OK button for about five seconds. This message will be displayed:

**CLEAR WEIGHT - # ?**

Where # is the number of the selected product counter. Press the OK button to complete the reset of the counter.



### 3.4. Shaft Mode

Selecting Shaft mode displays the RPM of the variable rate motors. The variable rate motors are labeled MOTOR, and each is given the same number as the EOH module associated with it. The Plus and Minus buttons are used to scroll through the motors. The variable rate motor RPM is displayed as shown:

**MOTOR 1** \_\_\_\_\_

The system calculates an RPM range. If the motor RPM is slower than what is required to supply the correct application rate, this message is displayed:

**MOTOR SPEED SLOW -# and PRESS KEY TO ACK**

If the motor RPM is faster than what is required to supply the correct application rate, this message is displayed:

**MOTOR SPEED HIGH!! and PRESS KEY TO ACK**

Where # is the number of the EOH module. An audible alarm accompanies these messages.



### 3.5. SEED CHECK ?

This menu is used to calibrate the amount of product weight put out for each turn of the motor. When selected, this message is displayed:

**PRODUCT # 1**

The PRODUCT label is given the same number as the EOH module associated with it. Use the Plus and Minus buttons to select the EOH module. Once selected, press the OK button, and this message is displayed:

**TURN OUT PRODUCT then WEIGHT 0 G**

Get a receptacle to collect the product from the metering shaft. Set the Calibrate switch to *Calibrate*. The EOH module will begin turning the metering shaft. As the meter turns, the number beside WEIGHT will increase. Once a sample has been collected, switch the Calibrate switch to *Operate* to stop the motor. Weight of the product and record the weight..

**Note: The weight measurement is always in grams. If needed, see the conversion table.**

Use the Plus and Minus buttons to set the product weight, and press the OK button to complete the change. This message will be displayed:

**SPEED RANGE then ## min - ##max MPH**

Where ##<sub>min</sub> is the minimum speed, and ##<sub>max</sub> is the maximum speed needed to provide the set application rate. The product weight value per meter turn is now set.



### **3.6. DELTA STEP ?**

This menu sets the amount of application rate change generated by each “one touch” adjustment of the Control switches. When selected, this message is displayed:

#### **DELTA STEP # 1**

The DELTA STEP label is given the same number as the EOH module associated with it. Use the Plus and Minus buttons to select an EOH module. Press the OK button, and this message is displayed:

#### **SIZE 10%**

The SIZE value is in a percentage (range of 0 to 100). Use the Plus and Minus buttons to set the SIZE value, and press the OK button to complete the change.

To make a change in rate of the delta step size, push the toggle switch for the product you want to change up or down to change the rate by the size of the delta step. For example, if the delta step is 10%, pushing switch 1 up will increase product 1 by 10%. The light on the number 1 switch will flash to provide a reminder that you have moved from your desired rate. Touching the switch down will return you to the target rate and the light will stop flashing.



### **3.7. VR # 1 CAL? to VR # 5 CAL?**

This menu is used to display the grams per rotation value of the EOH modules. The VR label represents the EOH modules. Once selected, this message is displayed:

#### **CAL# 1 \_\_\_\_ G/R**

Use the Plus and Minus buttons to change the CAL# value, and press the OK button to complete the change.



### **3.8. SAVE CAL?**

This menu is used to store the EOH module calibration values in memory. Once selected, this message is displayed:

#### **VR # 1 CAL?**

The VR labels represent the EOH modules. Use the Plus and Minus buttons to select an EOH module. Press the OK button, and this message is displayed:

#### **PRODUCT # 1**

Use the Plus and Minus buttons to select one of the five PRODUCT labels to save the EOH module calibration values in, and press the OK button. The values have now been saved to memory.



### 3.9. READ CAL?

This menu is used to load the EOH module calibration values from memory. Once selected, this message is displayed:

#### PRODUCT # 1

Use the Plus and Minus buttons to select the PRODUCT label containing the saved calibration values. Once selected, press the OK button, and this message is displayed:

#### VR # 1 CAL

The VR label represents the EOH modules. Use the Plus and Minus buttons to select the desired EOH module, and press the OK button. The saved variable rate calibration values have now been loaded into the selected EOH module.

## 4. Troubleshooting

Listed below are situations that could occur. Follow the SOLUTION process to restore normal operation.

### SITUATION

*The EOH module is not displayed in the SHOW INSTALL? menu.*

### SOLUTION

**First**, check that the module is connected as described in the **Installation** section.

**Second**, check that there is power to the module (power light).

**Third**, plug the EOH module into another module.

**Fourth**, replace the Module cable.

**Fifth**, replace the EOH module.

### SITUATION

*The Monitor Head displays COMM ERROR EOH 1 when the EOH module is connected.*

### SOLUTION

**First**, check that the module is connected as described in the **Installation** section.

**Second**, plug the EOH module into another module.

**Third**, replace the Module cable.

**Fourth**, replace the EOH module.

## SITUATION

*The EOH module is displayed, but the electric motors never turn.*

## SOLUTION

**First**, check that the motor is connected as described in the **Installation** section.

**Second**, check that the Speed sensor and EOH module calibration procedures have been done.

**Third**, check for any error messages (i.e. CAL SWITCH ON -1).

**Fourth**, replace the EOH module.

## SITUATION

When calibrating, motor revolutions aren't recorded.

## SOLUTION

Check wiring to tachometer sensor

Replace tachometer sensor

## SITUATION

Monitor shows motor slow but meter is turning at high rpm

## SOLUTION

Check wiring to tachometer sensor

Replace tachometer sensor