

Weighbatch

Central Loading System

Operating Manual

Software Version 1.39e

Operating Manual

Loading System

Table of Contents

INTRODUCTION	7
AT THE VERY LEAST, READ THIS !	8
PRINCIPLE OF OPERATION	9
SAFETY	10
LAYOUT	11
Controller	11
Control Panel	13
Loader	14
Self-Cleaning Filter	16
SPECIFICATION	18
INSTALLATION	19
Physical Layout	19
Controller	19
Filter	19
Vacuum Pump	19
IP/Bus Amplifiers	19
Junction Boxes	20
Vacuum Line	20
Vacuum Pump	20
Main Filter	21
Controller	21
Bus Wiring	22
Earthing	22
Loaders	22
SETUP	24
Entering Setup Menu	24
Changing Setup Options	24
Leaving Setup Menu	24
Setup Options	25
Loader Setup	28

LOADER ADDRESSES	30
Assigning an Address	30
Entering Change Address Menu	30
Leaving Change Addresses Menu	31
Change Addresses Options	31
TESTS	32
OPERATION	33
Starting the Loading System	33
Turning Single Loaders On/Off	33
Stopping All Loaders	34
LCD Displays	34
1> STATUS	34
2> ALARMS	35
3> WARNINGS	35
4> FILTER	35
5> LDRS IN QUEUE	35
6> LDRS CONNECTED	35
7> LDRS MISSING	36
8> UTILISATION	36
9> PUMP HOURS	36
10> SOFTWARE VERSION	36
NOT CONNECTED	36
ALARMS	37
Acknowledging Alarms	37
Alarm messages	37
2> ADDRESS REQD	37
2> ADDR CONFLICT	38
2> FILTER BLOCKED	38
2> LDR DISABLED	38
2> LDR DISCON	38
2> NOT FILLING	38
5> RESTARTED	39
2> TOO SLOW	39
2> VACUUM PUMP O/L	39
MAINTENANCE	40
Weekly	40
Monthly	40
Vacuum Pump	40
TROUBLESHOOTING	41
Won't Go	41
Won't Run	41
FAULT FINDING	42
Verify Power Supply	42
Verify Boards are Running	43
Isolate Communications Problems	43

Changing The CPU Board	43
Changing the I/O Board	43
WARRANTY	44
Service	44
Warranty Procedure:	44
CIRCUIT BOARDS AND MODULES	45
CPU Board	45
I/O Board	46
Loader Board	48
RECOMMENDED SPARES	49

Introduction

This manual describes the installation and operation of the Weighbatch Central Loading System. While we have taken care in designing your Loading System to make it easy to use we encourage you to read this manual to fully understand how it operates and to benefit from the experience of ourselves and previous users.

This manual contains information of use to everybody who uses the Loading System but is written particularly for the person who installs it, sets it up and probably teaches others how it is to be used.

Not everyone likes reading manuals. If you are the sort of person who likes to try first and ask questions later please read the short section **“At the very least, Read This!”**.

The instructions in this manual are designed for the Loading System as a stand alone product. If you have other Weighbatch products using your Loading System, such as the Weighbatch Mini Blend, the manuals accompanying these products should be read in conjunction with this manual.

How this manual is organised

The manual is grouped into four main areas. The first group (Read This, Principle of Operation, Safety and Layout) is a general introduction to the Loading System and how it works.

The next group (Specification, Installation, Setup, Tests and Applications) describes how the Loading System is installed and made ready to operate. The Applications section covers setup options available for different ways you may want to use the Loading System for your own application.

The next group (Operation and Service) describe the day-to-day operation of the Loading System and any regular maintenance requirements.

The final group (Troubleshooting, Warranty, Circuit Boards and Wiring) we hope you don't need to refer to very often. It covers what to look for when things go wrong and how to get things fixed.

If it doesn't work !

If you experience any problems with your unit, please refer to the **Operating** and then **Trouble Shooting** sections of this manual, particularly the **Alarms** section. We have attempted to cover the most likely problems. This will help you gain a better understanding of the Loading System and may result in a quicker solution than going straight to your supplier.

At the very least, Read This !

Ok, a Loading System is really a glorified vacuum cleaner and you probably can install and run it with your eyes closed but there are a few things we would like to draw your attention to.

If you are the operator ...

You're in luck, all the hard work has been done. Just press the main **Run** button on the main control panel to activate the system and then press the **Run** and **Stop** buttons on each loader to turn the loader on and off.

The main thing to watch out for is that there is a clean continuous flow of material. Adjust the material pickup probes so that they have lots of air going up them. You want to avoid any clogging of the material hose or tendency for the material to group into solid, surging plugs.

If you look after the system ...

The main thing is to take care of the vacuum pump and this means regular checking of the filters. There are two filters, the main self cleaning one and the secondary pump filter. The main filter looks after itself mostly and will alarm when it is getting blocked. You just need to take it out occasionally to give it a thorough clean and to check it hasn't been damaged by the blowback air.

The secondary filter mounted on the pump is more important as it is the pump's last line of defense against plastic dust. This dust can destroy the vacuum pump if it melts inside it. Examining the filter regularly (once a week) will also check that the main filter is working correctly. If everything is running as it should be the pump filter will hardly ever need cleaning or replacing.

If you are installing the system ...

Sorry, the Loading System is a bit more complicated to install than most Weighbatch products and you will just have to read at least the **Installation** and **Setup** sections.

Principle of Operation

The Weighbatch Loading System is a central vacuum loading system which uses one common vacuum pump and controller to load multiple hoppers. In its simplest form, the system has four primary components:

- a Vacuum Pump to supply the vacuum or air flow that carries the material,
- a Controller that controls the Vacuum Pump and synchronises the Loaders,
- a communications cable which allows the Controller to talk to each loader,
- and the Loaders themselves.

Up to 48 Loaders can be connected and any number of Vacuum Pumps can be used.

As each Loader empties of material the Controller starts the Vacuum Pump and opens a valve in the top of the Loader which causes air to be sucked through the Loader. This air flow carries material into the Loader where it is deposited by a “cyclone” action. When full, the Loader is emptied through a flap in the base.

Loaders are queued for service by the Vacuum Pump on a first-come/first-served basis. Loaders can be set to either high or low priority with all high priority loaders being serviced before low priority ones.

Safety

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

Follow the normal safety provisions for working with compressed air.

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

Ensure all material is free from foreign objects.

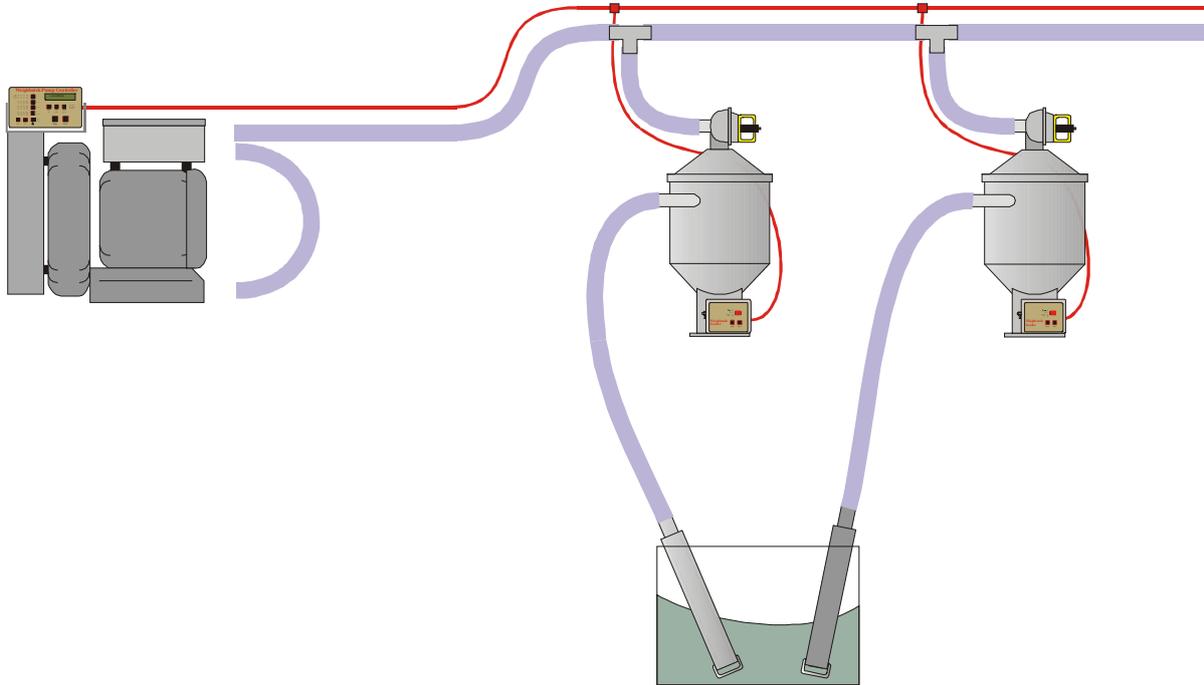
Do not modify your Loading System without consulting Weighbatch.

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

Never operate the Vacuum Pump without an immediately upstream filter. Never allow any item or raw material to pass into or through the pump.

Layout

The following illustration shows how each of the Loading System components are connected.



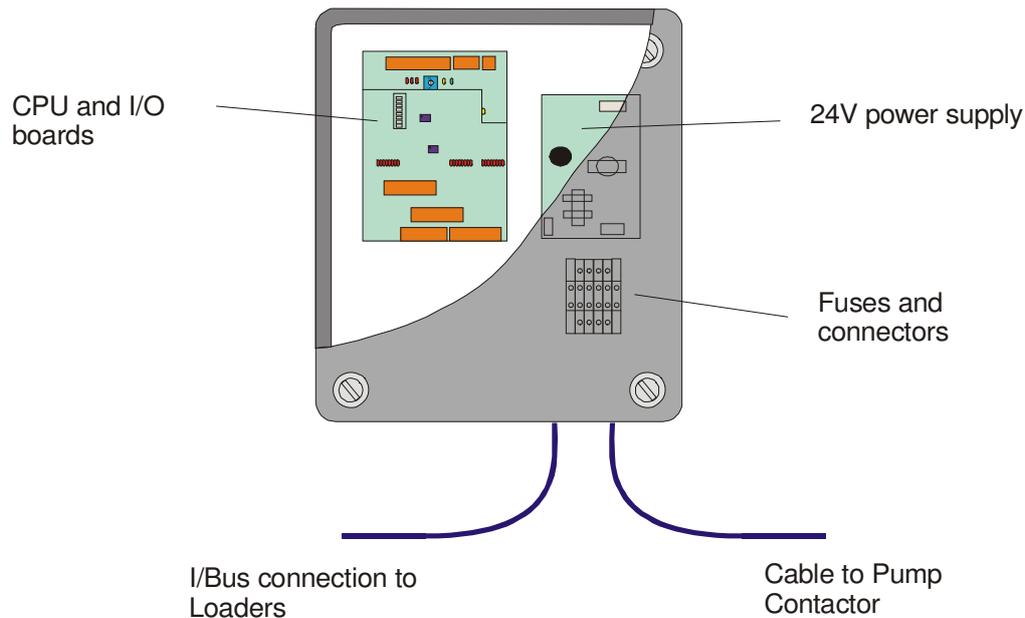
A common vacuum line runs from the Vacuum Pump past each Loader. A “T” junction connects each Loader’s vacuum valve to this common line using flexible hose. The other hose feeds material from a storage bin to the Loader. A filter just upstream of the Vacuum Pump prevents material and dust from passing through the Pump.

A communications cable, referred to as the I/Bus, connects the Controller to each of the Loaders. Depending on the distance between the Controller and the Loaders, and the number of Loaders, there may be signal amplifiers, isolators and junction boxes attached to the I/Bus.

The Loaders may be turned off or on from the control panel on the Loader itself or from the central control panel attached to the Controller. The central panel also displays the current status of the system and allows setup options to be entered.

Controller

The Controller is the central control component of the Weighbatch Loading System. It controls the stopping and starting of the Vacuum Pump, it sends and receives data from the Loaders and it controls the vacuum valves on the Loaders.



24V Power Supply

Low voltage power to the Loading System is provided by a 24V DC switch mode power supply. The supply has a 3A rating.

CPU and I/O Boards

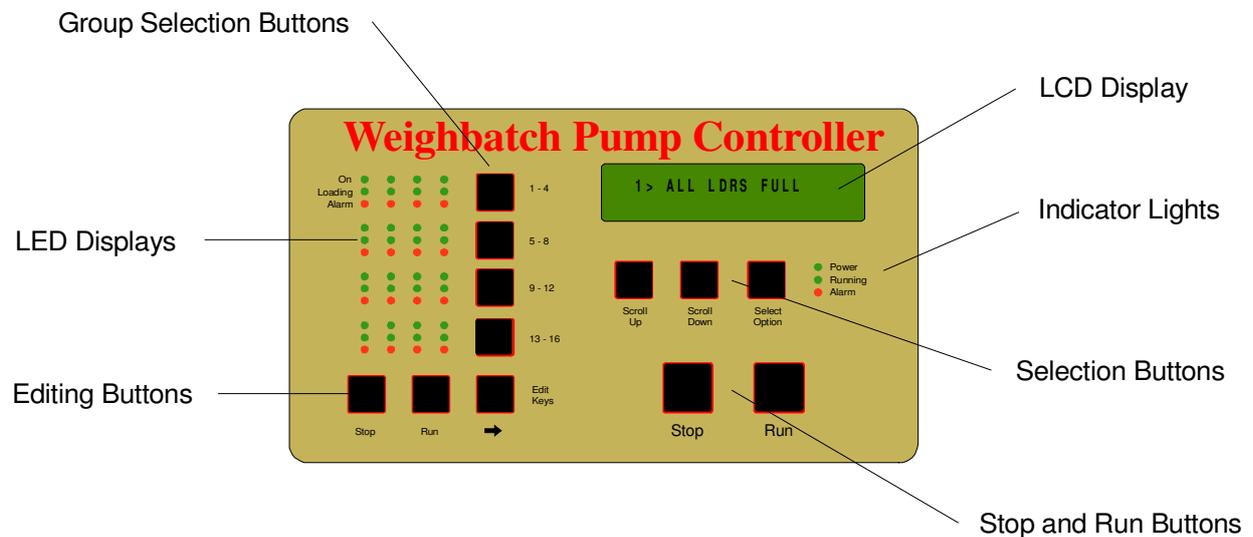
The Loading System is controlled by a Weighbatch designed CPU board. This board contains the control software and non-volatile memory required to store the setup parameters. It also provides serial ports for connection to a supervisory computer. The I/O board mounts on top of the CPU board and provides the primary input and outputs for the Loading System.

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

Vacuum Pump Interface and Starter

The Loading System is supplied with a separate DOL starter and overload to switch the Vacuum Pump on and off. This would usually be mounted near the pump and may be up to 50m from the Controller. It is connected to the controller by an 8 core low voltage cable. The Controller activates a low voltage relay in the DOL starter box which in turn activates the contactor and turns on the pump. An input from the overload relay to the controller is used to detect a pump fault.

Control Panel



The Loading System is run from a simple control panel that is normally mounted on the Controller. The control panel is used to set up the system and to display the current status. It can also be used to turn each of the Loaders on and off.

Group Selection Buttons

Are used to select a group of 4 Loaders.

LED Displays

Displays the current status of all Loaders. The LEDs for each Loader mirror the LEDs on the Loader itself.

LCD Display

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

Loader Control (Edit) Buttons

Are used to turn individual Loaders on and off and to edit settings on the LCD Display.

Indicator Lights

Indicate current status of the Loading System. Power On, Running and Alarm. The top green light will be on when the Controller's power is on.

The middle green light will be on when any of the Loaders are on.

The bottom red light will be on when the system 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.

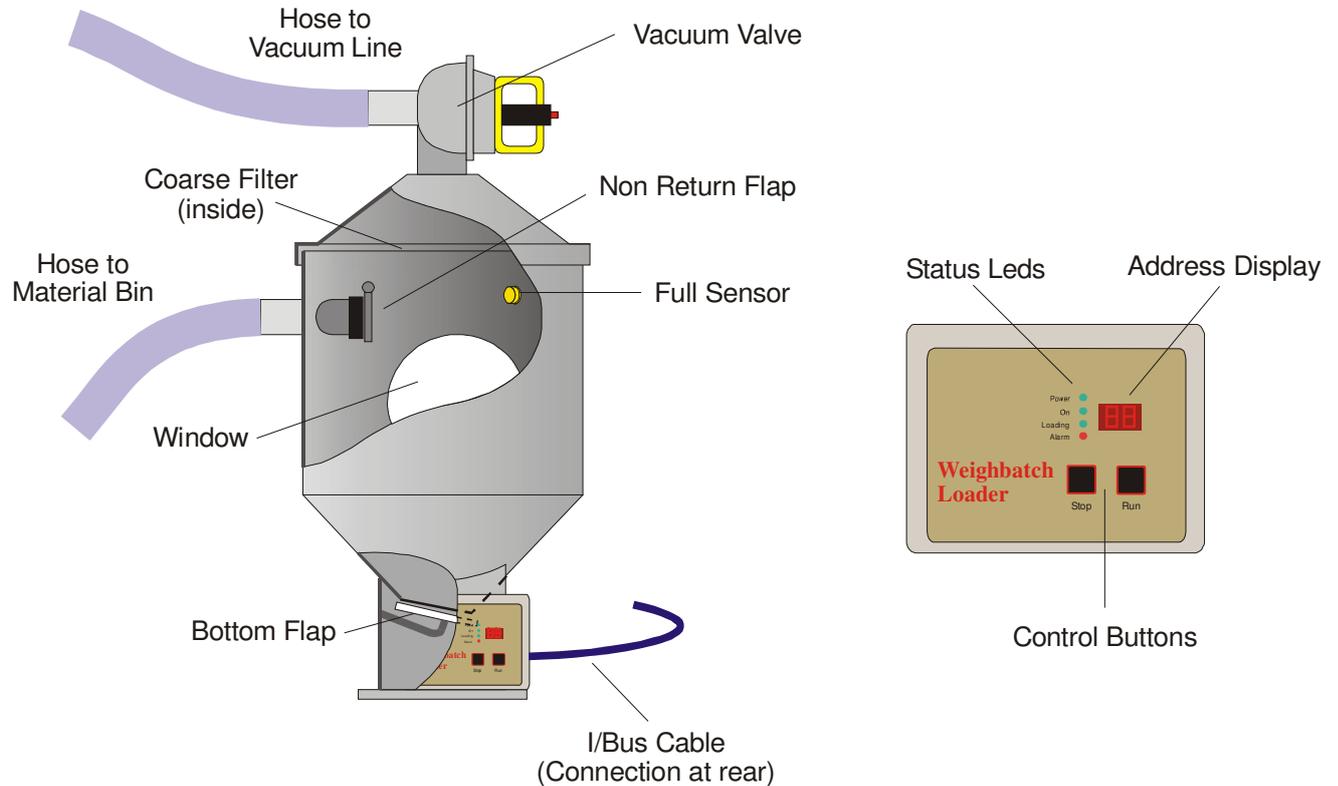
Selection Buttons

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 displayed.

Stop and Start Buttons

Are used to stop and restart all Loaders at once.

Loader



When the vacuum valve is opened the Loader is connected to the central vacuum line and air is drawn through the Loader. The Loader sucks material from a material bin or silo into the body of the Loader.

The cyclone effect and mesh filter within the Loader allows the air to pass through the Loader and leaves the material behind.

When the Loader is full of material the Loader stops sucking and allows the material to fall out through the flap at the bottom of the Loader.

As the material from the body of the Loader drains through the bottom flap it forces the flap open. While the area below the Loader remains full the flap is held open by the material. This flap has a proximity switch fitted to it, which indicates to the system the flap is open and the area below the Loader is full.

The bottom flap is lightly weighted so that when the material falls away from the Loader it will naturally close indicating that the Loader is no longer full. While the loader is sucking material this flap is held shut by the vacuum within the Loader.

Full Sensor

A capacitive proximity sensor is used to detect when the loader has filled with material. Use of this sensor allows for more efficient use of the Vacuum Pump since the Loader can stop loading when full rather than loading for a set time. The sensor also allows the generation of "Not Filling" alarms.

Non-Return Valve (Optional)

The use of a non-return valve allows multiple Loaders to be connected to the same material line. Without this Loaders would tend to draw air from neighbouring Loaders rather than from the material bin.

I/Bus Cable

A connection on the rear of the Loader control box allows the Loader to communicate with the Loading System Controller.

Control Buttons

Two buttons are used to control the Loader. One button turns the Loader On, one turns it Off.

Status LEDs

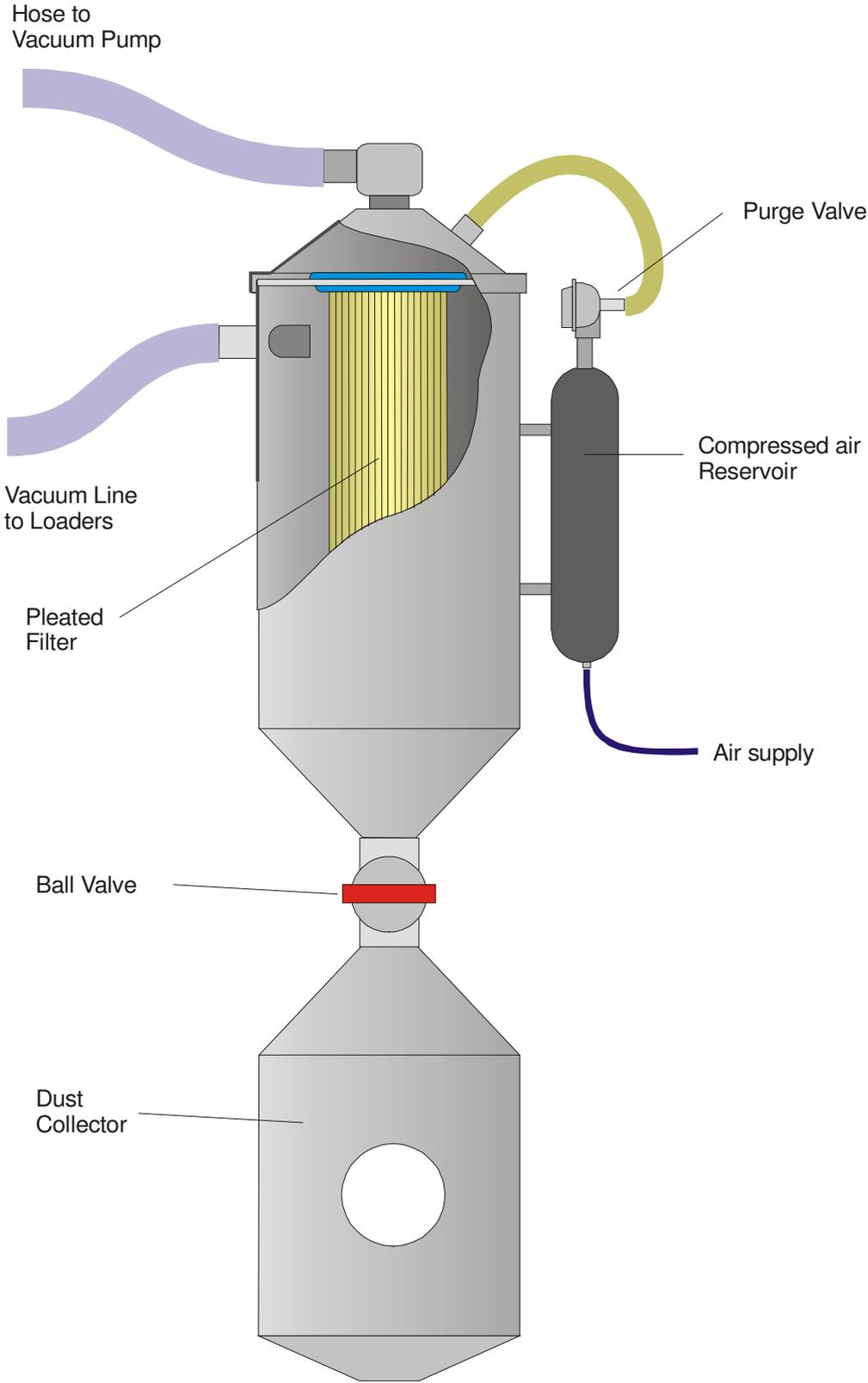
Four Status LEDs show the current status of the Loader. The top green LED indicates power is connected. The second green LED indicates whether the Loader is On. The third green LED indicates if the flap is closed, ie. if the Loader is empty. This LED will flash on and off when the Loader is loading. The bottom red LED indicates an alarm condition for this Loader. An alarm message will be displayed on the LCD display on the operator panel on the Loading System Controller.

The bottom three LEDs are mirrored on the Controller operator panel.

Address Display

Each Loader has a unique address number between 1 and 48 and this number is displayed on the Address Display. When there is an alarm condition on the Loader the display will change to show an alarm number of the form "E1". A list of these Loader alarms is given in the **Alarms** section.

Self-Cleaning Filter



The self-cleaning filter is installed immediately prior to the Vacuum Pump. Each time the pump is about to start the purge valve is opened briefly and high pressure air from the reservoir flows through the filter. This backflushes the filter and blows dust from the surface of the filter through the ball valve into the dust collection bowl. The collection bowl can be emptied with the pump running by closing the ball valve.

Specification

Parameter	Value	Condition
Maximum Loaders	48	
Max. Controller to Loader distance	15m	Without amp.
Max Controller to Loader distance	100m	With amplifier
Single phase electrical supply	80-240 VAC, 60W	
Three phase electrical supply		Refer vac. pump
Air supply	2 - 10 Bar	

Installation

Physical Layout

The Loading System is a very distributed product with parts of it spread all over the plant. The first step is to decide where all of the parts are to be positioned. Some of the parts are supplied together because that is the way they are normally installed but these can be separated if you wish. The Controller is supplied attached to the filter stand. The main operator display panel can be separated from the Controller.

Controller

Firstly decide on the position of the Controller. This may depend on what type of communications wiring you use. The system Controller communicates with each of the Loaders over a serial link which we call the **I/Bus**. Because this link also supplies power to the Loaders it is subject to voltage drops which can interfere with the communications. Because of this the simple I/Bus is limited to about 15m of cable between the Controller and any Loader. Beyond this you will need to use a slightly different link, the **IP/Bus** with amplifiers servicing clusters of Loaders.

The rule of thumb is that if all of the loaders are within a 10m radius from the Controller then you can use the simple I/Bus. Otherwise you will need to plan on using IP/Bus wiring. Note that the controller does not need to be near the filter or the vacuum pump. It could be in the middle of the production area with the filter and pump mounted outside.

The Controller will need a single phase electrical supply.

Filter

The main filter is supplied with the Controller attached but these can be separated. The filter is usually mounted near the vacuum pump although this is not necessary. It needs reasonable access for the operators to empty the dust collection bowl and it will need a compressed air supply.

Vacuum Pump

The vacuum pump can be mounted almost anywhere. The pressure losses in the vacuum line after the Loader are very small and so you don't normally need to worry about the length of the vacuum line. The pumps make a bit of noise and this may influence the position. If you can converse in the production area in a normal voice then the pump noise would be intrusive although not unbearable. A small amount of soundproofing could be used to correct this.

Remember that the vacuum pump blows out air and although it is well filtered (we hope!) you should consider where you point it.

The vacuum pump will need a compressed air supply (not needed for side channel pumps) and a three phase electrical power supply.

IP/Bus Amplifiers

If you need to use an IP/Bus wiring scheme then you will need to look at the clustering of the Loaders and decide where the Amplifiers should be mounted. Each Amplifier can service Loaders within a 10m radius approximately.

Junction Boxes

Unless you have a very simple Loading System with few Loaders you will probably wire the communications using a backbone/dropper type bus scheme rather than point-to-point with each Loader connected directly to the Controller. This point-to-point scheme is possible but hardly ever done in practice. The bus type wiring scheme uses junction boxes at each point of takeoff from the main bus. These may have been supplied by Weighbatch or you may be making your own. The Weighbatch Junction Boxes are designed to handle both the I/Bus (or IP/Bus) and the S/Bus used for communications back to a supervisory PC as these usually run together.

The positioning of the Junction Boxes usually depends on where the backbone I/Bus cable is run. From the junction box you will be connecting either to an Amplifier (IP/Bus) or directly to a cluster of Loaders (I/Bus).

Depending on the wiring layout of an IP/Bus you may not need Junction Boxes but run the backbone IP/Bus cable directly from Amplifier to Amplifier. The main object of the wiring scheme is to minimise the length of the I/Bus or IP/Bus cable.

Vacuum Line

The vacuum line carries air from the Loaders to the pump. It is subject to high levels of vacuum. The simplest, and most effective, material is 50mm PVC pressure pipe. This is easy to install and has a wide range of fittings available.

The vacuum line needs to run near the Loaders. Each Loader will be connected by 38mm ID flexible hose to the vacuum line and these links can be as long as you like so you have a lot of flexibility in how the vacuum line is run. You need to provide some form of "T" connection to the vacuum line where each Loader (or group of Loaders) is connected. It is useful, but not essential, to put a valve at this connection point so the Loaders can be isolated from the vacuum line.

If possible, arrange the takeoff "T"s so that they do not point downwards. There is some plastic dust which tends to travel along the bottom of the vacuum line and this will drop into any downward pointing "T"s.

The end of the vacuum line should terminate in a 50mm hose tail for connection to the main filter using flexible hose. Don't forget to close off the open end of the vacuum line.

Vacuum Pump

Bolt the vacuum pump needs to be bolted to its mounting base unless already supplied like that. Bolt the Pump Interface/Starter to the mounting frame. This is optional, you can mount the Interface/Starter away from the pump if you prefer. Bolt the mounting base into position. Consider the outlet exhaust air and access to the pump motor, oil filler and Interface/Starter.

Wire the Starter to the three phase supply through an isolating switch. Using a three phase plug and socket is also recommended for future maintenance. Wire the Starter to the pump if not already done. Manually close the contactor to check pump rotation. The correct rotation is shown by an arrow on the body of the pump.

For rotary lobe or vane pumps install the vacuum valve on the inlet to the pump. Connect the valve to a compressed air supply using 6mm air line. Connect the valve solenoid to the Pump Interface using the pre-wired lead.

Attach the pump filter to the vacuum valve (rotary lobe) or directly to the pump (side channel). The pump filter must be installed horizontally so that material does not fall into the pump when the filter cartridge is removed for cleaning.

Main Filter

Bolt the main self cleaning filter in position. Consider access to empty the dust collection bowl. If the Controller is left mounted on the filter then consider access to the electrical cabinet.

Connect the filter to the compressed air supply through the regulator. Set the regulator to 3 Bar. This pressure controls the force of the filter blowback. Setting it higher will give a more effective clean but setting it too high will possibly damage the filter cartridge.

Connect the filter inlet (the one on the side) to the vacuum line with 50mm flexible hose. Connect the outlet (the one on the lid) to the vacuum pump filter also using 50mm hose. These hoses are subject to possibly full vacuum. Do not use hose which will compress and shorten under vacuum. We recommend a solid wall, spiral reinforced type such as "Plutone". Try to use hose with steel reinforcing or made from anti-static material.

On the side of the filter stand is a small connection box containing the filter pressure loss sensor. Connect this to the Pump Interface using the pre-wired cable and DIN plug.

Controller

Mount the system Controller unless you are leaving it mounted on the filter. Consider access by the operators to the display panel and access to the electrical cabinet. The display can be removed and mounted up to 10m away.

Connect the Pump Interface to the Controller using the pre-wired 8 core cable. This connects to the connectors inside the Controller as follows:

Cable Core	Connector No.
Green	23
Yellow	24
Red	25
Blue	26
Black	27
White	28
Brown	29
Purple	30

If you have multiple vacuum pumps then connect the second pump Interface to the first pump Interface using the 8 core cable in a daisy-chain scheme as follows:

Cable Core	Connector No.
Green	1
Yellow	2
Red	3
Blue	4
Black	5
White	6
Brown	7
Purple	8

Connect the Controller to the single phase electrical supply. At this point you can test the pump and filter controls if you wish using the **Tests** menu on the controller. If you do then don't forget to turn the power off again before continuing with the wiring.

Bus Wiring

Install the Junction Boxes and Amplifiers as required. Wire the backbone I/Bus or IP/Bus cable between Junction Boxes and from the first Junction Box to the Controller.

If using I/Bus then use 4 core shielded cable. If using IP/Bus then use either Weighbatch IP/Bus cable (Part No. 351016) or use 4 core shielded cable plus 2 core x 0.5mm cable.

Between Junction boxes connect as follows:

Cable Core	Connector No.
Green	1
Yellow	2
Red	3
Blue	4
Brown (IP only)	5
White (IP only)	6

Between the first Junction Box and the Controller connect as follows:

Cable Core	Junct.Box No.	Controller No.
Green	1	11
Yellow	2	12
Red	3	13
Blue	4	14
Brown (IP only)	5	15
White (IP only)	6	16

If using IP/Bus then connect the Amplifiers to the Junction Boxes as follows:

Cable Core	Junct.Box No.	Amplifier No.
Green	1	1
Yellow	2	2
Red	3	3
Blue	4	4
Brown (IP only)	5	5
White (IP only)	6	6

Earthing

The cable shields should all be connected using the Green/Yellow connectors in the boxes and the backbone cable should be connected to the Earth connector in the Controller. Any alternate Earth paths will lead to communications problems.

If using the Junction Boxes for S/Bus wiring as well ensure that the no additional earth connections are introduced through this.

Loaders

Mount the loaders on the hoppers they are filling. Ensure there is an adequate opening for the flap to swing without interference. Consider operator access to the control buttons and access to the control box for electrical servicing.

Also consider the effect of vacuum if the flap does not seal fully. If the hopper the Loader is mounted on is fully sealed then it is possible, if the material hose is blocked, for full vacuum to be applied to the hopper. This could cause failure of the hopper or may try to pull material away from the extruder

or other process. This is particularly possible if you load material from plastic bags or from bins with flexible liners.

Connect each Loader to the nearest Junction Box (I/Bus) or Amplifier (IP/Bus) using the supplied Loader cable as follows:

Cable Core	Junct.Box No.	Amplifier No.
Green	1	7
Yellow	2	8
Red	3	9
Blue	4	10

Connect the shield of the Loader cable at the Junction Box or Amplifier end. Unless recommended by Weighbatch do **NOT** connect the cable shield to the loader. However you should ensure that the loader body is electrically earthed through its hopper mounting in order to help static dissipation.

Connect the Loader vacuum valve to the vacuum line using 38mm flexible hose. These hoses are subject to possibly full vacuum. Do not use hose which will compress and shorten under vacuum. We recommend a solid wall, spiral reinforced type such as "Plutone". Try to use hose with steel reinforcing or made from anti-static material.

Connect the Loader material inlet to the pickup probe or supply line using flexible hose. These hoses are not usually subject to the same level of vacuum (unless the probe is blocked) and a semi-rigid hose may be used. It is even more important that the material hoses have some level of electrical conductivity to avoid static problems. Either a steel reinforcing or made from anti-static material. If using a steel reinforced hose make sure that the steel reinforcing is in contact with the Loader and with the probe.

Failure to control static generation in the material lines will lead to serious on-going problems with the Loading System and with other electrical control equipment.

Setup

The Loading System has a series of setup parameters used to alter the way it performs. During normal operation it will not be necessary to access these parameters and care is necessary when viewing or editing them.

Entering Setup Menu

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

**CONTROL OPTIONS:
CHANGE SETUP DATA**

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

**SETUP DATA:
FILTER PULSE=2.0**

Changing Setup Options

Within the 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

VACUUM=NORM.OFF

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

VACUUM=NORM.ON

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 **Edit Keys**, ie. the **Stop**, **Run**, and **→** buttons. The **Stop** button will decrease the value. The **Run** button will increase it. For example, if the option displayed is

FILTER BLK=20 mBar

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

**FILTER BLK:
020 mBar**

One digit is underlined. Pressing the **→** button will move the underline to another digit. Pressing the **Run** button will increase the underlined digit by 1. Pressing the **Stop** button will decrease it by 1.

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

Leaving Setup Menu

Pressing the large **Stop** button will display:

SETUP DATA:
GOTO LOADER <SEL>

Pressing the **Select Option** button will allow you specify a loader number and will take you straight to the specified loader's setup data.

Press the **Stop** button to leave the 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 Setup Data menu is

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 Loading System before leaving the 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 Setup Data menu. The values shown are the default values.

FILTER PULSE=1 SEC

The time (in seconds) the self cleaning filter is pulsed for.

The Weighbatch self cleaning filter uses a pressure reservoir and a high flow rate dump valve to cause a rapid blast of air into the filter. For this filter the default value of 1 second is fine. Other filters may require a longer continuous output for filter cleaning.

FILTER DWELL=2 SEC

The time (in seconds) between the filter cleaning pulse and turning on the vacuum output. This gives some time for the material loosened by the cleaning

pulse to fall away from the filter before the vacuum is turned on and the material sucked back onto the filter.

FILTER FREQ=0

Specified how often the filter cleaning cycle is performed. If set to 0 or 1 then the cleaning is done every time the system is idle. If set to N then it is

done every Nth time. The system is idle when all loaders are either full or emptying, ie. there are no loaders wait to fill.

FILTER PERIOD=0 SEC

If set to zero then filter cleaning is done once each time the system starts up from idle (as above). If set to a non-zero value then the filter cleaning pulse

is done periodically at the specified number of seconds until the system becomes idle again. This should only be set to a non-zero value if using a filter capable of being cleaned while in use such as the Weighbatch Double Filter.

FILTER BLK=0 mBAR

Sets the differential pressure across the filter at which the Filter Blocked alarm is raised. If set to zero the alarm is disabled.

VACUUM=NORM.OFF

Specifies whether the vacuum source should be turned off or left on when the system is idle. The options are:

NORM.OFF	Turn vacuum off when idle
NORM.ON	Leave vacuum on when idle. Vacuum only turned off when filter cleaning
ANY ON	As above but turn vacuum off when no loaders are on.

The vacuum can be left on if there are small independent vacuum loaders sharing the same pump and vacuum line.

VAC FLUSH=0 MIN

If set to a non-zero value then this is the period (in minutes) at which any vacuum line flush valves are turned on. The valves are turned on for 5 seconds.

INTER HOPPER=0 SEC

Specifies the time between one loader finishing loading and the next loader in the queue starting. Used with systems with large vacuum line volumes

and small pumps to allow time for the vacuum level to rise and so ensure a clean start to loading.

MIN LOAD=5 SEC

Specifies the minimum loading time. Avoids the problem of loaders detecting they are full because of the initial surge of material past the sensor.

QUEUE HIGH=0

If non-zero and the number of loaders in the queue exceeds this number then the Queue High output is turned on.

This output could be used as an alarm or could be used to start a second backup vacuum pump to temporarily increase the pumping capacity.

AMS=NONE

Specifies the type of Weighbatch Automatic Material Selector controlled by the system. The options are:

NONE	No AMS fitted
16 WAY	16 way AMS
24 WAY	24 way AMS
32 WAY	32 way AMS
48 WAY	48 way AMS
32 CHAIN	Old chain drive 32 way AMS
36 CHAIN	Old chain drive 36 way AMS

AMS MAX SPEED=40 %

Specifies the maximum AMS arm velocity as a percentage of the absolute arm controller speed. If set too high may cause overshoot of the target hole.

AMS MIN SPEED=2 %

Specifies the minimum AMS arm velocity as a percentage of the absolute arm controller speed.

AMS SHORT MAT=0

If set to non-zero then specifies a material port number for which the loading time is reduced.

AMS SHORT TIME=0 SEC

Specifies the short loading time for the material port specified above.

Short loading is typically set up for one inlet port which just sucks filtered air. This is used for loader purging during material changes. Because it is sucking air the loader will not fill and would otherwise suck for the full loading time and then raise the Not Filling alarm.

AMS FLUSH=0 SEC

Specifies the time for which the AMS lower coupling is open while the loader continues loading to flush material from the AMS pipes.

AMS CLEAN=0 SEC

Specifies the time that the AMS will wait after a faulty loading cycle in order for any leftover material to drain from the AMS pipes.

AMS PPR VERIFY=YES

Normally set to YES. Set to NO for older selectors with arm control software older than version 1.10.

AUX MSG=AUX.ALARM

Specifies the alarm message text to be displayed for an Auxillary Input alarm (see later).

N/F ALM=NO FILL

Specifies the conditions under which the Not Filling alarm is raised. The options are:

NO FILL	Alarm is raised if material does not reach the full sensor within the specified allowable loading time
SLOW	Alarm is raised if material does not reach sensor (as NO FILL) and the flap closes immediately after emptying

The SLOW option can be used to prevent alarms being generated by material which is occasionally difficult to load (such as regrind). If the flap stays open after the loader empties then while the loader may not be loading well it is at least keeping up with the process.

N/F ALM ON=ONCE

Specifies how often the Not Filling alarm is raised. The options are:

ONCE	The alarm is raised when it first happens. If acknowledged by the operator it will not be raised again until the loader completes at least one good load
CYCLE	The alarm is raised on every bad cycle even if the operator acknowledges the alarm

ALARM=ALWAYS

If set to **NO COMMS** then the alarm output will not be turned on if communication with a supervisory PC is detected.

This option is used in PC controlled installations to avoid multiple alarms sounding when the supervisory PC has its own alarm.

ENABLE ALL CONNECTED

Pressing **Select Option** when this is displayed will cause all connected loaders to be enabled.

This is used as a fast method of enabling all loaders in a new installation. Any currently enabled loaders which are currently not connected will remain enabled.

DISABLE ALL MISSING

Pressing **Select Option** when this is displayed will cause all unconnected loaders to be disabled.

This is used as a fast method of disabling loaders after a significant system change. Any currently disabled loaders which are currently connected will remain disabled.

Loader Setup

The following options are repeated for each loader (1 through 48). A loader must be enabled in order to display all of the setup the options.

No.1 = ENABLED

Enables or Disables the Loader. The following options will only be displayed if the Loader is Enabled.

No.1 NAME=LDR 1

The short descriptive name for the Loader.

No.1 FILL=60 SEC

The maximum time that the Loader will load before stopping and raising a Not Filling alarm.

No.1 EMPTY=5 SEC

The time allowed for the Loader to empty. If the bottom flap of the Loader does not close within this time the Loader is regarded as FULL.

No.1 PURGE=NONE

The length of time an optional purge valve on the material line will be activated at the end of loading.

No.1 ALARM=NO FILL

Specifies if Not Filling alarms should be raised for this loader.

No.1 ALM.AT=FIRST

Specifies whether a Not Filling alarm should be raised the **FIRST** time it happens or on the **THIRD** time.

No.1 AUX AL=NONE

Specifies the conditions under which the loader's auxiliary alarm is raised. The options are:

NONE	No auxiliary input alarms
LDR ON	Auxiliary alarm raised when Loader is On and auxiliary input is active
LDR OFF	Auxiliary alarm raised when Loader is Off and auxiliary input is active
BOTH	Auxiliary alarm raised whenever auxiliary input is active

No.1 AUX MD=NONE

The auxiliary input mode. The options are:

NONE	Auxiliary input not used
INHIBIT	Auxiliary input inhibits loading
RUN	Auxiliary input required for loading

No.1 ZONE=0

The alarm zone number for the Loader.

A number of optional Zone Alarms may be fitted to the Loading System each of which has a number. If any loader in this zone has an alarm condition then the zone alarm output will be activated. This is used to provide a single alarm for a group of loaders.

No.1 PRIORITY=HIGH

The Loader priority. HIGH priority Loaders are serviced before LOW priority ones.

The previous options are repeated for each enabled Loader.

Loader Addresses

Each of the Loaders in a Loading System has a unique address number between 1 and 48. When first powered up the Loader address must be set manually. This address may subsequently be changed from the Controller using the Change Address Menu. It can also be changed manually at the Loader at any time.

Although you can use any address in the range 1 to 48 you will usually be limited by the main display panels you have. The basic display panel will show the status and allow Loaders 1 to 16 to be turn off and on. If you use a Loader address of 17 or higher it will work but you will have to turn it off and on from the Loader itself. You can get main displays which allow control of Loaders 17 to 32 and Loaders 33 to 48. These can be fitted at a later date as the Loading System expands.

Assigning an Address

When a new Loader is first connected it will initially have no address and will display the letters "AA".

To change the address, press and hold the **Stop** button. After about 2 seconds the display will change to show



Continue to press the **Stop** button. After a few more seconds the address will be shown



with a dot beside one of the digits. Pressing the **Run** button will cause the selected digit to increase. Pressing the **Stop** button will move the dot to the left and select the tens digit of the address. The **Run** button can then be used to set that part of the address. Pressing the **Stop** button again will cause the address to be saved and displayed without the dot.



Entering Change Address Menu

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

**CONTROL OPTIONS:
CHANGE SETUP DATA**

Press the **Scroll UP** button to move to the Change Addresses option.

**CONTROL OPTIONS:
CHANGE ADDRESSES**

Press the **Select** button to enter the Change Addresses menu:

CHANGE ADDRESSES:

No.1

Leaving Change Addresses Menu

Press the **Stop** button to leave the Change Addresses menu and return to the Control Options Menu. Press the **Stop** button again to return to normal operation.

The last option in the Change Addresses menu is

CHANGE ADDRESSES:

EXIT

Selecting this option will also leave the Change Addresses menu.

Change Addresses Options

The following options are available within the Change Addresses menu with the **Scroll Up** and **Scroll Down** buttons:

No.1

Pressing the **Select Option** button allows you to enter a new address for the specified Loader. The new address entered must not conflict with a connected Loader.

This option is repeated for all connected Loaders.

INSERT ONE

Pressing the **Select Option** button allows you to insert a gap into the list of addresses.

You will first be requested to confirm that you do wish to insert a gap and then will be asked at which address number the gap should be inserted. For example, if you request a gap to be inserted at address 12 then all Loaders numbered 12 and above will have their addresses increased by one.

DELETE ONE

Pressing the **Select Option** button allows you to delete one address from the list of addresses.

You will first be requested to confirm that you do wish to delete an address and then will be asked which address should be deleted. For example, if you request to delete address 12 then all Loaders numbered 12 and above will have their addresses decreased by one.

RESET ALL

Pressing the **Select Option** button will cause all Loaders to lose their current addresses

The Loaders will display "AA" and wait to be manually assigned a new address. You will be requested to confirm that you do wish all addresses to be reset.

Tests

In order to help resolve problems with the Loading System 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:
CHANGE SETUP DATA**

Press **Scroll UP** twice 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.

PUMP 1=OFF

Press the **Select Option** button to turn the Vacuum Pump on and off.

SINGLE LOADER

Forces the Loading System into a mode which allows only one loader to run at once.

PURGE VALVE

Turns the Purge Valve output On/Off every two seconds until a button is pressed.

Operation

This section assumes that your Loading System has been already installed and set up as described in the **Setup** section.

Starting the Loading System

Step 1

Turn the power on with the switch mounted on the Controller.

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

WEIGHBATCH NZ LTD
HOPPER LOADER

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

5> RESTARTED
PRESS SELECT TO ACK

A number of other alarm messages may be displayed briefly as the system connects to each Loader.

Step 2

Press the **Select Option** button to ACK (acknowledge) that the Loading System has restarted.

Any Loaders which were On the last time the Loading System was running will be turned on and if any of these Loaders are empty they will start filling.

Turning Single Loaders On/Off

Loaders may be turned On and Off either from the Loader or from the operator panel on the Controller.

From the Loader

Each Loader can be operated simply by pressing the **Run** and **Stop** buttons on the Loader itself. When the **Run** button is pressed the **On** LED will turn on. If the Loader is empty (ie. its bottom flap is closed) the **Loading** LED will turn on and Loader will start to load material within a few seconds. Pressing the **Stop** button will stop the loader instantly.

From the Controller Panel

To operate a Loader using the Controller panel you first need to know its position. The control panel shows four groups of four Loaders where Loaders No 1..4 are in the first row, Loaders No 5..8 are in the second etc.

First select a row by pressing a **Group** button. The leftmost Alarm LED will begin to blink. This blinking LED indicates the selected Loader. Use the **→** button to move the selected Loader (blinking LED) to the right. When the required Loader is selected the small **Stop** and **Run** buttons will stop and start the selected Loader as if controlled directly from the Loader itself. Press the same **Group** button

to stop the alarm LED blinking or another **Group** button to select another row. The LED will stop automatically after 30 seconds.

Example

- To turn on Loader No. 6 from the Controller panel:
1. Select row 2, using the “5-8” button. The left hand alarm LED will flash.
 2. Press the → button to select Loader 6.
 3. Press the small **Run** button to turn on the Loader.
 4. Press the “5-8” button again to deselect the Loader.

Queue Jumping

If more than one Loader requires material at the same time the Loaders fall into a queue. This queue normally ensures Loaders are serviced on a first-come/first-served basis. If you need to force a Loader to load immediately then pressing the **Run** button on the loader will advance it to the top of the queue, interrupting any other loader that may be loading. This also happens when a Loader is first started.

Stopping All Loaders

Pressing the large **Stop** button will stop all loading operations immediately. The Loaders remain turn “on” but will not load. The pumps will stop running.

Pressing the large **Run** button will start loading again as normal.

LCD Displays

During normal operation the LCD Display, on the right hand side of the operator panel, shows the current status of the Loading System 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.



The **Scroll UP** and **Scroll DOWN** buttons are used to increment and decrement the display number.

1> STATUS

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



Indicates that all loaders have been stopped. The large **Stop** button can be used to stop all Loaders.



Indicates that all loaders that are on are full (bottom flaps open).
It does not mean that all loaders are On.

1> PUMP ON

Appears only when the vacuum pump is first started and is running up to full speed.

1> LOADING No.7
LDR 7

Indicates Loader No 7 is loading. The second row is the descriptive name given to the Loader.

1> PURGING No.7
LDR 7

Indicates Loader No 7 has a purge valve fitted and it is currently purging the material line.

1> EMPTYING No.7
LDR 7

Indicates Loader No 7 has finished filling and is emptying. This will only be displayed if no other Loader starts loading.

2> ALARMS

2> NO ALARMS

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

3> WARNINGS

3> NO WARNINGS

Display <3> is used to show any active acknowledged alarms. For the full list of alarms refer to the **Alarms** section.

4> FILTER

4> FILTER 0%
BLOCKED @ 50%

Display <4> shows the pressure drop across the vacuum filter and the alarm trip point. This only applies if an optional vacuum loss sensor has been installed.

5> LDRS IN QUEUE

5> LDRS IN QUEUE 2
3 7

Display <5> shows the number of Loaders loading or waiting to load. The Loader numbers are listed.

6> LDRS CONNECTED

6> LDRS CONNECTED 8
SELECT TO LIST

Display <6> shows the number of connected Loaders. Pressing the **Select Option** button will display the first connected Loader status.

6> LDRS CONNECTED 8
LDR 1 FULL

Press the **Scroll** buttons to display the other connected Loaders.

7> LDRS MISSING

7> LDRS MISSING 0
SELECT TO LIST

Display <7> shows the number of Loaders which ought to be connected (ie. enabled in the setup) but fail to respond. Press **Select Option** to list the missing Loaders.

8> UTILISATION

8> UTILISATION 35%
SELECT TO LIST

Display <8> shows the percentage utilisation of the Loading System, ie. what fraction of the time is it loading. Press **Select Option** to list the utilisation of each Loader.

9> PUMP HOURS

9> PUMP HOURS 1856

Display <9> shows the total number of hours for which the Vacuum Pump has been running. Press **Select Option** to reset this total to zero.

10> SOFTWARE VERSION

10> SOFTWARE VERSION
LDR v1.14c

Display <10> shows the version number of the Controller software.

NOT CONNECTED

Not connected

This message is displayed by the operator panel when it has lost communication with the Controller CPU board. Refer to the **Fault Finding** section.

Alarms

Acknowledging Alarms

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

2> NOT FILLING No.7 LDR 7 SEL/ACK
--

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

Warnings

When an alarm is acknowledged and the alarm condition still applies the alarm message is converted to a warning and will be listed along with other warnings on display <3>.

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.

2> ADDRESS REQD

2> ADDRESS REQD SELECT TO ACK

Means that one or more Loaders is waiting to be assigned a new address. These Loaders will display "AA" as their address.

If a new Loader has just been connected to the system:

- Press the **Stop** button on the new Loader(s) to assign new address numbers.
- Press **Select Option** to acknowledge the alarm.
- Refer **Loader Addresses**.

If no new Loaders have been connected:

- Check the address display of all Loaders.
- Assign addresses to any Loaders with address display "AA" by pressing the **Stop** button on the loader.
- Change any incorrect Loader addresses. Refer **Loader Addresses**.

2> ADDR CONFLICT

2> ADDR CONFLICT #1
SELECT TO ACK

Means that two Loaders are trying to use the same address.

Check:

- Check the address display of all Loaders.
- Assign addresses to any Loaders with address display “AA” by pressing the **Stop** button on the loader.
- Change any incorrect Loader addresses. Refer **Loader Addresses**.

2> FILTER BLOCKED

2> FILTER BLOCKED
SELECT TO ACK

Means that the pressure loss across the vacuum filter exceeds the nominal “blocked” value.
Only applicable when vacuum loss sensor is installed.

Check:

- Is the blocked value correct. Refer **Display <4>**.

2> LDR DISABLED

2> LDR DISABLED No.1
LDR 1 SEL/ACK

Means that a Loader with address number 1 has been connected to the system but has not been enabled in the Setup.

If a new Loader has been connected:

- Enable the new Loader. Refer **Setup**.

If a new Loader has not been connected:

- Check the address display of all Loaders.
- Change any incorrect Loader addresses. Refer **Loader Addresses**.

2> LDR DISCON

2> LDR DISCON No.1
LDR 1 SEL/ACK

Means that an enabled Loader is no longer responding to communication from the Controller.

Check:

- Has the Loader been unplugged?
- Refer **Fault Finding**.

2> NOT FILLING

2> NOT FILLING No.1
LDR 1 SEL/ACK

Means that material is not being loaded into the Loader and activating the Loader’s Full Sensor within the setup maximum loading time.

Check:

- Have you run out of material?
- Is material being loaded into the Loader?

- Is there a vacuum leak or restriction of the material line?
- Is the maximum load time too short? Refer **Setup**.

5> RESTARTED

**5> RESTARTED
SELECT TO ACK**

Means that the Controller 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.

2> TOO SLOW

**2> TOO SLOW No.1
LDR 1 SEL/ACK**

Means that three consecutive loads were insufficient to fill the storage area below the Loader.

Check:

- Storage area was empty?
- Loader is filling too slowly?
- Material usage by process is too great?

2> VACUUM PUMP O/L

**2> VACUUM PUMP O/L
SELECT TO ACK**

Means that the overload relay on the Vacuum Pump contactor has tripped.

Maintenance

Weekly

- Inspect vacuum pump filter cartridge. Clean or replace as required.

Monthly

- Inspect main Filter cartridge. Clean or replace as required.

Vacuum Pump

Refer to the vacuum pump operating instructions for maintenance requirements specific to the supplied vacuum pump.

Troubleshooting

This section addresses problems that you may encounter with your Loading System 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

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

Won't Run

Loading System will not run. There is a readable message on the Controller LCD Display. If the message does not start with a number, eg. **1>**, **2>** etc., then check that the Loading System 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 <2> to see if there is an alarm message.

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

Fault Finding

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

Do not jump steps or replace anything unless advised to do so. To replace a board 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 agent for help first.

The steps to be followed are:

- Verify that the power supply is working and isolate any board with a power supply fault.
- Verify that all boards are running
- Isolate any board 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 provide a green Power LED. Check that these Power LEDs are ON on all boards. 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**.

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 Controller 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. 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 have power then unplug the cable from the Controller to the operator panel at the socket on the pane. Reconnect the CPU Board I-Bus connector.

If the Power LED goes OFF then there must be a problem with one of the Loader boards. Unplug the I-Bus Connectors of all Loaders. The CPU Power LED should be ON. If not then suspect a short circuit in the wiring between the CPU and the Loaders. Reconnect the I-Bus Connector of each Loader one by one to determine which Loaders are at fault. Any Loader at fault will cause all Power LEDs to go OFF. Replace faulty Loader boards.

If the CPU and I/O Boards and all Loaders have power then the problem must be in the operator display.

Verify Boards are Running

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

Isolate Communications Problems

All of the separate boards 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 which stops all communication
- One board which fails to communicate

It is possible for a board 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 is actually causing the problem. Failure to communicate with any board 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:

Not connected

All boards connected to the I-Bus, except the main operator display must be disconnected. This will mean unplugging the I-Bus Connector to the

Loaders. 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, one at a time, using the I-Bus test options to check communication with each board as it is connected. Replace any faulty boards 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 the setup data will be initialised. Any changes from the default setup values need to be re entered.

Changing the I/O Board

Changing the I/O Board will require the pressure sensor input to be adjusted if a vacuum loss sensor is installed.

Warranty

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 to cover most situations but should you require further assistance please call your supplier. In the case of a fault with the unit, please describe clearly the symptoms of the problem.

Warranty Procedure:

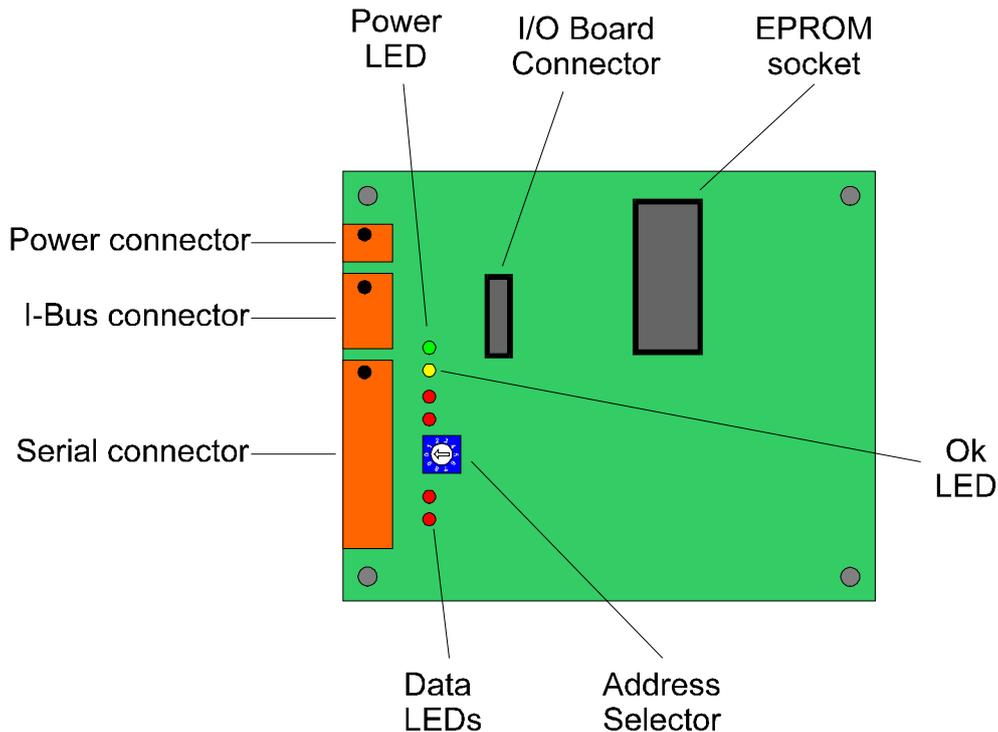
If you believe the fault is a warranty problem you need to advise Weighbatch as soon as possible and supply the following details of the fault:

- Company Name
- Contact Name
- Date Fault Occurred
- Model 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)

Circuit Boards and Modules

CPU Board

The CPU board layout is shown in the following diagram.



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

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

I-Bus Connector. Connects the CPU board with the operator display and Loaders.

Serial Connector. Provides two independent RS-422/485 serial ports. The Loading System 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.

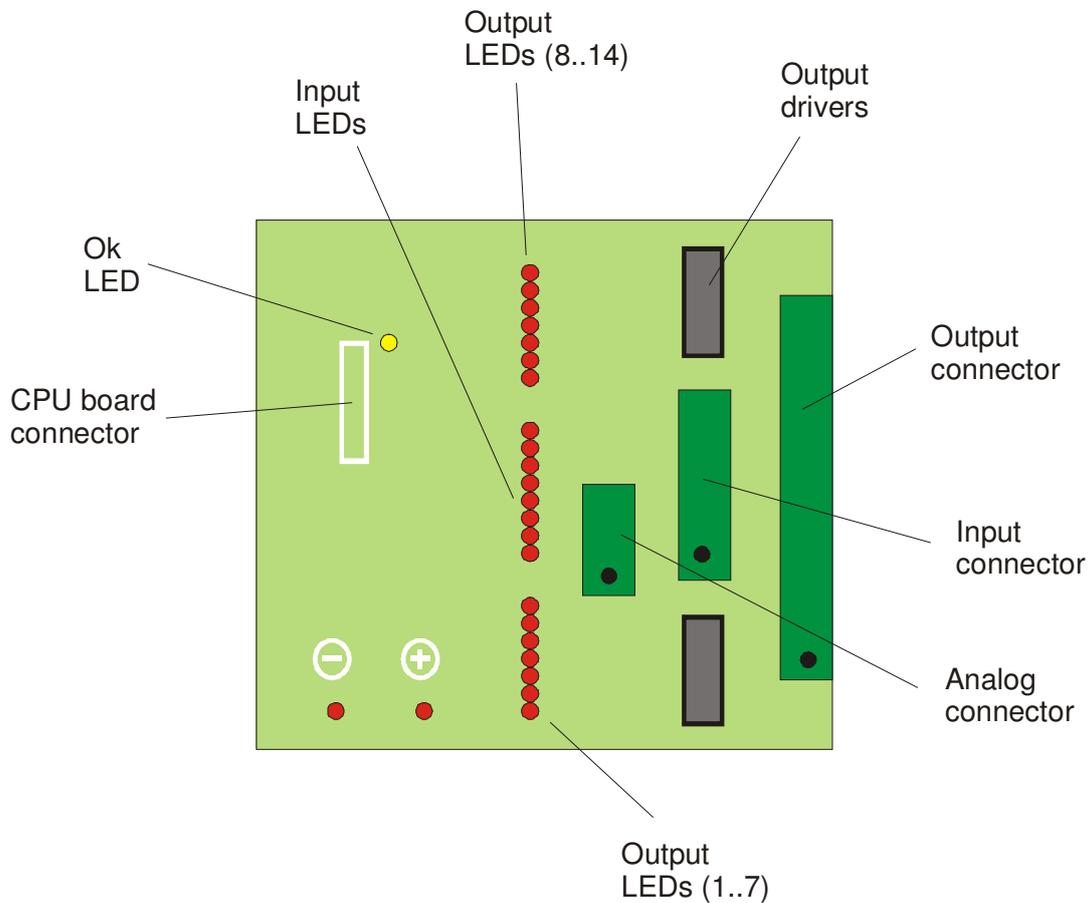
I/O Board Connector. The I/O Board mounts over the top of the CPU board and connects through this 16 pin header.

EPROM Socket. Holds the Loading Controller software.

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

I/O Board

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



For the three 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.

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

Pin#	Use
1	0V
2	Alarm
3	Pump run
4	Vacuum on

5	Filter clean
6	Purge valve open
7	Queue high
8	Not used
9	Loader 1 active
10	Loader 2 active
11	Loader 3 active
12	Loader 4 active
13	Loader 5 active
14	Loader 6 active
15	Loader 7 active
16	+24V

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

Pin#	Use
1	Pump turned on
2	Pump turned off
3	Pump overload
4	Not used
5	Not used
6	Not used
7	Not used
8	Not used

Analog connector. Provides connection to the vacuum filter pressure loss sensor.

Pin#	Use
1	Not used
2	Sensor input +
3	Sensor input -
4	Not used
5	Sensor reference (0V)

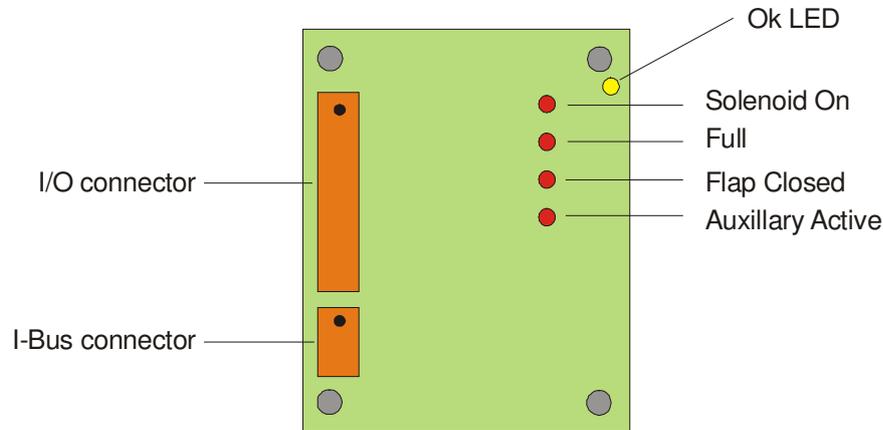
Output LEDs (two groups). Show the currently active outputs.

Input LEDs. Show the current input status.

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

Loader Board

The Loader board layout is shown in the following diagram. The Loader board mounts in the control box at the base of the Loader.



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

I-Bus Connector. Provides connection to the I-Bus for communicating with the Loading System Controller.

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

I/O Connector. Provides connection for the solenoid and sensors. Inputs are active when 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	Solenoid output
3	Auxillary input
4	+24V
5	0V
6	Full sensor input
7	+24V
8	0V
9	Flap sensor input
10	+24V

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

Solenoid, Full, Flap, Auxillary LEDs. Indicate active outputs and inputs.

Recommended Spares

Part No	Description	Qty
202010	Loader solenoid coil, 49 series, 24V	1
202011	Loader solenoid stem, 49 series	1
203021	Double loader inlet cylinder, 16*50, single acting	(note 1)
300011	Operator panel	1
300013	Operator additional panel (> 16 loaders)	1
300020	CPU board	1
300021	I/O board	1
300023	LDR software EPROM	1
300030	Addressable loader board	1
300202	Power supply, 24V, 3A	1
330622	Fuse link 6A	2
331012	Flap proximity sensor, inductive, flat	1
331020	Full proximity sensor, capacitive, 30mm	1

Note:

1. Only required for double inlet loaders.