Feed Control

with Feed & Monitoring and Alarms

Feed Auger Control with integrated alarms
Feed & Water Daily Use monitoring
Water use alarms

Time Clock

The program has a 24 hour timer which can be selected to give operation only for part of the 24 hours - for example, 5am to 7pm.

On networks, the time clock is provided by the central Netmon unit.

Feed 1, Feed 2 and Water can each be selected to OFF, ON or TIMER.

OFF = Not operational. Auger(s) not permitted to run and no alarm for the chosen function.

Note : Water is alarm only (not controlled).

ON = Operational at any time.

TIMER = Operational only during the chosen period.

Feed Control

The program is intended for *ad lib* feed system - switching on an auger motor as required, according to a level sensor.

The program may control one or two augers (Feed1 and Feed2). Each is controlled individually, based on its own level sensor.

For each auger the control system has a level sensor (Feedswitch1/2), a switched output (Auger1/2) and an auger motor mains detector (Feed1/2).

The level sensor detects when feed is low in a pen feeder. (This is usually a pressure pad with microswitch.)

When feed is low (Feedsw=1), the program waits a few seconds, then switches on output (Auger) until the level sensor indicates full (Feedsw=0), when it stops the auger.

The program constantly checks the mains detector status to ensure the system is working correctly.

Re-Run control : Once the auger has run, it cannot run again immediately (for example, it waits 30 minutes before running again.This is to avoid repeated short auger runs, which increases wear and causes bridging.

After this delay, the auger can run again, as soon as demanded by the level switch.

Auger Failure : The program compares the mains status of the auger (using the mains detector) with the output of the program. When the output is on, auger mains should be on. When the output is off, the mains should be off.

If they differ, the program indicates Auger Failure. This might be due to fuse or trip out, wiring fault, use of overrides or other reasons. Whichever cause, it indicates that the system is working incorrectly.

A brief delay (for example 5 seconds) allows for transients in mains detection.

Overrun : Maximum run time on any one occasion is limited - e.g. 30 minutes. If the level switch doesn't trigger full within this time, it suggests a problem such as bridging or other feed system problem.

The system indicates **Max Run Exceeded** and the auger is locked out until the alarm is reset.

Underrun : If the feeder goes too long without running (the low level switch hasn't been triggered) a **Max Off Exceeded** alarm is given. This suggests a faulty level switch. (The auger is not locked out, and can run as soon as the low level switch is triggered.)

Auger Status : When an auger is switched on, it is indicated in the Metering (Monitoring) section of the Feed & Water menu. For example, if Feed 1 is triggered, it shows FEED1 : AUGER ON and FEED1 TOTAL counts up. (Auger On but not counting up indicates auger problem.)

WARNING

1 The program switches the auger using software interlocks **not** electrical interlocks.

This means it is possible to bypass automatic control - for example, to switch on the output (run the auger) even if the level switch is already showing the bin is full.

This can be useful (for example, if the level sensor is faulty), but it is possible to cause damage to the feed system by incorrect use. DO NOT use Manual Override or bypass switches except with great care.

2 The program has functions to switch off outputs but this is not the same as an electrical isolator.

Auger motors **must** be electrically isolated before carrying out any maintenance work.

Monitoring

The program indicates usage for each auger and for the water meter.

Total : Cumulative total.

Today : Usage today - typically since 6 am.

Last : Yesterday's usage - typically from 6am yesterday to 6am today.

By default, the program counts (and displays) Feed as seconds of auger running time, measured by mains on the auger motor terminals. Water is measured by counting pulses from the water meter.

Program setup has an option to apply "scaling" to each reading, so that it shows approximate weight/volume. For example, if the auger delivers 0.45 lbs of feed per second, 1000 seconds of running time show as 450.

Today and Last are updated at the start of the day's operation - for example, 6am. Today's reading becomes Last, and yesterday's reading (Last) is deleted. If you want to keep a daily record, you must note down the Last reading on a daily basis. Since this reading is held until it is cleared tomorrow, you can note the reading at any time during the day. The program has a facility to reset the Total counter, for example when starting a new batch of animals.

Fault indications

When a problem is detected (see Alarms below), the type is indicated in the meter window (in place of Total). Pressing the button resets the warning, though augers may not start again immediately (due to Re-Run delay).

Feed Alarms

Max Run Exceeded

The auger has tried to run for longer than permitted.

Feed auger is locked out until Reset - see below.

Likely causes - bin bridging, feed pipe fallen off, trigger switch failure.

Max Off Exceeded

Too long since the feed system was triggered to run.

Likely causes - faulty feed trigger switch or unstocked building.

Auger Failure

No mains on the feed auger motor when switched on by Dicam, or mains on when it should not be running.

Likely causes - fuse failure, circuit breaker trip, switchgear fault, use of separate override switches.

Water Monitoring & Alarm

The program does not regulate water, but can monitor it in a similar way to feed use.

It requires a water meter with electrical "pulse" contacts. Each time a certain quantity is delivered, the Dicam program counts. Each count might be a litre, gallon or other amount, depending on the meter.

Total, Today and Last readings are as Feed.

Water alarms are similar to feed alarms, but slightly more complicated because of the way water is delivered. (Feed is delivered to all the animals through one or two augers, whilst water is delivered by dozens or even hundreds of individual drinkers.)

Water meters give a pulse when a certain quantity of water is delivered. The system converts this into a "rate of use", and alarms are based on the rate of use.

A high rate of use is counted *On*. This indicates that a number of drinkers are active (and delivering water) within a certain period of time.

A low rate of use is counted as *Off*. This indicates that few drinkers are active.

The water alarm function checks for excessive lengths of time at a higher rate (Off) or Low rate (off).

Max Run Exceeded

This indicates that water has run at a high rate for an excessive period.

Likely cause - pipe fracture.

Max Off Exceeded

This indicates that water has run at a low rate for an excessive period.

Likely cause - pipe blockage.

Alarms and Reset Alarms

Once a problem has been detected, it is indicated in the Keypoint alarms display and signalled to the Netmon (Network Monitor).

Depending on the type of problem, auger(s) may be locked out until the alarm is cleared.

The type of problem is indicated in the Meter reading section of the Feed & Water menu.

Clearing the alarm and returning equipment is a four stage process.

1 Go to the unit and press the button to view the alarms. If it's showing Feed Failure or Water Failure, go to the Feed & Water menu.

2 Find the Meter readings for Feed & Water to see the type of problem - for example Max Run Exceeded.

Look for and correct the problem, according to the type indicated. (We suggest you draw up a checklist for your own particular system.)

3 In the Feed & Water menu, use RESET ALARMS or press the button on the Meter reading where it shows the type of fault.

To check auger operation, trigger the low level switch for a few seconds. To check water, note the water reading, and run a drinker or press the ball valve.

4 Return to the Keypoint and press the button to clear the alarm memory.

Reset Alarms : This clears **all** the Feed & Water alarms (except the Keypoint alarm) and **resets** the expiry timers. So the augers can run again, even if it has just run.

Meter : Pressing the button on the meter reading alarm resets only that alarm **but** augers may wait (e.g. 30 minutes) before it can run again.

Clear Totals

Clear Totals resets the feed and water program.

Feed and Water use meters run continuously just like a mechanical meter (but see Program Restart).

For routine management, you should review the daily figures (Today and Last) every day. The program does not store previous daily totals, so if you want to keep them, you must write them down.

For batch stocked buildings, you may wish to start off each batch from zero.

To do this, go to the CLEAR TOTALS window and press the button. (It asks Are You Sure? So you don't do it by accident.)

Using Clear Totals resets the Feed & Water program entirely, so it will also clear timers and so on.

Program Restart

The program stores Feed & Water user readings on a regular basis (typically every 1 or 2 hours).

At program restart, it loads up the last saved reading. This may be up to 2 hours old, so Totals (and Today) may indicate less use than has actually occurred.

Expiry timers (Rerun control) are not saved automatically, so augers may run immediately after a program restart, even if they had run just before.

The program is restarted either using Test/Config Restart or by removing all power from the processor unit and powering it up again.

Configuration Settings

Ordinary user adjustments - On/Off/Timer etc. - plus meters and alarm resets are in the Feed & Water menu.

Other settings such as setting up the main timers, trigger values and so on are in the configuration menu - METER SETTINGS, as these do not require routine adjustment.

ZERO AT

Sets the daily time for starting daily use meters (change from Today to Last). This should be set to just before or the same as FEED ON AT.

FEED ON AT / OFF AT

This sets the normal period of operation - for example, ON AT 5am; OFF AT 7pm.

Within this period, repeat runs are regulated by the Min Off setting.

When set to the same value, the time period is the whole 24 hours, regardless of user setting of On/Timer.

(Water Alarms use the same values.)

FEED WAIT

This allows a short time for measured mains status to differ from output status, allowing for delays in the switch gear such as pneumatic delay solenoids.

For example, with FEED WAIT = 5 seconds, it allows up to 5 seconds between the Dicam output switching on, and mains voltage appearing on the motor. Equally, it allows mains to remain for up to 5 seconds after the output has switched off.

FEED DAILY RESET

Determines use of Max Run/Max Off expiry timers when timer operation is used. Applies to both Feed and Water.

YES = expiry timers are cleared at the start of each days operation.

Example - Feed Max Off is set to 4 hours. At the end of the day, it has gone 3 hours without running. Timer starts from 0 the next day - i.e. A further 4 hours before Max Off alarm is triggered.

NO = expiry timers are suspended at the end of each day's operation (not cleared). They start again from where they were the next time.

Example : Feed Max Off is set to 4 hours, and at the end of the day, it has gone for 3 hours without running. The timer starts at 3 hours the next day, so Max Off is triggered if auger does not run within 1 hour.

Feed Max Run

Maximum auger running time permitted on any one occasion (overrun timer).

If max run is exceeded, alarm is given and auger locked out until alarm is reset.

Example - 30 minutes max permitted run time.

Feed Max Off

Longest expected waited before auger should run again.

Example - 4 hours.

Note : Feed Max Off must always be set longer than Feed Min Off.

Note : If Feed Daily Reset = YES, Feed Max Off **must** be daily operating time. E.g. If On At 6am, Off At 6pm, Feed Max Off must be less than 12 hours.

Feed Min Off

Sets minimum time before auger is allowed to run again (re run timer).

Example - 1 hour minimum before auger can run again. Once the auger has completed its run, it is not allowed to run for 1 hour, so next time it runs, it will run for a decent length of time.

During installation/setup, you may want to set Min Off to 0 minutes so that motor run is allowed to run as soon as it is triggered. You can achieve the same result by using Reset Alarms after each motor run - this resets the timers as well as alarms.

Water On Rate

Rate of water delivery counted as "On" (high) in pulses per minute.

Water Off Rate

Rate of delivery counted as "off" (low rate) in pulses per minute.

Water Max Run

Maximum allowed period for running continuously at high (On) rate.

Water Max Off

Maximum allowed period for running continuously at low (Off) rate.

Scaling

Used for applying scaling to user monitoring.

Example Feed1 Scale = 0.45

Counts up 0.45 (e.g. Lbs) for every second of running time. Scaling does not affect timers, max run, max off etc.

Installation

Inputs

FEEDSW1 = feed level trigger switch.

Unless signal quality contacts are used, mains should be wired through N/O contacts on the level switch to an MD2 mains detector. The MD2 mains detector must be wired to chosen Dicam sensor input. (If necessary, choose channel using IO Config : Input Devices, and select TYPE = TIMED in IO Config : Input Channels)

If sealed signal quality contacts are used, they can be connected directly to Dicam sensor input - **contacts must be voltage free.** In this case, change Input Type to Timed*.

(Note : Signal contacts must be specified for reliable operation at 5V @ 1ma.

Input Channel Type = NORM

Testing : Test : Sensors

Feed level low (switch activated) = 1
Feed level high (switch released) = 0

Testing : Test : Information : Input Channels

INPUT Type = Norm

Activated (feed level low) <50
Released (feed level high) >1000

Testing : Terminal Voltage

Activated (feed low) <0.5V
Released (feed high) >4.5V

FEED1 = mains detector for auger motor terminals.

Used to ensure that mains is on motor when Dicam output is switched on. If device is not installed (Set to NONE in Input Devices), counting is based on “auger requested”.

Type = TIMED

Testing : Test : Sensors

Auger running = counting up
Auger not running = not counting

Testing : Test : Information : Input Channels

INPUT Type = TIMED

Auger running = counting up
Auger not running = not counting

Testing : Terminal Voltage

Auger running <0.5V
Auger not running >4.5V

FEEDSW2/FEED2 = as above for auger 2

WATER = water meter pulse contacts
- must be voltage free.

Input Channel Type = PULSE

Testing : Test : Sensors

Water running = counting up
Water not running = not counting

Testing : Test : Information : Input Channels

INPUT Type = PULSE

Water running = counting up
Water not running = not counting

Testing : Terminal Voltage

Water running = up and down <0.5 to >4.5V
Water not running either >4.5V or <0.5V

Installing without mains detector

It’s possible to install feed control without a mains detector on the auger motor, though not recommended.

Rerun timers and so on will still function, but monitoring does not as it relies on feedback from the motor.

Outputs

AUGER1 = feed auger 1 requires Output Type ON-OFF. Connect to CTR1

AUGER2 = feed auger 2

Feed Control Operating Instructions

All user settings for feed and water control, monitoring and alarm are in the Feed & Water menu.

Make sure you read documentation thoroughly before operating the system.

WARNING

DO NOT USE AUGER OVERRIDE SWITCHES UNLESS YOU ARE CLOSELY WATCHING THE SYSTEM.

To Start Feed Control and Alarm

Select MODE FEED1 = ON or TIMER
Select MODE FEED2 = ON or TIMER
ON = on 24 hours

TIMER = on only during timed period

To Stop Feed Control and Alarm

Select MODE FEED1= OFF

Select MODE FEED2 = OFF

To Start Water Alarms

Select MODE WATER = ON or TIMER

To Stop Water Alarms

Select MODE WATER = OFF

To Clear/Reset Feed & Water Alarms

In the event of a problem being detected, augers may be locked out. To reset alarms either -

1 Go to Feed & Water Reset Alarms. Press Button Once. (Resets alarms and timers. Augers can start again immediately.

2 Return to Keypoint display and press button until display returns to normal Keypoint Actual/Set.

OR

A Go to Meter : Water/Feed1/Feed2 - type of alarm is displayed (e.g. Auger Trip). Press button to return to normal operation. Augers may wait before starting again.

B Return to Keypoint display and press button until display returns to normal Keypoint Actual/Set.

To Read Meters

Find FEED 1 TOTAL

Press button to see TODAY use

Press button to see LAST and note reading

Find FEED2 TOTAL and repeat procedure.

Find WATER TOTAL and repeat procedure.

To Reset Total meters

Find RESET TOTALS and press button once.

If you are sure you want to clear readings, change SURE? NO to SURE? YES and press button.