



*Marlin<sup>TM</sup>*

*Integrated Plow and  
spreader control  
with ground speed trigger*

**Operation Manual**

Limited Warranty.....	3
Revision Log for this Manual .....	4
Package Contents .....	4
Functional Overview – Convertible Capability .....	4
High Current Electric Pre-Wet Systems .....	4
Operating Controls:.....	4
Pre-Delivery System Setup Checklist.....	5
Pre-Delivery .....	5
Step 1 .....	5
Installing the control unit .....	5
Guard Against RF Interference .....	5
Connecting the cabling - Back panel of Marlin .....	5
Step 2 – Configure and trim hydraulic channels and “blast” .....	6
Step 3 - Testing the signal outputs.....	10
Trouble Shooting Guide.....	11
Appendix A – Standard System Drawings .....	11
Appendix B – Spare Parts List.....	11
Appendix C – Typical Frequency Settings by Valve Mfg.....	11

## **Limited Warranty**

### **Cirus Controls, LLC.**

#### **What and who is covered?**

This warranty covers all defects in materials or workmanship in your Cirus Controls 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 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?**

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

#### **What will we do?**

Cirus Controls' 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 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?**

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 Cirus Controls' factory in any way (in the judgment of 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, 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 Cirus Controls' of any nature whatsoever by reason of the manufacture, sale, lease or use of such products and Cirus Controls neither assumes, nor authorizes anyone to assume for it, any other obligation or liability in connection with such products.

## Revision Log for this Manual

Rev	Release Date	Description
A	7/1/13	Production Release

## Package Contents

A complete *Marlin™* control system contains the following items:

- 1) *Marlin™* control unit;
- 2) This manual;
- 3) Power cable (MK-1003)
- 4) Remote Blast and Pass cable (TS 2004)
- 5) Hydraulic control cable (TS-2031)
- 6) 8 valve pigtails (TS-2020)

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

## Functional Overview – Convertible Capability

*Marlin™* is a manual controller for hydraulically powered plow and spreading systems, offering independent output control for auger (feed rate), spinner (lane width) and aux (a 3<sup>rd</sup> hydraulic function such as a pre-wet or a cross auger) as well as, Hoist up / down, Plow up / down / left / right. The *Marlin™* spreader can be configured in three ways during set up: a) **Manual only** – no ground speed; b) **Ground speed tripped on/off**; c) **Ground speed oriented on/off**.

## High Current Electric Pre-Wet Systems

The pre-wet channel on *Marlin™* is rated for a maximum current of 6 amps. For an electric pre-wet pump that is rated for higher than 6 amps, contact us for the Electric Pre-Wet Driver accessory.



## Operating Controls:

**Power On/Off:** turns on power to the complete system (“on” when red is visible on switch).

**Blast Switch:** pressing turns on blast, and pressing again turns it off when in on/ off.

**Pass Switch:** pressing this switch turns all the outputs off, until the pause is pressed again to restore the system to operating. **Note: Controller defaults (at power up) with “pass” function on and pass indicator light lit.**

**Gnd. Speed On/ Off:** when turned on, the “auger” and the “aux” are normally linked to the motion of the truck. (Spreading will commence when auger &/or Aux LED’s are set above zero and the truck moves).

**Note:** Proper operation requires the speedometer cable to be hooked up and the “Gnd Speed” switch to be in the “on” position. If the speedometer sensor or cable is not functioning, and the “Gnd Speed” switch is on, the controller receives no signal and the spreader will not output material.

When Gnd Speed switch is in the off position, the ground speed linkage is disabled and the auger, spinner and aux. controls operate without regard for motion of the truck. In the event of a ground speed sensing failure, turning off the “Gnd Speed switch” allows the EZ Spread to be operated manually until the sensor problem is corrected.

**Ground Speed Setup:** *Marlin™* controllers include “setup optional” ground speed interaction on the auger and auxiliary output channels. (The spinner channel is not ground speed oriented). No calibration is necessary for the ground speed orientation function. Set up personnel can choose to configure the controller as: a) Manual (no ground speed); b) Ground Speed Triggered on/off: controller actuates when ground speed switch is “on” and truck is in motion; c) Ground Speed Oriented on/off: controller orients with truck speed when ground speed switch is “on” and truck is in motion; See setup steps for details.

**Feed Rate (Auger) Control:** are up and down arrows allowing the operator to turn auger off (0 setting) and increase speed to maximum (10 setting). **Caution: auger can operate any time the LED’s are non-zero.**

**Lane Width (Spinner) Control:** are up and down arrows allowing the operator to turn the spinner off (0 setting) and/or to uniformly increase its speed to maximum (10 setting). **Caution: the spinner can operate any time the LED’s are non-zero.**

**Aux Control:** are up and down arrows allowing the operator to turn a third hydraulic function off (0 setting) and/or to uniformly increase its speed to maximum (10 setting). **Caution: the Aux function can operate any time the LED’s are non-zero.**

**10 Amp Fuse:** a single 10a fuse protects the circuitry and is located in the rear of the unit.

## ***Pre-Delivery System Setup Checklist***

	Description	Completed By/Date
Step 1	Install System and connect cables	
Step 2	Trim hydraulics for all functions	
Step 3	Test the Marlin and Outputs	

## ***Pre-Delivery***

### ***Step 1***

To install and run either *Marlin™* system, the following steps must be completed.

- 1) Mount the control unit in the truck cab;
- 2) Connect hydraulic control cables, power, remote blast/pass and any other optional cables;
- 3) Power up the unit, and check functionality of outputs;
- 4) Set the trims;

## **Installing the control unit**

The control unit of the *Marlin™* can be mounted in a stand alone configuration.

## **Guard Against RF Interference**


Even properly guarded sources of radio frequency (rf) noise can “leak” and interfere with in-cab electronics. Take care when installing radios and radio antenna cable to keep at least 24” spacing between them and any cabling for the *Marlin™*.

## **Connecting the cabling - Back panel of Marlin**



- 1) Connect the TS-2031 to HYD out for the plow and spreader functions. Connect the SF-1005 if prewet is being used.
- 2) Connect the TS-2004 speedo cable to the truck to access the speedometer signal. If equipped with a Cirrus Controls plow control, connect remote blast/pass cable to the Plow control remote/blast pass cable (optional).
- 3) Finally, connect the MK 1003 power cable to the unit. Check to make sure that the power switch is off before connecting the power leads and then connect power and ground to the cable. **The power cable is normally connected to a 12 volt ignition hot source** or it can be connected to the battery, as the unit is fused, or to a power circuit capable of delivering a minimum of 10 amps.

## Step 2 – Configure and trim hydraulic channels and “blast”

<b>WARNING</b>		<p>Potential for injury due to unexpected startup or movement of mechanical equipment.</p> <p>Unexpected startup or movement of mechanical equipment may cause injury to eyes and extremities.</p> <p>During initial startup and testing, the spreader components may start without warning. Stay clear of the auger, spinner, and liquid nozzles until initial power up and programming are complete.</p>
----------------	-------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

All three hydraulic channels can be trimmed using the controls on the front of the switch panel. **During configuration, the “Ground Speed” function is disabled, so the auger will move while the truck is standing still.** An “ideally trimmed” system will just begin to move at an operating setting of 1 and will reach its maximum speed at a setting of 10. Note that the setting on the LED used during “set up trimming of a function” (below) will not correlate to the settings used during normal operation.

**Note: Changes to configuration are saved when you reach the last step and the blast and pass LED’s alternately flash. If you terminate your configuration prior to reaching the last step, any and all changes are lost and the controller returns to default settings or to settings saved previously.**

**To enter the configuration mode:** Hold blast switch (left), turn on power, wait for two seconds till blast and pass LED’s flash, and release Blast. The flashing LED’s show values being set.

- a) **Set “Control Frequency” to match the frequency of the coil installed in the truck**  
**Indication:** Both blast and pass LED’s flash slow (2x sec)

**Action:** Set Frequency using auger arrows.  
(0 = 40, 1 = 60, 2 = 80, 3 = 100, 4 = 120, 5 = 140, 6 = 160, 7=180, 8=220 etc.)

**Accept:** See Attachment C for frequency by coil manufacturer. Default is set at 120Hz.  
Press **pause** to confirm chosen value (press **blast** to use previous setting).

**b) Set “Feed Rate” (Auger/Conveyor) Minimum trim level:**

**Indication:** Blast LED will flash slowly (2x sec).

**Action:** Set auger minimum trim using auger arrows.

**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting)

**c) Set “Feed Rate” (Auger/conveyor) Maximum trim level:**

**Indication:** Blast LED will flash quickly (8x sec).

**Action:** Set auger maximum trim using auger arrows.

**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**d) Set “Lane Width” (Spinner) Minimum trim level:**

**Indication:** Pause LED will flash slowly.

**Action:** **Start Auger Moving normally**

Set spinner minimum trim using spinner arrows.

**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**e) Set “Lane Width” (Spinner) Maximum trim level:**

**Indication:** Pause LED will flash quickly.

**Action:** **Leave Auger Moving as before**

Set spinner maximum trim using spinner arrows.

**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**f) Set “Aux” Minimum trim level:**

**Indication:** ground speed LED will flash slowly.

**Action:** Set aux min trim using aux arrows.

**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**g) Set “Aux” Maximum trim level:**

**Indication:** ground speed LED will flash quickly.

**Action:** Set aux max trim using aux arrows.

**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**h) Set Blast timer (or on/off):**

**Indication:** Blast and Pause flash quickly.

**Action:** Set blast using auger switches (each mark = 2 sec, **0=on/off**, 2 = 4 sec, 4 = 8 sec, 8=16 sec, etc.)

**Note: to configure Blast as “on/off” set LED’s at zero during this step.**

**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**i) Set “Ground Speed Mode”**

**Indication:** ground speed flash.

**Action:** Set ground speed mode using auger switches ( **0=manual only** - Gnd Speed switch disabled; **5 = Ground Speed Triggered** (on/off with switch); **10 = Ground speed oriented** (on/off with switch).

**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**j) Set “spinner at least at min setting when auger running”**

**Indication:** Blast, Pause, ground speed flash slowly.

**Action:** Set spinner on when auger is on using feed switches ( **0= not linked; 1 = linked**)  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**k) Set “liquid at least at min setting when auger running”**

**Indication:** Blast, Pause, ground speed flash fast.  
**Action:** Set liquid on when auger is on using feed switches ( **0= not linked; 1 = linked**)  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**l) Set “LED brightness”**

**Indication:** Blast and ground speed flash slowly.  
**Action:** Set LED brightness using feed switches ( **0= dim as possible; 10 = bright as possible**)  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**m) Set “Unseat percentage”**

**Indication:** Blast and Pause flash fast.  
**Action:** Set unseat percentage used for going from stopped to moving using feed switches ( **0= 0%; 1 = 10% ; 2 = 20% ; 3 = 30% ; 4= 40%; etc.**)  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**n) Set “PWM ramp time”**

**Indication:** Blast, Pause, ground speed flash fast.  
**Action:** Set ramp time using auger switches ( **0 = fast ramp; 10 = slow ramp**).  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**o) Set “Hoist up min trim”**

**Indication:** Spinner min setting and aux min flash slowly  
**Action:** Set min trim using auger switches, and then press implement direction to test speed.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**p) Set “Hoist down min trim”**

**Indication:** Spinner min setting and aux min flash fast.  
**Action:** Set min trim using auger switches, and then press implement direction to test speed.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**q) Set “Plow up min trim”**

**Indication:** Spinner min setting and aux second led flash slowly.  
**Action:** Set min trim using auger switches, and then press implement direction to test speed.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**r) Set “Plow down min trim”**

**Indication:** Spinner min setting and aux second led fast.  
**Action:** Set min trim using auger switches, and then press implement direction to test speed.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**s) Set “Plow right min trim”**

**Indication:** Spinner min setting and aux third led flash slowly  
**Action:** Set min trim using auger switches, and then press implement direction to test speed.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

**t) Set “Plow left min trim”**

**Indication:** Spinner min setting and aux third led flash fast.  
**Action:** Set min trim using auger switches, and then press implement direction to test speed.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).



u) **Set “Hoist up max trim”**

**Indication:** Spinner max setting and aux fourth led flash slowly.  
**Action:** Set min trim using auger switches, and then press implement direction to test speed.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

v) **Set “Hoist down max trim”**

**Indication:** Spinner max setting and aux fourth led flash fast.  
**Action:** Set min trim using auger switches, and then press implement direction to test speed.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

w) **Set “Plow up max trim”**

**Indication:** Spinner max setting and aux top led flash slowly.  
**Action:** Set min trim using auger switches, and then press implement direction to test speed.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

x) **Set “Plow down max trim”**

**Indication:** Spinner max setting and aux top led flash fast.  
**Action:** Set min trim using auger switches, and then press implement direction to test speed.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

y) **Set “Plow right max trim”**

**Indication:** Spinner max setting and aux bottom 2 led’s flash slowly.  
**Action:** Set min trim using auger switches, and then press implement direction to test speed.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

z) **Set “Plow left max trim”**

**Indication:** Spinner max setting and aux bottom 2 led’s flash fast.  
**Action:** Set min trim using auger switches, and then press implement direction to test speed.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

aa) **Turn on Plow float for SINGLE ACTING cylinders**

**Indication:** Spinner led 2<sup>nd</sup> down will flash.  
**Action:** turns on or off plow float. 0= off, 1= 1sec delay, 2 = 2 sec, 3 = 3 sec, etc. When plow float is active the ground speed led will blip on and off to show it is active.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).


bb) **Turn on hoist delay safety setting**

**Indication:** Spinner led 3<sup>rd</sup> down will flash.  
**Action:** Turns on a hoist safety that will require the user to hold the hoist up button for 1 to 10 seconds before the hoist will start to go up. 0= off, 1= 1sec delay, 2 = 2 sec, 3 = 3 sec, etc.  
**Accept:** Press **pause** to confirm chosen value (press **blast** to use previous setting).

cc) **Configuration is complete**

**Indication:** Blast and Pause will flash in an alternate sequence (left, right etc).  
**Accept:** Cycle power to start spreader in normal mode.

### Step 3 - Testing the signal outputs

<b>WARNING</b>		<p>Potential for injury due to unexpected startup or movement of mechanical equipment.</p> <p>Unexpected startup or movement of mechanical equipment may cause injury to eyes and extremities.</p> <p>During initial startup and testing, the spreader components may start without warning. Stay clear of the auger, spinner, and liquid nozzles until initial power up and programming are complete.</p>
----------------	-----------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

- 1) Turn on the system with the truck running.
- 2) Turn “off” the ground speed trigger switch and set the auger LED to any “non-zero” setting. The auger will engage and the LED on the valve junction box will light.
- 3) Turn “on” the “Gnd Speed” switch, the auger will stop running and the VJB LED will turn off.
- 4) Drive truck slowly forward. Verify that auger starts turning when truck runs above 2 mph. If not, adjust speedo reference trim pot (back panel) until auger responds to truck motion.
- 5) Final trimming of auger motion can be accomplished after ground speed signal is validated.
- 6) To adjust one or more trim settings, hold blast, turn on power, wait for two seconds, then release blast. The spreader will now enter configuration mode as before. When entering the configuration mode, the spreader retains the settings made in step 2. You can change only the settings you wish to change, by pressing blast to retain old settings. To accept new settings, press “pass” after making adjustments.

## Trouble Shooting Guide

Complaint	Cause (s)	Correction (s)
Set Up Issues		
Power Isn't On	a) Master Power Off; b) Fuse is blown; c) Bad Power or Ground connection;	a) Turn on power; b) Replace Fuse c) Verify power/ground connections.
EZ Spread cuts out or acts strange;	Low power supply voltage from truck battery/alternator;	Minimum truck voltage must be > 12.0 volts;
Auger or Spinner Doesn't Move (truck is stationary)	a) PTO not engaged; b) Hydraulics not functioning;  c) Electrical connection failure;  d) EZ Spread power off; e) "Pass" is engaged and LED lit	a) Engage PTO; b) Verify Hydraulics: actuate plow or hoist; manually operate using manual over-ride on valve;  c) Check LED at coil connection and at valve junction box; Repair cable connections; d) Check wiring connections; e) Select "pass" switch to begin spreading;
Auger doesn't move when truck starts;	a) Ground speed trigger not on; b) Ground Speed signal not received by controller due to reference error;	a) Turn on ground speed trigger; b) Adjust Speedo reference trim pot on rear of controller until signal is functioning normally.
Spinner slows down or stops	Minimum trim for spinner too low;  Hydraulic pressure in spinner circuit is below pressure compensator;	Re-trim spinner to a higher minimum trim level. Increase pressure in spinner circuit; Use spool with lower flow rating;
TOP Feed rate LED is blinking TOP spin rate LED is blinking TOP liquid rate LED is blinking Ground Speed LED is Blinking	Open or short in the cabling to the hydraulic valve. 3 <sup>rd</sup> Channel enabled, not in use.	Turn on one channel at a time to isolate which cable is bad and replace. Disable 3 <sup>rd</sup> channel in set up.

### Appendix A – Standard System Drawings

### Appendix B – Spare Parts List

Part #	Description
MK 1003	12V power cable;
TS 2004	Speedometer signal and remote blast and pass cable;
TS-2031	Hydraulic cable;
000203	10amp 32v fuse.

### Appendix C – Typical Frequency Settings by Valve Mfg

Brand Valve (prewet systems)	100 Hz
Husco – Section Valves –	100 Hz
Hydra Force (Cirrus manifold)	220 Hz
Parker -	60 Hz
Rexroth (MP18)	180 Hz
Sauer Dan Foss - PVG32	80 Hz