



Combination Weighing Machines. Retro-Fit package.

Combination weighers from different manufacturers have been imported into Australia for many years. The owners of these machines have in many cases maintained these machines mechanically, but are now unable to maintain them electrically due to the enormous cost involved in getting original replacement parts.

Compu-Weigh has developed a control package that completely eliminates the need for original electrical parts. The package uses components locally manufactured or available "Off the Shelf".

However, we do not convert machines that use Stepper motor drives for bucket opening. Machines that have pneumatic or Clutch / Brake type of bucket opening are supported.

We currently have experience converting Ishida, Yamato and Siminato, either with or without memory buckets and up to 16 weigh heads.

Development of improved circuit boards and software functions are on-going and are always added to the latest installations.

Compu-Weigh does not take responsibility for the mechanical state of the machine and therefore is not responsible for performance degradation as a result of these.

Conversions can be done on site and in our workshop.

The descriptions below are intended for a person technically aware of the functions and performance of the machine.

Description of retrofit package for Multi-Head Combination Weighers.

Use of existing components.

All circuit boards and monitor from the original manufacturer are discarded, including load cell pre-amplifier boards, cpu and I/O. When the vibratory feeder voltage is non-standard then the transformer may be retained. If the machine is pneumatic discharge type, then if the solenoids are AC they need to be replaced with 12 / 24 vdc.

Purpose of Control Package.

The controls to be supplied will allow an operator to select a product by Name and run the machine with all parameters set to suit that product. All these and other usual functions such as calibration and tuning are available through a colour LCD touch screen. Interface to other machines for product & discharge control .

General description of Items to be supplied.

1. One or more aluminium panels which can be bolted into the existing enclosures. This panel has all the electronic components mounted and wired to a terminal rail.
2. A 12inch Colour TFT touch screen is connected to the machine .(This unit is NOT washable). A clear impact protection door is provided.
3. A software package that will perform all the functions of the machine.
4. A Flash Disk Reader / Writer to allow remote email upgrades.
5. A testing program that will allow testing of all outputs / inputs.

Detailed Item description.

General:

Compu-Weigh uses passive ISA back planes into which we plug an off the shelf Industrial CPU board and a number of I/O boards. The CPU board has all the required items on board such as VGA ,Serial / Parr ports etc.

The I/O boards have on board intelligence which are pre-programmed to do some of the mundane tasks that the main CPU can delegate.

Most of the circuit boards manufactured by Compu-Weigh employ surface mount technology for low power consumption, noise immunity and reliability.

The controls are tested for noise emissions to comply with C-tick legislation, and the charts are supplied on the enclosed CD.

1. Feeder Control

The vibratory feeders are limited to 16 units plus the dispersion cone.

These feeders are controlled in amplitude by varying the Phase angle Firing of the AC supply. Specially designed boards read the Zero crossing of the AC supply and then delay (according to the amplitude setting) the firing of standard Solid State Relays. This method is extremely stable and reliable.

Feeders are individually controlled by voltage , and On-Time.

2. Load cell Interface.

Load cells are interfaced to a 8 input Multiplexing board and are limited to 16.

These boards are connected to I/O boards, where the onboard intelligence reads all 16 Load cells continuously as soon as the power is turned on.

Calibration is done via the LCD screen and is saved on the Flash Disk.

On-board software adjustable filters allow for customized vibration frequencies.

3. Outputs.

All DC outputs are surface mount MosFet Opto Couplers.

Once again the Output boards are connected to an I/O board via a 40 way ribbon.

These outputs are used to directly switch Pneumatic Solenoids , and via Din-Rail mounted relays any other high voltage or high current load. A current limit of 150 mA applies for each output. If solenoids are higher current then please specify this at time of placing the order.

4. Inputs.

The Inputs use identical MosFet's and are optically coupled to the I/O boards and can only be DC and usually limited to 24 VDC.

There are 16 inputs available on the terminal rail.

5. Software.

The software is primarily written in Assembly Language and PDS for the CPU and dedicated Xilinx for the distributed intelligence on board the I/O boards.

The source code for both of these are **not** included and remain the property of Compu-Weigh. (See "Run over by Bus" clause.)

6. Documentation.

A manual is provided which includes part numbers for all items supplied, and supplier detail if not manufactured by Compu-Weigh.

A circuit diagram drawn in Protel format is included.

All files, drawings and copies of software are also supplied on a CD.

7. Features.

The features that are included in software are listed below.

Staggered Dump

At setup for each product, the discharging of the heads can be staggered so that the product does not arrive at the bag maker in one large lump.

Split Machine.

The total number of heads can be split into 2 or more sections to allow for a multi outlet discharge chute. To be nominated at time of placing order.

Over Weight.

If a bucket has a significant overweight and can not be included into a combination, then it is discharged by itself and an alarm raised. An alarm relay has to be interfaced to audible or other indicator.

Timing Bucket Control.

If the machine has a timing bucket fitted, then our outputs can switch it and software settings allow the correct timing.

Product Supply.

The inputs allow a level detecting device to control the product supply by switching an output when level is low and preset delays are met.

Date & Time

Date and time setting for reporting and other reasons.

Learning.

Learning can be turned off during adjustment, and then re-enabled. The Voltage to the feeders and the feeding time is automatically adjusted.

Zeroing and Spanning.

Calibration , such as zeroing and spanning is done from the touch screen and no dip switches or pots need to be touched.

Cleaning Machine.

The feeders and buckets can be cleaned by selecting Clean mode. Feeders will go to the amplitude of the last product file, and all buckets will stay open, thereby discharging from the dispersion cone straight through to the outlet chute.

Disabling heads.

Weigh heads can be turned off if a problem with that head causes errors. Once the problem is resolved, the head can be turned on again.

Password protection.

Three levels of password protection ensures that only authorised persons can access critical settings.

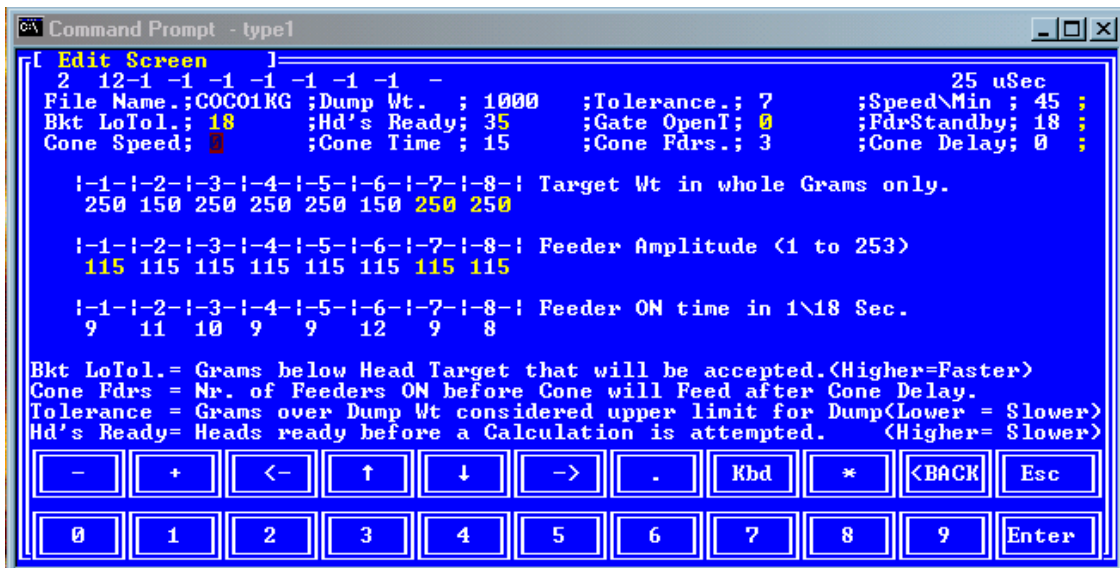
Level Control.

The level control of product is controlled by a photo eye above the cone. The product elevator is started by this level control.

This feature can be turned off if the level is controlled by others, or if the machine needs to be emptied.

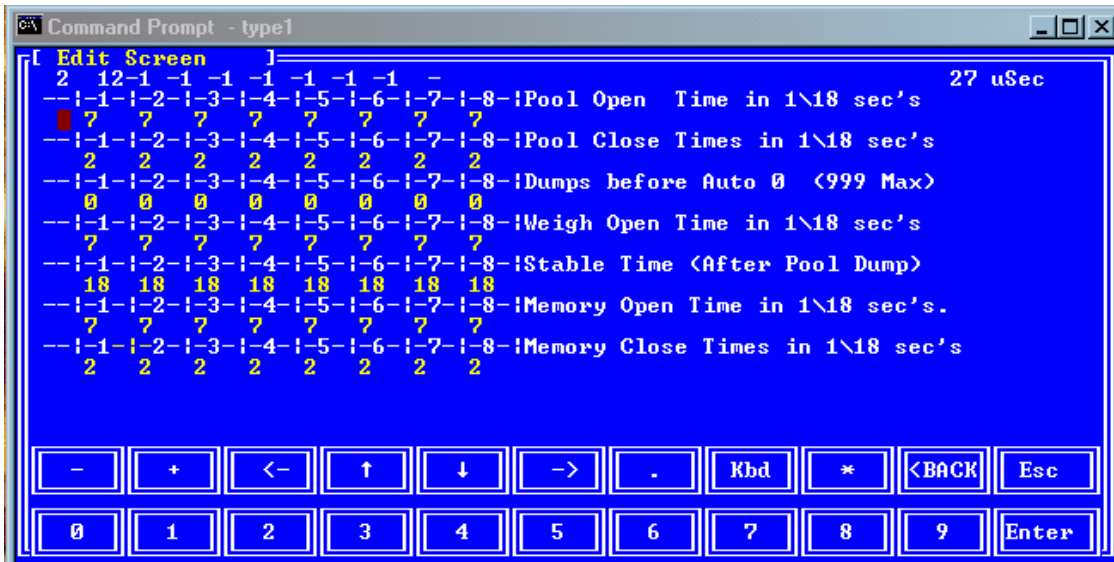
Adjustments available.

On-Screen. Individual product file settings.



These settings are protected by Level1 Password and are usually used to fine tune a particular product file.

Setup Settings



These settings are protected by Level 2 Password, and are normally only adjusted at installation or if some cylinders are getting lazy.

8. Reporting.

As the Retro-fit package uses an Flash Disk storage system, it is not desirable to store reporting information on the system. Flash Disks have a limited number of “write’s” to each location, and therefore it is best to retrieve the reports before power is turned off via an Ethernet connection. This connection can then also be used to save a complete copy of the Flash Disk on another computer.

If reports are saved on the Flash Disk, then don’t erase them until the disk is nearly full. This ensures that re-writes to any one location is limited.

The network is set to the TCP/IP protocol, and can therefore connect to most Windows based systems.

If the reporting format required is non-standard then this should be specified at time of placing order.

9. “Run over by bus” Clause.

As Compu-Weigh is a small (yet efficient) company, we are frequently confronted by prospective customer’s concern over the support , in the event of being run over by a bus. All the information pertaining to each machine is saved on a CD of which the customer gets a copy. A password protected .zip file has all source code , drawings and circuit board detail. In the event, the customer will have the opportunity to purchase the password. With that information a new system can be built without Compu-Weigh. Any attempt to access the source code prior to such an event, will result in legal action being taken.

10. Performance.

The original performance of the machine is not known to Compu-Weigh. For that reason we list some of the items that affect the performance.

Pneumatics:

- Door opening takes longer then ½ sec.
- Flow controls are badly adjusted.
- Air leakage affects weight.

Feeders:

- Feeder trays are transferring vibration to other feeders.
- Large variations in supply voltage.

Interface:

- Bagmaking or other packaging machine delays dump permission.

Product Supply:

- Feeders or conveyors supplying product to the machine vary in amount. delivered