

Water and Feed Meters and Alarms

Applies to : Programs 012-167 and greater

Introduction

Feed and water use are very significant indicators are extremely significant indicators of pig health and productivity.

As pigs grow, they gradually consume more and more. In normal batch production, you should expect to see a gradually rise in use according to a regular pattern.

Deviations from this pattern - or unusual patterns over the growth period - indicate possible problems. For example, poor feed palatability may affect intake.

That's why measuring and logging of feed and water use is so important. The best way to do this is by network logging, with subsequent viewing using the Barn Report service.

For logging purposes, it is not necessary to have feed and water "meters" on the Dicam control unit, as inputs can be logged directly from the Netmon Logger. (See Input Channels data sheet.)

However, if more immediate on site indication is required and/or water or feed alarms, the program must have "meters."

Water and Feed Measuring

Water use is measured using a standard water meter with a special attachment which signals to the Dicam unit each time a set volume of water passes through the meter.

Many types are commercially available, depending on maximum flow rate and accuracy required. The units used (litres or gallons) depend on your type of meter.

If necessary, a "scaling" factor can be used - for example, if your meter gives one pulse per half litre, then the display can be set accordingly.

Feed is measured by counting the amount of time the auger runs. A mains detector is connected to the auger motor, and when the motor is powered up, this is signalled to the Dicam unit, which counts the amount of time.

A scaling factor can also be applied to the feed counter. For example, if your feed system delivers 0.24 pounds or kilos per second, this can be set into the controller so it shows pounds or kilos.

Meter Menu

To view meter readings and/or set or unset water or feed alarms, go into the Meters Menu. (If your control unit does not have a Meters menu, it does not have water or feed alarms. Some earlier programs have meter readings in the Information menu.)

METER:	WATER
TOTAL	1147.0

This shows the total accumulated water consumption, just like mechanical dials on the meter. (But it "rolls over" to zero at 65,556 rather than 99,999.) The units shown (litres or gallons) depends on your meter.)

Press the button to see a display like :

METER:	WATER
TODAY	347.0

This shows the amount that has been used "today". Typically, this is since 6am this morning, as this is usually the start of the animal day.

Press the button again to see a display like :

METER:	WATER
LAST	846.0

This shows the consumption for the whole of yesterday. (If your day is set to start at 6am, that's from 6am yesterday to 6am today.)

If the display shows something like :

METER:	WATER
MAX RUN EXCEEDED	

This means a problem has been encountered. The display will persist until you reset this alarm. See "Water and Feed Alarms" below.

The next display is feed :

METER:	FEED
TOTAL	245.7

This shows seconds of run, or weight, depending on whether your auger has been calibrated or not.

As with Water, press the button to see today's and yesterday's consumption.

A program may one or more of feed and water meters. (For example, Feed 1 and Feed 2 meaning your two augers.)

The next display is Meter Alarms :

METER ALARMS	
ACTIVE	YES

Meter Alarms are either Active (Active Yes) or not (Active No).

If the room is Inactive (because it is unstocked), then the meters are automatically inactive as well.

However, you may want to switch off water and feed alarms even when the room is inactive - because the room is on to warm it up, although unstocked, or be-

cause the feed or water system has broken down, and you are trying to fix it.

Warning : For flexibility of use, it's possible to switch off the alarms. Take care to use this facility only when essential.

Water & Feed Alarms

Water and feed are delivered intermittently, on a "broadcast" basis, to many pens of animals at once.

From a single point (the control unit), it's not possible to be absolutely sure that all parts of the systems are working, that all pigs are getting just as much water and feed as they need.

This still relies on the "traditional virtues" of good stockmanship, careful observation, and of course good maintenance.

However, it is possible to detect and alarm on gross errors in the water and feed systems : Auger motors tripped out, water pump failure, and so on.

How does it work?

The alarms rely on detecting when the feed or water has run for longer than it should, or has spent too long without running.

The immediacy and sensitivity of detection depend very largely on how the "trigger levels" are set. Since these are a little complicated, they are set up in the configuration menu to minimise the problem of accidental incorrect adjustment. (For details see "Configuration".

In normal operation, both feed and water run for a while, and then stop for a while. (Neither should run continuously for long periods.) The alarm detection uses this variation.

In both cases, there is a Maximum Permitted Run (Max Run) and Maximum Permitted Off Time (Max Off).

If feed or water runs for too long - longer than Max Run - an alarm is triggered. There are many possible reasons - bin bridged, or level/proximity switch failed, fractured pipe. It may need some diagnosis, but , running for too long time means something is wrong.

Similarly, if feed or water goes too long without running - longer than Max Off - an alarm is triggered. There are many possible reasons for this as well, but the same logic applies. If you don't have any activity for a long time, there's something wrong.

The principle for feed and water is the same, but the exact details differ.

The feed auger is either on or off (powered or not powered), and usually runs for relatively short periods, so if it over runs, it is quickly clear if it runs for too long.

If it runs fairly regularly, it is soon obvious if it is not running. (If it is controlled by a timer to running only once

or twice a day, it won't be apparent it doesn't run until the next time it should have run).

Water, on the other hand, has a variable rate of throughput, changing considerably both throughout the growing period and throughout a day.

Hence, you have to establish a "high rate" as the trigger for running too long. A high rate may be sustained for some hours in normal use, though not all day and night. (If it is, it indicates a leak or rupture.) But this can't be clearly established until such time as it would normally fall to a low rate.

By contrast, water consumption falls, but doesn't usually stop altogether. So it is question of establishing a "low rate", which shouldn't be sustained for too long, but might be for some hours.

Hence, water failure or problems such as leakage may take longer to determine than feed system problems.

Water & Feed Alarm Warnings

As for other alarms, if a fault is detected, the Keypoint changes to show :

!! ALARMS !!
PRESS BUTTON

If you have been using the menu display, it does not change to this display until after 3 minutes. But a flashing [!] is shown in the top left corner of the display.

Pressing the button again will reveal the cause. You may see :

!! ALARMS !!
FEED FAILURE

Press the button to see other warnings such as water failure. After you have seen all the warnings, the display returns to the normal ACTual and SET Keypoint window, but a flashing [!] may indicate that the system is still in alarm.

If the problem is Feed or Water, go to the Meters menu and check the Water and Feed readings. You will see something like :

METER: FEED
MAX RUN EXCEEDED

(Or you may have Water Max Run Exceeded or Max Off Exceeded.)

Make sure you note the warning!

Once you have seen the type of warning, you can clear it. (It will remain until you clear it.)

While showing this message :

- 1** Press The Button - this returns the display to normal.
 - 2** Go back to the Keypoint window and press the button repeatedly to reset the unit Alarm.
- Clearing the alarm resets all the timers (Max Run, Max Off, etc.) but it **doesn't fix the problem**. If the problem is still present, it will return sooner or later.
- 3** Go and check your Feed/Water system to determine the nature of the fault - bin bridged, motor tripped, water leaks/pump failure etc.

Warning	Meaning
Feed/Water Max Run Exceeded	Your feed auger has run longer than it should, or water has run at a high rate for too long
Feed/Water Max Off Exceeded	Your feeder has been off for too long, or water has run at a low rate/off for too long

Configuration

Adjustments of trigger values requires access to the Configuration Menu. This should only be carried out by trained personnel since incorrect adjustment could cause a hazard.

Config : Meter Settings

Zero At

The "day start" - time at which the Today/Last readings are changed over. Typically, 06:00.

Feed Max Run

Maximum expected run for the feed auger. The tighter this is to the typical running time, the sooner problems will be detected.

If you have an overrun timer on the auger motor, set this value less than the overrun timer.

Adjustable 1 minute to 240 minutes (default 30 mins)

Warning : Setting = 0 means no Feed Max Run Alarm.

Feed Max Off

Maximum permitted time for feed auger switched off. The tighter this is to typical operation, the sooner problems will be detected. (Note : Allow for less frequent use when pigs are smaller.)

Note : If your auger is controlled by a timer, you must set a value greater than the longest interval between timer runs.

Adjustable 1 to 25 hours (default 8 hours)

Warning : Setting = 0 means no Feed Max Off Alarm.

Water Max Run

Maximum permitted time for water to run at or faster than "On Rate".

Adjustable 1 to 25 hours (default 12 hours)

Warning : Setting = 0 means no Water Max Run alarm

Water On Rate

Rate at which water is determined as "running". The higher you set this value, the less of the portion of the day when water is "running", but the less easy to detect leaks. If the On rate is set too high, "On" will never be detected, and so Water Max Run will never be triggered.

Setting is in Ppm (Pulses per Minute) - the amount of water this represents depends on the type of meter - e.g. 1 pulse per gallon or litre, etc.

Adjustable 0 to 255 (default 10).

A setting of 0 is permissible. With this setting, water is "running" whenever there is a pulse per minute or more.

Logging may be necessary to determine an appropriate On Rate.

Water Max Off

Maximum permitted time for water use to be below the "Off Rate".

Adjustable 1 to 25 hours. (Default 3 hours)

Warning : Setting = 0 means no Water Max Off alarm

Water Off Rate

Rate at which water is determined as "not running". The lower you set this value, the less of the portion of the day when water is "not running", but the less easy to detect water supply failure.

If the Off rate is set too low, "Off" will never be detected, and so Water Max Off will never be triggered.

Setting is in Ppm (Pulses per Minute) - the amount of water this represents depends on the type of meter - e.g. 1 pulse per gallon or litre, etc.

Adjustable 0 to 255 (default 10).

A setting of 0 is permissible. With this setting, water is only "not running" when pulses are less than once per minute.

Logging may be necessary to determine an appropriate Off Rate.

Water Scale

Multiplier for water meter.

E.g. If the meter measures in litres but gives two pulses per revolution (one pulse = 0.5 litres) set Water Scale = 0.5/pulse.

Feed Scale

Multiplier for feed auger - needs test weighing of delivery rate from auger.

E.g. If the auger delivers 4.7 pounds in 10 seconds, set Feed Scale = 0.47.