AG500-03 OPERATORS MANUAL

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INTRODUCTION.

The AG500 is the indicator of choice for farm management professionals and agricultural scientists the world over. It is the most advanced, most versatile livestock weighing indicator available, designed with the benefit of many years of animal weighing experience. It will provide hitherto unrealized information on the performance of your operations.

To ensure you receive the service you are entitled to, please complete and post the **GUARANTEE** card **IMMEDIATELY**.

Hardware features of this indicator include:

- ☆ Robust weather proof construction.
- ☆ High reliability.
- ☆ Large 8 digit LCD display with widest possible viewing angle.
- ☆ Operation from 12 volts, 110 volts, or 230 volts.
- ☆ Internal battery option.
- ☆ Interchangeable load bars and load cells.
- ☆ Extensive internal systems failure and warning messages.
- ☆ Simple upgrading from Model 1 through Model 3.

Operational features include:

- ☆ Automatic identification and calibration to connected load bars or suspension cell.
- ☆ Span calibration using known weights if required.
- ☆ Simple, minimal keystroke operation.
- ☆ Intelligent non-locking super damping algorithm.
- ☆ Battery backed up memory for over 7600 animal records.
- ☆ Multiple files (up to 99).
- ☆ Ear tag or ID numbers up to 8 digits.
- ☆ Condition code facility for each animal.
- ☆ Weight gain and daily weight gain operations.
- ☆ Drafting on weight or weight gain.
- ☆ Thirteen different types of print reports.
- ☆ Automatic (hands off) weight recording.
- ☆ Data editing and Electronic note pad.
- ☆ Computer down loading using optional linker program.
- ☆ Indicator turns itself off to save the battery after 30 minutes of inactivity.

How to use this manual.

In order to learn and appreciate the full capabilities of this indicator, which will streamline your weighing activities, please read the OPERATING PROCEDURE carefully.

The OPERATING PROCEDURE is divided into three sections which introduce features which are progressively more advanced. We start with the functions of an AG500 model one, then we go to model two, and finally to those of model three. It is a good idea to read the sections relevant to your weighing application again before your second weighing session to refresh your memory.

Each subject in the OPERATING PROCEDURE uses up to three text sizes. The largest size gives a basic description of the function and how to operate it.

❒ The smaller text gives more detailed information on how a function works, possible problems which may occur, and suggested uses.

❍ The fine print gives exceptions and special conditions for Weights and Measures approved indicators only.

To gain the best possible life from your indicator, please read the CARE AND MAINTENANCE section. If you have the internal battery option, you should also read the INTERNAL BATTERY section. The remainder of the manual is reference information.

Although the AG500 is packed with sophisticated features, operation is extremely simple and logical. All options have defaults, preset by the factory so that any feature not immediately needed can be ignored for the time being. For when you do wish to tailor something to your application, the indicator uses a set and forget philosophy. Use the manual for step by step instructions to do the setup required, then the indicator will remember it - forever.

If you have a problem, there is an extensive trouble shooting guide in Appendix A. Please check it before calling for service.

If you wish to find the function of a given connector, key, display annunciator or display message, you can look it up in Appendix B.

OPERATING PROCEDURE.

Preparation.

If this is the first time use of the indicator, please read the INSTALLATION section.

If there is no internal battery, apply the 12 volt supply to the indicator and turn it on. The indicator will show "TRU-TEST" and "no trAdE" if not a Weights and Measures approved scale. The indicator will then automatically zero your scale. If there is no load cell plugged in, it will display "rEAdy". The indicator is now in "live" mode.

Live mode.

The most important key is the **LIVE** key because it makes the display show a 'live' weight reading (or "rEAdy" if no load cell is connected).

The keyboard is like a menu of available functions. In live mode, the menu is all the grey keys (the same colour as the LIVE key). You can press any grey key to initiate its labelled function.

Set mode.

Set mode is another menu of functions. These are the white coloured functions on the bottom half of the keys. Many of the user configurable options in the model 03 are assigned to set mode keys. These functions are normally set once for your particular requirements and remain unchanged for the life of the indicator. However, they are simple to change at any time if required.

To activate the white key functions, press the **SET** key. The indicator will display "SEt". The indicator will remain in set mode until you press the **LIVE** key (or any FULL grey key).

Most set mode functions work in a similar manner. Press them once to see the current setting. Press them again to toggle or cycle through the settings.

MODEL 01 LEVEL FUNCTIONS.

Simple weighing.

In live mode, the indicator shows the current live weight on the platform. The reading is called live because it is never locked up. If the weight changes, the reading changes.

The STABLE annunciator comes on when the accuracy of the reading is within tolerance. (Annunciators are the row of pointers at the bottom of the display.)

❒ For livestock weighing, animal movement can sometimes be a problem with a digital scale. The AG500 has a super sophisticated damping algorithm which uses statistical techniques to display the best estimate it can of the animal's weight so far. This effectively eliminates this problem. Stabilization of the display is usually extremely fast.

The display reads in multiples of one division. A division is the minimum display resolution such as 0.01kg (0.02lb) or 0.5kg (1lb) depending on the type of load bars or suspension cells connected. The live capacity of the scale is usually a round multiple of the division size, e.g. 3000 by 0.5kg (3300 by 1lb). Refer to the system manual for the live capacities of TRU-TEST load bars and suspension cells.

The indicator works up to a load of live capacity plus 9 divisions. Above that point an overload message will appear. Never load the scale further beyond the overload message or load cell damage may result.

When the weight is nearly half way between two display values, it is normal for the display to be changing occasionally between the two values even after the stable annunciator is on.

Your indicator will usually be configured to autorange. This means that at a weight equivalent to 250 times the next division size (resolution), the displayed division size goes to the next coarser value eg. from a division size of 1kg (2lb) to 2kg (5lb) or from 2kg (5lb) to 5kg (10lb). This is repeated 3 times, each time the weight reaches 250 times the next division size. Autoranging allows the displayed resolution to better reflect the actual scale accuracy.

Example (standard load bars):

0 to 250kg (500lb) with a division size of 0.5kg (1lb),
250kg (500lb) to 500kg (1250lb) with a division size of 1kg (2lb),
500kg (1250lb) to 1250kg (2500lb) with a division size of 2kg (5lb),
1250kg (2500lb) to capacity with a division size of 5kg (10lb).

Autoranging (Multi-interval) is usually disabled when using span calibration. If autoranging is selected on for span cal, the change between each division size occurs at 500 times the next division size instead of 250 times and there are only 2 changes to a coarser division size.

❍ For Weights and Measures versions, autoranging (multi-interval) maybe disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

Manual zeroing.

Progressive build up of dirt on the weighing platform will cause the scale to not read zero when there is no load. This will add an error to weighing results. Refer to the section on "Automatic Zero Tracking" on page 7. If automatic zero tracking is not in use, the scale should be manually zeroed occasionally as required.

To Manually Zero the scale.

① Remove any load from the platform.

② Press the **ZERO** key.

❒ The display will show the message "ZEroing" while the indicator waits for a stable reading. After zeroing, the ZERO annunciator (Centre of Zero) should come on. The ZERO annunciator indicates that the scale is within plus or minus one quarter of a division of zero.

Zeroing differs from taring in that the capacity of the scale is not affected. That is, overload still occurs above live capacity plus 9 divisions over and above what is zeroed out (notwithstanding a safety total loading (live weight plus platform weight) overload check).

❍ For Weights and Measures versions:

The total zero range including zero and automatic zero tracking maybe limited (weights more than 2% away from the span calibrated zero point may show "ZEro OL" message) to conform with local regulations. Refer "Weights and Measures" on page 65.

Zero may clear tare to conform with local regulations. Refer "Weights and Measures" on page 65.

Automatic Zero Tracking.

The AG500 indicator is capable of automatically zeroing each time there is no load on the platform.

To view or change the Automatic Zero Tracking status.

① Press **SET**.

② Press the **AUTO ZERO** key. The current setting is displayed.

③ To change the setting, press the **AUTO ZERO** key again.

④ Press **LIVE**.

There are three options: "OFF", "ON" and "on nEt". "ON" works when the gross weight is near zero and "on nEt" works when the net weight is near zero.

❒ If automatic zero tracking is on, manual zeroing is usually unnecessary unless the reading is outside the automatic zero tracking capture band. Automatic zero tracking is preset to "ON" at the factory. The ZERO annunciator is a good indication that automatic zero tracking is working.

When there is no tare, there is no difference between the operation of the "ON" and "on nEt" modes. When a tare is present, "ON" allows automatic zero tracking when the container is off the platform, and the display reads close to the negative of the tared weight. "on nEt" allows automatic zero tracking when the tared container is on the platform (empty of course) and the display is reading close to zero.

When using span calibration, automatic zero tracking takes several seconds of stable data before it operates. This ensures high accuracy in the new zero. Zeroing can only re-occur after several seconds.

Automatic zero tracking has an associated capture band either side of zero. This range is factory configured. For non-trade use it is normally set to 6 divisions at a time.

○ For Weights and Measures versions:

Zero tracking capture band maybe set to 0.5d (divisions), 1d or 3d to conform with local regulations. Refer "Weights and Measures" on page 65.

The total zero range including zero and automatic zero tracking maybe limited (weights more than 2% away from the span calibrated zero point may show "ZEro OL" message) to conform with local regulations. Refer "Weights and Measures" on page 65.

Automatic zero tracking on net weight maybe disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

Power Up Zero.

The indicator normally automatically zeros itself on every power up. Any tare is also cleared. Under some circumstances, it is desirable to turn this feature off.

To view or change the Power Up Zero status.

① Press **SET**.

② Press the **PWR Z** key. The current setting is displayed.

③ To change the current setting, press **PWR UP ZERO** again.

④ Press **LIVE**.

❒ The power up zero feature can be turned off to allow a tare to be retained when the indicator switches itself off. This may happen if a container is tared out and then is being filled away from the platform.

As another example of a typical situation where the power up zero feature should be turned off, consider wool bales being filled on a wool press. The wool press itself is tared out. Power up zero should be off for this operation because it would be very inconvenient to have to empty the bale if the zero and tare were lost at turn on, after a power failure. Also, if a wool bale were partly full at the end of a shift, the indicator can be turned off overnight and the display will return to its original reading the next morning (notwithstanding any slight changes in moisture content of load etc).

○ For Weights and Measures versions, the power up zero maybe limited (weights more than 2% away from the span calibrated zero point may show "ZEro OL" message) to conform with local regulations. Refer "Weights and Measures" on page 65.

Taring.

Taring is used for subtracting a container weight so that the display reads only the contents of the container, the net weight.

To tare a container.

① Place the empty container on the platform.

② Press the **TARE** key.

❒ When you press **TARE**, the display will show the message "tAring" while the indicator waits for a stable reading. The TARE or NET annunciator will turn on (unless there was no load to tare out) indicating that the displayed weight is now a net weight. After taring, the display should read zero and the ZERO annunciator should come on. It is not possible to display the gross weight when a tare is in effect.

Unlike zeroing, taring affects the remaining capacity of the scale. That is, the gross weight (tare weight plus net weight) cannot exceed the live capacity plus 9 divisions. Any container weight up to 100% of the live capacity may be tared.

Very small weights cannot be tared out because if the tared weight is close to zero (less than 6d for non trade use), the indicator assumes you are clearing the tare.

○ For Weights and Measures versions:

The tare may operate down to 1d to conform with local regulations. Refer "Weights and Measures" on page 65.

The tare maybe disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

To clear the tare.

① Press **CLR T**.

❒ Note: Clearing the tare does not zero the scale.

❍ For Weights and Measures versions, the ZERO key maybe setup to clear the tare to conform with local regulations. Refer "Weights and Measures" on page 65.

Example of use of TARE and ZERO.

A good example of the different functions of taring and zeroing is during fleece weighing. At the beginning of a weighing session the scale is zeroed, then the empty container is placed on the platform and is tared out. When the container is removed, the display then reads -1.80kg (-4.0lb) say (the negative of the container weight). During weighing some fleece will fall on the platform gradually accumulating until the display reads -1.75kg (-3.9lb). By simply pressing the **ZERO** key, the display can be corrected so that it again reads -1.80kg (-4.0lb). Therefore, the empty container need never be put back on the scale to 're-zero'.

If the container picks up residue, first re-zero the scale without the container, then re-tare the container.

If automatic zero tracking is switched on, the indicator will automatically maintain the reading of -1.8kg (-4.0lb) between uses without having to press the **ZERO** key.

❍ For Weights and Measures versions, the automatic zero tracking may have to be used instead of the ZERO key as the ZERO key maybe setup to clear the tare to conform with local regulations. Refer "Weights and Measures" on page 65.

Changing units.

Two display annunciators show the current units of the indicator when weights are being displayed. These annunciators show as a downward pointing triangle over either the kg or lb labels.

To change the units.

① Press **SET**.

② Press the **kg/lb** key.

③ Press **LIVE**.

❍ For Weights and Measures versions, units selection maybe disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

Fleece mode.

Fleece mode allows low capacity, high resolution weighing on certain load bar systems. To determine if your load bar system allows this mode, attempt to activate fleece mode with the load bars connected.

To view or change fleece mode.

① Press **SET**.

② Press the **RESOL** key. The display will show "FLEECE" if that mode is active otherwise it will display a resolution.

③ To select fleece mode, press **RESOL** until the display shows "FLEECE". To return to normal weighing, press **RESOL** once (or until the desired resolution is selected).

④ Press **LIVE**.

❒ As well as for weighing fleeces, fleece mode is useful for produce weighing and for small animals. The capacity in fleece mode is 300kg (660lb) and the resolution is 0.1kg (0.2lb).

❒ Fleece mode may have been disabled for particular markets and models.

❒ Fleece mode is disabled when using span calibrated loadbars.

❍ For Weights and Measures versions, fleece mode is disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

Automatic power off.

Automatic power off turns off the indicator after 30 minutes of inactivity. That is, no change in weight or key presses has been detected. This feature ensures longer battery life by preventing the battery, external or internal, from being unnecessarily discharged by users forgetting to turn the indicator off.

❒ Automatic power off can be disabled if required. Contact your service agent or TRU-TEST for details.

MODEL 02 LEVEL FUNCTIONS.

Recording weights.

To record a weight.

① Wait for the STABLE annunciator to come on.

② Press the **RECORD** key. If the weight is accepted the display will blink.

When a weight is recorded, the RECORD'D annunciator turns on. This prevents further recording of the same animal. When the animal leaves the platform (or the platform weight changes), the RECORD'D annunciator turns back off. This interlocking feature greatly helps to prevent operator errors.

❒ There are several conditions which will prevent recording. In each case, the indicator will beep when the **RECORD** key is pressed and a brief message to identify the problem will be displayed. (If the **RECORD** key is dead, it is because the display is not showing a live weight - press the **LIVE** key.) Any of the following messages may appear.

"not StbL"	The STABLE annunciator was not on.
"no rEc'd"	The weight is not recorded because it has already been recorded.
"OvErLoAd"	The scale is overloaded.
" FULL "	The indicator's memory is full.
"diF cELL"	File records are present which were recorded with a different cell code than the current load bar or suspension cell. Select another file or clear the current file.
"diF Unit"	The indicator is currently weighing in different units (kgs or lbs) than that being used for file records. Press **SET, LIVE** to change the units back.
"no FiLE"	Select a file other than file 00.
Negative reading	A negative weight cannot be recorded.

If the STABLE annunciator goes off just as the **RECORD** key is pressed (because the animal jumped clean off the platform say), the indicator will still store the true stable weight that was displayed while the stable annunciator was on. There is a 0.5 second period provided for this, after which the **RECORD** key is disabled until the stable annunciator once again comes on.

It is possible that the RECORD'D annunciator will occasionally go off when it shouldn't or not go off when it should. It may go off if an animal leans against an unweighed part of the enclosure or jumps violently. Usually this will not be a problem because the animal is released as soon as it is recorded.

More importantly the RECORD'D annunciator may not go off or may be delayed in turning off during speed weighing when a new animal, which is equal in weight to the previous animal, quickly follows onto the platform (especially when the second animal is moving about). Usually a short pause is all that is necessary for the indicator to recognize a slight change in weight. If it does not, then pressing the **CLEAR** key will force the RECORD'D annunciator off.

If a printer is connected, the indicator will automatically print the entire record when the RECORD key is pressed. Refer "Hidden remote functions" on page 61 for details on how to disable this feature.

Tag numbers (or ID numbers).

The AG500 indicator records all animal weights in a memory file along with a tag number. If no tag number has been entered, the indicator will generate one automatically every time a weight is recorded (beginning at 00,00,0001).

To enter a tag.

① The tag must be entered prior to pressing the **RECORD** key.

② Press the **TAG** key (or the **ID** key). The display will show "Entr tAg" (or "EntEr id") prompting for a tag number.

③ Enter a tag number on the numeric key pad (up to 8 digits).

④ Press **ENTER**. The tag is now entered into the tag buffer ready for the press of the **RECORD** key.

There is a faster method of entering tags (one less keystroke per tag). You can enter the digits of the tag then press the **TAG** or **ID** key. This eliminates the requirement to press the **ENTER** key.

Checking and correcting the tag.

The TAG ENTER'D annunciator (or ID ENTER'D annunciator) will turn on when a tag number has been entered and it will turn off again when the weight is recorded. This helps if you forget whether or not a tag has been entered for the current animal. It also helps if you forget whether or not you have pressed the **RECORD** key for the current animal.

If you have entered a tag (the TAG ENTER'D annunciator is on) and wish to view it, press the **TAG** key (or **ID** key). If it is okay, press **LIVE** to return to live mode. If not, re-enter the tag.

❒ When each tag number is entered, the indicator carries out a check of the tags already in the memory file to ascertain if that particular tag already exists. If it does, the indicator will display "duPLiCAt" (meaning duplicate tag) briefly and then the tag number. A new number can then be entered or if a duplicate tag is required then the **ENTER** key should be pressed for a second time. (If using the fast tag entry mode, press the **TAG** key (or **ID** key) a second time.)

Tag number entry can take place simultaneously with the indicator determining the animal's weight.

Tag numbers are separated into three fields (two digits followed by two digits followed by four digits). This allows easy identification of the constituent parts of the tag. For example the first field could contain the year, the second could contain the herd number and the third the animal tag number. When the tags are printed the three fields are separated by spaces.

Making Corrections.

If incorrect digits have been entered, but you have not yet pressed the **ENTER** key, the digits can be undone one at a time using the **CLEAR** key.

If an incorrect tag number (or ID number) has been entered into the tag buffer with the **TAG** or **ID** key, but you have not yet pressed the **RECORD** key, simply enter the tag number again.

If an incorrect tag number or weight is recorded into the memory file with the **RECORD** key, the whole record can be deleted by pressing the **DISPLAY** ⇑ key and then the **DELETE** key. "dEL rEC" will be momentarily displayed confirming that a record has been cleared. The previous record in the memory file will then be displayed. Return back to live mode by pressing the **LIVE** key. Refer also to "Editing Records in Memory" on page 22.

Turbo (stable annunciator speed).

The STABLE annunciator can be made to turn on more quickly for faster throughput, or more slowly for greater accuracy, because the **RECORD** key is disabled until this annunciator is on.

To view or change the turbo setting.

① Press **SET**.

② Press the **TURBO** key to view the current setting. The default factory setting is "StbL 1PC" which means that the STABLE annunciator is set to come on as soon as the reading is within 1% of the true weight.

③ Press the **TURBO** key one or more times to cycle through the available options, which are 0.5%, 1%, and 2%.

④ Press **LIVE**.

❒ The STABLE annunciator is based on a statistical analysis of the weight readings. It comes on when the weight is within 0.5%, 1% or 2% of the true weight. The choice of three settings allows the trade-off between weighing speed and accuracy that best suits your needs.

To do speed weighing, select 2%. To ensure that weights are not recorded until measured to the best accuracy of the scale, select 0.5%. These levels affect only the speed at which the stable annunciator comes on - not the accuracy of the eventual reading because the display can still be updated with a closer reading after the stable annunciator is on.

❍ For Weights and Measures versions, the turbo function maybe disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

Resolution setting.

The base resolution (or division size) is automatically set by the load cell connected. The displayed (and printed) resolution can be manually set to a coarser value if desired.

To view or change the resolution.

① Press **SET**.

② Press the **RESOL** key to view the current resolution.

③ Press the **RESOL** key one or more times to cycle through the four available resolutions.

④ Press **LIVE**.

❒ The resolution control can be used to prevent the indicator autoranging when animals are both above and below an autoranging boundary. For example, if the base resolution is 0.5kg (1lb), the indicator changes to a resolution of 1kg (2lb) above 250kg (500lb). If you are weighing animals with weights both above and below 250kg (500lb), you can set the resolution to 1kg (2lb) so that you get the same resolution for all animals. The greater of the manually selected resolution and the current autoranging resolution is used.

If there is no load cell connected and memory is clear then the indicator has no base resolution. In this case all possible resolutions can be selected.

❍ For Weights and Measures versions, resolution selection maybe disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

Statistics display.

The AG500 has five statistics keys. They display statistics about the animal records in the memory file. Each statistic is displayed with the two letter identifying prefix shown in brackets below.

MIN	(Lo)	The minimum weight recorded.
MAX	(Hi)	The maximum weight recorded.
AVERAGE	(Av)	The average of all weights recorded.
TOTAL	(tL)	The total of all weights recorded.
COUNT	(Cn)	The number of weights recorded.

Pressing the **LIVE** key will return the indicator to a live weight on the display.

Displaying Records in Memory.

The AG500 has a mode to view records in memory and to scroll through them. This is important if you do not have a printer because it allows you to write down and peruse the results at leisure after the heat of the weighing session.

First it is necessary to use one of the following three functions:

DISPLAY ⇑	Display last record.
DISPLAY ⇓	Display first record.
SEARCH	Initiate search for a particular tag.

The tag part of the record is displayed. The ⇑ and ⇓ keys move up or down one at a time as if moving along a listing of the records. By pressing and holding these keys, the indicator can be made to scroll rapidly through the records.

The ⇔ (toggle) key is used to shift across the listing from tag to weight, to condition code. The tag display is easily recognized by the two commas separating the fields. The weight display is identified by the letter "W", and the condition code by "CC".

Tag search (or ID search).

The AG500 is able to search through the records in memory to find a record with a particular tag number.

To search for a tag.

① Press the **SEARCH** key. The display will show "Entr tAg" or "EntEr id".

② Enter the tag number required using the numerical key pad.

③ Press the **ENTER** key to begin the search. If the indicator finds the tag number, it will display "Found" then show the tag number. If the tag number entered is not in the file the indicator will display "not Fnd" and beep.

MODEL 03 LEVEL FUNCTIONS.

Set-tare.

The set-tare is a keyboard entered tare weight. This function allows a container weight to be tared out, provided its weight is known, leaving just the contents of the container being weighed.

To enter a set-tare.

① Press the **SET T** key. The current set tare value will be displayed with a 't' (for tare) on the left.

② To change the set-tare to the value required, use the numerical key pad to input the value and then press the **ENTER** key. The indicator will then use this new set-tare value.

❒ Whenever a non zero set-tare is present, the TARE annunciator is on.

The set-tare value entered will be rounded to the indicator's base resolution.

If the power up zero function is off, then any tare or set-tare is retained when the indicator is switched off.

Entering a set-tare replaces any existing tare or set-tare.

❍ For Weights and Measures versions, the set-tare maybe disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

To clear the set-tare.

Press the **CLR T** key or you can press **SET T**, **CLEAR**. These methods will also clear a tare.

EXAMPLE

For this example, the object to be weighed is a small hand truck with a wool bale on it. The weight of the hand truck is known to be 256kg (256lb).

FUNCTION DESCRIPTION	KEY	DISPLAY	ANNUNCIATORS
Hand truck with bale is loaded on the scale.		442.0	STABLE
Hand truck weight entered into the indicator (setting set tare value).	**SET T**	t : 0.0	
	2	2	
	5	25	
	6	256	
Indicator displays weight of wool bale only.	**ENTER**	186.0	TARE STABLE
Check set-tare value.	**SET T**	256.0	
Go to set mode.	**SET**	SEt	
Turn off power up zero.	**PWR Z** **PWR Z**	ON OFF	
Return to live mode.	**LIVE**	186.0	TARE
Switch indicator off.	**OFF**		
Switch indicator on.	**ON**	186.0	TARE
Check set-tare value.	**SET T**	256.0	
Go to set mode.	**SET**	SEt	
Turn on power up zero.	**PWR Z** **PWR Z**	OFF ON	

Condition Codes.

In addition to a tag number, each animal can be recorded with a condition code.

If a condition code is required, it must be entered before pressing the **RECORD** key (either before or after entering the tag).

To enter a condition code.

① Press the **COND CODE** key. The display will prompt with "C CodE ?". If a condition code has already been entered, it is displayed with a prefix of "CC".

② Enter the required condition code on the numerical key pad and press **ENTER**. The condition code is now ready for recording when the **RECORD** key is pressed.

To view or correct the condition code.

① To check the condition code value press **COND CODE**.

② If you do not wish to change it, press **LIVE**. To change the condition code, simply enter the condition code again.

To view or edit the condition code after it's recorded.

❒ After the **RECORD** key is pressed, the condition code is gone, recorded into memory with the tag and weight. To correct the condition code after it is recorded (or if you forgot to enter a condition code) you can edit it.

① Press **DISPLAY** ⇑, ⇔, ⇔ to display the last recorded record's condition code. Zero means that none was entered for that record.

② If required, enter a new condition code on the numeric keypad.

③ Press **LIVE**.

❒ Condition codes are useful as a means of marking stock condition, performance or animals to be sold etc. Later a report can be printed of just those animals which have had condition codes entered and you will get statistics of just those animals on that report. Also condition codes are printed along with the tag and weight on most other print reports.

Condition codes would normally be only one digit, but the indicator will accept up to four. No decimal point is allowed.

Pre-tag (or Prefix or ID prefix).

The AG500-03 can automatically enter common digits for the left hand fields of tag numbers (up to the first 6 digits). To set this up, you enter a 'pre-tag' which stands for tag prefix.

To view or set the pre-tag.

① Press **SET**.

② Press the **PRE TAG** key (or the **PREFIX** or **ID PREFIX** key) to view the current pre-tag. If there is none, the display will be blank with the two commas which are displayed for all tags.

③ To enter a new pre-tag, use the numerical key pad. Digits entered appear from the left hand end of the display in the positions they will eventually occupy in tags. When all the required digits are entered, press the **ENTER** key.

④ Press **LIVE**.

To clear the pre-tag.

① Press **SET**.

② Press **PRE TAG** (or **PREFIX** or **ID PREFIX**).

③ Press **CLEAR**.

④ Press **LIVE**.

❒ A Pre-tag can also be useful when not entering tag numbers from the keyboard. In this case it can be used to set the starting tag number of the automatically assigned tags.

You can reset the automatic tags to begin from 00,00,0001 by clearing the pre-tag.

Automatic Weight Recording.

The AG500-03 is capable of totally hands off operation. In this mode the indicator effectively presses the RECORD key itself when there is a stable weight on the platform. Of course automatic weight recording is only useful if tags or ID numbers are not being manually entered.

To set for automatic weight recording.

① Press **SET**.

② Press the **AWR** key to view the current status of automatic weight recording.

③ To turn automatic weight recording on or off, press the **AWR** key again.

④ Press **LIVE**.

❒ When a weight is recorded in AWR mode, the display shows the recorded weight with an "rd" prefix for about two seconds. The RECORD'D annunciator also comes on as it does for normal recording. It is okay to let the animal go as soon as the "rd" prefix shows.

The indicator has several sophisticated safeguards to prevent most malfunctions during AWR operations. However, if the RECORD'D annunciator fails to turn off when a new animal of the same weight quickly follows onto the platform, press the **CLEAR** key.

As well as "OFF" or "ON" there is a third AWR mode called "on tAg". This mode is used with automatic tag id recognition systems which send the indicator a tag via the serial port.

❍ For Weights and Measures versions, AWR maybe disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

Editing Records in Memory.

The AG500-03 allows editing (changing) of any value stored in memory. This allows correction of data long after it is recorded.

To edit a memory record.

① Move to the tag or weight or condition code you wish to change as described in the section "Displaying Records In Memory" on page 16.

② Type in the new value followed by the **ENTER** key.

③ Repeat steps ① and ② as required.

④ Press **LIVE** to return to live mode.

❒ Edited records are marked with an asterisk on all printed reports.

❍ For Weights and Measures versions, editing of the weight part of the record maybe disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

Inserting animal records.

The AG500-03 indicator allows manual insertion of complete animal records into the memory file. This allows records to be added which were missed out during weighing.

To insert a record.

① Press the **INSERT** key. The indicator will create a new record and will be positioned to the tag part of that record. A tag number is automatically allocated but the display will show "Entr tAg" or "EntEr id".

② Using the numerical key pad enter a tag number and then press the **ENTER** key. If you wish to use the automatically allocated tag, press the **ENTER** or ⇔ (toggle) key. The display will show the weight, which is zero.

③ Using the numerical key pad enter a weight and then press the **ENTER** key. The display will now show a zero condition code.

④ If required, enter a condition code also.

⑤ Repeat steps ① through ④ as often as required.

⑥ Press **LIVE** to return to live mode.

❒ As soon as the **INSERT** key is pressed, a new record is created with zero values for the weight and the condition code. After that, the indicator is merely in edit mode as described above. The only difference is that each time you press **ENTER** (whether or not digits were entered), it automatically moves on to the next field. Also, after **ENTER** is pressed for a condition code, the indicator will automatically print the entire record (as it does when the **RECORD** key is pressed). Refer "Hidden remote functions" on page 61 for details on how to disable this feature.

Before using the insert function for the first time on an empty file (without the load bars connected), ensure that the resolution is appropriate. If the data is to be used for weight gain, the resolution must be the same as the minimum resolution in the other file (usually 0.5kg (1lb)). If weights are to be recorded using a loadbar, the resolution must be the same as the minimum resolution for the loadbar to be used (usually 0.5kg (1lb)).

❍ For Weights and Measures versions, the insert function maybe disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

Deleting animal records.

The AG500-03 is able to delete complete animal records from a memory file. This allows unwanted records to be removed.

To delete a record.

① Move to the unwanted record using the **DISPLAY** ⇑ or **DISPLAY** ⇓ or **SEARCH** key.

② While that record is displayed press the **DELETE** key. The display will briefly show "dEL rEC". This will delete that record.

③ As always, return to live mode by pressing the **LIVE** key.

❒ When the **DELETE** key is pressed the record is totally lost and cannot be recovered.

Unless the last record in the memory file was deleted, the indicator now positions to the next record. If it was the last record, the indicator positions to the previous record.

If more records are deleted immediately using the **DELETE** key, the "dEL rEC" message is not displayed, as this would slow down the deleting operation.

To undo the last press of the RECORD key.

① Press **DISPLAY** ⇑, **DELETE**, **LIVE**.

Electronic Note Pad.

The indicator can be used for manual data entry of measurements made in the field which can later be down loaded to a computer.

The Insert function, as described on page 23, is used for the entry of data.

❒ Three items of data can be stored in each record, the 'tag', 'weight', and 'condition code'. The tag can be used for integers up to 8 digits. If its fields are considered to be separate numbers, it can be used to store more than one quantity. The condition code is an integer quantity up to 4 digits.

The weight depends on the resolution selected. If there is no cell connected and the current file is empty, all possible resolution sizes are available (0.0001..100) by using the **RESOL** key. Select the one that is appropriate to your measurements. The maximum value you can enter during ata entry operation is 16000 times that resolution size. The indicator cannot store negative quantities.

Drafting (Sorting by weight).

The AG500-03 has the ability to do two way or three way drafting or sorting by weight. When the drafting mode is selected (with draft limits set) the indicator will display one of the following drafting messages during live weighing.

"- 0000 -"	No weight on Scales.
" - Lo - "	Weights below the lower limit.
"-CEntrE-"	Weights equal to or greater than the lower limit but less than the upper limit.
"- High -"	Weights greater or equal to the upper limit.
"UnStAbLE"	Unstable reading.

To set the drafting limits.

① Press the **SET** key and then the **DRFT H** key. The current draft high limit is displayed.

② Enter a new draft limit using the numerical key pad and press the **ENTER** key.

③ If two way drafting is required, only one draft limit must be set or set them both to the same value. If three way drafting is required, press the **DRFT L** key, and enter the new lower draft limit in the same way.

④ Press **LIVE**.

To select drafting mode.

① Press the **DRAFT** key. The display will change to drafting format.

② To return to normal weighing, press the **LIVE** key.

To clear the draft limits.

① Press **SET**.

② Press **DRFT L**, **CLEAR**.

③ Press **DRFT H**, **CLEAR** to clear the higher limit as well.

④ Press **LIVE**.

❒ The draft limits can be changed at any time. Changing the draft limits will alter any draft report or draft summary accordingly, even for animals already weighed.

Draft mode (the mode obtained by pressing the **DRAFT** key) is akin to live mode (the mode obtained by pressing the **LIVE** key). All functions normally available in live mode are also available in draft mode. The tag and weight recording operations as described in the "Recording weights" section also apply when the draft mode is being used.

If the indicator displays "diF cELL" when entering a draft limit, it means that there are memory records or draft limits present which apply to different load bars or suspension cell. Clear the file to enable use with the new load bars or suspension cell or select another file.

To display draft range statistics.

When draft limits are set, the statistics for each draft range can be obtained separately by pressing **1**, **2** or **3** after one of the 5 statistics keys. Press **1** for the low range, **2** for the centre range or **3** for the high range statistics.

Multiple files.

All operations described so far act on the current file without you having to be aware that there are other files. The indicator is pre-set to file 1 at the factory.

❒ Multiple files can be used for many purposes such as separating different mobs or herds, allowing you to keep the data from different jobs until they are all printed at the end of the day or allowing you to keep data from different load bar systems.

The most exciting use for multiple files is for weight gain, covered in the next section. Another use is in setting up the indicator to check the tag numbers as they are entered in order to reduce human error. See the "Tag Checking" section on page 31.

The **FILE SELECT** key is located in a handy position on the keyboard so it is conceivable to change files on a weighing by weighing basis in order to sort them on some arbitrary characteristic. This allows you to get separated statistics or print reports. In fact changing files is as easy and quick as entering in a condition code or a tag.

There are three parameters kept for each file. They are the file date, draft limits and gain reference file number (described on page 28).

To select a file.

① To view the current file number, press the **FILE SELECT** key. The display will show "FiLE: 01" (assuming the current file is still file 1). If the file is empty there will be a letter "E" after the file number.

② Enter a new file number on the numerical keypad and press **ENTER**.

To scan the files.

① Press **FILE SELECT**.

② Press the ⇑ or ⇓ key to increment or decrement the displayed file number. You can scan for an empty file by looking for the "E" empty indicator. If you press and hold the ⇑ or ⇓ key, they will autorepeat.

③ If you can't remember the file number of a particular file but you can remember how many animals were in it, you can have the animal count displayed for each file as you scan. To do that, press the ⇔ (toggle) key. The display now switches to "FL:01:count" format.

④ Alternatively, you can scan by file date. Press the ⇔ (toggle) key again to change the display to this format "01,date".

⑤ When the required file is found, press **LIVE.**

To select a file by global tag search.

If you know the tag number of one of the animals in the file, you can do a global (all files) search for it.

① Press **FILE SELECT**, **0**, **ENTER**. File zero is the global file.

② Press **SEARCH**. Then enter the known tag number followed by **ENTER**. The indicator will select the first file containing that tag and will display that record.

③ Press **LIVE**.

To get global statistics or printed reports.

The special global file zero is not a real file but allows you to do statistics and print reports on all data in all files. You can not record or edit data in file zero.

① Press **FILE SELECT**, **0**, **ENTER**.

② Display statistics or print reports as normally done for any other file.

❒ The global file should not be used if the files contain data from different types of load bars or suspension cells or if the files are in different units (kgs and lbs).

To clear a file.

① Press **SET.**

② Press the **CL FILE** key. The indicator shows "CLr FiLE". For safety, the file is not cleared yet. You can press any other key to abort the clear operation.

③ To actually clear the file, press the **CL FILE** key a second time. All data in that file is deleted along with its date, draft limits and gain reference file number.

④ Press **LIVE.**

To clear all files.

① Press **FILE SELECT, 0, ENTER** to select the global file.

② Clear this file using the procedure described above. However, the **CL FILE** key must be pressed three times.

Weight Gain Operation.

The AG500-03 can calculate an animal's weight gain (or loss) and display it during weighing. When the tag or id number is entered, the indicator looks for that tag in another file to get the animal's previous weight and uses it, together with the latest weight on the platform, to calculate the weight gain. If dates have been entered, the indicator can calculate the result in terms of weight gain per day.

❒ The weight gain capabilities of the indicator are extensive, and include drafting on weight gain, weight gain statistics and weight gain print reports. These operations are described in other sections.

○ For Weights and Measures versions, weight gain operation maybe disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

To set up for weight gain operation.

Before any weight gain operation is possible, you must specify a gain reference file number. Every file can have its own gain reference file number.

① Press **SET.**

② Press the **GAIN FL** key. The indicator shows the current gain reference file number. A value of 00 means there is no gain reference file.

③ Use the numeric keypad to enter the number of the required file, then press **ENTER.**

④ If you want accumulated (rather than daily) weight gain, press **LIVE** and skip the following steps.

⑤ If you want daily weight gain, the file dates must be set for both the current file and the gain reference file. To set the date for the current file, press the **FL DATE** key.

⑥ Enter a date on the numeric keypad followed by **ENTER.** The date must be in MM:DD:YY format for the USA or DD:MM:YY format for all other countries.

⑦ If the date on the gain reference file was already set last time (which it normally would be), setup is now complete - Press **LIVE.**

⑧ If it is necessary to set the file date for the gain reference file, press **FILE SELECT.** Enter the number of the gain reference file on the numeric keypad and press **ENTER.**

⑨ Press **SET, FL DATE** and then enter the date when that file's records were weighed. Then press **ENTER.**

⑩ Press **FILE SELECT.** Enter the number of the new file again on the numeric keypad and press **ENTER.**

❒ A suggested file allocation scheme, if you weigh each month, is to use files 1 through 12 in rotation for the respective months. This allows you to easily remember where each month's data is stored and to keep a full years data at any one time.

If you have trouble getting daily weight gain to work (but you have accumulated weight gain) it is most likely that the dates are not in the correct format. Check for this by entering the dates in the other format e.g MM,DD,YY instead of DD,MM,YY or vice versa. Also check that the date in the current file is latter than that in the gain reference file.

The maximum period which can be handled for daily weight gain is 15 years. If there is just one day between the dates or if both dates are set the same, then the indicator will revert to accumulated weight gain. The earliest date the indicator will handle is 1st March 1976.

To change from daily weight gain back to accumulated weight gain, you must clear one of the dates. Select either the reference file or the new file and press **SET, FL DATE, CLEAR.**

Using weight gain during weighing.

① Turn weight gain mode on using the ⇔ key.

② Enter a tag or id number.

❒ The ⇔ key toggles between weight gain mode and normal mode. It displays "ON" or "OFF" to show its new status. When a tag has been entered AND weight gain mode is on AND a load is on the platform, the display will show the weight gain. Weight gain is displayed with a prefix, either "Gn" for Gain or "dG" for daily Gain. The ⇔ key can be used to toggle from normal weight display to weight gain display, even after the tag is entered.

If a tag is entered which does not exist in the gain reference file (with weight gain mode on), the indicator will beep, display "not Fnd" briefly and re-display the entered tag. If the tag was correct, press **ENTER** a second time. (If using the fast tag entry mode, press the **TAG** key (or **ID** key) a second time.) If the tag was incorrect, a new tag can be entered.

When the animal leaves the platform, the display reverts to normal weight reading until another tag is entered. This prevents display of invalid weight gain data for the next animal on the platform.

When the indicator is turned off, weight gain mode is automatically turned off.

If the indicator displays "no Gn FL" when you press ⇔, it usually means there is no gain reference file number set for the current file. It can also mean that the current file and gain reference file have different minimum resolutions - that is they were created using different loadbars or it could mean that the gain reference file is empty. Ensure that loadbars with the same minimum resolutions are used or get one set of loadbars span calibrated to match the other set(s).

Displaying weight gains after weighing.

You can view the weight gains after the weighing session. This is especially important if you do not have a printer because it allows you to write down and peruse the results at leisure after the heat of the weighing session.

① Ensure the indicator is set up for weight gain as described above.

② Display the records as described on page 16.

❒ When displaying animal records with a gain reference file set, the ⇔ key rotates around 4 quantities (Tag, Weight, Condition code and Weight Gain). Weight gain is displayed with a prefix, either "Gn" for Gain or "dG" for daily Gain.

It is not necessary to turn weight gain mode on prior to displaying the animal records. Weight gain mode applies only to live weight gain displayed during weighing.

If a tag does not exist in the gain reference file, the indicator will display "not Fnd" for the weight gain.

Printing weight gain reports.

See page 33 for general instructions on printing.

❒ If a tag does not exist in the gain reference file, the weight gain field is left blank for that record. Both weight gain and normal statistics are printed on weight gain reports. The condition codes are not printed.

Daily weight gain is identified as kg/day or lb/day on all daily weight gain print reports and summaries.

To clear the gain reference file number.

① Press **SET, GAIN FL, CLEAR.**

❒ It is necessary to clear the gain reference file number to enable normal draft limits to be entered.

Tag Checking.

By far the most common source of errors during weighing occur during those tasks performed by human operators. In particular tags are often mis-read, mis-heard or mis-entered.

The indicator's ability to search for a tag during 'weight gain' operation can be applied to tag checking.

To set up for tag checking.

① You must set up a file containing all the valid tag numbers for the next weighing session. This can easily be done using the INSERT function. (See "Inserting animal records" on page 23.) The weights in the file should be left as zero and the file's date should not be set so that when the 'weight gain' is displayed, it will be the same as the actual weight.

If you have a Personal Computer you can use it with the TRU-TEST linker package to upload a file of tags into the indicator.

② Set up the indicator for weight gain operation. That is select a working file and then set its gain reference file number to the file containing the list of valid tags.

③ Use the indicator in weight gain mode during weighing. That is press the ⇔ key. Then, as you enter each tag, the indicator will search for it in the previously set up file. If the tag is incorrect, the indicator will display "not Fnd" and then redisplay the tag. If it is correct, the indicator will display the prefix "Gn" on the live weight display. Think of "Gn" as meaning "Good number".

The weight displayed will be the same as the normal weight display because the reference weight was left as zero in the gain reference file and we are not using daily weight gain because the date is not set in the gain reference file.

The tag checking mechanism could also be applied to do tag drafting. That is, you could sort animals into two groups as you weigh by previously setting up a file containing all the tags of one group. Then use the "not Fnd" or "Gn" status when tags are entered during weighing as your sorting indicator.

Weight Gain Drafting.

This section assumes familiarity with operation of both non-weight gain drafting on page 25 and non-drafting weight gain on page 28.

When a file has a gain reference file number set, its draft limits are interpreted as weight gain draft limits. If both dates are also set, the draft limits are interpreted as daily weight gain draft limits and may have a considerably finer resolution than the indicator's base resolution.

Because the draft limit resolution depends on the dates, the draft limits must be set after the gain reference file number and the dates have been set.

When the **DRAFT** key is pressed, the display will not change to the low, centre or high format unless weight gain mode is on AND a tag has been entered AND a load is on the platform.

Unlike normal drafting, weight gain draft limits can be zero or even negative. To change the sign of an entered draft limit, press the key with the (+/-) label below it before you press **ENTER**.

Weight gain drafting check list.

- ✓ Checked the gain reference file's date (if daily weight gain required).
- ✓ Selected an empty file for this weighing session.
- ✓ Set the gain reference file number.
- ✓ Set the file date (if daily weight gain required).
- ✓ Entered the draft limits.
- ✓ Pressed **DRAFT**.
- ✓ Pressed ⇔.
- ✓ Entered animal's tag number.
- ✓ Animal on platform.

Weight Gain Statistics.

When weight gain mode is ON, the statistics keys, **MIN**, **MAX**, **AVERAGE**, **TOTAL** and **COUNT** give the weight gain statistics of all the weight gains. Only animals whose tags exist in both the current file and the gain compare file will be included in these statistics.

The statistics for each of the three draft ranges (drafted on weight gain) can be obtained by following a statistics key with a number key **1**, **2** or **3**. Again if weight gain mode is on, the weight gain statistics are shown for each range. If weight gain mode is off then the absolute weight statistics for the draft range are shown even though the records are sorted into ranges by weight gain.

❒ For example, you can look at the average weight of the animals in the low weight gain range to see if there is a correlation of weight and weight gain. To do that, a gain reference file must be set (and both dates if working by daily weight gain) and the draft limits must be set for appropriate weight gain limits. Weight gain mode must be set to off with the ⇔ key. Then press **AVERAGE**. You see the average weight of all animals in the current file. Then press **1**. You see the average weight of the animals with low weight gain.

All weight gain reports and weight gain summaries have both absolute weight and weight gain statistics printed on them.

Printing reports.

The AG500-03 can do eight different full print reports and five different summaries. The following gives the selection labels under the **PRNT OP** key (print options) (or **RPRT OP** key (report options)) and the corresponding titles printed at the top of the report.

tAg id	Tag/id Ordered Report.
CuLL	Weight Ordered with Cull Report.
CuLL S	Cull summary.
GAin	Daily Weight Gain Report. Accumulated Weight Gain Report.
drAFt GAin dFt	Draft Report. Daily Weight Gain Draft Report. Accumulated Weight Gain Draft Report.
drAFt S Gn dFt S	Draft Summary. Daily Weight Gain Draft Summary. Accumulated Weight Gain Draft Summary.
CondCodE	Condition Code Report.
File S	File Summary.
cPtr out	Computer download format.

❍ For Weights and Measures versions, weight gain reports will not be available if weight gain is disabled to conform with local regulations. Refer "Weights and Measures" on page 65.

To select the print option.

① Press **SET**.

② Press the **PRNT OP** key (or **RPRT OP** key) to view the current print (or report) option format.

③ A new format can be selected by repeatedly pressing the **PRNT OP** key (or **RPRT OP** key) until the desired format is displayed.

④ Press **LIVE**.

❒ Reports have every animal record in the current memory file printed on them. Summaries have no information from individual records. The easiest way to get the statistics only is to do a Cull summary or a draft summary.

All reports except Weight Ordered with Cull and Condition Code are ordered by tag number. Draft reports are ordered by tag within each draft range. The condition code report is ordered by condition code, and only those records with a (non-zero) condition code are printed.

Where there is more than one report format on the same option, the relevant format is determined by other indicator settings. Weight gain reports are available only if a valid gain reference file is set. Daily, as opposed to accumulated, weight gain reports are given if the dates for both the current file and gain reference file are set.

Only one of the options 'DrAFt' or 'Gain dFt' is available depending on whether the current file has a gain reference file number set. Similarly only one of 'drAFt S' or 'Gn dFt S' is available at a time.

Using the TRU-TEST MP400 model (dark grey coloured) printer.

① Use only the RS232 cable supplied with the TRU-TEST printer. The TRU-TEST printer receives its power from the indicator via this cable. (But not when running solely from the internal battery. That is, the indicator must have an external 12 volt supply capable of driving the printer as well. The power supply unit or a car battery are suitable to drive the printer (small AC to DC adapters are NOT suitable).

Note: The printer cable used with the Citizen printers cannot be used with the MP400 printer.

② The indicator and printer are factory configured with compatible baud rate and hand shaking method. On earlier indicators the baud rate may need to be set to "9600" and the handshaking may need to be set to "Xon-Xoff". Refer "Setting communications port options" on page 37.

③ For changing the printer paper and general care off the printer refer "MP400 Printer Operators Manual" supplied with the printer.

④ It is strongly recommended that the printer is NOT used outdoors as it has moving parts which are affected by dust and moisture.

⑤ If there are any problems, refer to the trouble shooting guide in Appendix A.

Using the TRU-TEST Citizen model (cream coloured) printer.

① Use only the RS232 cable supplied with the TRU-TEST printer. The DC version of TRU-TEST printer receives its power from the indicator via this cable. (But not when running solely from the internal battery. That is, the indicator must have a an external 12 volt supply capable of driving the printer as well. The power supply unit or a car battery are suitable to drive the printer (small AC to DC adapters are NOT suitable). The AC version requires an AC supply for the printer and a 12 volt supply for the indicator (small AC to DC adapters are suitable).

Note: The printer cable used with old AG300 series TRU-TEST indicators cannot be used with the AG500 series.

② The printer is factory configured to "9600" baud rate and "dSr Pin6" handshaking. The indicator will need to be set to match the printer. Refer "Setting communications port options" on page 37. If the above settings don't work set the indicator baud rate to "600" as the earlier printers needed this setting.

③ If there are any problems, refer to the trouble shooting guide in Appendix A.

④ It is strongly recommended that the printer is NOT used outdoors as it has moving parts which are affected by dust and moisture.

⑤ To change the paper, refer to the underside of the mechanism cover on the printer.

Using a non TRU-TEST printer for the first time.

① The printer must have a SERIAL interface, otherwise known as RS232C. A suitable serial cable must be available (or a standard null modem cable). If necessary refer to "Communications Port" on page 59 for details on cable pin assignments. Caution in the selection of a printer cable is required as 12 volts is available from pin 25 on the indicator which could damage a printer if the cable is incorrectly wired.

② NEVER connect the indicator to a parallel (Centronics) printer interface as damage to the printer may result. NEVER use your parallel IBM printer cable.

③ If possible, set up the printer to use "9600" baud rate and "Xon-Xoff" handshaking which will match the indicator. Otherwise select the correct communications port baud rate and handshaking method for the indicator as described in the "Setting communication port options" on page 37. Check your printer manual for these parameters.

To print a report.

① Connect the printer cable to the indicator's communications port (printer port) and to the printer's 'data in' port. Ensure the printer is supplied with power, turned on and is ready for printing.

② If you wish to have a date printed on the report, set the current date. Press **SET**, **FL DATE**. Enter the date in DD:MM:YY or MM:DD:YY format as for your country then press **ENTER**. The date is cleared when the memory file is cleared, or by pressing **SET**, **FL DATE**, **CLEAR**.

③ If you are printing a draft report or draft summary, you may change the draft limits as required to affect the printout.

④ If the indicator is still in set mode, press **LIVE**.

⑤ Press **PRINT** (or **REPORT**). The indicator will display "Printing" and the printer will print the contents of the current file in the selected format.

⑥ To abort a printout, press **LIVE**.

Because the AG500-03 has a highly reliable battery backed up memory, it is strongly recommended that the printer be left in the office away from the dirt and moisture of the weighing area. At the end of weighing, take the indicator to the printer for printing (and charging if applicable).

Multiply and divide calculations.

The AG500-03 has the ability to perform calculations on the displayed live weight, on any statistic, or on any weight stored in the memory.

To multiply a weight.

① While a weight or a statistic is displayed on the indicator, press the × key. The display will show a "ti" (times) prefix. If the display was a live weight, it is frozen.

② Enter the value by which the weight is to be multiplied on the numerical key pad and press the **ENTER** key.

③ The result of the multiplication is then displayed. If you were viewing animal records in memory, the indicator remains in that mode.

To divide a weight, follow the same steps as for multiplication except use the ÷ key.

❒ Almost any displayed quantity can be used in a calculation - live weights, statistics, weight gains, condition codes, tags, even the result of a previous calculation.

The calculator functions are used for such applications as calculating the carcass weights. For example if the bone out percentage is 56%, you can multiply the average by 0.56 to get the average carcass weight. Another application is in animal dosage requirements. For example, if the dosage is 2ml/100kg (0.3floz/1000lb), multiply the displayed animal's weight by 0.02 (0.0003). In these cases, the calculation may be done repeatedly and so the constants (0.56 and 0.02 (0.0003)) need never be reentered after the first time.

An application of the divide function is in group animal weighing. Divide the weight by the number of animals on the platform to get the average weight.

The result of any multiplication or division cannot be stored in memory.

Constant Multiplication or Division.

The AG500-03 can be made to multiply or divide by a constant number. To achieve this, carry out the same steps for normal multiplication or division for the first weight. Then for every subsequent weight, simply omit entering the multiplier or divisor on the numerical keypad. That is, press the × or ÷ key followed immediately by the **ENTER** key. The indicator will then use the originally entered number.

Setting communications port options.

The communication interface (RS232C port) is used for connection to a printer or computer. The baud rate and the handshaking method can be set to the requirements of the connected device. The factory default is 9600 baud and "Hon-Hoff" handshaking to suit the TRU-TEST printer.

To set the baud rate.

While in set mode, press the **BAUD** key to see the current baud rate. Press it one or more times to cycle through the available baud rates. The possible baud rates are 110, 150, 300, 600, 1200, 2400, 4800, and 9600.

To set the handshaking mode.

While in set mode, press the **HND SHK** key to see the current communications port handshaking method. Press it one or more times to cycle through the available handshaking methods. The possible handshaking methods are: "Hon-HoFF" which means XON-XOFF for use with computers and printers with software handshaking, "ctS Pin 5" for use with hardwired handshaking on pin 5 of the RS232C port, and "dSr Pin 6" for use with hardwired handshaking on pin 6.

❒ Refer to "Communications port" on page 59 for further RS232C cabling details.

Clearing all of memory.

① Press **FILE SELECT**, **0**, **ENTER**.

② Press **SET**. The display will show "SEt".

③ Press **CL FILE**. The display will show "CLr-ALL?" and the beeper will sound.

④ Press **CL FILE**. The display will show " SURE ? " and the beeper will sound.

⑤ To erase all data press **CL FILE** a third time. To abort the clear operation, press **LIVE**.

Items cleared.

1. All records in all files.
2. The draft limits of all files.
3. The date of all files.
4. The gain reference file number of all files.
5. Any tare or set-tare.
6. Any pre-tag.
7. The calculator constants.

Not affect by clearing memory.

1. kg/lb setting.
2. Auto zero tracking on/off status.
3. Power up zero on/off status.
4. Stable annunciator speed setting.
5. Resolution selected.
6. Print option selected.
7. Baud rate.
8. Interface handshaking method.

TYPICAL RECORDING SESSION.

This example presents in one place, all the information you need to know for a typical weighing session.

The operation is the same for kg or lb.

FUNCTION DESCRIPTION	KEY	DISPLAY	ANNUNCIATORS
Turn the indicator on.	**ON**	0.0	ZERO STABLE kg
See if current file is empty.	**FILE SELECT**	FiLE: 01	
Scan files for 'E' (empty). (Repeat as necessary).	⇑ **DISPLAY**	FILE: 02E	
Return to live mode.	**LIVE**	0.0	ZERO STABLE kg
First animal onto platform.		670	kg
Enter its tag (ID) number.	**TAG (ID)**	Entr tAg (ID)	
	1	00,00,0001	
	2	00,00,0012	
	ENTER	670	STABLE kg Tag (ID) enter'd
Wait for STABLE. Record the tag (ID) and weight.	**RECORD**	<blink> 670	 STABLE kg Record'd
Next animal onto platform. Repeat from tag (ID) entry.		595	kg
Switch indicator off.	**OFF**		

CARE AND MAINTENANCE.

The AG500 indicator is a rugged and robust product designed to withstand the environment associated with livestock handling. The case is made from extremely tough, ultraviolet resistant polycarbonate alloy (the same as used in crash helmets). The keyboard is completely sealed for all weather operation.

Like any equipment, however, the life and good appearance of the indicator can be extended with appropriate care. Below is a set of simple rules which should be followed.

- Both the indicator and load bars or suspension cells are designed to be shower proof. Under no circumstances should the equipment be submerged in water or left in a damp environment for extended periods.
- Occasionally clean away foreign material from the underside of the platform to ensure that all the load is taken by the load sensors.
- The indicator should be stored in a dry cool place.
- Keep the indicator clean. Use a soft damp cloth to remove dust and mud. Do not use abrasive cleaners as the case could be scratched.
- The caps must be screwed onto the plugs whenever the load cells are detached from the indicator. When the load cells are connected to the indicator, the two caps should be screwed together. This will prevent dust and moisture contamination. Dust and moisture can be removed from the plugs and caps by using methylated spirits or ethyl alcohol. Stronger spirits must not be used as they may react with the plastic.
- The case is a sealed unit and there are no user serviceable parts inside. Refer all servicing matters to your local TRU-TEST representative. Do not open the indicator case because moisture contamination is likely and will affect the operation of the indicator. The product warranty will become void if the case seal is broken.
- If fitted with the internal battery option, store the indicator in a fully charged state and recharge every three months.

INTERNAL BATTERY.

This option makes the indicator conveniently independent of any power supply. The internal battery charger is designed to charge the battery either while the indicator is in use or while it is switched off, and to provide maximum protection for the battery.

The internal battery (if installed) in the indicator will give 8 hours of continuous operation from the fully charged state at normal temperatures (5 - 20 degrees C (40 - 70 degrees F)) with two load bars connected.

The battery will last for 3 to 5 years or 260 charges if it is stored in a charged state and not submitted to temperature extremes. (Refer to the specifications in Appendix E.)

To extend battery life...

- Never use an insufficiently charged or exhausted battery.
- Recharge the battery soon after use.
- Be sure to charge before use.
- Recharge the battery once every 3 months if not used.
- Store the indicator in a cool dry place.
- Use the recommended power supply.

Internal battery charging.

The internal battery charger unit (installed as part of the internal battery option) is designed to maintain maximum life of the battery, while giving the fastest charging rate possible. The charger automatically changes from a 'cycle' charge rate to a 'standby' charge rate depending on the internal battery state.

The internal battery charger is designed to operate from a 12 volt DC car battery or a power supply unit. AUTOMOTIVE BATTERY CHARGERS MUST NOT BE USED. Other charging supplies may damage the indicator resulting in the warranty becoming void. When charging the AG500 indicator from a 12 volt car battery, it should be realised that the car battery will drop energy equivalent to leaving the car headlights on for approximately 1 hour.

If the power source is unable to supply the required power, the charger will switch off and will not charge the internal battery. The indicator will continue to operate from the external power source. The charger will only restart once the external power supply has been disconnected or turned off and then reapplied.

A simple indication that the battery charger is working is that a quiet buzzing noise may be heard from within the indicator. Charging from a flat state takes six hours.

The AG500 enables the user to read the supply voltage at any time so that the condition of the internal battery can be determined. This is achieved by pressing **SET DIAG, DIAG, DIAG**. To update the voltage reading press **DIAG** once again.

A fully charged internal battery will read 12.5 volts or more when the AG500 has been on for 5 to 10 minutes with no load bars, printer or external power source connected.

The internal battery is considered low when the voltage reads less than 11.0 volts.

To use the internal voltmeter to determine if the battery is being charged, read the internal battery voltage 30 minutes after connecting to the external 12 volt supply. The battery should read greater than 13.5 volts. Note, this does not mean that charging is complete.

INSTALLATION.

In general, this section need only be read prior to first time use of the indicator.

Unpack and install the indicator mounting stirrup. Ensure that it is located in a secure position.

Follow the installation instructions in your system manual (included with your loadbars). Run the load cell cables to the indicator mounting location where they cannot be damaged.

To extend the life of the indicator (and printer if applicable), it is recommended that it be kept indoors when not in use. If the internal battery is fitted, it is convenient to do both charging and report printing at the same time indoors.

If the internal battery is installed, charge it by connecting the indicator to a good 12 volt DC source, either the recommended power supply unit or a 12 volt car battery. A small AC to DC adapter is not suitable for battery charging. Refer to "Internal battery charging" on page 41 for full details.

If no internal battery is installed, 12 volts must be available at the indicator mounting location. One of the following options must be used. (A small AC to DC adapter of 600mA or less is NOT suitable if a TRU-TEST DC printer is to be connected to the indicator.)

① 12 volt battery.
NOTE: Red lead to +ve terminal.
Black lead to -ve terminal.

② Power Supply Unit.
(230 volts or 115 volts AC to 13.8 volts DC @ 5 amps.)

③ AC to DC adapter.
(230 or 115 volts AC to 13.8 volts DC @ 600mA.)

NOTE: Red lead to Red lead.
Black lead to Black lead.

If there is only one load cell cable, it can be plugged into either of the two load cell connectors.

Appendix A. TROUBLE SHOOTING.

"Lo bAt" is displayed.

Cause The supply voltage is below 10.5 volts DC or the battery terminals are dirty. This message will be displayed for 15 seconds, after which time the indicator will switch itself off.

Solution Replace power pack or battery with a unit that can provide 10.5 to 16 volts DC, or clean battery terminals.

"High bAt" is displayed.

Cause The supply voltage is greater than 16 volts DC. This message will be displayed for 15 seconds after which time the indicator will switch itself off.

Solution Replace power supply with a unit that can provide 10.5 to 16 volts DC.

"8 voLt" is displayed.

Cause The internal 8 volt supply (used to excite the load cells) is outside its specified range.

Solution Disconnect the load cell cables from the indicator one at a time. If the "8 voLt" message disappears then there is a fault in the load cells or their cables. If after disconnecti g the cables the message is still displayed then the indicator is faulty. Return all faulty items to your service agent.

"nEg voLt" is displayed.

Cause The internal negative supply is outside its limits.

Solution Disconnect any cable on the communications port. If the problem disappears check the cable. Otherwise return the indicator to your service agent.

"Lith bAt" is displayed.

Cause The internal memory retention lithium battery is near the end of its life. (Normal battery life 7 years).

Solution Return the indicator to the service agent for battery replacement.

"CAL LOSt" displayed during turn on.

Cause The indicator has not been calibrated or it has lost its standard calibration data.

Solution The standard calibration data is not used if the indicator has been span calibrated. If this is the case then the extreme left annunciator (SPAN) should be on when the load bars or suspension cells are plugged in. The indicator can be used normally. If the indicator is not using span calibration then it may still be used without its standard calibration but with reduced accuracy. The accuracy cannot be guaranteed. Return the indicator to your service agent to have its standard calibration data cleared or restored.

"SPC LOSt" displayed during turn on.

Cause The span calibration data has been lost.

Solution If configured to do so, and if standard load cells are being used, the indicator may continue to function using standard calibration although possibly with different resolutions and load ratings and with reduced accuracy than that attainable with span calibration.

If you need to use span calibration, the system must be recalibrated in situation. If you do not use span calibration, you may continue to use the indicator normally. Return the indicator to your service agent to have the span calibration cleared.

If your indicator is a Weights and Measures version contact your service agent.

"bAd codE" is displayed.

Cause The code resistors in the load cell cable plugs are unrecognised. (This message also displays for load cells which are only used with span calibration before span calibration is done.)

Solution If you have two load bars, ascertain which has faulty code resistors. Return faulty parts to your service agent.

"SErvicE" or *"bAd conF"* is displayed.

Cause Essential RAM data containing the configuration number has been corrupted or an upgrade attempt has failed.

Solution Contact your TRU-TEST service representative for service.

"no cELL" displayed during turn on and then displays *"rEAdy"*.

Cause There is no load cell connected or the load cell code resistors are open circuit.

Cause Old code 99 load bars are being used with version 6 software or later.

Solution The indicator can be used without the load cell connected for setting up, editing, electronic note pad and report printing. If the condition persists when the load cell cables are plugged in, refer to "bAd codE".

Solution Contact your distributor for reconfiguration of the indicator to recognize 99 as a valid code.

"PR FAULt" is displayed.

Cause The PRocessor inside the indicator crashed probably due to an electrical trauma down the power supply line.

Solution Turn the indicator off and then on. If there is a "bAd conF", "CAL LOSt" or "SPC LOSt" message during turn on then the crash has caused the loss of vital internal data which the indicator has been unable to recover by itself. (The indicator keeps three copies of everything to enable recovery in most cases.) Refer to the trouble shooting section specific to the message(s) you get. If the "PR FAULt" recurs regularly, check the power supply by running the indicator from a 12 volt car battery. If the condition persists, return the indicator for service.

"CS FAULt" displayed.

Cause The EPROM CheckSum self test has failed.

Solution Turn the indicator off and then on again. If the condition persists, return the indicator for service.

"UndEr Ld" is displayed.

Cause The signal from the load bars is abnormally low (negative) or the indicator is faulty.

Solution If you have two load bars, determine which unit is faulty. Return faulty units to the service agent.

"tAring" or "ZEroing" message persists indefinitely.

Cause The signal from the load cells is excessively noisy or the cables are contaminated with moisture or the 12 volt power source is excessively noisy.

Solution Remove any alive weight on the platform. If you have two load bars, disconnect one at a time to determine if one is faulty. Check the power supply by replacing it or running the indicator off a 12 volt car battery.

"ZEro OL" is displayed.

Cause The indicator is using span calibration without the 50% dead load configuration option and is trying to zero more than 2% of live capacity.

Solution If a weights and measures approved scale, remove any dead weight which did not exist on the platform when it was span calibrated and re-zero manually.

If not a weights and measures approved scale, contact your service representative to check the configuration for 50% dead load allowance.

The displayed weights are out by a factor of near'y two.

Cause The indicator is working in the wrong units.

Solution If both kilograms and pounds are available, two annunciators labelled "kg" and "lb" indicate which one is currently being used. Change the units. If recording now shows "diF Unit", it will be necessary to clear the current file or change to a new file.

If the indicator's units cannot be changed, it must be returned to your supplier to have the configuration number corrected.

The indicator display is unstable. That is, the display jumps from reading to reading or cycles up or down.

Cause This is caused by moisture or dirt in the indicator or load cell plugs or the load cell cable being damaged or foreign material build up underneath the platform. (It can also be caused by the animal having one leg off the platform and resting on the ground or an unweighed part of the enclosure.)

Solution Clean with methylated spirits and dry out the indicator and load cell plugs. Check for broken or split areas on the covering of the load cell cable and repair by covering with waterproof tape. If any of the wires in the load cell cable are exposed, cut or frayed, return the load cell unit to your service agent for repair. Clean the underside of the platform.

Inaccurate weight readings.

Cause Loose bolts which hold the load cell, loose load cell foot bolts, load bearing surface is not supporting foot, faulty load cell, uneven or non-level surface or faulty indicator.

Solution Tighten all loose bolts and ensure that all four feet are resting on concrete or 25mm (1 inch) of timber. If a load cell or an indicator is faulty, return faulty item to your service agent.

"no rEc'd" displayed when pressing the **RECORD** key.

Cause The weight was not recorded when the **RECORD** key was pressed because it had already been recorded.

Solution If a new animal is on the platform, wait until the RECORD'D annunciator goes off or press the **CLEAR** key to force it off.

" FULL " is displayed.

Cause Memory is full.

Solution Print or down load the memory contents if needed and then clear some memory files.

"not StbL" displayed when pressing the **RECORD** key.

Cause The STABLE annunciator was not on when the **RECORD** key was pressed.

"diF cELL" displayed when pressing the **RECORD** key or entering draft limits.

Cause Memory records are present which were recorded with a different cell code than the current load bar or suspension cell.

Solution Clear the current file or select another file.

"diF Unit" displayed when pressing the **RECORD** key.

Cause The currently selected units (kgs or lbs) is different to that used for previous memory records.

Solution Change the units or clear the current file or select a new file.

Weights cannot be recorded.

Cause The displayed value is not a live weight or the displayed weight is negative. (Also check for "not StbL", "no rEc'd", "diF Unit", "diF cELL", "FULL", "OvErLoAd".)

Solution Press the **LIVE** key to return the indicator to a live weight display. Only positive weight readings can be recorded.

Weight gain doesn't work.

Cause Weight gain mode is not on. There is no weight on the platform. The entered tag has been cancelled by the weight returning to zero.

Solution Press the ⇔ key to turn weight gain mode on. (If it turns off, press again to turn back on.) The display does not switch to weight gain display until a weight is on the platform. Try re-entering the tag.

"not Fnd" is displayed when tags are entered.

Cause Weight gain mode is on and the tag does not exist in the gain reference file. If a pre-tag is set, it becomes part of each entered tag and may cause the "not Fnd" message.

Solution If not using weight gain, turn weight gain mode off using the ⇔ key. Clear the pre-tag unless the tags in the gain reference file all begin with it.

"no Gn FL" is displayed.

Cause a) There is no gain reference file number set or the gain reference file is empty.

b) The files have incompatible minimum resolutions (they must be the same).

Solution a) Ensure you have the correct file selected as the current file. Set a gain reference file number to a non-empty file using the **GAIN FL** key in set mode.

b) If using two loadbar systems with different minimum resolutions either: obtain compatible loadbars, or contact your local TRU-TEST service centre and get one of the loadbar systems span calibrated to match the other (the majority of TRU-TEST systems are 0.5kg (lb)).

If using heavy duty (HD100) loadbars or load cells with a minimum resolution different from 0.5kg (1lb) **AND** the display doesn't show "rEAdy" when no loadbars are connected, contact your local TRU-TEST service centre and ask to have "code 99" loadbars disabled.

Daily weight gain doesn't work but accumulated does.

Cause There is something wrong with the dates.

Solution Make sure both dates are set properly. Try swapping the day and month fields. If this works, contact your service representative to have the date format configured to your requirements.

The printer doesn't print and the indicator locks up.

Cause The handshake mode is set incorrectly.

Solution Try both "dSr Pin 6" and "ctS Pin 5". Then try again with the hand shaking set to XON-XOFF to verify it is a handshaking problem. If the printer now prints, check that there are no sections of the printout missing.

The printer prints nothing but the indicator does not lock up.

Cause Incorrect baud rate or faulty cabling.

Solution Check the cable. Set the baud rate to that of the printer. Most printers require 9600 baud. Refer to "Communications port" on page 59.

Sections of the printout are missing.

Cause Hand shaking is not working.

Solution Try changing the handshaking to DSR pin 6. If the indicator now locks up when printing, check the cabling. Refer to "Communications port" on page 59.

The printer prints garbage.

Cause Incorrect baud rate.

Solution Set the baud rate to that of the printer. Most printers require 9600 baud. Some old TRU-TEST printers used 600 baud.

One or more indicator functions suddenly behave abnormally.

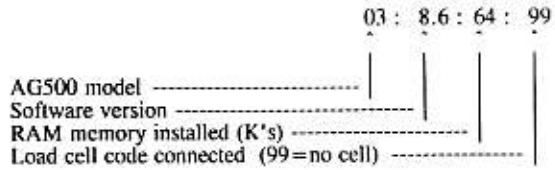
Cause An indicator memory variable may have become corrupted by severe electrical disturbance.

Solution Turn the indicator off and then on again. If the problem persists, check all indicator settings and change if necessary. If problem persists, clear all of memory.

☎ If after carrying out the above recommended solutions to the various problems the fault has not been rectified, contact your local TRU-TEST service centre.

New Zealand	**TRU-TEST Corporation Ltd:** **☎ Toll Free 0800-653-356**
USA	**TRU-TEST Inc:** **☎ Toll Free 1-800-874-8494** **☎ In Texas (512) 377-2885**
Australia	**Nearest Sunbeam State Office:** **N.S.W. ☎ (02) 789-8452** **QLD. ☎ (07) 848-5171** **VIC. ☎ (03) 318-2111** **S.A. ☎ (08) 375-0300** **W.A. ☎ (09) 444-7788** **TAS. ☎ (003) 93-6152**

✍ Please have on hand the following diagnostic information, which can be obtained from the indicator by pressing **SET, DIAG**. Have your load bars or suspension cell connected when you do this.



Press the **DIAG** key again to give the factory configuration number. Press it a third time to give the internal battery or external supply voltage.

Write your diagnostic information here:

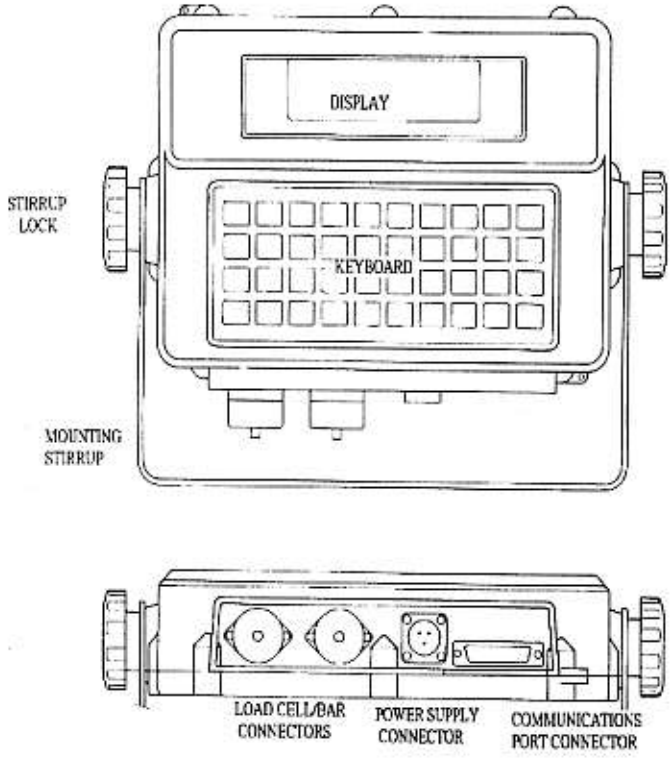
Diag number __:_:_:__

Config number _____

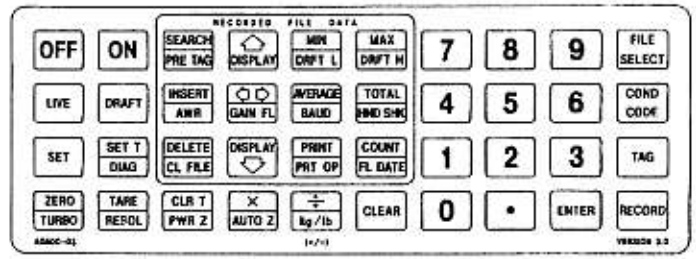
Voltage __._

Appendix B. Reference Information.

Description of parts.



Keyboard.



0 . . . 9, . Numerical key pad.

AUTO Z Set mode function for viewing or setting the automatic zero tracking status.

AWR Set mode function for viewing or setting the Automatic Weight Recording status.

AVERAGE Displays the average weight or weight gain, of all animals recorded in the current memory file.

BAUD Set mode function for viewing or setting the baud rate for the communications port.

CLEAR Clears the last digit entered during numerical keypad entry of any quantity (tags, draft limits, date, condition codes, weights, set-tare etc). Also used to clear the RECORD'D annunciator, the draft limits, the pre-tag, the file date, the gain file number, etc.

CL FILE Set mode function which clears the current file of all animal records, draft limits, date and gain reference file number. To prevent unwanted loss of recorded data, this key must be pressed twice.

CLR T Clears any tare or set-tare.

COND CODE Views or initiates entry of a condition code ready to be recorded with the **RECORD** key.

COUNT Displays the total number of animals recorded in the current memory file.

DELETE Deletes the displayed record from memory.

⇧ DISPLAY If not already displaying an animal record in memory, this key positions to the top (last) animal record and displays its tag. If already displaying an animal record, this key positions to and displays the next record.

When selecting files, this key selects the next file.

This key auto-repeats when held down.

DISPLAY ⇩ If not already displaying an animal record in memory, this key positions to the bottom (first) animal record and displays its tag. If already displaying an animal record, this key positions to and displays the previous record.

When selecting files, this key selects the previous file.

This key auto-repeats when held down.

DRAFT Selects draft display format.

DRFT H Set mode function for viewing or setting the higher drafting limit.

DRFT L Set mode function for viewing or setting the lower drafting limit.

DIAG Displays model number, software version, installed RAM (K's), connected cell code, configuration number and battery/supply voltage.

÷ Allows divide calculations on any displayed quantity.

ENTER Terminates entry of numbers keyed in on the numerical key pad, and calculates results of × and ÷ operations.

FILE SELECT Views the current file number or initiates selection of a new file number.

FL DATE Set mode function for viewing or setting the file date.

GAIN FL Set mode function for viewing or setting the gain reference file number.

HND SHK Set mode function for viewing or setting the communication port's handshaking method.

ID Views the ID number or initiates entry of an ID number for later recording with the **RECORD** key.

ID PREFIX Set mode function for viewing or setting the id prefix.

INSERT Inserts a complete new animal record into memory.

kg/lb Set mode function which toggles between kilograms and pounds.

⇔ When displaying animal records in memory, toggles between tag, weight, condition code, (and weight gain).

When selecting files, toggles between the different file select display formats.

In live mode, toggles between weight gain and normal weight display.

LIVE Selects live weighing mode (the normal state of the indicator). In this mode the grey keys are active. This key can be pressed at any stage during the operation of the indicator.

MAX Displays the maximum weight or weight gain, recorded in the current memory file.

MIN Displays the minimum weight or weight gain, recorded in the current memory file.

× Allows multiply calculations on any displayed quantity.

OFF Turns the indicator OFF.

ON Turns the indicator ON.

PRE TAG Set mode function for viewing or setting the pre-tag.

PREFIX Set mode function for viewing or setting the id prefix.

PRINT Prints a report or summary of the records in the current memory file.

PRNT OP Set mode function for viewing or setting the print report format option.

PWR Z Set mode function for viewing or setting the automatic power up zero status.

RECORD Records the displayed live weight (and associated tag and condition code) as an animal record in memory.

REPORT Prints a report or summary of the records in the current memory file.

RPRT OP Set mode function for viewing or setting the print report format option.

RESOL Set mode function for viewing or setting the minimum display resolution (division size).

SET Selects set mode. The white lower function on the dual function keys become active in set mode.

SET T Views the present set-tare (keyboard entered tare) value and allows a new set-tare value to be entered.

SEARCH Allows animal records in memory to be searched for by tag and displayed.

TAG Views the tag number or initiates entry of a tag number for later recording with the **RECORD** key.

TARE Cancels out a container weight.

TOTAL Displays the total weight or weight gain, of animals recorded in the current memory file.

TURBO Set mode function for viewing or setting the STABLE annunciator speed/percentage accuracy trade-off.

ZERO Cancels out dirt and excrement accumulating on the platform and returns the display to exactly zero.

Display annunciators.

SPAN CAL	Indicates when the span calibration option is being used.
ZERO	Indicates centre of zero (weight is within one quarter of a division of zero).
TARE	Indicates when displaying net weights (either a push-button tare or set-tare has been entered).
NET	Indicates when displaying net weights (either a push-button tare or set-tare has been entered).
STABLE	Indicates a stable reading when displaying live weights.
kg	Indicates that the displayed value is in kilograms.
lb	Indicates that the displayed value is in pounds.
TAG ENTER'D	Indicates that a tag number has been entered ready to go with the live weight the next time the **RECORD** key is pressed.
ID ENTER'D	Indicates that an ID number has been entered ready to go with the live weight the next time the **RECORD** key is pressed.
RECORD'D	Indicates that the current weight has been recorded into memory.

❒ The USA versions have some different key and annunciator names and display messages from the standard to suit local requirements.

❍ For Weights and Measures versions, some keys and annunciators may have been removed or changed to conform with local regulations. Refer "Weights and Measures" on page 65.

Display messages.

Message	Meaning
- 0000 -	Drafting, no weight on platform.
8 voLt	Internal 8 volt supply failure.
bAd codE	Bad cell code from load cell cable plug.
bAd conF	Configuration data is lost.
buSy	Busy performing sorting and/or calculations.
CAL LOSt	Standard calibration data is lost.
cAution	Caution on a span cal parameter. (see calibration manual).
C CodE ?	Enter a condition code.
-CEntrE-	Drafting CENTRE range.
CLr ALL?	Clear all files!?.
CLr FiLE	Clear file?.
CondCodE	Condition code report.
ConFig	Configuration data.
cPtr out	Computer output format.
CS FAULt	Checksum Fault in EPROM.
ctS Pin5	CTS handshaking on pin 5 of the communications interface.
CuLL	Weight ordered with Cull report.
CuLL S	Cull summary report.
dEL rEC	Delete animal record done.
diF cELL	Memory records present which were recorded with a different cell.
diF Unit	The units (kg/lb) are different to those being used for memory records.
drAFt	Draft report.
drAFt S	Draft summary report.
dSr Pin6	DSR handshaking on pin 6 of communications interface.
duPLiCAt	Duplicate tag warning.
EntEr id	Enter an identification number.
Entr tAg	Enter a tag.
Error	Error during span calibrating (see Configuration and Calibration manual).
FiLE xx	Current file is xx.
FiLE S	File Summary report.
FLEECE	FLEECE mode selected.
Found	Tag found.
FULL	Memory is full.
GAin	Weight gain report.
GAin dFt	Weight gain draft report.
Gn dFt S	Weight gain draft summary.
Gn FL xx	Gain reference file is xx.
- High -	Drafting HIGH range.
High bAt	High supply voltage indicated.
Hon-HoFF	XON XOFF handshaking on the communications interface.
Lith bAt	Internal lithium battery flat.
- Lo -	Drafting LOW range.
Lo bAt	Low supply voltage indicated.
nEg voLt	Internal negative voltage failure.
no cELL	No load cell is connected.
no dAtA	No data in memory file.

no Gn FL	No gain reference file number set or the gain reference file has a different base resolution or it is empty.
no rEc'd	Not recorded (already recorded).
no trAdE	Not legal for trade.
no FiLE	No data recording file selected (file 00 selected).
not Fnd	Tag not found.
not StbL	Not stable when attempting to record.
OFF	Function is OFF.
ON	Function is ON.
on nEt	Auto zero tracking on net weight.
on tAg	Automatic weight recording on tag entry.
OvErFLo	Overflow in number entry (value too large).
OvErLoAd	Overload on scale.
PR FAULt	Processor fault (crashed).
Printing	Printing in progress.
rEAdy	The indicator is ready, but no load cell is connected.
SErvicE	Indicator requires service.
SEt	The indicator is in set mode.
SPC LOSt	Span calibration data is lost.
StbL xPC	Stable annunciator on when within x%.
SURE ?	Are you sure about clearing all files?
tAg id	Tag or id ordered report.
tAring	The indicator is taring.
UndEr Ld	The voltage from the load cells is abnormally low.
UnStAbLE	Drafting, unstable reading.
xxxxbAud	Baud rate of communications port.
ZEro OL	Zero overload when using span calibration (can't zero > 2%).
ZEroing	The indicator is Zeroing.

Prefix letters used to identify non - live weight displays.

A=	Calculator result.
Av	Average weight statistic.
CA	Capacity during span calibration.
CC	Condition code.
Cn	Count statistic.
dG	Daily gain.
dH	Draft High limit.
di	Divisor entry.
dL	Draft low limit.
FL	File number.
Gn	Gain (accumulated).
Hi	Maximum (high) weight statistic.
Lo	Minimum (low) weight statistic.
rd	Recorded weight during AWR.
rE	Resolution.
t	Set tare value.
ti	Times (multiplier) entry.
tL	Total weight statistic or test load during span calibration.
W(UU)	Weight field of memory record.

Communications port.

The AG500 is equipped with a RS232C serial interface port to allow communication to a printer or a computer. The indicator is configured as a DTE (Data Terminal Equipment) device and therefore will require a cross-wired cable for most computers and printers which are also DTE devices.

The "Setting communication port" section on page 37 describes the setting up of the interface baud rate and handshaking method.

The interface connector pin assignment for the AG500 is as follows.

PIN NUMBER	NAME	FUNCTION	DIRECTION
2	TX	Transmit	output
3	RX	Receive	input
4	RTS	Request To Send	output
5	CTS	Clear To Send	input
6	DSR	Data Set Ready	input
7	SG	Signal Ground	
20	DTR	Data Terminal Ready	output
1	PG	0 volts supply	output
25		+12 volts DC	output

For connection to a computer or printer using software handshaking ("Hon-HoFF" selected), only TX, RX and SG need be wired. TX and RX must usually be cross wired.

For connection to a printer using hardwired (or sometimes called DTR) handshaking ("dSr Pin 6" selected), only TX, DSR and SG need be wired. Usually TX (pin 2) on the AG500 is wired to RX (pin 3) on the printer. DSR (pin 6) is wired to DTR (pin 20) on the printer.

Serial data format.

The format of the serial data is asynchronous, eight data bits, no parity, one stop bit. Baud rate and handshaking method are user selectable - refer to the "Setting communication port" section on page 37.

Appendix C. Computer Interfacing.

Down loading to a computer.

The AG500 has the facility to down load the records in its memory to a computer. This allows weights, tag numbers (and condition codes) to be transferred to a computer file for further farm management processing.

A linker program is available for IBM compatible computers which takes care of the entire down loading process and is extremely easy to use. Ask your local TRU-TEST representative for details. Connection between the indicator and the computer is by RS232 interface. The computer must have a serial port.

For those wishing to write their own down loading software, the following information will be of use.

HINT: It could be of assistance to those who are writing their own software for IBM compatibles to obtain a copy of the linker package to use for checking that the hardware is functioning correctly.

ATTENTION: Never use the printer cable to connect the indicator to an IBM computer as damage to the computer could result.

Computer down load format.

When the print function of the indicator is executed with the print option set to "cPtr out" the data records are output as ascii characters, one record per line. Each record contains the tag, the weight, and the condition code fields delimited by commas. Leading zeros are suppressed. Each line ends in a <CR><LF>. At the end of all the data is a line containing the word END.

e.g. 1,377.5,0
2,389.0,0
.
.
END

The number of decimal places given for the weights is appropriate for the resolution of those weights.

Remote control by computer.

In addition to being able to down load data from the indicator to a printer or computer, the AG500 can be remotely controlled by a computer.

The following gives details for those writing their own software to control the indicator.

Control of the indicator is gained by sending an STX and is relinquished by sending an ETX. While the indicator is under remote control, it will not respond to the keyboard.

All keys on the keyboard with exception of the ON and OFF keys are coded with two digit codes. The first digit is the row, 0..3, and the second is the column, 0..9. That is, from 02 to 39.

To simulate a key being pushed, the computer must send a key code having two ASCII characters e.g. the **LIVE** key is code 10. To remotely access this key, the computer will need to send '1','0', (31H,30H).

Hidden remote functions.

In addition to keyboard codes, there are a number of 'hidden' key functions which allow information to be extracted from the indicator. These are codes 42 through 49.

42 Turn off all output modes (ie. key codes 43, 45, 46).

43 Data output on RECORD key mode. In this mode, the indicator outputs to the serial port the TAG, WEIGHT, and COND CODE information (and draft status if in the draft mode) each time a weight is recorded by pressing the RECORD key. This is used for printing as animals are weighed or for semi-automatic draft gate control. (The indicator is factory preset into this mode.)

44 LCD one shot echo. Upon this command, the indicator outputs to the serial port the contents of the LCD buffer. The format is the same as for the continuous LCD echo mode.

45 Continuous LCD echo mode. In this mode, the indicator outputs to the serial port the contents of the LCD buffer every time it changes. This can be used for a complete remote display which mimics the AG500 display.

46 Continuous draft output mode. In this mode the indicator outputs the draft status information continuously when a stable weight is detected. This can be used for draft gate control. The output consists of a single character: 0, L, C, H which mean zero, low, centre or high respectively.

47 Beep. Activates the AG500 beeper.

48 Display Diagnostic information. This key code provides a compatible way to read the model on any model.

49 Go to set mode. This key provides a way to enter set mode on any model. (Model 1 and 2 have baud rate and hand shake functions on the same set mode keys as the model 3.)

Remote keys 42, 43, 45 & 46 control output modes which are mutually exclusive. The output mode activated remains active when computer control is relinquished and over indicator power downs.

Remote keys 42, 43, 45 & 46 can be executed from the indicator's keyboard if necessary. This allows the indicator to talk to some dumb output devices. To do this, turn the indicator off and then hold down the **'0'** key while turning it back on. The display will go blank. Release the **ON** key. Then press the two digits of the required function, e.g 42 will turn off data output on RECORD and allow a printer used for reports to be permanently connected.

Key 43. Output data format.

In live mode:

Tag field, Weight field, Units.
12_34_5678_12,345.67_kg<CR><LF>

In drafting mode:

Draft field, Tag field, Weight field, Units.
H_12_34_5678_12,345.67_kg<CR><LF>

The number of decimal places printed varies according to the current resolution of the indicator. If no decimal places are printed, no decimal point is printed. Leading zeros on the weight fields are spaces. The underlines represent space(s). For the draft field character, see Key 46 below.

Key 44 and 45. LCD echo data format.

The first two bytes contain the annunciators encoded as follows:

	bit7							bit0
byte 1	0	1	0	T5	T4	T3	T2	T1
byte 2	0	1	0	0	T9	T8	T7	T6

Where T1..T9 are the nine display annunciators from left to right.

Next is the contents of the LCD display as ASCII characters including any decimal points, commas or colons in their respective positions. Leading or trailing spaces are not removed, so the number of characters is always at least 8.

For example the TOTAL statistics display would be sent as follows:

@AtL:1,234.5_<CR>

'@A' are the encoded annunciators which in this case indicate that only T6 (kg) is on. The 'tL' is the prefix for the TOTAL statistic display. The underscore represents a space. The string is terminated with a <CR> (0DH).

Key 46. Draft output data format.

Single ascii character only (no <CR> or <LF>).

Draft status characters:
0 = zero.
L = Low range.
C = Centre range.
H = High range.

Automatic baud rate and handshaking set up.

To facilitate the computer automatically determining the indicator's current baud rate, the indicator will respond if it receives an ENQ with an ACK regardless of the handshaking mode. Wait a time dependent on the transmission time of one character there and back at the baud rate being tested. e.g. for 110 baud, wait 200mS. Discard any characters received except ACK. Start at 9600 baud and work down to avoid the indicator getting junk characters.

After determining the baud rate and sending an STX, we can start sending key codes but since handshaking is not necessarily working yet we must allow time for the indicator to execute each command. Allow 150mS plus transmission time for two characters for each command. You should send code 10 (LIVE) to get the indicator into a known state. Then send 42 to turn off all automatic output modes.

Next the baud rate can be set to that required for communications (usually 9600 baud). First send code 49 to put the indicator into 'SEt' mode. (Use 49 rather than 20 because 49 works on a model 02 indicator.) Then send code 14 (BAUD) to invoke the indicator's baud function. Wait 150mS plus transmission time for the two characters. Then send a code 14. Wait 150mS plus transmission time for the two characters and change the baud rate at the computer end to the next higher available on the indicator as well. Repeat sending code 14's, timing out and incrementing the computer baud rate until the desired baud rate is obtained.

The handshaking mode should be determined and set as required as follows.

1) Flush any garbage characters the indicator may have sent to the computer's receive buffer.

2) Go to set mode using key code 49 (if not already) then send key code 15 to put the hand shake mode on the display. Wait 150mS (plus transmission time for two characters) after each command.

3) Send code 44 to echo the LCD display.

4) If you receive the contents of the display, you now know the handshaking mode. Go to step 6.

5) If you time out (150mS plus transmission time for two characters plus transmission time for received message) or miss some characters, send code 15 to change the handshake mode. Go to step 3)

6) If needed, send code 15's to change the handshaking mode to that required for successful handshaking.

Xon-Xoff handshaking is usually used for indicator/computer communication. Handshaking should be set up to work in both directions so that all subsequent communication can occur without use of delays.

Electronic tag (ID) reader interfacing.

The preferred approach is for the tag (ID) reader to input the tag (ID) number, using the keyboard remote control functions, into the indicator and use the indicator to store the data. If hands off operation is required use an AG500-03 and select AWR "ON TAG" option. The weight will then automatically be recorded once the tag has been read. This requires that the tag is read once the animal is in the weigh crate.

Example:

① Identification of the tag (ID) number and conversion to a 8 digit (or less) whole number. No decimal points allowed.

② Gain control of the AG500 by transmitting **STX** ASCII (02hex), if identification is valid.

③ Transmit numbers to the AG500:

LIVE	10 ASCII (31hex, 30hex)
TAG	29 ASCII (32hex, 39hex)
1	26 ASCII (32hex, 36hex)
2	27 ASCII (32hex, 37hex)
3	28 ASCII (32hex, 38hex)
4	16 ASCII (31hex, 36hex)
5	17 ASCII (31hex, 37hex)
6	18 ASCII (31hex, 38hex)
7	06 ASCII (30hex, 36hex)
8	07 ASCII (30hex, 37hex)
ENTER	38 ASCII (33hex, 38hex)

ASCII and hex codes for other numbers are:

0	36 ASCII (33hex, 36hex)
9	08 ASCII (30hex, 38hex)

④ Switch control back to the AG500 with **ETX** ASCII (02hex).

⑤ The animal weight can now be recorded along with the tag number.

NOTES:

These instructions only apply to the current versions (version 3) of AG500 models 02 and 03.

It is advised to execute the **LIVE** key first to ensure that the indicator is in a known state before commencing entry of the tag.

Appendix D. Weights and Measures.

Weights and Measures versions of the indicator will have some of the functions either changed or disabled due to local regulations. This section describes the differences of these indicators from standard on a country by country basis.

The physical differences are the use of the special Weights and Measures circuit board, different keyboard and window legends, different configuration number and different labelling. The platform (load bars) will have been matched to the indicator and must not be mixed up with other platforms.

For further details on correct configuration numbers contact your local TRU-TEST agent. Agents please refer "calibration and configuration manual".

The weighing system normally needs checking and stamping by a Weights and Measures inspector on a regular basis to ensure that the system is approved for trade (user responsibility).

Australia (Version 3.1).

The indicator will have Version 3.1 keyboard and window legends fitted. The Australian display and descriptive labels will be fitted and the required system information entered onto these labels.

Functional differences:

- ☆ The **ZERO** function (including automatic zero tracking) only operates if the weight to be zeroed is within 2% (of capacity) of the initial platform zero. Otherwise it displays "ZEro OL" message and the display returns to the previous weight.
- ☆ The stable annunciator turns on when the weight is within ±0.5d (divisions).
- ☆ The **TURBO** function is disabled and the auto zero capture range is set to ±0.5d (divisions) maximum.
- ☆ Auto zero tracking on net weights is disabled.
- ☆ Editing of the weight part of the records and the **INSERT** function are disabled.
- ☆ The **RESOL** function is disabled.
- ☆ The system is span calibrated and standard calibration is disabled.
- ☆ The **kg/lb** function is disabled and only kg units are allowed.
- ☆ Extras zeros are displayed when the indicator displays zero and the division size (resolution) is greater or equal to 10.
- ☆ Pressing the **ZERO** key clears the tare and the **TARE** functions with tare weights as small as 1 division (resolution).
- ☆ The **AWR** function is disabled.
- ☆ The weight gain function is disabled. The **GAIN FL** key and the gain printouts are disabled.
- ☆ If the weighing system is set up as a multi-interval system, multi-interval (autoranging) will be functional otherwise it is disabled. The multi-interval transition points occur at 500 times the next coarser division size.

United States (Version 3.3).

The indicator will have Version 3.3 keyboard and window legends fitted. The United States display and descriptive labels will be fitted and the required system information entered onto these labels.

Functional differences:

- ☆ The **ZERO** function (including automatic zero tracking) only operates if the weight to be zeroed is within 2% (of capacity) of the initial platform zero. Otherwise it displays "ZEro OL" and the display returns to the previous weight.
- ☆ The stable annunciator turns on when the weight is within ±1d (divisions).
- ☆ The **TURBO** function is disabled and the auto zero capture band is set to ±1d (divisions) for Class III, ±0.5d for Class IIIL livestock and ±3d for Class IIIL non livestock.
- ☆ Auto zero tracking on net weights is disabled except for Class IIIL livestock.
- ☆ Editing of the weight part of the records and the **INSERT** function are disabled.
- ☆ The date and messages are in USA format.
- ☆ The **RESOL** function is disabled.
- ☆ The **TARE** and **SET T** functions may be disabled for Class IIIL live stock.
- ☆ The system is span calibrated and standard calibration is disabled.
- ☆ Extras zeros are displayed when the indicator displays zero and the division size (resolution) is greater or equal to 10.
- ☆ The **AWR** function is disabled.
- ☆ The weight gain function is disabled. The **GAIN FL** key and the gain printouts are disabled.

NOTE: Multi-interval is not allowed for USA Weights and Measures indicators.

Appendix E. SPECIFICATIONS.

NOTE: For configuration details of Weights and Measures versions refer "Weights and Measures" on page 65.

Class (Weights and Measures versions):

Australia	Class III NSC (version 3.1).
United States	Class III/IIIL NTEP (version 3.3).

Analogue input.

Load cell excitation:	8 volts DC, 4 wire, 6x 350 ohm load cells max.
Sensitivity:	3 microvolts/division minimum. (Weights and Measures versions)
Full Scale:	27mV max. including dead load.
Input Ranges:	2.0 or 3.0 mV/V.
AccuracyStd. Cal. (System):	+/- 1d or 0.5% of reading, whichever is the greater OR +/- 2d or 1.0% of reading, whichever is the greater depending on the load cell type used. Refer AG500 System manual.
Accuracy Span Cal. (Indicator only, Weights and Measures versions):	+/- 0.35d below 500d. +/- 0.7d from 500 to 2000d. +/- 1.05d above 2000d. Where d is the selected interval for multi-interval applications.

Read out.

Display divisions:	Single-interval (Weights and Measures versions): 3000 maximum. Number of divisions selectable as required during span calibration. Multi-interval (Weights and Measures versions): 5000 maximum (Max3/d1). Three division sizes (d1, d2, and d3). Transitions at 500d2 and 500d3. Requires configuration. Maximum number of divisions selectable as required during span calibration. Standard versions (non trade): Set by built-in configuration, dependent on load cell type used. Four division sizes (d1, d2, d3, and d4). Transitions at 250d2, 250d3, and 250d4.
Centre of Zero:	Annunciator turns on when scale is within +/- 0.25d of centre of zero. (Net or gross weight.)
Stable annunciator:	(Weights & Measures versions): On when displayed result is within +/- 1d or +/- 0.5d of the static condition depending on configuration. (Non Weights and Measures versions): On when displayed result is within 0.5%, 1% or 2% of the true weight (user selectable).
Weighing speed:	For a step change in weight, the display will indicate a stable reading within 0.8 seconds.
Damping algorithm:	Non locking, based on intelligent statistical analysis.
Maximum capacity:	999,999 kg or lb.
Division sizes:	0.0001 through 100 (kg or lb).
Zone of uncertainty	0.3d
Overload indication:	Indicates "OvErLoAd" at greater than 9d above live capacity.
Under zero:	Indicates negative weights until the hardware limits, then displays "UndEr Ld".

Zero and tare controls.

Push button Zero:	For span cal and Weights and Measures: Maximum weight which can be zeroed is +/- 2% of live capacity. For std cal or if 50% deadweight allowance option: Any weight up to live capacity may be zeroed. Capacity reduces if zeroed weight is greater than the built-in dead weight allowance.
Auto zero tracking:	User selectable (off, on, or on net). Capture range factory configured to one of 0.5d, 1d, 3d or 6d. Minimum time between operations: 8 seconds. Non Weights and Measures versions: 6d. Weights and Measures versions: Capture range and disabling of "on net" option depends on configuration.
Auto power up zero:	User selectable ON/OFF. Limits are same as for push button zero.
Push-button tare:	Any weight up to live capacity. Not rounded to nearest division.
Set-tare (kb tare):	Any weight to live capacity. Rounded to nearest division.
Minimum tare	6d or 1d depending on configuration. (Taring with gross weight within +/- 6d (or +/-1d) of zero clears the tare.)

Power requirements.

Voltage:	+10.5 to +16.0 volts DC (Protected against polarity reversal).
Current:	200 mA. 1.5A with internal battery charger option.

Internal battery. Sealed lead acid. Must be stored in a charged state.

Operating time:	8 hours @ 20 degrees C (70 degrees F), with two load bars connected.
Charging time:	Not less than 6 hours using 12 volt DC 1.5A (3 Amp 20uS pulses) @ 20 degrees C (70 degrees F).

Environmental.

Operating temperature:	-10 to +40 degrees C. +15 to +105 degrees F.
Storage temperature:	-20 to +80 degrees C. -5 to +175 degrees F.
Storage with internal battery:	-10 to +30 degrees C. +15 to +85 degrees F. Approximately 20 degrees C (70 degrees F) recommended if stored for extended periods.
Humidity:	95% relative humidity. Case is proof to IP53 moisture and dust.

Communications port. RS232C serial port.

Baud rates:	110, 150, 300, 600, 1200, 2400, 4800, 9600.
Handshaking:	Software: Xon Xoff. Wired: CTS pin 5. DSR pin 6.
Format:	Asynchronous 8 data bits. no parity. 1 stop bit.

Memory capacity. 64K RAM: 7672 records.

Stored Tag numbers:	Eight numerical digits.
Stored Weights:	Up to 16383d (Positive weights only).
Condition Code:	Up to 4 digits.
Number of files:	99 maximum.

Physical dimensions.

Display:	8 by 7 segment LCD. Height 18mm (3/4 inch). 9 annunciators.
Dimensions:	Height 210 mm (8.25 inches). Width 315 mm (12.5 inches). Depth 62 mm (2.5 inches).
Weight:	Indicator only: 1.8 kg (4.0 lb). With battery: 2.6 kg (6.0 lb).

NOTE: Product specifications are subject to alteration without notification.

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