Moray JR ™

Adaptive Weight Control

Operation Manual

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Contents

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Limited Warranty

Certified Cirus Control Systems

What and who is covered?

This warranty covers all defects in materials or workmanship in your Certified Cirus Control system under normal use, maintenance and service. This warranty coverage applies only to the original owner and is not transferable.

How long is the warranty period?

This warranty coverage runs for a period of 1 year from the date of initial installation (or 13 months from date of shipment from Certified Cirus Controls, whichever occurs first. Replacement parts are warranted for the remaining portion of the original warranty period or thirty (30) days from date of shipment from our factory (whichever is greater).

How can you get service?

Certified Cirus Control systems obligation under this warranty is limited to repairing and/or replacing, at Certified Cirus Controls option, any part or parts that are determined, by Certified Cirus Controls to be defective. To be eligible for any claim under this warranty, the owner (or Certified Cirus Controls authorized dealer) must return any defective part(s) to the factory, within the applicable warranty period (as set out above).

What will we do?

Certified Cirus Control Systems may, at its option, elect to grant adjustments in the field through an authorized representative and may thereby elect to waive the requirement that parts be returned to Certified Cirus Controls factory. The repair or replacement of defective parts under this warranty will be made without charge to the owner except for transportation of the part to our authorized repair location.

What is not covered under this warranty?

Certified Cirus Controls will not assume any expense or liability for repairs made outside our plant without our prior written consent. We are not responsible for damage to any associated equipment or product and will not be liable for loss of profit or other special damages.

The provisions of this warranty do not apply to any product or parts which have been subject to misuse, negligence or accident, or which have been repaired or altered outside of Certified Cirus Controls system factory in any way (in the judgment of Certified Cirus Controls) so as to affect adversely its performance or reliability. Neither does this warranty apply to normal maintenance service and parts or to normal deterioration due to wear and exposure.

This warranty is expressly in lieu of other warranties, expressed or implied, in fact or by law, including any implied warranty of merchantability of fitness for a particular purpose. The remedies of repair or replacement as set forth are the only remedies under this warranty, Certified Cirus Controls disclaims any obligations or liability for loss of time, inconvenience, commercial loss or direct consequential, special or incidental damages. This warranty is in lieu of any other obligation or liability of Certified Cirus Controls of any nature whatsoever by reason of the manufacture, sale, lease or use of such products and Certified Cirus Controls neither assumes, not authorizes anyone to assume for it, any other obligation or liability in connection with such products.

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Revision Level of this Manual

Rev Letter	Effective Date	Contents
A	2/14/12	Initial Release
B	3/27/13	Replaced trim pot calibration with engage/set point
C	7/18/13	Further description of toggle in the calibration.
D	12/10/15	Firmware version 3.0 only requires 1 toggle of the engage switch to enter calibration mode. Previous versions require 5 toggles.
E	3/3/16	Calibration update.
F	4/25/17	12/24 volt system
G	4/28/17	Typo in calibration section
H	6/22/20	Calibration Update

Package Contents

A complete ***Moray JR ™*** control system contains the following items:

1) ***MORAY JR ™*** control unit;
2) Power cable (MK-1003);
3) PWM Hydraulic control cable (SF-1005);
4) Valve hydraulic control cable (MK-2005);
5) Trigger cable (JP-1002);
6) This manual;

If any of these items are missing, please contact your distributor for replacement parts.

Functional Overview

MORAY JR ™ is a manually regulated plow controller which adjusts the "contact weight" (down force) that the moldboard of a snowplow exerts on a road surface. The system decreases or increases the contact weight of the snowplow depending on the position of the Set Point.

This controller can transfer weight from the truck to the plow to increase the plowing capability for packed snow/ice. (This feature requires a snowplow designed for down pressure and the proper size truck).

Normal Operation:

1. Turn the power switch on.
2. To activate the system, turn the engage switch to "ON" or set the Trigger.
3. Turn the Set Point dial to reduce or increase the contact weight.

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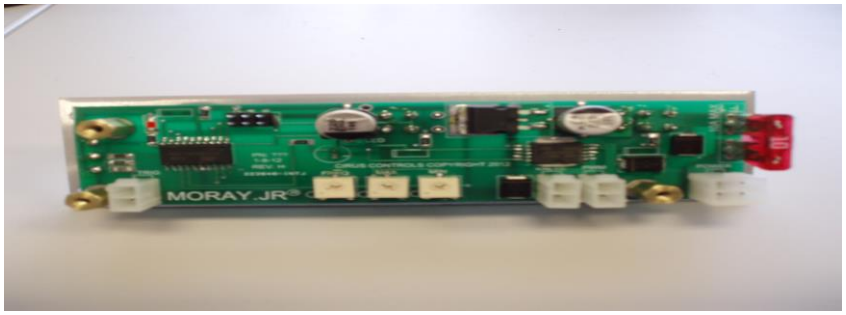
Feature Overview

MORAY JR ™ Control Panel Front View

Power Switch: Main system power switch.
Engage: Enables the ***MORAY JR ™*** to take control of the contact weight.
Set Point: Dial used to set the contact weight of the implement.
Red LED: Voltage output signal on or off.

MORAY JR ™ Control Panel Back View



POWER: Provides power and ground to unit. (MK-1003 cable)
PWM: Voltage signal output to the valve controlled by the set point. (SF-1005 cable)
VALVE POWER: On/Off output signal to the valve. (MK-2005 cable)
TRIG: Enables the ***MORAY JR ™*** to take control of contact weight. (JP-1002 cable)

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Features

Power Switch

The Power Switch is the master power switch for the ***MORAY JR ™***. The ***MORAY JR ™*** requires 13 Volts to operate. When the power switch is enabled the white text on the control panel is backlit with red LED's to act as a visual indicator that the ***MORAY JR ™*** is powered on.

Set Point

The set point dial varies the "PWM port" output voltage between 0 and 13 volts. The available output voltage is defined by the set point on the dial. The higher the set point the greater the output voltage signal. For example:

Set point dial set to 0 → output will be "off" 0 volts

Set point dial setting 1-9 → output will be linear; between .1 ~12 volts

Set point dial set to 10 → output will be fully "on" ~13 volts

Note: the above output references are based on a calibration setup of minimum trim = 1 and maximum trim = 10. Output voltages will vary based upon min and max calibration settings.

Engage Switch/Trigger

The engage switch and trigger allow the set point dial to become active to turn on the "PWM port" and the "Valve power port." The PWM output and valve power can be activated when the engage switch OR the trigger are active. The trigger becomes active when it is supplied with 13 volts. The following table defines the states of the engage switch, trigger and output:

Engage Switch (On/Off)	Trigger Input (12V/0V)	Output Enabled
Off	0V	False
Off	12V	True
On	0V	True
On	12V	True

Red LED

The red LED signals that the PWM port and Valve ports are turned "on".

Power

A jumper is set to allow 12 or 24 Volts to be supplied to the ***MORAY JR ™*.**

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Valve Power

This is a static 12V output, which supplies 12 volts to the valve when the PWM port is turned on.

PWM Output Signal

The PWM output produces a linear output PWM signal to a hydraulic coil which is dependent on the Trigger, Engage, Min/Max calibration, and the Set Point dial. The output is labeled 'PWM' on the back of the control panel and should be connected to the valve with the SF-1005 cable. The full range of the Set Point dial (0-10) is used to vary the signal.

Calibration

The ***MORAY JR ™*** stores the minimum voltage, maximum voltage and frequency response for various types of hydraulic setups. All 3 of these values are field configurable to provide optimum user performance. To modify and/or change these values follow the below process:

1.) Turn the engage switch "off" (Red part of the switch is NOT showing)

2.) Turn the power "off" on the ***MORAY JR ™***

3.) Rotate the set point dial to number 10

4.) Turn the power switch "on"
   a.) Within 1 seconds turn on the "ENGAGE" switch (red bar of switch showing)
   b.) Within in 1 seconds rotate the set point dial to "0"

5.) The red LED on the front of the controller should now be blinking slowly (approximately 2-3 times per second). If not, start over at step 1.

6.) Turn the set point dial to 10 if you are using a 24V system, and to 0 for a 12V system.

7.) Click the engage switch to the "off" position (non-red bar) and then back to the "on" position. This will save the 24/12 supply voltage value and cause the LED light to start blinking approximately 10 times per second. If not, start over at step 1.

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8.) Choose the preferred frequency of the coil that the controller is attached to. Rotate the set point dial to the desired number based on the table below. *Default is set to 200 Hz.*

Set Point Dial Value	<1	2	3	4	5	6	7	8	9	10
PWM Output Frequency	40	60	80	100	120	150	175	200	250	300

Table 1 Set Point PWM Frequency Calibration

9.) Click the engage switch to the "off" position (non-red bar) and then back to the "on" position. This saves the frequency value settings.

The red LED should now be blinking slower (around 3 times per second).

10.) The controller is now in minimum voltage calibration:

a. Turn the set point dial to the minimum value that allows for the blade to just start to lift off the ground. Or where the blade just starts to reduce pressure off of the ground. *Default is #1.*

b. Click the engage switch to the "off" position (non-red bar) and then back to the "on" position. This saves the minimum trim value.

The red LED should now be blinking faster (approximately 10 times per second).

11.) The controller is now in maximum voltage calibration:

a. Turn the set point dial to the maximum value that allows for the blade to lift off the ground. Or where the blades movement is to your preference. *Default is #10.*

b. Click the engage switch to the "off" position (non-red bar) and then back to the "on" position. This saves the maximum trim value.

12.) Turn the engage switch to the "off" position.

13.) Calibration is now complete. Turn the engage switch "on". Move the set point knob to your desired setting.

*Note: If the red LED is still blinking, this signifies that the minimum output voltage set point was greater than the maximum set point during calibration, the process needs to be restarted at step 1.

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Trouble Shooting Guide

Complaint	Cause (s)	Correction (s)
Red LED blinks whether the engage switch is on or off, and regardless of the set point value	Miscalibration. The calibrated minimum PWM value is greater than the calibrated maximum PWM value.	Recalibrate the controller.
Power Isn't On	a) Master Power Off; b) Bad Power or Ground connection;	a) Turn on power; b) Verify power/ground connections.
MORAY cuts out or acts strange;	Low power supply voltage from truck battery/alternator;	Minimum truck voltage must be > 12.0 volts.

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