

MEASUREMENT SYSTEMS

for Wind and Solar Resource Assessment,
Power Curve Measurements and
Meteorological Observations



Wilmers Messtechnik GmbH

www.wilmers.com

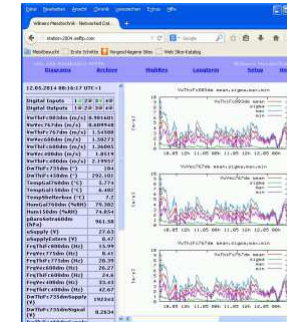
2014-08-05



Wilmers Messtechnik GmbH develops and manufactures

Data loggers

- Modular / COMPACT, direct Internet access



Complete measurement systems for

- Wind resource assessment
- Solar resource assessment
- Wind turbine power curve measurement
- Meteorological observations



Autonomous power supply systems

- Range: 1 W ... 3 kW
- Solar / wind / fuel cell / diesel



1991 foundation of **Wilmers Meßtechnik GbR**

2004 conversion to **Wilmers Messtechnik GmbH**

2014 actual activities

- Manufacture of data loggers and complete measurement systems
- Manufacture of autonomous power supply systems (Solar / Wind / Diesel)
- Installation and maintenance of measurement systems
- 8 employees, network of freelancers
- Network of international partners and distributors
- International Quality Standards: IEC 61400-12, MEASNET, WMO
- Applications: wind energy, solar energy, meteorology, climate research
- Customers: Wind mast installers, project developers, wind turbine manufacturers, measurement institutes, NGOs, wind + solar consultants
- More than 3,000 measurement systems installed worldwide
- Main regions: France, Sweden, Croatia, Poland, Pakistan, Turkey, Brazil, Spain, Italy

International Partner Network



1991 Wind Classifier **wikla**

- Simple site assessment tool for single wind turbine sites



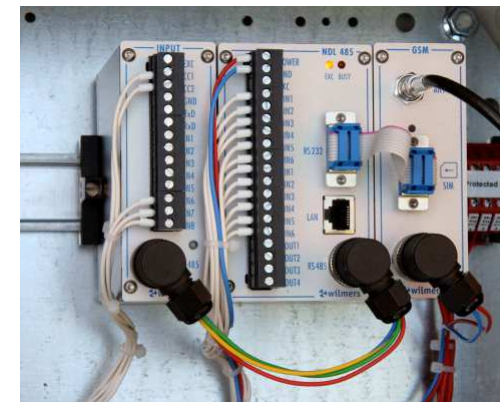
1997 Data Logger **wilog303/306**

- Data logger for 3 anemometers and 6 analogue sensors



2003 Modular Data Logger **blueberry NDL485**

- First meteorological data logger with web interface
- Internet integration via GPRS
- Modular system, expandable via RS485 serial bus
- RS485 interface for sonic anemometers



2012 All-In-One Data Logger **blueberry COMPACT**

- All components integrated in a compact enclosure
- Integrated surge arrestors, charge controller, GPRS modem, baro sensor
- Easy to use
- Based on the proven **blueberry NDL485**
- Direct connection of passive Pt100 and thermopile Pyranometers
- Direct connection of all anemometers types, including small AC

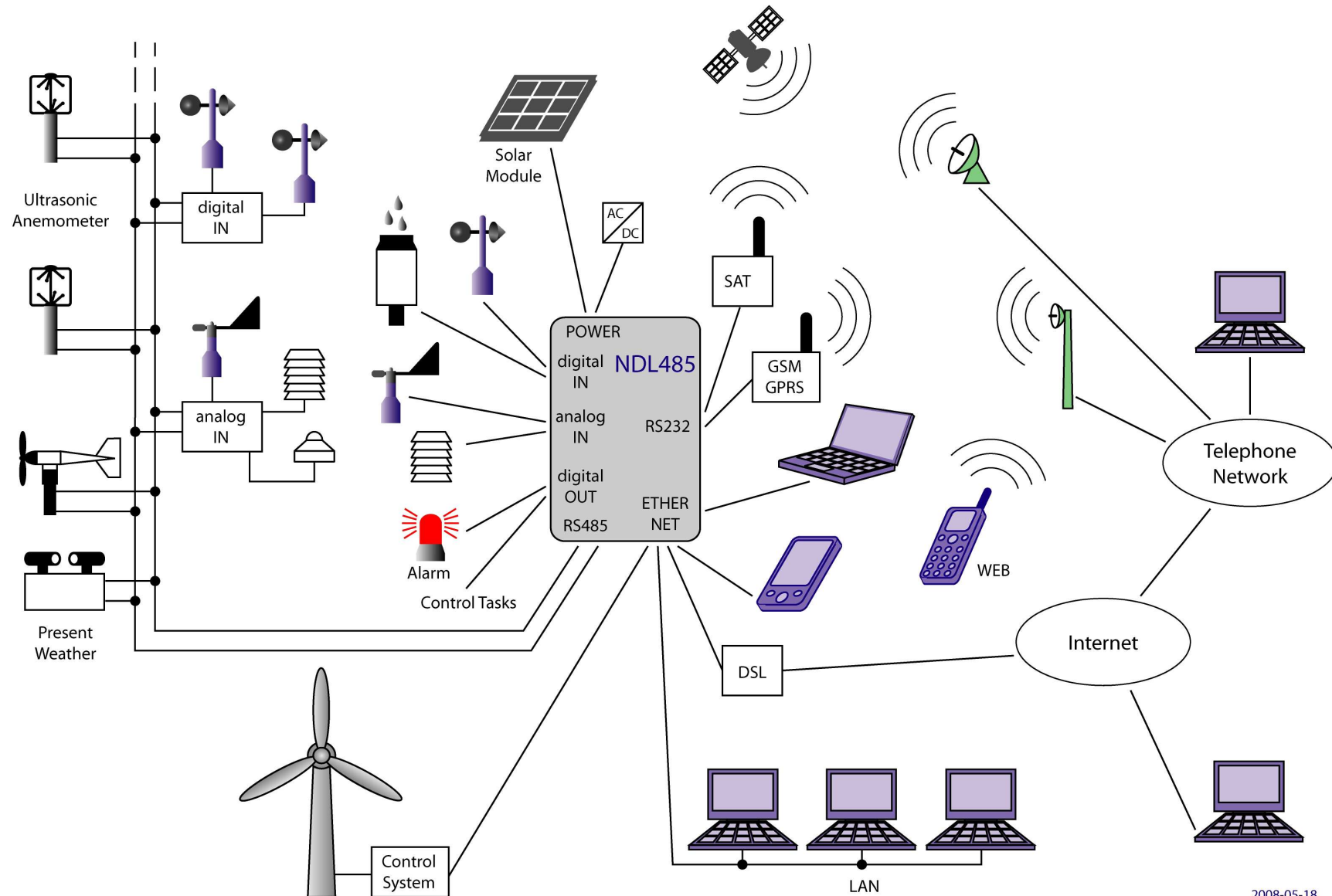


2011 Autonomous Power Supply **WindPowerPack**

- Diesel generator with battery charger, 24VDC / 230VAC, 2.5 kW
- Applications:
 - Wind measurement masts with heated sensors
 - LiDAR, SoDAR remote sensing systems
 - Radio / Cellular transmission stations
- Remote monitoring via Internet



Data Logger: NDL485 Data Transmission



2008-05-18

Data Monitoring Server: Overview

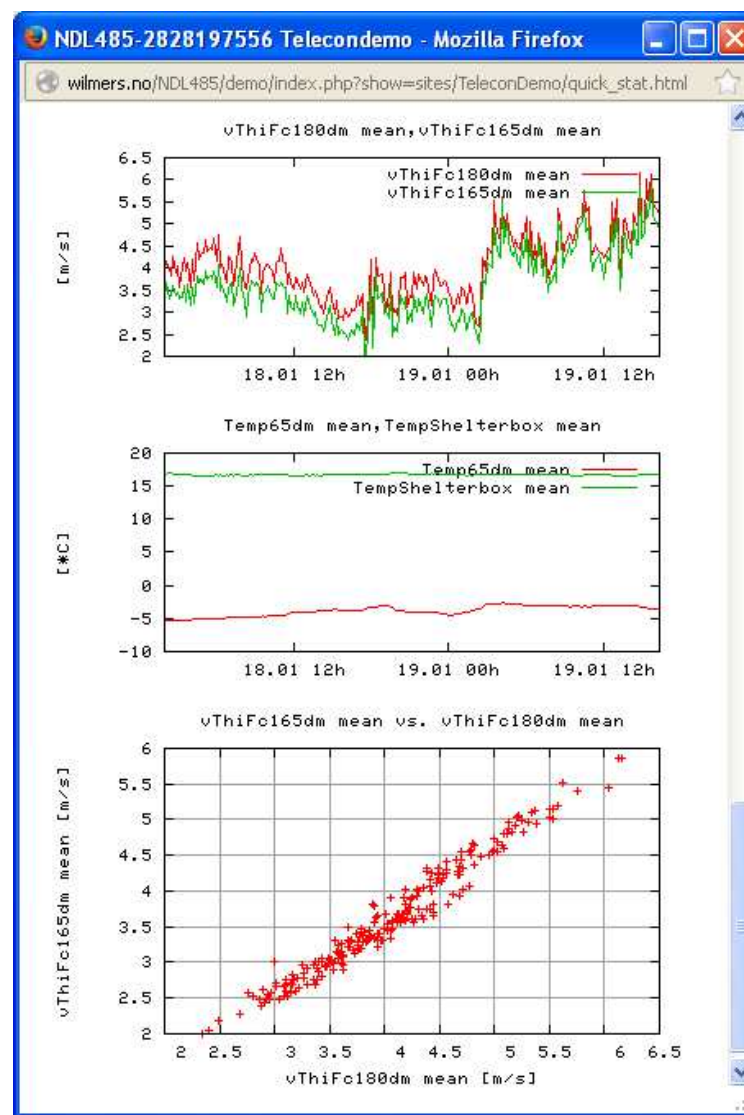
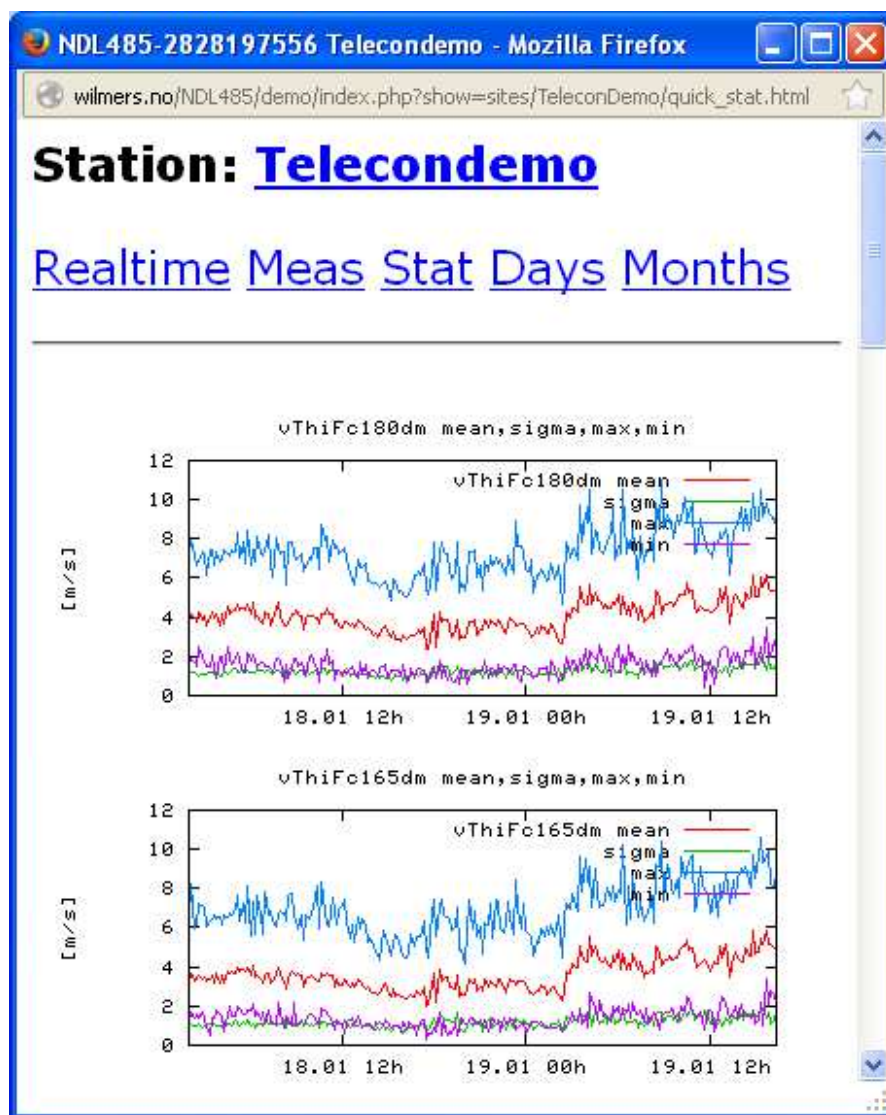
Blueberry Site Monitor

Overview Archives Realtime

Site	Status	Logger ID	Folder	Data Age	Records	Last File
Wind Power Pack, Testsite	OK	NDL485-3971690102	NDL485-3971690102	15 hours	144	010093_2014-01-18_stat.csv
Telecondemo	OK	NDL485-2828197556	TeleconDemo	16 hours	144	000126_2014-01-18_stat.csv
Asker, Norway	WARNING	NDL485-3539662431	asker_old	822 days	2721	000835_2011-10_stat.csv
Boroy, Norway	WARNING	NDL485-1221930297	boroy	110 days	204	001938_2013-09_stat.csv

- Monitoring of measurement stations on central server
- Automatic heuristic validation algorithm
- Graphical data display for manual validation

Data Monitoring Server: Archive Data



References 1 – Wind Measurements



Wind Measurements with **blueberry COMPACT** (Sweden / India / Pakistan / Jordan)

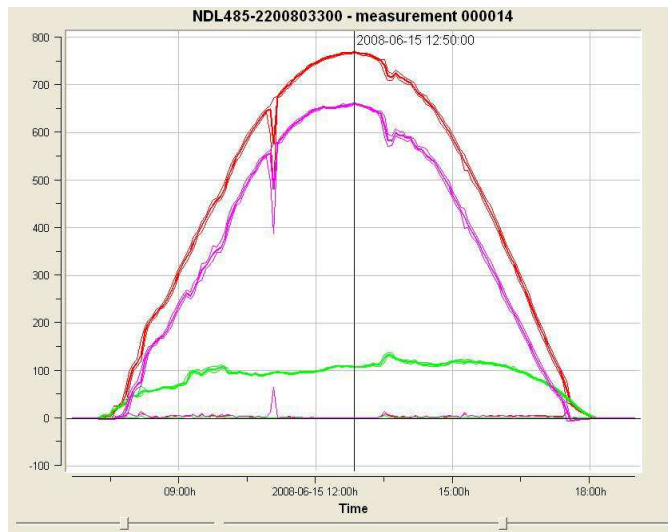
References 2 – 200m Wind Mast (Fraunhofer IWES)



References 3 – WEC Power Curve Measurement and SCADA



References 4 – Solar Energy Measurements



Solar Energy Measurements for Thermosolar (CSP) and Photovoltaic (PV)

Why Should I choose Wilmers Products?

Measurement Systems from Wilmers are...

- **easy to use**
 - Pluggable terminals enable installation of preconfigured cables without tools
- **cost effective**
 - Surge arrestors, fuses, GPRS modem, charge controller and baro sensor are integrated in the data logger
 - No need of converters for passive Pt100, thermopile pyranometers and small AC anemometers
 - Interface for sonic anemometers and SCADA are integrated
- **reliable**
 - Based on the proven **blueberry NDL485** technology
- **accessible via Internet**
 - Direct realtime Internet access without need of server structure
- **based on many years of field experience!**

Challenge Us!

We will offer the Solution.



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