

## **Latest generation of automatic network-able weather stations UNIKLIMA® vario: Network connectivity, communication forms**

### **Attributes of the weather station UNIKLIMA® vario**

The automatic weather station UNIKLIMA® vario with Ethernet functionality is used for the registration of climatic data as well as for process controlling and monitoring. It is an inexpensive complex data logger without keyboard and display, and it can be configured and managed through its network functionality via cable or remote data transmission by any PC or laptop.

An Ethernet interface (RJ45) allows the integration of the professional weather station UNIKLIMA® vario into a local area network and the retrieval of meteorological data by TCP/IP. The weather station works as server for the weather data and it can be accessed from various clients in the net. By using DynDNS the data retrieval can be carried out worldwide via the World Wide Web (WWW). The UNIKLIMA® vario gets an own IP address / domain name through the free dynamic domain name system registration service, with which it is also accessible from the outside via the Internet.

The data can for example manually be imported and further processed by Microsoft Excel. No additional weather station software is needed. With the weather station UNIKLIMA® vario a digital recording and storage of measured values in different time periods is possible (for example hourly averages and daily averages).

Furthermore the UNIKLIMA® vario has an internal Web server. The internally generated HTML pages of the weather station with the current climatic data, hourly and daily averages, trends and extreme values as well as a wind HTML page with wind-direction-velocity diagram are always visible with the web browser for all connected network users.

Additionally the UNIKLIMA® vario has freely programmable, potential free switch outputs. Switching processes can be triggered by these outputs depending on the current weather situation. Of course further sensors can be added to the weather station, too.

The currently most cost-effective and innovative form of communication via GPRS / UMTS is described more detailed in some following methods. Optionally the station can be equipped with an analog or GSM radio modem or WLAN.

In connection with a GSM/GPRS modem the UNIKLIMA® vario can send SMS. There is distinguished between the auto answer mode (weather data on the mobile phone) and the sending of warning messages (e.g. frost warning, level states or exceedings).

Besides the data retrieval from the UNIKLIMA® vario it also is possible actively and scheduled to upload weather data from within the UNIKLIMA® vario onto the FTP server of a customer or to send it as data file attachment of email.

The sending of coded weather information in SYNOP and METAR format per SMS or network connection is available.

Internationally available NTP time servers can be used for the automatic synchronization of the internal time base of the UNIKLIMA® vario.

For automatic data retrieval, archiving and comfortable graphical and numerical display and analysis our standard software UK\_TOSS is available.

## **Communication with the weather station UNIKLIMA® vario**

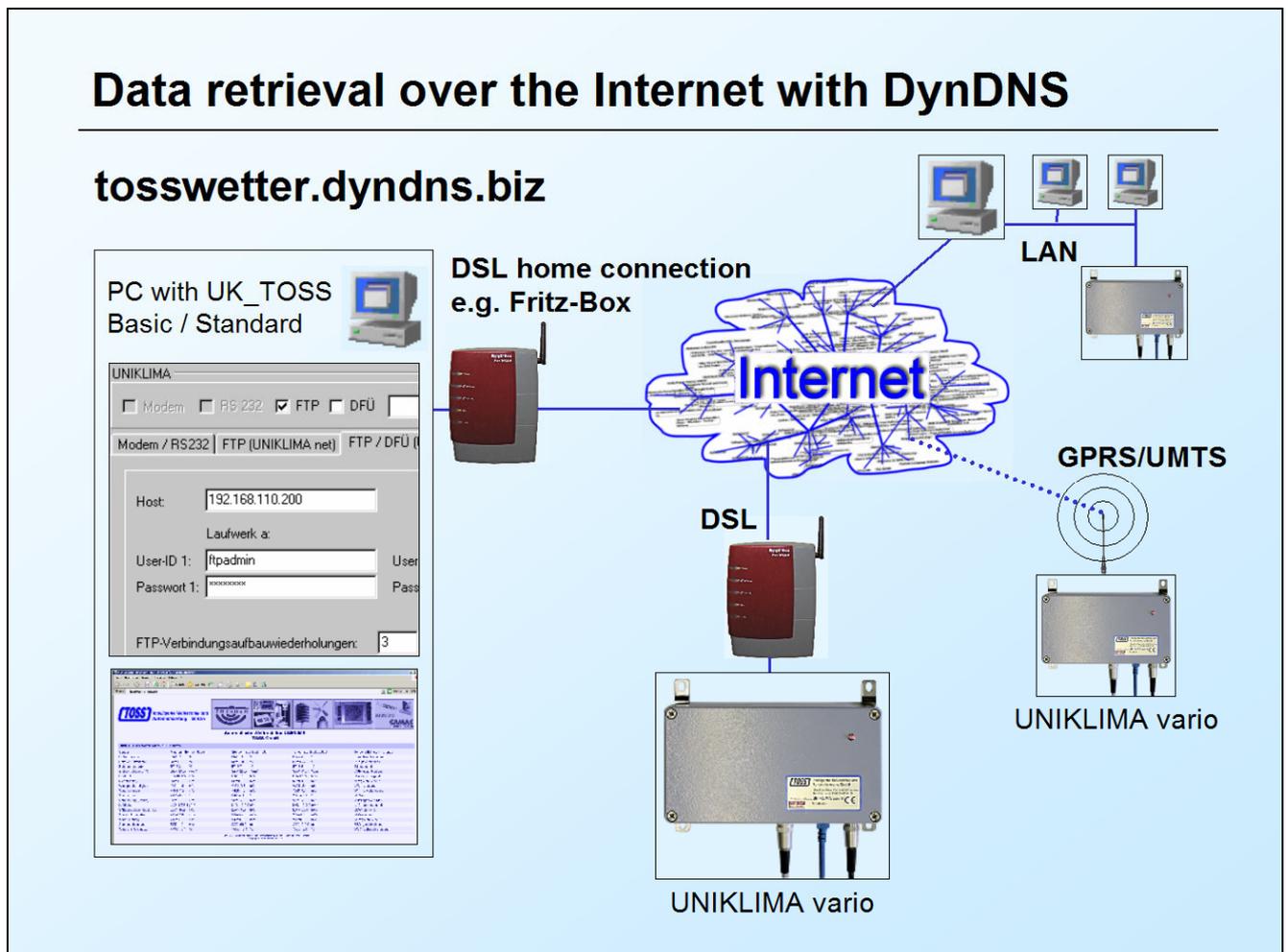
The accessibility of the weather station is now realized over a network. This can be done in two ways, which are briefly outlined below. In order that other users can access the weather station, it must have a public IP / Internet address or it must be part of a local area network (LAN). Outdoors this is realized by a built-in GPRS modem with T-D1 SIM card. It works the same way as if you go into the Internet with your laptop and cell phone. If the location of the weather station has a DSL connection, the weather station can use this Internet access. On the other hand it is possible that the weather station is not visible from the outside via the Internet and thus not public. The one sided, protected access of the weather station to the Internet then is used for the autonomous sending of weather data (push mode, FTP upload). Parameter settings therefore can be changed only on the spot over the Ethernet socket.

There are several ways to access the weather station. They are explained below.

Method 1 – public mode

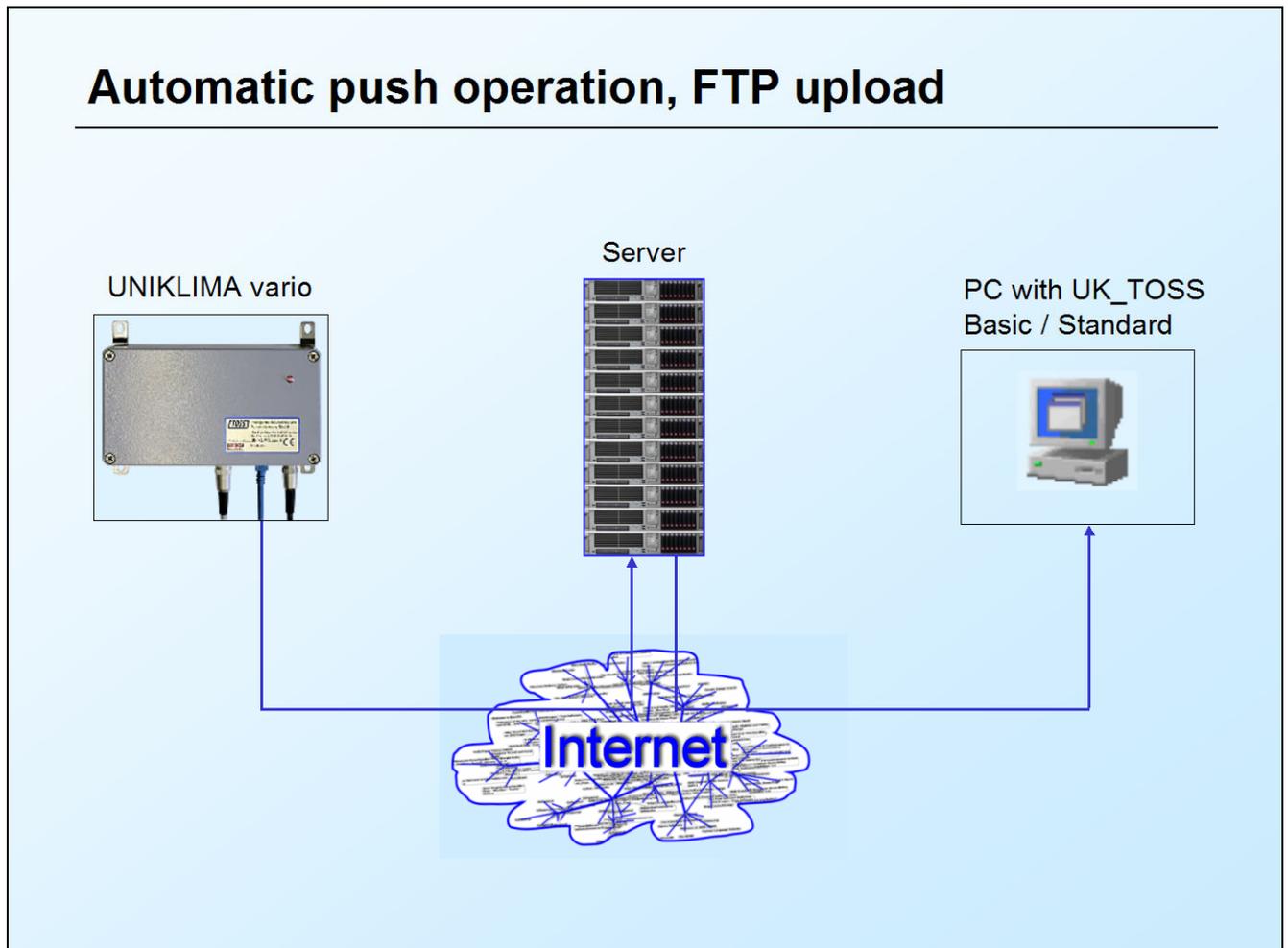
Over the service DynDNS.org the weather station gets a fixed Internet address assigned, such as [tossgetter.dyndns.biz](http://tossgetter.dyndns.biz) (weather station TOSS GmbH Potsdam). Through this Internet address the web pages of the weather station with current weather data, hourly averages, daily averages, trend and extreme values as well as a wind page with a graphical wind-direction-speed diagram can be displayed in the browser. These web pages are newly generated by the weather station itself every second. With the UK\_TOSS PC software you can download the weather data from the weather station by FTP as usual. This access and changing the parameters of the weather station by telnet are protected by user names and passwords, application ports can be modified.

An advantage is that several users simultaneously can access the weather station (as opposed to the old modem call which allowed only a single simultaneous telephone connection). Even the parameters setup and remote maintenance of the weather station (firmware update) are possible over the Internet. The daily call of a time server by the weather station synchronizes it every day new exactly to the second over the permanent Internet connection, i.e. the internal clock is always right and does not need to be adjusted manually.



### Method 2 – encapsulated, unidirectional operation

The weather station dials itself in a one sided way into the World Wide Web (WWW), but it is not visible and not reachable for the public from the outside. Hence there is no accessibility of the website of the weather station either. But the weather station sends hourly averages and daily averages onto a freely selectable FTP server on its own, for example once in every hour. In the simplest case this may be just a part of the web space (subdirectory) of the company at your web space provider. In this way a current data pool of weather stations is created on your server. So the user downloads the current weather data not directly from the weather station, but from the data cache FTP server. The UK\_TOSS PC software supports the automatic data retrieval directly from the weather station or from a server without any difference.



### Method 3 – combined mode

The weather station UNIKLIMA® vario is able to support both described modes 1 and 2 also simultaneously. This is useful if the user wants to see his weather station on the Internet in order to integrate the web pages of the weather station into the company's web site. Hereby the independent data retrieval is not given up and additionally the weather data can be made available on the server for further users by the automatic data upload.

### Method 4 – operation mode with limited rights of use

This mode is a special case. For users in offices or companies with limited administrative rights, where for example for security reasons only the Internet access (HTTP port 80) is allowed, the download by FTP (port 21) is accordingly not possible. The PC software UK\_TOSS therefore offers the possibility to retrieve the data both from a server by FTP and also by HTTP. Thus also these users can access the weather data pool.

# Direct access to the web pages in the weather station UNIKLIMA® vario

Check out our home station

UNIKLIMA® vario TOSS GmbH Potsdam <http://tosswetter.dyndns.biz>

## Current weather data



**Intelligente Meßtechnik und Automatisierung GmbH**



**Automatische Wetterstation UNIKLIMA  
TOSS LAN [013.0100°N52.2650°]**






Aktuelle Wetterdaten 29.06.11 12:28 MEZ (← Extremwerte, → Winddaten)									
Sensor	Aktueller Messwert		Minutenmittel		Stundenmittel		Tagesmittel		Tendenz [Minute → Stunde]
Lufttemperatur	LT=29.6	°C	LT=29.6	°C	LT=29.6	°C	LT=23.4	°C	LT=gleichbleibend
Relative Luftfeuchte	RF=29.7	%	RF=30.0	%	RF=32.0	%	RF=49.4	%	RF=schwach fallend
Bodentemperatur	BT=22.6	°C	BT=22.6	°C	BT=22.3	°C	BT=22.8	°C	BT=schwach steigend
Luftdruck	LD=1016.0	hPa	LD=1016.0	hPa	LD=1016.3	hPa	LD=1018.1	hPa	LD=schwach fallend
Beleuchtungsstärke	SBS=86832.7	Lux	SBS=87321.1	Lux	SBS=86232.5	Lux	SBS=32117.5	Lux	SBS=schwach steigend
Niederschlag	NR=0.0	mm	NR=0.0	mm	NR=0.0	mm	NR=0.0	mm	NR=gleichbleibend
Windgeschwindigkeit	WG1=1.0	m/s	WG1=0.8	m/s	WG1=1.2	m/s	WG1=1.1	m/s	WG1=schwach fallend
Windmaximum	WM1=1.0	m/s	WM1=1.0	m/s	WM1=3.6	m/s	WM1=5.0	m/s	WM1=schwach fallend
Windrichtung	WR1=293.0	°	WR1=302.9	°	WR1=48.0	°	WR1=71.7	°	WR1=WWW
Globalstrahlung CMP	SGP=720.0	W/m²	SGP=774.3	W/m²	SGP=905.1	W/m²	SGP=341.5	W/m²	SGP=fallend
UV-Strahlung	SUV=50.5	W/m²	SUV=50.8	W/m²	SUV=50.8	W/m²	SUV=17.3	W/m²	SUV=gleichbleibend
Ortsdosisleistung	ODL=76.4	nSvh	ODL=75.8	nSvh	ODL=72.4	nSvh	ODL=71.3	nSvh	ODL=schwach steigend
Sonnenscheindauer	SDC=1.0	min	SDC=1.0	min	SDC=60.0	min	SDC=763.2	min	SDC=fallend
Wind Chill Index	WCC=29.6	°C	WCC=29.6	°C	WCC=29.6	°C	WCC=23.4	°C	WCC=gleichbleibend
Taupunkt-Temperatur	TT=10.0	°C	TT=10.2	°C	TT=11.1	°C	TT=11.3	°C	TT=schwach fallend
Nasstemperatur	LTF=18.7	°C	LTF=18.8	°C	LTF=19.1	°C	LTF=16.5	°C	LTF=schwach fallend
Luftfuchte	LAD=1157.8	g/m³	LAD=1157.4	g/m³	LAD=1157.3	g/m³	LAD=1183.9	g/m³	LAD=gleichbleibend
Verdunstung (Haude)	VH=7.1	mm	VH=7.1	mm	VH=7.1	mm	VH=7.1	mm	VH=gleichbleibend Tageswert[14:30]

Messwerte sind gleiches Mittel der letzten 60 bis 24 Datenwerte.  
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## Extreme values



**Intelligente Meßtechnik und Automatisierung GmbH**



**Automatische Wetterstation UNIKLIMA  
TOSS LAN [013.0100°N52.2650°]**






Extremwerte vom 28.06.11 MEZ und aktuelles Maximum, Minimum seit 00:00Uhr (→ Aktuelle Wetterdaten, → Winddaten)														
Sensor	Tagesmittel vom 28.06.11		Max. vom 28.06.11		Min. vom 28.06.11		Maximum [seit 00:00]		Minimum [seit 00:00]					
Lufttemperatur	LT=22.6	°C	LT=29.8	°C	16.36 MEZ	LT=15.1	°C	03.56 MEZ	LT=30.0	°C	11.39 MEZ	LT=15.4	°C	01:37 MEZ
Relative Luftfeuchte	RF=52.6	%	RF=79.8	%	04:07 MEZ	RF=27.9	%	18:13 MEZ	RF=82.7	%	02:00 MEZ	RF=28.4	%	12:17 MEZ
Bodentemperatur	BT=23.3	°C	BT=24.7	°C	18:32 MEZ	BT=20.3	°C	08:33 MEZ	BT=23.1	°C	00:00 MEZ	BT=21.3	°C	08:10 MEZ
Luftdruck	LD=1021.0	hPa	LD=1023.2	hPa	09:08 MEZ	LD=1017.2	hPa	21:15 MEZ	LD=1019.0	hPa	00:00 MEZ	LD=1015.4	hPa	09:37 MEZ
Beleuchtungsstärke	SBS=31533.7	Lux	SBS=86773.7	Lux	11:36 MEZ	SBS=0.0	Lux	00:00 MEZ	SBS=89031.0	Lux	11:57 MEZ	SBS=0.0	Lux	00:00 MEZ
Niederschlag	NR=0.0	mm	NR=0.0	mm	00:00 MEZ	NR=0.0	mm	00:00 MEZ	NR=0.0	mm	00:00 MEZ	NR=0.0	mm	00:00 MEZ
Windgeschwindigkeit	WG1=1.4	m/s	WG1=5.8	m/s	13:18 MEZ	WG1=0.0	m/s	02:02 MEZ	WG1=5.0	m/s	03:57 MEZ	WG1=0.0	m/s	01:07 MEZ
Windmaximum	WM1=5.8	m/s	WM1=5.8	m/s	13:18 MEZ	WM1=0.0	m/s	22:56 MEZ	WM1=5.0	m/s	03:57 MEZ	WM1=0.0	m/s	11:25 MEZ
Windrichtung	WR1=75.3	°	WR1=359.0	°	01:57 MEZ	WR1=0.0	°	01:42 MEZ	WR1=359.0	°	01:08 MEZ	WR1=0.0	°	00:07 MEZ
Globalstrahlung CMP	SGP=337.8	W/m²	SGP=899.8	W/m²	12:20 MEZ	SGP=0.0	W/m²	00:00 MEZ	SGP=924.3	W/m²	11:58 MEZ	SGP=0.0	W/m²	00:00 MEZ
UV-Strahlung	SUV=17.1	W/m²	SUV=50.5	W/m²	12:13 MEZ	SUV=0.0	W/m²	00:00 MEZ	SUV=51.6	W/m²	11:58 MEZ	SUV=0.0	W/m²	00:00 MEZ
Ortsdosisleistung	ODL=72.0	nSvh	ODL=78.3	nSvh	13:22 MEZ	ODL=65.1	nSvh	17:59 MEZ	ODL=76.9	nSvh	12:29 MEZ	ODL=66.2	nSvh	11:02 MEZ
Sonnenscheindauer	SDC=763.2	min	SDC=60.0	min	07:30 MEZ	SDC=0.0	min	00:00 MEZ	SDC=60.0	min	07:29 MEZ	SDC=0.0	min	00:00 MEZ
Wind Chill Index	WCC=22.6	°C	WCC=29.8	°C	16:36 MEZ	WCC=14.7	°C	04:24 MEZ	WCC=30.0	°C	11:39 MEZ	WCC=15.4	°C	01:37 MEZ
Taupunkt-Temperatur	TT=11.6	°C	TT=14.5	°C	11:22 MEZ	TT=7.6	°C	18:13 MEZ	TT=14.5	°C	09:39 MEZ	TT=9.5	°C	12:30 MEZ
Nasstemperatur	LTF=16.3	°C	LTF=19.9	°C	14:44 MEZ	LTF=12.9	°C	03:52 MEZ	LTF=20.0	°C	11:32 MEZ	LTF=13.5	°C	04:52 MEZ
Luftfuchte	LAD=1190.5	g/m³	LAD=1223.1	g/m³	03:57 MEZ	LAD=1159.9	g/m³	16:36 MEZ	LAD=1215.9	g/m³	01:36 MEZ	LAD=1155.3	g/m³	11:40 MEZ
Verdunstung (Haude)	VH=7.1	mm	VH=7.1	mm	14:30 MEZ	VH=7.1	mm	14:30 MEZ	VH=7.1	mm	00:00 MEZ	VH=7.1	mm	00:00 MEZ

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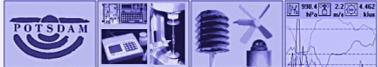
# Wind data



**Intelligente Meßtechnik und  
Automatisierung GmbH**



**Automatische Wetterstation UNIKLIMA  
TOSS LAN [013.01007/52.2650°]**



**Winddaten 29.06.11 12:33 MEZ** (→ Aktuelle Wetterdaten, → Extramwerte)

Aktuelle Messwerte	Windrichtung	Windgeschwindigkeit
Aktueller Messwert	WR1=336.0 *	WG1=1.4 m/s
Minutenmittel	WR1=326.7 *	WG1=1.2 m/s
02_Minutenmittel	WR1=314.2 *	WG1=0.8 m/s
10_Minutenmittel	WR1=297.0 *	WG1=1.0 m/s
Stundenmittel	WR1=46.3 *	WG1=1.2 m/s
Tagesmittel	WR1=71.7 *	WG1=1.1 m/s
Tagesmittel vom 28.06.11	WR1=75.3 *	WG1=1.4 m/s

Extremwerte	Windrichtung	Zeit	Windgeschwindigkeit	Zeit
akt. Minuten-Maximum	WR1=339.0 *	32sec MEZ	WG1=1.8 m/s	33sec MEZ
akt. Minuten-Minimum	WR1=311.0 *	06sec MEZ	WG1=0.9 m/s	11sec MEZ
akt. Stunden-Maximum	WR1=369.0 *	12:01 MEZ	WG1=3.6 m/s	12:17 MEZ
akt. Stunden-Minimum	WR1=0.0 *	12:12 MEZ	WG1=0.0 m/s	12:31 MEZ
Maximum [seit 00:00]	WR1=369.0 *	01:08 MEZ	WG1=5.0 m/s	03:57 MEZ
Minimum [seit 00:00]	WR1=0.0 *	00:07 MEZ	WG1=0.0 m/s	01:07 MEZ
Maximum vom 28.06.11	WR1=369.0 *	01:57 MEZ	WG1=5.0 m/s	13:18 MEZ
Minimum vom 28.06.11	WR1=0.0 *	01:42 MEZ	WG1=0.0 m/s	02:02 MEZ

**Windrichtungs-Geschwindigkeits-Diagramm**

Windgeschwindigkeit WG1  
Windrichtung WR1

Skalierung WG1  
0 bis 3.0 m/s

Mittelwerte  
Stunde  
Minute  
2Min  
10Min

Windrichtungspfeil zeigt geltendes Minutenmittel

Mittelwerte sind globales Mittel der letzten 60 bzw. 24 Datenwerte. Extremwerte sind zwei Beobachtungswerte innerhalb eines Zeitfensters.  
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**If you have any questions, we will gladly help you. Give us a call or send an e-mail.**

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