



## How To Use This Guide

This pocket guide lists the formal syntax for each instruction in alphabetical order of the instruction's two-letter mnemonic. The HP-RL recorder instructions are listed first, followed by HP-GL plotter instructions. Also included are no operation (NOP) instructions, plotter and recorder default conditions, default coordinates for limits and scaling points, and HP-GL/HP-RL error messages.

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Each instruction is listed with its syntax, purpose, parameter or response type, range, and default condition. Omitting a parameter sets the default condition unless otherwise noted. A semicolon is included as the terminator for all instructions except the HP-GL label instruction, *LB*. The ASCII carriage return and line feed characters (CRLF) are sent at the end of all output responses.

## HP-RL INSTRUCTIONS

### DG Draw Grid

*DG* grid type; or *DG*;

Purpose: Draws grid. Omitting parameter defaults to user-defined grid defined by *GL* instruction.

Parameter	Format	Range	Default
grid type	integer	0 = user-defined grid 1 = centimetre grid	0

### DO Set Data Output

*DO* channel(s), # of samples, format, trigger status; or *DO*;

Purpose: Defines format for output of data samples following *QD* or *QI* instructions. Omitting parameters defaults to default conditions listed below.

Parameter	Format	Range	Default
channel(s)	integer	0 = channels 1, 2, and 3 1 = channel 1 2 = channel 2 3 = channel 3	0
# of samples	integer	0 to 32 767 0 = continuous sampling	0
format	integer	0 = ASCII 1 = binary	0
trigger status	integer	0 = no trigger status 1 = send trigger status	0

**GL Set Grid Divisions**

*GL* X-axis divisions, Y-axis divisions (, quadrants); or *GL*;

Purpose: Specifies number of user-defined grid divisions and quadrants to receive grid when *DG* instruction is executed.

Parameter	Format	Range	Default	
			A/A4	B/A3
X-axis divisions	integer	1 to 100	25	38
Y-axis divisions	integer	1 to 100	18	25
quadrant	integer	1 to 15	1	1

**IR Set Full Scale Range**

*IR* FS1 (, FS2, FS3); or *IR*;

Purpose: Sets input channel ranges.

Parameter	Format	Range	Default
volts	real	0.0050 V to 100.0 V	10.0 V

**IT Set Real-Time Clock**

*IT* year, month, day, hours, minutes;

Purpose: Sets time and date of real-time clock. Seconds are set to zero when *IT* instruction is executed.

Parameter	Format	Range	Default
year	integer	0 to 99	none
month	integer or character	1 to 12 or JAN to DEC	
day	integer	1 to 31	
hour	integer	0 to 23	
minutes	integer	0 to 59	

**IZ Set Zero and Full Scale**

*IZ*  $Z_X, Z_Y$  ( $FS_X, FS_Y$ ); or *IZ*;

Purpose: Sets location of zero and full-scale points. Omitting parameters sets points to default locations.

Parameter	Format	Range	Default
X, Y coordinates	integer	-32768 to 32767	Dependent on paper size

**MS Measurement Start**

*MS* measurement; or *MS*;

Purpose: Initiates measurement.

Parameter	Format	Range	Default
measurement type	integer	0 = direct recording 1 = buffered recording	0

**MT Measurement Terminate**

*MT*;

Purpose: Terminates measurement or data acquisition mode.  
No parameter required.

**PL Plot Buffer**

*PL*;

Purpose: Plots buffer contents for selected channel(s). No parameter required.

**QA Query Trigger Level and Width**

*QA*;

Purpose: Outputs current trigger level and width voltages, and validity of values (0 = valid, 1 = invalid).

Response: level, width, validity CRLF

**QB Query Total Time***QB*;

Purpose: Outputs value of current total time selection.

Response: time, units CRLF

where: time = 0.030 to 100 (s)	units = 0 (s)
1.00 to 100 (min)	1 (min)
1.00 to 24.0 (h)	2 (h)

**QC Query Channel Status***QC*;

Purpose: Outputs decimal value (0 to 255) of channel status byte in ASCII.

Response: channel status CRLF

**QD Query Direct A/D Data Sample***QD*;

Purpose: Initiates data streaming from A/D converters to computer (data acquisition mode).

Response: Outputs number of samples specified by *DO* instruction at rate specified by *SD* instruction.**QG Query Post-/Pre-Trigger Time***QG*;

Purpose: Outputs the currently requested post- or pre-trigger time, and the validity of the time value (0 = valid, 1 = invalid).

Response: time, units, validity CRLF

where: time = $\pm$ (0.00 to 100) (s)	units = 0 (s)
$\pm$ (1.00 to 100) (min)	1 (min)
$\pm$ (1.00 to 24) (h)	2 (h)

**QI Query Buffered A/D Data Sample**

*QI*;

Purpose: Initiates transfer of channel buffer contents to computer.

Response: Outputs number of samples specified by *DO* instruction (*SD* instruction is ignored).

**QL Query Grid Divisions**

*QL*;

Purpose: Outputs current number of user-defined grid divisions and quadrants to receive grid.

Response: X-axis divisions, Y-axis divisions, quadrants  
CRLF

**QM Query Recording Mode**

*QM*;

Purpose: Outputs current definitions of X- and Y-axes of recording area.

Response: mode CRLF

**QR Query Full Scale Range**

*QR*;

Purpose: Outputs current range settings for all channels.

Response: range 1, range 2, range 3 CRLF

**QS Query Recorder Status**

*QS*;

Purpose: Outputs decimal value (0-255) of recorder status byte in ASCII.

Response: recorder status CRLF

**QT Query Trigger Mode***QT;*

Purpose: Outputs currently selected trigger mode.

Response: mode, option CRLF

where: mode = 0 (manual)    option = 0 (above level)  
          1 (external)        1 (below level)  
          2 (internal)        2 (inside window)  
                                  3 (outside window)

**QU Query Trigger Time***QU;*

Purpose: Outputs time of last trigger occurrence.

Response: hours, minutes, seconds CRLF

where:    hours = 0 to 23  
          minutes = 0 to 59  
          seconds = 0 to 59

**QV Query DC Offset***QV;*

Purpose: Outputs requested channel offset value(s) and validity (0 = valid, 1 = invalid).

Response: offset1, offset2, offset3, validity CRLF

**QW Query Real-Time Clock***QW;*

Purpose: Outputs current time and date of real-time clock.

Response: year, month, day, hours, minutes, seconds  
CRLF

where:    year = 00 to 99  
          month = 01 to 12  
          day = 01 to 31  
          hours = 00 to 23  
          minutes = 00 to 59  
          seconds = 00 to 59

**QZ Query Zero and Full Scale***QZ*;

Purpose: Outputs current X- and Y-coordinates of zero and full-scale points.

Response:  $Z_X, Z_Y, FS_X, FS_Y$  CRLF

**RE Set Recording Mode***RE* mode; or *RE*;

Purpose: Defines X- and Y-axes of recording area in terms of input channels and/or time. Omitting parameter defaults to channel 1 vs. time.

Parameter	Format	Range	Default
mode	integer	3 through 15 except 6, 10, and 14	9

**RL Remote/Local***RL* state; or *RL*;

Purpose: Enables or disables front-panel controls.

Parameter	Format	Range	Default
state	integer	0 = local state 1 = remote state	0

**SD Set Sample Delay***SD* time; or *SD*;

Purpose: Sets time interval between samples, or sample sets, for data transfers initiated by *QD* instruction.

Parameter	Format	Range	Default
time	real	0.002 to 1000 s	0.1 s

**SV Set DC Offset**

*SV* offset1 (,offset2,offset3); or *SV*;

Purpose: Sets zero voltage position of each channel's input signal.

Parameter	Format	Range	Default
volts (offset)	real	-100 to 100 V	0.0 V

**TA Set Trigger Level and Width**

*TA* level(,width); or *TA*;

Purpose: Specifies trigger level and width for internal triggering.

Parameter	Format	Range	Default
level	real	-200 to 200 V	0.0 V
width	real	0 to 200 V	0.0 V

**TB Set Total Time**

*TB* Time (,units); or *TB*;

Purpose: Specifies total time setting.

Parameter	Format	Range	Default
time	real	0.030 s to 24.0 h	1
units	integer	0 = seconds 1 = minutes 2 = hours	0

**TD Label Time and Date**

*TD* label type; or *TD*;

Purpose: Label current setup conditions, current time and date, and/or time of the trigger occurred.

Parameter	Format	Range	Default
label type	integer	0 = time and date 1 = time 2 = date 3 = trigger time 4 = setup conditions	0

**TG Set Post-/Pre-Trigger**

*TG* time (,units); or *TG*;

Purpose: Specifies post- or pre-trigger time setting.

Parameter	Format	Range	Default
time	real	±(0.00 to 100) (s) ±(1.00 to 100) (min) ±(1.00 to 24.0) (h)	0
units	integer	0 = seconds 1 = minutes 2 = hours	0

**TM Set Trigger Mode**

*TM* mode (,options); or *TM*;

Purpose: Selects trigger mode.

Parameter	Format	Range	Default
mode	integer	0 = manual 1 = external 2 = internal	0
options	integer	0 = above level 1 = below level 2 = inside window 3 = outside window	0

**XS Set Plotter or Recorder Status**

*XS* status type; or *XS*;

Purpose: Selects plotter status byte (*OS*) or recorder status byte (*QS*) as HP-IB status byte.

Parameter	Format	Range	Default
status byte	integer	0 = plotter 1 = recorder	0

## HP-GL INSTRUCTIONS

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### CA Designate Alternate Character Set

CA set number; or CA;

Purpose: Designates alternate character set.

Parameter	Format	Range	Default
set number	integer	0 to 4	0

### CP Character Plot

CP spaces, lines; or CP;

Purpose: Moves pen the number of spaces and lines specified. Omitting parameters causes carriage return and line feed.

Parameter	Format	Range	Default
spaces	real	-128.0000 to 127.9999	Carriage return point
lines	real	-128.0000 to 127.9999	

### CS Designate Standard Character Set

CS set number; or CS;

Purpose: Designates standard character set.

Parameter	Format	Range	Default
set number	integer	0 to 4	0

### DF Default

DF;

Purpose: Returns certain plotter functions to default conditions (see table of Plotter Default Conditions).

**DI Absolute Direction***DI* run, rise; or *DI*;

Purpose: Sets direction of labels. At least one parameter must be effectively nonzero; i.e.,  $\leq 0.0004$ .

Parameter	Format	Range	Default
run	real	-128.0000 to 127.9999	1
rise	real	-128.0000 to 127.9999	0

**DR Relative Direction***DR* run, rise; or *DR*;

Purpose: Sets direction of labels. Omitting parameters causes horizontal labels. Run is % of  $P2_X - P1_X$ , rise is % of  $P2_Y - P1_Y$ .

Parameter	Format	Range	Default
run	real	-128.0000 to 127.9999	1
rise	real	-128.0000 to 127.9999	0

**DT Define Terminator***DT* terminator;

Purpose: Defines character that terminates label mode.

Parameter	Format	Range	Default
terminator	character	ASCII characters with decimal values 1 through 127	ETX (decimal value 3)

**IM Input Mask***IM* E-mask (, S-mask, P-mask); or *IM*;

Purpose: Controls conditions under which HP-RL and HP-GL error status is reported, conditions that can cause an HP-IB service request message, and conditions that can cause a positive response to an HP-IB parallel poll.

Parameter	Format	Range	Default
E-mask	integer	0 to 255	233
S-mask	integer	0 to 255	0
P-mask	integer	0 to 255	0

**IN Initialize***IN*;

Purpose: Sets plotter functions as for the *DF* instruction; in addition, sets certain recorder functions to predefined states (see table of Recorder Default Conditions). Also — the pen is raised, any error is cleared, plotter status byte is selected as the HP-IB status byte and bit position 3 set true, channel buffers are flushed, rotation is set to 0° and all limits and scaling points are set to default coordinate values for current paper-size selection.

**IP Input P1 and P2***IP* P1<sub>X</sub>, P1<sub>Y</sub> (, P2<sub>X</sub>, P2<sub>Y</sub>); or *IP*;

Purpose: Sets P1/P2 scaling points. Omitting parameters sets P1 and P2 to default coordinates for current paper size. Defaults to hard-clip limit coordinates if parameter is outside current hard-clip limit.

Parameter	Format	Range	Default
X, Y coordinates	integer	-32 768 to 32 767	dependent on paper size

**IW Input Window***IW* X<sub>LL</sub>, Y<sub>LL</sub>, X<sub>UR</sub>, Y<sub>UR</sub>; or *IW*;

where: LL = lower left, UR = upper right

Purpose: Sets input window (soft-clip limits). Omitting parameters sets window area to default coordinate values for current paper size.

Parameter	Format	Range	Default
X, Y coordinates	integer	-32 768 to 32 767	dependent on paper size

**LB Label***LB* *c...ct*

where: *c* is an ASCII character and *t* is the label terminator defined by *DT*. Default is ETX, decimal equivalent 3.

Purpose: Draws character string using current character set.

Parameter	Format	Range	Default
ASCII character	character	all ASCII characters	off

**LO Label Origin***LO* position number; or *LO*;

Purpose: Positions labels relative to current pen position.

L03	L06	L09
L02	L05	L08
L01	L04	L07
L013	L016	L019
L012	L015	L018
L011	L014	L017

**LT Line Type**

*LT* pattern number (, pattern length); or *LT*;

Purpose: Sets line type used for drawing lines.

Parameter	Format	Range	Default
pattern number	real	-128.0000 to 127.9999 (0 to 6, useful range)	solid line
pattern length	real	-128.0000 to 127.9999	4% of diagonal P2-P1

0 Specifies dots only at the points that are plotted.

1 .  
 2 \_\_\_\_\_  
 3 \_\_\_\_\_  
 4 \_\_\_\_\_  
 5 \_\_\_\_\_  
 6 \_\_\_\_\_

\_\_\_\_\_ One pattern length  
 No parameter (Default Value) \_\_\_\_\_

**OA Output Actual Position and Pen Status**

*OA*;

Purpose: Outputs pen's physical position.

Response: X, Y, P CRLF

where: X and Y are in plotter units; P is pen status (0 = up, 1 = down).

**OC Output Commanded Position and Pen Status**

*OC*;

Purpose: Outputs pen's logical position and status.

Response: X, Y, P CRLF

where: X and Y are in plotter units if scaling is off, or user units if scaling is on; P is pen status (0 = up, 1 = down).

**OE Output Error**

*OE*;

Purpose: Outputs first HP-RL or HP-GL error number.

Response: error number CRLF

where: error number is positive ASCII integer, 0 through 8 except 4 and 7.

**OF Output Factors**

*OF*;

Purpose: Outputs number of plotter units per millimetre in each axis.

Response: 40,40 CRLF

**OH Output Hard-Clip Limits**

*OH*;

Purpose: Outputs lower-left (LL) and upper-right (UR) coordinates of hard-clip limits in plotter units.

Response: X<sub>LL</sub>, Y<sub>LL</sub>, X<sub>UR</sub>, Y<sub>UR</sub> CRLF

**OI Output Identification**

*OI*;

Purpose: Outputs instrument model number (ASCII string).

Response: 7090A CRLF

**OO Output Options**

*OO*;

Purpose: Outputs instrument's capabilities.

Response: 0, 1, 0, 0, 0, 0, 0 CRLF

└ indicates pen select capability is included

**OP Output P1 and P2**

OP;

Purpose: Outputs coordinates of P1 and P2 in plotter units.

Response: P1<sub>X</sub>, P1<sub>Y</sub>, P2<sub>X</sub>, P2<sub>Y</sub> CRLF

**OS Output Plotter Status**

OS;

Purpose: Outputs ASCII decimal equivalent value (0 to 255) of plotter status byte.

Response: plotter status CRLF

**OW Output Window**

OW;

Purpose: Outputs plotter unit coordinates of lower-left (LL) and upper-right (UR) corners of current window.

Response: X<sub>LL</sub>, Y<sub>LL</sub>, X<sub>UR</sub>, Y<sub>UR</sub> CRLF

**OY Locate Syntax Error**

OY;

Purpose: Outputs the sixteen characters received immediately prior to HP-RL or HP-GL error.

Response: ASCII character string

**OZ Output Command String**

OZ;

Purpose: Outputs "OZ" and the fourteen characters received immediately before OZ was issued. (Carriage return and line feed characters not included.)

Response: ASCII character string

**PA Plot Absolute**

*PA*  $X_1$  coordinate,  $Y_1$  coordinate(,  $X_2$  coordinate,  $Y_2$  coordinate, ...,  $X_n$  coordinate,  $Y_n$  coordinate); or *PA*;

Purpose: Plots to X,Y coordinates in order listed using current pen up/down state. *PA*; sets absolute plotting. Coordinate pairs represent plotter units if scaling is off, user units if off.

Parameter	Format	Range	Default
X, Y coordinate(s)	integer	-32768 to 32767	none

**PD Pen Down**

*PD*; or *PD*  $X, Y(\dots)$ ;

Purpose: Lowers pen. Parameters may be included as in *PA* or *PR*.

Parameter	Format	Range	Default
X, Y coordinate(s)	integer	-32768 to 32767	none

**PR Plot Relative**

*PR*  $X_1$  increment,  $Y_1$  increment (,  $X_2$  increment,  $Y_2$  increment, ...,  $X_n$  increment,  $Y_n$  increment); or *PR*;

Purpose: Plots to points indicated by the X,Y increments, relative to previous position. *PR*; sets relative plotting for *PU* or *PD* with parameters.

Parameter	Format	Range	Default
X, Y increments	integer	-32768 to 32767	none

**PS Paper Size**

*PS* paper size;

Purpose: Toggles between A and B, or A3 and A4 paper sizes.

Parameter	Format	Range	Default
paper size	integer	0 to 3 = B/A3-size 4 to 127 = A/A4-size	none

**PU Pen Up**

*PU*; or *PU X,Y(...)*;

Purpose: Raises pen. Parameters may be included as in *PA* or *PR*.

Parameter	Format	Range	Default
X, Y coordinate(s)	integer	-32 768 to 32 767	none

**RO Rotate Coordinate System**

*RO* angle; or *RO*;

Purpose: Rotates coordinate systems 90°.

Parameter	Format	Range	Default
angle	integer	0° = normal 90° = rotated	0

**SA Select Alternate Set**

*SA*;

Purpose: Selects alternate character set designated by *CA* instruction as set to be used for subsequent labeling.

**SC Scale**

*SC X<sub>min</sub>, X<sub>max</sub>, Y<sub>min</sub>, Y<sub>max</sub>*; or *SC*;

Purpose: Scales plotting area into user units. Omitting parameters cancels scaling, and parameters of plot instruction are subsequently interpreted as plotter units.

Parameter	Format	Range	Default
X, Y coordinate(s)	integer	-32 768 to 32 767	plotter units

**SI Absolute Character Size**

*SI* width,height; or *SI*;

Purpose: Sets character width and height in centimetres. Omitting parameters defaults character size based on paper size.

Parameter	Format	Range	Default	
			A/A4	B/A3
width	real	-128.0000 to 127.9999	0.187	0.285
height	real	-128.0000 to 127.9999	0.269	0.375

**SL Character Slant**

*SL*  $\tan \theta$ ; or *SL*;

Purpose: Establishes slant for labeled characters. Omitting parameter defaults to no slant.

Parameter	Format	Range	Default
$\tan \theta$	real	-128.0000 to 127.9999	0

**SM Symbol Mode**

*SM* character; or *SM*;

Purpose: Draws single character centered at end of each plotted vector. Omitting parameter cancels symbol mode.

Parameter	Format	Range	Default
ASCII character	character	ASCII 33 through 126 except 59	off

**SP Select Pen**

*SP* pen number; or *SP*;

Purpose: Selects or stores pen. Omitting parameter (or parameter = 0) stores pen.

Parameter	Format	Range	Default
pen number	integer	0 to 6	0

**SR Relative Character Size**

*SR* width,height; or *SR*;

Purpose: Specifies size of characters and symbols as percentage of distance between P1 and P2.

Parameter	Format	Range	Default
width	real	-128.0000 to 127.9999	0.75
height	real	-128.0000 to 127.9999	1.5

**SS Select Standard Set**

*SS*;

Purpose: Selects standard character set designated by the *CS* instruction as set used for subsequent labeling.

**TL Tick Length**

*TL* *tp*(,*tn*); or *TL*;

Purpose: Establishes length of ticks drawn with *XT* and *YT*. Omitting parameters defaults *tp* (tick positive: above X-axis, to right of Y-axis) and *tn* (tick negative: below X-axis, to left of Y-axis) to 0.5% of  $P2_Y - P1_Y$  for *XT* and 0.5% of  $P2_X - P1_X$  for *YT*.

Parameter	Format	Range	Default
<i>tp</i> , <i>tn</i>	real	-128.0000 to 127.9999	as described above

**VS Velocity Select**

*VS* pen velocity; or *VS*;

Purpose: Specifies pen speed for plotting and labeling operations.

Parameter	Format	Range	Default
pen velocity	real	0 to 127.9999 cm/s	75 cm/s

**XT X-Tick**

*XT*;

Purpose: Draws vertical X-tick at current pen location.

**YT Y-Tick**

*YT*;

Purpose: Draws horizontal Y-tick at current pen location.

## **NOP INSTRUCTIONS**

In order to maintain software compatibility with the HP 9872 plotter, the HP 7090 recognizes the following HP 9872-related instructions as NOP (no operation) instructions:

- AF* Advance Full Page
- AH* Advance Half Page
- AP* Automatic Pen Pickup
- EC* Enable Cutting Line
- PG* Advance Full Page
- VA* Advance Velocity
- VN* Normal Velocity

## DEFAULT COORDINATE VALUES

The following tables show the default plotter unit coordinate values that define the hard- and soft-clip limits and scaling point locations. For rotated coordinates, exchange the X- and Y-values.

**Hard-Clip and Default Soft-Clip Limits**

Paper Size	Hard-Clip Limits	
	X <sub>LL</sub> , Y <sub>LL</sub>	X <sub>UR</sub> , Y <sub>UR</sub>
A	-333, -100	10 703, 7 987
B	-475, -333	16 260, 10 703
A4	-322, -100	11 400, 7 785
A3	-525, -322	15 762, 11 400
Paper Size	Soft-Clip Limits	
	X <sub>LL</sub> , Y <sub>LL</sub>	X <sub>UR</sub> , Y <sub>UR</sub>
A	0, 0	10 370, 7 987
B	0, 0	16 260, 10 370
A4	0, 0	11 078, 7 785
A3	0, 0	15 762, 11 078

**Default Scaling Point Locations**

Paper Size	Zero and P1	Full Scale and P2
	Z <sub>X</sub> , Z <sub>Y</sub> (P1 <sub>X</sub> , P1 <sub>Y</sub> )	FS <sub>X</sub> , FS <sub>Y</sub> (P2 <sub>X</sub> , P2 <sub>Y</sub> )
A	160, 447	10 210, 7 682
B	865, 160	16 140, 10 210
A4	514, 348	10 564, 7 583
A3	325, 514	15 600, 10 564

## PLOTTER DEFAULT CONDITIONS

The following chart lists the plotter default conditions set by the *DF* instruction.\* The *IN* instruction also sets the plotter default conditions, in addition to the recorder default conditions.

Function	Equivalent Instruction	Condition
Plotting mode	PA;	Absolute (PA)
Relative character direction	DR 1,0;	Horizontal
Line type	LT;	Solid line
Line pattern length	LT;	4% of the diagonal distance between P1 and P2
Input window	IW;	Set according to current size paper
Relative character size	SR;	Width = 0.75% of $P2_X - P1_X$ Height = 1.5% of $P2_Y - P1_Y$
Symbol mode	SM;	Off
Tick length	TL;	$tp = tn = 0.5\%$ of $P2_X - P1_X$ for Y-tick and $0.5\%$ of $P2_Y - P1_Y$ for X-tick
Standard character set	CS 0;	Set 0
Alternate character set	CA 0;	Set 0
Character set selected	SS;	Standard
Character slant	SL 0;	0 degrees
Mask value	IM 223,0,0;	Recognizes all errors, except position overflow
Scaling	SC;	Plotter units
Pen velocity	VS;	75 cm/s (30 in./s)
Label terminator	DT <b>ETX</b>	ETX (ASCII decimal equivalent 3)
Label origin	LO;	Label starts at current pen position.

\*The *DF* instruction has no effect on recorder functions, the location of P1 and P2, the current pen and its position, or coordinate system rotation.

## RECORDER DEFAULT CONDITIONS

The following chart lists the recorder default conditions set by the *IN* instruction, which also sets the plotter default conditions listed by the preceding chart.

Function	Equivalent Instruction	Condition
Range	IR;	All channels set to 10.0 V
Offset	SV;	All channels set to 0.0 V
Grid type and Grid divisions	DG;	User-defined grid  A/A4 = 25, 18 (X, Y) B/A3 = 38, 25 (X, Y)
Grid quadrants	DG;	Quadrant 1
Total time	TB;	1.0 s
Post-trigger time	TG;	0 s
Pre-trigger time	TG;	0 s
Trigger level	TA;	0.0 V
Trigger width	TA;	0.0 V
Trigger mode	TM;	Manual
Channel selection	RE 9;	Channel 1 vs time
Data output	DO;	Continuous, all channels, ASCII format, no trigger status
Sample delay	SD;	0.1 s

**HP-RL/HP-GL  
ERROR MESSAGES**

<b>Displayed Error Number</b>	<b>Meaning</b>
0	No error
1	Instruction not recognized
2	Wrong number of parameters
3	Parameter out-of-range
4	Not used
5	Unknown character set
6	Position overflow
7	Not used
8	Vector move requested while pinch wheels raised; servo inoperative