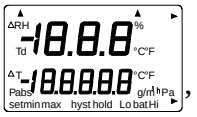
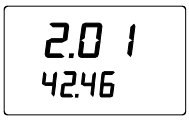
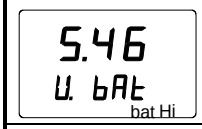
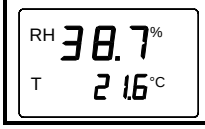
APPENDIX 1: QUICK REFERENCE TO COMMANDS

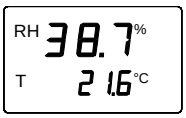
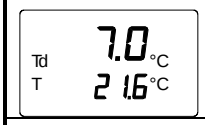
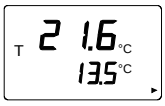
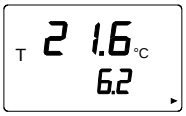
1. DISPLAY TEXTS AND OPERATING COMMANDS

The HMI41 is used by simply turning it on with the ON/OFF button. In the following, you will find a summary of the display texts with explanations and the operating commands.

ON/OFF: the HMI41 is turned ON or OFF

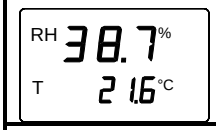
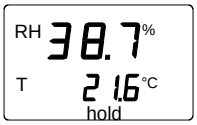
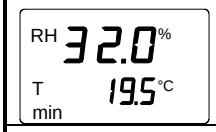
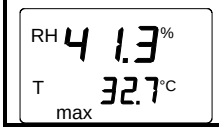
DISPLAY	DESCRIPTION
	The HMI41 has been turned on.
	The HMI41 software version and probe type indication. If the software version does not appear, it is less than 1.02 and the HMI41 cannot be used with the HMP46; contact Vaisala or a Vaisala representative. If the probe type indication (**41.45** or **42.46**) does not appear, the indicator does not recognize the probe type automatically; give the setting manually (see Chapter 4 of this appendix). If the probe type indication is replaced with text **NO PRB**, check that the probe is correctly connected.
	Indication of the battery voltage.
	Relative humidity and temperature readings are output.

MODE: outputting of the selected quantities

	Relative humidity and temperature readings are output (automatically after power-up). PRESS MODE (the following appears):
	**Dewpoint temperature** and temperature readings are output. PRESS MODE (return to the normal RH&T display or one of the following appears):
	**Absolute humidity** and temperature readings are output if absolute humidity has been selected during the setup procedure. PRESS MODE (return to the RH&T display)
	**Wet bulb temperature** and temperature readings are output if wet bulb temperature has been selected during the setup procedure. PRESS MODE (return to the RH&T display)
	**Mixing ratio** and temperature readings are output if mixing ratio has been selected during the setup procedure. PRESS MODE (return to the RH&T display)

HOLD:

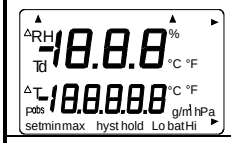
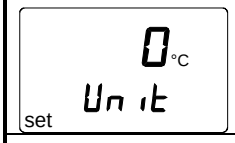
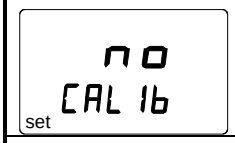
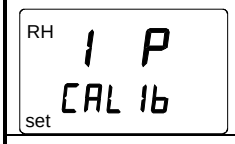
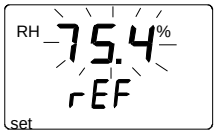
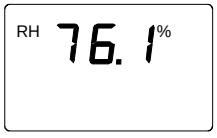
freezes the display to show the current readings or outputs the minimum or maximum values measured after power-up.

	Relative humidity and temperature readings are output in the normal display mode. PRESS HOLD (the following appears):
	The display is frozen to show the current readings. This mode is available for all quantities. PRESS HOLD for the second time:
	The minimum readings after power-up are output. This mode is available for all quantities. PRESS HOLD for the third time:
	The maximum readings after power-up are output. This mode is available for all quantities. Return to the normal RH&T display mode with any button except ON/OFF.

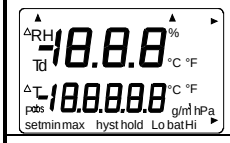
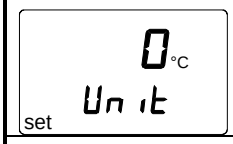
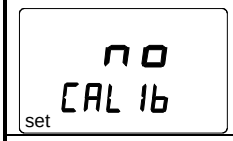
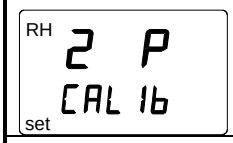
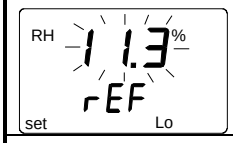
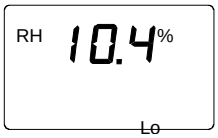
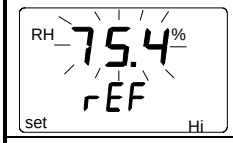
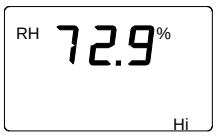
2. CALIBRATION WITH THE HMI41 SOFTWARE

This quick reference is meant for those users who already know how to use the HMI41 indicator. The operating manual gives more detailed instructions. NOTE: it is recommended that the calibration is done with trimmer potentiometers of the probe. However, if only one probe is being used, the calibration can also be done according to the following instructions.

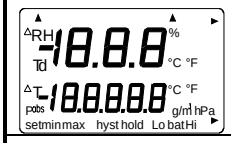
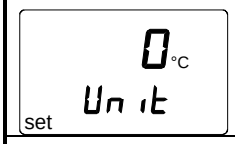
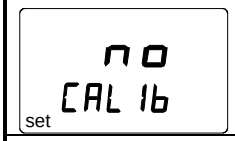
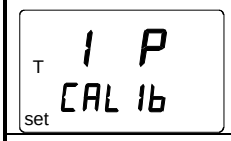
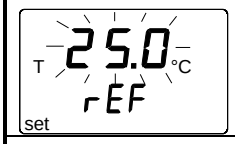
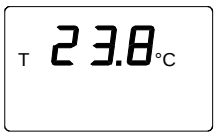
2.1 One-point humidity calibration

	Turn the HMI41 indicator on. Within 1-2 seconds press simultaneously buttons MODE and HOLD until the text SEtUP appears.
	Wait a few seconds.
	Press ENTER eight times.
	Press MODE twice.
	Press ENTER to activate one point humidity calibration.
	The reference humidity reading stored in the HMI41 memory is blinking. Change it to the correct value (see calibration table) with buttons ▲ or ▼. The reading changes in steps of 0,1 %. Press ENTER.
	The indicator shows the value that the probe is measuring. Wait at least 10 minutes for the reading to stabilize and acknowledge it by pressing ENTER. Press ENTER again to conclude the calibration.
	Calibration was successful. If it was not succesful, some other text appears on the display (e.g. *too close*, *err offst* or *err gain*). Perform the calibration again.

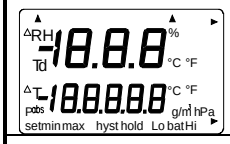
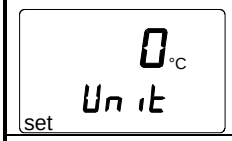
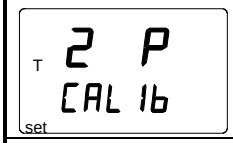
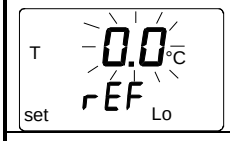
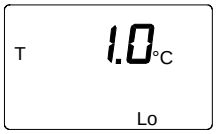
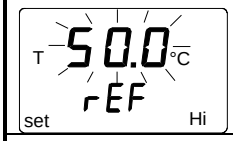
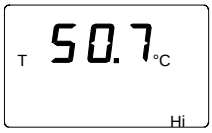
2.2 Two-point humidity calibration

	Turn the HMI41 indicator on. Within 1-2 seconds press simultaneously buttons MODE and HOLD until the text SEtUP appears.
	Wait a few seconds.
	Press ENTER eight times.
	Press MODE three times.
	Press ENTER to activate two point humidity calibration.
	The lower reference reading stored in the HMI41 memory is blinking. Change it to the correct value (see calibration table) with buttons ▲ or ▼. Press ENTER.
	The indicator shows the value that the probe is currently measuring. Wait at least10 minutes for the reading to stabilize and acknowledge it with ENTER. Press ENTER again to conclude the lower point calibration.
	The higher reference reading stored in the HMI41 memory is blinking. Change it to the correct value (see calibration table) with buttons ▲ or ▼. Press ENTER.
	The indicator shows the value that the probe is currently measuring. Wait at least 10 minutes for the reading to stabilize and acknowledge it with ENTER. Press ENTER again to conclude the calibration.
	Calibration was successful. If it was not succesful, some other text appears on the display (e.g. *too close*, *err offst* or *err gain*). Perform the calibration again.

2.3 One-point temperature calibration

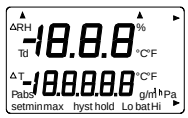
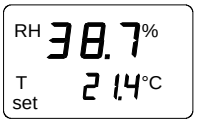
	Turn the HMI41 indicator on. Within 1-2 seconds press simultaneously buttons MODE and HOLD until the text SEtUP appears.
	Wait a few seconds.
	Press ENTER eight times.
	Press MODE four times.
	Press ENTER to activate one point temperature calibration.
	The reference reading stored in the HMI41 memory is blinking. Change it to the correct value with buttons ▲ or ▼. Press ENTER.
	The indicator shows the value that the probe is currently measuring. Wait at least 10 minutes for the reading to stabilize and acknowledge it with ENTER. Press ENTER again to conclude the calibration.
	Calibration was successful. If it was not succesful, some other text appears on the display (e.g. *too close*, *err offst* or *err gain*). Perform the calibration again.

2.4 Two-point temperature calibration

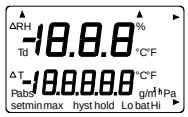
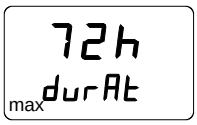
	Turn the HMI41 indicator on. Within 1-2 seconds press simultaneously buttons MODE and HOLD until the text SEtUP appears.
	Wait a few seconds.
	Press ENTER eight times.
	Press MODE five times.
	Press ENTER to activate two-point temperature calibration.
	The lower reference reading stored in the HMI41 memory is blinking. Change it to the correct value with buttons ▲ or ▼. Press ENTER.
	The indicator shows the value that the probe is currently measuring. Wait at least 10 minutes for the reading to stabilize and acknowledge it with ENTER. Press ENTER again to conclude the lower point calibration.
	The higher reference reading stored in the HMI41 memory is blinking. Change it to the correct value with buttons ▲ or ▼. Press ENTER.
	The indicator shows the value that the probe is currently measuring. Wait at least 10 minutes for the reading to stabilize and acknowledge it with ENTER. Press ENTER again to conclude the calibration.
	Calibration was successful. If it was not succesful, some other text appears on the display (e.g. *too close*, *err offst* or *err gain*). Perform the calibration again.

3. DATA COLLECTING MODE

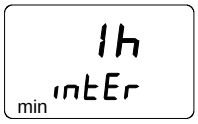
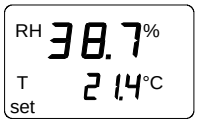
3.1 Manual data collecting

	Turn the indicator on. Within 1 - 2 seconds press the button HOLD until the text REC AUTO appears, then release the button.
	Press the button MODE to enter the manual data collecting.
	Press ENTER to start the measurements.
	The probe is now taking measurements. You can store the readings at appropriate intervals by pressing the button HOLD. This brings the sequence number of the reading in the indicator's memory on the display for a couple of seconds:
	The indicator returns automatically to the previous display. The readings can be read in the REC READ mode (see chapter 3.4 of this appendix). You can store max. 199 readings in the indicator memory. Stop the data collecting by turning the indicator off.

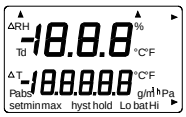
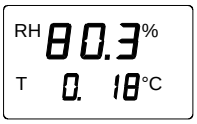
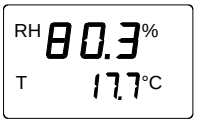
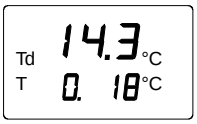
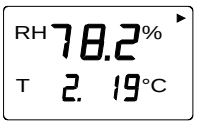
3.2 Setting the measurement duration for automatic data collecting

	Turn the indicator on. Within 1 - 2 seconds press the button HOLD until the text REC AUTO appears, then release the button.
	Press ENTER when the text REC AUTO is displayed.
	Previously set duration time appears. If the previously set duration is too long for the current battery charge, the calculated longest duration time possible for the current battery charge appears instead; this is also indicated with the text MAX.
	Set the duration time with buttons ▲ or ▼. The duration time can be set from 15 minutes to 7 days. Text BAT on the display indicates that the battery charge is not sufficient for the duration time selected; select a shorter duration time. Turn the indicator off or press ENTER for setting the measurement interval.

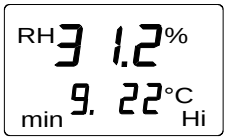
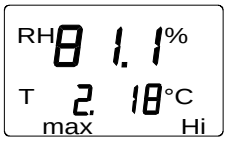
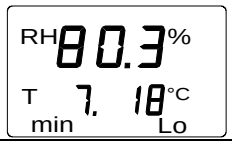
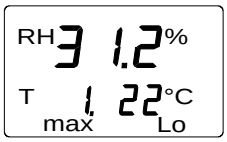
3.3 Setting the measurement interval for automatic data collecting

	Previously set measurement interval appears. If the previously set interval is too long for the indicator's current memory capacity, the calculated shortest possible interval appears instead; this is also indicated with the text MIN. Select the interval with buttons ▲ or ▼. Text LO on the display indicates that there is not enough memory left for the chosen interval; select a longer interval. Press ENTER to activate the measurements in the automatic data collecting mode.
	Press ON/OFF if you wish to stop the automatic data collecting.

3.4 Reading the measurement results

	Turn the indicator on. Within 1 - 2 seconds press the button HOLD until the text REC AUTO appears, then release the button.
	Press twice the button MODE.
	Press ENTER.
	Numbers on the first line indicate the stored reading of the quantity shown; numbers on the left of the second line indicate the sequence number of the stored reading in the indicator memory. Numbers on the right of the second line indicate the temperature measured simultaneously with the first line reading. The decimals of the T reading can be seen by pressing the button ENTER:
	The display returns to the previous display after a couple of seconds.
	You can change the quantity on the first line by pressing MODE.
	To scroll all measurement results, press ENTER. An arrow is displayed on the higher righthand corner. Press HOLD while the arrow is displayed. Note that the sequence number changes.

3.4.1 MIN and MAX in the data collecting mode

	In this example, the minimum value of the first line reading is being observed (MIN = minimum, HI = the first line reading); press ENTER to see the T reading with decimals.
	In this example, the maximum value of the first line reading is being observed (MAX = maximum, HI = the first line reading); press ENTER to see the T reading with decimals.
	In this example, the minimum value of the second line reading is being observed (MIN = minimum, LO = the 2nd line reading); press ENTER to see the T reading with decimals.
	In this example, the maximum value of the second line reading is being observed (MAX = maximum, LO = the 2nd line reading); press ENTER to see the T reading with decimals.

4. TRANSFERRING THE MEASURED DATA TO A PC

Give the communication parameters when using this terminal session for the first time; save them for future use. See instructions in the following tables.

Table 4.1 Giving parameters in Windows 3.1

MENU	DESCRIPTION
PROGRAM MANAGER	
⇩	
ACCESSORIES	double click
⇩	
TERMINAL	double click
⇩	
Settings	click
⇩	
Communications	click and select parameters (see list below); click OK
⇩	move the cursor to:
File	click
⇩	
Save as	click and save settings: type the name of the file (e.g. HMI41) and click OK
Turn the HMI41 on and follow the instructions in Ch. 4.2	

The communication parameters are:

- connector according to your computer
- baud rate 4800
- data bits 7
- stop bits 1
- parity even
- flow control none

Table 4.2 Giving parameters in Windows 95 and Windows NT

WINDOWS 95		WINDOWS NT	
MENU	WHAT TO DO	MENU	WHAT TO DO
Start		**Start**	
⇩	move the cursor to:	⇩	move the cursor to:
Programs		**Programs**	
⇩	move the cursor to:	⇩	move the cursor to:
Accessories		**Accessories**	
⇩	move the cursor to:	⇩	move the cursor to:
HyperTerminal	click	**HyperTerminal**	
⇩	move the cursor to:	⇩	move the cursor to:
Hypertrm	double click	**Hyperterminal**	click
⇩		⇩	
Connection Description	type the name of the connection (e.g. HMI41) in the appropriate field and select an icon if available; click OK.	**Connection Description**	type the name of the connection (e.g. HMI41) in the appropriate field and select an icon if available; click OK.
⇩			
Phone Number	move the cursor to the field CONNECT USING and select **'direct to COM x'** (x = serial port available); click OK	**Connect to**	move the cursor to the field CONNECT USING and select **'COM x'** (x = serial port available); click OK
⇩		⇩	
COM x properties	select parameters according to the list on previous page; click OK	**COM x properties**	select parameters according to the list on previous page; click OK
Turn the HMI41 on and follow the instructions in Chapter 4.2			

4.2 Using the serial commands

4.2.1 PLAY Transferring the data

To output the stored readings on your computer, turn the HMI41 on, type PLAY and press ENTER. An example of outputting automatically stored readings:

```
>play
Reading Log... OK

data    hh:mm:ss          RH      T       Td
  0     00:00:00         12.54   21.53   -8.48
  1     00:01:00         12.10   21.23   -9.16
  2     00:02:00         12.18   21.18   -9.12
  3     00:03:00         12.12   21.15   -9.21
  4     00:04:00         12.16   21.14   -9.18
  5     00:05:00         12.09   21.12   -9.27
  6     00:06:00         12.09   21.09   -9.28
>
```

An example of outputting manually stored readings:

```
>play
Reading Log... OK

  data   RH      T       Td
  1     12.10   21.23   -9.16
  2     12.18   21.18   -9.12
  3     12.12   21.15   -9.21
  4     12.16   21.14   -9.18
  5     12.09   21.12   -9.27
  6     12.09   21.09   -9.28
>
```

If you know the starting time of the automatic data collecting, type it with the command; for example:

```
>play 15:05
Reading Log... OK

data    hh:mm:ss          RH      T       Td
  0     15:05:00          8.52   23.69  -11.70
  1     15:06:00          9.58   23.66  -10.26
  2     15:07:00          9.60   23.50  -10.35
  3     15:08:00          9.61   23.30  -10.48
  4     15:09:00          9.65   23.25  -10.47
  5     15:10:00         11.22   23.41   -8.44
  6     15:11:00          9.93   23.30  -10.08
  7     15:12:00          9.92   23.22  -10.15
>
```

4.2.2 CPLAY Setting characters between decimals and fields

Type CPLAY and press ENTER to see the characters between decimals and fields. An example:

```
>cplay
Desimal separator : .
Field separator   : TAB
example:
```

```
  1     01:00:00          38.72   21.61    7.01
>
```

To change the output, type CPLAY, the character you wish to appear between decimals, the character you wish to use between fields and then <cr>. An example:

```
>cplay ,        <cr>
Desimal separator : ,
Field separator   : TAB

example:
  1     01:00:00          38,72   21,61    7,01
>
```

4.2.3 HELP Outputting available commands and their contents

Type HELP and press ENTER:

```
>help
Available commands :
HELP      ?         PLAY      CPLAY
Type HELP <command_name> for more help
>
```

To see the contents of each command, type HELP, command name (e.g. PLAY) and press ENTER:

```
>help play

Command : PLAY
Purpose : Send recordings from memory to serial port
Usage   : PLAY hh:mm <cr>, hh:mm = rec starting time (optional)

if command is used without parameters it uses default setting
>
```

4.3.4 ? Outputting the HMI41 settings

Type ? and press ENTER:

```
>?

HMI41 / 2.01
Serial number : A0000000
Output units  : metric
Baud P D S    :   4800 E 7 1 FDX
Pressure      :  1013.25
Auto Off      :        5
Probe         :        2
Start-up mode :        1
4.th variable :  none
>
```

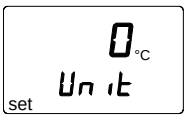
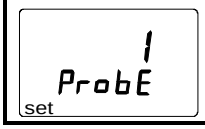
To exit the terminal session, go to FILE menu and select EXIT. Confirm that you wish to quit and then select whether you wish to store the parameters of this session for future use or not (SAVE - YES/NO).

5. CHANGING THE SETTINGS

The HMI41 factory settings are the following:

- display units:	**0**	(metric)
- automatic power-off:	**5**	(minutes)
- display quantities:	**0**	(RH, T and Td)
- pressure:	**1013.25 hPa**	(1 hPa = 1 mbar)
- probe type:	**AUT**	(or **1**, see below)
- start:	**1**	

Indicators marked with letters ID have the automatic probe recognition (AUT PROBE) as default, previous versions the probe type 1. With previous versions, set the probe type setting manually to PROBE TYPE **2** when using the HMP46. To change the setting, press ON/OFF until you can see some text on the display. Release the ON/OFF button and press within 1-2 seconds simultaneously both ENTER and MODE buttons until the text "**SEtUP**" appears on the display:

DISPLAY	WHAT TO DO	PRESS:
	Wait for a few seconds.	
	Select the display units: **0** = metric units **1** = non-metric units	▲ (number up) or ▼ (number down) ENTER(to scroll the menu) or ON/OFF (to exit the setup mode)
	Set the time for the automatic power-off in minutes (NO,1...60); if NO is chosen, the power-off function is not activated	▲ (up) or ▼ (down) ENTER (to scroll the menu) or ON/OFF (to exit the setup mode)
	Select the display quantities: **0** = RH, T, Td **1** = RH, T, Td, abs **2** = RH, T, Td, Tw **3** = RH, T, Td, x	▲ (up) or ▼ (down) ENTER(to scroll the menu) or ON/OFF (to exit the setup mode)
	Set the pressure for mixing ratio and wet bulb temperature calculations.	▲ (0.25 hPas up) or ▼ (0.25 hPas down) ENTER (to acknowledge the setting) ON/OFF (to exit the setup mode)
	Select the correct probe type: 1 = HMP41,HMP45 (HMP44/44L) **2** = HMP42, **HMP46**	▲ (up) or ▼ (down) ON/OFF (to exit the setup mode)

NOTE

The HMI41 setup contains further settings (*start, baud, seri* and *calib*) that appear after probe type setting when pressing ENTER. *Start* setting is changed only when using the HMP44/L probes (START 5, see the HM44 Operating Manual). For calib, see the operating manual. Other settings are meant for the HMI41 used as a field calibrator for Vaisala humidity transmitters. Do not change them. Press ON/OFF after probe type setting.