HF/HF-G/HR OPTIONS

INSTRUCTION MANUAL

Instruction-HF/HF-G/HR-03/05-v.1.a-94.10.03

Serial Interface

HF-03
HF-05
HR-03
HR-05

A&D Company, Limited

Contents

C-Parameter Keys and Displays

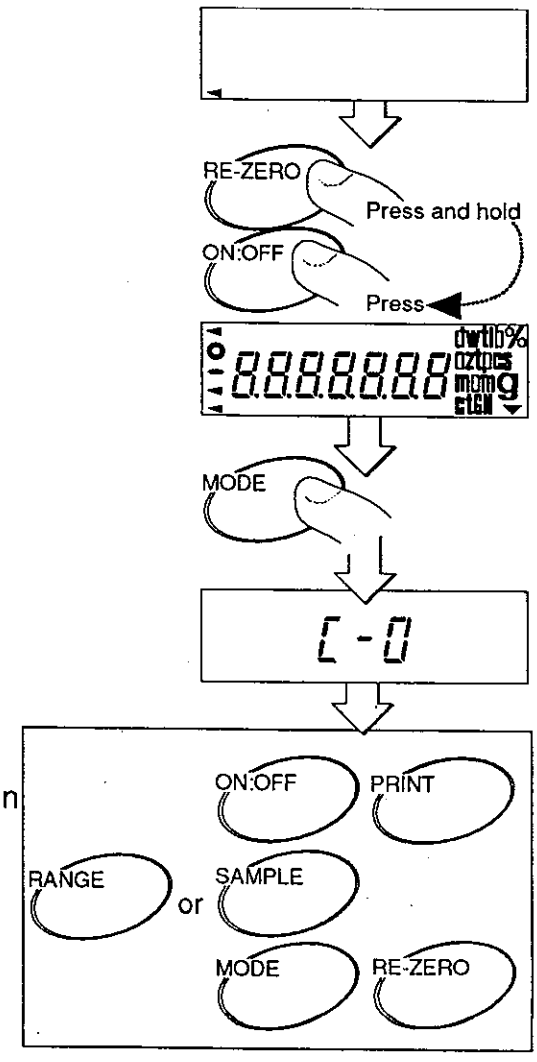
o	This mark appears when the memorized parameter is shown in the display.
MODE	The [MODE] key is used to select the group of C-parameters.
RANGE or SAMPLE	The [SAMPLE] key or [RANGE] key is used to select the item from the group selected by the mode key.
RE-ZERO	The [RE-ZERO] key is used to select a parameter for the item selected by the [MODE] and [SAMPLE] key (or [RANGE] key).
PRINT	The [PRINT] key is used to save the new C-Parameter settings and to exit to the weighing mode.
ON:OFF	The [ON:OFF] key cancels the new C-parameter settings and turns the display off.

1 Turn the display off.

2 Press and hold the [RE-ZERO] key and press the [ON:OFF] key. Release both keys.

3 Press the [MODE] key. The balance enters the function setting mode and [- 0 will be displayed.

4 Set the C-parameter using the keys described on the preceding page.



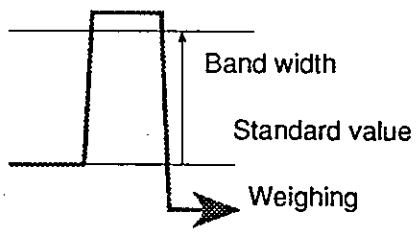
C-Parameters Settings

C-4 Data out Settings for options 03 and 05

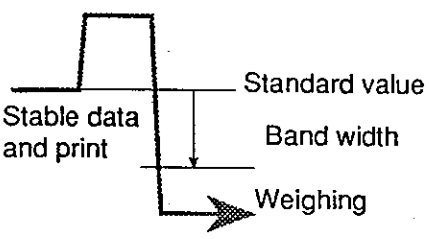
Pr int Data out mode	parameter	It is necessary to select the method and condition when data is transmitted. If you use auto print mode, please set both "Auto print polarity" and "Auto print band".	
	*0	PRINT key mode	PRINT key command is accepted only if the display is stable. The display will blink when data is transmitted.
	1	Auto print mode A	Data is transmitted when the display is stable and meets the conditions of "Auto print polarity" and "Auto print band". This standard value is the zero-point. Refer to the figure at the bottom of the page.
	2	Auto print mode B	Data is transmitted when display is stable and meets the condition of "Auto print polarity" and "Auto print band". This standard value is the last weighing data. Refer to the figure at the bottom of the page.
	3	Streem mode	Data is transmitted continuously.
AP-P Auto print polarity	parameter	This parameter sets the polarity condition from the standard value that weighing data is able to transmit.	
	*0	Data is able to be transmitted when the weighing data is more than the standard value. (It is called "Plus polarity")	
	1	Data is able to be transmitted when the weighing data is less than standard value. (It is called "Minus polarity")	
	2	Data is able to be transmitted when the weighing data is less than or more than the standard value. (It is called "Absolute polarity")	
AP-b Auto print band	parameter	This parameter sets the band width condition from the standard value that weighing data is able to transmit.	
	*0	Data is able to be transmitted when the weighing data deviates from the standard value more than 10 digits.	
	1	Data is able to be transmitted when the weighing data deviates from the standard value more than 100 digits.	
	2	Data is able to be transmitted when the weighing data deviates from the standard value more than 1000 digits.	

* Factory setting.

AUTO PRINT MODE: ○ Stable data and print



Case of plus polarity



Case of minus polarity

C-4 *Continued*

PAUSE Data pause		Selects the use of a pause. If your printer requires a pause, set this to 1.
	*0	No pause.
	1	Using a pause.
At-F Auto feed		Selects whether or not to use Auto feed after printing. (AD-8121A)
	*0	Not using auto feed
	1	Using auto feed
Ar-d Automatically re-zero after data out		Selects whether to use auto re-zero after transmitting.
	*0	Not using re-zero
	1	Using re-zero
inFo Verifying the calibration		Selects whether you verify the calibration using printer, a computer or no verification after calibration.
	*0	No verification of the calibration
	1	Verifying the calibration using the AD-8121 printer.
	2	Verifying the calibration using a computer.

* Factory setting.

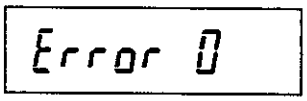
C-5 Serial Interface Settings for options 03 and 05.

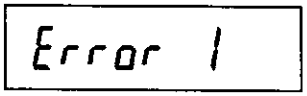
bPS Baud rate		Parameter definition and use.
	0	600 baud
	1	1200 baud
	*2	2400 baud
	3	4800 baud
	4	9600 baud
bt-Pr Parity bit		Parameter definition and use.
	*0	7 bits, Even parity check
	1	7 bits, Odd parity check
	2	8 bits, no parity check
Cr-LF Terminator		Parameter definition and use. (Common setting to both transmitting and receiving.)
	*0	C_R , L_F
	1	C_R
tYPE Data format		Selects a weighing data format. Refer to the book for the option used.
	*0	A&D standard
	1	Dump print format
	2	KF format
	3	MT format
t-UP Receive time		Selects the maximum waiting time between receiving command characters.
	0	NO limit
	*1	One second. If the time is over, the balance canceles receiving the command and outputs the error code.
E-Cod Error code	*0	Error codes or <AK> signal are not output.
	1	Error codes or <AK> signal are output.
CtS CTS control		Selects the use of the control lines CTS and RTS.
	*0	Not using CTS or RTS.
	1	Using CTS and RTS. Keep the RTS line (active) high while the computer receive data. The balance will set CTS low if it is busy.

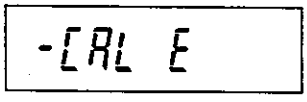
* Factory setting.

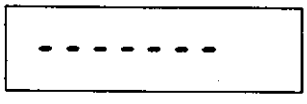
Error Codes

Error code	Description of the error
E00	**Communications error** There is a protocol error in communications. Check the format, baud rate and parity.
E01	**Undefined error** The command received was not in the list of commands recognized by this balance.
E02	**Balance not ready** The command can not be received due to a timing error or the balance is busy. Commands that the balance can not respond to such as "Q", when the balance is in the counting mode.
E03	**Time over error** The balance did not receive next character of a command within the time limit of one second.
E04	**Excess characters error** The command has more characters than is required or the range of the data is beyond what the balance will accept. Example; when the calibration weight entered is greater than the range of the balance.
E05	**Terminator error** A command is followed by other than CR or CR, LF (carriage return and a line feed).
E06	**Format error** A command that should include numerical data has none or the data is in the wrong place in the command.
E07	**Out of range error** The data entered exceeds the range that the balance will accept.
E10	**Internal operation error** The balance is in an abnormal operating condition.
E11	**Stability error** The balance can not stabilize due to vibration or other environmental problem.
E20	**Calibration error** The calibration weight is to heavy.
E21	**Calibration error** The calibration weight is to light.
E22	**Zero out of range error** The balance can not zero the display as the zero point offset exceeds the range.







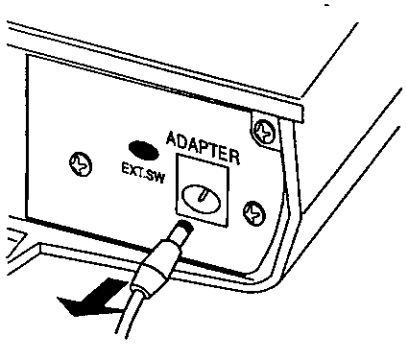


Serial Interface (OP-03)

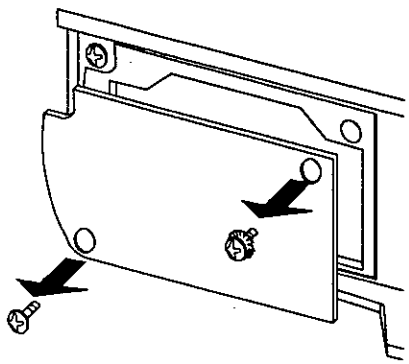
Option 03, is a serial interface that consists of two sections, a bi-directional EIA RS-232C interface and a 20mA passive current loop.

Installation

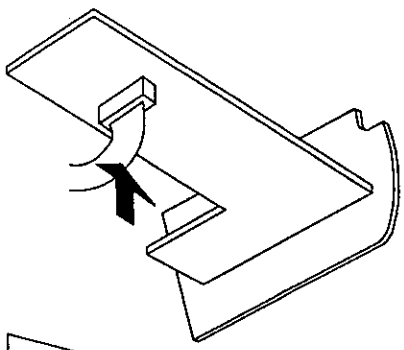
1. Turn off the balance and remove the AC adapter.



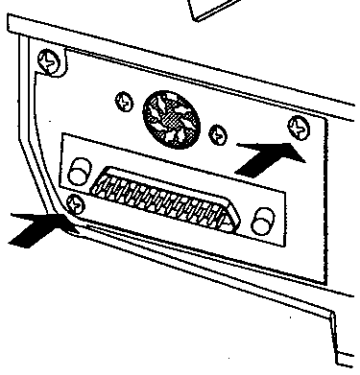
2. Remove two screws securing the blank cover on the rear of the balance.



3. Remove the cable attached to this panel and connect it to the socket on the option board as shown.



4. Install the option board using the screws removed in step 1.



Specifications

Transmission system : EIA RS-232C, 20mA current loop (passive)
Transmission form : Asynchronous, bi-directional, half duplex
Data format : Baud rate : 600, 1200, 2400, 4800, 9600 bps
Data : 7 or 8 bits
Parity : Even, Odd (7 bit)
None (8 bit)
Stop bit : 1 or 2 bits
Code : ASCII

DATA	RS-232C levels	Current loop
1	- 5V to - 15V	20mA
0	+ 5V to + 15V	0mA

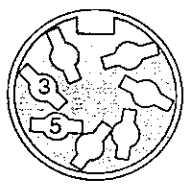
Pin connections

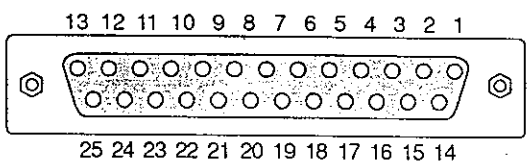
RS-232C

Pin No.	Signal name	Direction	Description
1	FG	-	Frame ground
2	R x D	Input	Receive data
3	T x D	Output	Transmit data
4	RTS	Input	Ready to send
5	CTS	Output	Clear to send
6	DSR	Output	Data set ready
7	GND	-	Signal ground
8 - 25	n/a	-	-

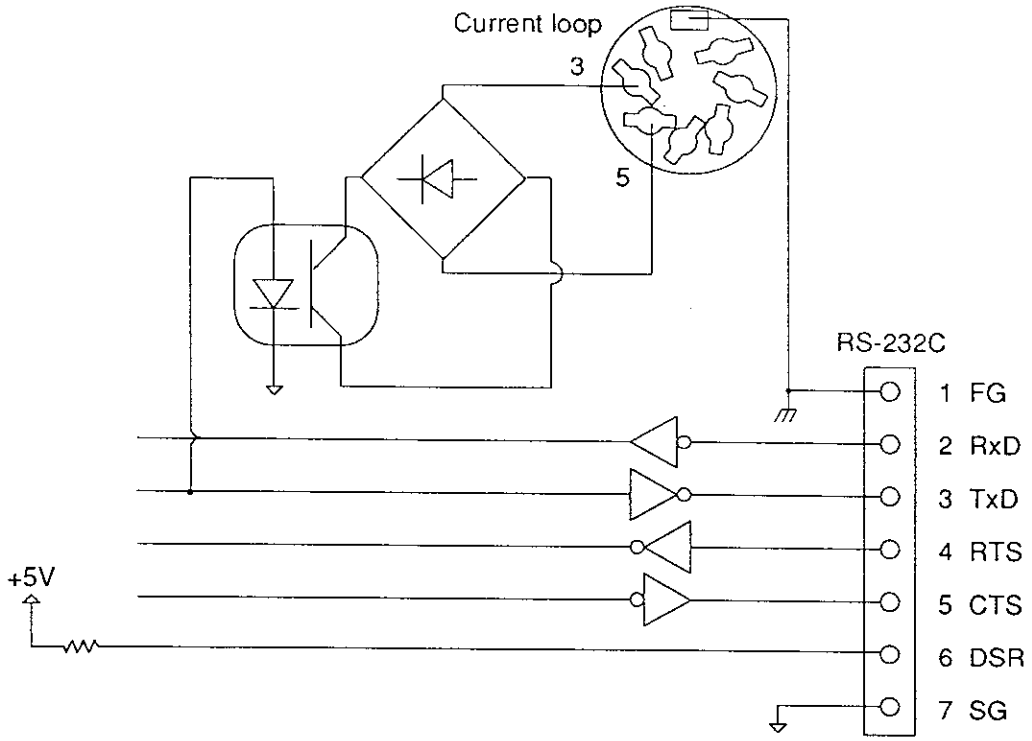
Current loop

Pin No.	Signal name
1	N.C.
2	N.C.
3	Loop
4	N.C.
5	Loop
CASE	Frame GND





Current loop specifications
Maximum voltage----------25V



Connection to other Equipment

- The current loop is of the passive type. It requires an external source of 20mA DC.
- The RS-232C is of the DCE type (Data Communications Equipment) and can use standard DCE cables.
- When connecting to another piece of equipment, consult the manual for that equipment for proper settings and connections.

Connection to an AD-8121

The following balance functions must be set to use the AD-8121 printer

"C" function	Settings
C-4 Print 0, 1, 2, 3	Select a print mode
C-4 AP-P 0, 1, 2	Select the polarity for the auto-print mode
C-4 AP-b 0, 1, 2	Set the auto-print band
C-5 bPS 2	Select "2400bps"
C-5 bt-Pr 0	Select "7 bits, Even parity check"
C-5 Cr-LF 0	Select "CR, LF"
C-5 tYPE 0, 1	Select "A&D Standard format" or "Dump print format"
C-5 t-UP 1	Set the receive timing to 1 second
C-5 t-Cod 0	Select "Error codes are not output"
C-5 CtS 0	Select "Not using CTS and RTS"

Data Output

There are four modes to control the transmission of the weighing data.

Key Mode

When you press the PRINT key, the balance transmits the weighing data when the display is stable (the stability indicator is on). When the data is transmitted the display will blink one time.

C-4 Print 0 ..... Print key mode

Auto-print Mode A

The balance transmits the weighing data when the display is stable (the stability indicator is on), meets the conditions of "Auto-print polarity" and "Auto-print band". The reference for the auto-print band is the zero point. When the data is transmitted the display will blink one time.

C-4 Print 1 ..... Auto-print mode A

C-4 AP-P X ..... Auto-print polarity X = 0, 1, 2

C-4 AP-b X ..... Auto-print band X = 0, 1, 2

Auto-print Mode B

The balance transmits the weighing data when the display is stable (the stability indicator is on), meets the conditions of "Auto-print polarity" and "Auto-print band". The reference for the auto-print band is the last weighing data printed. When the data is transmitted the display will blink one time.

C-4 Print 2 ..... Auto-print mode B

C-4 AP-P X ..... Auto-print polarity X = 0, 1, 2

C-4 AP-b X ..... Auto-print band X = 0, 1, 2

Stream Mode

The balance transmits the weighing data continuously.

C-1 SPEEd X ..... Display update rate. X = 0, 1, 2

C-5 bPS X ..... Baud rate. X = 0, 1, 2, 3, 4

NOTE:

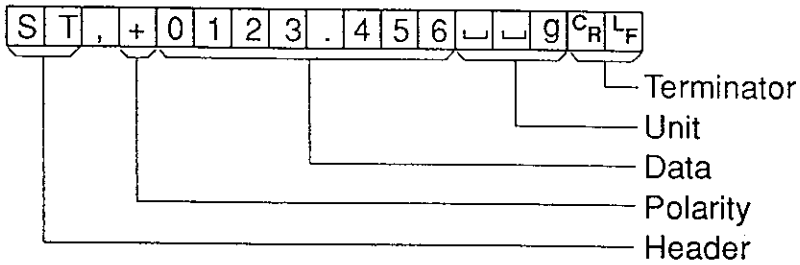
When the baud rate is set to 600 or 1200bps and the refresh rate of the display is set to high speed, the balance is unable to transmit the data completely.

Data Format

There are four formats for transmission of the weighing data. The setting of C-5 TYPE selects the data format.

A&D Standard Format TYPE 0

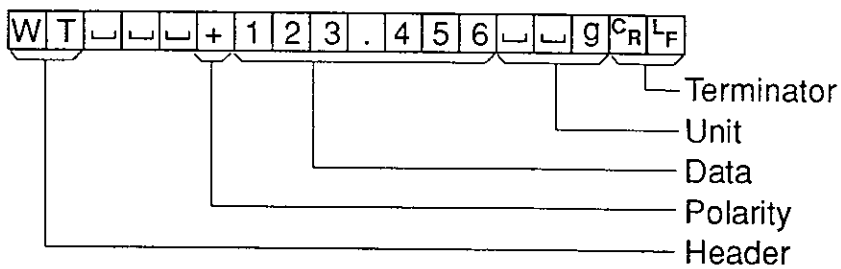
This format is used when the peripheral equipment is capable of receiving A&D format. If an AD-8121 is to be used and you are sending a 15 character data string (no excluding the terminator), set the printer to mode 1 or 2.



- A two character header indicates the status of the stability.
- The weighing data (with leading zeros) plus sign and decimal point, followed by a three character "unit of weight" make up the body of the data.
- A terminator consisting of C_R, L_F to indicate to the peripheral equipment that all of the data has been sent.
- Header: Stable header is [S][T], Stable header for counting mode is [Q][T]
  Unstable header is [U][S]
  Overload header is [O][L]

Dump Print Format TYPE 1

This format is used when the peripheral equipment is not capable of receiving A&D format. If an AD-8121 is to be used and you are sending a 16 character data string (no excluding the terminator), set the printer to mode 3.

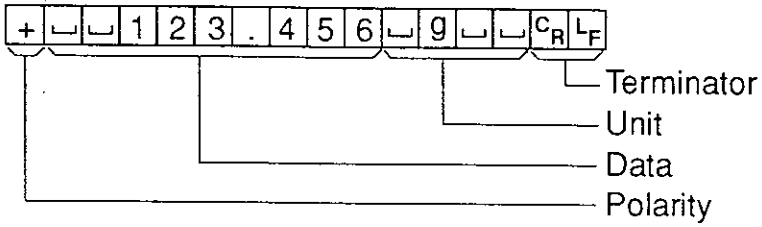


- A two character header indicates the status of the stability if not overloaded or the display is zero.
- The weighing data (with leading zeros replaced by spaces) plus sign and decimal point, followed by a three character "unit of weight" make up the body of the data.
- A terminator consisting of C_R, L_F to indicate to the peripheral equipment that all of the data has been sent.
- Header: Stable header is [W][T], Stable header for counting mode is [Q][T]
  Unstable header is [U][S]

KF Format

tYPE 2

This is the Karl-Fischer moisture meter format and is used when the peripheral equipment can not communicate using A&D format.

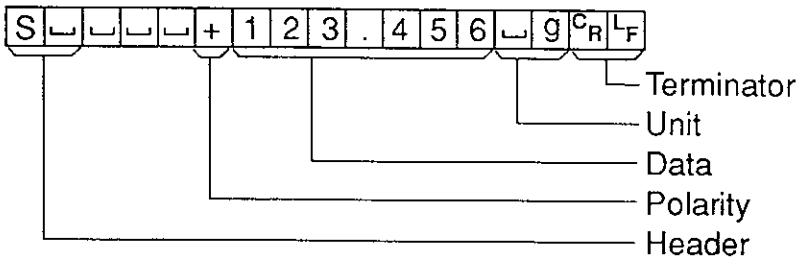


- The data consists of 14 characters (no excluding the terminator).
- The sign of the weighing data is first if the balance is not in overload. The sign is omitted if the balance is at zero.
- The sign is followed by the weighing data (with leading zeros replaced by spaces) and decimal point. The weight data is followed by the unit if the balance is stable.
- A terminator consisting of C_R, L_F to indicate to the peripheral equipment that all of the data has been sent.
- The unit presents at stable. ␣ g ␣ ␣
  The unit does not present at unstable. ␣ ␣ ␣ ␣

MT Format

tYPE 3

- The data length will be changed by the unit or overload.



- The weighing data is proceeded by a header of two characters. If stable, one character and a space are transmitted.
- The minus sign will be next if the weighing data is negative. The sign is omitted if the weighing data is positive or at zero. Leading zeros are replaced by spaces.
- If the balance is in overload, the weighing data is omitted.
- Header: Stable header is S ␣ ,
  Unstable header is S D

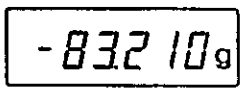
Data Format Examples

Data format examples use HF-30(

STABLE

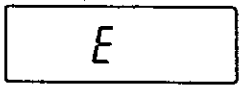
A&D	S	T	,	+	0	0	0	0	.	0	0	0	␣	␣	g	CR	LF
D.P.	W	T	␣	␣	␣	␣	␣	␣	0	.	0	0	0	␣	␣	g	CR
KF	␣	␣	␣	␣	␣	0	.	0	0	0	␣	g	␣	␣	CR	LF	
MT	S	␣	␣	␣	␣	␣	␣	␣	0	.	0	0	0	␣	g	CR	LF

UN-STABLE



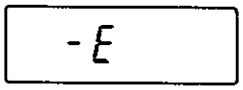
A&D	U	S	,	−	0	0	8	3	.	2	1	0	␣	␣	g	CR	LF
D.P.	U	S	␣	␣	␣	␣	−	8	3	.	2	1	0	␣	␣	g	CR
KF	−	␣	␣	␣	8	3	.	2	1	0	␣	␣	␣	␣	CR	LF	
MT	S	D	␣	␣	␣	␣	−	8	3	.	2	1	0	␣	g	CR	LF

OVERLOAD Positive error



A&D	O	L	,	+	9	9	9	9	9	9	E	+	1	9	C_R	L_F		
D.P.	␣	␣	␣	␣	␣	␣	␣	␣	E	␣	␣	␣	␣	␣	␣	␣	C_R	L_F
KF	␣	␣	␣	␣	␣	␣	H	␣	␣	␣	␣	␣	␣	␣	C_R	L_F		
MT	S	I	+	C_R	L_F													

OVERLOAD Negative error



A&D	O	L	,	-	9	9	9	9	9	9	E	+	1	9	C_R	L_F		
D.P.	␣	␣	␣	␣	␣	␣	␣	-	E	␣	␣	␣	␣	␣	␣	␣	C_R	L_F
KF	␣	␣	␣	␣	␣	␣	L	␣	␣	␣	␣	␣	␣	␣	C_R	L_F		
MT	S	I	-	C_R	L_F													

UNITS *(HF-G series can not change the unit and HR series can use without animal weighing mode)*

Unit and display sign		A&D	D.P.	KF	MT
g	g	␣␣g	␣␣g	␣g␣␣	␣g
mg mode	mg	␣mg	␣mg	␣mg␣	␣mg
Counting mode	pcs	␣PC	␣PC	␣pcs	␣PCS
Precent mode	%	␣␣%	␣␣%	␣%␣␣	␣%
Ounce (Avoir)	oz	␣oz	␣oz	␣oz␣	␣oz
Pound	lb	␣lb	␣lb	␣lb␣	␣lb
Pound Ounce	lb oz	␣oz	␣oz	␣oz␣	␣oz
Troy Ounce	ozt	ozt	ozt	␣ozt	␣ozt
Metric Carat	ct	␣ct	␣ct	␣ct␣	␣ct
Momme	mom	mom	mom	␣mom	␣mo
Pennyweight	dwt	dwt	dwt	␣dwt	␣dwt
Grain	GN	␣GN	␣GN	␣gr␣	␣GN
Tael (HK general,Sing.)	tl	␣tl	␣tl	␣tls	␣tl
Tael (HK, jewelry)	tl	␣tl	␣tl	␣tlh	␣tl
Tael (China)	tl	␣tl	␣tl	␣tlt	␣tl
Tael (Taiwan)	tl	␣tl	␣tl	␣tlc	␣tl
Tola (India)	t	␣␣t	␣␣t	␣tol	␣t
Messghal	m	mes	mes	␣MS␣	␣m
Animal mode	g	␣␣g	␣␣g	␣g␣␣	␣g

␣ Space, ASCII 20H
C_R Carriage Return, ASCII 0DH
L_F Line Feed, ASCII 0AH

Command list

Command examples use HF-300.

Command list

Commands to request weighing data	Description of the command
Q	Request for weighing data immediately
SI	Request for weighing data immediately
S	Request for weighing data when stable
SIR	Request for weighing data continuously
C	Clear the SIR command
Commands to control the balance	
P	Display ON/OFF (same as [ON:OFF] key)
ON	Display ON
OFF	Display OFF
R	Display RE-ZERO (same as [RE-ZERO] key)
CAL	Perform calibration
U *2	Change unit of weigh (same as [MODE] key)
PRT	Print (same as [PRINT] key)
RNG *1	Change Range (same as [SAMPLE] key or [RANGE] key)
SMP *2	Enter the sample weight in counting mode and percent mode (same as [SAMPLE] key or [RANGE] key)
Commands to set values	
CW:	Set the calibration weight
PT:	Set the digital tare weight
ID:	Set the ID number
UW: *2	Set the unit weight for counting mode
PW: *2	Set the 100% weight for percent mode
FC:	Set a function parameter
Commands to request Data	
?CW	Request for the calibration weight
?PT	Request for the digital tare weight
?ID	Request for the ID number
?UW *2	Request for the unit weight for counting mode
?PW *2	Request for the 100% weight for percent mode
?FC	Request for a function parameter
?UT *2	Request the current unit of weight
?SN	Request the serial number of the balance
?LT	Request for all function parameters

*1 HF-G and HR series use [RANGE] key and HF series uses [SAMPLE] key.

*2 HF-G series can not use.

Commands to request Weighing Data

Q Query for weighing data
(the balance will respond with the weighing data immediately)

Command Q CR LF

Reply S T , + 0 0 1 2 . 7 8 3 ␣ ␣ g CR LF

S I Send the weighing data immediately (same as Q)
(the balance will respond with the weighing data immediately)

Command S I CR LF

Reply U S , + 0 0 1 2 . 7 8 3 ␣ ␣ g CR LF

S Send the weighing data when it is stable
(the balance display will blink when the data is transmitted)

Command S CR LF

Reply S T , + 0 0 2 7 . 8 3 5 ␣ ␣ g CR LF

S I R Send the weighing data continuously
(the balance sends the data in stream mode)

Command S I R CR LF

Reply U S , + 0 0 2 7 . 8 3 5 ␣ ␣ g CR LF

⋮

S T , + 0 0 2 7 . 8 3 5 ␣ ␣ g CR LF

S T , + 0 0 2 7 . 8 3 5 ␣ ␣ g CR LF

C Cancel the SIR command
(the balance will stop sending data in stream mode)

Command C CR LF

Commands to control the Balance

P Display ON/OFF (same as pressing the ON/OFF key)
(if the balance is on it will turn off, if it is off it will turn on)

Command P CR LF

O N Display ON (If the balance is OFF, it will turn ON)

Command O N CR LF

O F F Display OFF (If the balance is ON, it will turn OFF)
(if the balance is already off, nothing will happen)

Command O F F CR LF

R RE-ZERO the balance (same as pressing the RE-ZERO key)
(the balance display will zero)

Command R CR LF

C A L Preform calibration
(the balance will enter the calibration mode)

Command C A L CR LF

[U] Change the mode (same as pressing the [MODE] key)
(the balance will shift to the next selected unit of weigh, to the counting or percent mode)
Command [U][CR][LF] (HF and HR series can use this command)

[P][R][T] Print (same as pressing the [PRINT] key)
(if the balance will send data dependent on the function parameters)
Command [P][R][T][CR][LF]

[R][N][G] Change range (same as pressing the [RANGE] key or [SAMPLE] key)
Command [R][N][G][CR][LF]

[S][M][P] Enter the sample weight in counting mode and percent mode (same as pressing the [RANGE] key or [SAMPLE] key)
Command [S][M][P][CR][LF]

Commands to set Data

[C][W][:] Command [C][W][:][0][3][0][0][.][0][3][4][␣][␣][g][CR][LF]
When in the calibration mode, this command is used to set the actual value of the calibration weight. The calibration weight is reset to the standard value upon entry into the calibration mode.

Caution : only grams can be used as the unit of weight when setting the value. Please set the calibration weight after entering the calibration mode.

[P][T][:] Command [P][T][:][0][0][4][5][.][6][7][0][␣][␣][g][CR][LF]
This command is used to set the digital tare weight.

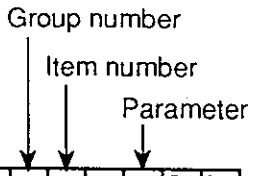
Caution : pressing the [RE-ZERO] key or commanding RE-ZERO will clear this value.

[I][D][:] Command [I][D][:][1][2][3][-][A][B][C][CR][LF]
When using GLP (Good Laboratory Practice), this command is used to set the ID number to be printed out of the verifcation of calibration. The ID can consist of seven characters, A through F, numbers, 0 through 9, spaces or the negative sign (-).

[U][W][:] Command [U][W][:][␣][0][0][1][.][2][3][4][␣][␣][g][CR][LF]
When using counting mode, this command is used to set the unit weight.
The command that delete the unit weight is as follows :
Command [U][W][:][C][␣][␣][g][CR][LF] (HF and HR series can use this command)

[P][W][:] Command [P][W][:][␣][0][3][4][.][5][6][0][␣][␣][g][CR][LF]
When using percent mode, this command is used to set the 100% weight.
The command that delete the 100% weight is as follows :
Command [P][W][:][C][␣][␣][g][CR][LF] (HF and HR series can use this command)

F C : Setting a "C" parameter



Command

F C : 0 1 ; 3 C_R L_F	C-0 Cond 3	Sets display stability to strong
F C : 5 0 ; 3 C_R L_F	C-5 bPS 3	Sets the baud rate to 4800bps
F C : 5 3 ; 1 C_R L_F	C-5 tYPE 1	Sets the print format to D.P.

Group Number		Item and Item Number						
	Group	0	1	2	3	4	5	6
0	C-0 Environment	Stb-b Stability band	Cond Resp. / Environ.	trc Zero tracking				
1	C-1 Display	SPEEd Refresh rate	Po, nt Decimal point	P-on Auto start function				
2	C-2 Auto re-zero	Ar-0 Auto re-zero on/off	Ar-b Auto re-zero band	Ar-t Detection time				
3	C-3 Calibration	CAL Calibration inhibit						
4	C-4 Data out	Pr, nt Data out mode	AP-P Auto print polarity	AP-b Auto print band	PAUSE Data pause	At-F Auto feed	Ar-d Zero after data out	, nFo Cal verification
5	C-5 Serial interface	bPS Baud rate	bt-Pr Parity bit	Cr-LF Terminator	tYPE Data format	t-UP Receive time	E-Cod Error code	CtS CTS control
6	C-6	Response/environment is common data with the condition of resopnse accessable using the keyboard. If a value is set in the C parameters, it will be changed if new conditions of response are set.						
7	C-7							
8	C-8							
9	C-9 Parameter control	Pn ID protect	PF Parameter protect					

Commands to request Data

? C W Request for the calibration weight.

"␣"= a space

Command ? C W C_R L_F

Reply C W , + 0 3 0 0 . 0 3 4 ␣ ␣ g C_R L_F

Caution, if the calibration mode has been entered since the calibration weight was last entered, the value returned will be the standard calibration weight. The unit of weight will always be grams.

? P T Request for the digital tare weight.

Command ? P T C_R L_F

Reply P T , + 0 0 4 5 . 6 7 0 ␣ ␣ g C_R L_F

Caution, if the RE-ZERO key has been pressed since the last digital tare was registered, the value returned will be a positive value equivalent to the weight of any item on the pan prior to pressing the RE-ZERO key. The unit of weight will be the unit of weight currently in use.

The fact that the value returned after RE-ZERO has been pressed is the actual tare weight, means this can be used to read the tare weight into a program.

?ID Request for the ID number.

Command ?ID$_{CR}$$_{LF}$

Reply ID, +123-ABC$_{CR}$$_{LF}$

The number returned can be used as a lot control number or to identify the balance.

?UW Request for the unit weight. (HF and HR series can use this command)

Command ?UW$_{CR}$$_{LF}$

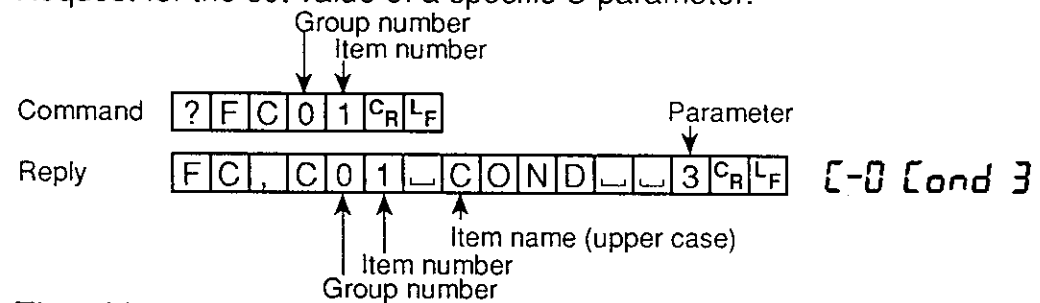
Reply UW, +0001.234␣␣g$_{CR}$$_{LF}$

?PW Request for the 100% weight. (HF and HR series can use this command)

Command ?PW$_{CR}$$_{LF}$

Reply PW, +0100.000␣␣g$_{CR}$$_{LF}$

?FC Request for the set value of a specific C parameter.



The table on the previous page lists the group number, item and item numbers. For a breakdown of the parameters, please refer to the C parameters in the function section of the instruction manual.

?UT Request for the current unit of weight or the mode if using percent or counting. The unit is returned as three digits. (HF and HR series can use this command)

Command ?UT$_{CR}$$_{LF}$

Reply UT, ␣␣g$_{CR}$$_{LF}$ "␣"= a space

UT, ␣mg$_{CR}$$_{LF}$

UT, dwt$_{CR}$$_{LF}$

?SN Request for the serial number of the balance. This command can be used to inventory the instruments in a LIM system or for other record keeping such as GLP (Good Laboratory Practice). This number can not be changed in the C parameters.

Command ?SN$_{CR}$$_{LF}$

Reply SN, 12345678$_{CR}$$_{LF}$

?LT Request for all parameters. The balance will respond by sending the C parameters in sequence.

Command ?LT$_{CR}$$_{LF}$

Reply FC, C00␣STB-B␣1$_{CR}$$_{LF}$ "␣"= a space

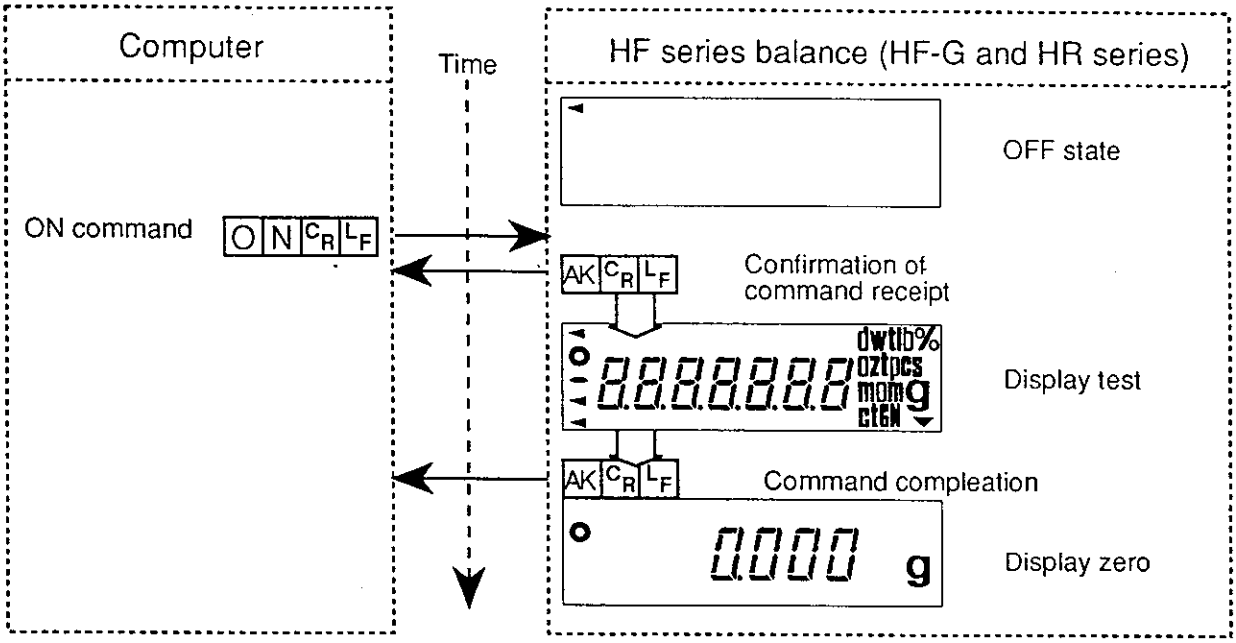
⋮

FC, C91␣PF␣␣␣␣0$_{CR}$$_{LF}$

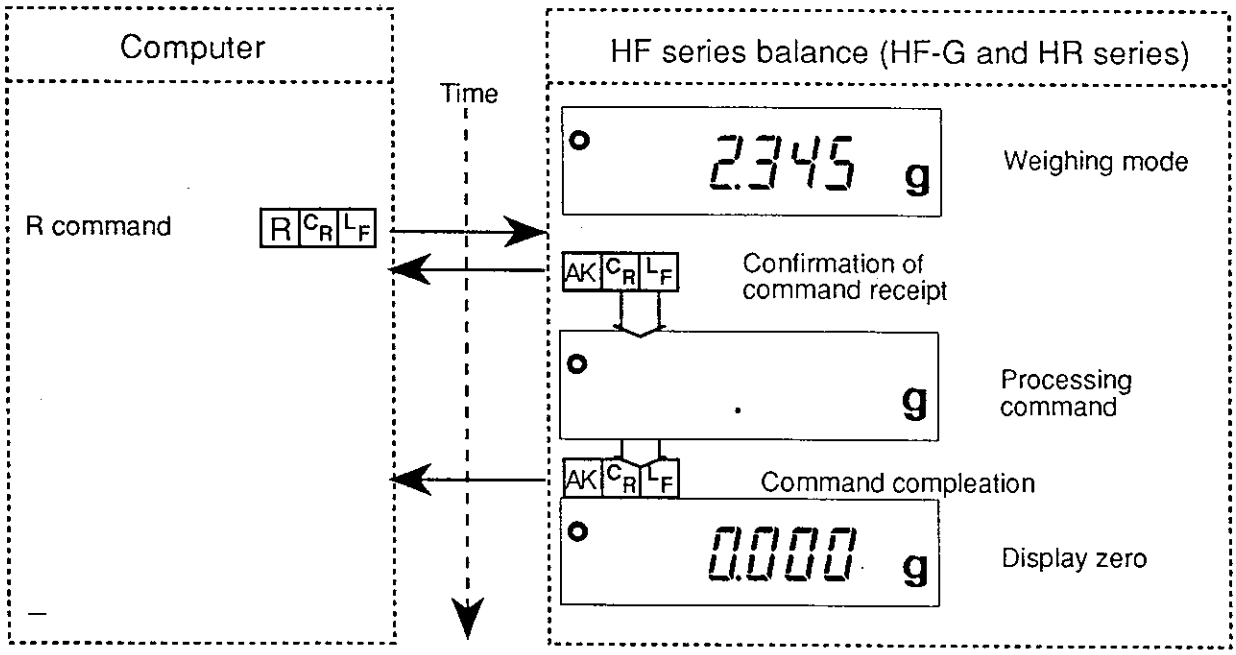
Command Examples

[ON] Command

Command examples use HF-300.



[R] Command (RE-ZERO)



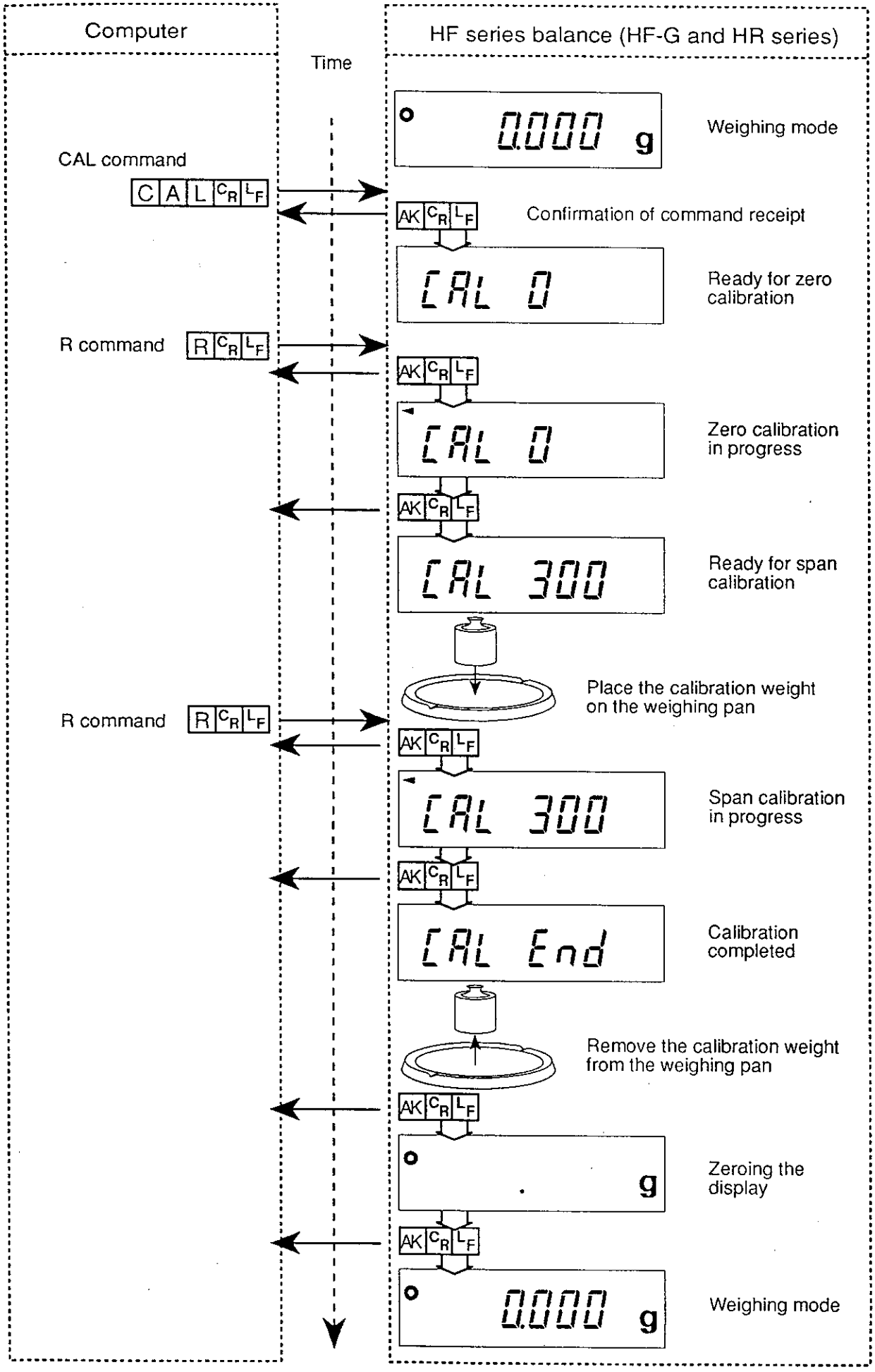
Please note that there needs to be a delay time of one second between the balance acknowledgment <AK> and the next command transmission to the balance. Line 124 sets the delay time. To change the delay, set "100" to another value. Example: 124 FOR I = 1 TO 200: NEXT I.

Example using a BASIC language program

```
1...
123  LINE INPUT #1, AK$          Receive <AK>
124  FOR I = 1 TO 100: NEXT I    Delay time (the '100' sets the delay)
125  PRINT #1, "Q"               TX: 'Q' command
1...
```

OP-03

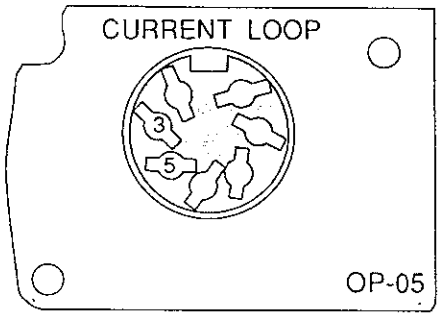
CAL Command (Calibration)



Current Loop Interface (OP-05)

Option 05 is a 20mA current loop interface. As this option is similar to option 03, please refer to that section for characteristics and use.

This option is passive and requires an external current source to operate. It is a transmit only device and as such is best used with external displays or printers. Many such devices supply the current required by this interface.



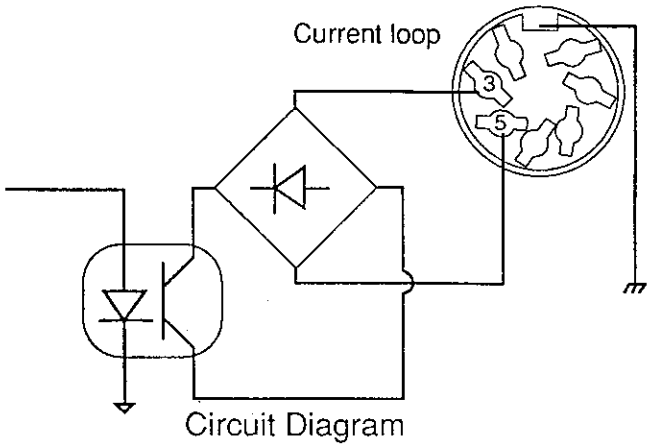
Installation

The installation of this option is the same as option 03, please refer to that section for the installation.

Circuit Diagram and Connector Drawing

Pin	Discription
1	No connection
2	No connection
3	Current loop (positive or negative)
4	No connection
5	Current loop (positive or negative)
6	No connection
7	No connection
Shell	Frame ground

7 Pin DIN Connector



Circuit Diagram

Specifications

Maximum voltage ---------- 25V