

Memfeed D-96

FEEDER CONTROL BOX

INSTALLATION AND OPERATION
MANUAL

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OVERVIEW

The Memfeed D-96 is the next generation feeder control, capable of storing the feed requirements for up to 9999 cows. The programmed ration can be in the range 0 - 32 units. The unit will also store a message for each cow, selectable from a pre-defined list. This message is displayed to the operator whenever the cow number is selected.

The feeders are controlled by remote relay cards that can be positioned above the feed dispensers on either side of the parlour or all housed in one enclosure at one point in the parlour. The relay cards and Memfeed D-96 control panel are linked together (daisy-chained) using twisted pair cable for the data link and two core cable for the system power supply. The system incorporates its own switch mode power supply to provide power for the relay cards and the Memfeed D-96 control panel.

1.0 MEMFEED D-96 KEYS



“TICK” Key used to accept commands or values.



“X” Key used to cancel commands or delete values.



“COW” Key for total cows fed.



“FEED” Key for total feed dispensed in units.



“CAL” Key for entering calibration menu.



“BATCH” Key for batch feeding cows.



“LEFT ARROW” Key for selecting left side of parlour.



“RIGHT ARROW” Key for selecting right side of parlour.



“STALL” Key for skipping stalls during feeding.



“NOTE” Key for entering pre-defined messages for individual cows in programming mode.



“ENTER” Key for entering cow numbers during feeding or accepting commands or values.



“CLEAR” Key for deleting values.



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Number keys for selecting feed rations.

2.0 SETTINGS MENU

- 2.1 To access the settings menu the operator must press and hold down the “Left Arrow” key and press the “Cow” key once.

Once in the settings menu, the user can scroll the different settings by pressing the left arrow key or the right arrow key.

- 2.2 **Parlour size** can be altered from 1 to 48 stalls per side. To change the current setting the user needs to press the "X" key to clear the current value and then enter the new parlour size using the numeric keypad.
- 2.3 **Single shot** option can be enabled or disabled by pressing the "X" key to select either "YES" or "NO". This facility when activated encourages the first cow to stall 1 by dropping 1 unit of feed as the operator enters the cow numbers.
- 2.4 **Auger feeders/Pulse feeders** can be toggled by the user by pressing the "X" key.

- 2.5 **Pulse feeders On time** can be altered from 1 to 20 seconds. To change the current setting the user needs to press the "X" key to clear the current value and then enter a new value.
- 2.6 **Quick Feed** when enabled will allow instantaneous feeding per stall as the user enters cow numbers. To toggle the Quick Feed option press the "X" key.
- 2.7 **Feed Group Size** allows feeding in group sizes of 1,2,4,8 or 16 stalls. This greatly reduces the load on the feed dispenser transformer. To change the Feed Group Size press the "No" button.

To Exit the settings menu the operator must press and hold down the "Left Arrow" key and press the "Right Arrow" key once. The Memfeed D-96 will automatically exit the settings menu after 1 minute.

3.0 PROGRAM MODE - PROGRAMMING FEED AMOUNTS AND NOTES

- 3.1 To access program mode press and hold down the "Left Arrow" key and press the "Feed" key once, the unit will now display the following message:

"Batch Program"
"Feed? Y/N"

The operator can either press the "X" key to program individual amounts of feed to cows or the "TICK" key to program feed amounts to batches of cows.

- 3.2 In order to program the feed requirements for individual cows, the operator must first enter the cow number by pressing the correct keys on the numeric key pad in the required order. The operator must then enter the amount of feed that he requires this cow to receive. In some cases it will be quicker to program all the cows that are getting one unit of feed first, followed by all the cows that are getting two units of feed followed by all the cows that are getting three units of feed etc.. In this case, when the Memfeed D-96 displays the message "Batch Program Feed? Y/N", the operator should press the "TICK" key.

When this mode is selected, the unit can only be used to program feed amounts and any messages programmed for a particular cow cannot be changed, or new messages entered.

3.3 Batch Program mode

If batch programming is selected, then it is logical to program all the cows requiring one unit of feed first. To do this we simply select the first cow number to receive one unit of feed, for example cow number 14. To enter the cow number we press the following keys in the correct order as follows.

“1” “4”

The number 14 will then appear on the display under the words “Cow number”. If the operator has made an error in entering the cow number he can clear the display by pressing the “CLEAR” key.

When the cow number is correct, the operator can enter the feed quantity. For example, if the cow requires 1 unit of feed, press the following keys.

“FEED” “1”

The figure “1” will appear on the display below the word “feed”. Again if the operator has made an error, they can clear the display by pressing the “CLEAR” key and entering the correct number. When the cow number and feed are correct then the operator can transfer this information into the memory of the control unit by pressing the “ENTER” key. After the “ENTER” key has been pressed the cow number display will be cleared, but the number “1” will still appear on the feed display. The next cow can then be entered but this time after the cow numbers have been entered press the “ENTER” key to move on to the next cow.

When you require to change the feed amount press the “FEED” key and the number “1” in the feed display will disappear and zero will appear. Enter your required feed amount and press the “ENTER” key, the cursor will then return to the cow number position.

3.4 Program Individual Feed Amounts

The second method of programming is to individually program feed amounts for each cow and this can be done by pressing the "X" key when the Memfeed D-96 displays "Batch Program Feed? Y/N" when entering program mode.

To enter a cow the operator would follow a similar procedure as described above by entering a cow number by pressing the "COW" key followed by the cow number using the numerical keys. Then the operator should press the "FEED" key and enter the feed amount again using the numerical keypad. To store the cow in memory the operator needs to press the "ENTER" key. Once the operator has pressed the "ENTER" key the display will clear and the cursor will return to the cow number position.

3.5 Entering Cow Messages

In this programming mode, it is also possible to program a pre-defined message for any cow number. To program a message for a cow the operator must first either program in a particular cow or recall a programmed cow by pressing the "COW" key and entering in the appropriate cow number. When the correct cow number is displayed press the "NOTE" key and enter any of the following codes followed by the "ENTER" key.

01 DUMP MILK	02 DO NOT MILK	03 DIVERT FOR A.I.
04 DIVERT FOR VET	05 SLOW MILKER	06 NERVOUS COW
07 INSPECT UDDER	08 DRY OFF	09 * NOTE A *
10 * NOTE B *	11 * NOTE C *	12 * NOTE D *
13 CHECK R/LEFT QTR	14 CHECK F/LEFT QTR	15 CHECK R/RIGHT QR
16 CHECK F/RIGHT QR	17 TREAT R/LEFT QTR	18 TREAT F/LEFT QTR
19 TREAT R/RIGHT QR	20 TREAT F/RIGHT QR	

If the operator wishes to erase a particular message attached to a cow, they must recall the cow by pressing the "COW" key followed by the cow number and then press the "NOTE" key followed by "0" and "ENTER".

To end the programming session the operator simply needs to press and hold down the “Left Arrow” key and press the “Feed” key once.

4.0 FEEDING

Assuming the Memfeed D-96 is not in the settings mode or the program mode then the operator can initiate feeding by firstly selecting which side of the parlour to feed by pressing either the “left arrow” key or the “right arrow” key. The display will indicate which side is selected by the “<<” or “>>” arrows and the stall indicator “L01” or “R01”.

As the cows are entering the parlour the operator can key in the cow numbers by pressing the numbered keys on the numerical keypad. Once a cow number has been entered the user will then need to press the “ENTER” key. Once the “ENTER” key has been pressed the cursor will move back to the cow number position and the stall indicator will increment by 1 stall. The operator can now enter the next cow.

When the last cow number has been entered the Memfeed D-96 will display the following message “Start Feed” followed by “Press X to clear”. To start feeding the operator needs to press the “TICK” key, otherwise the operator can press the “X” to cancel the whole process.

Once the operator has pressed the “TICK” key to initiate feeding the Memfeed D-96 will automatically switch over to the opposite side of the parlour. If the operator presses the appropriate arrow key to go back to the side they have just fed the Memfeed D-96 will display “BUSY” indicating that feed is still being dispensed to that side.

If for any reason the operator needs to cancel feeding after starting the feed process, the operator needs to select the side feeding using the arrow keys and then press the “X” key to cancel feeding. The Memfeed D-96 will then display the following message “STOP FEEDING?” followed by either “Left Side Y/N” or “Right Side Y/N”. Press the “TICK” key to cancel feeding or the “X” key to carry on feeding.

4.1 Skipping Stalls

When the operator comes to feed the last side of cows, it is very unlikely that there will be exactly enough cows to fill the side. To skip any empty stalls the operator needs to press the “STALL” key until the “Start feed” message is displayed.

4.2 Cow Totalizer

Pressing the “Cow” key will result in the display showing the total number of cows fed since the counter was last reset. The bottom line of the display shows the message “Press X to clear”. If the operator wishes to leave the counter at its current value then they should press the “TICK” key. If the operator wishes to reset the counter then they should press the “X” key.

4.3 Feed Totalizer

In the same way, pressing the "Feed" key will indicate the total number of portions of feed dispensed since the counter was last reset. Again the operator has the option to leave the counter at its current value or to reset it to 0 either by pressing the "X" or the "TICK" keys.

5.0 INSTALLATION

5.1 Cables required for Memfeed D-96 installation are:

Twisted pair 22AWG screened cable (RS485 Data cable).
Two core 0.5mm². Recommend 2192Y. (Power cable).

*Cable for feed dispensers needs to be selected according to what type of dispensers are being used and their current consumption on full load. Please refer to the manufacturers specification on the feed dispensers. Davlec cannot be held responsible for damage caused by inappropriate wiring considerations.

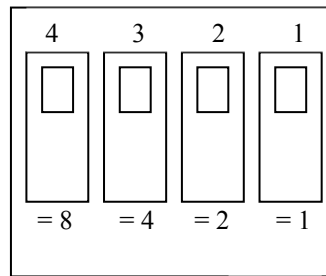
5.2 The Memfeed D-96 is normally installed on the bridge arm at the cow entry end of the parlour. In certain circumstances, the customer may have special requirements regarding the siting of the unit.

The relay cards are commonly housed in separate enclosures that are fitted either side of the parlour above the feed dispensers. It is recommended that the enclosures are 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.

Memfeed D-96 and relay cards are housed in strong, splash proof enclosures. The water resistance of this enclosure is however, only as good as the arrangements that are made to connect conduit to it. 20mm conduit adapters are supplied to accommodate the conduit from the relay card enclosures to the Memfeed D-96 enclosure. **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.**

5.3 The Memfeed D-96 and relays are connected in a daisy-chain style of wiring, with the data cable and power cable looped from the first relay card with incorporated power supply, to the next relay card and then finally to the Memfeed D-96 control box. Please refer to the enclosed wiring diagram (fig 1.0) located at the end of this manual.

- 5.4 The relay cards need to be individually addressed using the small 4 way dip-switch located on the relay card. The cards are addressed in binary format where each switch is weighted 1, 2, 4, 8. If for example you want to address a relay card number “5” then you would switch on switches “1” and “3”, therefore $1 + 4 = 5$.



If you are installing a parlour up to 16-a-side the left side relay card would be addressed “1” and the right side relay card would be addressed “2”.

If you are installing a parlour up to 32-a-side the left side relay cards would be addressed “1” and “2” and the right side relay cards would be addressed “3” and “4”. Relay cards with addresses “1” and “3” would correspond to feeders 1 to 16. Relay cards with addresses “2” and “4” would correspond to feeders 17 up to 32.

If you are installing a parlour up to 48-a-side the left side relay cards would be addressed “1”, “2” and “3” and the right side relay cards would be addressed “4”, “5” and “6”. Relay cards with addresses “1” and “4” would correspond to feeders 1 to 16. Relay cards with addresses “2” and “5” would correspond to feeders 17 to 32. Relay cards with addresses “3” and “6” would correspond to feeders 33 up to 48.

- 5.5 A push button batch feed for the left and right sides is also incorporated into the main Memfeed D-96 control enclosure. These buttons are located on the left and right sides of the enclosure. Please also refer to the wiring diagram (fig 1.0).

5.6 Feed Dispenser Wiring

The Memfeed D-96 relay cards can accommodate most types of feeders at various voltages e.g., D.C. and A.C. The relay card has two “Feeder power” connection studs (M5) for one phase of the feeder power supply. The reason the card has two studs is to share the overall load of the feeders on one relay card, therefore feeders 1 to 8 are connected to the stud just to the left of the connections and feeders 9 to 16 are connected to the stud just to the right of the connections.

Normally with a 12 volt D.C. system the negative connections on all the feeders are linked together and directly connected to the feeder power supply**. The positive on the feeder power supply is connected directly to the “feeder power” stud on the relay cards and also a small connection from the “feeder common” terminal on the relay card is connected to the feeder power supply negative. The positive connection on each feeder is then connected to each corresponding output connector on the relay card.

With positive ground system all the positives from each feeder are linked together and the feeder power supply negative is connected to the “feeder power” stud on the relay card. The “feeder common” 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.

On an A.C. system, one phase would be linked on each feeder and the other phase switched on the relay card.

It is recommended that each feed dispenser is fused accordingly to the manufacturers specifications. Normally each feeder will be fused in-line between the relay card of the Memfeed D-96 and the connection on the feeder. It is also recommended that D.C. feeders are suppressed using a diode.

5.7 Before switching on the power supply, the installing engineer should ensure that the polarity of the power cable and data cable is correct.

** Feeder transformer not included with Memfeed D-96. Contact Davlec Ltd for further information on suitable power supplies.

6.0 FEEDER CALIBRATION

6.1 Auger Type Dispensers

To calibrate feeders press the “CAL” key. If the controller does not respond to the “CAL” key check that auger feeders have been selected in the settings menu (page 4).

The display should now have “Please confirm calibration? Y/N”. Press the “TICK” key to proceed or the “X” key to cancel the operation.

The next screen will show “Seconds/portion” and followed by “Auger 00.0 Secs”. To delete the previous value press the “X” key until the display shows only zero’s. Enter the new value in seconds of how long it takes for the feed dispenser to dispense 1 unit of feed. Press the “TICK” key to save the value.

The next screen will show “Grams/portion” followed by “Auger 000 Grms.”. To delete the previous value press the “X” key until the display shows only zero’s. Enter the new value in grams for 1 portion of feed. Press the “TICK” key to save the value.

The next screen will show “Calibrate all Feeders? Y/N”. To continue the calibration process press the “TICK” key or to cancel the calibration process press the “X” key. You will then be asked to “Calibrate Left” followed by “Press Y to start”, as soon as the “TICK” key is pressed the feeders will dispense 5 units of feed.

If for example the operator has entered 500 grams for the portion size then ideally each stall should have 2500 grams of feed dispensed, but realistically there will be differences between each stall. The Memfeed D-96 can accommodate feeder variations up to +/- 20%, that is to say for example that if the feed amount weighed was 2000 grams instead of the expected 2500 grams the Memfeed D-96 will compensate this error and run the feeder for an extra length of time until 2500 grams has been dispensed. Alternatively if the feeder dispensed 3000 grams instead of the expected 2500 grams then the Memfeed D-96 will run the feeder for less time. If all feeders universally dispense more or less feed above the +/- 20% margin then the run time per portion needs to be altered accordingly.

When all the left side weights have been entered the Memfeed D-96 will ask “Calibrate Right” followed by “Press Y to start”. Press the “TICK” key and again the right side will dispense 5 portions of feed. Weigh each feed amount and enter it into the Memfeed D-96. Once the last weight has been entered the Memfeed D-96 will resume normal feed mode.

6.2 PowerDos Feeders

To calibrate feeders press the “CAL” key. If the controller does not respond to the “CAL” key check that PowerDos feeders have been selected in the settings menu (page 4).

The display should now have “Please confirm calibration? Y/N”. Press the “TICK” key to proceed or the “X” key to cancel the operation.

As the PowerDos feeder dispenses a fixed 50 gram portion, the Memfeed enables the user to set a fixed number of portions per unit of feed. For example, in the PowerDos calibration if you enter '10' portions the Memfeed will dispense 500 grams per one unit of feed, 1000 grams per two units of feed, 1500 grams per three units of feed, and so on.

To save the calibration settings and exit press the "TICK" key.

7.0 ROUTINE MAINTENANCE AND SERVICE

The Memfeed D-96 is housed in a strong, splash proof enclosure. It must be noted however, that this enclosure is not suitable for washing with a high pressure hose. Any cleaning required should be done using luke warm soapy water and a soft cloth. Direct blows to the front of the unit should be avoided and sharp objects should not be allowed to come into contact with the splash proof membrane.