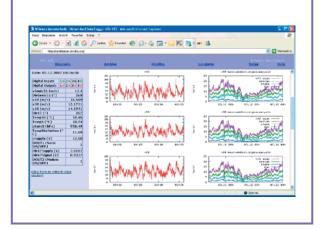
# Manual Data Logger blueberry COMPACT









#### IMPRINT

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This manual relates to firmware release 3.2.6 of the data logger **blueberry COMPACT** (partNo. 0141).

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### Introduction

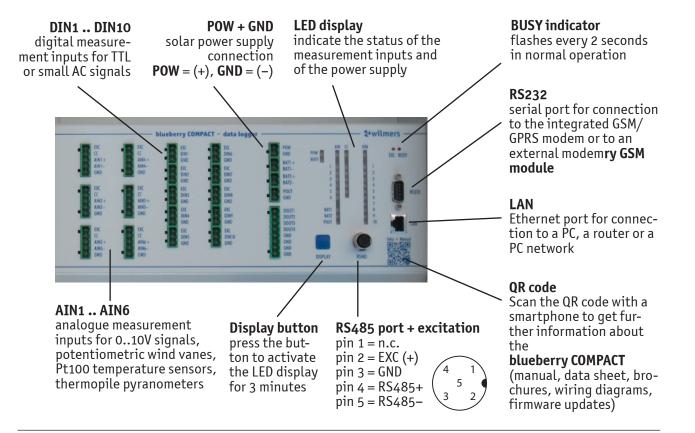
The **blueberry COMPACT** is an all-in-one data logger system. It features digital and analogue measurement inputs for the connection of sensors providing pulses, voltage or current signals. A serial **RS485** bus interface allows the connection of sonic anemometers and other sensors with **RS485** interface. The **blueberry COMPACT** is integrated into the Internet via GSM/GPRS or DSL. It sends measured data automatically via E-Mail and FTP. The Ethernet port and the integrated web interface provide fast data transmission to a PC or a LAN and easy access via a web browser.

### **Getting Started**

### **Scope of Delivery**

The following components are supplied with the data logger **blueberry COMPACT**:

- Data logger in a rugged weatherproof enclosure
- Crosspatch Ethernet cable for local data connection



### Installation

Please proceed as follows to install and to test the **blueberry COMPACT** data logger:

- 1. Install the **blueberry COMPACT** to the mast.
- 2. Remove the battery cover plate and insert the two sealed lead batteries and connect them to **BAT1** and **BAT2**. Please use only the battery types stated on the label in the data logger shelter box.
- 3. Insert the battery cover plate and tighten the fixing screw.
- **NOTE:** Never disconnect the backup batteries from the data logger when a solar module is connected. This may damage the data logger.
- Connect a 12V solar module (60 Wp) to the POW

   (+) and GND (-) terminals of the terminal strip.
   The BUSY indicator LED is steadily alight. The boot process takes approx. 2 minutes. The data logger is fully operating when the BUSY LED flashes in regular intervals of 2 seconds.
- **NOTE:** Never connect a solar module to the data logger before batteries are connected. This may damage the data logger.

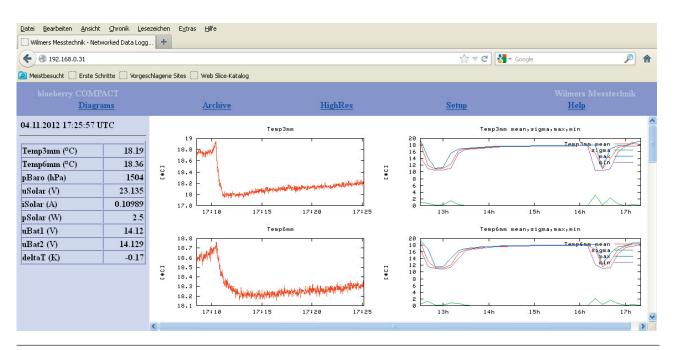
Optionally, a 24 VDC (15..30 VDC / max. 5A) power supply can be connected instead of the solar module. The integrated charge controller will charge the backup batteries working as a UPS.

- 5. Plug the crosspatch cable into the **LAN** connection at the front plate of the **blueberry COMPACT**. Connect the crosspatch cable to the Ethernet interface of a PC or notebook.
- 6. Adapt the network settings of the PC to the IP address of the **blueberry COMPACT**. The network parameters are indicated on a label at the bottom of the housing of the data logger.
- Start your Internet browser, enter the IP address of the data logger into the address field and type <enter>. Enter the access code into the login dialog:

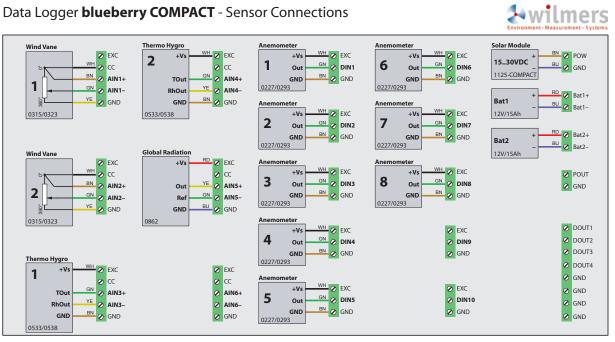
user:	admin	
password:	****	(=admin password)

- 8. You should now see a screen similar to the image below.
- Connect sensors or test signals to the terminals at DIN1 .. DIN10 and AIN1 .. AIN6. Enter the measurement functions according to chapter Measurement Setup of this manual.

Delivered within a complete measurement system the **blueberry COMPACT** usually provides a wiring diagram attached to the lid of the shelter box. The **blueberry COMPACT** includes built-in overvoltage protection for all terminals. The following image shows the **blueberry COMPACT** data logger with backup batteries connected, the **GSM module** that integrates the data logger into the Internet via GPRS.







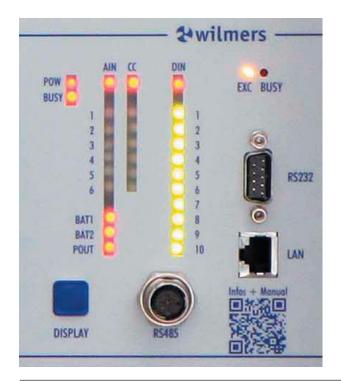
Farben / Colors / Couleurs WH = weiß / white / blanc BN = braun / brown / marron GN = grün / green / vert YE = gelb / yellow / jaune GY = grau / grey / gris PK = rosa / pink / rose BU = blau / blue / bleu RD = rot / red / rougeBK = schwarz / black / noire VT = violett / violet / violet GNYE = grün-gelb / green-yellow / vert-jaune



### **LED Display**

The **blueberry COMPACT** provides an array of LEDs that indicate the status of the measurement inputs and of the power supply. Press the **DISPLAY** button to activate the LEDs for 3 minutes.

Significance of the LEDs						
LED	Off	Red	Green			
POW	Supply Voltage <11 V	Supply Voltage 1116 V	Supply Voltage >16 V			
BUSY	-	Received an invalid telegram	Received a valid telegram			
AIN (top)	-	Analogue Excitation On	Analogue Excitation Off			
CC (top)	-	Constant Current On	Constant Current Off			
DIN (top)	-	Digital Excitation On	Digital Excitation Off			
AIN16	<0.05 V	0.050.5 V	>0.5 V			
CC16	<0.1 mA	0.10.9 mA	>0.9 mA			
DIN110	-	High	Low			
BAT1	<11 V	1113 V	>13 V			
BAT2	<11 V	1113 V	>13 V			
POUT	-	On	Off			



### QR Code (Infos + Manual)

Scan the QR code with your smartphone in order to get further information about the **blueberry COMPACT.** The QR code links to a website that provides technical data, manual, wiring schemes, brochure, application notes and firmware updates for the data logger. The website is also available under the following link:

#### http://wilmers.com/blueberry-compact

### Web Interface

### Introduction

The user surface of the data logger **blueberry COMPACT** is a web interface. Configuration of the data logger, display and download of measured data requires a web browser (e.g., Firefox, Opera, Internet Explorer, Safari). The data logger is connected to the PC via local Ethernet connection or via remote data transmission (GSM, GPRS, UMTS, CDMA, DSL, Satellite).

Start the browser, enter the IP address of the data logger into the address field and type **<enter>**. Enter the access code into the login dialog. The **blueberry COMPACT** provides two user levels:

The user **guest** is allowed to display actual measured values and configuration settings and to down-load measured data. He cannot delete any data or change configuration settings. He is only allowed to set date and time.

The user **admin** has all rights. In addition to the **guest** rights he is allowed to delete measured data and to change the configuration.

### Data Display

### **Displaying Actual Measured Values**

The left part of the screen displays in a table all actual measured values. When the data logger is connected locally these values are automatically updated. At remote connections, please click on

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Datei Bearbeiten Ansicht	Lesezeichen E>
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NDL 485 <u>Diagrams</u>	
Date: 02.06.2006 1	3:15:48
Digital Inputs 1	2 3 4
Digital Outputs 10	20 30 40
Temp (°C)	20.56
rHumidity (%RH)	43.13
pBaro (hPa)	1026.13
vSonic (m/s)	4.76698
dirSonic (°)	117.227
vSupply (V)	12.0955
Freq1 (Hz)	0
densityAir (kg/ m3)	1.21709

**Refresh Data View** below the data table in order to update the display. Measured values are displayed as floating point numbers with the significant number of characters after the decimal point.

### Data Transfer

### Downloading Measured Data

The **blueberry COMPACT** contains two ring buffer data memories; one for the statistics, one for the samples. Actual data overwrite the oldest data lines which makes the deletion of the memory unnecessary.

Select **Archive** in order to display a list of all stored statistics files. The **blueberry COMPACT** creates one statistics file per day. These files contain time series of the statistical evaluations of the samples. The file name contains the index of the actual measurement, the date and the tag **stat** for ,statistics'. The data logger increments the index every time the configuration is changed or the data logger reboots.

Example: 000024\_2004-03-19\_stat.csv

wilmers Messtechni Datei Bearbeiten Ansie		Data Logger NDL485 - Microsoft Internet Expl	×
			»
Adresse 🕘 http://192.168	3.0.33/	💌 🔁 Wechseln	zu
NDL 485 <u>Archive</u>	<u>Highl</u>	wilmers Messtechnik n <mark>Res Setup Help</mark>	
Date: 02.06.20	06	000007 2006-06-02 stat.csv 9KB	
Date: 14:46:06		000006 2006-06-02 stat.csv 1KB	
Digital		000005 2006-06-02 stat.csv 1KB	
Inputs 1	2• 3• 4•	0000004 2006-06-02 stat.csv 11KB	
Digital 1	2.3.4.	000004 2006-06-01 stat.csv 1KB	
Outputs	2 3 4	0000003 2006-06-01 stat.csv 1KB	
v80a (m/s)	1.39333	000002 2006-06-01 stat.csv 6KB	
v80b (m/s)	1.09065	000001 2006-06-01 stat.csv 2KB	
v60 (m/s)	1.30403	T 1	
v30 (m/s)	0.87633	Index generated Fri Jun 2 14:43:33 2006	
v10 (m/s)	0.8016		
Dir78 (°) Dir28°)	203.842 210.571		
Temp78 (°C)	210.371		
Temp05 (°C)	20.03		
rHum05 (% RH)	46.1		
pBaro (hPa)	1026.55		
uSupply (V)	13.6624		
uCC1(V)	3.029		
uCC2(V)	3.024		
🛃 Fertig		🚺 🚺 🔮 Internet	.;;

Select **HighRes** in order to display a list of all stored samples files. The **blueberry COMPACT** creates one CSV file per hour. These files contain time series of all measured samples. The file name contains the index of the actual measurement, date and time, and the tag **meas** for ,measurement'.

Example: 000024\_2004-03-19\_15\_meas.csv

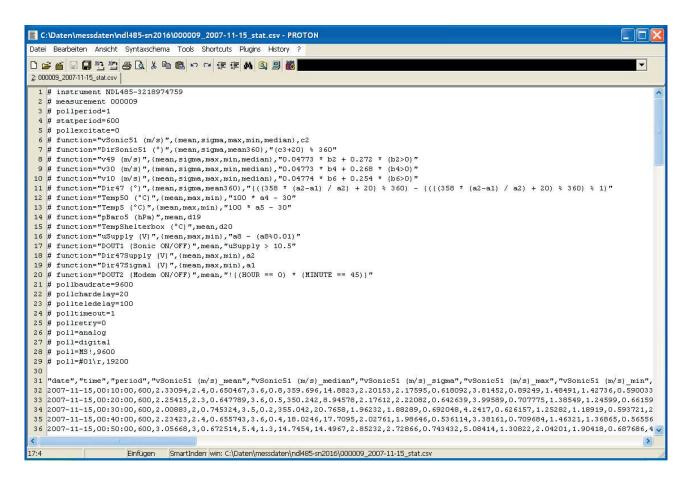
	<u>HighRes</u>	Setup
:39	Archive	
8 4 9	000153 2005-12-29 stat.	csv
39 49	000152_2005-12-29_stat.	csv
8704	000151_2005-12-29_stat.	csv
0701	000150_2005-12-29_stat.	csv
9285	000149_2005-12-29_stat.	csv
	000145_2005-12-29_stat.	csv
.8.74	000143_2005-12-29_stat	Öffnen
9063	000142_2005-12-29_sta	Orrnen In neuem Fenster öffnen
17.74	000141_2005-12-29_sta	Ziel speichern unter
0	000140_2005-12-29_sta	Ziel drucken
11.9	000139_2005-12-29_sta	a 1
06.41	000138_2005-12-29_sta	Ausschneiden Kopieren
	000137_2005-12-29_sta	Verknüpfung kopieren
06.99	000136_2005-12-29_sta	Einfügen
	000136_2005-12-28_sta	
15.49	000135_2005-12-28_sta	Zu Favoriten hinzufügen
0	000135_2005-12-27_sta	Eigenschaften
0	000134_2005-12-26_stat.	csv

Downloading measured data works like a download from an Internet site: click with the right mouse button on a file, select **Save file as...** from the pull-down menu, enter the destination path and click **OK**.

CSV files can be imported into data analysis software like **WAsP** or **WindPRO**. Double-clicking on the CSV file opens it directly in **MS-Excel**.

### Data Format

The **blueberry COMPACT** stores measured data as comma separated ASCII files (CSV). Each data file contains a header which indicates information about the data logger and the measurement configuration: serial number of the data logger, index of the measurement, site info, measurement functions and parameter settings. The header is followed by an empty line and a line with column headers. The measured data lines have the format: date, time, period, measured values. Decimal delimiter is a dot (e.g., **2.564**), columns are separated by a comma.



🖞 Datei Bearbeiten <u>A</u> nsicht Einfügen Fon	ma <u>t</u> E <u>x</u> tras	Date <u>n</u>	Eenster <u>?</u>				_ 8
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K22 - =							
A	В	С	D	E	F	G	Н
# instrument NDL485-3218974759							
2 # measurement 000009							
3 # pollperiod=1							
# statperiod=600							
5 #pollexcitate=0							
# function="vSonic51 (m/s)"	{mean	sigma	max	min	median}	c2	
# function="DirSonic51 (")"	{mean	sigma	mean360}	(c3+20) % 360	0.0253		
# function="v49 (m/s)"	{mean	sigma	max	min	median}	0.04773 * b2 + 0.272 *	(b2>0)
# function="v30 (m/s)"	{mean	sigma	max	min	median}	0.04773 * b4 + 0.268 *	(b4>0)
0 #function="v10 (m/s)"	{mean	sigma	max	min	median}	0.04774 * b6 + 0.254 *	(b6>0)
1 # function="Dir47 (°)"	{mean	sigma	mean360}	(((358 * (a2-a1) / a2) + 20)	% 360) - ((((358 * (a2-a)	l) / a2) + 20) % 360) %	1)
2 # function="Temp50 (°C)"	{mean	max	min}	100 * a4 - 30	,		
3 # function="Temp5 (°C)"	{mean	max	min}	100 * a5 - 30	1		
4 #function="pBaro5 (hPa)"	mean	d19	- DA				
5 #function="TempShelterbox (°C)"	mean	d20					
6 #function="uSupplγ (∨)"	{mean	max	min}	a8 - (a8%0.01)			
7 #function="DOUT1 (Sonic ON/OFF)"	mean	uSupply					
B # function="Dir47Supply (V)"	{mean		min}	a2			
# function="Dir47Signal (V)"	{mean	max	min}	a1			
#function="DOUT2 (Modem ON/OFF)"	mean		== 0) * (MINUTE == 45)				
#pollbaudrate=9600	moun		o) (minore 10,			1	
# polichardelay=20		-					
3 # politeledelay=100							
4 #politimeout=1							
5 # pollretry=0		-					
# poll=analog							
/ # poll=digital							
3 #poll=MS!	9600						
3 # poll=#01\r	19200						
	19200						
date	time	period	vSonic51 (m/s) moon	vSonic51 (m/s) median	vSonic51 (m/s) sigma	vSonic51 (m/s) may	vSonic51 (m/s) min [
2 15.11.2007						3,6	
15.11.2007						3,6	
4 15.11.2007						3,5	
5 15.11.2007						3,5	
3 15.11.2007							
IS.11.2007	00.50.00	000	3.05668		0.072514	5.4	3

## Transmitting Measured Data via E-Mail

The **blueberry COMPACT** sends measured data automatically via e-mail every day at 0:00. The CSV data file of the previous day is attached to the e-mail. If several files have been created since last e-mailing (e.g., because of configuration changes or rebooting of the data logger) all closed files are send. Each file is attached to a separate e-mail. Please first setup the Internet integration via GPRS or DSL.

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worked Data Logger		<u>ه</u> -	🔊 🔹 🖶 🔹 🔂 Seite 🔹 🎯 Extras 🔹 🎽
HighRes	5	Setup	Wilmers Messtechnik <u>Help</u>
Mail Transf Mail Server From: Username Password Recipient(s Test this co Test Mail tr	smtp.com greenland3 ) measdata@ (List mai	on?	net separated by spaces.)
		please wait o measdata@wilm	ers.com wd@gmy.net

## To setup the e-mail data transfer select **Setup > FTP/Mail**.

Enter the URL of your mail server (SMTP server) in the field **Mail Server**. If your mail server requires authorization enter the user name and password. Enter the mail addresses in the field **Recipient(s)**. Separate more than one mail address by space characters.

#### Select yes at Test Mail Transfer now.

Click **OK** to save the settings. If the **Test Mail** option is active the **blueberry COMPACT** now sends a test mail to all recipients. A message displays the result of the test mailing. Please check whether the mail has been sent without errors. Otherwise, please check the correctness of your mail settings.

### **Site Description**

The **blueberry COMPACT** saves information about the measurement. They are stored in the header of each CSV data file for proper documentation of the measurement process.

To enter the information about the measurement select **Setup > Site Description**.

In the running measurement, this information is first upd midnight). You can start a new measurement to include to Description Name Greenland 3 Description Smooth hill, low trees in the SW sector Geographical Position Latitude 72°00'55.06" North Latitude 60°47'12.54" West Elevation 275 m a.s.1	dated when a new file is written (typically a
Site Setup The information given in this setup is included in the arch In the running measurement, this information is first upd midnight). You can start a new measurement to include to Description Name Creenland 3 Description Smooth hill, low trees in the SW sector Geographical Position Latitude 72°00′55.06″ North ■ Longitude 60°47′12.54″ West ■ Elevation 275 m a.s.1	Help iived measurement files. dated when a new file is written (typically a
The information given in this setup is included in the arch In the running measurement, this information is first upd midnight). You can start a new measurement to include t Description Name Creenland 3 Description Smooth hill, low trees in the SW sector Geographical Position Latitude 72°00'S5.06" North • Longitude 60°47'12.54" West • Elevation 275 m a.s.1	dated when a new file is written (typically a
The information given in this setup is included in the arch In the running measurement, this information is first upd midnight). You can start a new measurement to include to Description Name Creenland 3 Description Smooth hill, low trees in the SW sector Geographical Position Latitude 72'00'55.06" North • Longitude 60'47'12.54" West • Elevation 275 m a.s.l	dated when a new file is written (typically a
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Description Smooth hill, low trees in the SW sector Geographical Position Latitude 72°00'55.06" North • Longitude 60°47'12.54" West • Elevation 275 m a.s.l	
Geographical Position Latitude 72'00'55.06" North Longitude 60'47'12.54" West Elevation 275 m a.s.1	
Latitude 72°00'55.66" North  Longitude 60°47'12.54" West  Elevation 275 m a.s.l	
Latitude 72'00'55.06" North  Longitude 60'47'12.54" West  Elevation 275 m a.s.1	
Longitude 60°47'12.54" West  Elevation 275 m a.s.l	
Elevation 275 m a.s.l	
Other Information	
Tag Text	
MastType Lattice mast, Leutner 100m	
VaneOrientation north = 235 deg	
Sonic1003dm R.M.Young 85004, sn24542, cal08_674	452
Cup998dm THIES 4.3350.10.000, sn1408352, cal0	08_67455
Cup800dm THIES 4.3350.10.000, sn1408361, cal0	08_67458
add new:	

Documentation of the measurement includes the following information:

- NameName of the measurement siteDescriptionDescription of the measurement lo-<br/>cation and its environment. Please
- cation and its environment. Please enter here orography, roughness, obstacles and other elements having an impact on the measurement result.
- **Geographical Position** Enter here latitude, longitude and elevation of the measurement site.
- Other Information Use these universal input fields to enter all supplementary information about the measurement: e.g., geographical coordinate system, mast type, mast dimen-

sions, type, serial numbers and calibration numbers of the sensors, dimensions and alignment of sensor mounting booms

### **Measurement Setup**

#### **Measurement Parameters**

To define measurement parameters or sensor characteristics select **Setup > Measurement**.

- **Measure Period** Measure period is the time interval in which the data logger records actual measured values (samples) from all sensors.
- **Statistic Interval** Statistic interval is the time interval in which the data logger performs a statistical evaluation of the samples and stores the results in the memory. The variables a1..an correspond to the first to nth value of the data line sent by the first sensor. The variables b1..bn correspond to the values sent by the second sensor and so further.

**Excitation** defines how long the sensor constant current source (**CC**) is switched on before the **blueberry COMPACT** sends a poll command. Selecting **always on** switches the excitation voltage continuously on. The **blueberry INPUT Module** requires this setting as it needs a warm-up time of approx. 5 seconds.

## Measurement Functions (Standard Setup)

To add a new measurement function enter a function name in the field **Name**, check the required statistical evaluations and enter the measurement function. Type **<enter>** to transmit the settings to the data logger.

#### **Function Names**

Variable names may principally contain umlauts (**ä**, **ö**, **ü**) and special characters like comma (,) and period (.). If function names are used as variables in further measurement functions the first part of the function name may however only contain the following characters: **A..Z**, **a..z**, **0..9**, \_. The second part, i.e. the part after the first space character is used as axis label for realtime diagrams. We recommend to use the following syntax for function names: **Value (unit)**.

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Diagrams	L	Archive	HighRes	Setup	Help	
04.11.2012 18:24:58	UTC	Measurement Se	tup			<
vYouWm100m (m/s)	0					6
vThiFc98m (m/s)	0	Archive Setup				
vThiFc80m (m/s)	0	Archive Filelength	1 day 💌			
vThiFc60m (m/s)	0	Highres Data	in Ringbuffer and Files	*		
vThiFc40m (m/s)	0					
DirYouWm100m (°)	nan	Timing				
DirWil60m (°)	nan	Measure Period 1	s 💙			
Temp100m (°C)	19.98	Statistic Interval 1	0 min 🛛 🚩			
Temp10m (°C)	19.68	~ <			>	

Example:

vWind80m (m/s) = 0.04727 \* b10 + 0.264 \* (b10>0)

The first part of the function name can be used as variable *vWind80m* in further measurement functions.

The diagram title for this function is *vWind80m*, the y axis label is *(m/s)*.

#### **Digital Measurement Inputs (DIN1..10)**

The table **Digital Inputs** provides one line for each of the 10 digital measurement inputs DIN1..10.

Enter the function name into the field Name.

Select the signal type from the **Type** list:

- --- if the input is not used.
- **Frequency TTL** for TTL pulse frequency signals [Hz], from anemometers like Thies First Class, Vector A100, Heval ECONOMY or RISØ reed switch anemometer with external pullup resistor.

- **Frequency AC** for small AC frequency signals [Hz], from wind sensors like R.M.Young Wind Monitor
- **Counter** if you want to count pulses, e.g., from a tipping bucket rain gauge.

Select the **Slope** and **Offset** for the transfer function of the respective input. Take these values from the sensor data sheet or from the calibration certificate for individually calibrated sensors.

Select the option from the **Option** list:

- --- if no option required.
- **no offset when zero** suppresses the offset for 0 Hz frequency signals. Select this option for anemometers because otherwise wind speed will record the anemometer offset value at zero wind speed.

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blueberry COMPA		-	-		-						Wilmers Messte	-b-sile	
Diagrams			rg <u>Archi</u>	ive	Ī	<u>lighRes</u>		Setup	2		<u>Help</u>		
04.11.2012 18:25:31 U	JTC	^	Digital	Inputs								6	^
				Name		Туре		Slope		Offset	Option		
vYouWm100m (m/s)	0		DIN1	√YouWm100m (m/s	=	Frequency AC 💌	*	0.09867	+	0.241	no offset when ze	ero 💌	
vThiFc98m (m/s)	0		DIN2	∨ThiFc98m (m/s)	=	Frequency TTL 💌	*	0.04673	+	0.214	no offset when ze	ero 💌	
vThiFc80m (m/s)	0		DIN3	∨ThiFc80m (m/s)	=	Frequency TTL 💌	*	0.04701	+	0.236	no offset when ze	ero 💌	-
vThiFc60m (m/s)	0		DIN4	vThiFc60m (m/s)	=	Frequency TTL 💌	*	0.04688	+	0.218	no offset when ze	ero 💌	
vThiFc40m (m/s)	0		DIN5	vThiFc40m (m/s)	1=	Frequency TTL 💌	*	0.04679	+	0.231	no offset when ze	ero 💌	
DirYouWm100m (°)	nan		DIN6		i_	- *	*		+		—	~	
DirWil60m (°)	nan		DIN7		1_	- *	*		+		_	*	
Temp100m (°C)	19.89	۲	DIN8		1_				+		_	~	
Temp10m (°C)	19.62		DIN9		1_		1		+		_	~	
pBaro (hPa)	1504		DIN10						+			*	
uSolar (V)	23.185				=		1		+				~
iSolar (A)	0.12747	~	<									>	

#### Analogue Measurement Inputs (AIN1..6)

The table **Analog Inputs** provides one line for each of the 6 analogue measurement inputs AIN1..6.

Enter the function name into the field Name.

Select the signal type from the **Type** list:

--- if the input is not used.

- **Voltage** provides the voltage between **AIN+** and **AIN-** of the respective analogue input. If the sensor does not provide a reference for the measurement signal **AIN-** must be connected to **GND**.
- **Temperature (Pt100)** for passive Pt100 temperature sensors connected in 4-wire technique. The blueberry COMPACT automatically converts the voltage into temperature according to IEC751.
- **Potentiometer 0..1** provides the dimensionsless value of a potentiometer.
- **Direction 0..360°** provides the 0..360° wind direction of a potentiometric wind vane connected in 4-wire technique. Direction value increases when the vane rotates clockwise.
- **Direction 360..0°** provides the 0..360° wind direction of a potentiometric wind vane connected in 4-wire technique. Direction value increases when the vane rotates anti-clockwise.

**Resistance** provides the electrical resistance  $[\Omega]$  of a resistor connected in 4-wire technique. Use this option for PTC or NTC temperature sensors.

Select the **Slope** and **Offset** for the transfer function of the respective input. Take these values from the sensor data sheet or from the calibration certificate for individually calibrated sensors.

## Measurement Functions (Expert Setup)

The Expert Setup allows input of virtual measurement functions similar to the data logger **blueberry NDL485**.

To add a new measurement function enter a function name in the field **Name**, check the required statistical evaluations and enter the measurement function. Type **<enter>** to transmit the settings to the data logger.

Maximum length of the measurement function including function name and statistics options is 1023 characters or 64 elements. Each variable or operator counts as one element. Please use the following elements to built the measurement function:

#### **Arithmetic Operators**

Addition

👋 Wilmers Messtechnik - Network	ed Data Logger NDL485 - Mozilla	a Firefox			
<u>D</u> atei <u>B</u> earbeiten <u>A</u> nsicht ⊆hronik	Lesezeichen Extras Hilfe				
🗌 🗍 Wilmers Messtechnik - Networked Data I	Logg +				
<b>( ( 192.168.0.31</b>			습 🗸 C 😫	▼ Google	<i>P</i> <b>^</b>
🔎 Meistbesucht 🗍 Erste Schritte 🦳 Vo	orgeschlagene Sites 🚺 Web Slice-Katal	og			
blueberry COMPACT - Har					
Diagrams	Archive	<u>HighRes</u>	<u>Setup</u>	l	<u>Help</u>
04.11.2012 18:26:05 UTC	Analog Inputs				^
	Name	Туре	Slope	Offset	
vYouWm100m (m/s) 0	AIN1 DirYouWm100m (")	= Direction 0360 🛛 💌	* +	- 0	
vThiFc98m (m/s) 0	AIN2 DirWil60m (")	= Direction 0360 🛛 💌	* +	- 251	3
vThiFc80m (m/s) 0	AIN3 Temp100m (°C)	= Temperature (PT100) 💌	* +	-	
vThiFc60m (m/s) 0	AIN4 Temp10m (°C)	= Temperature (PT100) 💌	* +	-	
vThiFc40m (m/s) 0	AIN5	- *	* +	-	
DirYouWm100m (°) nan	AIN6	= - *	* +	-	
DirWil60m (°) nan					~
T 100 (0(3) 10.01	× <	III			:, <

 Subtraction or minus sign. If a – is used to characterize a negative number at the beginning of a measurement function or after another operator the number must be put into parenthesis.

#### Example: Negative Numbers

HumAir (%RF) = (-25) + 62.5 \* a5 vSonic (m/s) = e2 else (-9999)

- \* Multiplication
- / Division
- Exponent, real number

#### Example: Length of a Vector

uSonic (m/s)= d2 vSonic (m/s)= d3 wsHorizontal (m/s)=(uSonic^2 + vSonic^2)^0.5

This function converts the  ${\bf u}$  and  ${\bf v}$  components of a sonic anemometer to horizontal wind speed.

Modulo division. This operator provides the positive residue of a division. Unlike the general modulo operator defined for integer numbers, the **blueberry COMPACT** modulo operator is based on real (floating point) numbers for parameters and for the result. The second parameter of the % function must be positive (a % b with b>0).

#### Example: Wind Direction

Dir (°) = (360 \* b1 / b0 + 126) % 360

The measured wind direction value with an offset correction of **126** degrees is projected into the range of 0..360°.

**sin** Sine function. The angle must be defined in degrees.

#### Example: Vector Component

vWind (m/s) = 0.04752 \* b8 + 0.224 \* (b8>0) dirWind (°) = (360 \* (a1-a2)/a1) % 360 vEast (m/s) = vWind \* sin (dirWind)

The multiplication of the wind speed with the sine of the wind direction results in the eastern component of the total wind speed vector.

**cos** Cosine function. The angle must be defined in degrees.

#### Example: Vector Component

vWind (m/s) = 0.04752 \* b8 + 0.224 \* (b8>0) dirWind (°) = (360 \* (a1-a2)/a1) % 360 vNorth (m/s) = vWind \* cos (dirWind)

The multiplication of the wind speed with the sine of the wind direction results in the northern component of the total wind speed vector.

**In** Natural logarithm

Example: *log* = *ln c7* 

#### **Boolean Operators**

> Comparison **superior to**. The result is **1**, if the condition is true, otherwise it is **0**.

#### Example: Calibrated Cup Anemometer

ws30m (m/s)= 0.04827 \* c2 + 0.19 \* (c2 > 0)

This function suppresses the wind speed offset when the frequency is **0**. Otherwise, even at total calm the data logger would indicate a wind speed of **0.19** m/s.

Comparison inferior to. The result is 1, if the condition is true, otherwise it is 0.

Example: Status from Threshold Value

Temperature (Celsius) = 20 \* a4 - 40 Frost = Temperature < 0

The comparison with a threshold value creates the status signal **1** = **frost** / **0** = **no frost**.

== Comparison **equal**. The result is **1**, if the condition is true, otherwise it is **0**.

Example:

identic (1=equal) = (0.2 \* a2) == 1.2

This function compares a measured value with a constant.

!= Comparison **not equal**. The result is **1**, if the condition is true, otherwise it is **0**.

Example:

*differentStatus (1=different) = c1 != c2* with third poll command: **DIN** 

This function compares the status of digital inputs **DIN1** and **DIN2**.

>= Comparison **superior or equal**. The result is **1**, if the condition is true, otherwise it is **0**.

Example:

condensation = Humidity >= 100.1

Relative humidity of more than 100 %RH is considered as condensation.

- Comparison inferior or equal. The result is 1, if the condition is true, otherwise it is 0.
- ! NOT operator. This operator inverts the logical level of a boolean value.

Example:

DOUT2 = ! a1 with first poll command: **DIN** 

Switching output **DOUT2** is set active if the status signal at digital input **DIN1** is low.

valid This operator checks whether a value is a valid number. The result is 0, if the value is nan, otherwise it is 1.

Examples: Validity Check

checkValue (1=0k) = valid (2.45 \* a1) error (1=invalid) = ! valid (2.45 \* a1)

**if** This operator checks whether a value is not **0** or **nan**. The **if** operator is typically combined with the **else** operator.

Example: **Output Limitation** 

Hum (%RH) = 100\*a4 if (100\*a4<=100) else 100

In case of condensation, some thermo hygro sensors show measured values above 100 %RH. This function limits the output of relative humidity to 100 %RH.

Example: Validity Check

vCup (m/s) = 0.253 \* b8 + 0.22 \* (b8>0) vValid (m/s) = vCup if ((vCup>=0)\*(vCup<90))

This function defines a range of **0** to **90** *m/s* for valid wind speed values. The result of **vValid** is **vCup** if **vCup** is within this range, otherwise it is **nan**.

else replaces a value if the value is nan.

#### Example: Filtering of invalid Samples

uSonic (m/s) = d2 else #uSonic else 0

If the sonic anemometer returns an invalid value, the data logger will keep the previous value. If the previous value is also invalid the result is set to **0**.

#### Example: Marking of invalid Samples

relHum (%RH) = 100\*a2 else (-9999)

Invalid samples (nan) are stored as -9999.

#### Combining boolean Results:

The multiplication operator \* corresponds to the logical **AND** operator. The addition operator + corresponds to the non exclusive **OR** operator.

Example: **AND**, **non exclusive OR and exclusive OR**  AND = (a2>=0) \* (a2<=100) OR = (a2<0) + (a5<0)XOR = ((a2<0) + (a5<0)) == 1

#### **Rounding Operators**

**abs** provides the unsigned floating point value of a signed value.

Example:

alwaysPositive = abs (125 \* g7 -75)

**int** removes the decimal part of the floating point value.

Example:

intValue = int (-2.45 \* d2 + 100)

**round** rounds the floating point value to the nearest integer (up or down).

Example: **Display without Decimals** 

LowResDir (deg) = **round((360 \* a2/a1) % 360)** 

This function displays the wind direction without decimals.

Example: Fixed Number of Decimals

Radiation = 0.01 \* round(100 \* (2.645\*a2-25))

The floating point function result is reduced to 2 decimals.

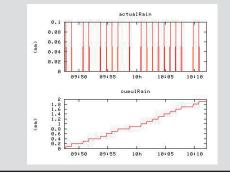
#### **Other Operators**

- () Parantheses structure the function elements and determine the calculation sequence.
- # provides the previous value of the measurement function.

#### Example: Cumulated Rainfall

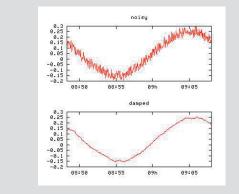
actualRain (mm) = 0.1 \* b3 cumulRain (mm) = (#cumulRain + (actualRain else 0)) else actualRain else 0

These two functions record actual and cumulated rainfall. *cumulRain* adds the actual rainfall to the previous cumulated rainfall. When the measurement starts *#cumulRain* is invalid because no previous value exists. The result is then replaced by *actualRain*. If this value is also invalid the result is set to *0*. The *else* operator defines the starting value and prevents the cumulative value from being reset in case of an invalid value of *actualRain*.



### Example: Low Pass Filter noisy = 62.5 \* a6 - 55 damped = (0.1 \* noisy + 0.9 \* #damped) else noisy

This function implements a low pass filter that smooths a noisy value. *damped* provides a damped value of the actual measurement value provided by *noisy*.



#### **Operator Summary**

The following table lists examples of results based on the operators with different parameters.

	Results for	<b>:</b> a =		
	-2.7183	0	+2.7183	nan
a <b>else</b> b	-2.7183	0	2.7183	b
b <b>if</b> a	b	nan	b	nan
b <b>if</b> a <b>else</b> c	b	С	b	с
valid a	1	1	1	0
<b>!</b> a	0	1	0	0
a > 0	0	0	1	nan
a <b>&lt;</b> 0	1	0	0	nan
a == 0	0	1	0	nan
a <b>!=</b> 0	1	0	1	nan
a >= 0	0	1	1	nan
a <b>&lt;=</b> 0	1	1	0	nan
a <b>%</b> 1	0.2817	0	0.7183	nan
a <b>%</b> 0.01	0.0017	0	0.0083	nan
a-(a <b>%</b> 0.01)	-2.72	0	2.71	nan
abs a	2.7183	0	2.7183	nan
int a	-2	0	2	nan
round a	-3	0	3	nan
<b>ln</b> a	nan	nan	1.0000	nan

#### Variables

Variables The variables a1..an correspond to the first to nth value inside the data line sent by the first sensor. The blueberry INPUT module supplies the voltages of all inputs in Volt as well as the frequency in Hertz and the counted pulses. In addition to the variables, other function names can be used inside a measurement function. They must be defined former to the function in which they are used as a variable. A # character in front of a function name provides the measurement.

Example: **Temperature Gradient** 

Temp (°C) = 100 \* a3 – 30 *deltaTemp (K/s) = (Temp – #Temp) else 0* 

*deltaTemp* provides the temperature gradient between 2 samples.

#### Predefined Variables (internal Sensors)

The following predefined variables provide values from the senors that are integrated into the **blueberry COMPACT**.

**PAIR1..2** provides the barometric pressure and internal temperature measured by the integrated pressure sensor.

Example: Barometric Pressure

pBaro (hPa) = PAIR1 TempShelterbox (°C) = PAIR2

**POWER1..4** provides infos about the power supply.

Example: Power Supply *uSolar (V) = POWER1 uBattery1 (V) = POWER2 uBattery2 (V) = POWER3 iSolar (A) = POWER4 PSolar (W) = POWER1 \* POWER4* 

This functions provide voltages of the solar module and the two backup batteries. Multiplication of voltage and current calculates the charging power of the solar module.

#### Predefined Variables (Time Info)

The following predefined variables provide time information.

**PERIOD** provides the actual measurement period in seconds.

Example: Integration over Time

flow (m3/s) = 125 \* b2 volume (m3) = flow \* PERIOD

The function *volume* uses *PERIOD* to intergrate actual flow into a volume.

- **TIME** provides the time in seconds since 1.1.1970 00:00:00.
- **DAYTIME** provides the time in seconds since 00:00:00 of the current day.

Example: Flashing Light

DOUT3 (flash) = ! (DAYTIME % 10)

This function flashes a signal lamp every *10* seconds.

- YEAR provides the actual calendar year as 4 digit integer (e.g., 2007).
- **MONTH** provides the actual calendar month as integer (January = 1 .. December = 12).

Example: Season dependent Factors

factor = 0.26\*(MONTH<4) + 0.22\*(MONTH==4) + 0.25\*(MONTH>4)

This function selects a factor depending on the month. Some algorithms for determination of potential evaporation (e.g., HAUDE) use empirical factors that vary with the season.

provides the actual calender day as integer (1 31).
provides the actual hour as integer (0 23).
provides the actual minute as integer (0 59).
provides the actual second as integer (0 59).
provides the day of the week as integer (Monday = 1 Sunday = 7).
provides the day of the year as integer (1st January = 1).

Click **OK** to save the settings into the data logger. As the measurement functions represent virtual channels they are independent of the number of hardware inputs of the data logging system. The user can define an unlimited number of measurement functions.

### **Data Polling**

The **blueberry COMPACT** sends poll commands through the **RS 485** serial port and to the internal measurement interfaces. Each poll command provides a set of return values that are used as variables in the measurement functions. Please set the poll parameters as follows:

- Baudrate Select from the Baudrate list the baud rate of the serial port. The blueberry INPUT Module requires a baud rate of 19200.
- Character DelaySelect from the Character Delay list the delay between the characters sent by the blueberry COMPACT to the serial port. Some sensors (e.g., R.M.Young sonic anemometers) require character delays. The blueberry INPUT Module is polled with a character delay of **0**.
- Poll Pausedefines the delay between the last<br/>character of a data line received<br/>by the blueberry COMPACT and the<br/>sending of the next poll command.<br/>The blueberry INPUT Module re-<br/>quires a poll pause of 50 ms. The<br/>poll pause is required because the<br/>RS 485 bus allows only one compo-

nent (sensor, **INPUT Module** or data logger) at a time to transmit data. All other components work in receiver mode. The poll pause allows to switch from transmitter to receiver mode.

- Timeout defines the maximum time the blueberry COMPACT waits for the answer to a poll command. If the polled component does not answer the poll command will be repeated once or several times depending on the value set for Retry. If no data was received the measured values are stored as nan ("not a number").
   Poll Command Enter the poll command into the
- field **Poll Command** and click **OK** to save the setting into the data logger.

The following poll commands provide measured values from the **blueberry COMPACT** data logger itself:

Command: <b>#100 f1f2f3f4f5f6f7f8f9f10\r</b>				
or	#100 F\r			
Results:	:			
Index	Value	Unit		
1	Frequency of <b>DIN1</b>	Hz		
2	Frequency of <b>DIN2</b>	Hz		
3	Frequency of <b>DIN3</b>	Hz		
4	Frequency of <b>DIN4</b>	Hz		
5	Frequency of <b>DIN5</b>	Hz		
6	Frequency of <b>DIN6</b>	Hz		
7	Frequency of <b>DIN7</b>	Hz		
8	Frequency of <b>DIN8</b>	Hz		
9	Frequency of <b>DIN9</b>	Hz		
10	Frequency of <b>DIN10</b>	Hz		

Command: **#100 v1v2v3v4v5v6\r** 

#### or **#100 V\r**

#### Results:

Index	Value	Unit
1	Differential voltage at A <b>IN1</b>	V
2	Differential voltage at A <b>IN2</b>	V
3	Differential voltage at A <b>IN3</b>	V
4	Differential voltage at A <b>IN4</b>	V
5	Differential voltage at A <b>IN5</b>	V
6	Differential voltage at A <b>IN6</b>	V

Comman or <b>Results:</b>	d: #100 s1s12\r #100 S\r	
Index	Value	Unit
1	Single-ended Voltage at <b>AIN1+</b>	V
25	AIN2+AIN5+	V
6	Single-ended Voltage at AIN6+	V
7	Single-ended Voltage at <b>AIN1-</b>	V
811	AIN2AIN5-	V
12	Single-ended Voltage at AIN6-	V

The following poll command provides temperatures from Pt100 sensors connected as 4-wire circuit to the **blueberry COMPACT**:

Command: <b>#100 t1t6\r</b>				
or	#100 T\r			
Results:	:			
Index	Value	Unit		
1	Pt100 Temperature at <b>AIN1</b>	°C		
25		°C		
6	Pt100 Temperature at <b>AIN6</b>	°C		

The following poll command provides the voltage

ratio data from potentiometric wind vanes connected as 4-wire circuit to the **blueberry COMPACT**:

Command	: #100 p1p6\r
or	#100 P\r
<b>Results:</b>	

Index	Value	Unit
1	Potentiometer ratio at <b>AIN1</b>	V/V
25		V/V
6	Potentiometer ratio at AIN6	V/V

The following poll command provides absolute pressure (QFE) and internal temperature of the built-in barometric pressure sensor of the **blueberry COMPACT**:

Command: <b>#100 m1m2\r</b>				
or	#100 M\r			
Results:				
Index	Value	Unit		
1	Barometric pressure	hPa		
2	Internal temperature	٦°		

The following poll command provides supply voltages and charging current of the **blueberry COMPACT**:

Comma	Command: <b>#100 b1b2b3\r</b>					
or	#100 B\r					
Results	Results:					
Index	Value	Unit				
1	Voltage of the solar module at <b>POW</b>	V				
2	Voltage of the backup battery at <b>BAT1</b>	V				
3	Voltage of the backup battery at <b>BAT1</b>	V				
4	Charging current at <b>POW</b>	V				

Data Format Select the data format from the list: decimal reads the received data values as decimal floating point numbers. hex reads the received data values as hexadecimal values and converts them into decimal integer values (e.q., 8A ⇔ 138).

Click **OK** to save all settings into the data logger.

### Digital Outputs (DOUT1..4)

The **blueberry COMPACT** provides 4 digital outputs. They represent switched power supplies that can be used to activate peripheric devices, like modems, sensor heatings, shelter box heating, beacon lights and alarm devices. Please refer to the technical data section for maximum load of the digital outputs.

The status of the digital outputs are defined as measurement functions. The name of the measurement function must be **DOUT1..DOUT4** for digital output 1..4. The respective digital output is set to HI if the result of the measurement function is 1 or higher. Otherwise it is set to LO. The status of the digital outputs are logged like normal measurement functions. Digital outputs can be switched depending on time or depending on measurement values.

#### Example: Time scheduled Switching

 $DOUT1 (0=Off 1=On) = (HOUR \ge 6) + (HOUR \le 18)$ 

Switching output **DOUT1** is set active from 6:00 to 18:00 every day.

### Alarm E-Mails

The **blueberry COMPACT** sends alarm e-mails at conditions defined by the user.

The alarm conditions are defined as measurement functions. The name of the measurement function must be **ALARM**i where i is the index of the alarm. The number of alarms is not limited. The text of the function name is sent as e-mail when the result of the measurement function is 1 or higher.

Example: Battery Monitoring

uBat1 (V) = POWER2 uBat2 (V) = POWER3 ALARM1 Battery Low = (uBat1 < 11.4) + (uBat2 < 11.4)

The data logger sends an alarm e-mail with the text **Battery Low** when the voltage of at least one of the backup batteries is below 11.4 V.

To set the e-mail alarm transfer select **Setup > FTP/Mail**.

Enter the URL of your mail server (SMTP server) in the field **Mail Server**. If your mail server requires

authorization enter the user name and password. Enter the mail addresses in the field **Send Alarms to.** Separate more than one mail address by space characters.

#### Select yes at Test Mail Transfer now.

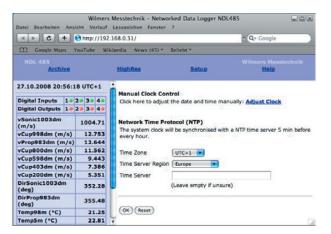
Click **OK** to save the settings. If the **Test Mail** option is active the **blueberry COMPACT** now sends a test mail to all data and alarm recipients. A message displays the result of the test mailing. Please check whether the mail has been sent without errors. Otherwise, please check the correctness of your mail settings.

Mail Transfer		
Mail Server	yourmailserver	
From:	compact-31@station.xx	
Username	user	
Password	••••••	
Compress Datalogs	no	
Recipient(s)		
Send Alarms to	alarm@wilmers.com service@user.com	
	(List mail recipients here, separated by spaces.)	
Measure data w setup.	ill not be sent via mail, if an archive folder is specified in the FTP	
Test this config	uration?	
Test FTP and M	ail transfer now yes 💌	

### **Date and Time**

If the **blueberry COMPACT** is connected to the Internet the data logger updates its internal realtime clock automatically from an Internet time server. The **blueberry COMPACT** adjustes the clock to the time zone set by the user.

Select **Setup > Date & Time** to set the parameters for realtime clock synchronization. Select the time related to UTC. Select the region where the data logger is installed. The **blueberry COMPACT** uses the time server the closest to its site in order to provide maximum accuracy. Optionally, select a time server. If you do not define a specific time server the **blueberry COMPACT** automatically selects a suitable server from a pool of time servers. Click **OK** to accept the settings.



If the data logger is not connected to the Internet, select **Adjust Clock** to set the realtime clock manually.

Select the settings from the **Time** and **Date** lists and click **OK**.

🔍 🕨 🖉 😋 http	://192.168.0.3	1/ • Q+ Google
	.//192.108.0.3	Google
Google Maps Y	ouTube Wiki	pedia News ▼ Beliebt ▼
Archive	HighRes	Setup Help
	29 39 49	Time 05 h 💌 54 min 💌
Digital Outputs 19	20 30 40	Date 28 October 2008
Digital Outputs 19		Date 28  October  2008
	1005.43	Date 28 V October V 2008 V
vSonic1003dm (m/s)		Date 28 V October V 2008 V
vSonic1003dm	1005.43	Date 28  October  CORD Reset
vSonic1003dm (m/s) vCup998dm (m/s)	1005.43 12.753	

### **Network Interface**

#### **Network Parameters**

The **blueberry COMPACT** can be connected locally to a PC via crosspatch cable and it can be integrated into a PC network (LAN) by means of a standard Ethernet cable. The IP address of the data logger has to be adapted to the network.

#### Select Setup > Network.

IP address	Network (LA 192.168.0.31	]	
Netmask		]	
	(Leave netma	sk empty if	unsure)
Gateway	192.168.0.1		
Nameserve	r 195.159.0.200		

Assign an IP address to the data logger.

Enter the subnet mask required for your network type. If you are unsure about the subnet mask leave this field empty. In this case, the default subnet mask **255.255.0** is used.

Enter the gateway and name server (DNS) of your LAN and click **OK**. The data logger uses the gateway to built up a connection to the Internet in order to send data via e-mail or FTP and to synchronize the internal realtime clock from the Internet.

### **Internet Integration**

The **blueberry COMPACT** is integrated into the Internet by means of a DSL router or in remote sites by means of the **blueberry GSM Module**. The **GSM Module** offers remote data transmission and realtime access via cellular phone networks (900 MHz, 1800 MHz and 1900 MHz). Two operation modes are available:

In **GSM mode**, the data logger is called from a PC by means of a telephone modem, similar to the dial-in connection to an Internet provider. This mode offers direct access to the web server of the **blueberry COMPACT**. In GSM mode, the telephone costs depend on the connection time.

The **GPRS mode** offers full integration of the **blue**berry COMPACT into the Internet. The data logger connects itself automatically to the Internet providing realtime access from any Internet access point. Two password levels protect the data logger against unauthorized access. As GPRS does not use fixed IP addresses a dynamic DNS server (e.g., dyndns.org) manages the dynamic IP address. It provides access via a named URL. The name of the server used by the **blueberry COMPACT** to access the Internet is called Access Point Name (APN). Private APNs provide outgoing data transmission from the data logger to the Internet, e.g., via FTP or e-mail. However, they block access from outside into the data logger. Public APNs provide both access types. Dynamic DNS requires a public APN! Please make sure that your GSM provider offers a public APN. Public APNs are offered among others by T-Mobile (Germany), TIM (Italy), Telenor (Norway, Sweden), WARID (Pakistan). In GPRS mode, the telephone costs depend on the volume of transmitted data.

Please prepare the following information for the GSM/GPRS setup of the **blueberry COMPACT**:

- The data number of the SIM card. Please make sure that you are really using the data number. Usually, SIM cards have separate numbers for voice, fax and asynchronous data transmission. We recommend to use SIM cards without voice function. Pure data cards are cheaper than voice cards.
- The PIN of the SIM card. You must disable the PIN request before use because the blueberry COM-PACT is not able to enter the PIN. Please insert the SIM card into your mobile phone, enter the PIN and disable the PIN request.

3. The APN. Please make sure that you have got a public APN.

### **GPRS** Connection

Select **Setup > GPRS** to setup a GPRS connection. Select **yes** at **Activate GPRS** and enter the APN and optionally the user name and password at **GPRS Internet Connection**. Please ask your GSM provider for these data. A list of international APNs is available in the Internet at

http://www.quickim.com/support/gprssettings.html.

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When the **blueberry COMPACT** operates in GPRS mode it will switch to GSM mode every day between 20:00 and 21:00. During this time the data logger is accessible via dial-in connection.

Please enter the host name of the data logger in section **Dynamic DNS Service**. Please enter the access code to your **dyndns.org** account in the fields **Username** and **Password**. The host name must be registered at **http://www.dyndns.org** before. Please refer to the following chapter for further details.

Click **OK** to save the settings.

### **Remote Access via Internet**

GPRS networks use dynamic IP addresses. Every time the **blueberry COMPACT** connects to the Internet it gets a new IP address from the Internet service provider. If we want to access the data logger via Internet we need to know this IP address. **Dynamic DNS** manages dynamic IP addresses and provides access to them. The user defines a host name for his measurement station (e.g., station-103.dyndns.org). When the **blueberry COMPACT** connects to the Internet it sends its actual IP address to the **DynDNS** server. The **DynDNS** server translates the IP address to the host name of the data logger. This provides us access to the measurement station without knowing its IP address.

#### **Creating a DynDNS Access**

Please proceed as follows to create your account and a host at **DynDNS**:

- 1. Open your Internet browser and visit the web site **http://www.dyndns.org**.
- 2. Select Create Account.



3. Define a user name, a password and enter your e-mail address.



Scroll down and activate **I agree to AUP** and **I** will only create one (1) free account. Click on Create Account.

Control c

4. A message confirms the creation of your account.



5. You will now receive an e-mail with a confirmation for the **DynDNS** account. This takes typically a few minutes. Open the e-mail and follow the stated link.



You have now created your account. The next steps create a **DynDNS** host.

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- 6. Select Login.
- 7. Enter your access code (user name and password) and click **Login**.

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8. Select My Services.



9. Select Add New Hostname.

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10.Enter a host name and click **Use auto-detected IP address.** Click **Create Host.** 

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11.A message confirms the creation of the new host.

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This host can now be used with the **blueberry COMPACT** (see Setting up the GPRS connection). If you want to create further hosts, please click **Add New Hostname** and repeat step 10.

## Accessing the blueberry COMPACT via Internet

Please proceed as follows to access your **blueberry COMPACT** from the Internet:

Start your Internet browser, enter the **DyDNS** host name of your measurement station (e.g., station-103.dyndns.org) into the address field and hit **<enter>**. Do not add **www** to the host name!

The remote Internet access provides the same functionality as the local access via Ethernet. The user can display and download data and diagrams and he can change the configuration.

## Accessing the blueberry COMPACT from a Mobile Phone

The **blueberry COMPACT** provides a special web interface adapted to small displays of pocket PCs, MDAs and mobile phones.

Please proceed as follows to access your **blueberry COMPACT** from an Internet capable mobile device :

- 1. Connect your mobile device to the Internet and start the Internet browser.
- Enter the DynDNS host name of your measurement station into the address field and add /compact to the host name. (e.g., station-123.dyndns.org/compact). Do not add www to the host name!
- 3. Click **Connect**.



4. Enter user name and password of the data logger into the login dialog.

The functionality of the mobile access depends on the browser of your mobile device. Some mobile browsers might not be able of downloading measured data files. **Opera** offers a powerful free browser for mobile phones. Please refer to **http://www.operamini.com** for further details.

#### **Remote Access via GSM**

GPRS provides the most flexible and powerful remote access to the **blueberry COMPACT**. It requires a public APN. For GSM providers that do not offer a public APN, the **blueberry GSM Module** provides remote connection to the **blueberry COMPACT** via PPP. This operation mode is similar to a dial-in connection to an Internet server. It requires a PC with analogue telephone modem.

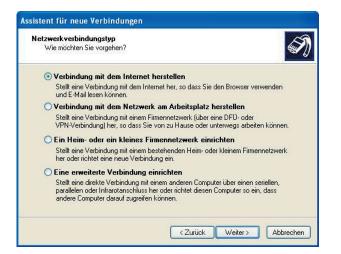
#### Setting up the GSM Connection

Please proceed as follows in order to configure your Windows PC for a GSM remote connection:

- Select Start > Settings > Network and Dial-In Connections > New Connection. A wizard will lead you through the configuration process.
- 2. Click Next.



3. Select Establish an Internet Connection and click Next.



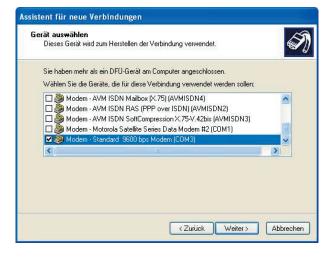
4. Select Manual Connection and click on Next.



5. Select Modem Connection and click Next.



6. A list displays all modems available on your PC. Select the modem to be used for remote data transmission and click **Next**.



7. Enter a name for the remote connection, e.g., the name of the measurement site and click **Next**.

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blueberry-ndl485	
	ne Name wird als Name für die zu erstellende Verbindung verwendet.

8. Enter the telephone number of the GSM modem. GSM SIM cards have separate numbers for fax and data transmission. Please make sure to use the data number. Click **Next**.

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	<zurück weiter=""> Abbrechen</zurück>

9. Click **Next** without entering the access code in the dialogue.

Internetkonto.  Geben Sie einen Kontonamen und ein Kennwort für den Internetdienstanbieter ein. Schreiben Sie diese Informationen auf und verwahren Sie sie an einem sicheren Drt. (Wenden Sie sich an den Internetdienstanbieter, wenn Sie den Kontonamen oder das Kernwort eines vorhandenen Kontos vergessen haben.) Benutzername: Kennwort: Kennwort bestätigen: Diesen Kontonamen und Kennwort für die Internetverbindung aller Benutzer dieses Computers verwenden	nd ein Kennwort für die Anmeldung an Ihrem 🛛 🏼 🏀
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10.Click **Next** to finish the configuration.

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VJ	Verknüpfung auf dem Desktop hinzufügen Klicken Sie auf "Fertig stellen", um diese Verbindung zu erstellen und den Vorgang abzuschließen.
	< Zurück Fertig stellen Abbrechen

This chapter describes the configuration process under **MS Windows XP**. Similar wizards assist you at the configuration under **Windows 2000**, **Mac OS** or **Linux**.

#### Accessing the blueberry COMPACT via GSM

Please proceed as follows in order to establish a remote connection to the **blueberry COMPACT** via GSM:

- Select Start > Settings > Network and Dial-In Connections > blueberry-ndl485 where blueberry-ndl485 is the name of your remote connection.
- 2. Click on **Dial** without entering the access code. A dialogue diplays the progress while connecting. When the connection has been established the dialogue box changes into an icon in the lower right corner of the task bar.

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- Once the connection is established, please start your Internet browser, enter the IP address 10.1.1.1 into the address field of the browser and hit the <enter> key. Please note that this IP address is the same for all blueberry COMPACT units. It is independent of the IP address set at Local Network Settings.
- 4. Enter the user name and password for the **blueberry COMPACT** and click **OK**.
- 5. In GSM mode, the web interface provides all functions that are available at local or at GPRS connection.

 To disconnect the GSM connection click on the connection icon with the right mouse botton and select **Disconnect** from the popup menu.

### **Password Protection**

Two password levels protect the **blueberry COMPACT** against unauthorized access:

The user **guest** is allowed to view actual measured data and configuration settings and to download measured data. He is allowed to set date and time. The user **guest** is not allowed to delete measured data or to change any configuration settings.

The user **admin** has all rights. He is allowed to delete measured data and to change configuration settings.

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### **User Password**

Login as user **admin** with the original admin password and select **Setup > Password**. Enter the new password for user **guest** and click **OK**.

The original password for the user **admin** cannot be changed. You can however define a second admin password. The second admin user has all rights except the one to change his own password.

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### **Help Function**

The help function the **blueberry COMPACT** provides system information about the data logger as well as an online manual.

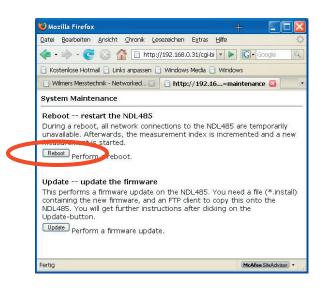
Select **Setup > Help > About**. The dialog indicates information about type and firmware version of the data logger.

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#### Rebooting the blueberry COMPACT

The **blueberry COMPACT** can be rebooted in two ways: by interruption of the power supply and via the web interface. In order to reboot the **blueberry COMPACT** via the web interface please proceed as follows:

- 1. Start the web browser and login to the **blueberry COMPACT** as user **admin**.
- 2. Select Help > About > Maintenance.
- 3. Click on Reboot.



4. Wait 2 minutes until the data logger is up again.

### **FTP Access**

Some operations, like deleting measured data and applying a firmware update require FTP access to the **blueberry COMPACT**. The following describes the establishment of an FTP access by means of the free FTP client **FileZilla**.

### Installing FileZilla

The FTP client **FileZilla** can be downloaded free of charge from the Internet at the following site:

#### http://sourceforge.net/projects/filezilla

In order to install **FileZilla** and to configure it for the **blueberry COMPACT** please proceed as follows:

- 1. Download the software from the above stated website and install it according to the instructions of the supplier.
- 2. Start FileZilla.
- 3. Select File > Server Mangement.

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- 4. Select **New Server** and enter a name for the data logger.
- 5. Enter the IP address of the **blueberry COMPACT** into the **Host** field.
- 6. Select the logon type **normal**.
- 7. Enter the user name **admin** and the admin password of your **blueberry COMPACT**.
- 8. Click on **Save** to save the settings.

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9. Click on Connect to built up the connection to the blueberry COMPACT. The right part of the screen displays the file system of the blueberry COMPACT. You can use the FTP client like a file explorer to delete measured data files from the blueberry COMPACT and to move files from the blueberry COMPACT to your local computer or from your computer to the blueberry COMPACT.

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### **Deleting Measured Data**

The **blueberry COMPACT** saves measured data in a ring buffer. The oldest data lines are automatically overwritten when the data memory is full. Usually, deleting of measured data is only necessary at the beginning of a new measurement, e.g., if the data logger is moved to another site. In order to delete measured data please proceed as follows:

- 1. Establish an FTP connection to the **blueberry COMPACT**.
- 2. Double click on **archive** to change to the archive directory.
- 3. Mark all files to be deleted and press **<Del>**.

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If only data files (\*.csv) are deleted the measurement index continues with the actual value. In order to reset the index please delete the file **index**.

### **Updating the Firmware**

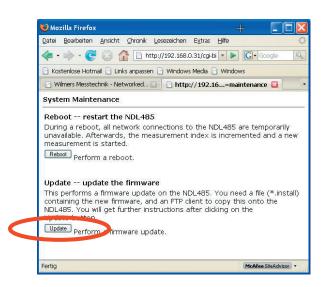
The firmware of the **blueberry COMPACT** can be updated via local Ethernet connection or remotely via GSM, GPRS or DSL. In order to update the firmware of the **blueberry COMPACT** please proceed as follows:

- 1. Establish an FTP connection to the **blueberry COMPACT**.
- 2. Double click on .. to change to the root directory.
- 3. Open the folder **/tmp**.

- 4. Change on the local computer to the folder that contains the firmware update file.
- 5. Click with the right mouse button on the firmware update file (e.g., Ndl485-2-0-11.in-stall) and select **Upload**. Now, FTP transfers this file to your **blueberry COMPACT**.
- 6. Please wait until the transfer is sucessfully completed. The uploaded file is now visible in the /tmp folder of the blueberry COMPACT.

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L Ordner und 2 Dateen mit 1506974 Bytes.		11 Dataien mit 167060	) Bytes.			

- 7. Start the web browser and login to the **blueberry COMPACT** as user **admin**.
- 8. Select Help > About > Maintenance.
- 9. Click on **Update** in order to start the update process.



10. Please follow the instructions displayed on the screen. The update process will take approx. 5 minutes. The **blueberry COMPACT** will restart automatically after the update is completed. Regular flashing of the **BUSY** LED at the data logger indicates that the **blueberry COMPACT** is up again.

#### **IMPORTANT NOTE:**

The **blueberry COMPACT** must never be disconnected from the power supply during update process! Interruption of the update process can block the operation of the **blueberry COMPACT**.

Please restart the web browser and login to the **blueberry COMPACT**.

In order to check whether the update was successfull please select **Help > About**. Check whether the indicated firmware version corresponds to the update you went to apply.

#### Adapting the PC Network Settings

When the **blueberry COMPACT** is connected to a PC or a LAN the network settings of the PC must comply to those of the data logger.

In order to change the network settings of the PC please proceed as follows:

1. Right click on the network icon in the task bar and select **Open Network Settings**.



- 2. Double click on LAN Connection.
- 3. Select **Internet Protocol (TCP/IP)** from the list and click on **Properties**.

Eigens	chaften von LAN-Verbindung 🛛 🔹 👔
Allgemein	Erweitert
Verbindur	ng herstellen über:
📑 Bro	badcom NetXtreme 57xx Gigabit Cc Konfigurieren
Diese Ve	rbindung verwendet folgende Elemente:
	NWLink IPX/SPX/NetBIOS-kompatibles Transportpro 📩
	Microsoft TCT //T Venien 6 Internetprotokoll (TCP/IP)
<	
Inst	allieren Deinstallieren Eigenschaften
Beschre	
Symbo	ol bei Verbindung im Infobereich anzeigen
Benad	chrichtigen, wenn diese Verbindung eingeschränkte oder Konnektivität besitzt
	OK Abbrechen

4. Activate **Use the following IP Address**. Enter the IP address, subnet mask and gateway according to the settings in the **blueberry COMPACT**. The **blueberry COMPACT** has two IP addresses: one is the fixed IP adress **192.168.111.1**. This IP address cannot be changed. The second IP address can be changed by the user. Please refer to the label on the data logger for its default settings. The last entry of the IP address must be different from the setting of the data logger. All other settings must be set identical to the data logger.

Example:	
Data logger:	192.168.0. <b>31</b>
PC:	192.168.0. <b>104</b>

	rotokoll (TCP/IP)
gemein	
letzwerk diese Funktion unterstütz len Netzwerkadministrator, um die eziehen. OIBA tesse automatisch bezie	ben
<ul> <li>Folgende IP-Adresse verwend</li> <li>IP-Adresse verwend</li> </ul>	len:
Subnetzmaske:	255.255.255.0
Standardgateway:	192.168.0.1
ODNS-Serveradresse automatis	
Folgende DNS-Serveradresse	
Bevorzugter DNS-Server:	213 . 191 . 74 . 18
Alternativer DNS-Server:	213 . 191 . 74 . 19
	Erweitert
	OK Abbreche

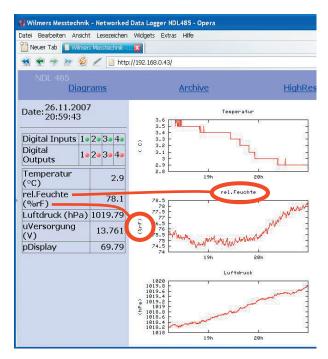
5. Click **Ok** to accept the settings.

### **Displaying Diagrams**

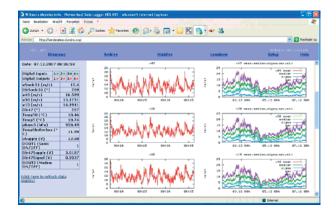
The **blueberry COMPACT** generates time series plots of all measured values and displays them as diagrams. The texts for title and y label of the diagram axes are taken from the name of the measurement function: the first part of the function name is used as diagram title, the second part is used as y axis label. First and second part must be separated by a space character. We recommend to write function names as **Value (unit)**.

#### Example: *relFeuchte (%rF)* = 100 \* a4

The diagram titel for this function is *relFeuchte*, the y axis label is *(%rF)*.



Shorttime diagrams display a time series of the samples. Statistics diagrams display a time series of the statistics.



# Transmitting Measured Data via FTP

The **blueberry COMPACT** sends measured data automatically via FTP to a website or to a data file server. Please first setup the Internet integration via DSL or GPRS.

Select Setup > FTP/Mail.

Enter the URL of your FTP server in the field **FTP Server**. Enter the destination folder and access code and click **OK** to save the settings.



### ANNEX

## Technical Specifications (compared to NDL 485)

Model	blueberry COMPACT	NDL485 research	
PartNo.	0141	0103	
<b>Measuring Inputs</b>			
Digital inputs	10	6	
Analogue inputs	6 differential or 12 single ended	6 single ended	
Additional inputs	via RS485 and INPUT modules (8 x AIN/DIN per module)		
Serial inputs	RS485, half-duplex, RS232 for Modem		
Digital Measuring In	nputs (DIN1 DIN6 / DIN10)		
Measuring range	frequency 0 2,000 Hz counter 0 2,000 Hz status HI / L0		
Resolution	0.01 Hz		
Accuracy	frequency ± 0.1% counter ± 1 pulse		
Signal level	HI = >2.5 V LO = <0.7 V or potential free switch closure		
Input impedance	>20 kΩ		
Analogue Measuring	J Inputs (AIN1 AIN6)		
Measuring range	0 10 V		
Resolution	16 Bit (0.2 0.01 mV depending on measurement range) // 16 Bit (0.2 mV)		
Accuracy	depending on measurement range $// \pm 0.1\%$ of reading $\pm 1$ mV		
Input impedance	>1 MΩ		
Barometric Pressure Sensor			
Туре	integrated baro sensor	-	
Measuring range	400 1,100 hPa	-	
Resolution	0.1 hPa	-	
Accuracy	±0.2 hPa @ 700 1,100 hPa	-	
Longterm stability	±0.5 hPa/a	-	
Measuring Functions	blueberry COMPACT	NDL485 research	
Measuring interval	1 s 24 h	0.1 s 24 h	
Statistic interval	1 s 24 h	0.1 s 24 h	
Statistic funcions	mean value (arithmetic + vector), standard deviation (arithmetic + vector), minimum, maximum, sum	mean value (arithmetic + vector), standard deviation (arithmetic + vector), minimum, maximum, sum, median	

Data memory for statistic time series	32 MB non-volatile ring buffer	128 MB, expandable to up to 512 MB, non-volatile ring buffer
Data memory for samples	32 MB non-volatile ring buffer	
Communication	blueberry COMPACT	NDL 485 research
Data interface	RS232 interface, 1,200 115,200 baud, RS485 interface, half-duplex, 1,200 115,200 baud, Ethernet interface (LAN), 10 MBit/s, optional MODBUS-TCP protocol	
Remote data transfer	GSM, GPRS, DSL, ISDN router	
Automatical data transmission	via eMail	via eMail and FTP
Internet integra- tion	via GPRS or DSL	
User interface	web interface, Internet browser	
Graphical data display	-	realtime diagrams of measured values, optional custom specific graphical display
Display	-	-
Power Supply		
External power supply	5 24 VDC	
Internal power supply	-	-
Power consumption	typ. 600 mW (50 mA @ 12 V)	
Sensor excitation <b>EXC</b>	524 VDC switched, max. 500 mA	
Switching outputs DOUT1 DOUT4	4 switching outputs, max. 300 mA, HI = supply voltage, LO = 0 V, time or event triggered	
Mechanic and Operation	Conditions	
Casing	65 x 105 x 127 mm, IP20 top-hat rail housing, anodized aluminium	
Connections	screw terminals, connectors	
Temperature range	-40+70 °C	

## **CE** Compliancy Declaration

Based on test report no. EMV-08/8117-1 of 22.07.2008

Manufacturer: Wilmers Messtechnik GmbH Hammer Steindamm 35 D-22089 Hamburg / Germany

Product: Data logger **blueberry COMPACT** 

Part number: 0141

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## Capturing the Future

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