ADAM

Adam Equipment

AFP-L & LC SERIES

(Includes EC Type approved models)

www.adamequipment.com

CONTENTS

1. INTRODUCTION

- The AFP-L & LC series of analytical precision electronic balances are used for fast determination of mass.

OIML TYPE APPROVAL: The AFP balances can be configured at the factory for compliance with EN 45501, OIML R-76. The balances have earned the EC type approval certificate and OIML Certificate of Conformity. The approved models are called AFP-LA series of balances. Some functions may not be available on the approved models. These will be described in a box like this.

- The AFP-LC series of balances have an internal calibration weight and will automatically calibrate when initiated by an operator.
- The balance will also calibrate automatically when the temperature changes in excess of a preset amount. This function can be disabled by the user.

OIML TYPE APPROVAL: For AFP-LA series, automatic and semi-automatic span adjustment is done with internal calibration mass only. It is operational after 7 minutes of switching the balance on, when the temperature changes by 3°C and on every 3 hrs after switching on. This function can not be disabled by user.

- All balances can be used with the special software to automatically determine the specific gravity of solids or liquids when used in conjunction with the Adam Equipment Density Determination Kit. This feature may be installed by your dealer when an Adam Equipment Density Determination Kit is ordered.

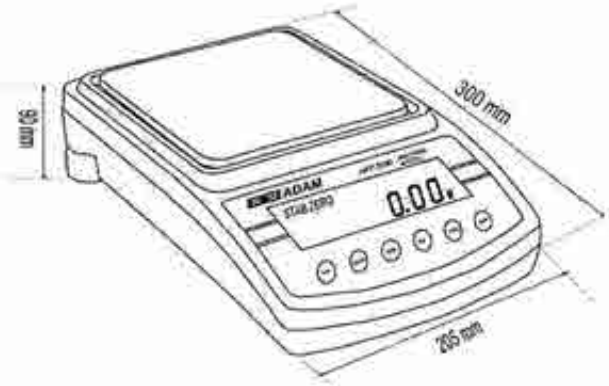
Other standard features include:

- Weigh in grams, grams with the last digit suppressed, milligrams, carats, grains, mommes, ounce or pennyweight.

OIML TYPE APPROVAL: For AFP-LA series, weighing units are grams and carats only. The display and the RS-232 output are marked with brackets on the least significant digit. For example-

12.3[4] g

- Transmit weighing data to a computer or printer and control the balance using commands from a PC via a standard RS-232C interface.
- Parts Counting, percentage weighing and below pan weighing capability, etc.



2. TECHNICAL SPECIFICATIONS

2.1 SPECIFICATIONS FOR REGULAR RANGE- AFP L & LC

	AFP-110	AFP-210	AFP-360	AFP-720	AFP-800	AFP-1200	AFP-2100	AFP-3100	AFP-4100
Maximum weighing capacity (Max.)	110 g	210 g	360 g	720 g	800 g	1200 g	2100 g	3100 g	4100 g
Tare range	-110 g	-210 g	-360 g	-720 g	-800 g	-1200 g	-2100 g	-3100 g	-4100 g
Interval, d=	0.001 g	0.001 g	0.001 g	0.001 g	0.01 g	0.01 g	0.01 g	0.01 g	0.01 g
Repeatability (s.d.)	0.001 g	0.001 g	0.001 g	0.001 g	0.01 g	0.01 g	0.01 g	0.01 g	0.01 g
Linearity ±	0.002 g	0.002 g	0.002 g	0.002 g	0.02 g	0.02 g	0.02 g	0.03 g	0.03 g
Operating temperature	Compensated ±1d/ °C over +15°C to 30°C Operational +5°C to +40°C								
Power supply	10 VAC-12 VAC, 50/60 Hz 400 mA								
Pan Size	128 x 128 mm / 5" x 5"				163 x163mm / 6.5 x 6.5 inches				
Calibration weight **AFP-L ONLY**	100 g	200 g	200 g	500 g	500 g	1000 g	2000 g	2000 g	2000 g
Dimensions	205 mm x 300 mm x 90 mm / 8.1" x 11.8" x 3.6"								
Gross weight	Approx. 9 kg / 20 lb								

2.2 SPECIFICATIONS FOR APPROVED RANGE- AFP LA

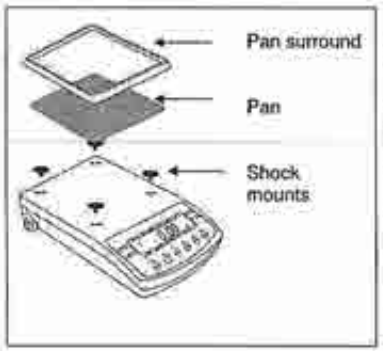
	AFP-110LA	AFP-210LA	AFP-360LA	AFP-510LA	AFP-800LA	AFP-1200LA	AFP-2100LA	AFP-3100LA	AFP-4000LA
Maximum weighing capacity (Max.)	110 g	210 g	360 g	510 g	800 g	1200 g	2100 g	3100 g	4000 g
Tare range	-110 g	-210 g	-360 g	-510 g	-800 g	-1200 g	-2100 g	-3100 g	-4000 g
Verification interval,e=	0.01 g				0.1 g				
Interval, d=	0.001 g				0.01 g				
Internal Calibration	Manual and automatic calibration using internal mass only- after 7 minutes of switching on the balance, when temperature changes by 3°C and every 3 hrs.								
Operating temperature	15°C to 30°C								
Power supply	10.5 VAC, 50 Hz								
Pan Size	128 x 128 mm / 5" x 5"				163 x163mm / 6.5 x 6.5 inches				
Dimensions	205 mm x 300 mm x 90 mm / 8.1" x 11.8" x 3.6"								
Gross weight	Approx. 9 kg / 20 lb								

3. INSTALLATION

3.1 LOCATING THE BALANCE

- Place the balance on a stable surface.
- The ambient temperature of the balance should be kept as constant as possible. Do not place the balance where it may be subjected to draughts or heaters. Do not place the balance near windows, air conditioning vents or radiators.
- The weighing area should be kept clean and dry.
- Protect the balance from vibration, temperature variations and dust.

3.2 SETTING UP THE BALANCE



Assemble according to the diagram.

Turn the adjustable feet until the balance is levelled (check the bubble level on the rear of the balance).

Important: Insert the power supply connector into the plug on the rear of the balance before plugging the power module into the main supply.

- Static electricity will have an influence on the balance indication. To minimise this effect ground the balance using the earth screw provided with the balance. There are four shock mounts to support the pan to sit on the balance. To drain static electricity from the pan, check whether a spring is installed at the hole where the right rear shock mount sits.
- When plugged in the power module, the display will show the software revision number and after all segments are displayed, it will show "**tEst**" and then start an auto-test. Wait until the auto test is finished and zeros are displayed.
- It is suggested the balance be calibrated before use.
- Allow the balance to warm up before calibration.

OIML TYPE APPROVAL: For AFP-LA series, automatic and semi-automatic span adjustment is done with internal calibration mass only. It is operational after 7 minutes of switching the balance on, when the temperature changes by 3°C and on every 3 hrs after switching on. This function can not be disabled by user.

- The balance will then begin normal operation.
- The balance will initially display the weight in grams.
- It is best to allow min.1 hour warm up time before calibration and use.

For best stability the balance should be connected to the mains at all times. The display can be turned off using the **[On/Off]** key.

4. INDICATORS

During normal operation the display will show indicators for the following:

"*ZERO*"	***ZERO*** Indicator will be on when the balance is at zero. If the balance is not at zero with no weight on the platform, press **[Tare]**.
"*STAB*"	***STABLE*** Indicator will be on when the balance has determined that the value displayed is stable. If the stable indicator does not turn on, the balance may be positioned in an unsuitable location, air draughts over the platform may be causing some instability or the sample being weighed may be moving, i.e. during animal weighing.
WEIGHING UNITS- "g", "g" with last digit suppressed, "mg", "ct", "GN", "mo", "oz", "dwt"	Indicators next to the weight display will show the weighing units selected. The units are grams, grams with last digit suppressed, milligrams, carat, grain, mommes, ounces and pennyweight. For AFP-LA series, weighing units are grams and carats only.
"°C" / "t"	The "°C" or "t" indicator is displayed when the temperature or time has changed by more than a pre-programmed amount. After this has been displayed for a minute, the balance will auto-calibrate. (Applicable for LC and LA series)
": :"	When the display is turned off using the **[On/Off]** key only two ":" indicators will be displayed. Press the **[On/Off]** key to turn the display back on. It is suggested the balance be connected to the power supply at all times to eliminate any warm-up drift or delay.

5. OPERATION

5.1 WEIGHING

Place the object to be weighed on the pan and read the weight after stabilisation of the display. The stability indicator "***STAB***" will turn on.

When you use a container, you can set the display to zero so that only the net weight of any items added to the container, is shown.

- Place the empty container on the pan.
- Press the **[Tare]** key. The display will show "***STAB ZERO***".
- Remove the container. The balance will retain the weight of the container.
- Fill the container.
- Place the full container on the pan. The display will show only the weight of the contents i.e., the net weight. The stability indicator "***STAB***" will turn on.

This may be repeated as many times as necessary to add more items to the container, each time only the weight of the new addition will be shown.

Make sure that the weight of the container and contents do not exceed the maximum capacity of the balance.

The weight of items removed from a container can also be determined.

- Place the full container on the pan.
- Press the **[Tare]** key.
- Remove the container. The balance will show a negative number for the gross weight of the full container.
- Empty some of the material from the container.
- Place the container on the pan again. The display will show a negative number representing the weight of the material removed from the container.
- Press **[Tare]** to return to weighing.

5.2 WEIGHING FUNCTIONS

Press the **[Func]** key

- To choose the additional functions that can be set
- To select units of weight other than grams such as- grams with the last digit suppressed, milligrams, carats (ct), grains (GN), mommes (mo), ounce (oz) or pennyweight (dwt)

It will show the weighing unit selected by turning on the legend next to the weight display.

OIML TYPE APPROVAL: For AFP-LA, weighing units are grams and carats only

5.3 INTERFACE FUNCTIONS

- Press the **[Tare]** key then press the **[Print]** key while "- - - - -"is displayed to access the functions that control the RS-232 interface.
- Pressing the **[Func]** key will cycle through the functions: **bod**, **StAb**, **Cont** and **dAtE** as described below.
- The balance will return to weighing after setting a parameter by pressing the **[Print]** key.

5.3.1 bod = Baud Rate

- To modify the RS-232 baud rate select "**bod**" on the display.
- Press **[Print]** to view the current setting and then press the **[Func]** key to modify the displayed value.

bod 1	=	300 Baud
bod 2	=	600 Baud
bod 3	=	1200 Baud
bod 4	=	2400 Baud
bod 5	=	4800 Baud
bod 6	=	9600 Baud

- When the desired value is displayed, press **[Print]** key to store the value and return to weighing.

5.3.2 StAb = Print when stable or instantaneous

The balance can be set to print either immediately after the **[Print]** key is pressed or only once the balance is stable after the **[Print]** key is pressed.

Printing when stable can also be enabled from the RS-232 interface. See Section 6 on Communications with a Computer or Printer.

- To set the parameter, press the **[Func]** key to show "**StAb**" in the LCD.
- Press **[Print]** to see the chosen parameter.
- Press the **[Func]** key to select either **StAb = 0** or **StAb = 1**.

  StAb = 0 Balance sends weight results only when the balance is stable.
  StAb = 1 Balance sends results immediately after **[Print]** is pressed.
- Press the **[Print]** key to return to weighing.

EC TYPE APPROVAL: For AFP-LA series, this function is not available since the balance is set to print only when it is stable.

5.3.3 cont = RS-232 Continuous Output

To enable or disable continuous output

- Press the **[Func]** key until the display shows "**cont**".
- Press the **[Print]** key to access the selected continuous command.
- Press **[Func]** again to change the command from "**cont 0**" to "**cont 1**".
- Press the **[Print]** key to return to weighing.
- Continuous output can also be enabled from the RS-232 interface. See Section 6 on Communications with a Computer or Printer.

"**cont 1**" Continuous Output is enabled
The value of the display will be sent to the RS-232 interface continuously. If the stability parameter is set to "**StAb 1**" the data will be sent when the weight is stable or unstable. If the stability parameter is "**StAb 0**" then only stable readings will be sent continuously.

EC TYPE APPROVAL: For AFP-LA series, the balance will print only when it is stable, even if continuous output is enabled.

"**cont 0**" Continuous Output is disabled
The value of the display will only be sent when the **[Print]** key is pressed or the print command (SI) is received over the RS-232 interface.

5.3.4 dAtE = Date, Time Printing Function

To enable or disable the printing of date and time using Adam Printer-

- Press the **[Func]** key until display shows "**dAtE**".
- Press the **[Print]** key to enter the "**dAtE**" function.
- Press **[Func]** to change the parameter from "**dAtE 0**" to "**dAtE 1**".
- Press **[Print]** to set the parameter and return to normal operation.

"**dAtE 1**" = Date and time is enabled while printing
When the balance prints out information on the Adam Printer via the RS-232 interface, it will also instruct the printer to print the date and time with each reading. The date and time is set on the Adam Printer via instructions from a computer only, see printer manual.

"**dAtE 0**" =The displayed weight is printed only without date and time.

5.4 ADDITIONAL FUNCTIONS

- Press the **[Tare]** key then press the **[Func]** key while "- - - - -"is displayed to access the additional functions.
- The display will show "**PIECES**" and if **[Func]** is pressed again the other functions are shown after which the balance will return to weighing.
- To come out of the counting mode or % mode press **[Tare]** and then press **[Func]** while "- - - - - -" is displayed.
- To return to weighing press **[Tare]** again.

5.4.1 PIECES = Parts Counting Function

A known sample of pieces can be used to set the balance to count a large quantity of parts. If a container is to be used then this should be tared in weighing mode first.

- When the balance displays "**PIECES**" press the **[Print]** button to enter the parts counting mode. The display will show a row of zeros with the first zero flashing.
- Use **[On/Off]** to move across and **[Func]** to increment the display to the number of samples that you will load to set the balance. (10 pieces is the minimum number of parts that should be used and the accuracy will increase if more pieces are used).

- Press **[Print]** and the display will ask to load the sample parts displaying "**LoAd**". Place these on the pan and press **[Print]** again.
- The balance will display "**ProcES**" until a stable value is found (*STAB* will be on) and then will show the number of parts entered as "**XX pcs**", where "**XX**" is the number of the item.
- More parts can now be added to count out the required number.
- If the display shows "**-Lo-**" and then returns to weighing, it indicates that the sample was too small and must be increased.
- Once the sample value has been set, the balance will be in the parts counting mode.
- Removing the sample from the pan will show "**0 pcs**"
- To count unknown quantity of the item, place those on the pan. The balance will display "**XX pcs**" where "**XX**" is the no. of the item.
- To return to other additional functions, press **[Tare]** and then **[Func]** while "- - - - - -" is displayed.
- To return to weighing press **[Tare]** again.

5.4.2 PErc A = Weighing to a known percentage by sample

A known weight can be sampled to set the display to 100% then other measurements can be made in percentage form without noting the weight.

- Enter the "**PErc A**" function and press the **[Print]** button. The display will show "**LOAd**".
- Load the sample to the pan and press **[Print]**. The display will show "**ProcES**" until a stable value is shown (*STAB* will be on) and then will display 100%.
- The sample mass can now be removed and other masses can be weighed. If the display shows "**-Lo-**"and then returns to weighing, it indicates that the sample was too small and must be increased.

The display will have a "%" indicator ON at the top right corner to indicate that the balance is currently in the percentage weighing mode.

5.4.3 PErc b = Weighing to a known percentage by numeric entry

A weight value can be numerically entered to set the display to 100% then other measurements can be made without noting the weight.

- Enter the "**PErc b**" function and press **[Print]**. The display will show a row of zero's.
- Use the **[On/Off]** and **[Func]** buttons to enter a known weight value then press **[Print]**. The display will then show 0 % (*STAB ZERO* will be on).
- Other masses can now be loaded to equal the weight entered when 100% is displayed.

5.4.4 AUtO = Autozero Function

The balance has an autozero function to automatically re-zero the balance. This function will reset the zero of the balance if the zero should drift from the initial zero condition.

The autozero function is normally enabled to ensure a stable zero condition. However some operations may be affected by enabling the autozero function.

Examples are filling applications where the material flows very slowly and also in case of evaporation, where the user tares the balance with the sample on the pan and is looking for the amount of material that might evaporate. In these conditions, the autozero may be disabled.

- To set this, enter the "**AUtO** " function and press **[Print]** to see the parameter chosen earlier.
- Press the **[Func]** key to select either **AUtO = 0** or **AUtO = 1**.

"**AUtO = 0**" Auto zero function is enabled.
"**AUtO = 1**" Auto zero function is disabled.

OIML TYPE APPROVAL: For AFP-LA series, this function is not available, since the auto-zero can not be disabled at any time.

Pressing **[Print]** will store the selected value. The balance will return to weighing.

NOTE: The following 3 functions **AC_t**, **AC_C** and **Pd_d** are not applicable for AFP and AFP- LA series of balances.

5.4.5 AC_t= Auto-calibrate by temperature enable

The AFP-LC balances have the ability to calibrate automatically when the ambient temperature changes a preset amount. The user has the option enabling or disabling this automatic calibration. Setting **AC_t = 0** enables the calibration, **AC_t =1** disables the function.

- To set the parameter press the **[Func]** key to show "**AC_t**".
- Press **[Print]** to see the parameter selected earlier.
- Press the **[Func]** key to select either **AC_t = 0** or **AC_t = 1**.
  "**AC_t = 0**" Auto-calibrate function is enabled.
  "**AC_t = 1**" Auto-calibrate function is disabled.
- Press the **[Print]** key to return to weighing.

OIML TYPE APPROVAL: For AFP-LA series this function is not available, since the auto-calibration can not be disabled at any time.

5.4.6 AC_C= Auto-calibrate by time enable

The AFP-LC balances have the ability to calibrate automatically when the time since last calibration exceeds a preset amount. The time in hours is set in the service menu ranging from 2 – 8 hours, default 4 hours. The user has the option of enabling or disabling this automatic calibration.

- To set the parameter, press the **[Func]** key to show "**AC_C**".
- Press **[Print]** to see the parameter selected earlier.
- Press the **[Func]** key to select either **AC_C = 0** or **AC_C = 1**.
  "**AC_C = 0**" Auto-calibrate function is enabled.
  "**AC_C = 1**" Auto-calibrate function is disabled.
- Press the **[Print]** key to return to weighing.

OIML TYPE APPROVAL: For AFP-LA series this function is not available, since the auto-calibration can not be disabled at any time.

5.4.7 Pd_d = Brackets on last digits

- To set the parameter for AFP-LC, press **[Func]** to show "**Pd_d**".
- Press **[Print]** to see the value selected earlier.
- Press the **[Func]** key to select either **Pd_d = 0** or **Pd_d = 1**.
  "**Pd_d = 0**" No brackets printed on the last digit.
  "**Pd_d = 1**" Brackets on last digits printed.
- Press **[Print]** to return to weighing.

OIML TYPE APPROVAL: For AFP-LA series this function is not available, since this function can not be disabled at any time.

5.4.8 Con = Number of of A/D Conversions required for stability

The balance will determine the results are stable when the A/D converter sends data that is nearly of the same value. The parameter "**Con**" is the number of results necessary to determine stability. The range of value is 1 to 5. A smaller value will signal the balance is stable quicker and a larger value will slow the time to achieve stability. This function is usually required when the balance has been set for printing when stable, see Section 5.3.2.

- To set the parameter, press the **[Func]** key to show "**Con**".
- Press **[Print]** to see the parameter.
- Press the **[Func]** key to select another value.
- Pressing the **[Print]** key will store the selected value and will return the balance to weighing.

5.4.9 AVE= Display Averaging Rate

- Select the required averaging rate for the display update.
- Press the **[Func]** key until "**AVE**" is displayed.
- Press **[Print]** to select the desired value.
- Press the **[Func]** key to return to weighing.
  "**AVE 1**" = Fastest display rate for applications such as filling.
  "**AVE 3**" = Slowest display rate for applications such as animal weighing or unstable environment.

6. CALIBRATION

- For best accuracy the balance should be calibrated before use.
- The calibration should be executed after connecting the balance to the power supply for 1 hour and in case of any change in external operating conditions such as temperature, air pressure or location.

6.1 AFP-L CALIBRATION

- With no weight on the pan press the **[Cal]** key to begin calibration.
- For AFP-L series, the display will initially show "**noCAL**" and then "**LoAd**" followed by a value of the calibration weight to be placed on the pan. Place the suggested weight on the pan.
- The display will show "**CAL**" while the calibration is in progress.
- Once the calibration process is complete, the display will show "**unLoAd**". Remove the weight from the pan.
- The display will show a row of dashes and the balance will return to normal operation after calibration.
- To quit calibration at any point, press the **[Tare]** key. The balance will return to normal weighing.

6.2 AUTO-CALIBRATION

- Calibration is automatic using the internal calibration weight for AFP-LC and AFP-LA series of balances.
- To verify calibration with an external weight, first calibrate the balance then place the user's weight on the balance. Note the difference between the known value for the weight and the displayed value.
- If the auto-calibration is enabled (see section 5.4.5 and 5.4.6) the balance will calibrate without user intervention anytime the ambient temperature changes by more than a preset amount or when the number of hours since last calibration exceeds a preset figure.
- The balance will warn when calibration is required by displaying the "**°C**" symbol in the top right of the display window for one minute before calibration begins. This will allow the user to go to the auto-calibrate function (see section 5.4.5 and 5.4.6) to disable the calibration if it is not desirable at this time. The function must be enabled again if the auto-calibration is required at another time. This function will be reinstated if the balance is unplugged.

- If the user is using the balance and ignores the one minute warning then the balance will display "**unLOAd**" to tell the user to remove all weights from the pan so that calibration can proceed. Remove the weights and then the balance will begin calibration automatically. The balance is ready for use when the display returns to zero again.

OIML TYPE APPROVAL: For AFP-LA series, automatic and semi-automatic span adjustment is done with internal calibration mass only. It is operational after 7 minutes of switching the balance on, when the temperature changes by 3°C and on every 3 hours after switching on. This function can not be disabled by the user.

6.3 CALIBRATION REPORT

The balance will output information to assist the users to document the calibration of the balance. The balance will calibrate and then print a record of the calibration.

Procedure

- Press the **[Tare]** and the **[Cal]** keys together. The balance will display "**rEPort**" and proceed with the calibration routine as above (See 6.1).
- After calibration, the weight must be loaded again when the balance shows "**rEPort**", "**LoAd**" and then followed by the recommended weight. The report will be printed if attached to a printer. Remove the load when "**unLoAd**" is displayed. The display will show a row of dashes and the balance will return to normal weighing.
- If the printer is an Adam printer that includes the time and date function, these items will also be on the record, otherwise only the balance data will be printed.

```
DATE  2004.05.29
TIME  15:29
      CALIBRATION REPORT

FACTORY NUMBER    0120432
PROGRAM NUMBER    LSr 507
CALIBRATION MASS  160.2364 g
MEASURED MASS     160.2362 g
DIFFERENCE MASS    - 0.0002 g

SIGNATURE _____
```

6.4 CALIBRATION VERIFICATION

The balance will display the difference between the weight measured for the calibration mass and the value stored in memory for the calibration mass. This allows a quick verification of the calibration of the balance.

- Press **[Tare]** and **[Func]** together.
- The balance displays "**control**", "**LoAd**" and asks for the recommended weight. Place the required calibration weight. It will display "**control**" and after sometime will display the difference between the measured weight and the ideal value for the weight, i.e. "**-d.0003**".
- If the value is unacceptable, the balance should be calibrated again.
- Press **[Tare]**. The display will show "**unLoAd**" and the balance will return to normal weighing.

7. COMMUNICATION WITH A COMPUTER/PRINTER

The AFP balances can be connected to a printer or computer through the RS-232 interface. Press the **[Print]** key to transmit weighing data (value and unit of mass) to a computer or printer (RS-232C).

7.1 PARAMETER

The interface parameters are:

4800 Baud (default) adjustable from 300 to 9600
8 data bit
No parity
1 stop bit

7.2 CONNECTION

Output Connector: 9 pin D-subminiature plug

Pin 2,	Data to the balance
Pin 3,	Data from the balance
Pin 5,	Signal Ground

Handshaking is not implemented.

OIML TYPE APPROVAL: For AFP-LA series, the display and the RS-232 output is marked with brackets on the least significant digit. For example-

12.3̲4̲ g

7.1.3 Input Commands Format

The balance can be controlled with the following commands. The commands must be sent in upper case letters, i.e. "**T**" not "**t**". The balance will send the message ES if it does not understand a command that is sent to it.

T<cr><lf>	The uppercase **T** will tare the balance. This is the same as pressing the **[Tare]** key.
S<cr>lf	It sends the weight over the RS-232 interface when the criteria for the interface functions are met. (See section 5.3)
SI<cr><lf>	The SI command will cause the weight to be transmitted over the RS-232 interface instantly. This is the same as pressing the **[Print]** key.
C1<cr><lf>	Send the C1 command to enable continuous output, equivalent to "**cont 1**"
C0<cr><lf>	Send the C0 command (c-zero not C-o) to disable continuous output, same as "**cont 0**"
S1<cr><lf>	Send the S1 command to print whether the balance is stable or not, equivalent to "**StAb 1**"
S0<cr><lf>	Send the S0 command to print only when the balance is stable, equivalent to "**StAb 0**"

NOTE: Continuous output is not recommended when a printer is connected as often the printers cannot keep up with the number of values sent from the RS-232 interface. The RS-232 will print about 3 lines per second at the fastest baud rate (9600 baud).

8. SPECIFIC GRAVITY

The balances have the ability to determine the specific gravity of a solid or a liquid using the Specific Gravity Kit available from Adam Equipment. This kit gives you the parts, necessary to convert the balance to determine the specific gravity. These parts include a special sample holder to replace the pan, supports for the liquid, a beaker, thermometer and precision float. The kit also has special software that the operator can use to determine the specific gravity directly using the balance.

If the software has been installed then the following commands are available. If the software has not been installed, contact Adam Equipment or your dealer for details.

8.1 -CO- SPECIFIC GRAVITY FOR SOLIDS

This function and the specific gravity for liquids function are normally used with the Specific Gravity Kit that is an option for the AFP balances.

To enter the specific gravity determination program for solids-

- Press the **[Tare]** key so that the display shows a row of dashes.
- Then press the **[Func]** key to display **-CO-**.
- Next press the **[Print]** key.
- Follow the instruction supplied with the Specific Gravity Kit.

8.2 -LI- SPECIFIC GRAVITY FOR LIQUIDS

This function is similar to the specific gravity for solids function, except it is designed to measure the density of liquids.

To enter the specific gravity determination program for liquids-

- Press the **[Tare]** key so that the display shows a row of dashes.
- Then press the **[Func]** key to display **-LI-**.
- Next press the **[Print]** key.

Follow the instructions supplied with the Specific Gravity Kit.

9. BELOW BALANCE WEIGHING

The AFP balances have the capability of below balance weighing if required. This feature is convenient for measuring Density of the material that is too large for the Density Determination Kit to deal with. It is also useful when weighing samples in a chamber or samples those are not wise to use on top of the balances, for example highly magnetic materials.

10. ERROR MESSAGES

nuLL	This error message is displayed when the initial weight on the pan is too small for the balance to operate correctly. Make sure the pan is correctly installed before turning on the balance. If the message is still shown after applying power, the weighing mechanism might be damaged.
FULL2	This message is shown when the weight on the pan exceeds the capacity of the balance. Remove the weight to avoid damage to the electronics.
-UUr-	It is displayed if the weight on the pan is too low while in the percentage mode. Use a proper sample. Also make sure the pan is installed correctly.

ADAM
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CE

Declaration of Conformity | Verklaring van overeenstemming
Konformitätserklärung | Dichiarazione di Conformità
Déclaration de Conformité | Declaración de Conformidad

The non-automatic weighing instrument
Die nichtselbsttätigen Waage
L'instrument de pesage à fonctionnement non automatique
Het niet –automatische weegwerktuig
Strumento per pesatura non automatico
Instrumento para pesaje non automatico

II

Manufacturer:	Adam Equipment Co. Ltd.
Type:	AFP xxLA
No of the EC type-approval certificate:	T6375

Corresponds to the production model described in the EC type-approval certificate and to the requirements of the Council Directive 90/384/EEC as amended and to the requirements of the following EC Directives:

73/23/EEC	Electrical equipment for use within certain voltage limits (Low Voltage Directive)
89/336/EEC	Electromagnetic compatibility

This declaration is only valid when accompanied by a Certificate of Conformity issued by a Notified Body.

Hersteller:	Adam Equipment Co. Ltd.
Typ:	AFP xxLA
Nr. der EG-Bauartzulassung:	T6375

Entspricht dem in der Bescheinigung über die Bauartzulassung beschriebenen Baumuster, sowie den Anforderungen der EG-Richtlinie 90/384/EWG in der jeweils geltenden Fassung und den Anforderungen folgender EG-Richtlinien:

73/23/EWG	Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter (Niederspannungsrichtlinie)
89/336/EWG	Elektromagnetische Verträglichkeit

Diese Erklärung gilt nur in verbindung mit einer Konformitätsbescheinigung einer benannten Stelle

Fabricant:	Adam Equipment Co. Ltd.
Type:	AFP xxLA
N° du certificate d'approbation CE de type:	T6375

Correspond au modèle décrit dans le certificat d'approbation CE de type, aux exigences de la directive 90/384/CEE modifiée et aux exigences des directives CE suivantes:

73/23/CEE	Matériel électrique pour utilisation dans des limites de tension définies (Directive Basse Tension)
89/336/CEE	Compatibilité électromagnétique

Cette déclaration est seulement valide quand elle est accompagnée par un Certificat de Conformité délivré par un Organisme Notifié

Fabrikant:	Adam Equipment Co. Ltd.
Type:	AFP xxLA
Nummer van de Verklaring van EG-typegoedkeuring	T6375

Conform met het model beschreven in de verklaring van EG-typegoedkeuring en met de voorschriften van EG richtlijn 90/384/EEC zoals gewijzigd en met de volgende EG richtlijnen:

73/23/EEC	Laagspanning richtlijn
89/336/EEC	EMC richtlijn

Deze verklaring is alleen geldig samen met een verklaring van overeenstemming afgegeven door een bevoegde instantie

Produttore:	Adam Equipment Co. Ltd.
Modello:	AFP xxLA
N. di certificato di approvazione di tipo CE	T6375

Conforme al modello di produzione descritto nel certificato di approvazione de tipo CE e secondo le richieste CE direttive 90/384/CEE come modificato e secondo le richieste della seguente direttive CE :

73/23/EWG	Strumenti elettrici per uso entro certi limiti di voltaggio (Direttivo di voltaggio basso)
89/336/EWG	Compatibilità elettromagnetico

Questa dichiarazione e valida solamente se accompagnato da un certificato di conformita rilasciato da un ente riconosciuto.

Fabricante:	Adam Equipment Co. Ltd.
Tipo:	AFP xxLA
Número del certificado de aprobación de tipo CE:	T6375

Conforme al modelo de producion descrito nel certificado di aprobación del tipo CE y segun los requisitos del CE directiva 90/384/CEE como modificado e segun los requisitos della siguiente directiva CE :

73/23/CEE	Instrumentos eléctricos para uso dentro ciertos límites del voltaje (Directivo di voltaje bajo)
89/336/CEE	Compatibilidad electromagnetico

Esta declaracion es valida solamente si accompagnado a un certificado de conformidad emitida por un organismo notificado.

Signature / Unterschrift / Signature / Handtekening / Firma / Firma
J.S. Cuelbach
Technical Manager

Date / Datum / Date / Datum / Date / Date / Fecha
27 January 2004

ADAM EQUIPMENT is an ISO 9001:2002 certified global organisation with more than 30 years experience in the production and sale of electronic weighing equipments. Products are sold through a world wide distributor network -supported from our company locations in the UK, USA and SOUTH AFRICA. The company and their distributors offer a full range of Technical Services such as on site and workshop repair, preventative maintenance and calibration facilities.

ADAM's products are predominantly designed for the Laboratory, Educational, Medical and Industrial Segments. The product range can be classified as follows:

- Analytical and Precision Laboratory Balances
- Top Loading Balances for Educational establishments
- Counting Scales for Industrial and Warehouse applications
- Digital Weighing/Check-weighing Scales
- High performance Platform Scales with extensive software features including parts counting, percent weighing etc.
- Digital Electronic Scales for Medical use
- Retail Scales for price computing

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Adam Equipment reserves the right to make changes to the technology, features, specifications and design of the equipment without notice.

All information contained within this publication was to the best of our knowledge timely, complete and accurate when issued. However, we are not responsible for misimpressions which may result form the reading of this material.

The latest version of this publication can be found on our Website.

Visit us at **www.adamequipment.com**