



MULTI-C1

IN-PARLOUR FEEDING



Installation & Operation Manual

Revision 2



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OVERVIEW




The Multi-C1 control unit provides the user with a complete all round solution to in-parlour feeding. The Multi-C1 can be configured to be used as a manual ration feeding system or a cow memory feeding system with the capability to connect to automatic identification hardware. The Multi-C1 controller works in conjunction with our remote 20 channel feeder interface unit.

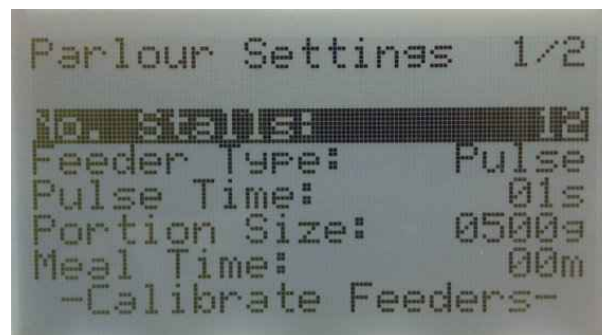
Multi-C1 controller features:

- Control up to 40 stalls per side (herringbone parlour).
- Individual feed or batch feed a side option.
- Calibrate individual auger motors.
- Cows fed and feed dispensed counters.
- Single ration drop enticement option.
- *Quick Feed* immediate dispensing option.
- 9999 cow storage.

SETTING UP PARLOUR PARAMETERS

The following procedures will help you quickly get the Multi-C1 controller up and running.

Press the  button to enter the set up menu. Use the  and  buttons to navigate through the different screens until you reach the *Parlour Settings 1/2* screen as shown below.




Use the  and  buttons to move through the different parameters.

Parlour Size

To edit the *No. Stalls* parameter simply highlight the parameter and then enter the parlour size using the numeric keypad. Maximum number of stalls allowed is 40.

Feeder Type

The feed dispenser type can be selected by highlighting *Feeder Type* and using the  button to choose either Pulse or Auger type feeders.

Pulse/Portion Time

The time it takes the system to deliver a portion of feed can be set by highlighting either *Pulse Time* or *Portion Time* depending on the feeder type selected. For *Pulse Time* the time entered in seconds will relate to the length of time the feed dispenser solenoid is energised and de-energised. For *Portion Time* the time entered will relate to the running time of the auger motor per portion. Maximum allowed portion time is 25.0 seconds.

Manufacturer Feed Dispenser Pulse/Portion Times

Auger feeder portion size is 500g for times below.

Make	Type	Run Time (seconds)
ATL	Auger	2
Ration Master	Pulse	1
Hosier	Auger	1
Alfa Laval 2	Pulse	2
Simplex Alum	Auger	2
Westfalia EZ	Auger	12
Westfalia M	Pulse	2
Westfalia EP	Pulse	2
Auger Master	Auger	11
Orby	Pulse	1
Surge	Auger	12
Gascoigne	Auger	6
Simplex Galv	Auger	6
EB	Auger	1
Somerset	Pulse	1
Alfa Laval 4	Pulse	1
Alfa Laval 24	Auger	15
Vaccar	Auger	11


Portion Size

The Portion Size relates to the amount of feed dispensed during the pulse/portion time. This is by default set to 500g but can be adjusted up to 1000g.

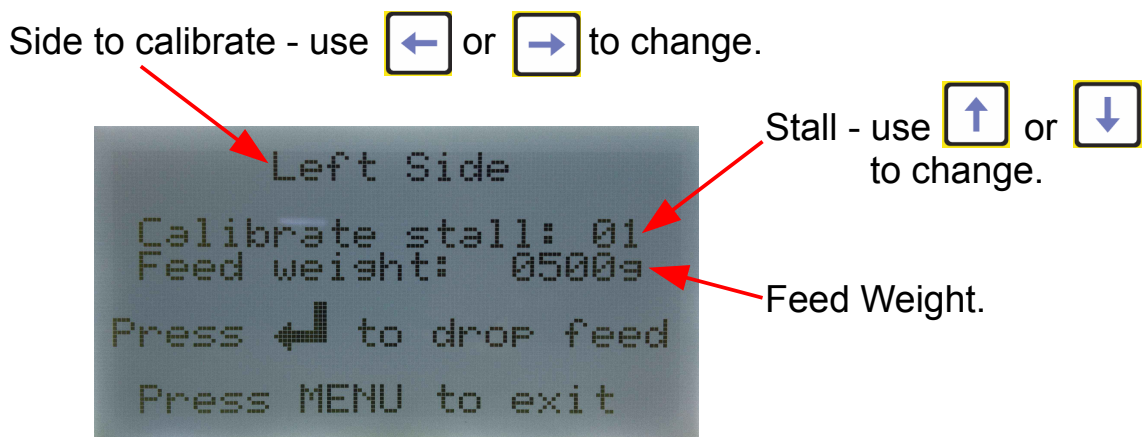
Meal Time


The Meal Time feature allows feeding over a pre-set time. If for example Meal Time is set to 5 minutes then all rations fed to a side regardless of size will be split over the 5 minute period normally in 1 second drops.

Calibrating Auger Feeders

The Multi-C1 controller allows individual stall calibration on auger type feed dispensers. Calibration can be accessed from the Parlour Settings 1/2 screen by highlighting *-Calibrate Feeders-* and pressing the  button.

Calibrating the feed dispensers allows the system to compensate for any feed dispensers that drop more or less feed than the average dispenser because of age or different parts. Calibrating essentially equalizes the feed portions between all the feed dispensers.



To calibrate a stall first select the side and then the stall number. Make sure the feed dispenser hopper and auger is full of feed and the feeding trough empty. Press the  button to dispense **one** portion.

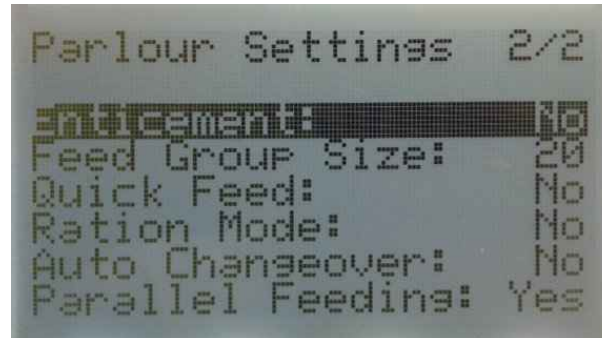
Go to the stall and collect the dropped feed and weigh it. The weight should be no more than +/- 20% out from the desired portion size, if the deviation is greater than 20% then readjust the *Portion Time* in the *Parlour Settings 1/2* page.

Hint...


To obtain better accuracy during calibration drop three portions in one go and weigh the combined weight and then divide that figure by three.

ADDITIONAL PARLOUR PARAMETERS


Below is a summary of Parlour Settings 2/2 page parameters.



Enticement

The *Enticement* parameter when set to **Yes** will dispense one portion of feed to the first stall as soon as the user inputs the first feed amount or cow number into the controller. This feature acts as the name suggests as an enticement to the first cow to enter the stall line and proceed down to the first stall. Pressing the  button toggles this parameter.

Feed Group Size


The *Feed Group Size* parameter sets the system to operate groups of feed dispensers. This is a particularly useful feature if the transformer powering the feed dispensers cannot cope with operating a full line of feeders in one go. Pressing the  button toggles between 5, 10 or 20 feed dispensers.

If for example the parlour has 8 feed dispensers in total down one side and the *Feed Group Size* parameter is set to 5, then when feeding commences the first five feed dispensers will operate and then when they have finished the last three feed dispensers will operate.


Alternatively, if the parlour has 12 feed dispensers in total down one side and the *Feed Group Size* parameter is set to 20, then when feeding commences all feed dispensers will operate.


***Feed Group Size* does not function if Quick Feed is enabled.**


Quick Feed

The *Quick Feed* parameter when set to **Yes** will operate the feed dispensers immediately after the user has input a ration amount or cow number for a stall. If the *Quick Feed* parameter is set to **No** then the system will wait until the user has input an entire side of ration amounts or cow numbers before commencing feeding. Pressing the  button toggles this parameter.

Ration Mode

The *Ration Mode* parameter sets the controller into feeding ration amounts only when manually feeding shown by the  icon on the feeding screen when this parameter is set to **Yes**.

If the *Ration Mode* parameter is set to **No** the controller will accept only cow numbers when manually feeding. This is shown by the  icon on the feeding screen.

Use the  button to toggle this parameter.

If the *Auto-id* parameter is set to **Yes** on the *Auto-id Settings* page then *Ration Mode* will always revert back to **No**.

Auto Changeover

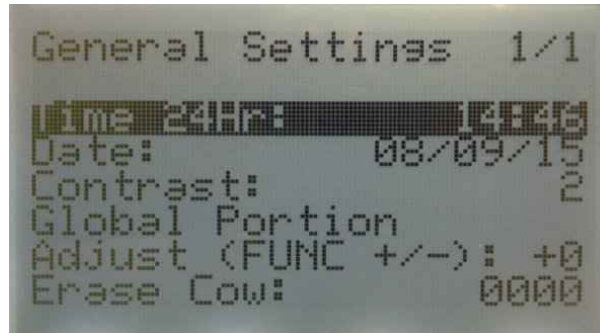
Selecting **Yes** will allow automatic side changeover when entering feed amounts or cows on a side has been completed. Selecting **No** will allow the user to manually select sides.

Parallel Feeding

Selecting **Yes** will allow both sides to potentially feed at the same time depending on how quickly a side is loaded and the speed of the feeders. Selecting **No** prevents a side from feeding until the other side has finished feeding. **IF YES IS SELECTED PLEASE MAKE SURE THE FEED DISPENSER TRANSFORMER IS SUFFICIENT FOR THE LOAD.**

GENERAL SETTINGS

Below is a summary of the general settings page 1/1 parameters.



Time

System time in 24 hour format. Use keypad to alter.

Date



System date DD/MM/YY format. Use keypad to alter.

Contrast


Screen contrast adjustment. The contrast scale is 0 to 9 where 0 is the lightest and 9 is the darkest. Use numeric keypad numbers to select scale.

Global Portion Adjust

Portion feed amounts for all stored cows can be globally adjusted up or down using this feature.

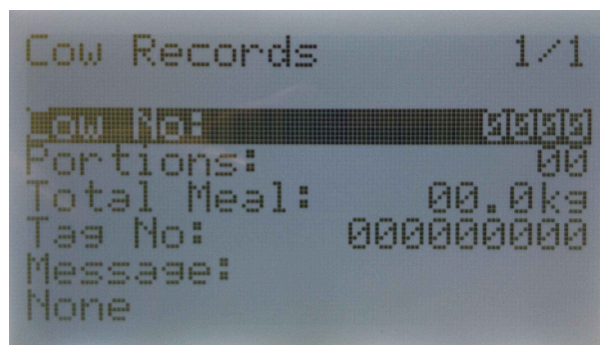
To toggle the + or - sign use the  button. Use keypad to enter number of portions. Press  to carry out feed adjustment.

Erase Cow


Cow records can be erased by entering in the cow number and pressing the  button.

ENTERING COW RECORDS


By default the system is set up to manually input cow numbers when feeding. If the cow icon is not shown on the feeding screen then please refer to the *Ration Mode* parameter in the settings menu and set to **No**.




To **scroll up through stored cow records** use the  button.

To enter a new cow record simply highlight *Cow No.* and enter a cow number using the numeric buttons. Next use the  button to highlight the *Portions* parameter.

Enter the number of portions to be fed for one milking using the numeric buttons. Remember that the portion size is set in *Parlour Settings 1/2* page. As you enter a portion amount the *Total Meal* amount will adjust to correspond with the portions being entered.

If the system is connected to Auto-id hardware then use the  button to highlight the *Tag No.* entry. This represents the number printed on the identification transponder of the cow.

If you wish to add a warning message to the cow record use the  button to highlight the *Message* entry. Use the numeric buttons to enter a pre-set message as listed below.

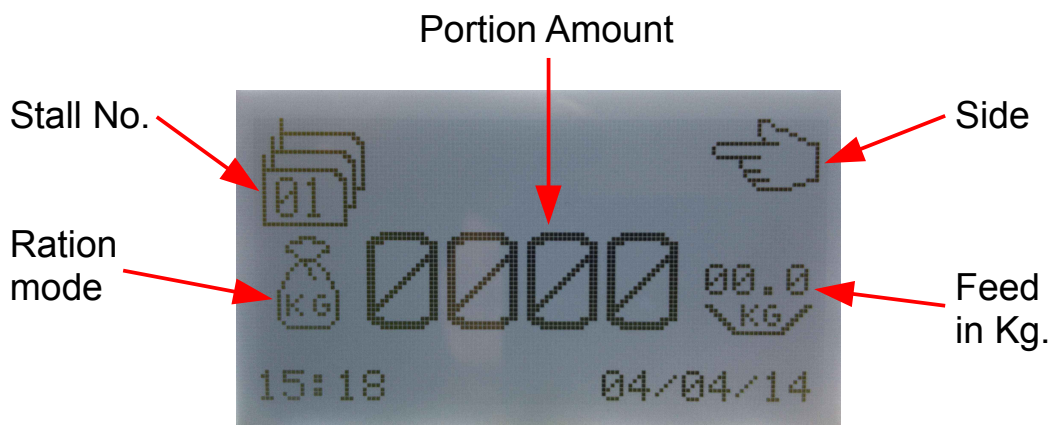
- | | | |
|----------------------|----------------|---------------------|
| 1. Dump milk | 2. Do not milk | 3. Segregate for AI |
| 4. Segregate for vet | 5. Slow milker | 6. Nervous cow |
| 7. Inspect udder | 8. Dry off | 9. High cell count |
| | | 0. None |



Messages will be shown when cow number is entered during feeding.


FEEDING

The Multi-C1 controller can feed either by entering ration amounts or by entering cow numbers which have pre-stored rations. The user can easily change the method of feeding by toggling the *Ration Mode* parameter in the *Parlour Settings 2/2* page in the menu.


Ration Feeding






Use the  or  buttons to change the side from left to right.

Use the  or  buttons to change the stall number.

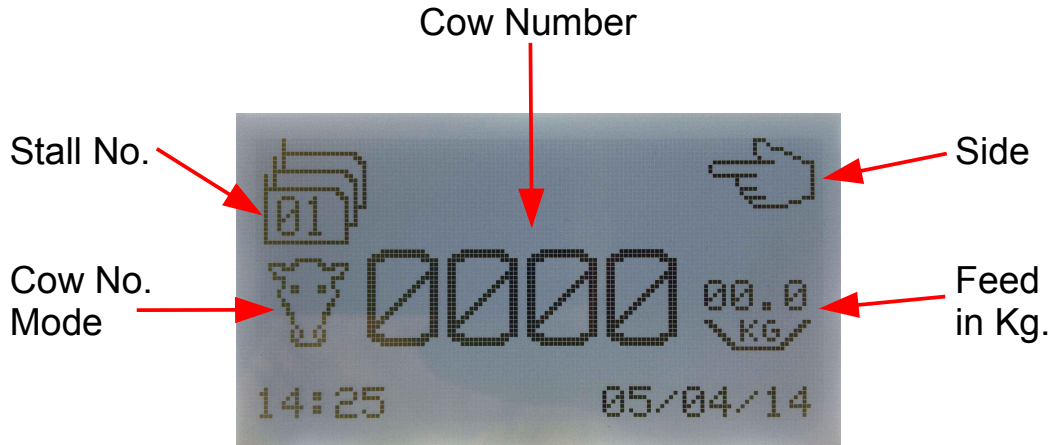
To enter a ration amount press a numeric button. The controller will automatically increment to the next stall.



If you require to not feed a stall press the 0 button or the  button to skip a stall.


When all the stalls have been allocated rations the controller will prompt you to begin feeding by pressing the  to feed the left side or the  to feed the right side.


Pressing the  button allows you to modify the rations previously entered.



Feeding By Cow Numbers




Use the  or  buttons to change the side from left to right.

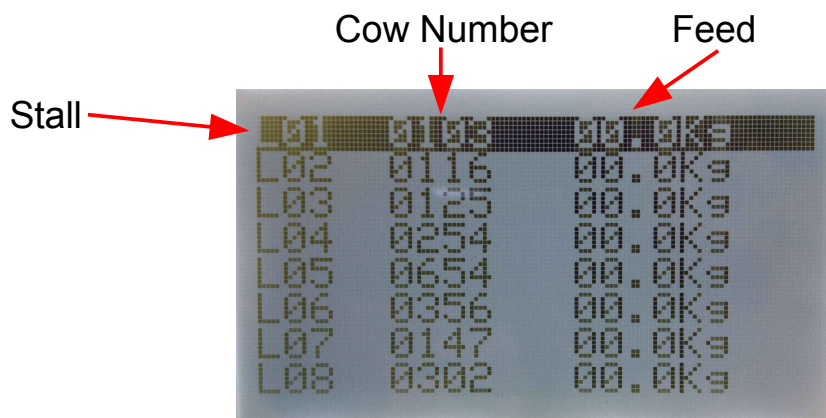
Use the  button to change the stall number.



To enter a cow number use the numeric buttons and then press the  button to load that cow and move on to the next stall.


To skip a stall use either the  or  buttons but make sure the cow number is set to zero.



To clear a cow number press the  button.

Pressing the  changes the screen to a stall list view as shown below.




You can use the  and  arrows to highlight individual stalls to enter or edit cow numbers.

Press the  to load the new cow number.

When all the stalls have been allocated cow numbers the controller will prompt you to begin feeding by pressing the  to feed the left side or the  to feed the right side.



Function Button

The function button  provides the user with some extra features as listed below.

Pressing  and then  will **shift the cow numbers down** by one stall in the list view screen.

Pressing  and then  will **shift the cow numbers up** by one stall in the list view screen.

Pressing  and then  will **clear all the cow numbers** from the current side selected.

Pressing  and then  will **enable flat rate feeding**. Flat rate feeding mode allows the user to feed a selected ration to all stalls on the current side selected.

To exit flat rate feeding press the  and then  buttons again.

INSTALLATION

The Multi-C1 is normally installed on the bridge arm at the cow entry end of the parlour. The enclosure is strong and waterproof and should withstand the harsh working conditions of a milking parlour.

The feeder interface relay cards are commonly housed in a separate enclosure that is fitted in a convenient place above the Multi-C1 controller. It is recommended that the feeder interface relay enclosure is fitted to a flat surface and the fixing holes located in each corner of the enclosures are used. It is not recommended to drill fixing holes inside the enclosure as this prevents the enclosure from being water resistant.

The water-proofing of both enclosures is however dependant on how and where conduit or compression glands are fitted by the installation engineer. It is strongly recommended that the adapters should be fitted on the underside of the enclosures to eliminate the possibility of water entering and damaging the electronics.

A little care during this part of the installation process will pay dividends in terms of the long term reliability of the control box.

Cables required for Multi-C1 controller installation are:

Twisted pair 22AWG screened cable (RS485 Data cable)
Farnell Stock No. 1499576. RS Stock No. 409-167

Two core 0.5mm². Recommend 2192Y. (Power cable).

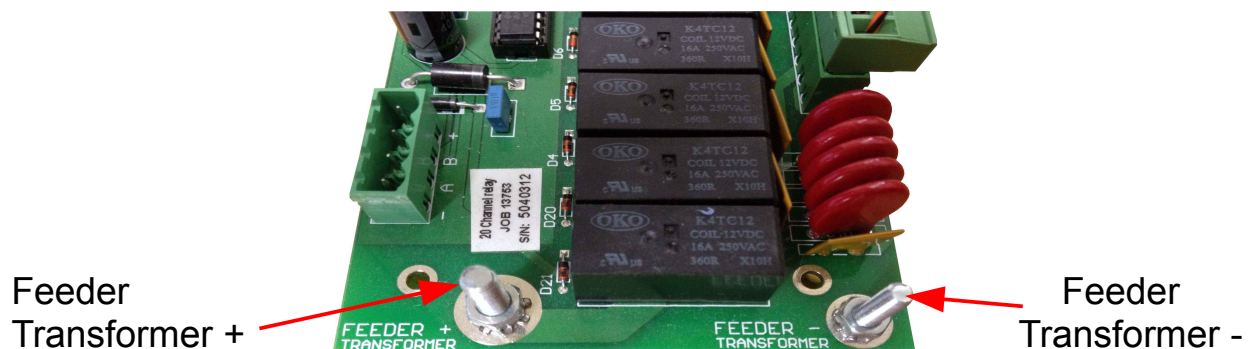
Please note the following:

Cables used for this system (Data & Power) must not be routed next to A.C. power cables.

Cable for feed dispensers needs to be selected according to the total current consumption on full load and the location to which the cable will be installed either conduit or trunking. Please refer to the manufacturers specification on the feed dispensers for selecting appropriate sized cable. Davlec Ltd. cannot be held responsible for damage caused by inappropriate wiring considerations.

Feed Dispenser Wiring

The Multi-C1 feeder interface relay cards can accommodate most types of feeders at various voltages e.g., D.C. and A.C. The relay card has two *Feeder + Transformer* connection studs (M5) for the positive phase of the feeder power supply. There is also a *Feeder - Transformer* stud (M4) connection for the negative phase of the feeder power supply.



Normally with a 12 volt D.C. system the negative connections on all the feeders are linked together and directly connected to the feeder transformer.

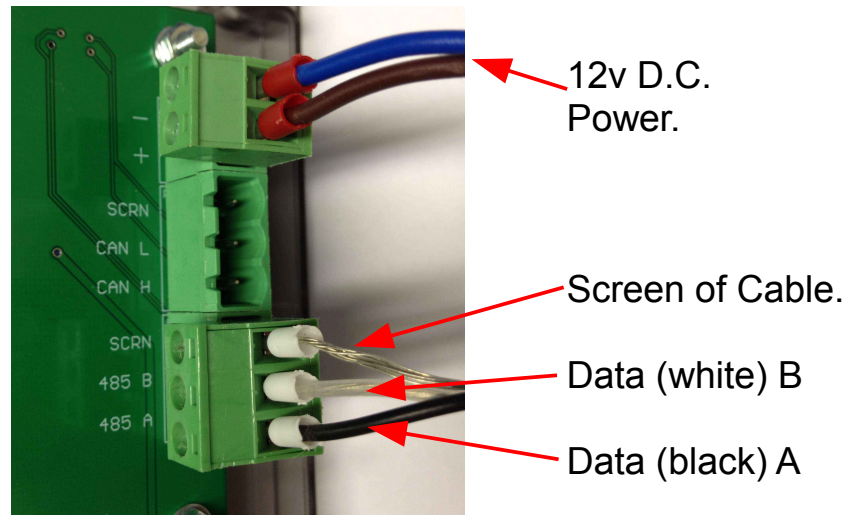
The positive connection on each feeder is then connected to each corresponding output connector on the relay card. With a positive ground system all the positives from each feeder are linked together and the feeder power supply negative is connected to the *Feeder + Transformer* stud on the relay card. The *Feeder - Transformer* connector is then connected to the feeder power supply positive.

All the negative connections from the feeders are connected to the corresponding outputs on the relay card.

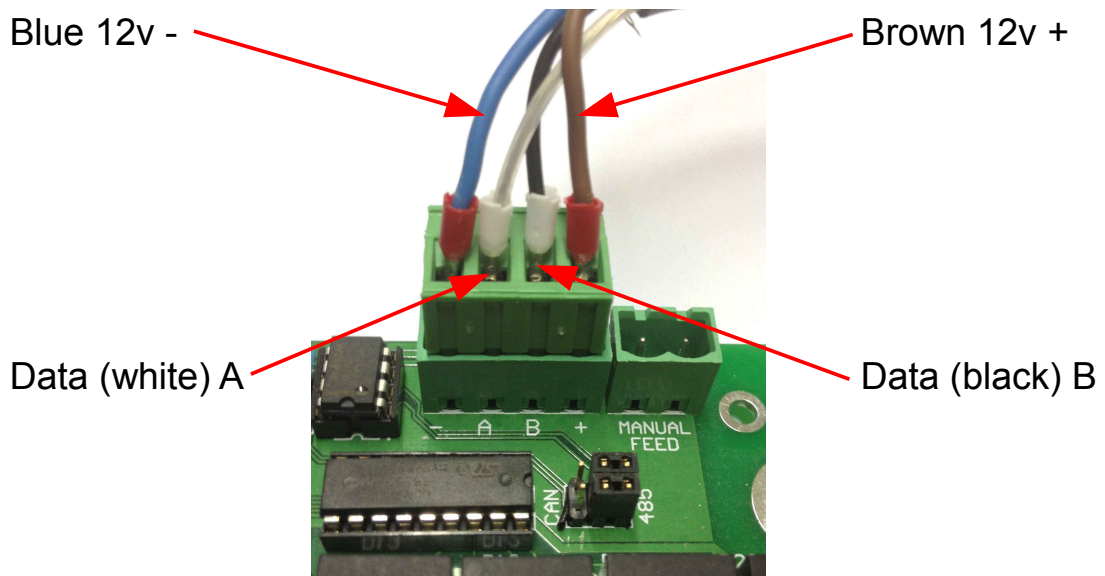
Each feed dispenser output on the relay card is protected with a 5 Amp thermal fuse.

System Wiring

The image below shows the correct way to wire the Multi-C1 controller.



The image below shows the wiring of the feeder interface relay card.



The Manual Feed connection on the feeder interface relay card (shown above) connects directly to either the left or right push buttons located on the Multi-C1 base. When either the left or right button is pressed the feeder interface relay card will operate all outputs for the duration that the button is pressed.

PRODUCT SPECIFICATION

Product Name	Multi-C1					
Product Family	Feed Controllers					
Enclosure						
IP Rating	67					
Material	ABS					
Dimensions	W	180mm	L	180mm	D	60mm
Electrical						
Supply Voltage	12 volts D.C.					
Maximum Peak Voltage	15 volts D.C.					
Frequency	N/A					
Maximum Current Load	1.5 Amps					
Protection	3 Amp 20mm Fuse (Relay PCB)					
Environmental Conditions						
Temperature	0 to 45°C					
Humidity	5 to 95%					
Location	Indoor use only					
Approvals						
EMC Conformity to:						
EN 61000-6-1:2007, EN 61000-6-3:2007, EN 55022:2006						