

Weighbatch

Weight Control

Operating Manual

Software Version 2.09h

Operating Manual

Weight Control

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Introduction

Congratulations on purchasing your new Weighbatch Weight Control. We have taken every care in designing and assembling your Weight Control to ensure it operates efficiently, is easy to use, and has many useful features.

For safety reasons, and to obtain maximum benefit from your Weight Control we recommend that you read and follow the advice contained in this manual before operating your unit.

In the unlikely event that you experience any problems with your unit, please refer to the **Alarms** and then **Trouble Shooting** sections of this manual before contacting us for service. We have attempted to cover the most likely problems. This will help you gain a better understanding of the machine and may result in a quicker solution.

The instructions in this manual are designed for the Weight Control as a stand alone Weighbatch unit. If you have other Weighbatch products linked to your Weight Control, such as the Weighbatch Loader or Weighbatch Mini Blend, the manuals accompanying these products should be read in conjunction with this manual.

Principle of Operation

The Weight Control measures the material throughput of an extruder and controls this to achieve a consistent mass rate. It can also measure the line speed and use this to achieve a consistent linear density or mass per unit length.

The Weight Control hopper contains a weight chamber, open at the base, from which the extruder continually drains material. The rate at which the chamber weight decreases is the same as the extruder throughput. The weigh chamber is periodically refilled through a slide valve.

The "G" series Weight Control models act in the opposite fashion, ie. they operate by measuring the rate at which the weight of material increases. These have a weigh chamber open at the top which is slowly filled by material and periodically drained through a valve.

The rate of weight change and the extruder RPM together are used to determine a figure for extruder efficiency in terms of mass per revolution of the screw. The actual extruder throughput at any time can be estimated from this efficiency figure and the current extruder RPM. This provides a much more responsive system than using the rate of weight loss alone although the Weight Control can be used without this RPM input.

Having determined the current throughput the Weight Control can then attempt to change either the extruder speed or the line speed (or both) to achieve the required setpoint. It does this by either increasing or decreasing the speed.

Using the increase/decrease technique, rather than attempting to set the absolute speed, means that when the Weight Control is switched between auto and manual there are no sudden changes of speed caused by the line switching back to a previous manual setting.

The weigh hopper's internal rubber mounts and strong construction allow direct mounting to the extruder without interference from the general vibration of the machine.

Safety

The following is a list of safety points that should be adhered to at all times:

Treat your Weight Control with the respect you give any other electrical machinery in your plant.

Ensure all material is free from foreign objects.

Do not modify your Weight Control without consulting Weighbatch.

Only use Weighbatch supplied spares or recommended parts if you are replacing any parts.

Keep hands and foreign objects clear of the Weight Control's slide valve. Do not attempt to move the slide valve by hand with the compressed air supply connected.

Glossary of Terms

Control Mode. A setup parameter which determines what setpoints are allowed and what outputs the Weight Control will alter to achieve them.

Linear Density. The weight of finished product per unit of length, eg. grams/meter.

Weigh Chamber. The inner hopper suspended by loadcells which holds material.

Throughput. The mass output of the process per unit time, eg. Kgs/hour.

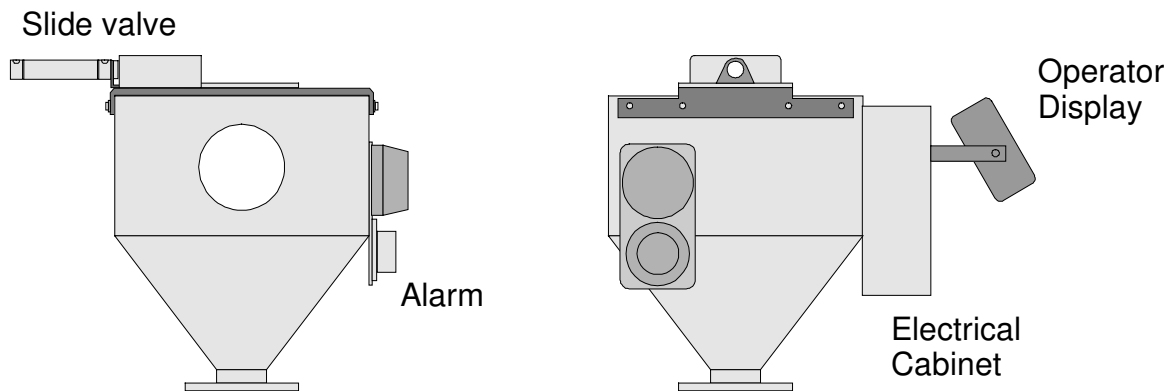
Loss in Weight. The measurement technique where the process continually drains material from the weigh chamber which is occasionally refilled. The throughput is measured by the rate of loss in weight.

Gain in Weight. The measurement technique where the process continually adds material to the weigh chamber which is occasionally emptied. The throughput is measured by the rate of gain in weight.

Weight Control Layout

The Weight Control consists of two parts. The first is the Weight Control unit itself which (typically) sits on the extruder and measures material throughput. The second are a group of input and output modules which normally sit within the electrical cabinet of the extruder control system. A low voltage communication cable connects the i/o modules to the Weight Control unit.

Weight Control Unit



NOTE: This description is for the normal Loss-in-Weight type hopper. The less common "G" series Gain-in-Weight hoppers are described a following section.

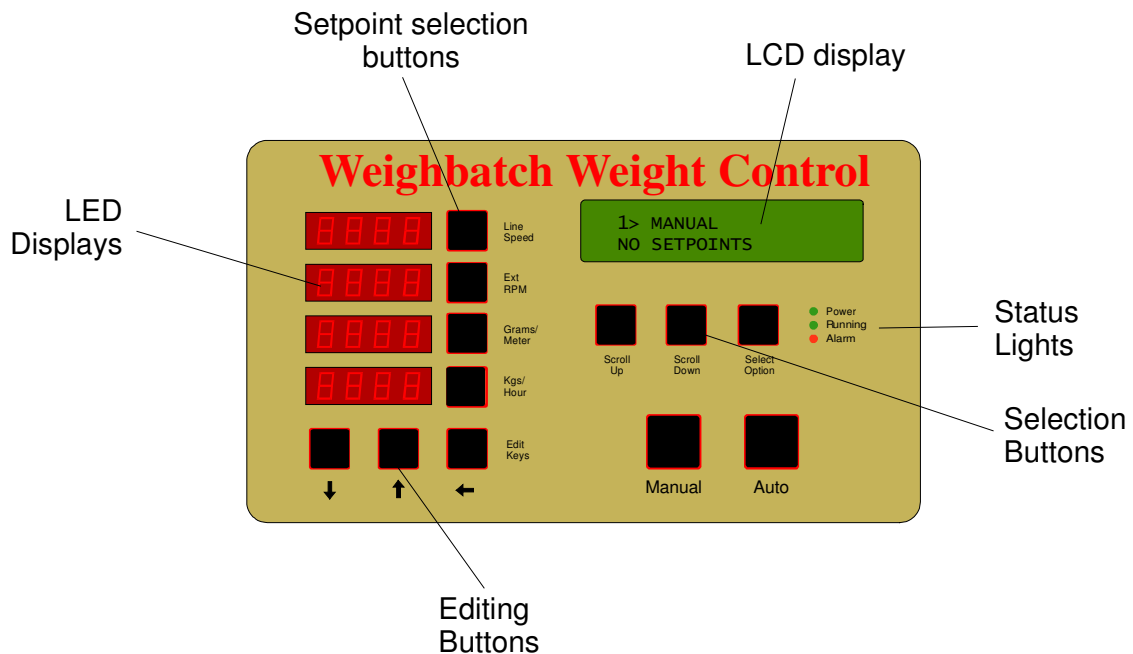
The Weight Control unit has a steel outer hopper with a weigh chamber mounted inside. A pneumatically operated slide valve allows material from above to fill the weigh chamber. The outer hopper and weigh chamber are open at the base and material is drained away by the extruder.

The control electronics are located in a small electrical cabinet mounted on the side of the outer hopper.

Also mounted on the hopper are an alarm (with strobe and siren) and the operator display panel. Both of these can be removed and mounted up to 10 meters away.

Weight Controller control panel

The Weight Controller is run from a simple control panel that is normally mounted on the unit. The control panel is used to set up and monitor the process.



LED Displays

Displays the actual line speed, RPM and throughput. Also used to display and change the setpoints.

LCD Display

Displays additional features, operational data, error messages and set-up parameters.

Editing Buttons

Are used to edit settings on both the LED and LCD Displays.

Status Lights

Indicate current status of the Weigh Control. Power On, Auto and Alarm. The top green light will be on when the Weight Control's power is on. The main power switch is located at the rear of Weight Control, on the electrical cabinet.

The middle green light will be on when the Weight Control is in "Auto" mode.

The bottom red light will be on when the Weight Control is in alarm status, ie an error has occurred. The LCD Display will give an error description. The errors are listed in the **Alarms** section.

Selection Buttons

Scroll Up and **Scroll Down** are used to scroll through the different LCD Displays available. The **Select Option** button is used to select or edit an option.

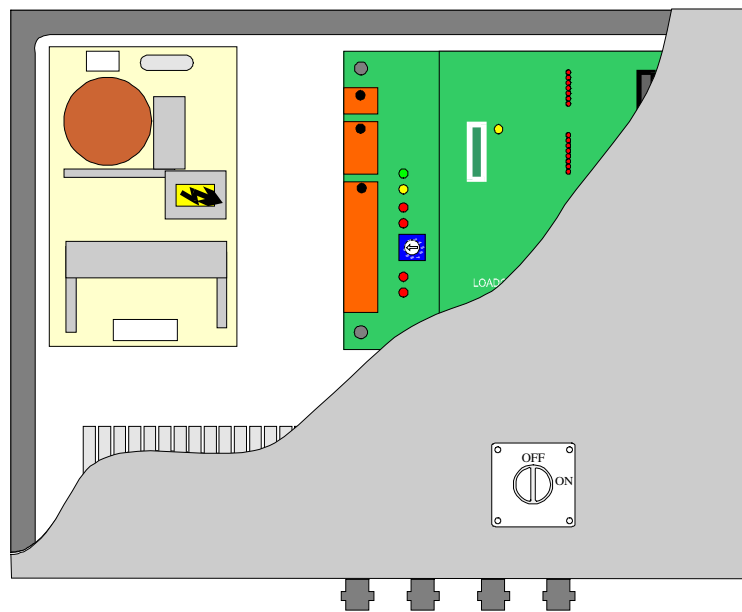
Manual and Auto Buttons

Are used to switch the Weight Control between manual and Auto control modes.

Setpoint Selection Buttons

Are used to select a parameter to edit the setpoint. An exception is the RPM button. Pressing this button will display the current required extruder RPM.

Electrical Cabinet



The control cabinet is mounted on the side of the Weight Control.

24V Power Supply

Low voltage power to the Weight Control is provided by a 24V DC switch mode power supply. The supply has a 1A rating.

CPU and I/O Boards

The Weight Control is controlled by a Weighbatch designed CPU board. This board contains the control software and non-volatile memory required to store the setup parameters. It also provides serial ports for connection to a supervisory computer.

The I/O board mounts on top of the CPU board and provides the primary input and outputs for the Weight Control. In particular it contains the electronics for the Weigh Chamber loadcell input.

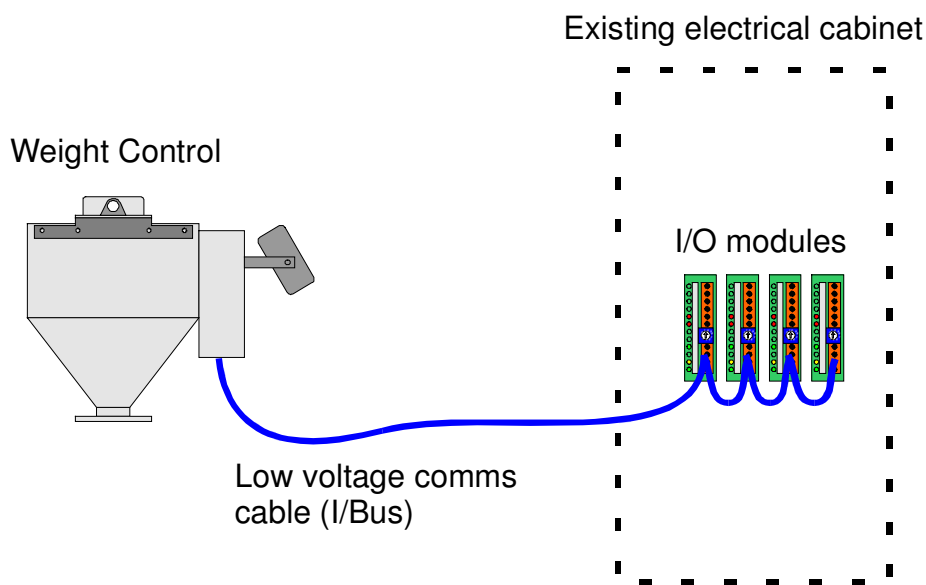
Both boards are described more fully in the **Circuit Boards and Modules** section

Pneumatics

The Weight Control slide valve is controlled by a 24V DC solenoid mounted on the side of the hopper. Air is supplied to the valve through a filter/regulator connected directly to the external air supply. The regulator should be set to 4 Bar.

I/O Modules

In order to operate in anything other than a pure monitoring mode the Weight Control needs inputs from the line and the ability to control the line. These inputs and outputs are usually associated with the existing line control electronics and are often at or near hazardous voltages. In order to keep these voltages away from the Weight Control we use a set of input and output modules mounted inside the existing line electric cabinets and connected to the Weight Control by a low voltage connection. All inputs and outputs are isolated from this low voltage connection.



The I/O modules are powered through the communication cable. This is an extension of the same cable used to connect to the operator display and is called the **I/Bus**. Each of the modules is connected to the I/Bus in a daisy chain. The modules can be mounted up to 20 meters from the Weight Control.

The following table summarises the types of modules available.

	Input	Output
WC-CONNECT	I/Bus	I/Bus, 24V
WC-SPEED	Speed, digital or analog	
WC-OPTO		Dual opto-isolator
WC-POT		Stepper motor driven pot
WC-RELAY		Dual SPNO relays
WC-ALOG	Analog setpoint	Offset setpoint
WC-MOTOR		DC motor H-Bridge
WC-BUFFER	Digital/analog	Buffered/filtered input

WC-CONNECT

The WC-CONNECT module provides a convenient entry point for the I/Bus cable from the Weight Control into the modules. It also provides a non-isolated 24V supply derived from the I/Bus.

WC-SPEED

The WC-SPEED module is the primary input module for line speed and extruder RPM. It can also be used for up to four secondary speed inputs. The module can accept digital inputs, PNP or PNP, up to 100 KHz. It can also accept DC analog inputs of either 0-10V or 0-200V. Analog input impedance is 10K for 0-10V and 400K for 0-200V.

WC-OPTO

The WC-OPTO module is a control output module with two opto-isolator outputs. This module is the standard control module supplied with the Weight Control and is normally used when controlling AC motor drives with digital increase/decrease inputs or PLC controlled lines. The outputs withstand 60V and source/sink 100mA.

WC-POT

The WC-POT module is a control output module supplied together with a stepper motor driven potentiometer. This module is normally used with lines having existing potentiometer controlled drives. The motorised pot replaces the existing control pot. The potentiometer supplied is 10 turn, 5K.

WC-RELAY

The WC-RELAY module is a control output module with two relay outputs. This module is normally used in lines having manual increase and decrease buttons switching high voltages. The relays are wired across the buttons. The relays are rated at 240V, 1A.

WC-ALOG

The WC-ALOG module is a control output module for lines whose drives use an analog setpoint not derived from a potentiometer and which cannot be controlled by a digital input. When not on auto-control the module is bypassed by an internal relay and the output setpoint is coupled to the input setpoint. When on auto-control the output setpoint is derived from the input setpoint plus an offset voltage. When taken off auto-control the offset voltage is ramped down to zero before the internal relay is de-energised. This avoids rapid step change of line or extruder speed. The input and output setpoint voltages are 0-10V.

The WC-ALOG module is also used as a simple analog output for controlling up to four additives.

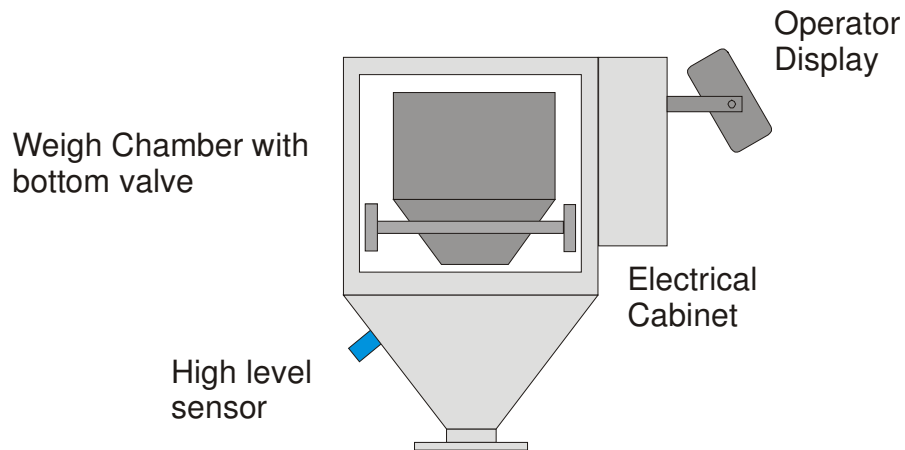
WC-MOTOR

The WC-MOTOR module is a control output module for lines with motorised potentiometers driven by low voltage DC motors. The output is in the form of an H-bridge. Motor voltage can be 60V at 1A.

WC-BUFFER

The WC-BUFFER module is used for signal conditioning. It has the same inputs as the WC-SPEED module. Digital inputs (NPN or PNP) are filtered with a 10msec single pole filter and output as NPN. This is used normally for low speed digital inputs where the signal cables are picking up noise. Analog inputs (0-10V, 0-200V) are buffered and output as 0-10V. This is normally used when the standard WC-SPEED module causes too much load on the signal line or when using multiple WC-SPEED modules on the same signal.

Gain-in-Weight Hopper



The “G” series Gain-in-Weight hoppers are less common. They are typically used to measure post-process throughput such as the output from a granulator. Other than the different physical arrangement of the hopper itself the Gain-in-Weight system is identical to the more common Loss-in-Weight system as described above.

The Weight Control unit has a steel outer body with a weigh chamber mounted inside on rails so it can be slid out of the body. Material flows from above the body to fill the weigh chamber which is open at the top. A pneumatically operated funnel valve in the bottom of the weigh chamber allows the chamber to be emptied.

The control electronics are located in a small electrical cabinet mounted on the side of the outer hopper. Also mounted on the hopper are an alarm (with strobe and siren) and the operator display panel. Both of these can be removed and mounted up to 10 meters away.

A high level sensor is fitted to alarm if material fills the bottom of the hopper. This would prevent the weigh chamber from emptying and could result in incorrect throughput measurement.

Installation

Make sure you have the correct control modules !!

Prior to ordering your Weight Control you should have had a discussion with your supplier about the type and number of control modules you need.

The simplest way to determine the modules needed is to look at how the operators control the line manually.

- Do they use potentiometers? Are these already motorised (WC-MOTOR) or will they be replaced with Weighbatch motorised potentiometers (WC-POT).
- Do they use increase/decrease buttons? Are these high voltage (WC-RELAY) or low voltage (WC-OPTO).
- Is the line controlled by a PLC with digital increase/decrease inputs (WC-OPTO)?
- Are the drives controlled by analog setpoints not controllable as above (WC-ALOG)?
- Will you be controlling both line and extruder speed?

Weight Control Hopper

The Weight Control hopper can be mounted directly on the extruder throat. Ensure there is access to the electrical cabinet.

Connect a compressed air supply to the filter/regulator using 6mm plastic hose. Check that the regulator is set to 4 Bar. Air usage is minimal.

Connect the Weight Control to a single phase power supply. You can use the power lead provided or can replace this with your own cable wired directly into the electrical cabinet. The power supply can be 80–250VAC. Consumption is minimal (20W).

Operator Display

The operator display normally mounts on the door of the electrical cabinet. It can be relocated up to 10m away by replacing the connecting cable. Use four core shielded cable and refer to the electrical wiring drawings. The cable carries low voltage communications signals and should not be run near sources of interference.

Alarm

The strobe/siren alarm normally mounts on the Weight Control hopper. It can be relocated by replacing the two core connecting cable. The cable is not noise sensitive but should not be run near sources of severe interference or static buildup which might couple high voltage spikes back to the Weight Control.

Input/Output Modules

Mount the input/output modules in the existing line electrical cabinet, away from sources of interference. The modules mount on standard DIN rail or can be mounted using the supplied holder.

Connect the I/Bus cable from the Weight Control to the WC-CONNECT module. Connect all of the modules together using the supplied daisy-chain plugs.

Connect the input modules to their signal sources. Line and extruder speed can be taken from sources such as:

- drive analog output
- tacho-generator output
- drive digital pulse output
- proximity sensor

The line speed module should have its address set to 0. The extruder RPM module should have its address set to 1. If you are using speed modules for secondary speed inputs these should be set to addresses starting from 2.

Connect the control output modules to their control devices. If using WC-POT modules then replace the existing potentiometers with the Weighbatch motorised pots.

The line control module should have its address set to 0. The extruder control module should have its address set to 1. If you are using WC-ALOG modules for controlling additives these should be set to addresses starting from 2.

Turn On Power

Power up the Weight Control.

A number of alarms will be generated during the startup. These can be acknowledged (and the siren silenced!) by pressing the **Select Option** button on the operator panel. This is the button at the top-right.

Ensure that the system starts up correctly. If not, refer to the **Troubleshooting** section.

The operator panel should have its power light on and should have something displayed on the LCD screen.

The input/output modules should all have their green Power light on. Other than the WC-CONNECT and WC-BUFFER modules they should also have their green Connected light on and the yellow Ok light flashing on/off once per second.

Change Setup Data

Check the setup data and change as required. Refer to the **Setup** section.

The initial parameters that will need to be set are:

- Control mode
- Number of additives (if any)
- Number of secondary inputs (if any)

Test Modules

Use the MODULE SUMMARY option on the TESTS menu to check that the input/output modules are operating. Refer to the **Tests** section.

Initially do this test to check which modules are connected and that their addresses are correctly set. This can be done with the line stopped. At this stage you can also check that any motorised potentiometers are working.

With the line running perform the test again. This will show actual speed inputs and will allow you to check the line and extruder control output modules.

Calibrate

Use the options on the CALIBRATE menu to calibrate input and control modules and the weigh chamber. Refer to the **Calibrate** section.

The weigh chamber calibration will require the hopper to be empty. The subsequent setting of the overfull weight will require the hopper to be filled with material.

Calibration of the line and extruder speed will require them to be running at an average speed. Calibration of the line and extruder control will require the line and extruder speed to be significantly changed and would not normally be done with the line in production.

Control Modes

There are six different control modes in which the Weight Control can run. Each mode requires some essential modules. The non-essential modules are optional but generally provide additional process information.

KGS

The KGS mode controls the extruder only to achieve a throughput target (Kg/hour). The essential modules for this mode are:

- Extruder Speed
- Extruder Control

GPM (EXT)

The GPM (EXT) mode controls the extruder only to achieve a linear density target (gram/meter). The essential modules for this mode are:

- Line Speed
- Extruder Speed
- Extruder Control

GPM (LINE)

The GPM (LINE) mode controls the line speed only to achieve a linear density target (gram/meter). The essential modules for this mode are:

- Line Speed
- Line Control
- Extruder Speed

FULL

The FULL mode controls both the extruder and line speed to achieve a throughput target (Kg/hour) and a linear density target (gram/meter). The essential modules for this mode are:

- Line Speed
- Line Control
- Extruder Speed
- Extruder Control

REMOTE

The REMOTE mode controls either the extruder or line speed or both achieve a throughput target (Kg/hour) and/or a line speed target (meter/minute). The essential modules for this mode are:

- Line Speed (for line speed target)
- Line Control (for line speed target)
- Extruder Speed (for extruder target)
- Extruder Control (for extruder target)

REMOTE mode is only used for Weight Controls which are part of a co-extrusion line controlled by a Weighbatch AdvanTec system. In such a system only one Weight Control will control line speed but all will control their own extruder speed.

Where a line speed input is available the Weight Control will allow a grams/meter target to be entered if communication with the AdvanTec computer is lost. This provides a fallback method of manually entering setpoints for a co-ex line. A Line Speed input module must be provided for each Weight Control.

NONE

NONE mode performs no control of either extruder or line speed. It is only for Weight Controls being used purely to monitor a line. There are no essential modules in this mode.

Running without an extruder RPM input forces the Weight Control to use the raw weight loss per second data from the weigh chamber to determine the throughput. Because of the amount of filtering required on this data the response time to any change in extruder speed will be much longer than normal.

Manual Linespeed Entry

The KGS and NONE modes allow operation without a line speed input module. If this module is not used the Weight Control will allow the manual entry of a line speed by pressing the **Line Speed** button. This will allow the actual linear density (grams/meter) to be calculated and displayed.

Operation

Starting the Weight Control

Step 1

Turn the power on with the switch mounted on the control cabinet on the side of the Weight Control.

The Power On indicator light on the front panel should now be on and the LCD Display will show:

WEIGHBATCH NZ LTD
WEIGHT CONTROL

This display will only last a few seconds, then the Alarm warning light will come on to indicate that the Weight Control has been restarted:

5 > RESTARTED
PRESS SELECT TO ACK

If the any input/output modules are not connected these alarms will be displayed first.

Step 2

Press the **Select Option** button to ACK (acknowledge) that the Weight Control has restarted.

You will then be prompted that the Weight Control is ready and not on auto-control:

1 > MANUAL
K/H=32.7

The Weight Control will also display the current setpoints for extruder throughput or line speed.

Depending on the input modules connected the red LED displays on the left side of the operator panel will show the actual line speed, extruder RPM, throughput and linear density.

Step 3

Enter the set points required, throughput or linear density or both.

Step 4

Manually adjust the line to close to the desired setpoint. This step is not essential but does save some limit alarms from going off later.

Step 5

Press the **Auto** button to put the Weight Control into auto-control mode.

The Weight Control will now maintain the line/extruder at the specified setpoint until the **Manual** button is pressed or the unit is switched off.

1 > AUTO KPH
K/H=32.7

The LCD Display will indicate the control mode and the current setpoints. To find out more about the various displays refer to the **Operation / LCD Displays** section.

Changing The Setpoints

A setpoint is changed by first selecting the setpoint wish to change. The button to the right of each of the red LED displays will select that setpoint. Depending on the control mode only some of the values can be entered as setpoints.

Mode	Setpoints
FULL	Throughput (kg/hr)
KPH	Throughput (kg/hr)
GPM (EXT)	Linear density (g/m)
GPM (LINE)	Linear density (g/m)
REMOTE	Refer Control Modes section
None	None

When a setpoint is selected the right hand digit will blink and any left hand zeros will appear.

Use the **↑** and **↓** buttons to increment and decrement the digit that is blinking. If a digit to the left is the digit to be changed press the **←** button, this will move the blinking digit to the next left position.

When the value has been changed to the required value press the selection button again. Pressing any other selection button will also complete the entry as will doing nothing for 30 seconds. The blinking digit will stop blinking and any left hand zeros will vanish.

Example

To change the throughput setpoint from 32.7 to 42.7 do the following.

1. Select the setpoint using the **Kgs/Hour** button. The display will read '032.7' and the "7" will blink.
2. Move the blinking digit to the "3" by pushing **←** button twice. The display will read "032.7" and the "3" will blink.
3. Change the "3" to a "4" by pushing the **↑** button. The display will read "042.7" and the "4" will blink.
4. Complete the entry by pushing the **Kgs/Hour** button, the display will read 42.7. The left hand zero will have gone and no number will blink.

View Targets

For the two linear density modes the setpoint is grams/meter but the actual control target is either extruder RPM or line speed. Similarly for the Full and Remote modes one of the setpoints is kgs/hour but the control target is extruder RPM. Pressing the **RPM** button will briefly display the target RPM required for the current setpoint. Similarly in GPM (LINE) mode pressing the **Line Speed** button will briefly show the line speed target.

Auto / Close Switch

During normal operation material drains out of the weigh chamber into the extruder and the weight in the chamber decreases. At a preset weight the slide valve opens to refill the weigh chamber and the cycle repeats.

There is a switch on the top of the Weight Control electrical cabinet which can be set to **Close**. This stops the weigh chamber refilling and allows the chamber to be completely emptied.

LCD Displays

During normal operation the LCD Display, on the right hand side of the operator panel, shows the current status of the Weight Control as well as other operating data. This information is displayed in a number of formats each prefixed by a display number. All are accessible for viewing during normal operation by the operator.

The current display number is displayed on the first position of the first line.

```
1 >
```

The **Scroll UP** and **Scroll DOWN** buttons are used to increment and decrement the display number. For some displays, the **Select Option** button is used to change some value. The **↑**, **↓** and **←** buttons are used to edit the value in the same way as for the setpoints.

1> STATUS

```
1 > AUTO KPH  
K/H=32.7
```

Display <1> shows the current control status of the Weight Control and the current setpoints.

2> ALARMS

```
2 > NO ALARMS  
1 WARNING
```

Display <2> is used to show the current alarms, if any. For the full list of alarms refer to the **Alarms** section.

3> WARNINGS

```
3 > LINE CTRL N/C
```

Display <3> shows and warnings, ie. acknowledged alarms which are still active.

4> ALARM POINTS

```
4 > MPM RPM GPM KPH  
ALM 5 5 10 10
```

Display <4> shows the tolerance levels set for alarms on the various setpoint and target values. Refer to the **Operating** section. Any zero alarm points are ignored.

To set the alarm points press the **Select Option** button. You can then enter each of the four points in turn with the arrow buttons pressing **Select Option** between each one.

5> HOPPER STATUS

5> HOPPER STATUS:
7851G CLOSED

Display <5> shows the current hopper weight. If the slide valve is currently open to refill the hopper then the display will show **OPEN**. If the Auto/Close switch is set closed then the display will show **CLOSED**.

6> KGS USED

6> KGS USED: 234

Display <6> shows the total Kgs of material used since the total was last reset. Press **Select Option** to reset the total. The message:

CLEAR KGS USED ?
PRESS SELECT TO OK

will be displayed. Press **Select Option** to confirm that you wish to reset the total.

7> KGS TO GO

7> KGS TO GO: 200

Display <7> shows the number of Kgs to go in the current job. Press **Select Option** to change the value. When this number reaches zero the alarm:

2> PRESET QTY DONE
SELECT TO ACK

will be displayed. Press the **Select Option** button to clear the alarm.

8> METERS TO GO

8> METERS TO GO: 200

Display <8> shows the number of Meters to go in the current job. Press **Select Option** to change the value. When this number reaches zero the alarm:

2> PRESET QTY DONE
SELECT TO ACK

will be displayed. Press the **Select Option** button to clear the alarm.

9> INCREASE LINE

9> INCREASE LINE
PRESS <SEL>

Display <9> allows you to manually increase the line speed and/or extruder speed. Press the **Select Option** button. While the button is pressed the line and extruder control outputs will increase at about

80% of the normal rate.

10> DECREASE LINE

10> DECREASE LINE
PRESS <SEL>

Display <10> allows you to manually decrease the line speed and/or extruder speed in the same fashion as display <9>.

11> EXTENDED DISPLAY

11> EXTENDED DISPLAY
PRESS SELECT

Display <11> allows you to view the remaining displays if required. Press **Select Option** to go on to display <12> or press **Scroll UP** to go back to display <1>.

12> ADDITIVES

12> ADDITIVES
3.0 5.0

can then enter each of the additive in turn with each one.

Display <12> is only used if the Weight Control has been set up with additive control. It shows the percentage of each additive. To set the additive percentages press the **Select Option** button. You

the arrow buttons pressing **Select Option** between

13> CONTROL MODE

13> CONTROL MODE
KPH

Display <13> shows the control mode in which the Weight Control has been set up.

17> SOFTWARE

17> SOFTWARE
WGT v2.09h

Display <17> shows the current version number of the Weight Control software.

NOT CONNECTED

NOT CONNECTED

This message is displayed by the Operator Panel when it has lost communication with the Weight Control CPU board. Refer to the **Fault Finding** section.

Alarms

Acknowledging Alarms

During operation of the Weight Control alarms may be raised to indicate equipment faults, error conditions or critical events. When an alarm is raised the Weight Control switches to display <2> and displays the alarm, eg:

```
2> EXT CTRL N/C
SELECT TO ACK
```

The alarm will continued to be displayed on display <2> until it is acknowledged by pressing the **Select Option** button. Pressing **Select Option** as soon as the alarm is displayed will result in the alarm being cleared and the display returning to the previous display number. Alternatively you may use the normal **Scroll** buttons to view other displays before returning to display <2> to acknowledge the alarm. You can only acknowledge the alarm when it is displayed. If more than one alarm is active the most recent one is displayed first although you can use the **Scroll** buttons to view the other active alarms.

Alarm messages

This section lists all possible alarm messages in alphabetic order. Each alarm message is followed by things to check to determine the cause of the alarm. Many of these will refer you to the **Checks** section of this manual.

2> ADD.n CTRL N/C

```
2> ADD.1 CTRL N/C
SELECT TO ACK
```

Means that the Weight Control has been set up for additive control but no analog output module with address n+1 is communicating with the Weight Control unit.

Check:

Should additive control be setup.

If the module is connected check:

- Is module address switch set to n+1.
- Refer **Checks/Modules**.

2> EXT CTRL N/C

```
2> EXT CTRL N/C
SELECT TO ACK
```

Means that no output control module with address one is communicating with the Weight Control unit.

If the module is connected check:

- Is module address switch set to one.
- Refer **Checks/Modules**.

2> EXT SPEED N/C

2> EXT SPEED N/C
SELECT TO ACK

Means that no input module with address one is communicating with the Weight Control unit.

If the module is connected check:

- Is module address switch set to one.
- Refer **Checks/Modules**.

2> G/REV INVALID

2> G/REV INVALID
SELECT TO ACK

Means that the Weight Control has detected a weight change where the implied grams per rev would exceed the maximum allowable value specified in the Setup Data. The weight loss data for

this reading is ignored. Often caused by operators interfering with the weigh hopper or manually adding or draining material with the extruder running.

Check:

- Is the setup maximum grams per rev too small.

2> GPM HIGH

2> GPM HIGH
SELECT TO ACK

Means that the actual measured linear density (grams/meter) value is higher than the setpoint value plus the alarm point.

2> GPM LOW

2> GPM LOW
SELECT TO ACK

Means that the actual measured linear density (grams/meter) value is less than the setpoint value minus the alarm point.

2> HOPPER FULL

2> HOPPER FULL
SELECT TO ACK

Means that the measured hopper weight is greater than the calibrated overfull weight. Normally means that the hopper is overfull of material or that there is a loadcell error.

Check:

- If the Weigh Chamber has overfilled with material during normal running, is the slide valves are closing properly. Refer **Checks/Slide Valve**.
- Is the overfull value set correctly.
- Refer **Checks/Weight Measurement**.

2> HOPPER LOW

2> HOPPER LOW
SELECT TO ACK

Means that the measured hopper weight is less than 20% of the overfull weight. Normally means that the hopper is running out of material or that there is a loadcell error.

Check:

- Is the Auto/Close switch set to "Closed".
- Is there material available to fill the weigh chamber.
- Is the slide valve opening properly. Refer **Checks/Slide Valve**.
- Refer **Checks/Weight Measurement**.

2> KPH HIGH

2> KPH HIGH
SELECT TO ACK

Means that the actual measured throughput (kilograms/hour) value is higher than the setpoint value plus the alarm point.

2> KPH LOW

2> KPH LOW
SELECT TO ACK

Means that the actual measured throughput (kilograms/hour) value is less than the setpoint value minus the alarm point.

2> LINE CTRL N/C

2> LINE CTRL N/C
SELECT TO ACK

Means that no output control module with address zero is communicating with the Weight Control unit.

If the module is connected check:

- Is module address switch set to zero.
- Refer **Checks/Modules**.

2> LINE SPEED N/C

2> LINE SPEED N/C
SELECT TO ACK

Means that no input module with address zero is communicating with the Weight Control unit.

If the module is connected check:

- Is module address switch set to zero.
- Refer **Checks/Modules**.

2> MPM CTL HI LIMIT

2> MPM CTL HI LIMIT
SET MPM 12.3

Means that the line speed has been increased too far from the original value it had when the Weight Control was first put on Auto. The required line speed is now greater than the original value (shown

on the second line) plus the MPM alarm point. If the line is operating normally the operator can take the Weight Control off Auto and then put it back on Auto. This causes a new original value to be saved.

Check:

- Is the alarm point set too low.

2> MPM CTL LO LIMIT

2> MPM CTL LO LIMIT
SET MPM 12.3

Means that the line speed has been decreased too far from the original value it had when the Weight Control was first put on Auto. The required line speed is now less than the original value (shown on

the second line) minus the MPM alarm point. If the line is operating normally the operator can take the Weight Control off Auto and then put it back on Auto. This causes a new original value to be saved.

Check:

- Is the alarm point set too low.

2> NOT FILLING

2> NOT FILLING
SELECT TO ACK

Means that the weigh chamber is taking longer than 15 seconds to refill with material.

Check:

- Is there material available to fill the weigh chamber.
- Is the slide valve opening properly. Refer **Checks/Slide Valve**.
- Is material flowing freely
- Is the refill percentage set too low. Refer **Setup** section.

2> PRESET QTY DONE

2> PRESET QTY DONE
SELECT TO ACK

Means that the Kgs To Go value or the Meters To Go value has reached zero.

5> RESTARTED

5> RESTARTED
SELECT TO ACK

Means that the Weight Control has been restarted. Normally occurs only when power is first turned on but can occur if the CPU board processor resets due to a power supply problem.

If power was not turned off check:

- Static charge building up in the weigh chamber.
- Earth connection to weigh chamber.
- Power supply spikes or interference.

2> RPM CTL HI LIMIT

2> RPM CTL HI LIMIT
SET RPM 45.6

Means that the extruder RPM has been increased too far from the original value it had when the Weight Control was first put on Auto. The required RPM is now greater than the original value (shown on the

second line) plus the RPM alarm point. If the line is operating normally the operator can take the Weight Control off Auto and then put it back on Auto. This causes a new original value to be saved.

Check:

- Is the alarm point set too low.

2> RPM CTL LO LIMIT

2> RPM CTL LO LIMIT
SET RPM 45.6

Means that the extruder RPM has been decreased too far from the original value it had when the Weight Control was first put on Auto. The required RPM is now less than the original value (shown on the

second line) minus the RPM alarm point. If the line is operating normally the operator can take the Weight Control off Auto and then put it back on Auto. This causes a new original value to be saved.

Check:

- Is the alarm point set too low.

2> STORAGE EMPTY

2> STORAGE EMPTY
SELECT TO ACK

Means that an optional low level proximity sensor has been fitted and has detected no material. Normally means that the hopper is running out of material.

Check:

- Is there material available to fill the weigh chamber.
- Is the sensor working properly.

Loadcell Tare

This section describes adjustment of the loadcell input for changes in the tare weight of the weigh chamber. The Weight Control should read a weight of zero when the weigh chamber is empty. Due to temperature changes or minor mechanical changes it is usually not exactly zero. This is not a problem as the Weight Control bases all of its calculations on differences in weight. If the weigh chamber is knocked the loadcells may be overstressed and the tare weight shifted by many grams. If it shifts too far the Weight Control cannot determine if the weigh chamber is empty or not. In this case (or whenever you wish) the weight can be re-tared to return to zero.

Taring is necessary:

- When the empty weigh chamber weight becomes significantly non-zero
- When a HOPPER LOW alarm does not occur with an empty chamber
- When a HOPPER FULL alarm does not occur with the chamber full of material.

The tare process will take only a few seconds and can be done while in production.

To tare do the following:

Press the **←** and **Select Option** buttons together to enter the Control Options menu:

**CONTROL OPTIONS:
TARE**

Press the **Select Option** button to enter the Tare option. The message:

**RETARE ?
PRESS SELECT TO OK**

will be displayed. Press **Select Option** to continue, any other button to quit:

**CHAMBER IS EMPTY ?
PRESS SELECT TO OK**

Ensure that the weigh chamber is empty. Press **Select Option**. The Weight Control will wait for the loadcell input to settle and will then read the weight.

Press **Manual** to return to the normal display.

Loadcell Calibration

This section describes calibration of the weigh chamber. In order to obtain accurate weights from the weigh chamber the loadcell input must be correctly calibrated.

Calibration is necessary:

- When first installed
- 3 months after installation
- Every 12 months
- When a new I/O board is installed
- When a loadcell is replaced

The calibration process will take less than 2 minutes and can be done while in production. When calibration has been completed record the date and new calibration number.

To calibrate the loadcell do the following:

Press the **←** and **Select Option** buttons together to enter the Control Options menu. Press the **Scroll Up** button to reach the Calibrate option:

**CONTROL OPTIONS:
CALIBRATE**

Press the **Select Option** button to enter the Calibration menu then press **Scroll Up** three times to reach the WGT CAL option:

**CALIBRATE:
WGT CAL=0.7512**

The current calibration number is displayed. You can note this number and subsequently compare it with the new calibration number to check for loadcell drift. Press **Select Option** to recalibrate. The

message:

**RECALIBRATE ?
PRESS SELECT TO OK**

will be displayed. Press **Select Option** to continue, any other button to quit:

**CHAMBER IS EMPTY ?
PRESS SELECT TO OK**

Ensure that the weigh chamber is empty. Press **Select Option**. The Weight Control will wait for the loadcell input to settle and will then read the weight.

**PLACE 4KG WEIGHT ?
PRESS SELECT TO OK**

Place the specified calibration weight in the weigh chamber. Press **Select Option**. Again the Weight Control will wait for the loadcell input to settle and will then read the weight. The calibration weight is then

displayed:

**CALIBRATION WEIGHT
04000.0 G**

and can be adjusted to suit the weights available if required using the **↑**, **↓** and **←** buttons. Press **Select Option** to continue. The Weight Control then recalculates the new calibration parameters and if all

is Ok returns to the calibration display:

CALIBRATE:
WGT CAL=0.7516

At this point you can either press **Manual** to exit from the Calibration menu or press **Scroll Down** to display the current weight and analog input percentage:

CALIBRATE:
+4001G 85.0%FS

Don't forget to remove the calibration weight!

Loadcell Calibration Errors

If there is a fault in the loadcell input then one of the following errors may be displayed at the end of the calibration procedure.

LOADCELL ERROR
NO CHANGE IN INPUT

This error means that there was too little difference in loadcell input between the empty weigh chamber and with the calibration weight. You may have forgotten to empty the chamber or to place the

calibration weight. It may indicate a fault in the loadcell or the I/O board. Refer to the **Checks/Loadcell Input** section.

LOADCELL ERROR
INPUT TOO LOW
INPUT TOO HIGH

These errors mean that the loadcell input is either too low or overrange and cannot provide reliable weight readings over the full range of weights. Refer to the **Checks/Loadcell Input** section.

Setup

The Weight Control has a series of set-up parameters used to alter the way the it performs. During normal operation it will not be necessary to access these parameters and care is necessary when viewing or editing them.

Entering Setup Menu

Press the **←** and **Select Option** buttons together to enter the Control Options menu:

CONTROL OPTIONS:
TARE

Then press the **Scroll UP** button to reach the Change Setup Data option:

CONTROL OPTIONS:
CHANGE SETUP DATA

Press the **Select** button to enter the Change Setup Data menu:

CHANGE SETUP DATA:
MODE=KPH

Changing Setup Options

Within the Change Setup Data menu you can use the **Scroll UP** or the **Scroll DOWN** buttons to move from one setup option to another. The options are in a continuous list. pressing **Scroll UP** on the last option will take you back to the first option again.

To change a particular option press the **Select Option** button. Where there is a limited choice of values this will change the option value immediately. Continuing to press **Select Option** will cycle through all possible values. For example, if the option displayed is

MODE=KPH

then pressing **Select Option** will change this immediately to:

MODE=GPM (EXT)

Where the option value is a number then pressing **Select Option** will display the number by itself and allow you to change it with the **↑**, **↓** and **←** buttons. For example, if the option displayed is

REFILL=30 %

Then pressing **Select Option** will display this as

REFILL:
30 %

One digit is underlined. Pressing the **←** button will move the underline to another digit. Pressing the **↑** button will increase the underlined digit by 1. Pressing the **↓** button will decrease it by 1. Pressing

any other button will save the changes and return to the normal display.

Leaving Setup Menu

Press the **Manual** button to leave the Change Setup Data menu and return to the Control Options Menu. Press the **Manual** button again to return to normal operation.

The last option in the Change Setup Data menu is

**CHANGE SETUP DATA:
EXIT**

Selecting this option will also leave the Change Setup Data menu.

When you leave the modified setup options are saved to the non-volatile memory on the CPU Board.

If for some reason you do not wish to save the changes you should turn off power to the Weight Control before leaving the Change Setup Data menu.

Setup Options

The remainder of this section describes each of the setup options in the order in which they appear in the Change Setup Data menu. The values shown are the default values.

MODE=NONE

The control mode. Refer to the **Control Modes** section for a description of each mode.

PART#=WC200

The model number of the Weight Control. This is used to establish the default loadcell calibration and overfull weight values.

REFILL=30%

The level at which the weigh chamber is refilled with material. Expressed as a percentage of the overfull weight.

FILL TIME=15SEC

The time allowed to refill the weigh chamber before a Not Filling alarm is raised.

MIN FILL=0G

If non-zero, the smallest acceptable amount of material which must be loaded during refilling to avoid a Not Filling alarm.

**MPM DECIMALS=1
RPM DECIMALS=1
GPM DECIMALS=1
KPH DECIMALS=1**

This sets the number of decimal points on the LED Display for each parameter.

G / REV FILTER = 100

The amount of filtering performed on the raw weight loss data. Roughly the number of seconds to respond to a change in extruder efficiency. If the grams per rev figure seems to be too unstable then this value should be increased. If it seems unresponsive then this value should be decreased. The normal range would be between 50 and 200.

MAX G / REV = 0 G

The upper limit of expected grams per rev efficiency for the extruder. Weight loss data over this limit will be ignored. Should be set to at least twice the actual maximum expected from the extruder. If set to zero then no checking is done.

FEEDBACK = 0.30

The amount of feedback used in controlling the line speed and extruder RPM. If set to 0.5 then only half of any required change in speed is actually applied in any one control period. Increasing this number causes the Weight Control to be more aggressive in its speed changes but may cause the control process to become unstable. Decreasing this number causes the control to be less responsive but more stable.

FAST FEEDBACK = 0.80

The amount of control feedback used during "high speed control". This is a special control mode used with PC control of line ramping.

CTL.PULSE = 0 MSEC

A non-zero value causes a control output signal to be broken up into a number of short pulses of this duration. Used for PLC control inputs where the amount of speed change depends on the number of pulses rather than the length of the pulse.

MIN.CTL = 0 MSEC

The minimum length of allowed for a control output time. Control outputs shorter than this time are accumulated until the minimum pulse width is required. Typically used for slow polling PLC systems, relay based control outputs or DC motorised potentiometers with high backlash.

APPLICATION = NONE

Allows the Weight Control to run in specific application modes. The only current mode is **FILM**.

NUM ADDITIVE = 0

The number of additives to be controlled by this Weight Control.

ADD.n MAX KGS = 0.0

The maximum feed rate of the additive feeder (in Kgs/hour) with a 10V control voltage.

ADD.n MIN = 0.0 %

The minimum feed rate of the additive feeder (expressed as a percentage of the maximum rate) with a 0V control voltage.

NUM SEC.INPUT = 0

The number of secondary speed inputs being monitored by this Weight Control.

STIR PERIOD=0SEC

For Weigh Controller with internal stirring mechanism to avoid bridging. Specifies the frequency of activation of the serrer.

0-10V OUT=NONE

actual throughput.

Specifies analog output of a process value. The options are RPM which will output the current extruder RPM and KGS which will output the current

0-10V SPAN=0.0

Specifies the analog output span if analog output is enabled (above). This is the RPM or Kg/Hr value corresponding to 10V output.

ALARM=ALWAYS

Used to control the physical alarm output. When set to **ALWAYS** the alarm output will always be raised when an alarm is active. When set to **NO COMMS** the alarm output will be active only if there is no communication with a supervisory PC. Used when a supervisory PC provides a single audible alarm for an entire line.

PRINT=NO

Enables printing of job material usage to an attached printer.

RESET LIFE DATA

zero.

Pressing the **Select Option** button twice will cause the lifetime usage data (kgs, meters) to be reset to

RESET SETUP DATA

its default values.

Pressing the **Select Option** button three times will cause the setup and configuration data to be reset to

PIN NUMBER=0

the password. If you do you must contact your supplier for a special password to allow you re-entry.

Setting this to a non-zero value creates a PIN number password which must be entered before you can get into the Control Options menu. Don't forget

Tests

In order to help resolve problems with the Weight Control there is a menu of tests which enable individual operations to be manually controlled.

To enter the Test menu press the **←** and **Select Option** buttons together to enter the Control Options menu:

CONTROL OPTIONS:
TARE

Press **Scroll UP** three times to move to the Tests option.

CONTROL OPTIONS:
TESTS

Press **Select Option** to enter the Tests menu. The following options are then available with the **Scroll UP** and **Scroll DOWN** buttons.

MODULE SUMMARY

Provides a sub-menu with the status of all input/output modules

LINE

Allows you to test the line speed input module and line speed control module.

EXT

Allows you to test the extruder speed input module, the extruder control module and the weigh chamber.

ADDITIVES

Allows you to set the output voltage for any additive analog output module.

Trouble Shooting

This section addresses problems that you may encounter with your Weight Control that are not covered by the Alarms section.

You should always refer to and follow any guidelines in the Alarms section before using this section.

Won't Go

Weight Control will not function at all. There is no readable message on the LCD Display. This is probably caused by an electronics problem. Refer to the **Fault Finding** section.

Won't Run

Weight Control will not run. There is a readable message on the LCD Display. If the message does not start with a number, eg. **1>**, **2>** etc, then check that the Weight Control is not in one of the Control Options by pressing the **Stop** button several times.

If the message does start with a number try pressing the **Scroll** buttons to change to display number <2> to see if there is an alarm message.

If the display does not respond to button presses the refer to the **Fault Finding** section.

Checks

This section describes various checks which can be made on the Weight Control in order to resolve problems.

Weight measurement

Scroll the operator display to number <5>. The current weight will be displayed:

5> HOPPER STATUS
7654G

Empty the weigh chamber. Check that the indicated weight is small. Otherwise recalibrate the loadcell.

Add some weight to the weigh chamber and check that the indicated weight increases by the correct amount. If no change in weight is indicated then check **Loadcell Input**. If the change in weight is incorrect then recalibrate the loadcell.

Loadcell Input

Open the Electrical Cabinet at the side of the Weight Control. Locate the two “Loadcell +/-” LEDs on the I/O board. Refer section **Circuit Boards and Modules**. If either LED is lit then there is a loadcell input fault. Check for physical interference with the weigh chamber.

If no physical problem is found then check the voltages across the following pins of the 5 way connector J2 on the I/O Board. Refer section **Circuit Boards and Modules**. Empty the Weigh Chamber before measuring.

Between Pins	Allowable Voltage
4 - 5	5V +/- 0.1V
3 - 5	2.5V +/- 0.1V
2 - 5	2.5V +/- 0.1V
2 - 3	0 to 10mV

If the voltage between pins 4 and 5 is not 5V then unplug the connector and measure the socket pins again. If still not 5V then the I/O Board should be replaced. Otherwise there is a fault in the loadcells or a short circuit in the wiring.

If the voltage between pins 2/3 and 5 is not 2.5V then there is a fault in the loadcells or wiring.

If the voltage between pins 2 and 3 is not correct then there is a fault in the loadcells. If the voltage is less than +/-30mV it indicates that the loadcells have been overloaded. The problem may be able to be **temporarily** fixed by reverse overloading the loadcells until the voltage remains in the range 0-20mV.

Weigh Chamber Valve

Empty the weigh chamber and remove material from above. The slide valve should open and should be able to be opened and closed by using the Auto/Close switch.

Check that the valve opens fully and when closed seats against the Weigh Chamber body with only small gaps. Both opening and closing should occur in less than half a second.

If the valve does not open then check the solenoid and cylinder (refer **Checks/Pneumatics**). If these are Ok, or if the valve operates slowly or inconsistently, then remove the air lines from the cylinder and try to move the slider by hand. It should move easily and should be sufficiently loose to “rattle” in its housing. Check for material trapped in the slide grooves.

NEVER ATTEMPT TO MOVE THE SLIDE VALVE BY HAND OR PLACE YOUR HAND INSIDE THE GUARD WITH AIR CONNECTED TO THE WEIGHT CONTROLLER.

Pneumatics

The slide valve in the Weight Control is operated by a pneumatic piston. This is controlled by a 24V DC solenoid. The solenoid has a small indicator (red or orange) which lights when the solenoid is on. If this is not lighting (or remains lit when it should be off) then check the output from the I/O Board (refer **Circuit Boards and Modules**). This should be 24V when on.

If the solenoid indicator is lighting then check the air supply to the Weight Control. This should be at least 4 Bar. Remove the air line(s) to the cylinder and check that there is reasonable airflow when the solenoid is on (and no airflow when the solenoid is off). If there is no airflow the solenoid should be replaced. If there is restricted airflow then the air lines should be checked for obstruction. If no obstruction can be found in the air lines then the solenoid should be replaced.

With the air lines disconnected from the cylinder check that the piston moves freely. Reconnect the airlines and check for air leaks from the cylinder.

Low Level Sensor

Note: A Low level sensor in the storage hopper is optional on the Weight Control. If no Low Level sensor is fitted and the **Low Level** alarm is being displayed then the I/O Board should be replaced.

As an alternative to actual material, the sensor should also detect your hand at a distance of about 20mm. If the alarm does not change in the presence/absence of material (or your hand) then check the sensor itself (refer **Checks/Proximity Sensor**).

Proximity Sensor

The level sensor used on the Weight Control is a standard capacitive proximity sensor. The sensor has an indicator light, either at the rear or on the side, which turns on in the presence of material. The sensor also has a small adjustment screw which can be used to alter the sensitivity. If the light remains lit try reducing the sensitivity. If still lit then replace the sensor. If the light remains unlit try increasing the sensitivity. If the light remains unlit at maximum sensitivity check the 24V power supply to the sensor. If the power supply is Ok then replace the sensor.

If the sensor is Ok then check the signal voltage at the input to the I/O Board. The signal should be +24V in the presence of material (ie. with the sensor light on) and close to 0V in the absence of material (ie. with the sensor light off). If the signal level remains unchanged then replace the sensor or the I/O Board (if required).

Circuit Boards and Modules

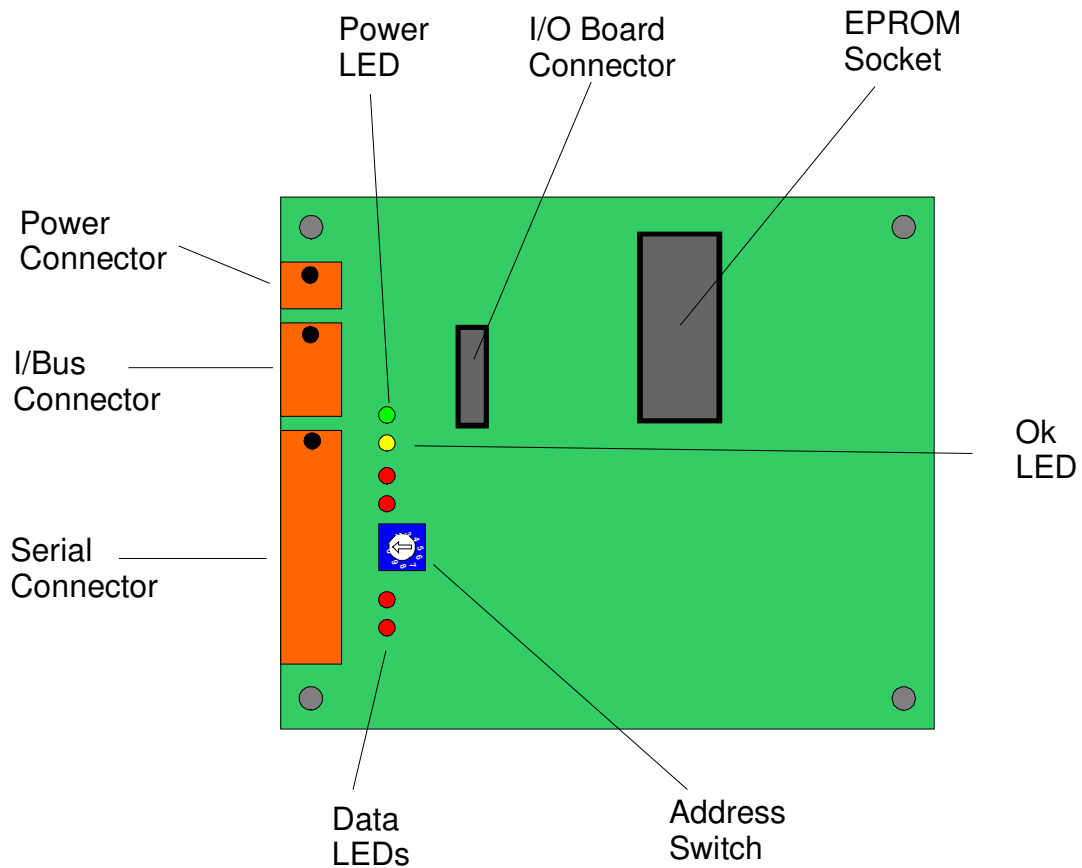
CPU Board

The CPU board layout is shown in the following diagram.

For the three orange connectors pin 1 is always at the left hand end looking into the board. In the diagram above a black dot indicates pin 1.

Power Connector. Supplies power to the CPU and I/O boards and to any boards connected to the I-Bus.

I-Bus Connector. Connects the CPU board with the operator display, component modules and printer interface.



Serial Connector. Provides two independent RS-422/485 serial ports. The Weight Control can use one of these (COM1) to communicate with a supervisory PC. The connection can supply 24V to power connected devices if required.

Pin	Use
1	COM1 - Transmit +
2	COM1 - Transmit -
3	COM1 - Receive +
4	COM1 - Receive -
9	0V
10	+24V

Power LED. Green LED indicates power connected.

Ok LED. Flashes on/off each second to indicate board is Ok and software is running.

Data LEDs. Each of the two serial ports has transmit and received data LEDs.

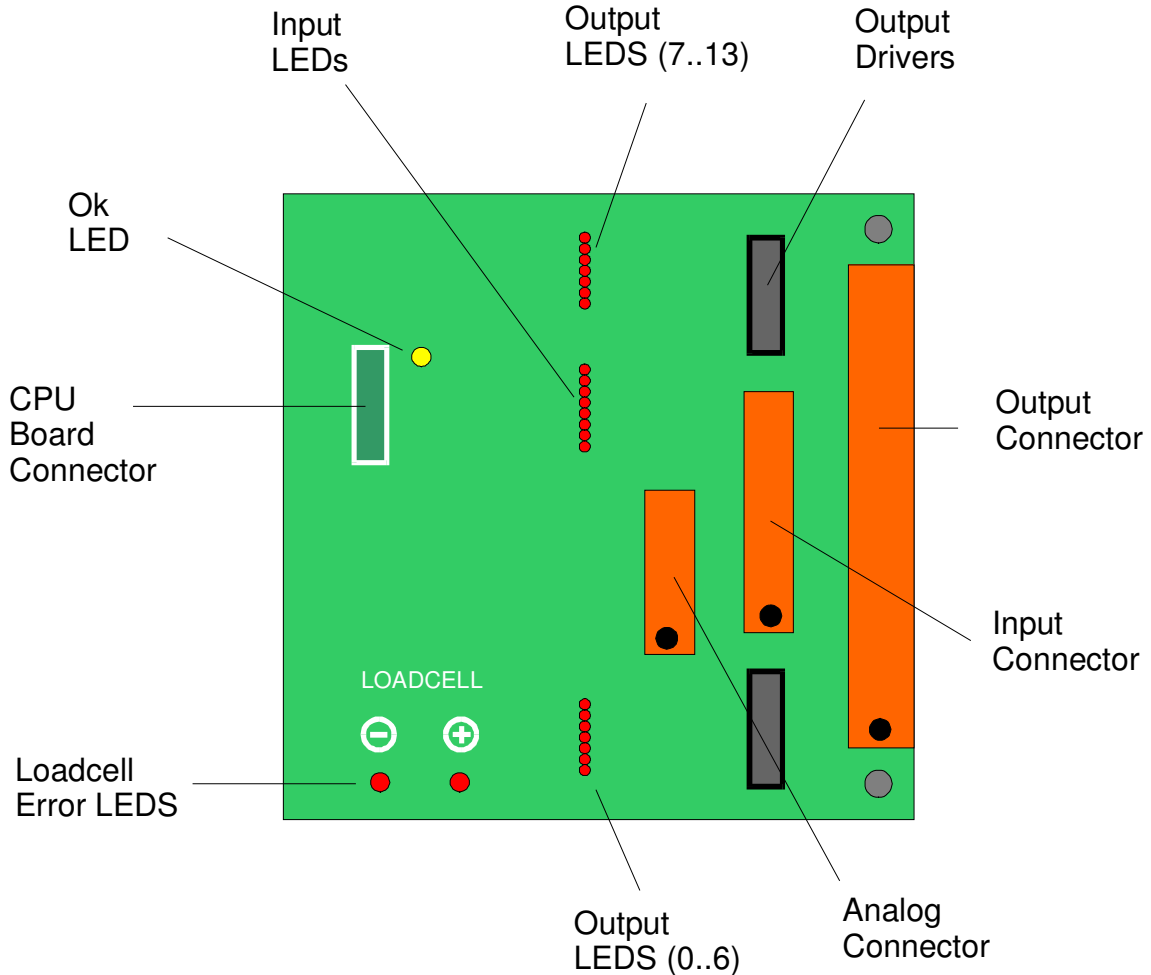
I/O Board Connector. The I/O Board mounts over the top of the CPU board and connects through this 16 pin header.

EPROM Socket. Holds the Weight Control software.

Address Switch. Used to indicate the Weight Control number when communicating to a supervisory PC.

I/O Board

The I/O board layout is shown in the following diagram. The I/O board mounts on top of the CPU board with the two mounting screws passing through both boards.



For the three orange connectors pin 1 is always at the left hand end looking into the board. In the diagram above a black dot indicates pin 1.

Output Connector. Provides 14 isolated digital outputs and connections for the power supply. Pins 1 and 16 are connected to the normal 24V supply. Outputs source current at 24V up to 200mA per output.

Pin	Use
1	0V
2	Slide valve
3	Alarm
4	Hopper low
5..14	Not used
16	+24V

Input Connector. Provides 8 isolated digital inputs using the same power supply as the isolated outputs. Inputs are active when pulled to 0V. Resistance is 10K to the positive supply.

Pin	Use
1,2	Not used

3	Closed switch
4	Low level sensor
5	Roll change
6	Open switch
7,8	Not used

Analog connector. Provides connection to the weigh chamber loadcell (drive and differential input) and provides a 0-10V analog output to the variable speed drive (MB100).

Pin	Use
1	Not used
2	Loadcell input +
3	Loadcell input -
4	Loadcell drive (+5V)
5	Loadcell drive (0V)

Output LEDs (two groups). Show the currently active outputs.

Input LEDs. Show the current input status.

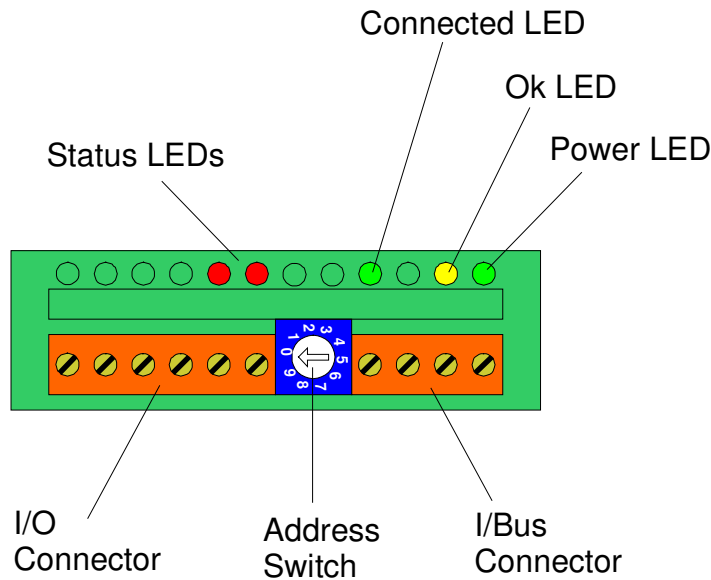
Ok LED. Flashes on/off each second to indicate board is Ok.

Loadcell Error LEDs. Indicate a problem with the loadcell input.

Input / Output Modules

Speed input and control output is done by a number of modules mounted in the existing electrical cabinet of the line control system. The modules can be mounted in standard DIN rail or can mount in the supplied holder.

The modules have the following in common:



Power LED. Green LED indicates power connected.

Ok LED. Yellow LED. Flashes on/off each second to indicate module is Ok and software is running.

Connected LED. Green LED indicates module is communicating with the Weight Control.

Status LEDs. Not used on all modules. For control output modules these indicate that the module is doing an increase or decrease.

I/Bus Connector. Provides power and communications with the Weight Control. The I/Bus connectors of all modules are wired together in parallel.

Pin	Use
1	Clock
2	0V
3	+24V
4	Data

Address Switch. Identifies each module. All input modules have unique addresses. All output modules have unique addresses. Line modules have address zero. Extruder modules have address one.

I/O Connector. Isolated input or output signals. Use depends on module type.

Fault Finding

If the **Alarms** or **Troubleshooting** sections have led you here your Weight Control has probably stopped or won't respond to button presses on the control panel. This section will isolate which of the Circuit Boards or Input/Output Modules are at fault. Refer to the **Circuit Boards and Modules** section for a description of each of the electronics components. Refer to the **Weight Control Drawings** section for wiring diagrams.

Do not jump steps or replace anything unless advised to do so. To replace a board or module prematurely can make a situation worse and leave you with a pile of unknown spares. If in doubt at this point, you should ask your supplier for help first.

The steps to be followed are:

- Verify that the power supply is working and isolate any board or module with a power supply fault.
- Verify that all boards and modules are running
- Isolate any board or module causing I-Bus communication problems

Verify Power Supply

The Power Supply has lethal high voltages on exposed components.

Turn on the main power switch. All of the circuit boards and modules provide a green Power LED. Check that these Power LEDs are ON on all boards and modules. If they are initially on but go OFF after a few minutes then proceed as though there is a power supply problem. If they are ON proceed to **Verify Boards and Modules**.

If there is a power supply problem then determine whether it is due to the power supply having failed or to too high a load on the supply causing it to shutdown. Unplug the output from the Power Supply and measure the output voltage with no load. This should be 24V. If there is no output then check the input voltage to the power supply. This should be between 85V and 240V AC. If the input voltage is correct then the Power Supply should be replaced. If there is no input voltage then check the Weight Control fuses and the incoming main supply.

If the unloaded Power Supply output voltage is 24V then the fault is too high a load from one or more boards and modules. Unplug the Power Connector and the I-Bus Connector from the CPU Board. Reconnect the Power Supply 24V output. Measure the Power Supply output voltage again. If not 24V then contact your supplier.

Reconnect the CPU Board Power Connector. The green Power LED on the CPU Board should go ON. If not then power off, remove the I/O Board and power on again. If the CPU Power LED now lights then replace the I/O board. If the CPU Power LED still does not light then replace the CPU Board and reconnect the I/O Board.

If the CPU and I/O Boards have power then unplug the cable from the Weight Control to the WC-CONNECT module at the socket on the module. Reconnect the CPU Board I-Bus connector.

If the Power LED goes OFF then there must be a problem with the Operator Display board. Remove the display from its box and unplug the I-Bus Connector on the display board. Replace faulty display.

If the Operator Display has power then the problem may be with one of the Input/Output Modules. Reconnect the I/Bus cable to the WC-CONNECT module, unplug the I/Bus connector to all modules and reconnect one by one to determine which modules are at fault. Any module at fault will cause all Power LEDs to go OFF. Replace faulty modules.

Verify Boards and Modules are Running

With all boards and modules reconnected and their green Power LEDs ON, check that their yellow Ok LEDs are flashing on and off each second. Replace any faulty boards and modules.

Isolate Communications Problems

All of the separate boards and modules communicate via a serial data bus using the I2C protocol. This bus is referred to as the I-Bus. Two types of problem may occur.

- A faulty board or module which stops all communication
- One board or module which fails to communicate

It is possible for a board or module with a faulty interface to the I-Bus to stop all communication on the bus. Because of this it is easy to confuse which board or module is actually causing the problem. Failure to communicate with any board or module will raise an alarm although this can only be seen on the Operator Display. It is important therefore to firstly re-establish communication with the Operator Display.

If communication to the Operator Display has been lost the display will show the message:

NOT CONNECTED

All boards and modules connected to the I-Bus, except the main Operator Display must be disconnected. This will mean removing any auxiliary

displays (if fitted) and disconnecting all modules. If the Operator Display still shows the Not Connected message then either the Display Board or the CPU Board is faulty. Replace the Operator Display first. If that does not fix the problem replace the CPU Board. If this still does not fix the problem then check the wiring between the CPU Board and the Operator Display. If no problem can be found call your supplier.

Once the Operator Display has some reasonable message displayed check that button presses are being read. In particular try to enter the Test menu, Module Summary option. Now reconnect each of the previously disconnected boards and modules, one at a time, using the test options to check communication with each board or module as it is connected. Replace any faulty boards or modules as they are found.

Changing The CPU Board

The CPU Board has on board memory which remains on the board when it is changed. This means that the new CPU Board will need to be setup up correctly.

Any changes from the default setup values need to be re entered and the weigh chamber, line and extruder i/o will need recalibrating.

Changing the I/O Board

Changing the I/O Board will require the weigh chamber to be recalibrated.

Service, Care & Maintenance

Service

Weighbatch machines carry a limited parts warranty as stipulated in Weighbatch's Terms and Conditions of Sale.

If your service request is not covered by this warranty you will be charged for parts, time and disbursements accordingly.

This manual is set out with great care to cover most situations but should you require further assistance please call your supplier. Quote the serial number of your Weight Control when requesting service. The serial number is located on the control cabinet at rear of the Weight Control. In the case of a fault with the unit, please describe clearly the symptoms of the problem.

Warranty Procedure:

If you believe the fault is a warranty problem you need to advise Weighbatch as soon as possible and supply the following details of the fault in writing within 2 weeks of the fault occurring:

- Company Name
- Contact Name
- Date Fault Occurred
- Weighbatch Machine Serial Number
- Your Machine Name/Number
- Description of Fault (Please describe accurately nature of fault)
- Description of circumstances when fault occurred (throughput of your machine etc)

Care

The Weight Control should only be used for the purpose for which it is intended.

It should only be used by your employees that have read and understood the instructions in this manual.

It should not be operated in extreme temperatures or dusty and humid environments.

It is important to handle the weigh chamber with care as it contains sensitive weighing equipment (ie the load cell) which can be easily damaged.

Maintenance and Calibration

Your Weight Control requires routine maintenance to ensure you continue to get maximum efficiency from the unit.

On Installation

- Calibrate weigh chamber
- Check air pressure is at 4 Bar

3 Months After First Installed

- Calibrate the weigh chamber
- Check for loose bolts

Every 12 Months

- Check calibration of weigh chamber

Every 5 Years

- Check condition of slide valve cylinder
- Check for loose bolts and fatigue

Record Sheets

It is important to record the initial setup and any changes done on the **Setup Record Sheet**. Record when calibrations are done on the **Calibration Records Sheet** and any faults that may occur on **Fault Records Sheet**.

This is necessary to build a history on your Weight Control so that in years to come you are able to see that calibrations have or have not been done regularly, set-up changes have been done by some one that is capable of doing so and if a problem was to re-occur a more informed decision can be made to implement a permanent solution.

Weighbatch strongly recommend you follow the maintenance and calibration as laid out previously.

Set-up Record

Setup Parameter Changed and Reason	Previous Value	New Value	Date

Calibration Record

Calibration Parameter	Previous Value	New Value	Date

Fault Record

Fault Description	Corrective Action	Date