HEIDENHAIN

Addendum

ND 1400 QUADRA-CHEK

Software Version 2.2.x

English (en)
4/2015

Information contained in this manual

This Operating Instructions addendum covers the setup feature additions and improvements implemented in ND 1400 Software v2.2.x.

1 Setup

2 Operation

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Setup

1.1 Setup

USB Target Folder

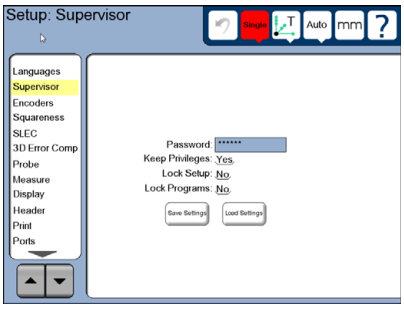
A user can set a folder on a USB flash drive where files containing data can be saved to. This folder can be set in the system by entering the folder name in the USB Target Folder field located in the Miscellaneous Setup page. The system will import and export all data to the USB port into this folder. If this field is left empty, the system will import or export data to a default folder labeled "QC300".

To edit the name of the USB Target Folder:

- Press the HELP button. The about screen is displayed showing the software version and system settings.
- Press the SETUP button. A second About screen is displayed describing the Setup menu.
- Press the SETUP button. The Setup menu is displayed.
- Press the DOWN ARROW button to highlight the Supervisor menu
- Enter the password in the Password field

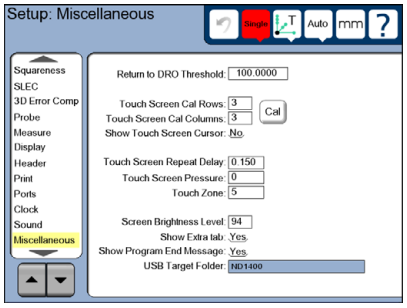
Press HELP

Press SETUP twice



Highlight the Supervisor menu and enter the password

- Press the DOWN ARROW button until the Miscellaneous menu is selected
- Press ENTER until the USB Target Folder field is highlighted
- Press inside the USB Target Folder field. A popup keypad is displayed.
- Using the popup keypad and numeric keypad enter the desired name for the folder
- Press the FINISH key to save the folder name into the field
- Press the FINISH key to save settings and exit Setup



Highlight the Miscellaneous menu and enter a Target Folder name

Press the FINISH key twice

Probe Type Selection

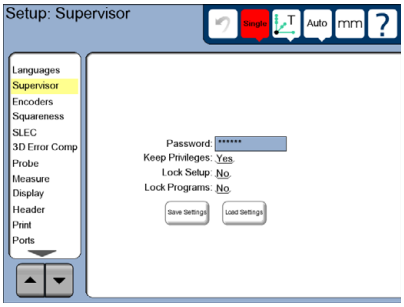
The contact probe option allows an OEM to configure a system using a touch probe or hard probe for points input. The system supports certain types of probes. Once the system has been configured with a certain probe type, then the supervisor must set the corresponding probe type name in the Probe setup page.

To set the probe type:

- Press the HELP button. The about screen is displayed showing the software version and system settings.
- Press the SETUP button. A second About screen is displayed describing the Setup menu.
- Press the SETUP button. The Setup menu is displayed.
- Press the DOWN ARROW button to highlight the Supervisor menu
- Enter the password in the Password field

Press HELP

Press SETUP twice

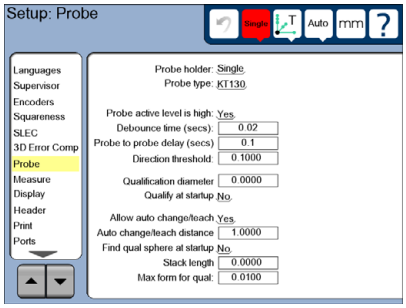


Highlight the Supervisor menu and enter the password

- Press the DOWN ARROW button until the Probe menu is selected
- Press on the Probe Type field to scroll through the list of probe types supported in the system until the desired type is shown

Probe type	Description
Standard	For use with standard probes that include a wired electrical connection between the probe and the ND 1400. e.g. TS 248, TS 149.
Hard Probe	For use with non-electrical contact probe. No connection between probe and the ND 1400.
KT 130	For use with HEIDENHAIN KT 130 probe.

- Press the FINISH key to save the probe type and exit Setup



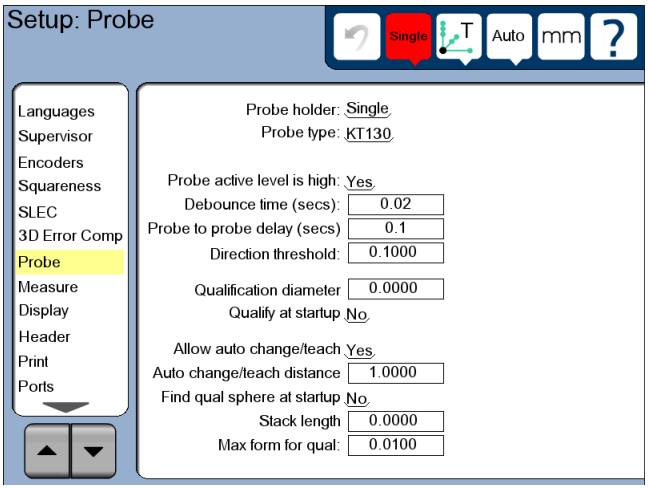
Highlight the Probe menu and select a Probe type

Press the FINISH key twice

Maximum Form for Qualification

Maximum form for qualification is the maximum form error allowed when teaching a probe tip. The qualification fails if the form error exceeds the value set in the parameter field.

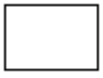
The Max form for qual parameter is located on the Probe setup page.

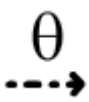
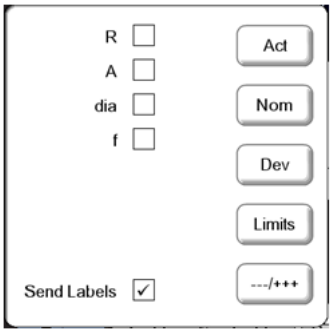


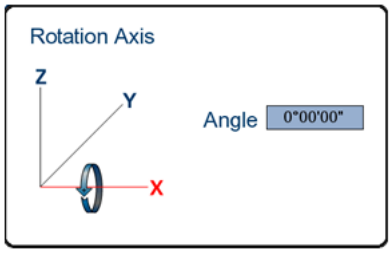
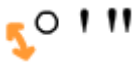
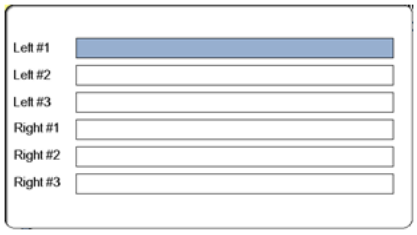
Probe setup page with Max form for qual parameter

Extra Tab Functions

Extra tab functions are added to the Extra tab in the Display setup screen. A description for each of the functions is provided in the table below. The functions that are available depends on the system configuration. Not all functions listed may be available on your system. Refer to "Configuring the Extra tab" and "Sending data to a computer from the Extra tab" in the User's Guide for additional information.

Icon	Name	Description
	**Space**	Inserts a blank space for separating function icons into groups.
	Divider	Inserts a vertical dividing line for separating function icons into groups.
	**Send X**	Sends the X value for the selected features. When no features are selected, the X value of the DRO (if the display is in Cartesian coordinates), or the R value of the DRO (if the display is in Polar coordinates) is sent.
	**Send Y**	Sends the Y value for the selected features. When no features are selected, the Y value of the DRO (if the display is in Cartesian coordinates), or the Theta value of the DRO (if the display is in Polar coordinates) is sent.

Icon	Name	Description
	**Send Z**	Sends the Z value for the selected features. When no features are selected, the Z position of the DRO is sent.
	**Send Q**	Sends the Q position for the DRO.
	**Send r**	Sends the radius value for the selected features.
	**Send D**	Sends the diameter value for the selected features.
	**Send L**	Sends the length value for the selected features.
	**Send W**	Sends the width value for the selected features.
	**Send Theta**	Sends the angle value for the selected features.
	**Send Prompt**	Displays a dialog box prompting you for which of the feature/axis fields to send for each of the selected features. Example of when a circle feature is selected: 

Icon	Name	Description
	**Rotate**	Used to rotate the reference frame. The rotation dialog is shown below: 
	**Send Two**	Sends the X and Y values for the selected features. When no features are selected, the X value and the Y value of the DRO (if the display is in Cartesian coordinates), or the R value and the Theta value of the DRO (if the display is in Polar coordinates) are sent.
	**Zero Two**	When a feature is selected the DRO will be zeroed based on the feature's X and Y position. This will only work for the currently selected feature, not for multiple selected features. When no feature is present the DRO will be zeroed at the current location.
	**DMS/DD**	Toggles the current angle display format between decimal-degrees and degrees-minutes-seconds.
	**Report Header**	Brings up the report header dialog box (shown below) for entering header information. 

2

Operation

2.1 Operation

Remote Operation from a PC

The ND 1400 RS-232 serial port supports bi-directional communications. Measured data value output—display values or probing functions—can be requested and exported to an external device. Requests can be made by using remote key commands from a PC using a serial communications program.

Refer to "Chapter 9: Communication" in the User's Guide for information on connecting a computer and sending data over the RS-232 port.

Remote keypad commands are only available if a remote keypad is attached

Remote Operation Example

To simulate pressing the Print button:

- type **@PRINT** at the command line
- Press the **ENTER** key on the computer keyboard

The following key commands are available for operating the ND 1400 from a PC:

Command	Function
@0	Key **0**
@1	Key **1**
@2	Key **2**
@3	Key **3**
@4	Key **4**
@5	Key **5**
@6	Key **6**
@7	Key **7**
@8	Key **8**
@9	Key **9**
@+	Key **+**
@-	Key **_**
@.	Key **.**
@ENTER	Key **ENTER**
@FINISH	Key **FINISH**

Command	Function
@QUIT	Key **QUIT**
@CANCEL	Key **CANCEL**
@PRINT	Key **PRINT**
@WIDE1	Key WIDE1
@WIDE2	Key WIDE2
@REMOTE0	Remote keypad **0**
@REMOTE1	Remote keypad **1**
@REMOTE2	Remote keypad **2**
@REMOTE3	Remote keypad **3**
@REMOTE4	Remote keypad **4**
@REMOTE5	Remote keypad **5**
@REMOTE6	Remote keypad **6**
@REMOTE7	Remote keypad **7**
@REMOTE8	Remote keypad **8**
@REMOTE9	Remote keypad **9**
@REMOTE .	Remote keypad **.**
@REMOTE +	Remote keypad **+**
@REMOTE -	Remote keypad **-**
@REMOTE ENTER	Remote keypad **ENTER**
@REMOTE FINISH	Remote keypad **FINISH**
BEEP	Make Beep sound.
HELP	Prints available remote commands with syntax.
S or **s**	Sends the current DRO position in the format (D, X value, Y value, Z value). In case there is no Z axis, the Z value is set to 0. In a system with a probe the format is temporarily changed to show the last position where a probe hit occurred (A, X probe value, Y probe value, Z probe value). This only happens the first time the S or s command is sent after a probe hit occurs.
VERSION	Prints the unit system name and software version.

Report Types

The ND 1400 provides six report types for exporting data reports. Refer to the Report Type table below for descriptions of the Report type options. Refer to "Report Examples" on page 20 for examples of report types.

Refer to "Print screen" in the Setup chapter, and "Printing a report" in the Communications chapter of the User's Guide for information on setting up and printing a report.

Report Type	Description
Standard	Report type that includes all measured values' coefficients where coefficients of the same type are grouped together in one column.
Tolerance	Report type for measured values with applied tolerances only.
Export	Report type of minimal coefficients that are for measured values with each coefficient displayed in its own column regardless of type.
Legacy Export	Report type of maximum coefficients that are for measured values with each coefficient displayed in its own column regardless of type.
32 Column	Report type with minimum number of coefficients presented in two columns
Actuals Report	Report type that includes all measured values' coefficients where coefficients of the same type are grouped together in one column, with further details on the measured values.

Formatting Report Data

There are four formatting options available for reports. Formatting options are specified using row and column separators. Refer to "Specifying column separators" in the Print screen section of the User's Guide for information on selecting a format.

Command	Function
None	Data is exported with spaces for column separators.
Dividing Lines	Data is exported with line dividers for rows and columns.
CSV	Data is exported with Comma Separated Values.
Tab	Data is exported with Tab delimited values.

Report Examples

Character Output

The number of characters is the same per line of data for each report type. Each line may contain different characters depending on the data being exported.

The following measured value is used to illustrate each report type:

Circle Feature

Circle feature	
Coefficients	**X**=68.1235 mm **Y**=-42.4320 mm **Z**=0.0000 mm **R**=7.5036 mm **F**=0.0035 mm
True Position tolerance nominal coefficients	**X**=68.1500 mm **Y**=-42.4500 mm **Z**=0.0000 mm **R**=7.5000 mm
True Position value	+/- 0.1000 mm for position and size

Send

▶ Send X 

1	2	3	4	5	6	7	8	9	10
X	<SP>		68	.	1235	<SP>	mm	<CR>	<LF>

▶ Send Y 

1	2	3	4	5	6	7	8	9	10
Y	<SP>	-	42	.	4320	<SP>	mm	<CR>	<LF>

Char	Description
1	Coordinate axis
2, 7	Space
3	Sign (positive sign is not displayed)
4	1 to 9 places before the decimal point
5	Decimal point
6	0 to 6 places after the decimal point
8	2 characters for units: **in** for Inch and **mm** for Millimeters
9	Carriage return
10	Line feed

Standard

Column Separators: **`Dividing Lines`**

▶ Command **`@PRINT`**

1	2	3	4	5	6	7	8	9	10	11	12
|	P	|	Cir	<SP>	3	<SPS>	|	X	<SP>		68

13	14	15	16	17	18	19	20	21	22	23	24
.	1235	|	<SP>		68	.	1235	|	<SP>		0

25	26	27	28	29	30	31	32	33	34	35	36
.	0000	|	<SP>					|	<SP>		

37	38	39	40	41	42	43	44	45	-	-	-
		|		.	++	|	<CR>	<LF>			

Character	Description
1, 3, 15, 21, 27, 33, 39, 43	Column dividing lines
2	Tolerance overall status ("P" for pass and "F" for fail)
4	Feature name (up to three characters long)
5, 10, 16, 22, 28, 34	Space
6	Feature ID (up to three characters long)
7	Trailing spaces (up to four spaces)
9	Coordinate axis (up to three characters long)
11, 17, 23, 29, 35	Sign (positive sign is not displayed)
12, 18, 24, 30, 36	1 to 9 places before the decimal point
13, 19, 25, 31, 37	Decimal point
14, 20, 26, 32, 38	0 to 6 places after the decimal point
40	Tolerance under - If tolerance passed but on the lower side of the nominal (see example)
41	Tolerance midpoint - If tolerance passed equal to the nominal (see example)
42	Tolerance over - If tolerance passed but on the upper side of the nominal (see example)
44	Carriage return
45	Line feed

			QC300 Feature Printout				
Date: 11-25-2013					Time: 1:02:43 PM		
Job: _____			Part: _____		Operator: _____		
T	Name	Actual/APD	Nom/Zone	Dev	Min	Max/EPD	---/+++
P	Cir 1	X 68.1235	68.1500	-0.0265			
		Y -42.4320	-42.4500	0.0180			
		Z 0.0000	0.0000	0.0000			
		TP 0.0641	0.1000			0.1000	.++
		rad 7.5036	7.5000	0.0036	7.4000	7.6000	.
		f 0.0000					

Standard Report Example

In the example above the tolerance range is divided into seven sections:

For the True Position tolerance that has been applied, the range is 0.2000 mm and is divided into seven sections (=0.0286 mm for each section) and the nominal is 0.0000 mm. The actual True Position value is 0.0641 mm (which falls in the second section from the nominal) hence is given 2 plus signs.

For the radius, the tolerance range is 0.2000 mm with nominal of 7.5000 mm. If you divide the range into seven sections as above, the deviation of 0.0036 mm from nominal size falls in the middle section, and therefore has no plus or minus signs.

Refer to "Chapter 7: Tolerances" in the User's Guide for tolerancing information.

Tolerance

Column Separators: **`Dividing Lines`**

▶ Command **`@PRINT`**

1	2	3	4	5	6	7	8	9	10	11	12
|	P	|	Cir	<SP>	3	<SPS>	|	r	<SPS>	|	<SP>

13	14	15	16	17	18	19	20	21	22	23	24
	7	.	5036	|	<SP>		7	.	5036	|	<SP>

25	26	27	28	29	30	31	32	33	34	35	36
	7	.	4036	|	<SP>		7	.	6036	|	<SP>

37	38	39	40	41	42	43	-	-	-	-	-
	0	.	0000	|	<CR>	<LF>					

Character	Description
1, 3, 8, 11, 17, 23, 29, 35, 41	Column dividing lines
2	Tolerance overall status ("P" for pass and "F" for fail)
4	Feature name (up to three characters long)
5, 12, 18, 24, 30, 35	Space
6	Feature ID (up to three characters long)
7, 10	Trailing spaces (up to six spaces)
9	Tolerance coefficient (up to three characters long)
13, 19, 25, 31, 37	Sign (positive sign is not displayed)
14, 20, 26, 32, 38	1 to 9 places before the decimal point
15, 21, 27, 33, 39	15, 21, 27, 33, and 39 Decimal point
16, 22, 28, 34, 40	16, 22, 28, 34, and 40 0 to 6 places after the decimal point
42	Carriage return
43	Line feed

```
+-+--------------+--------+----------+----------+----------+----------+----------+
|                          QC300 Feature Printout                                 |
+-+--------------+--------+----------+----------+----------+----------+----------+
| Date: 11-25-2013                                  Time: 1:01:57 PM              |
| Job:  __________          Part: _____________     Operator: _______________     |
+-+--------------+--------+----------+----------+----------+----------+----------+
|T|Name          |ID      |Actual    |Nominal   |Minus     |Plus      |Dev       |
+-+--------------+--------+----------+----------+----------+----------+----------+
|P|Cir 1         |r       |    7.5036|    7.5000|    7.4000|    7.6000|    0.0036|
| |Cir 1         |TP      |    0.0641|    0.0000|    0.0000|    0.1000|    0.0641|
+-+--------------+--------+----------+----------+----------+----------+----------+
```

Tolerance Report Example

Export

Column Separators: **Dividing Lines**

▶ Command **@PRINT**

1	2	3	4	5	6	7	8	9	10	11	12
|	P	|	Cir	<SP>	3	<SPS>	|	X	<SP>		68

13	14	15	16	17	18	19	20	21	22	23	24
.	1235	|	Y	<SP>	-	42	.	4320	|	Z	<SP>

25	26	27	28	29	30	31	32	33	34	35	36
	0	.	0000	|	<SP>		7	.	5036	|	<SP>

37	38	39	40	41	42	43	44	45	46	47	48
				|	<SP>		0	.	0035	|	<SP>

49	50	51	52	53	54	55	56	57	-	-	-
					<SPS>	|	<CR>	<LF>			

Character	Description
1, 3, 8, 15, 22, 29, 35, 41, 47, 55	Column dividing lines
2	Tolerance overall status ("P" for pass and "F" for fail)
4	Feature name (up to three characters long)
5, 10, 17, 24, 30, 36, 42, 48	Space
6	Feature ID (up to three characters long)
7, 54	Trailing spaces (up to four spaces)
9, 16, 23	Coordinate axis (up to three characters long)
11, 18, 25, 31, 37, 43	Sign (positive sign is not displayed)
12, 19, 26, 32, 38, 44	1 to 9 places before the decimal point
13, 20, 27, 33, 39, 45	Decimal point
14, 21, 28, 34, 40, 46	0 to 6 places after the decimal point
49	Degrees (1 to 3 characters)
50	Degrees/Minutes separator
51	Minutes (1 to 2 characters)
52	Minutes/Seconds separator

Character	Description
53	Seconds (1 to 2 characters)
56	Carriage return
57	Linefeed

```
+-+----------+------------+------------+------------+------------+------------+------------+------------+
|                                        QC300 Feature Printout                                          |
+-+----------+------------+------------+------------+------------+------------+------------+------------+
| Date: 11-25-2013                                  Time: 2:11:28 AM                                     |
| Job:  __________          Part: ____________      Operator: _______________                            |
+-+----------+------------+------------+------------+------------+------------+------------+------------+
|T|Name      |X           |Y           |Z           |Size        |Width       |Form        |Angle       |
+-+----------+------------+------------+------------+------------+------------+------------+------------+
|P|Cir 1     |X     68.1235|Y    -42.4320|Z      0.0000|    7.5036  |            |    0.0000  |            |
+-+----------+------------+------------+------------+------------+------------+------------+------------+
```

Export Report Example

Legacy Export

Column Separators: **`Dividing Lines`**

▶ Command **`@PRINT`**

1	2	3	4	5	6	7	8	9	10	11	12
|	Circle	<SPS>	|	3	<SPS>	|	X	<SP>		68	.

13	14	15	16	17	18	19	20	21	22	23	24
1235	|	Y	<SP>	-	42	.	4320	|	Z	<SP>	

25	26	27	28	29	30	31	32	33	34	35	36
0	.	0000	|	7	.	5036	<SPS>	|	15	.	0072

37	38	39	40	41	42	43	44	45	46	47	48
<SPS>	|							|			

49	50	51	52	53	54	55	56	57	58	59	60
			|	0	.	0035	<SPS>	|			

61	62	63	64	65	66	67	68	69	70	71	72
			|						|	

73	74	75	76	77	78	79	80	81	82	83	84
					|					

85	86	87	88	89	90	91	92	93	94	95	96
|					|				|	<CR>

97	-	-	-	-	-	-	-	-	-	-	-
<LF>											

Character	Description
1, 4, 7, 14, 21, 28, 33, 38, 45, 52, 57, 64, 71, 78, 85, 90, 95	Column dividing lines
2	Feature name (up to eight characters long)
3, 32, 37, 44, 51, 56, 89, 94	Trailing spaces (up to four spaces)
5	Feature ID (up to three characters long)
8, 15, 22, 58, 65, 72, 79	Coordinate axis (up to three characters long)
9, 16, 23, 66, 80	Space
10, 17, 24, 60, 67, 74, 81	Sign (positive sign is not displayed)
11, 18, 25, 29, 34, 53, 61, 68, 75, 82, 86, 91	1 to 9 places before the decimal point
12, 19, 26, 30, 35, 54, 62, 69, 76, 83, 87, 92	Decimal point
13, 20, 27, 31, 36, 55, 63, 70, 78, 84, 88, 93	0 to 6 places after the decimal point
39, 46	Degrees (1 to 3 characters)
40, 47	Degrees/Minutes separator
41, 48	Minutes (1 to 2 characters)
42, 49	Minutes/Seconds separator
43, 50	Seconds (1 to 2 characters)
96	Carriage return
97	Line feed

```
+-----------+------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+
|                                QC300 Feature Printout                                                                                                                                  |
+-----------+------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+
| Date: 11-25-2013                                      Time: 2:15:25 AM                                                                                                                |
| Job:  _________          Part: ___________            Operator: _____________                                                                                                         |
+-----------+------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+
|Type       |Id    |X          |Y          |Z          |rad        |dia        |<          |<2         |Form       |dx         |dy         |dz         |dl         |L          |W          |
+-----------+------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+
|Circle     |1     |X     68.1235|Y    -42.4320|Z      0.0000|    7.5036 |   15.0072 |           |           |    0.0000 |           |           |           |           |           |           |
+-----------+------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+-----------+
```

Legacy Export Report Example

32 Column

Column Separators: **`Dividing Lines`**

▶ Command **`@PRINT`**

1	2	3	4	5	6	7	8	9	10	11	12
|	Cir	<SP>	3	<SPS>	|	X	<SP>		68	.	1235

13	14	15	16	-	-	-	-	-	-	-	-
<SPS>	|	<CR>	<LF>								

Character	Description
1, 6, 14	Column dividing lines
2	Feature name (up to three characters long)
3, 8	Space
4	Feature ID (up to three characters long)
5, 13	Trailing spaces (up to four spaces)
7	Coordinate axis (up to three characters long)
9	Sign (positive sign is not displayed)
10	1 to 9 places before the decimal point
11|	Decimal point|
12	0 to 6 places after the decimal point
15	Carriage return
16	Line feed

```
+--------+--------------------+
|    QC300 Feature Printout   |
+--------+--------------------+
| Date: 11-25-2013            |
| Time: 2:38:47 AM            |
| Job:  __________            |
| Part: ____________          |
| Operator: _______________   |
+--------+--------------------+
|Name    |Actual/APD          |
+--------+--------------------+
|Cir 1   |X     68.1235       |
|        |Y    -42.4320       |
|        |Z      0.0000       |
|        |TP     0.0641       |
|        |rad    7.5036       |
|        |f      0.0000       |
+--------+--------------------+
```

32 Column Report Example

Actuals Report

Column Separators: **`Dividing Lines`**

▶ Command **`@PRINT`**

1	2	3	4	5	6	7	8	9	10	11	12
|	<SP>	003	<SP>	|	Circle	<SPS>	|	<SP>	3	<SPS>	|

13	14	15	16	17	18	19	20	21	22	23	24
<SP>	mm	<SPS>	|	X	<SP>		68	.	1235	<SP>	|

25	26	27	28	29	20	31	32	33	34	35	36
rad	<SP>		7	.	5036	<SP>	|	f	<SP>	0	.

37	38	39	40	41	-	-	-	-	-	-	-
0035	<SP>	|	<CR>	<LF>							

Character	Description
1, 5, 8, 12, 16, 24, 32, 39	Column dividing lines
2, 4, 9, 13, 18, 23, 26, 31, 34, 38	Space
3	Feature Measurement Index
6	Feature name (up to eight characters long)
7, 11, 15	Trailing spaces (up to eight spaces)
10	Feature ID (up to three characters long)
14	Measuring units (up to three characters long)
17	Coordinate axis
19, 27	Sign (positive sign is not displayed)
20, 28, 35	1 to 9 places before the decimal point
21, 29, 36	Decimal point
22, 30, 37	0 to 6 places after the decimal point
25	Feature size coefficient
33	Feature form coefficient
40	Carriage return
41	Line feed

```
+-----+----------+-----+----------+--------------+--------------+--------------+
|                          QC300 Feature Printout                               |
+-----+----------+-----+----------+--------------+--------------+--------------+
| Date: 11-25-2013                                  Time: 2:39:18 AM           |
| Job: __________          Part: ____________       Operator: _______________  |
+-----+----------+-----+----------+--------------+--------------+--------------+
|No.  |Feature   |Id   |Info      |Position      |Size          |Form          |
+-----+----------+-----+----------+--------------+--------------+--------------+
| 001 |Circle    | 1   | mm       |X     68.1235 |rad    7.5036 |f      0.0000 |
|     |          |     | DMS      |Y    -42.4320 |dia   15.0072 |              |
|     |          |     |          |Z      0.0000 |              |              |
+-----+----------+-----+----------+--------------+--------------+--------------+
```

Actuals Report Example

HEIDENHAIN

DR. JOHANNES HEIDENHAIN GmbH
Dr.-Johannes-Heidenhain-Straße 5
83301 Traunreut, Germany
☏ +49 8669 31-0
FAX +49 8669 32-5061
E-mail: info@heidenhain.de

Technical support FAX +49 8669 32-1000
Measuring systems ☏ +49 8669 31-3104
E-mail: service.ms-support@heidenhain.de
TNC support ☏ +49 8669 31-3101
E-mail: service.nc-support@heidenhain.de
NC programming ☏ +49 8669 31-3103
E-mail: service.nc-pgm@heidenhain.de
PLC programming ☏ +49 8669 31-3102
E-mail: service.plc@heidenhain.de
Lathe controls ☏ +49 8669 31-3105
E-mail: service.lathe-support@heidenhain.de

www.heidenhain.de

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