Weighbatch

MiniBlend
Gravimetric Blender

Operating Manual

November 2009
Software Version 1.79e

Table of Contents

At the very least read this

- MiniBlend installation is very simple, just connect power and air. For more complete instructions refer to the **Installation** section.

- If the **Stop** button is pressed once the green Run Light will blink and the blender will stop at the end of the current mixing cycle. If the Stop button is pressed twice the blender will abort the current cycle and stop.

- To enter Test and Setup Modes press the ← and **Select Option** buttons together. To exit Test and Setup Modes press the **Stop** button as many times as required.

- To change the mix ratio press the **Comp** button. 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. Use the ← button to move the blinking digit to the next left position. Press the **Comp** button again to complete the entry.

- Press the **Run** button to start the blender. The numbers displayed in red are the ratios that will be mixed.

Introduction

Thank you for the purchase of your new Weighbatch MiniBlend. We have taken every care in designing and assembling your MiniBlend unit to ensure it operates efficiently, is easy to use, and has many useful features.

For safety reasons, and to obtain maximum benefit from your MiniBlend unit 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.

This manual contains operating instructions for all Weighbatch MiniBlend models. Where the information is only applicable to some models this is noted, eg. (MB300). Where the information is applicable to smaller blenders this will be noted as (MB300-) or to large blenders as (MB600+) for example.

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

Principle of Operation

The Weighbatch MiniBlend is a multi-component (up to 8) gravimetric batch blender designed for throughput up to 2400 kilograms per hour. Where high accuracy and consistency is required either to make your process work or to simply use the least possible of expensive materials, a Weighbatch MiniBlend is the ideal choice of equipment.

It will measure by weight up to eight different materials and mix these materials ready for your use. Measuring by weight gives assurance that all materials requested are actually loaded, and in their correct ratio.

The operator enters the mix ratio required on the Operator Display. The MiniBlend will calculate the weight of each component required to make a batch. The batch size varies from 300g (MB20) to 45kg (MB2400).

Each of the components are measured into a central weigh chamber with a two speed feeding mechanism using a slide valve and metering wheel. Each batch of materials loaded in the central weigh chamber is then mixed in the weigh chamber (MB600-) or emptied into a separate mixing bowl (MB1200+). When the mixing cycle is complete the mixed batch of material is emptied into the storage area at the bottom of the unit from where it can be continuously fed into your application.

The two speed feed mechanism allows both high throughput and high accuracy. This means that the MiniBlend will cope with a wide range of ratios without the operator having to change screws and barrels etc.

Although the main function of the MiniBlend is to mix different materials at a preset ratio it also has a variety of other features that will be important to different users. For example, there are displays to show material used or material required to finish a preset total, there are material usage reports, and there are various regrind options. These are all detailed within this manual.

Safety

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

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

Ensure all material is free from foreign objects.

Do not modify your MiniBlend 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 MiniBlend's moving parts. In particular keep hands away from the slide valves.

Do not tamper with the MiniBlend door switch. When opening the MiniBlend door the MiniBlend should acknowledge the door is open. If the mixer is running it should stop.

Glossary of Terms

Mix Ratio - Represents the ratio of the components that make up the batch to be mixed. This is displayed as a ratio (or percentage) on the Numeric Display.

Ratio Entry Method - The operator enters the ratio of each component that represents the mix ratio required. With this method the total can be greater than 100 eg; 60, 40, 6, 4 = 110 or you can represent units eg; 25kgs, 15kgs, 2kgs, 1kgs = 43kgs.

Percentage Entry Method - The operator enters the percentage of total mix required for components 2, 3, 4 etc. With each entry, component 1 will automatically adjust to make the total of the components equal to 100% eg; 60, 30, 6, 4 = 100%.

Machine Cycle - Represents the completion of one cycle of the MiniBlend's sequence of operation. Each component is added by weight, one at a time, into the common weigh chamber. The material is then emptied into the mixing bowl where it is mixed before being emptied into the storage area. This completes one machine cycle**.**

Flushing Cycle- Represents the process the MiniBlend uses to empty out the weigh chamber and mixing bowl to ready itself for the next machine cycle**.** It will complete a flushing cycle when it thinks the integrity of the mix ratio is in question, or to ensure the system is empty.

Normal Mode - Is the mode in which the MiniBlend will normally run. It will run at a set mix ratio until **Stop** is pressed.

Stop At Preset Mode - Is used for off-line blending where the MiniBlend is requested to mix a preset weight of material and stop.

Regrind Mode - Alters the mix ratio so that one or more components are regarded as regrind. These components will already contain additives in the correct ratio. The remaining components are regarded as virgin or natural. The MiniBlend will mix these virgin components in the specified ratio and will top up the batch with the specified percentage of regrind.

Natural and Additive – Normally a mix ratio is specified as a combination of regrind and virgin material and in percentage mode the ratio of virgin components add up to 100%. However some people distinguish between large virgin components, called the **Naturals**, and the smaller components, called the **Additives**. In this case the Naturals add up to 100% and the additives as specified as a percentage of the Naturals. The MiniBlend supports this method as an alternative to the standard virgin/regrind method.

MiniBlend Layout

The MiniBlend range is made up of two main types. The smaller MB20, MB60, MB150, MB300 and MB600 blenders use a combined weigh chamber and mixing bowl. The larger MB1200 and MB2400 blenders have separate weigh chambers and mixing bowls.

MB-60 / 150 / 300 / 600

Main Component Hoppers

Additive Component

Slide valve and metering wheel feed mechanism

Control Panel

Control Cabinet

Loadcell, Gearbox and pneumatic Tipping Actuator (under cover)

Combined Mixing Bowl and Weigh Chamber

Mixer Drive

Safety Switch

Storage Area

Full Sensor
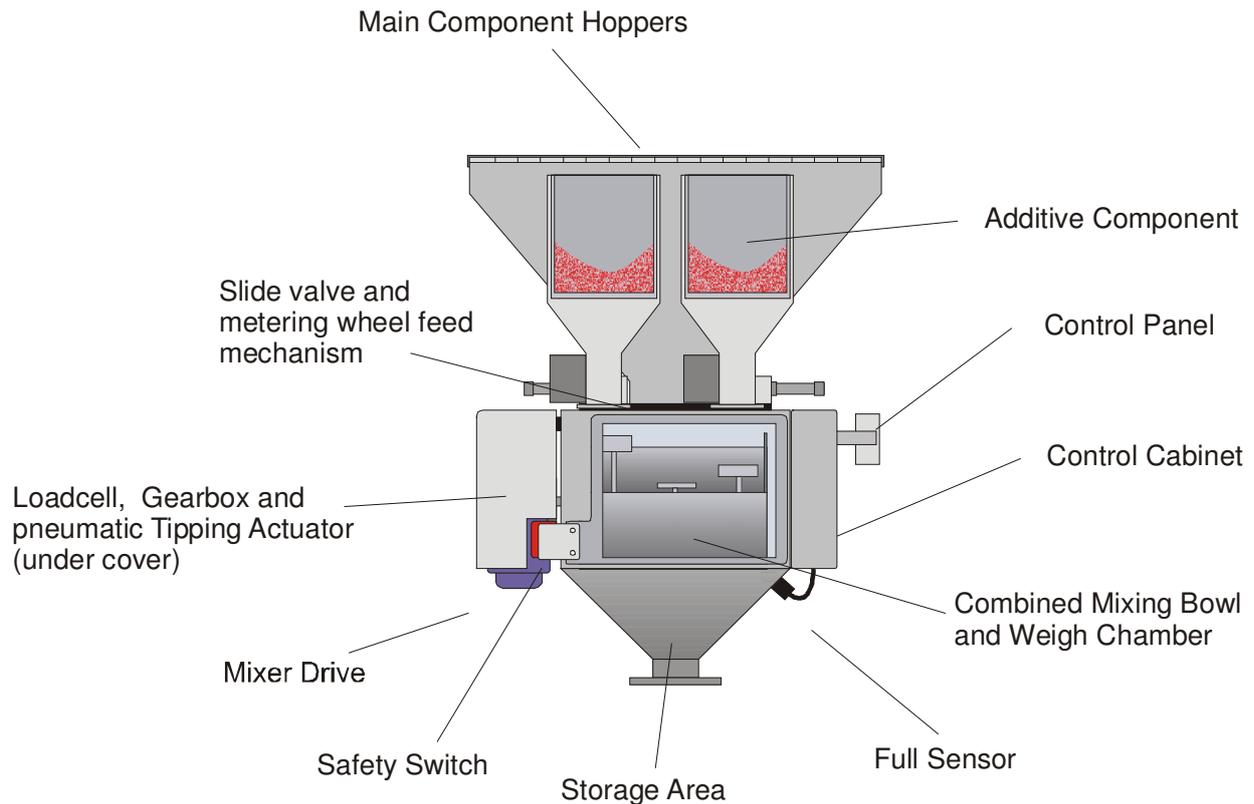
Weigh Chamber and Mixing Bowl

A unique feature of the MB600- type blender is the use of a combined weigh chamber and mixing bowl.   This makes the unit more compact than the MB1200+ type but does limit the throughput because the weighing and mixing operations cannot be overlapped. The weigh chamber sub-assembly is attached to the side of the body of the blender.

For the MB-150 and MB-300 it can be completely removed by the operator. It is a relatively heavy item mounted on a sensitive loadcell and so care must be used when removing it.   There are electrical and air connections on the rear of the assembly. These must be disconnected and the door opened before removal.

For the MB-60 and MB-600 the mixer can only be removed for maintenance. The MB-60 being too small and the MB-600 weigh chamber too heavy to allow operator removal.

The weigh chamber assembly can be compared to a simple set of scales. Operator display number <7> displays the weight of material in the chamber. The weigh chamber requires regular calibration and cleaning. Refer to the **Calibration** section.

The mixer drive is a simple fixed speed motor and gearbox driving a tumble mixer. The mixing time is adjustable within the set-up parameters. The mixing bowl is emptied using a motor/gearbox (MB60) or pneumatic rotary actuator (MB150/300/600) that tips the mixing bowl upside down through a set of gears.

Control Cabinet

The control cabinet contains the electronic equipment used to control the MiniBlend. The layout inside the control cabinet is described more fully later.

Safety Switch

There is a safety switch operated by opening/closing the front door. Opening the door will turn off power to the mixer.

Storage Area

The lower section of the MiniBlend stores mixed material for your machine to use.

Full Sensor

The full sensor detects when the storage area is full . When it is full the MiniBlend will stop mixing until some material is used.

Main Component Hoppers

These are used to store the primary material that is to be mixed by the MiniBlend. A Weighbatch Loader can easily be fitted to these hoppers to load material from your storage bins.

Additive Component

Depending on the configuration of the MiniBlend a number of components may be fed from removable additive hoppers. For the MB-60 these additives use metering wheel feeding only. They connect to the blender using a spring loaded pin connection. The additive hoppers fit underneath an extension of the main hopper on which can be mounted small vacuum loaders.

For the MB-150, MB-300 and MB-600 the additives use both slide valve and metering wheel. They connect to the MiniBlend through plug in electrical and air connections. Other than being removable they operate in exactly the same fashion as the fixed components. A bracket can be fitted to the main hopper on which can be mounted small vacuum loaders.

Control Panel

The control panel is used to set-up and calibrate the MiniBlend, enter the mix ratio for a job, and monitor the progress of a job. It is described more fully in the **MiniBlend Layout/Control Panel** section.

MB-20
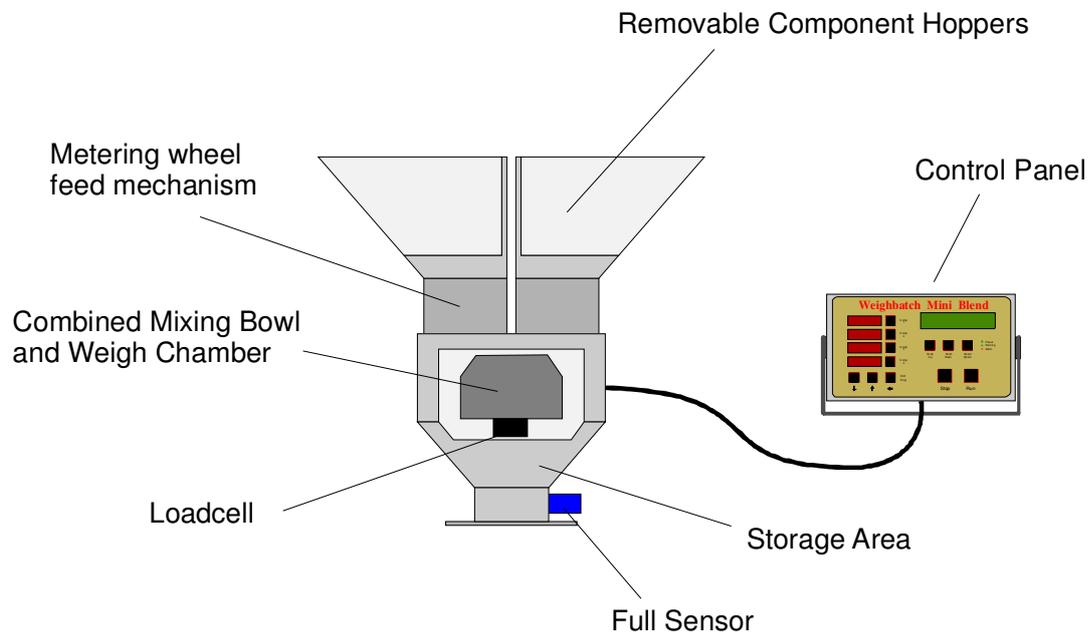
Weigh Chamber and Mixing Bowl

The MB-20 blender is the smallest of the MiniBlend series with a batch size of 300g. It uses a unique combined weigh chamber and mixing bowl directly supported on a loadcell. Mixing is accomplished using static mixing blades inside the weigh chamber and rocking the chamber from side to side. The chamber is inverted to empty material.

The weigh chamber can be removed from the loadcell for cleaning by pulling out the fastening clip and sliding the chamber forward.

The weigh chamber assembly can be compared to a simple set of scales. Operator display number <7> displays the weight of material in the chamber. The weigh chamber requires regular calibration and cleaning. Refer to the **Calibration** section.

The mixer drive is a variable speed stepper motor mounted in the rear of the blender.

Control Panel

The control panel is used to set-up and calibrate the MiniBlend, enter the mix ratio for a job, and monitor the progress of a job. It is described more fully in the **MiniBlend Layout**/**Control Panel** section. For the MB-20 it also contains the electronic equipment used to control the MiniBlend. The layout inside the control panel is described more fully later.

Storage Area

The lower section of the MiniBlend stores mixed material for your machine to use.

Full Sensor

The full sensor detects when the storage area is full . When it is full the MiniBlend will stop mixing until some material is used.

Component Hoppers

These are used to store the material that is to be mixed by the MiniBlend. There are four component hoppers and all are removable. The hoppers each have a variable speed metering wheel to feed material. For more difficult material special hoppers can be used with either DC motor driven augers or pneumatic slide valves

A bracket can be fitted over each hopper on which can be mounted a small vacuum loader.

MB-1200 / 2400

Main Component Hoppers

Low Level Sensors
(optional)

Control Panel

Slide valves and
metering wheels

Weigh Chamber

Control Cabinet
(at rear)

Mixer Drive

Full Sensor

Mixing Bowl

Storage Area
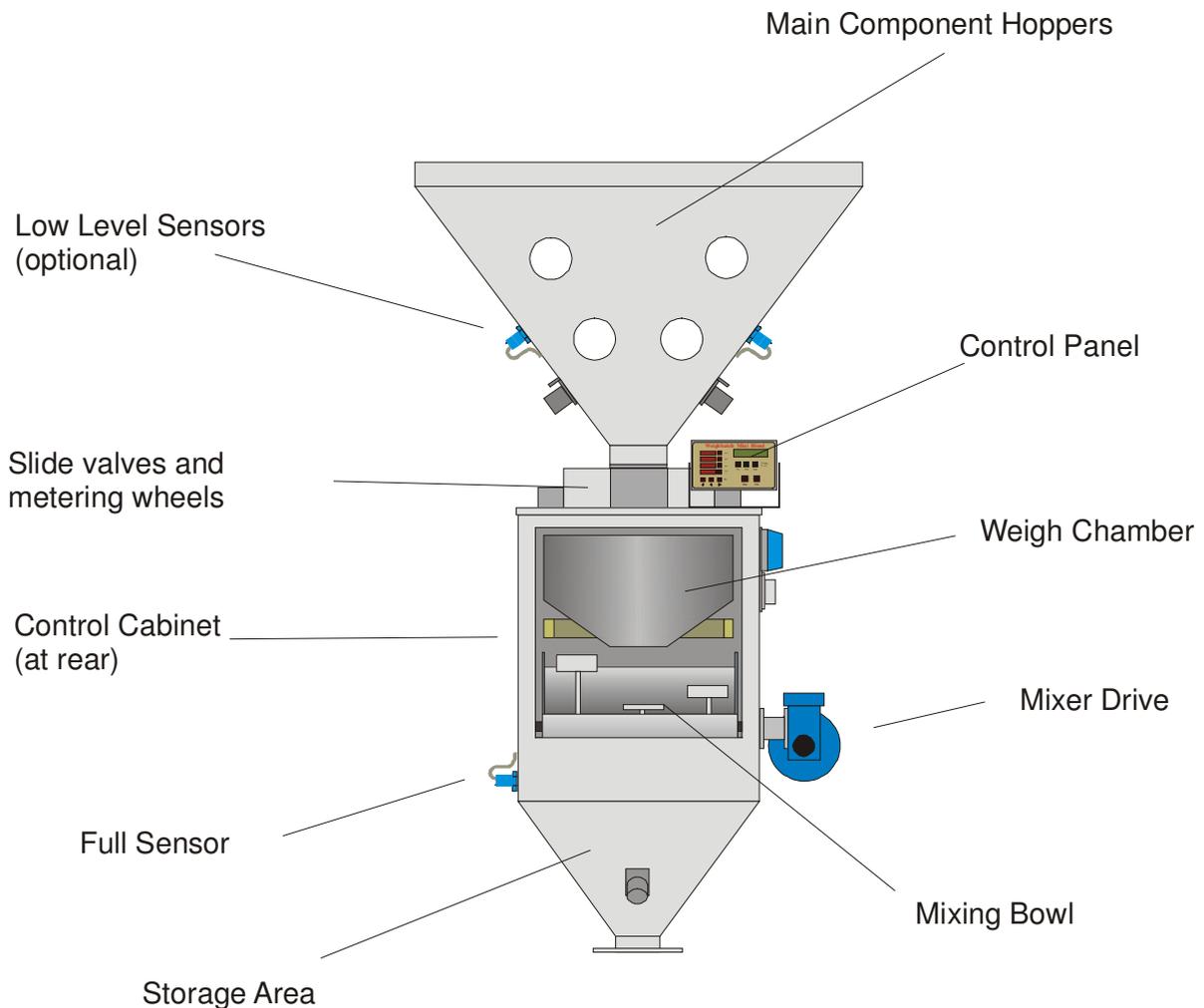
Weigh Chamber

The weigh chamber is a sub-assembly located in the body of the MiniBlend. Material from the slide valves and metering wheels is caught by the weigh chamber and is emptied through a funnel valve in the bottom of the chamber. When cleaning, the funnel valve can be manually lifted to allow any remaining material to fall through.

The weigh chamber is mounted on draw rollers. This allows the complete assembly to be rolled forward for cleaning and/or inspection. The weigh chamber assembly is connected to the body of the MiniBlend via a 5 pin plug and an air line. Unplugging the 5 pin plug and pulling out the air line disconnects the weigh chamber assembly and allows it to be completely removed.

Blenders using regrind or other difficult materials may be fitted with a Regrind Weigh Chamber. This weigh chamber uses a clamshell design which fully opens the bottom of the chamber to discharge the material. The only operational difference with the normal weigh chamber is that it has two air line connections.

The weigh chamber assembly can be compared to a simple set of scales. Operator display number <7> displays the weight of material in the chamber. The weigh chamber requires regular calibration and cleaning. Refer to the **Calibration** section.

Control Cabinet

The control cabinet contains the pneumatic and electronic equipment used to control the MiniBlend. The layout inside the control cabinet is described more fully later.

Slide Valves and Metering Wheels

The MiniBlend is available with up to 8 components. Each component has a slide valve. Minor components have variable speed metering wheels as well.

Low Level Sensors

Each of the components may optionally be fitted with low level sensors to generate a Low Level alarm before running out of material.

Mixer Drive / Mixing Bowl

The mixer drive is a simple fixed speed motor and gearbox driving a tumble mixing bowl. The mixing time is adjustable within the set-up parameters. The mixing bowl is emptied using a pneumatic cylinder that tips the mixing bowl upside down.

Storage Area

The lower section of the MiniBlend stores mixed material for your machine to use.

Full Sensor

The full sensor detects when the storage area is full . When it is full the MiniBlend will stop mixing until some material is used.

Component Storage Hopper

A multi-compartment hopper is used to store the material that is to be mixed by the MiniBlend. Weighbatch Loaders can easily be fitted to this hopper to load material from your storage bins.

Additive Component

Depending on the configuration of the MiniBlend a number of components may be fed from removable additive hoppers. The additives use both slide valve and metering wheel. They connect to the MiniBlend through plug in electrical and air connections. Other than being removable they operate in exactly the same fashion as the fixed components. A bracket can be fitted to the main hopper on which can be mounted small vacuum loaders.

Control Panel

The control panel is used to set-up and calibrate the MiniBlend, enter the mix ratio for a job, and monitor the progress of a job. It is described more fully in the **MiniBlend Layout** / **Control Panel** section.

Control Panel
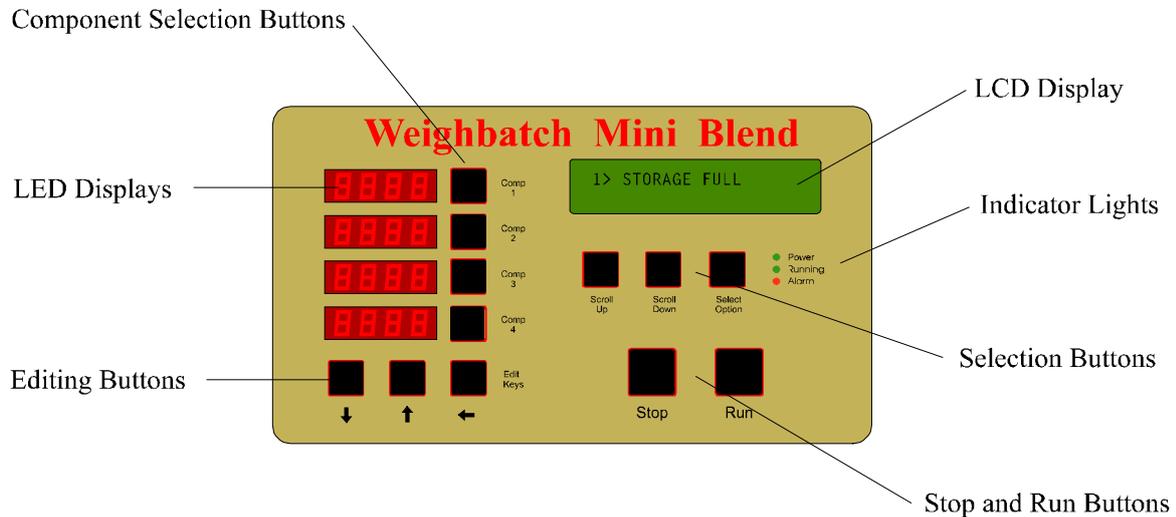
The MiniBlend is run from a simple control panel that is normally mounted on the blender. The control panel is used to set-up and calibrate the MiniBlend, enter the mix ratio for a job, and monitor the progress of a job.

Component Selection Buttons

Are used to select a component to edit the mix ratio.

LED Displays

Displays each component's requested mix ratio.

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.

Indicator Lights

Indicate current status of the MiniBlend. Power On, Running and Alarm. The top green light will be on when the MiniBlend's power is on. The main power switch is located at the rear of MiniBlend, on the control cabinet.

The middle green light will be on when the MiniBlend is running. This light will flash if the stop button is pressed. The MiniBlend will then stop at the end of the current machine cycle.

The bottom red light will be on when the MiniBlend 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.

Stop and Start Buttons

Are used to stop and start the MiniBlend .

Control Cabinet

MB-60 / 150 / 300

For the MB-60, MB-150, MB-300 and MB-600 type blenders the control cabinet is mounted on the right hand side of the MiniBlend. The control cabinet contains the 24V power supply, CPU and I/O board.

MB-1200 / 2400
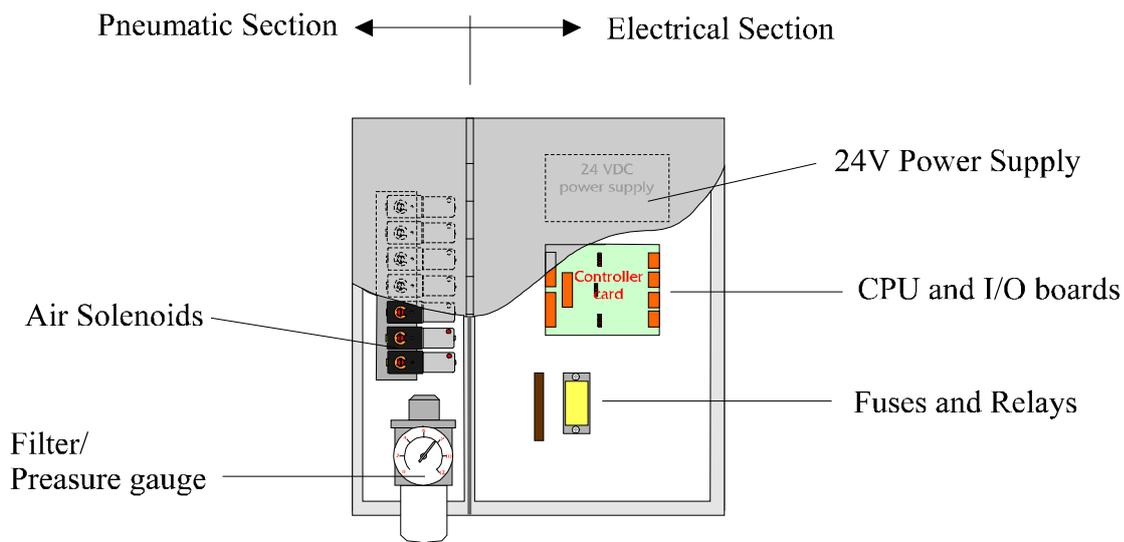
For the MB1200+ type blender the control cabinet is mounted on the rear of the MiniBlend. The cover of the cabinet has been designed so that the pneumatic section can be opened without having to open the electrical section. Additional control modules for each component are mounted under the slide valve covers on the top plate.

Air Solenoids

The MiniBlend pneumatics are controlled by 24V DC solenoid valves. There are valves for the weigh chamber funnel valve (MB1200+) and for mixer dump and retract. There is one valve per component to activate the slide valve but these are mounted in the top plate or on the additive.

Filter / Pressure Gauge

This filter is connected to the external air supply.

24V Power Supply

Low voltage power to the MiniBlend to provided by a 24V DC switch mode power supply. The supply has a 60W rating.

CPU and I/O Boards

The MiniBlend 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 input and outputs for the MiniBlend. 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

Installation

Installing the MiniBlend is very simple but following these steps will ensure you don't overlook anything.

Uncrating

The MB300 and smaller blenders are shipped fully assembled in a single crate standing vertically upright. Remove the crate lid and then the four sides. The blender is bolted to the base. The MB600 is also shipped with the body vertical but the hopper is shipped separately.

The MB150, MB300 and MB600 blenders have a RED shipping bracket supporting the mixer motor. Before unbolting the blender from the base, remove the shipping bracket. This bracket supports the weigh chamber during transit and protects the loadcell. Leaving it on could damage the loadcell if you attempted to remove the mixer assembly. The blender can then be unbolted from the crate base and moved onto its mounting flange (see below).

The MB1200 and larger blenders are shipped with the hopper separate from the body. Typically the body is installed first and then the hopper attached to the body. The body is shipped lying on its side and bolted to the ends of the crate. Remove the crate lid and the sides. Then unbolt the blender from the base end and unscrew the timber support holding the top plate end. The blender will be supported by the foam packing underneath. Remove the crate ends and then the plywood support from the top plate. Open the blender door and slide out the weigh chamber. Remove the foam support from behind the weigh chamber. The blender is now ready to be moved onto its mounting flange (see below).

For all blenders, one or two 2kg calibration weights will be screwed to the crate base. Remove and retain these.

Mounting flanges

Details of the blender mounting flanges are shown below. The 150mm flange is used for the MB300 and smaller. The 200mm flange for the MB600 and larger.
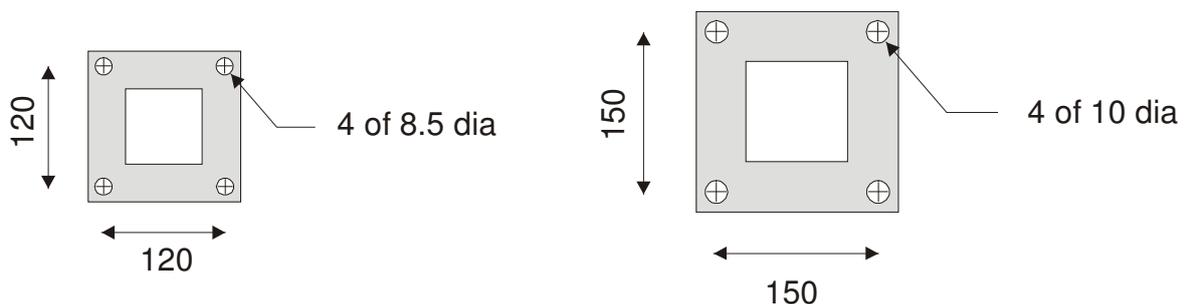
150mm Flange:
150mm square external,
70mm square opening,
4 of 8.5 dia holes at 120

200mm Flange:
200mm square external,
100mm square opening,
4 x 10 dia holes at 150

Access

In mounting the blender bear in mind that primary operator access is to the front of the blender. The MB600 and smaller blenders require limited access to the rear and service access to the electrical cabinet on the right and to the mixer assembly on the left. The MB1200 and larger blenders require service access to the electrical cabinet on the rear and limited access on each side.

Operator Panel

For the MB600 and smaller blenders, the operator panel is shipped attached to the blender. For the MB1200 and above the panel bracket is attached to the blender top cover but the operator panel will need to be screwed to the bracket.

In both cases the operator panel can be relocated to any convenient position within 10m of the blender. You will need to replace the supplied cable. Any 4 core shielded cable should be acceptable.

Power and Air

The blender requires a single phase power supply. It is supplied with the lead and standard NZ 3 pin plug used for testing. You may want to replace the plug with a more permanent connection. Power requirement for the MB-300 and smaller blenders is 120W. Power for the larger blenders is about 400W.

The MB-2400 blender, and some regrind stirrers require a separate three phase power supply to the mixer/stirrer motor.

The MB-150 and larger blenders require a compressed air supply. The inlet to the blender regulator is a "push-in" type fitting for a 6mm plastic air line. The regulator is factory set at 5 Bar. Air consumption is minimal.

Calibration

After installing the blender a Weigh Chamber calibration should be done (refer **Calibration** section).

Operation

Your MiniBlend will be initially set-up and calibrated to run in Normal Mode and to use the Ratio Entry method to alter the mix ratio, as this is suited to most applications. To change your MiniBlend set-up refer to the **Setup** section. It is important to document any changes done to this standard setup.

Starting the MiniBlend

Step 1

Ensure that your MiniBlend has power and air connected to it.

Step 2

Turn the power on with the switch mounted on the control cabinet at the rear of the MiniBlend.

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

```
WEIGHBATCH NZ LTD
MINIBLEND MB300
```

This display will only last a few seconds. You will then be prompted that the MiniBlend is ready after a flushing cycle has been completed:

```
1> READY EST 198 KG
100% MIX
```

The MiniBlend will also display what its estimated achievable throughput is.

This throughput is based on the current mix ratios and current setup and the material loading times for the last cycle. The more minor components in use the lower the throughput will be.

Step 3

Enter the mix ratio required and load the component storage hoppers with material.

The mix ratio is displayed on the red LED Displays. A blank display represents a zero for that component. The top red LED Display shows the ratio for component one, the second shows the ratio for component two etc.

Step 4

Press the **Run** button to start the MiniBlend.

The MiniBlend will now mix and blend your material based on the current ratio displayed on the LED Displays. It will remain running until:
• The **Stop** button is pressed or the blender is switched off.
• A material supply problem is detected.
• The Storage Area is full to the Full Sensor.

```
1>  R U N N I N G
100%  M I X
```

The LCD Display will indicate the current status of the machine as it cycles through. To find out more about these messages refer to the **Operation** / **LCD Displays** section.

Changing The Mix Ratio

The mix ratio is changed by first selecting the component you wish to change. The **Comp** button next to each of the red LED Displays will select that component.

When a component 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 **Comp** button again. Pressing any other **Comp** key 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.

In Percentage Entry mode Component 1 can not be adjusted directly. It will automatically adjust so that the total equates to 100% each time the other components are changed.

The new mix ratio will take effect at the start of the next mixing cycle.

Example

If the current mix ratio is 60.0, 30.0, 6.0 and 4.0, then to change component 2 from 30.0 to 40.0 do the following.

1. Select component 2, using the **Comp 2** button. The display will read '030.0' and the furthest right '0' will blink.
2. Move the blinking digit to the '3' by pushing ← button twice. The display will read '030.0' and the '3' will blink.
3. Change the '3' to a '4' by pushing the ↑ button. The display will read '040.0' and the '4' will blink.
4. Complete the entry by pushing the **Comp 2** button, the display will read 40.0. The left hand zero will have gone and no number will blink.

Stopping the MiniBlend

There are a number of ways to stop the MiniBlend:

Normal Stop (used in most cases)

Press the **Stop** button **once only**. This will cause the MiniBlend to stop at the completion of a machine cycle, therefore ensuring the last mix has no missed components. The sequence will be as follows:

• The Running light will start to blink.
• The MiniBlend will finish the current cycle and then stop. If the storage area is full then it may be sometime before the mix can be emptied and cycle completed.
• The Running light will go off and the Stopped alarm will be displayed.

```
5> STOPPED

SELECT TO ACK
```

- Press **Select Option** to clear the alarm.
- The MiniBlend will prompt you that it is ready to run again and display the maximum throughput for the current mix ratio.

```
1> READY MAX 181 KG

100% MIX
```

You can restart the MiniBlend again by pushing the **Run** button.

Quick Stop

By pushing the **Stop** button **twice** you effectively put the MiniBlend into a flushing cycle where it will interrupt the current cycle and empty out the weigh chamber and mixing bowl without necessarily blending the last batch properly. This should only be used when you can not wait for the cycle to finish or if an incomplete mix is acceptable.

You will need to acknowledge the Stopped alarm to restart your MiniBlend.

Door Stop

By opening the door of the MiniBlend you immediately interrupt the MiniBlend at whatever stage of the cycle it is in. The message

```
BLENDER STOPPED

DOOR OPEN
```

is briefly displayed before the MiniBlend displays the Door Open alarm:

```
DOOR OPEN:

SELECT TO ACK
```

Pressing **Select Option** will acknowledge the alarm and display the Door Open menu (refer following section).

This is useful if you want to inspect the material in the weigh chamber or the mixing bowl.
If you close the door the alarm:

```
5> DOOR CLOSED

SELECT TO ACK
```

is displayed. Pressing **Select Option** will acknowledge the alarm.

The MiniBlend will restart from where it left off, unless the weight in the weigh chamber has altered significantly. If the weight in the Weigh Chamber has been altered more than the predefined tolerance (default 100g) the MiniBlend will go into a flushing cycle when the door is closed and the MiniBlend is restarted.

Cleanout Menu

If you press the **Stop** button when the blender is already stopped the Cleanout Open menu is displayed. The options on this menu are used for emptying material in the hoppers and in the weigh

chamber and for mixing and dumping material in the mixer. Use the **Scroll UP** and **Scroll DOWN** buttons to change option. Press the **Stop** button again to go back to the normal display.

| COMP #1   SEL/OPEN |

The first options allow you to use the **Select** button to open and close the component slide or run the component motor.

| CHAMBER   SEL/OPEN |

(MB400+) This option allows you to open or close the Weigh Chamber funnel valve to drain material from the Weigh Chamber.

| MIXER   SEL/ON |

This option allows you to turn the mixer off or on.

| MIXER   SEL/DUMP |

This option allows you to dump the material in the mixer.

Door Open Menu

The Door Open menu is displayed when the door at the front of the MiniBlend is opened. Opening the door turns off the mixer and stops loading material. The options on this menu are used for purging material and checking the Weigh Chamber. Use the **Scroll UP** and **Scroll DOWN** buttons to change option.

| WEIGHT   116G   28.3% |

The first option displays the current Weigh Chamber weight and the raw loadcell input as percentage of full scale.

| DUMP CHAMBER |

(MB400+) This option allows you to open the Weigh Chamber funnel valve to drain material from the Weigh Chamber. The valve will stay opened while the **Select Option** button is pressed.

| DUMP #1 |

The Dump options allow you to operate each component's slide valve or metering wheel to drain material from the storage hopper. Material will be fed while the **Select Option** button is pressed.

Pneumatically powered slide valves can inflict serious injury. Keep fingers clear when using this option.

No Material Alarm

During loading of a component the MiniBlend continually checks for increasing chamber weight to ensure that material is being loaded. If it detects that loading has stopped or is too slow the No Material alarm is displayed.

```
5 > N O   M A T E R I A L   # 1
< R U N / S T O P >   T O   C O N T .
```

Pressing **Select Option** will acknowledge the alarm.

Often there will be a simple reason for the problem, such as running out of material. The normal action is to add more material to the hopper and press the **Run** button to restart loading of that component. The alternative is to press **Stop** which will cause the remainder of that component to be skipped. The MiniBlend will continue with the next component. If you do not want to continue with this batch then press the **Stop** button again to abort the cycle.

In all circumstances pressing Stop twice will immediately stop the MiniBlend.

LCD Displays

During normal operation the LCD Display, on the right hand side of the operator panel, shows the current status of the MiniBlend 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 component mix ratio.

1> STATUS

Display <1> shows the current status of the MiniBlend. The display can take one of the following formats.

```
1 > Z E R O   M I X   W E I G H T
```

Indicates that the maximum mix weight is set to zero in the setup data. The MiniBlend cannot be started.

```
1 > Z E R O   C O M P O N E N T S
```

Indicates that all component entries are zero. The MiniBlend cannot be started.

```
1 > L O C K E D   O U T
```

Indicates that the MiniBlend cannot be started because a connected supervisory PC has locked it out.

```
1 > F L U S H I N G   C H A M B E R
```

Indicates that the MiniBlend is about to start a new batch but the weigh chamber weight is too far from zero. The MiniBlend is dumping this material.

1> READY MAX 123 KG

Indicates that the MiniBlend is ready to be started and shows the maximum mixes per hour possible with the current settings.

1> RUNNING

Indicates that the MiniBlend has started a cycle and is preparing to load the first component or perform some other operation.

1> CMP #1 45%   451
TARGET 1000G   FAST

Indicates that a component is in the fast loading part of the cycle. Shows the target weight for the component, the percentage and grams loaded so far.

1> WAIT LOADER #1

Indicates that there has been a material feed problem but that such problems are expected due to an attached vacuum loader. The MiniBlend is waiting for the loader to finish loading.

1> CMP #1 96%   962
TARGET 1000G   SETL

Indicates that the fast loading has stopped and the MiniBlend is waiting for the weight to settle before reading it.

1> CMP #1 99%   989
TARGET 1000G   SLOW

Indicates that the component is in the slow loading part of the cycle.

1> CMP #1 END 1001
TARGET 1000G   SETL

Indicates that the slow loading has stopped, all of the component has been loaded and the MiniBlend is waiting for the weight to settle.

1> WAITING FOR MIXER

Indicates that the MiniBlend is ready to empty material from the weigh chamber into the mixer but is waiting for the mixer to finish mixing the previous mix.

1> EMPTYING INTO MIX

(MB400+) Indicates that the MiniBlend is emptying the weigh chamber into the mixer.

1> MIXING

(MBx80/300) Indicates that the batch is being mixed.

1> STORAGE FULL

Indicates that the MiniBlend has completed the next batch and is waiting for the material in the base to drop before continuing.

The second line of the display, if not being used as shown above, is used to indicate mix size, batch progress or PIN number information.

```
┌─────────────────────────────┐
│  1 >  ...                    │
│                             │
│  1 0 0 %  M I X              │
└─────────────────────────────┘
```

Shows what fraction of the normal mix size the MiniBlend has been set to run at. See display <7> for more details.

```
┌─────────────────────────────┐
│  1 >  ...                    │
│                             │
│  x x x  K G  T O  G O        │
└─────────────────────────────┘
```

If the MiniBlend has been set up to run a specified batch weight then this shows how much more of the batch is yet to be blended.

```
┌─────────────────────────────┐
│  1 >  ...                    │
│                             │
│  x x x  K G  B A T C H       │
└─────────────────────────────┘
```

If the MiniBlend has been set up to automatically run specified batch weights then this shows how large the batches are.

```
┌─────────────────────────────┐
│  1 >  ...                    │
│                             │
│  ...              * * P I N * * │
└─────────────────────────────┘
```

Shows a required operator PIN number has been entered correctly.

```
┌─────────────────────────────┐
│  1 >  ...                    │
│                             │
│  ...                N O  P I N │
└─────────────────────────────┘
```

Shows a required operator PIN number has not been entered.

2> COMPONENT WEIGHTS

```
┌─────────────────────────────┐
│  2 >  C O M P O N E N T  W E I G H T S │
│                             │
│  1 2 0 0   6 0 0   8 0   4 0 │
└─────────────────────────────┘
```

Display <2> shows the MiniBlend's target weight for each component.

The MiniBlend takes the mix ratio entered by the operator and converts it into grams for each component based on the total mix weight. The results of this conversion is the target weight for each of the components.

Note: After the first component has been dosed the actual weight is measured and the target weights for the remaining components are adjusted to suit.

3> KGS USED

```
┌─────────────────────────────┐
│  3 >  K G S  U S E D :   2 3 4 │
│                             │
│    2 1 5   1 9   0   0       │
└─────────────────────────────┘
```

Display <3> shows the total Kgs of material used, and the total for each component, since the totals were last reset. Press **Select Option** to reset the total. The message:

```
┌─────────────────────────────┐
│  C L E A R  K G S  U S E D  ? │
│                             │
│  P R E S S  S E L E C T  T O  O K │
└─────────────────────────────┘
```

will be displayed. Press **Select Option** to confirm that you wish to reset the totals. If a printer is attached it may be setup to print the current Kgs Used (Job Summary).

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Often the total Kgs for all components will be to much to display on one line. In this case pressing **Select Option** will cause the display to shows one component at a time and you can use the **Scroll** buttons to move from one component to another. There will also be a separate option to clear or reset the total.

The MiniBlend can be set up to show % used of each component instead of or as well as the Kgs used. In this case the Display <3> will show

```
3> % USED:  234KG
   91.9  8.1   0    0
```

If set up to show either Kgs or % then the display is forced to show one component at a time and you can switch between the Kgs and % display by pressing **Select Option**.

4> KGS TO GO

```
4> KGS TO GO:  200
   180   20   0    0
```

Display <4> 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:

```
5> PRESET WGT MIXED
SELECT TO ACK
```

will be displayed. If required the MiniBlend can be setup to stop. Press the **Select Option** button to clear the alarm.

The MiniBlend can also be set up with the size of each component's storage hopper (in Kgs). When the Kgs To Go for each component drops below this storage size the alarm:

```
5> CMP #1 19 KG REQD
SELECT TO ACK
```

will be displayed. This prompts the operator to turn off the component's loader.

If the MiniBlend is set up to allow bin weights then the display will show:

```
4> TO GO:   200/50
   180  20
```

where the /**50** is the Kgs to go for the current bin. Pressing **Select Option** will allow you to specify the bin size as well as the total Kgs.

5> ALARMS

```
5> NO ALARMS
```

Display <5> is used to show the current alarms, if any. For the full list of alarms refer to the **Alarms** section.

6> KG/HR

```
6 >  K G / H R
C U R  8 3 ,  M A X  1 3 2
```

Display <6> shows both the current throughput and the maximum throughput that the machine would be capable of with the current component settings.

The current Kg/Hr estimate is based on the mix weight and then time between cycles. Because this depends on how the material is lying in the base and how it uncovers the sensor it is only approximate. Also, when the blender is stopped the current estimate will remain until the Maximum Cycle time has elapsed. At that point it will go to zero.

7> CHAMBER WGT

```
7 >  C H A M B E R  W G T  1 9 6 1 G
1 0 0 %  M I X             4  K G
```

Display <7> shows the current weigh chamber weight and the mix weight. Pressing **Select Option** allows you to change mix weight by setting a new percentage of the maximum mix weight.

Note: Reducing the mix size is normally done if there is a low bulk density material being used which would cause the normal mix size to overflow the weigh chamber or mixer.

8> LAST MIX ERROR

```
8 >  L A S T  M I X  E R R O R
0 . 0 2  0 . 0 1  0 . 0 0  0 . 0 0
```

Display <8> shows the error in the last mix. This is displayed in the same "units" as the component is entered, ie. the error is shown as the difference between "actual ratio" and then "required ratio".

If the number of components or the number of decimal places mean that the errors for all components will not fit on one line then the display shows:

```
8 >  L A S T  M I X  E R R O R
S E L E C T  T O  L I S T
```

Press **Select Option** and use the **Scroll UP** and **Scroll DOWN** buttons to display the errors for each component.

9> MIX ALARMS

```
9 >  M I X  A L A R M S
S E L E C T  T O  L I S T
```

Display <9> is used to set up the allowable mix error for each component.

Press **Select Option** and use the **Scroll UP** and **Scroll DOWN** buttons to display the allowable error for each component. Press **Select Option** to edit the value. If the alarm error value for a component is zero then no alarm will be raised. Otherwise if the mix error for the component exceeds the alarm error the alarm:

```
5 >  C O M P  # 1  M I X  E R R O R
0 . 0 2            S E L / A C K
```

will be displayed showing the component and the mix error. Press **Select Option** to clear the alarm.

10> EXTENDED DISPLAY

```
10> EXTENDED DISPLAY
PRESS SELECT
```

Display <10> allows you to view the remaining displays if required. Press **Select Option** to go on to display <11> or press **Scroll UP** to go back to display <1>.

11> LIFE KGS

```
11> LIFE KGS 563856
SELECT TO LIST
```

Display <11> shows the total Kgs of material mixed by the MiniBlend. The total is not resettable. Press **Select Option** and use the **Scroll UP** and **Scroll DOWN** buttons to display the totals for each component.

12> MACHINE CYCLES

```
12> MACHINE CYCLES
128766 CYCLES
```

Display <12> shows the total mix cycles done by the MiniBlend. The total is not resettable.

13> MIXER DRIVE HOURS

```
13> MIXER DRIVE HOURS
1845 HRS
```

Display <13> shows the total hours for which the mixer has been on. The total is not resettable.

16> ENTRY MODE

```
16> ENTRY MODE
RATIO
```

Display <16> shows the current component entry mode, ie. RATIO or PERCENT.

17> STOP MODE

```
17> STOP MODE
NO STOP
```

Display <17> shows the current "stop at zero to-go" mode, ie. what happens when the Kgs To Go shown by display <4> reaches zero.

The Stop Mode will be shown as either: NO STOP, STOP AFTER nnn KG, AUTO nnn KG or AUTO ALM nnn KG. The "nnn" is the default preset Kgs.

18> REGRIND MODE

```
18> REGRIND MODE
NONE
```

Display <18> shows the current "Regrind" mode, ie. whether one or more components are treated as regrind.

19> SOFTWARE

```
19> SOFTWARE
MBLv1.60
```

Display <19> shows the current version number of the MiniBlend software.

CANNOT RUN, LOCKED OUT

```
CANNOT RUN
LOCKED OUT
```

This message is displayed if the operator presses **Run** when the MiniBlend has been locked out by a connected supervisory PC.

NOT CONNECTED

```
NOT CONNECTED
```

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

Operate PIN Password

The MiniBlend can be set up so that the operator needs to enter a PIN number in order to change the blend ratio settings. In this case the **<1>** status display will show whether or not this PIN number has been entered. Typically the bottom line of the display shows the PIN status.

```
1> READY MAX 123 KG
100% MIX        NO PIN
```

If no PIN number has been entered. Press **Select Option** to enter the PIN number.

```
1> READY MAX 123 KG
100% MIX        **PIN**
```

If the correct PIN number has been entered. Press **Select Option** to cancel the PIN number and revert to protected mode.

Alarms

Acknowledging Alarms

During operation of the MiniBlend alarms may be raised to indicate equipment faults, error conditions or critical events. When an alarm is raised the MiniBlend switches to display <5> and displays the alarm, eg:

```
5> STOPPED

SELECT TO ACK
```

The alarm will continued to be displayed on display <5> 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 <5> 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.

5> BIN WGT MIXED

```
5> BIN WGT MIXED

SELECT TO ACK
```

Means that the MiniBlend has been set to stop after each bin weight has been mixed and the Bin Kgs To Go value has reached zero.

5> CHAMBER NOT EMPTY

```
5> CHAMBER NOT EMPTY

SELECT TO ACK
```

Means the weigh chamber is not empty at the start of a mix cycle. Clearing the alarm will cause the weigh chamber to be emptied and the MiniBlend stopped.

If there is material left in the Weigh Chamber check:
• Is there something stopping the material from emptying into the mixer?
• Is the Weigh Chamber air line plugged in?
• Refer **Checks/Weigh Chamber Valve**.

If the Weigh Chamber is empty check:
• Refer **Checks / Weight Measurement**.

5> COMP #n nnKG REQD

```
5 >  C O M P  # 1  1 9 K G  R E Q D

S E L E C T  T O  A C K
```

Means that you have set the Kgs To Go and the Kgs required for this component has dropped below the warning value setup for the component. This indicates to the operator that the loader can be turned off.

5> COMP #n MIX ERROR

```
5 >  C O M P  # 1  M I X  E R R O R

0 . 0 2         S E L / A C K
```

Means that the error in the amount of the component in the previous mix was greater than the alarm limit.

Check:
*   Did anything unusual happen in the previous mix such as running out of material? This can result in the following few mixes being inaccurate.
*   Is the material flowing consistently?
*   Refer **Checks/Slide Valve** and **Checks/Metering Wheel**.

5> DOOR CLOSED

```
5 >  D O O R  C L O S E D

S E L E C T  T O  A C K
```

Means that the **Door** has been closed after a Door Open condition.

If door has not been opened check:
*   Is the door switch secure?
*   Does switch operate reliably?
*   (MB600-) Is the connector to the mixer assembly connected securely.

5> DOOR OPEN

```
5 >  D O O R  O P E N

S E L E C T  T O  A C K
```

Means that the **Door** has been opened.

If door has not been opened check:
*   Is the door switch secure?
*   Does switch operate reliably?
*   (MB600-) Is the connector to the mixer assembly connected securely.

5> LOADCELL ERROR

```
5 >  L O A D C E L L  E R R O R

S E L E C T  T O  A C K
```

Means that the loadcell input has fallen to zero, or risen too high, indicating a possible fault with the loadcell input.

Check:
*   Refer **Checks/Weight Measurement**.

5> LOW LEVEL #1

```
5> LOW LEVEL #1

SELECT TO ACK
```

Means that the MiniBlend has low level sensors for each component and the material for the component is below the sensor.

If you have not run out of material check:
• Refer **Checks/Low Level Sensor**.

5> NO MATERIAL #n

```
5> NO MATERIAL #1

<RUN/STOP> TO CONT.
```

Means that some problem with loading has caused too small an amount of material to be loaded within the loading timeout period. The MiniBlend will have paused. Press **Run** to restart loading.

Check:
• Have you run out of material? Is there a blockage in the storage hopper?
• Is a vacuum loader creating a vacuum within the storage hopper? Setup a non-zero Loader Time for the component.
• Has the Weigh Chamber overfilled because the material (this or previous component) has low bulk density? You may need to reduce the mix size (**Select Option** on display <7>).
• (MB100) Is the feed screw turning? Refer **Checks/Screw Feed**.
• (MB80/400) Is the slide valve opening and/or metering wheel turning? Refer **Checks/Slide Valve**.
• Refer **Checks/Weight Measurement**.
• Has the setup Timeout Weight been made too large or the Timeout Time been made too small.

5> NOT EMPTYING

```
5> NOT EMPTYING

SELECT TO ACK
```

Means that the weigh chamber is not emptying within the predefined time.

Check:
• Is the setup Empty Time too short?
• Refer to **Chamber Not Empty** alarm

5> OVERFILLING

```
5> OVERFILING

SELECT TO ACK
```

Means that the weight of material in the weigh chamber has significantly increased during a period when it should be stable, probably because of material loading when it should not.

Check:
• Are the slide valves are closing properly. Refer **Checks/Slide Valve**.
• Are all components stoping and starting correctly.
• Is material bypassing the slide or metering wheel. This can be caused by low slip angle of the material. It can also be caused by loading systems which pressurise the hopper.
• Refer **Checks/Weight Measurement**.

5> PRESET WGT MIXED

```
5> PRESET WGT MIXED
SELECT TO ACK
```

Means that the Kgs To Go value has reached zero.

5> PRINTER ERROR

```
5> PRINTER ERROR, xxx
SELECT TO ACK
```

Means that a printer interface module is installed and has detected a printer error.

The types of errors are:
*   **N/C** – the printer interface module is not connected or is faulty.
*   **OFFLINE** – the printer is offline or is not connected to the interface module.
*   **NO PAPER** – the printer has run out of paper.

5> RESTARTED

```
5> RESTARTED
SELECT TO ACK
```

Means that the MiniBlend 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
*   Earth connection to mixing bowl
*   (MB80) Earth connection to additives

5> STOPPED

```
5> STOPPED
SELECT TO ACK
```

Means that the MiniBlend has been forced to interrupt a cycle and stopped.

Tare Adjustment

This section describes adjustment of the loadcell input for changes in the tare weight of the weigh chamber. The MiniBlend should read a weight of zero when the weigh chamber is empty. Due to temperature changes or minor bumps it is usually not exactly zero. This is not a problem as the empty weigh chamber is weighed at the start of each blend cycle. If the weigh chamber is heavily knocked the loadcell may be overstressed and the tare weight shifted by many grams. If it shifts too far the MiniBlend 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 Chamber Not Empty alarm occurs with an empty chamber

The tare process will take less than 1 minute 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 and is in its normal operating position. Press **Select Option**. The MiniBlend will wait for the loadcell input to settle and will then read the weight.

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
- When a Loadcell Error alarm occurs

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:

```
CONTROL OPTIONS:

CALIBRATE
```

Press the **Select Option** button to enter the Calibration menu:

```
CALIBRATE:

CALIBRATION=0.07512
```

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. 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:

```
CHAMBER IS EMPTY ?

PRESS SELECT TO OK
```

Ensure that the weigh chamber is empty and is in its normal operating position inside the MiniBlend body. Press **Select Option**. The MiniBlend 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 and ensure the Weigh Chamber is in its normal operating position. Press **Select Option**. Again the MiniBlend will wait for the loadcell input to settle and will then read the weight. The MiniBlend then recalculates the new calibration parameters and if all is Ok returns to the calibration display:

```
CALIBRATE:

CALIBRATION=0.07516
```

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

```
CALIBRATE:

+4001G     85.0%FS
```

Don't forget to remove the calibration weight!

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 place the calibration weight.

```
LOADCELL ERROR

INPUT TOO LOW
```

This error means that the loadcell input is too close to zero when the weigh chamber is empty.

```
LOADCELL ERROR

INPUT TOO HIGH
```

This error means that the loadcell input is too high to be able to reliably weigh the specified mix weight.

Any of these errors may indicate a fault in the loadcell or the I/O board. Refer to the **Checks/Loadcell Input** section.

Setup

The MiniBlend 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:

<table>
<tr><td>
CONTROL OPTIONS:

TARE
</td></tr>
</table>

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

<table>
<tr><td>
CONTROL OPTIONS:

CHANGE SETUP DATA
</td></tr>
</table>

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

<table>
<tr><td>
CHANGE SETUP DATA:

MIX WEIGHT=4000G
</td></tr>
</table>

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

<table>
<tr><td>
ENTRY=RATIO
</td></tr>
</table>

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

<table>
<tr><td>
ENTRY=PERCENT
</td></tr>
</table>

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

<table>
<tr><td>
MIX TIME=40 SEC
</td></tr>
</table>

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

<table>
<tr><td>
MIX TIME:

040.<u>0</u> SEC
</td></tr>
</table>

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 **Stop** button to leave the Change Setup Data menu and return to the Control Options Menu. Press the **Stop** 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 MiniBlend 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 for the MB300. Default values for all models are listed in the **Setup**/**Defaults** section.

MIX WEIGHT=4000G

The mix weight is the normal target weight of each batch of materials that is mixed with every cycle of the MiniBlend. The actual mix size can be temporarily changed by altering the Mix % by pressing **Select Option** on display <7>.

REGRIND=NONE

Regrind mode allows you to add regrind material through your MiniBlend without the amount of regrind altering the ratio of the virgin components.

The regrind options are:
NONE – all components are virgin and added in the specified ratios.
ONE COMP – one component is permanently assigned as the regrind component.
ANY COMP – any components may be set to regrind by the operator
ONE FIRST – one component is permanently assigned as regrind and this component is run first.
ANY FIRST – any component may be set to regrind and all of these are run first.
N/R/A – any component may be set to natural, additive or regrind.
N/R/A FIRST – any component may be set to natural, additive or regrind and all of the regrind components are run first.

REGRIND CMP=2

For regrind modes ONE COMP and ONE FIRST, specifies the regrind component.

ENTRY=RATIO

This sets the data entry mode. The options are RATIO and PERCENT.

STOP AT PRESET=NO

If this mode is set to anything other than NO the MiniBlend will stop when the Kgs To Go weight first reaches zero.

The Stop At Preset options are:
NO - Blender does not stop but will alarm when Kgs to Go reaches zero
YES - Blender will alarm and stop

AUTO - Kgs to Go will be automatically set to the default value when the blender is started. The number of batches required is determined and the batch weight adjusted so that the required kgs are reached in uniform size batches.

AUTO ALM - As for AUTO but will alarm when the Kgs to Go reaches zero and the blender stops.

DEF PRESET WGT=0KG	The default value for Kgs To Go.

BIN WEIGHT=NO	If set to YES then after setting Kgs To Go the operator must enter a Bin Weight.

DEF BIN WGT=0KG	The default Bin Weight entered in Kgs To Go

DOOR ALARM=YES	Allows the alarm which is raised when the door is opened to be disabled.

DISP USED=WGT	Controls how the material usage is displayed in the KGS USED display.

The Disp Used options are:

WGT - Displays the Kgs of each component used

PERCENT - Displays the amount of material used by each component as a percentage of the total.

WGT+PCT - Displays both weight and percentage with the weight displayed by default. Use the **Select** button to switch between the two.

PCT+WGT - As for WGT+PCT but displays the percentage by default.

CAL.WEIGHT=4000G	The weight used during loadcell calibration. This can also be altered during the calibration process itself.

MIX TIME=20 SEC	This sets the time for which the mixer will mix.

HOT MIX=NO	If set to YES then the mixer operation will be modified so that the mixer is emptied at the end of each blender cycle. This is used to avoid

overheating of the weigh chamber and mixing bowl when blending dried materials.

MIXER POSN=100	(MB-20 only) These parameters define the rest position and amount of swing of the rocking mixer used in the MB-20.
MIXER ANGLE=60	

SETTLE TIME=2 SEC	The settle time is the time allowed for the weight reading to settle after each component is added into the weigh chamber.

OPEN TIME=6 SEC
OPEN MODE=ASAP

(MB400+) This is the maximum time allowed for the Weigh Chamber to empty and the operating mode.

If the mode is set to ASAP then if the Weigh Chamber is empty before the allowed time the valve will close and the machine can continue. If the mode is set to FIXED then the valve remains open for the specified time. If the chamber does not empty within this open time the MiniBlend will try twice more before activating the Weigh Chamber Not Empty alarm and going into a flushing cycle**.**

EMPTY TIME=6 SEC

This sets the time for the mixing bowl to empty.

RETRACT TIME=2 SEC

This sets the time for the mixing bowl to tip upright .

TIMEOUT WEIGHT=100G
TIMEOUT TIME=30SEC

Time-out weight and time-out time are used together to trigger the No Material alarm. The weigh chamber must increase in weight by the Timeout Weight within the Timeout Time or the No Material alarm will be activated.

SLIDE TIMEOUT=SHORT

For material fed by slide valve, set to SHORT to use a rapid timeout or LONG to use the Timeout Time above.

Where material is fed by slide valve the MiniBlend expects rapid material loading and it is usually pointless waiting for the length of timeout used for slower metering wheel feeding. The default action is to use a short timeout of 3 seconds for normal material and 6 seconds for regrind. Setting the Slide Timeout to LONG forces the MiniBlend to use the standard timeout time. This can be useful when feeding materials which take a long time to start moving or where vibrators and the like are used.

EMPTY TOL=10%

The amount by which the empty weigh chamber can vary from zero at the start of each cycle before triggering a flushing cycle (% of mix weight).

E/STOP WGT TOL=100G

When the door is open, this is the maximum change in weight allowed in the weigh chamber from the time the door is open until it is closed

again.

If there has been a change in weight greater than this tolerable amount, the Weigh Chamber is emptied and the MiniBlend will complete a flushing cycle and stop. If the change is within tolerance then the MiniBlend will continue as normal when the door is closed.

OVERFILL=NONE
OVERFILL=0.0%

Sets the overfilling alarm mode and the allowable weight change (as % of mix weight)

The options are:
NONE – No overfilling checks are performed.

STG.FULL – The weigh chamber weight is monitored during the Storage Full condition, ie. while the blender is waiting for material to drain from the base. If the weight increases by more than the allowable amount the Overfilling alarm is raised.
LAST CMP – The blender pauses after the last component and monitors the weigh chamber weight.
EACH CMP – The blender pauses after each component and monitors the weigh chamber weight.

The STG.FULL mode does not slow down the MiniBlend because it happens while the blender is otherwise waiting but is a less rigorous test. The LAST CMP and EACH CMP modes will slow down the MiniBlend.

AUTO START=NO

If set to YES the blender will automatically start running when powered on if it was previously running.

ALARM=ALWAYS

If set to NO COMMS then the alarm output will not be activated if a supervisory PC is communicating with the MiniBlend.

SMALL CMP=2.0%

Sets the component size below which the MiniBlend will regard this as a small component and start slowing down for increased accuracy.

SMALL % MIN=80%

Sets the minimum amount of material to load for mixed mode components.

If a component is set to run in volumetric mode (???) with a weight override, or in gravimetric mode with a time override then this parameter specifies the minimum time the component must run for or the minimum weight it must reach as a percentage of the target.

MIN VIRGIN=30%

Sets the minimum amount of virgin material the MiniBlend will attempt to mix when running in REGRIND FIRST modes.

STEP RATE=130/SEC
STEP RATE=2MSEC

Sets the maximum speed of the metering wheel motors. These motors are small stepper motors and more torque is available at lower stepping rates. Entering a number less than 30 changes the input

from steps/second to milliseconds per step.

AUX INPUT=NONE

Sets the function of the Auxiliary Input. For MiniBlends using IO5 and IO6 boards this is the Component #2 Low Level input.

The options are:
NONE – Input used for normal function
MIXER – Input used for mixer pulse. The absence of these pulses during mixing triggers then NOT MIXING alarm.
PRINT – Input used to control material usage printing.

MAX CYCLE=10MIN

The maximum time allowed to elapse between two machine cycles before the current Kgs per hour will be set to zero.

| KG/HR FILTER=0 |
| KG/HR SPAN=0 |

(MB1200+) Sets the 0-10V analog output of estimated Kg/Hr throughput. The filter value specifies the degree of filtering on each batch to give the average throughput. The span parameter specifies the Kg/Hr giving 10V output.

| FULL DELAY=0SEC |

Specifies a delay between the hopper empty sensor detecting that the storage hopper is empty and triggering the next blender cycle.

| COMPONENT #n |

Pressing **Select Option** takes you into the Component sub-menu with the following options:

| COMPONENT #n |
| ENTRY=ENABLED |

Setting a component to DISABLED will prevent the operator entering a ratio and prevent them operating the component slide/wheel.

| COMPONENT #n |
| DECIMALS=1 |

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

| COMPONENT #n |
| MATERIAL=NONE |

Only displayed if the Regrind Mode is set to one of the N/R/A modes. This sets the types of materials which can be used in this component.

The materials allowed with the various Material options are:

Option	Natural	Regrind	Additive
NONE			
NAT	X		
REG		X	
NAT/REG	X	X	
ADD			X
NAT/ADD	X		X
REG/ADD		X	X
ALL	X	X	X

| COMPONENT #n |
| SLOWDOWN WGT #2=50G |

The slow down weight is the approximate weight of material which will be loaded at slow speed.

| COMPONENT #n |
| FEED MODE=STD |

Sets the feed mode of the component if a NO MATERIAL condition is detected.

The options are:
STD – Standard action is to display the NO MATERIAL alarm and wait for operator input.
NO STOP – Raise the NO MATERIAL alarm but continue with the next component.
ANY – Accept whatever material has been added and continue without alarming.

AUTO STOP – Raise the NO MATERIAL alarm, abort the cycle and stop the MiniBlend.
NO STOP REG – As for NO STOP but only if the component is regrind.
ANY REG – As for ANY but only if the component is regrind.
RETRY – Display the NO MATERIAL alarm but continue to try to feed material.

COMPONENT #n **SLOW SPEED=FULL**	This sets the base speed of the metering wheel for the component as a fraction of the general stepper rate.

COMPONENT #n **SMALL% MODE=WGT**	Sets the dosing mode used for "small" components.

Normally the MiniBlend works by monitoring the weigh chamber weight and stopping feeding when the correct weight of material has been added (allowing for overshoot). For very small components this can be a problem when there is inconsistent vibration or electrical noise affecting the weight readings and may lead to variations in material added from mix to mix. Setting this parameter to TIME causes the MiniBlend to use a timed mode where it calculates the metering wheel feed rate and runs the wheel for the appropriate time. The rate calculation is still done by gravimetric calculation but is averaged over a larger number of cycles.

A variation of this are two intermediate modes. MIN TIME acts like normal weight mode where the dosing is stopped at a specified weight but in addition the wheel must run for a specified minimum time. This gives the benefits of weight mode but ensures that a minimum amount of material is added regardless of weight fluctuations. MIN WGT acts like a timed mode but in addition a specified minimum weight of material must be detected. This gives the consistency of timed mode while again ensuring a minimum amount of actual material is dosed.

COMPONENT #n **TIMEOUT=STD**	Setting this parameter to LONG allows for the full timeout time to elapse even if the general SLIDE TIMEOUT parameter is set to SHORT.

COMPONENT #n **USE PULSE=YES**	If set to NO then stops the component using pulsed slide dosing and forces all slide dosing to be done by weight monitoring.

COMPONENT #n **WARNING WGT #1=30KG**	Typically set to the weight of material in a full hopper and loader. Used in conjunction with the Kgs To Go display, an alarm is raised when the component has only the Warning Weight left to go.

COMPONENT #n **FULL WGT #1 = 4000G**	The weight of material for the component that would fill the weigh chamber.

This prevents the weigh chamber being over filled where a lower bulk density material, or poor flowing material, is used. Often used with regrind material. If the target weight for a component would exceed the Full Weight the mix size is automatically reduced.

| COMPONENT #n | Sets a period of time that a component will wait after a Not Feeding condition is detected before automatically retrying. |
| LOADER TIME #1 = 0SEC | |

Typically used when operating with a vacuum loader where the loader vacuum prevents material being fed into the MiniBlend. If a Loader Time is set then the MiniBlend will wait and retry feeding the component twice before raising the NO MATERIAL alarm. Can also be used where the hopper volume is small and there are a number of loaders in the system so that it may be some time before an empty loader is refilled.

| COMPONENT #n | Specifies the default value of Fast Overshoot used when the MiniBlend is powered on. |
| FAST O/S=30G | |

| COMPONENT #n | Specifies the default value for slide pulse feed rate when the MiniBlend is powered on. |
| PULSE=0.10KG/SEC | |

| PRINT=NO | Set to YES if the MiniBlend has an attached printer interface. |

| PRINT JOB=NO | Set to YES to print a Material Usage summary each time the Kgs-Used is cleared. |

| PRINT BIN=NO | Set to YES to print a Material Usage summary each time a Bin Weight amount of material is used during Kgs To Go. |

| PRINT DAY=NO | Set to YES to print a Material Usage summary each day. |

| PRINT SHIFT=NO | Set to YES to print a Material Usage summary each shift. |

| PRINT HOUR=NO | Set to YES to print a Material Usage summary each hour. |

| HOUR OPTIONAL=NO | Set to YES to print a hourly report only if auxiliary input is on. |

| PRINT SETTING=NO | Set to YES to print the component settings (ratios) at the start of a cycle where any setting as been changed. |

| PRINT ALL MIX=NO | Set to YES to print the actual component weights and ratios for each mix. |

PRINT BAD MIX=NO

Set to YES to print the actual component weights and ratios for each mix where one or more component weights exceed the allowable error.

PRINT ALARM=NO

Set to YES to print any alarms displayed while running.

SHOW WGT=NO

Set to YES to print component material weights on the Mix Report and Setting Report..

RATIO 10 MIX=NO

Set to YES to print the component ratio settings every 10 mixes in the Mix Report.

SHOW %=NO

Set to YES to print component material percentages on the Job, Bin, Day, Shift and Hour Reports.

DAY START=00:00

(if printing Day or Shift) The working day start time.

No. SHIFT=0

(only if printing Shift) The number of shifts in a working day.

SHIFT TIME=00:00

(if printing Shift) The length of each shift.

KEEP ALIVE=NO

Set to YES to output a null character to the printer at regular intervals to prevent page printer timeout.

PRINT SETUP

Press the **Select Option** button to print the MiniBlend setup data.

NUM COMP=4

Specifies the number of components for the MiniBlend.

NUM ADDITIVE=0

(MB300+) Specifies the number of additive components for the MiniBlend.

Additives are removable optional components. These may have been factory fitted with the original blender or may be retrofitted at a later date. (NUM COMP – NUM ADDITIVE) is the number of fixed components and is used by the MiniBlend to decide the type of feed mechanism on each component and how the internal electronics is connected to each component.

MODULE CHK=YES

(MB400+) Set to NO to disable Component Module Not Connected alarms.

COMMS=FAST

Set to SLOW to slow down the speed of the external I/Bus used to communicate with the operator display or printer interface.

SAVE CMP DEFLTS

Pressing the **Select** button will cause the current values for overshoot and pulse rate to be saved for each component.

RESET SETUP DATA

Press the **Select Option** button to clear the current setup data and reset to the default values.

You will be asked to confirm that you wish to do this and will need to specify the MiniBlend model and number of components and (MB300+) additives.

RESET LIFE KGS

Press the **Select Option** button to set the Lifetime Kgs material usage for each component to zero. You will be asked to confirm you wish to do this.

OPERATE PIN=0

Sets the PIN number (password) required to make changes to the blend ratio settings and/or other operating parameters.

Setting the Operator PIN to a non-zero value requires the operator to enter this password number before any changes can be made to the blend ratio settings or other operating settings such as the Kgs Used. The status display **<1>** will show whether the operator has entered a pin number or not.

OP PIN=RATIO

If an Operating PIN number has been set then this option specifies the operating settings that it applies to.

The options are:
RATIO – PIN required to change blend ratios only.
KGS – PIN required to reset the Kgs Used only.
MISCL – PIN required to reset Kgs Used, set Kgs To Go, set Mix% or set Blend Ratio Alarms. Operator can still change blend ratios without PIN number.
ALL – PIN required for all of the above.

SETUP PIN=0

Sets the PIN number (password) required to make changes to the MiniBlend setup data.

Setup Defaults

General Defaults

Parameter	
Regrind	None
Regrind Cmp	2
Entry	Percent
Stop At Preset	No
Def Preset Wgt	0 kg
Bin Weight	No
Def Bin Wgt	0 kg
Door Alarm	Yes
Disp Used	Wgt
Mix Time	20 sec
Hot Mix	No
Mixer Posn	100
Mixer Angle	60
Settle Time	2 sec
Open Time	6 sec
Open Mode	Asap
Empty Time	4 sec
Retract Time	2 sec
Timeout Weight	100 g
Timeout Time	30 sec
Slide Timeout	Short
Empty Tol	10 %
E/Stop Wgt Tol	100 g
Overfill	None
Overfill	0%
Auto Start	No
Alarm	Always
Small Cmp	2%
Small % Min	80%
Min Virgin	30%
Step Rate	2 msec
Aux Input	None
Max Cycle	10 min
Kg/Hr Filter	0
Kg/Hr Span	0
Full Delay	0
Print	No
Print Job	No
Print Bin	No
Print Day	No
Print Shift	No
Print Hour	No
Hour Optional	No
Print Setting	No
Print All Mix	No
Print Bad Mix	No
Print Alarm	No
Day Start	00:00

No. Shift	0
Shift Time	00:00
Operate Pin	0
Op Pin	Ratio
Setup Pin	0
Comms	FAST

Component Defaults

Parameter	
Entry	Enabled
Decimals	1
Material	None
Feed Mode	Std
Slow Speed	Full
Small% By Mode	Wgt
Timeout	Std
Use Pulse	Yes
Warning Wgt	0 kg
Full Wgt	Mix Wgt
Loader Time	0 sec

Model Defaults

Parameter	Model	
Mix weight (g)	MB-20	300
	MB-60	1000
	MB-150	2000
	MB-300	4000
	MB-600	10000
	MB-1200	20000
	MB-2400	40000
Cal. Weight (g)	MB-150-	2000
	MB-300+	4000
Slowdown Wgt (g)	MB-300-	20
	MB-600+	50

Tests

In order to help resolve problems with the MiniBlend 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.

IO BOARD=IO1

Indicates the type of I/O board installed in the MiniBlend.

COMPONENTS

Allows you to test the operation of the slide valves and metering wheels for each component. You can:

- Open and close each slide valve.
- Turn each metering wheel motor on or off.

MIXER

Allows you to test the operation of the mixer drive and mixing bowl. You can:

- Turn the mixer drive on or off.
- Dump or retract the mixing bowl.

WEIGH CHAMBER

Allows you to test the operation of the weigh chamber. You can:

- Display the current weight in grams.
- Display the current loadcell input % and the minimum and maximum values.
- (MB400+) Open and close the Weigh Chamber funnel valve.

INPUTS

Allows you to view the current status of the input signals from Full Sensor, Door Switch and Low Level Sensors.

I-BUS

Allows you to check for communication with any of the boards or modules connected to the I-Bus serial communications link.

TEST MODE

Allows you to run the MiniBlend without material. The MiniBlend software simulates material being loaded into the Weigh Chamber.

Applications

Reducing the material left at the end of a job

After the **Kgs To Go** is set, the weight of material required for each manually filled minor component should be checked before refilling the component storage hoppers. The aim of this is to avoid opening up new bags of resin or master batches unnecessarily and also to reduce the amount of material to be drained from the component storage hoppers at the completion of the job.

The automatically filled main components have an **alarm** that appears at a preset weight. This weight is an estimated weight in the component storage hopper. It is used as a prompt to the operator to turn off the loader concerned because there will be enough material in the component storage hopper to complete the current job (assuming the component storage hopper is full).

By turning the Weighbatch Loader off when prompted will reduce the material handling at the completion of the job.

Trouble Shooting

This section addresses problems that you may encounter with your MiniBlend 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

MiniBlend 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

MiniBlend 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 MiniBlend is not in one of the Control Options by pressing the **Stop** button several times.

If the message does end in a number try pressing the **Scroll** buttons to change to display number <5> to see if there is an alarm message.

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

Not Stopping and Filling with Material

The MiniBlend can fill with material if the Full Sensor does not detect that the storage area is full. This will usually result in a Not Empty alarm. Refer **Checks/Full Sensor**.

Checks

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

Weight measurement

Open the MiniBlend door and acknowledge the Door Open alarm to display the Door Open menu. The current weight will be displayed along with the loadcell input %.

```
DOOR OPEN:
WEIGHT    -2G      32.7%
```

Firstly check that the loadcell input% is between 5% and 95%. Push down on the weigh chamber and check that the loadcell input does **increase**. Except in the very large MiniBlends you should be able to quite easily generate a 10% change in loadcell input. If you cannot generate a loadcell input change then refer to the next section.

Empty the Weigh Chamber. Check that the indicated weight is close to zero. Otherwise Retare or Recalibrate.

Add some weight to the Weigh Chamber and check that the indicated weight increases by the correct amount. Otherwise recalibrate.

Loadcell Input

Firstly check that the loadcell is plugged in. On the MB-60, MB-150, MB-300 and MB-600 the plug to the mixer assembly needs to be connected. On the MB-1200 and MB-2400 the weigh chamber plug needs to be connected.

Check for physical interference with the weigh chamber such as material trapped between the loadcell and the frame.

Check the voltages across the following pins of the 4 way loadcell connector on the I/O Board. Refer section **Circuit Boards and Modules**. Empty the Weigh Chamber before measuring.

Function	Between Pins	Allowable Voltage
Supply	3 – 4	5V +/- 0.1V
Signal +	2 – 4	2.5V +/- 0.1V
Signal -	1 – 4	2.5V +/- 0.1V
Difference	1 – 2	0 to 10mV

If the Supply voltage is not 5V then unplug the connector from the board and measure the voltage at the socket pins again. If still not 5V then the I/O Board should be replaced. Otherwise there is a fault in the Loadcell or a short circuit in the wiring or Loadcell Connector (MB100).

If the Signal voltages are not approximately 2.5V then there is a fault in the Loadcell or wiring.

If the Difference voltage is not correct then there is a fault in the loadcell. If the voltage is less than +/-30mV it indicates that the Loadcell has been overloaded. The problem may be able to be **temporarily** fixed by reverse overloading the Loadcell until the voltage remains in the range 0-10mV.

(MB1200+) Weigh Chamber Valve

Open the MiniBlend door to display the Door Open menu:

```
DOOR OPEN:
WEIGHT    2G    32.7%
```

Press **Scroll UP** to display the Dump Chamber option:

```
DOOR OPEN:
DUMP CHAMBER
```

Press **Select Option** to open the Weigh Chamber Valve.

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 ensure that the air hose from the Weigh Chamber is plugged in. Try lifting the valve by hand to ensure that the cylinder is not jammed. If it moves easily then check the solenoid and cylinder (refer **Checks/Pneumatics**).

Slide Valve

Empty all material from the component's storage hopper. Open the MiniBlend door to display the Door Open menu:

```
DOOR OPEN:
WEIGHT    2G    32.7%
```

Press **Scroll UP** as required to reach the Dump option for the required component:

```
DOOR OPEN:
DUMP #1
```

Press **Select Option** to open the Slide Valve.

 Check that the valve opens fully and when closed does not allow material to pass. It is normal for some material to be trapped in a small gap between the slider and the body but the gap must be too small for material to pass through. Both opening and closing should occur in less than one tenth of a second. There should be no apparent variation in the speed of the valve's operation.

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.

Metering Wheel

For MB150+ fixed components, remove the inspection cover from the front or rear of the top plate. This will enable you to view the metering wheel and the material flow.   For MB80, MB180 or other removable additive components, empty the hopper. This will enable you to view the metering wheel from above.

Enter the Test Menu (refer **Tests**; press ← and **Select Option**, **Scroll Up** three times, **Select Option**)

```
TESTS:

COMPONENTS
```

Press **Select Option** and then **Scroll Up** as required to get to the Motor option for the required component:

```
TEST COMPONENTS:

#2 MOTOR=OFF
```

Press **Select Option** to turn the Metering Wheel off and on.

With the motor turned on the paddle should turn steadily at about 2 revolutions per second with material being thrown into the Weigh chamber. When the motor is turned off no further material should fall into the Weigh Chamber. Check the rotation direction. The material should pass under the wheel and be pushed up and over the exit gate.

If there is an initial flow of material which stops after several seconds then check that the material is continuing to flow around the paddle. Some cohesive materials will allow the paddle to dig a "hole".

If the paddle turns slowly or inconsistently then turn the motor off and check for trapped material or filaments wrapped around the paddle or motor shaft. Check that the paddle is still fastened securely to the motor shaft.

For an additive try running the additive hopper in another position. If the motor runs in another position then he fault must be with the I/O board or the wiring.

If the paddle does not turn at all, or is still slow, attempt to move the paddle by hand. There should be some very slight, jerky, resistance caused by the poles of the stepper motor. If the motor appears to be too stiff then the motor should be replaced.

Pneumatics

Many of the mechanical actions within the MiniBlend are performed by air operated pneumatic pistons. These are controlled by 24V DC solenoid valves. All of the pneumatically actuated operations have a Test option which allow you to manually extend and retract the cylinder rod (refer **Tests**).

The solenoid has a small indicator (red LED) 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 or Component Module (refer **Circuit Boards and Modules**). This should be 24V when on.

If the solenoid indicator is lighting then check the air supply to the MiniBlend. This should be at least 75 psi. 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 valve 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 valve should be replaced.

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

Low Level Sensor

Note: Low level sensors in the storage hoppers are optional on the MiniBlend. If no Low Level sensors are fitted and **Low Level** alarms are being displayed then the I/O Board should be replaced.

Enter the Test Menu (refer **Tests**; press ← and **Select Option**, **Scroll Up** three times, **Select Option**):

```
T E S T S :

I O   B O A R D
```

Press **Scroll Up** to get to the Inputs option:

```
T E S T S :

I N P U T S
```

Press **Select Option** and then **Scroll Up** as required to get to the Level input of the required component:

```
I N P U T S :

L E V E L   # 1 = H I G H
```

The display will show either HIGH or LOW depending on whether the sensor is covered by material or uncovered.

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

Full Sensor

Enter the Test Menu (refer **Tests**; press ← and **Select Option**, **Scroll Up** three times, **Select Option**):

```
T E S T S :

I O   B O A R D
```

Press **Scroll Up** to get to the Inputs option:

```
T E S T S :

I N P U T S
```

Press **Select Option** to display the Storage sensor input:

```
I N P U T S :

S T O R A G E = F U L L
```

The display will show either FULL or EMPTY depending on whether the sensor is covered by material or uncovered.

As an easy alternative to actual material, the sensor should also detect your hand at a distance of about 20mm. If the display 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 sensors used on the MiniBlend are standard capacitive proximity sensors. 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 either the I/O Board or Component Module. 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 or Component Module (if reqd).

Circuit Boards and Modules

CPU Board

The CPU board layout is shown in the following diagram.
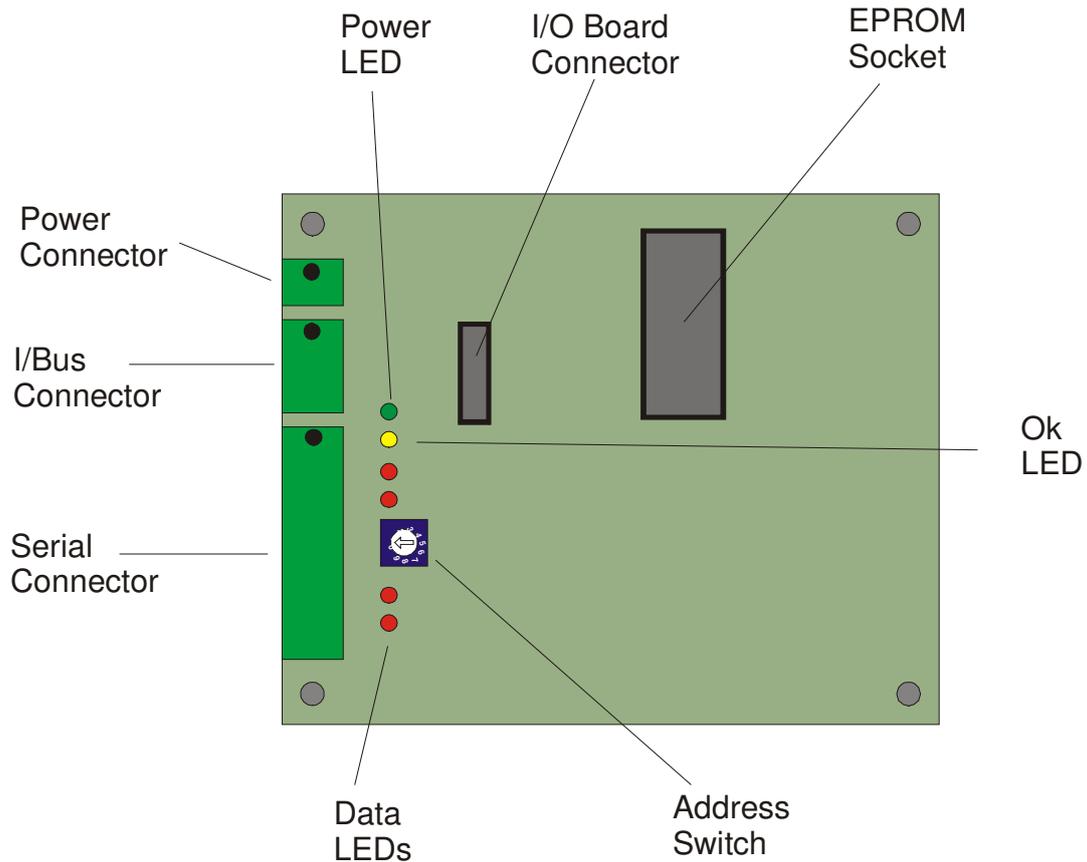
For the three green connectors pin 1 is always at the left hand end looking into the board. In the diagram above a black dot indicates pin 1.

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 MiniBlend 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 MiniBlend software.

Address Selector. Used to indicate the MiniBlend number when communicating to a supervisory PC.

I/O Board (IO2, MB60)

The IO2 board is used in the MB60 blender.

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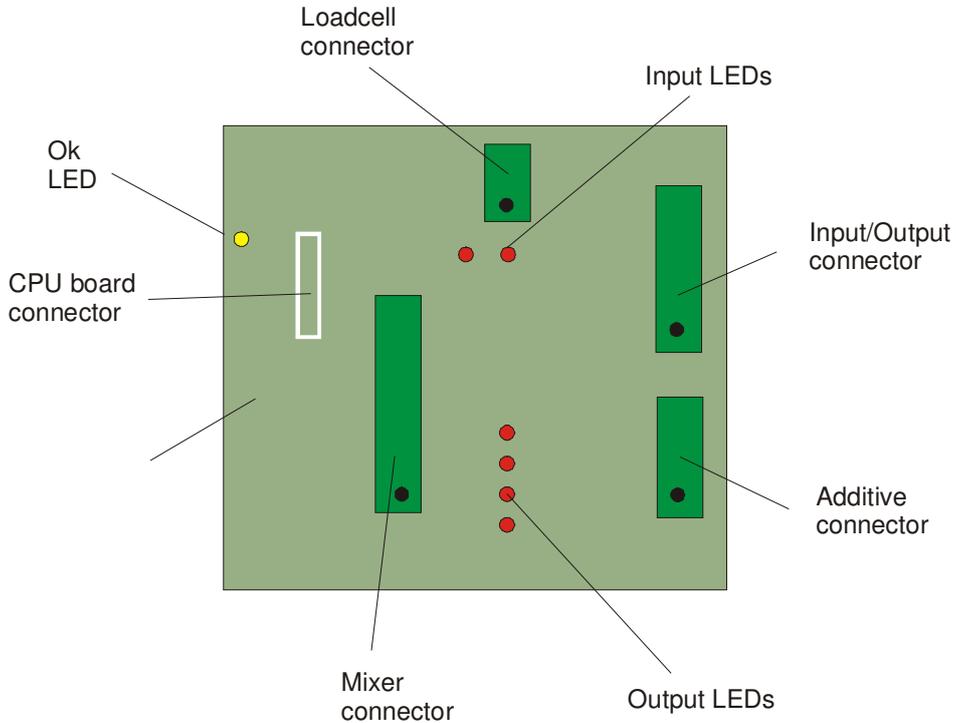
For the four green connectors pin 1 is always at the left hand end looking into the board. In the diagram above a black dot indicates pin 1.

Input / **Output Connector**. Provides 3 digital inputs (pins 6..8) and 3 digital outputs (pins 1..5). Inputs are active pulled to 0V. Resistance is 10K to the positive supply. Outputs source current at 24V up to 200mA per output.

Pin#	Use
1	0V
2	Comp 1 solenoid
3	0V
4	Comp 2 solenoid
5	Alarm output
6	Full sensor input
7	Comp 1 low level
8	Comp 2 low level

Loadcell connector. Provides connection to the weigh chamber loadcell (drive and differential input).

Pin#	Use
1	Loadcell input +
2	Loadcell input -

3	Loadcell drive (+5V)
4	Loadcell drive (0V)

Additive connector. Provides connection to the two additives.

Pin#	Use
1	0V
2	Comp 3 step
3	Comp 3 run
4	0 V
5	Comp 4 step
6	Comp 4 run

Mixer connector. Provides connection to the mixer motors and position sensors.

Pin#	Use
1	Shaft motor -
2	Shaft motor +
3	Bowl motor -
4	Bowl motor +
5	0V
6	0V
7	Shaft sensor input
8	Bowl sensor input
9	Door Switch
10	+24V

Output LEDs . Show the currently active components.

Input LEDs. Show the current input status of the Full sensor and Door switch.

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

I/O Board (IO3, MB150+)

The IO3 board is used in all blenders (except MB-20 and MB-60).

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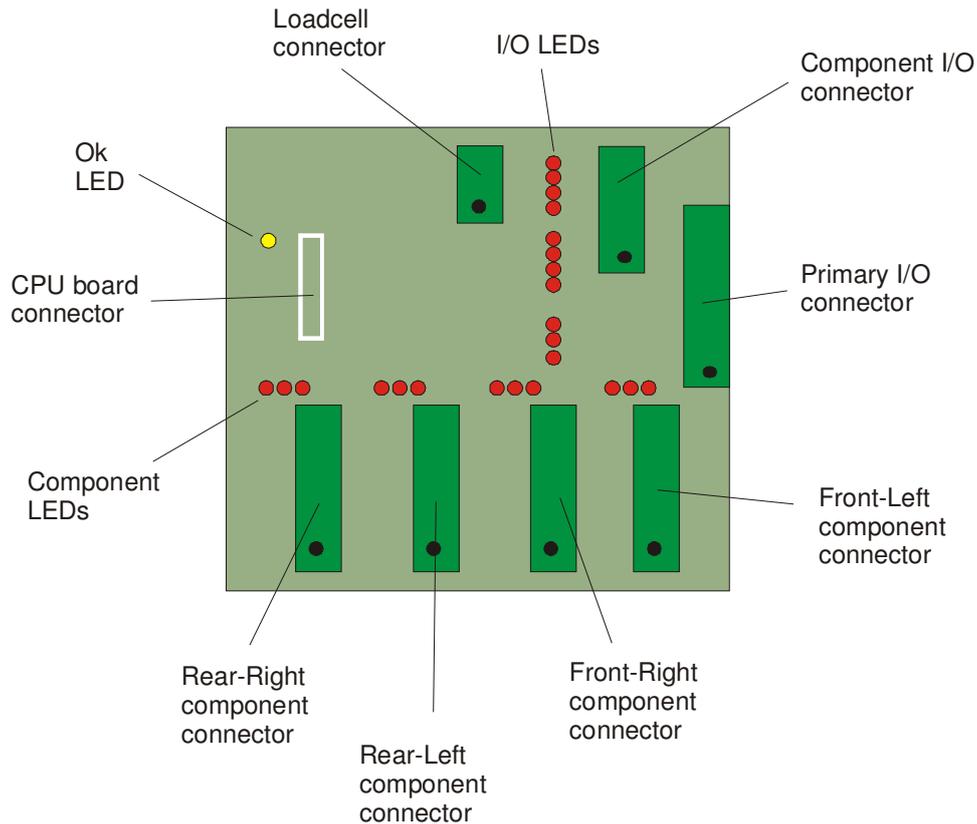
For the seven green connectors pin 1 is always at the left hand end looking into the board. In the diagram above a black dot indicates pin 1.

Primary I/O Connector. Provides digital inputs and outputs for control of the weigh chamber and mixer. Inputs are active pulled to 0V. Resistance is 10K to the positive supply. Outputs source current at 24V up to 500mA per output.

Pin#	Use
1	0V
2	Mixer dump
3	Mixer retract
4	Chamber open
5	Mixer run
6	Alarm
7	Full sensor
8	Door switch

Loadcell connector. Provides connection to the weigh chamber loadcell (drive and differential input).

Pin#	Use
1	Loadcell input +
2	Loadcell input -
3	Loadcell drive (+5V)
4	Loadcell drive (0V)

Component I/O Connector. Provides digital inputs and outputs for the center components in blenders with more than 4 components.

Pin#	Use
1	0V
2	Center-Left solenoid
3	Center-Right solenoid
4	Center-Left low level
5	Center-Right low level
6	+24V

Component connector. Provides connection to one fixed or removable component.

Pin#	Use
1	Motor phase A
2	Motor phase B
3	+24 V
4	Motor phase C
5	Motor phase D
6	Low level input
7	Solenoid output
8	0 V

I/O LEDs . Show the currently active inputs and outputs.

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

MBX Board (MB300+)

The MBX board is used in all blenders with more than 6 components. It provides the inputs and outputs for two of the components.

The MBX board layout is shown in the following diagram. The MBX board mounts inside the electrical cabinet door.
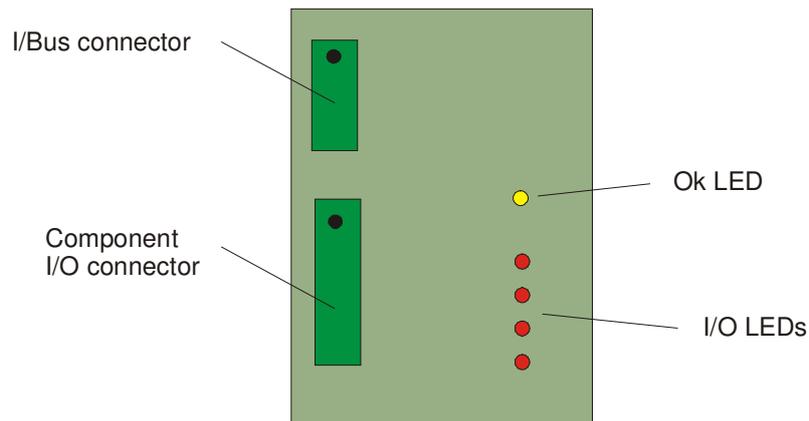
For the two green connectors pin 1 is always at the left hand end looking into the board. In the diagram above a black dot indicates pin 1.

I/Bus Connector. Provides communications between this board and the CPU board.

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

Component I/O Connector. Provides digital inputs and outputs for the components.

Pin#	Use
1	0V
2	Left solenoid
3	Right solenoid
4	Left low level
5	Right low level
6	+24V

I/O LEDs . Show the currently active inputs and outputs.

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

BIO Board (MB-20)

The BIO board is used in the MB-20 blender only. It provides the inputs and outputs for the loadcell, mixer motor and component feeders.

The BIO board layout is shown in the following diagram. The BIO board mounts inside the electrical cabinet on the rear of the blender body.
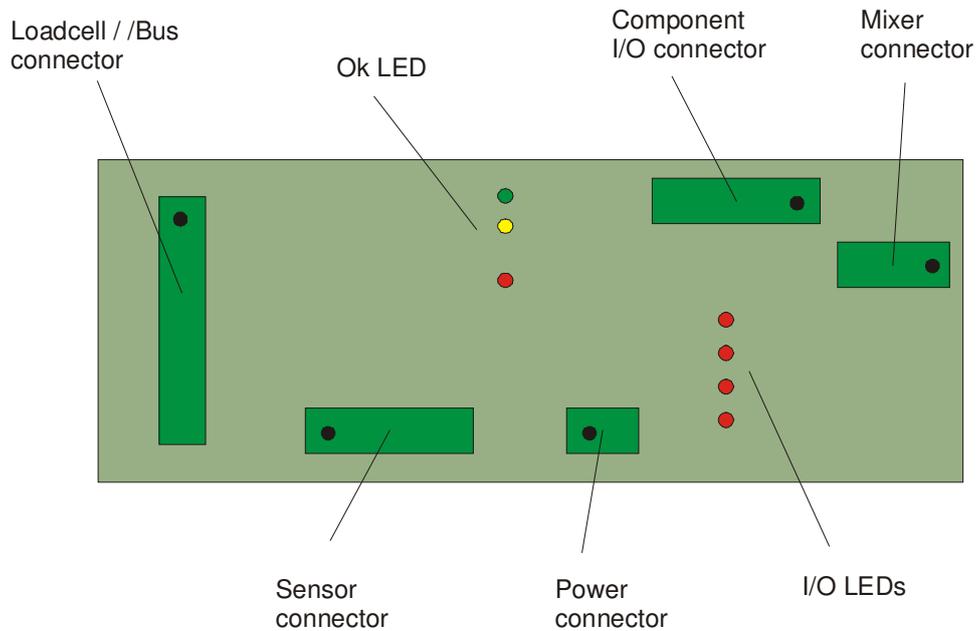
For the two green connectors pin 1 is always at the left hand end looking into the board. In the diagram above a black dot indicates pin 1.

Loadcell / **I/Bus Connector**. Provides loadcell input and communications between this board and the CPU board in the controller.

Pin#	Use
1	Loadcell input +
2	Loadcell input -
3	Loadcell drive (+5V)
4	Loadcell drive (0V)
5	Clock
6	0V
7	+24V
8	Data

Component I/O Connector. Provides power output to each of the four components plus the rate signal for the stepper motors.

Pin#	Use
1	0V
2	Step rate

3	C1 output (+24V)
4	C2 output (+24V)
5	C3 output (+24V)
6	C4 output (+24V)

Mixer Connector. Provides output to mixer stepper motor.

Pin#	Use
1	Phase A-
2	Phase A+
3	Phase B-
4	Phase B+

Power Connector. Provides power output which can be used for devices such as a venturi loader.

Pin#	Use
1	0V
2	+24V

Sensor Connector. Provides inputs for the storage full sensor and the mixer position sensor.

Pin#	Use
1	0V
2	Full sensor in
3	+24V
4	0V
5	Position sensor in
6	+24V

I/O LEDs . Shows the currently active component and whether the mixer is running.

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

Fault Finding

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

NOTE: 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 MiniBlend 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 agent!

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 and all Control Modules have power then the problem must be in the Operator Display, the display components 5 through 8 (if fitted) or the Roll Printer (if fitted). Remove each display and printer from its box and unplug the I-Bus Connector of each. Reconnect the CPU Board's I-Bus Connector. The CPU Power LED should be ON. If not then suspect a short circuit in the cable between the Electrical Cabinet and the Operator Display. Reconnect the I-Bus Connector of each display and printer board one by one to determine which are at fault. Any board at fault will cause all Power LEDs to go OFF. Replace faulty boards.

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 reestablish communication with the Operator Display.

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

N O T   C O N N E C T E D

All boards and modules connected to the I-Bus, except the main Operator Display must be disconnected. This will mean removing the Auxiliary Display (if fitted) and Roll Printer (if fitted) from their enclosures and unplugging the I-Bus Connector. (MB400+) Remove the Slide Valve covers and unplug the I-Bus Connector from each Control Module. Unplug the Printer Interface (if fitted). 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 local agent.

Once the Operator Display has some reasonable message displayed check that button presses are being read. In particular try to enter the Test menu, I-Bus option. Now reconnect each of the previously disconnected boards and modules, one at a time, using the I-Bus 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.

When first powered on you will need to select the MiniBlend model type. Press **Select Option** to change the model and press **Stop** when the right model is selected.

You will then need to select the number of components. Press **Select Option** to change the number and press **Stop** when the right number is selected.

Any changes from the default setup values need to be re entered and the Weigh Chamber will need recalibrating.

Changing the I/O Board

Changing the I/O Board will require the Loadcell Input to be adjusted and the Weigh Chamber 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 local agent, quote the serial number of your MiniBlend when requesting service. The serial number is located on the control cabinet at rear of the MiniBlend. 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 MiniBlend 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 recommended that a set of spares be carried (see below). If you have not purchased these with your MiniBlend we suggest you do so now.

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 MiniBlend requires routine maintenance to ensure you continue to get maximum efficiency from the unit.

On Installation
- Calibrate weigh chamber

- Check air pressure is at 75 psi

3 Months After First Installed

- Calibrate the weigh chamber
- (MB100) Check meshing of gears
- Check for loose bolts

Every 12 Months

- Check calibration of weigh chamber

Every 5 Years

- (MB100) Check gearbox and replace oil
- Check for loose bolts and fatigue

Spare Parts

Recommended Spares

Part No.	Description	MB60- Additive	MB150+ Additive	MB-20	MB-60	MB-150	MB-300	MB-600	MB-1200	MB-2400
312110	Valve stem 49 series					X	X	X	X	X
312130	22mm indicator plug					X	X	X	X	X
312220	Valve body+coil Nugget 40		X		X	X	X	X	X	X
313132	Cyl 20 x 40 double acting		X		X	X				
313136	Cyl 20 x 50 double acting						X			
313146	Clevis (20mm cyl)					X	X			
313154	Cyl 25 x 80 double acting							X	X	
313156	Cyl 25 x 100 double acting									X
313166	Clevis (25mm cyl)							X	X	X
313178	Cyl 32 x 160 double acting								X	
313179	Cyl 32 x 250 double acting									X
330200	BIO - MB20 blender I/O board			X						
330250	CPU - Standard CPU board			X	X	X	X	X	X	X
330460	IO2 - MB60 I/O board				X					
330470	IO3 - Blender I/O board					X	X	X	X	X
330610	OP1 - Standard operator panel			X	X	a	a	a	a	a
330640	OP6 - 6 component operator panel					a	a	a	a	a
331212	Power supply 24v 60W, open				X	X	X	X	X	X
331222	Power supply 24V, 30W, micro			X						
334140	Stepper motor #23, 12V, 0.4A	X	X			X	X	X	X	X
335310	Prox.sensor, Inductive, M12			X						
335410	Prox sensor 30mm capacitive			X	X	X	X	X	X	X
336120	Fuse link 6amp for ASK1/35 fuse			X	X	X	X	X	X	X
336350	Solid State Relay, 1ph, 400V, 3A					X	X	X	X	X
337105	Loadcell, horizontal mount, 5 kg			X						
337115	Loadcell, horizontal mount, 15kg				X					
337135	Loadcell, horizontal mount, 35kg					X	X			
337175	Loadcell, horizontal mount, 75kg							X		
337230	Loadcell, vertical mount, 30kg								X	X
345213	Gearbox NMR25 30:1					X	X			

Other Spares

Part No.	Description	MB60- Additive	MB150+ Additive	MB-20	MB-60	MB-150	MB-300	MB-600	MB-1200	MB-2400
032116	MB150 dosing wheel rubber profile					X				
032140	MB150/300 tipping bearing					X	X			
032141	MB150/300 mixer tipping shaft					X	X			
032242	MB150 mixer shaft					X				
032342	MB300 mixer shaft						X			
032442	MB600 mixer shaft							X		
033116	MB300 dosing wheel rubber profile						X	X		
311010	Filter/regulator				X	X	X	X	X	X
311030	Filter/regulator gauge				X	X	X	X	X	X
312122	Valve coil + plug, 49 series, 24v 2w					X	X	X	X	X
312230	Solenoid plug Nugget				X	X	X	X	X	X
313210	Kinetrol 030 double actuator					X	X			
313225	Kinetrol 070 double actuator							X		
332210	Software EPROM, MBL			X	X	X	X	X	X	X
334210	Strobe light, blue, 12V	X	X							
334220	Strobe light, blue, 24V					X	X	X	X	X
334340	Fulleon panel mount sounder					X	X	X	X	X
335121	Small safety switch				X					
335122	Small safety switch key				X					
335123	Door safety switch					X	X	X	X	X
335124	Door safety switch key					X	X	X	X	X
335137	Microswitch					X	X	X		
336530	Overload, 1.0 - 5.0 amp					X	X	X	X	
336610	Starter dol 5.5kW 415v									X
341220	Bearing 6902 LLU, 15x28x7					X	X			
341230	Bearing 6202 LLU, 15x35x11					X	X	X		
341240	Bearing 609 LLU, 9x24x7			X						
341250	Bearing 6004 LLU, 20x42x12							X	X	X
341260	Bearing 6000 LLU, 10x26x8								X	
342322	Oil seal, 15 x 26mm					X	X			
342331	Oil seal, 17 x 30mm					X	X			
342343	Oil seal, 20 x 35mm							X		
342353	Oil seal, 25 x 35mm							X	X	X
345111	AC motor 1ph 90w					X	X			
345113	AC motor 1ph 375w							X	X	
345114	AC motor 3ph 375w									X
345223	Gearbox NMR40 30:1, 160 flange							X	X	
345224	Gearbox NMR40 40:1, 160 flange									X