Agricultural Weather Stations

Highlights

- Professional Weather Station
- High-quality sensors manufactured in accordance with WMO (World Meteorological Organization) prescriptions
- Operational limits suitable for any weather conditions
- Very low consumption
- Wide range of communication modes
- Web-based data applications
- Software for data management on local PC

For over 40 years LSI LASTEM, has designed and produced complete, high-quality weather stations. All sensors are manufactured in accordance with the technical regulations defined by WMO (World Meteorological Organization); the acquisition system has been developed to be fully reliable even in extreme conditions of use. The sensors are mounted on weather masts available in various heights. The data logger is normally installed inside an IP65 box where power supply and data communication systems are housed as well. LSI LASTEM catalogue includes a complete choice of IP65 boxes with different solutions to attain optimal energy autonomy. Different types of communication devices (GPRS and TCP/IP) are available for remote data transmission.

Main Features

Professional Solutions

Complete weather stations specifically designed by LSI LASTEM to meet professional requirements, when ensuring long-lasting operation and accuracy of data are primary needs, even in extreme environmental conditions. For this purpose, design solutions have been oriented toward selecting performing and reliable materials, electronics and mechanical parts.

Leaf wetness sensor

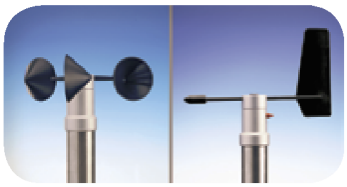
The leaf wetness sensor detects the presence of water on crop surface, independently from its source (rain, dew, frost,…).

Soil temperature sensor

Sensor for the measurement of temperature in depth or in the upper layers of soil.

Anemometers

DNA202 (wind speed) and DNA212 (wind direction) sensors combine high measuring accuracy to operational limits up to 75 m/s.



Solar Radiation

Second Class Pyranometer (DPA053) according to ISO9060 standard. These sensors are a good compromise for basic meteorological and agro-meteorological applications.

Precipitation radar/ present weather sensor

Sensor for the measurement of rainfall intensity and state, in whatever form: rain, snow, sleet and hail.

Rain

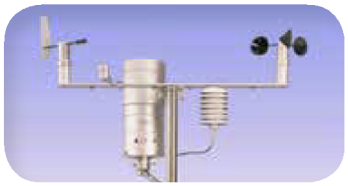
Tipping-bucket rain gauge (DQA130.1) made of aluminum, according to WMO guidelines (Guide No. 8).

The data logger is provided with the intensity-based correction formula; this ensures measurement accuracy also with high-intensity rainfalls.

Temperature and Humidity

Thermo-hygrometer (DMA672.1) specifically developed for meteorological applications.
The sensor includes a high-efficiency radinat screen ensuring reliable temperature measurements even under high irradiation conditions.

Met mast



Typically, the station is mounted on a 45÷65 mm diameter tubular mast. LSI LASTEM offers a wide range of masts and accessories for fastening the instruments.

Surface temperature sensor

Sensor for the measurement of air temperature in the first 5 cm from the ground. Distance from the ground can be adjusted. Protected against direct solar radiation by means of a radiant screen.

Soil water content sensor

This sensor is the ideal solution to measure volumetric water content of soil (0-100%). This sensor is based on TDR (Time Domain reflectometry) technology, ensuring high accuracy even in very wet soil and without special calibrations for mineral soils. This sensor can be introduced 11 cm in the soil, measuring temperature as well.

Low energy consumption

The station, as a whole, has a very low energy consumption. This performance is the outcome of LSI LASTEM long experience in the field of equipment for environmental applications, where limiting power consumption is essential.

Data logger housings

The data logger should be protected against external atmospheric agents. LSI LASTEM offers different solutions for fixed or mobile installations. The containment boxes normally include the power supply system and housing for the selected communication system.

Data logger for long-term measurements

The core of the system is a 12-input data logger where data are stored in the form of statistical values with a programmable base (default 10 minutes, ensuring in this case 12 months of memory operation).

LSI LASTEM Web-based solution

Data from LSI LASTEM stations can be uploaded to a web space managed by LSI LASTEM. Data communication shall occur through a GPRS modem (GPRS SIM data and on-site GPRS signal availability is under user's responsibility) or TCP/IP converter. For more details, see description of this service in the last pages of this document.

Remote PC connection

The data logger can be connected to a remote PC with the following interfaces:

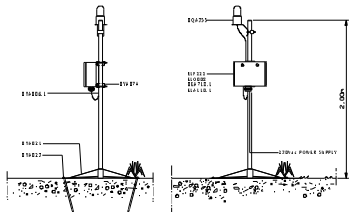
- Cellular telephone network: GSM modem;
- GPRS network: GSM/GPRS modem;
- LAN/WAN network: TCP/IP Converter
- Radio UHF

Connection to local PC

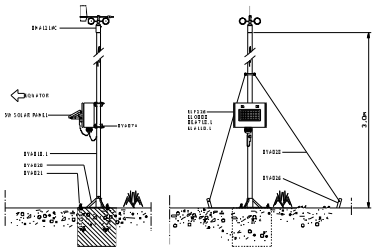
Each KME kit includes a serial cable and a USB adapter for direct connection of the data logger to a PC. Different devices, such as TCP/IP converters for LAN networks or RS485 converters for cable connections up to 1000m can be selected to fit specific communication needs.

Sales Kit
Agricultural Weather Stations

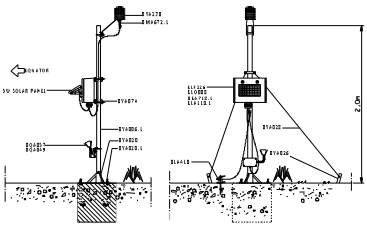
LSI LASTEM proposes different configurations included in specific sales kits.



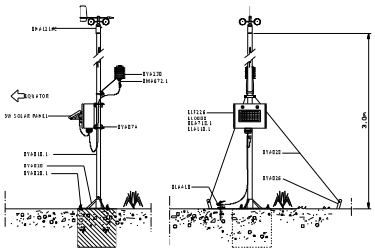
KIT 1: Hail
Station with 4-input Data logger and IP65 box, 220 Vac power supply and rainfall sensor, precipitation radar for the measurement of rainfall and hail intensity, 1m mast with base for ground mounting.



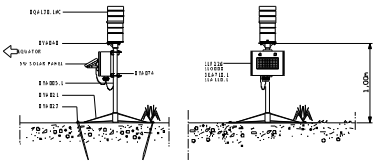
KIT 2: Strong Wind
Station with 4-input Data logger and IP65 box, solar panel power supply, wind speed and direction sensors, 3m mast, for ground or plinth mounting.



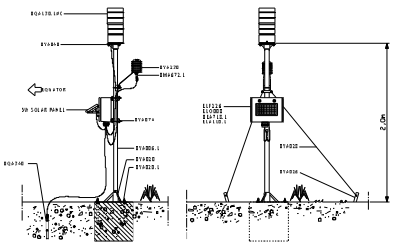
KIT 3: Frost & Hoarfrost, Sun Stroke and Thermal Stress
Station with 4-input Data logger and IP65 box, solar panel power supply, air temperature and humidity sensors, soil surface temperature sensor, leaf wetness sensor, 2m mast, for ground or plinth mounting.



KIT 4: Scirocco Winds
Station with 4-input Data logger and IP65 box, solar panel power supply, wind speed and direction sensors, air temperature and humidity sensors, soil surface temperature sensor, 3m mast for ground or plinth mounting.



KIT 5: Heavy Rain
Station with 4-input Data logger and IP65 box, solar panel power supply, rainfall sensor (pluviometer), 1m mast for ground or plinth mounting.



KIT 6: Drought
Station with 4-input Data logger and IP65 box, solar panel power supply, air temperature and humidity sensor, rain gauge and soil water content sensor, 2m mast mast for ground or plinth mounting.

Code	Description	KIT 1	KIT 2	KIT 3	KIT 4	KIT 5	KIT 6
	Data Logger						
ELO008	Data logger 4 inputs, 12 Vcc power supply, 2 Mb memory, 2 RS232 ports. Includes RS232 cable, USB adapter, 3DOM program for PC	●	●	●	●	●	●
ELF226	IP65 case for data logger housing. Tilting solar panel mounted on the front panel. 4 A/h battery included		●	●	●	●	●
ELF222	IP65 box for data logger housing. 220 Vac power system included.	●					
DYA074	ELF226 box fastener to diam. 45÷65 mm mast	●	●	●	●	●	●
	Wind Sensors						
DNA121#C	Wind speed and direction sensor, cable		●		●		
DWA510	10 m Cable						
	Temperature and RH% sensors						
DMA672.1	Air temperature and relative humidity sensor, 3m cable			●	●		●
DYA230	Anti-radiation screen for DMA672.1 sensor			●	●		●
DYA049	Collar for DYA230 screen fastening to diam. 45÷65 mm met mast			●	●		●
DLA410	Air temperature Pt100 sensor close to the ground			●	●		
	Solar Radiation Sensor						
DPA053	Class 2 Radiometer according to ISO9060						
DYA032	Rod for DPA053 sensor mounting						
DYA049	Collar for DYA032 screen mounting to diam. 45÷65 mm met mast						
	Leaf Wetting						
DQA057	Leaf wetting sensor			●			
DYA049	Collar for DQA057			●			
	Hail						
DQA355	Disdrometer	●					
	Pluviometer						
DQA130.1#C	Pluviometer 200 mm diameter collector					●	●
DYA040	Support to secure the pluviometer on top of mast					●	●
DWA510	10 m cable for pluviometer					●	●
	Mast	Note 1					
DYA005.1	Met mast H=1,5 m. Ø 50 mm	●				●	
DYA006.1	Met mast H=2m. Ø 50 mm			●			●
DYA010.1	Met mast H=3 m. Ø 50 mm		●		●		
DYA020	Tripod base to mount Ø 50 mm met mast on a concrete plinth	●					
DYA020.1	Set of 3 coach screws to secure DYA020 base to a plinth	●					
DYA021	Base to secure Ø 50 mm met mast to the ground		●	●	●	●	●
DYA023	Set of 3 stakes to secure DYA021 base to the ground		●	●	●	●	●

continued

Code	Description	KIT 1	KIT 2	KIT 3	KIT 4	KIT 5	KIT 6
	Guy wires						
DYA028	Set of 3 guy wires and collar for mast mounting		●	●	●		●
DYA026	Set of 3 stakes to secure guy wires to the ground		●	●	●		●
	GSM/GPRS modem						
DEA718.1	GSM-GPRS Modem.	●	●	●	●	●	●
ELA110.1	DEA718.1 modem connection cable to data logger	●	●	●	●	●	●
	TCP/IP Ethernet Converter	Note 2					
DEA550	RS232-Ethernet Converter						
	PC Applications	Note 3					
BSZ311	GIDAS: program for data storage in SQL database and data display as graphs or tables.						
BSZ306.2	CommNetEG: program for data communication between data logger and server in automatic mode. GPRS communication in “push” mode from data logger.						
BSZ411	XPanel: program for dynamic display of instant data on control panel.						
	Web-based Application	Note 4					
DZZDAT3	Web-based application for data display and reports	●	●	●	●	●	●

Note 1 1, 2 and 3 m. masts are available. Masts can be mounted on a concrete plinth, by using DYA020 tripod and DYA020.1 coach screws, or by directly securing them to the ground by means of DYA021 tripod and DYA023 stakes.

Note 2 Two options are available for remote communication: GSM/GPRS modem and Ethernet converter. The latter allows to transmit data through an internet router on TCP/IP protocol with virtually no connection costs.

Note 3 Each data logger includes the 3DOM software that allows configuration of the data logger itself and data download from memory in ASCII format. For post-processing operations, GIDAS (BSZ311) software is available, allowing storage of the received data on a SQL data base and preparation of statistical reports with graphs and tables. To automate GPRS communication and data download, CommNetEG (BSZ306.2) module is available. It allows to interrogate stations at programmable intervals and to download the last available data. Xpanel (BSZ411) program is available for the display of dynamic data.

Note 4 Solution for data editing on an Internet site managed by LSI LASTEM. This is a subscription service and is available for stations equipped with GPRS modem or TCP/IP converter connected to a router.

Data Logger

Technical features - MODELS

Data Logger

Explicitly designed for environmental applications, M-Log data logger features specific inputs and calculations for environmental sensors while maintaining an all-time-low power consumption. It stores statistical values “min/max/average/Standard deviation” for temperature, RH%, pressure, solar irradiance and wind speed, vector averaging for wind direction (prevalent sector, average and max gust) and intensity calculation for rain. Rugged and durable, this platform ensures prolonged data-logging in even the most severe environments, while the 16-bit design of the A/D converter ensures data accuracy and reliability.

Order numb.	**ELO105**	
Analogue inputs	*Input number*	N.4
	ESD protections	±8 kV contact discharge IEC 1000–4-2
	Max input signal	1,2 V
	EMC filters	On all inputs
Digital inputs	*Input number*	N.1
Actuators output	*Use*	Power for sensors and communication devices
	Output number	N.1
	Max current on each output	150 mA
	Protection	Thermal and over current (> 0.15 A)
Power supply	*Power supply*	12 V ± 10%
	Power consumption (during acquisition)	20 mA
	Power consumption (Stand-by)	Stand-by: 0,2 mA
	Protections	Transient voltage suppressor: 600 W, t = 10 µs; inv.polarity
Other features	*RS232 port*	n.2x9 pins/Female/Male/DTE/DCE, 1200 ÷ 115200 bps
	Internal clock	Accuracy 30 sec/month (T=25°C)
	Environmental limits	-40 ÷ 60 °C, 15 ÷ 100 % UR/RH (not condensing)
	Protection	IP 40
	Weight	500 g
	Dimensions	140 x 120 x 50 mm

Meteorological Sensors
Technical features - MODELS

Thermo-Hygrometer

Air temperature and RH% sensor. This sensor is suitable for long-term operation in severe environments and in presence of steep thermal and hygrometric variations. The high-efficiency radiant screen protects it from external radiant sources ensuring the best accuracy of the temperature measurement.

Order numb.	**DMA672.1**	
Temperature	*Principle*	Pt100 1/3 DIN B
	Measuring range	-50÷70°C
	Uncertainty	0,1°C (@0°C)
	Resolution	0,01°C
Relative humidity	*Principle*	Capacitive
	Measuring range	0÷100%
	Uncertainty	±1,5% RH (5÷95%)
	Cable	L = 3 m

Air temperature near the ground level (Pt100 output)

Sensor to measure air temperature nearby ground level. It can be mounted on a DLA411 picket, in order to adjust it at the required height. The sensor is screened from the direct solar radiation by a radiant screen included in P/N DLA411.

Order numb.	**DLA410**	
Temperatura	*Sensitive element*	Pt100 DIN-A
	Range	Depending by the data acquisition system
	Accuracy	0,15°C (a 0°C) DIN-IEC751
	Response time	45 sec
	Operative temperature	-30+70°C
	Material	AISI304
	Weight	350 gr (with cable)
	Cable	L.10 m
	Data logger compatibility	M-Log (ELO007-008), R-Log (ELR515), E-Log (all models)

Accessories	**Order numb.**	
	DLA411	Sensor support, complete with radiant screen and setting ring

Combined Wind speed and Direction sensors

Combined wind speed and wind direction sensor. Direct signal output for wind speed (Hz) and wind direction (0-1 Vdc). This sensor range includes, in a single apparatus, transducers for both wind speed and wind direction measurement. Its use simplifies installation requirements, other than being smaller, lighter and cheaper than the general 2-sensor kit. Model DNA122#S is equipped with a potentiometer and its wind direction output is in Ω, with very low power consumption and it can be used in applications with limited energy availability.

Order numb.	DNA121#C	DNA122#C
WS output	0÷833 Hz	
WD output	0÷1 Vdc	0÷2000 Ω
Power supply	12 Vdc	
Power consumption	30 mA	2 mA
Wind direction principle	Hall effect sensor	2 kΩ potenziom.
Data logger compatibility	M-Log (ELO007-008) R-Log (ELR515) E-Log (all models)	

Common features

Wind speed	*Principle*	N.32 step optoelectronic disk
	Operative limit	75 m/s
	Uncertainty	0÷3 m/s=1,5%, >3 m/s= 1%
	Threshold	0,26 m/s
	Delay distance	4,8 m (at 10 m/s) Acc to VDI3786 and ASTM 5096-96
	Resolution	0,07 m/s
Wind direction	*Principle*	See table above
	Measuring range	0-360° (0-355° DNA122#C)
	Uncertainty	1%
	Threshold	0,15 m/s
	Resolution	0,3°
	Delay distance	1,2 m (at 10 m/s) Acc to VDI3786 and ASTM 5366-96
	Damping coeff.	0,21 (at 10 m/s) Acc to VDI3786 and ASTM 5096-96
General information	*Connector*	7 pin IP65 watertight connector
	Housing	Anodized aluminum,
	Cup	PA6 plastic and fiberglass
	Vane	Aluminum
	Mounting	Mast ø 48 ÷ 50 mm
	Protections	Tranzorb and Emifilters
	Operative temperature	>-30°C (without ice)

Global irradiance

Radiometer for solar irradiance measurement, according to ISO 9060 and WMO No. 8 (Part I, Chapter 7) standards. This sensor is classified as ISO 9060 Second Class. Light and compact, this sensor is the ideal solution for basic environmental, meteorological, and solar energy applications.

Order numb.	DPA053	
Global Irradiance	*Principle*	Thermopile
	Classification	Second class (ISO9060)
	Spectral range	305÷2800 nm
	Uncertainty	10% daily
General information	*Cable*	L = 5 m

Wetness presence sensor

The wet presence sensors detect the presence of water irrespective of the source. These sensors are also based on the principle of conductivity between electrodes, which are arranged on petals exposed in four directions.

Order numb.	DQA057	
	Principle	Conductimetric
	Measure	Presence of water
	Output 1	100 mV present, 200 mV absent
	Output 2	Open collector 100 mA 40 Vmax
	Operative temperature	-15÷ 50°C
	Power supply	10÷14 Vdc
Accessories	**Order numb.**	
	DYA049	Mast-mounting device for ø 45÷65 mm pipe
	MN1071	Cable

Rain gauge

A rain gauge is a sensor to measure rain quantity. The external body is made of anodized aluminum. The measurement device is composed of a collector cone and a bascule connected to a magnet that operates one reed switch, which generates impulses: each impulse is equal to 0.2 mm of rain.
The rain gauge is normally ground-mounted by means of a base plate. DQA130.1 is expressed designed for the measurement of the rain intensity, its calibration curve is stored inside the data logger in order to obtain the best accuracy at every intensity.

Order numb.	**DQA130.1**	
Rain gauge	*Principle*	Tipping bucket
	Design	WMO accordance
	Diameter	200 mm
	Inlet area	324 cmq
	Resolution	0,2 mm
	Uncertainty	Intensity 0÷1 mm/min: ± 0,2 mm Intensity 1÷10 mm/min: 1%
General information	*Output*	Pulses 0,5 A/24V non inductive
	Housing	Aluminum

Doppler 24 GHz radar disdrometer

Sensor to measure precipitation type, quantity and intensity. The water drops are recorder by a Doppler 24 GHz radar. The rain intensity is measured by the drop speed and dimension. Precipitation type is indentify by the falling speed. Sensor gives the following information:
- Precipitation type (rain, snow, ice, hail.
- Precipitation intensity
- Precipitation quantity

Order numb.	**DQA355**
Principle	24GHz Doppler radar
Measurement unit	mm/m², mm/h
Measurement range	0÷200 mm/h
Rain drop dimension range	0,3÷5,0 mm
Hail dimension range	5,1÷30 mm
Rain quantity resolution	0,01, 0,1, 1 mm/m²
Precipitation type	Rain, snow, ice, hail
Reproducibility	Typical > 90%
Serial output	RS485 2 wire half-duplex
Pulse output for LSI LASTEM data logger	N.2 pulse outputs: 1) Precipitation quantity 2) Precipitation type
Power supply	24 Vdc (22÷28 Vdc)
Power consumption	<100 mA (heater not included)
Heater	30 VA
Environmental limit	-40÷60°C, 0÷100% UR
Protection	IP66
Cable	L = 10 m included
Mounting (included)	Arm for 40-80 mm pole diameter
Dimensions	D = 90 mm L = 220 mm
Weight	4,5 Kg

Accessories
Agrometeorological monitoring systems

To every type of automatic weather station described in the “sales kit” some accessories are needed to complete the assembling. Every accessory is selected according the specific requirements.

IP65 enclosures for outdoor data logger protection in fix applications

For continuous, long-term or outdoors operation the data loggers are normally installed inside IP65 protection boxes for protection against water, dust and atmospheric agents; each case contains also a specific power supply system. The case has also room for communication devices to be chosen from the above list. Each box can be supplied with an arm for pole or wall installation.

Order numb.		
ELF226		IP65 box complete with (4 Ah) rechargeable batteries and solar panel 5 W mounted on the front panel
	Dimension	340x270x140 mm
	Weight	8 Kg
	Compatibility	M-Log, E-Log, R-Log
DYA079	*Support*	For 45÷65 mm diameter pole

Remote comunication devices

To connect data loggers to PC via RS232 cable in every set of M-Log, includes one serial cable and DEB515 USB adapter.
In order to connect longer cable (up to 1 Km) between data logger and PC it is possible to use RS485 interfaces. TCP/IP connection on the Ethernet network permit to send data from data logger to PC within the Ethernet local network or connected by Internet.
For long distance connections, a GSM/GPRS modem is also available. GPRS can push ASCII data to standard Windows/Linux FTP servers or, using CommNETEG software by TCP/IP, to an LSI LASTEM GIDAS database. With GSM protocol, a remote PC using 3DOM or CommNETEG software polls the data logger to retrieve stored data. Those devices can be mounted inside the ELF box.

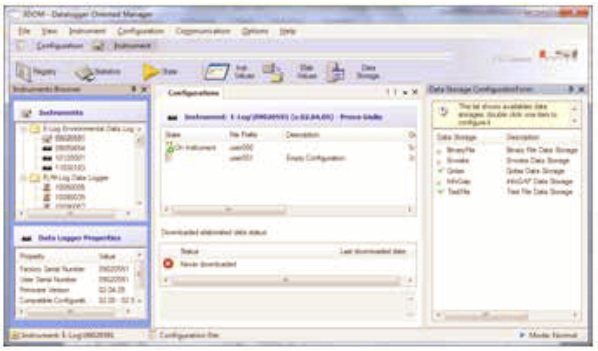
Order numb.		
DEA718.1		GSM-850 / EGSM-900 / DCS-1800 / PCS-1900 MHz Quad-Band. GPRS class 10
	Operative temperature	-20÷70°C
	Power supply	9÷24 Vdc from data logger
	Power consumption	Sleep: 8 mA During communication: 110 mA
ELA110.1	*Cable*	Connection cable between M-Log and DEA718 modem
DEA550		Universal port device server. RS232-to-Ethernet converter
	Serial speed	75 bps to 230 Kbps
	Hardware flow control	RTS/CTS
	Software flow control	Xon/Xoff
	Network interface	10/100 Base-Tx Ethernet with RJ45 Ethernet connector
	Address	Support static and dynamic IP address
	Operative temperature	0÷50°C
	Power supply	9÷30 Vdc
	Power consumption	Communication: 300mA @ 12V (max) Idle: 120mA @ 12V (max)

PC Software

LSI LASTEM suggests different solutions to manage data on PC:
- Every data logger includes 3DOM program
- Programs for data communication, data display and data management on PC: GIDAS, Xpanel, CommNET
- Web solution. Data are received on a web application managed by LSI LASTEM

3DOM

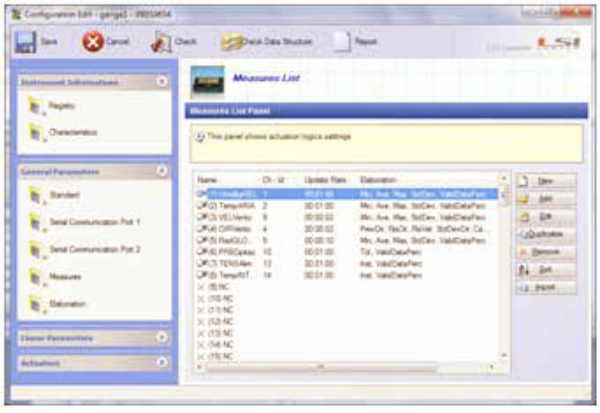
Software for data logger setup, diagnostics and data downloading. It is included free of charge in any M-Log, E-Log and R-Log MASTER package.



Main

- Editing new data logger configuration;
- Data logger configuration import&export;
- Edit data logger channels (add/remove sensors) and properties;
- Edit data logger storage mode;
- Edit data logger output mode;
- Edit data logger communication properties;
- Data storing into ASCII or SQL formats, also via GSM modem and TCP/IP;
- Data logger clock synchronization;
- On-line data display.

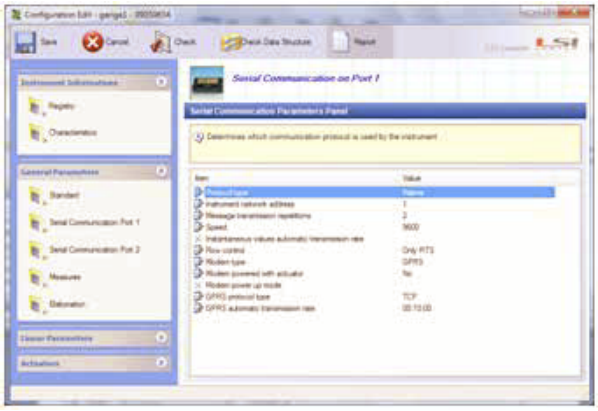
interface - **Data logger oriented manager**



Data logger channel configuration

- Add sensor from a list of LSI-LASTEM sensors; edit sensors configuration;
- Create a new third-party sensor configuration.

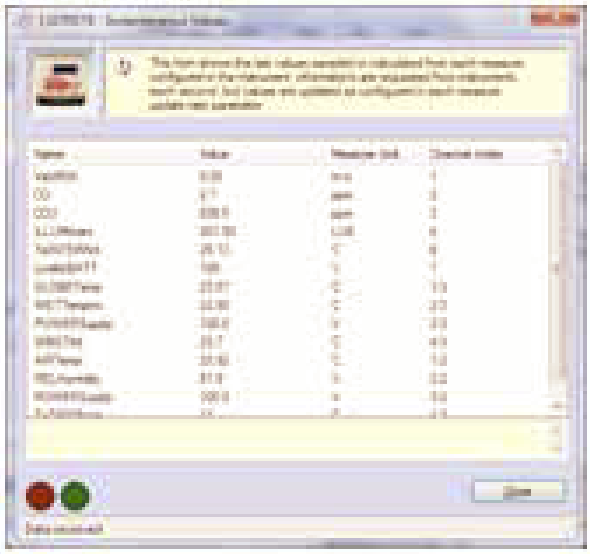
interface - **Configuration edit**



Communication setup

- Data output communication protocol setup (Native, Modbus, TTY);
- Data output mode (push or pull mode);
- ZigBee radio channels setup;
- Connection to host setup (GPRS, FTP, TCP/IP parameters).

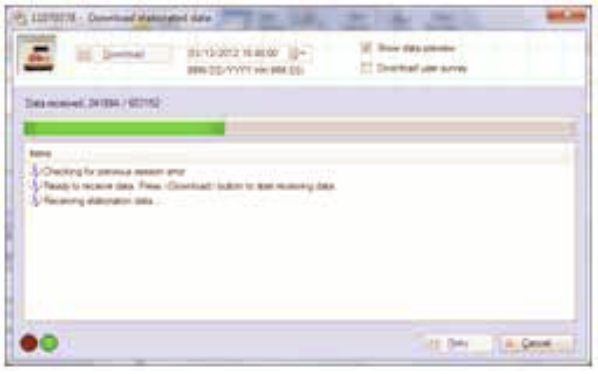
interface - **Configuration edit**



Data communication

- Data downloading in manual mode;
- On-line data display.

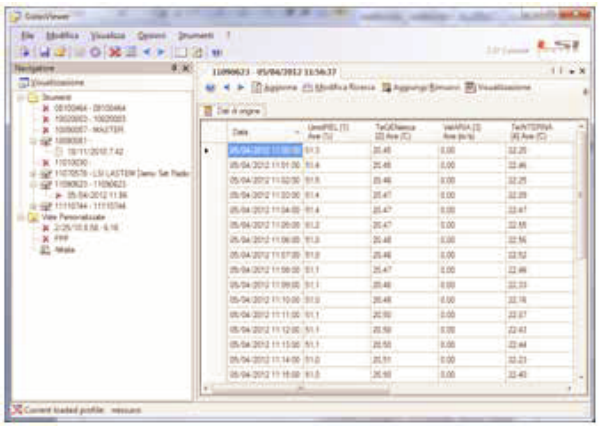
interface - **Instantaneous values**



interface - **Download elaborated data**

SQL-GIDAS VIEWER

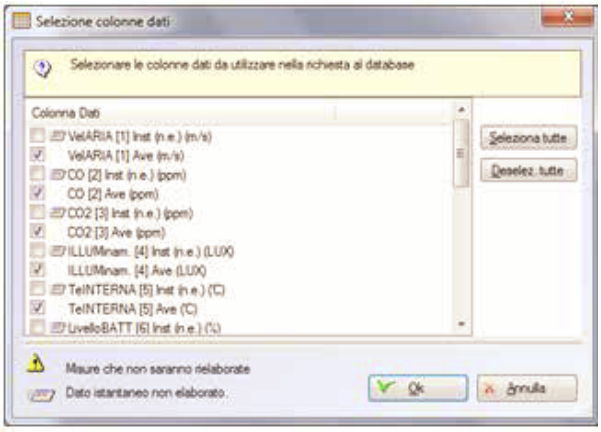
Gidas Viewer is a post-processing solution that allows for data display, management and analysis of the data downloaded by 3DOM and CommNET programs. The user can access data in various tabular and chart form (including Wind Roses), process data using different time bases, joint together data and instruments. Gidas Viewer is based on a powerful SQL Database for better data security and management, including tools for data backup and storage.
Gidas Viewer SQL database can be installed locally or in PC networks and it is also accessible from third-party software for custom-made software applications and web data display.



interface - **Gidas viewer**

Main

- Instrument browser, including all data loggers and surveys for easy data selection;
- Selection of one or more time base for displaying statistical data;
- Reports (table and charts) with measurement selection;
- Wind rose option for wind analysis (including Weibull analysis);
- Export data to ASCII table and Excel;
- Fast data query recall for easy reports update using fresh data.

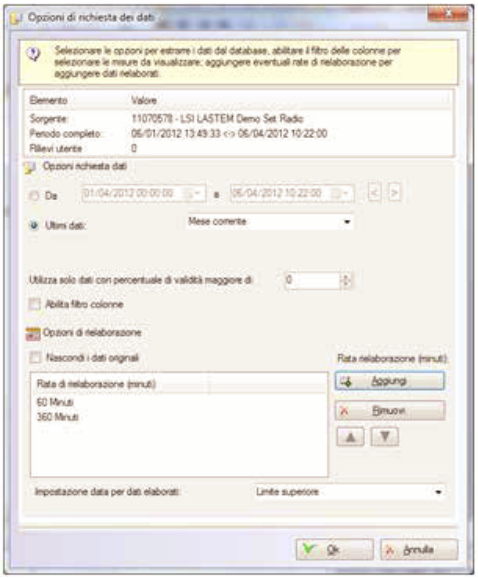


interface - **Data selection**

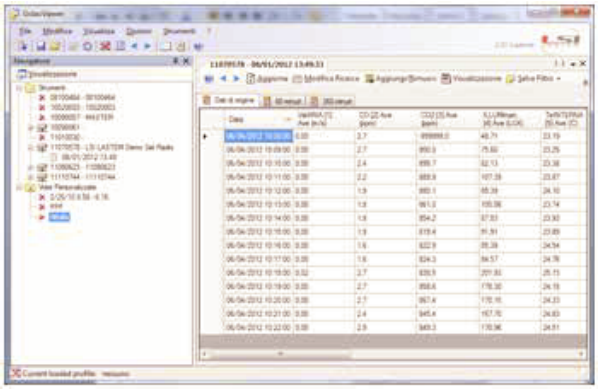
Data selection

- Data selection by date;
- Selection of one or more elaboration time base;
- Selection of measurements to be placed inside the report.

continued



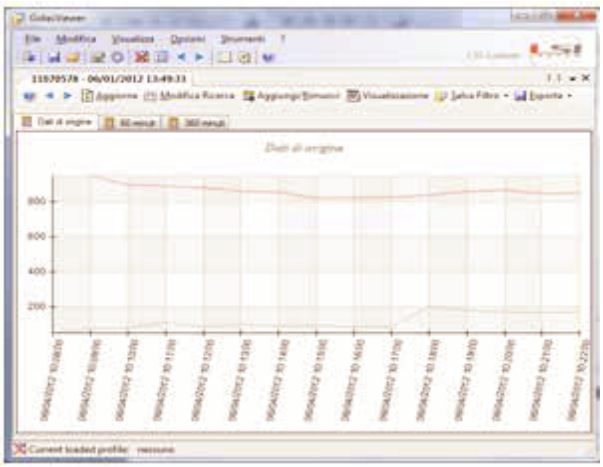
interface - **Data selection**



Data reports

- Table;
- Charts: zoom scroll;
- Export: ASCII ed Excel;
- Wind rose;
- Weibull analysis.

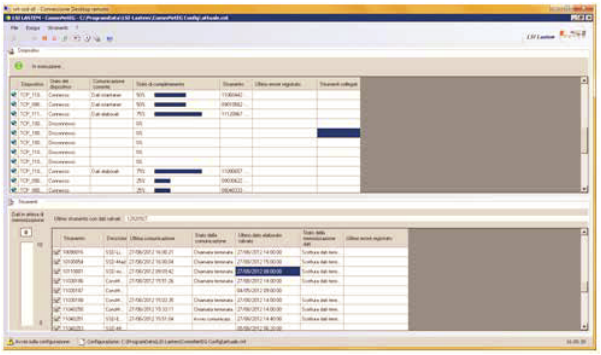
interface - **Data report**



interface - **Data report**

CommNET-EG (BSZ306)

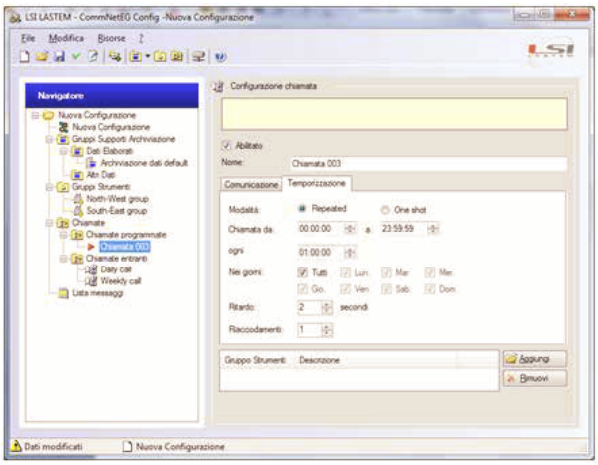
CommNetEG is the solution for automatic data download from LSI LASTEM data loggers to PCs and Servers. CommNetEG can manage several simultaneous communication channels and protocols, including parallel serial COM, PSTN, GSM and GPRS modem, VHF/UHF radio and TCP/IP.



interface - **CommNET-EG**

Main

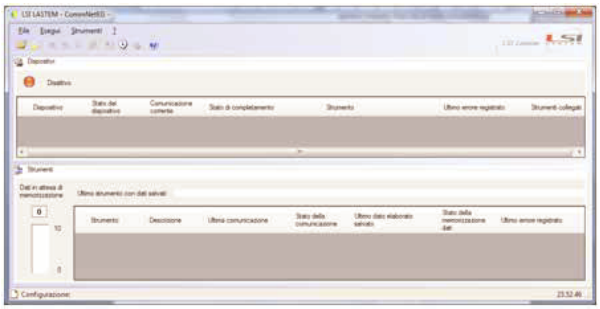
- Data downloading from one or more data loggers in automatic mode;
- Simultaneous use of different communication devices (VHF/UHF radio, GSM, GPRS, LAN, USB, RS232 cable) using different communication channels;
- Data storing in several formats, including ASCII files, SQL databases and Binary for successive data management with SQL-GIDAS Viewer, XPanel, SYNOP, Evapotranspiration, TEA Thermal Environment Application, InfoFlux programs;
- Cyclical data download at programmed times or on operator's request, from one or more instruments (or groups of them).



interface - **CommNET-EG config**

Configuration module

- Setup module to program all the communication parameters;
- Wizard tool for procedure configuration;
- Group of stations each using its own communication parameter: device, day/time starts, repetitions;
- Communication devices setup;
- Data storing formats setup: ASCII, SQL-GIDAS, SQL-ENVIEW, Binary, formats;
- PC and data logger clock synchronization;
- Switch-off data logger communication device after data communication;
- Save one or more configurations.



Operative service

- Communication statistical analysis;
- Selection of the configuration to be used;
- Events log book;
- Start/Stop communication;
- Manual calls.

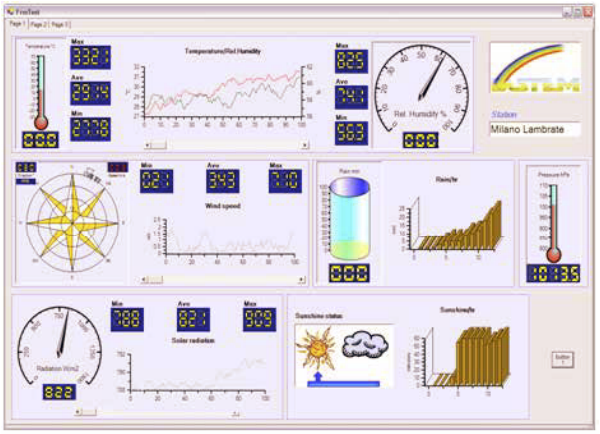
interface - **CommNET-EG config**

Modulo GPRS

- Entry calls from data logger by GPRS modem in “push” mode.

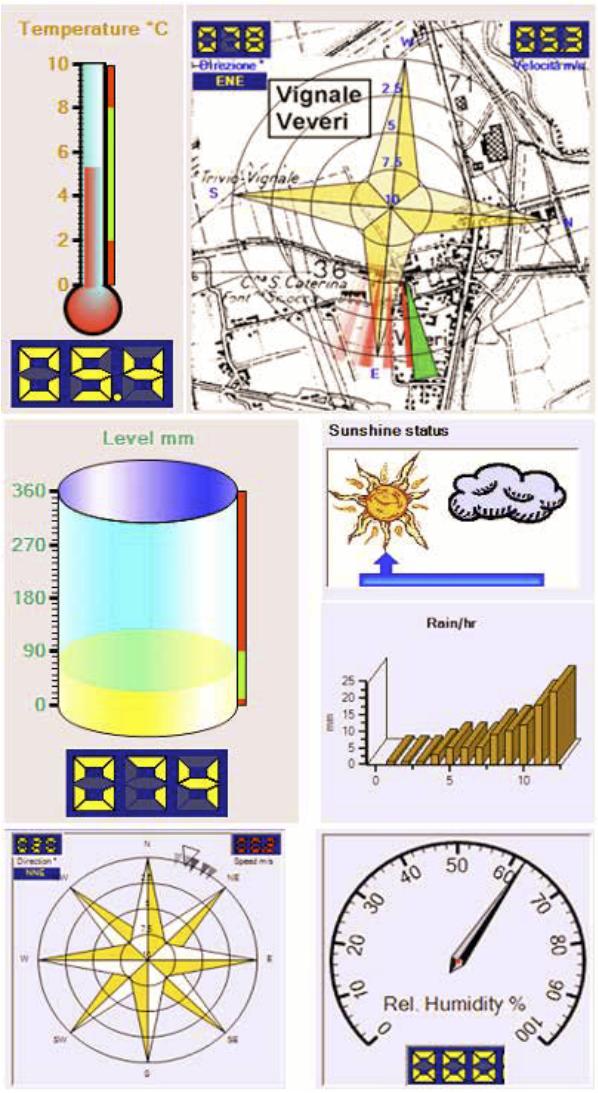
XPanel

XPanel is a dashboard of the dynamic data for LSI Lastem data-loggers. XPanel includes a communication module for data exchange and update and a display module to create real-time dashboards.



Main

- Digital and numerical controls referred to every measurement, Including dynamic wind rose;
- Real-time charts of the last “n” instant values;
- Alarms features;
- Running over many PC of the network using same data base;
- Auto-change multi-page.



Controls

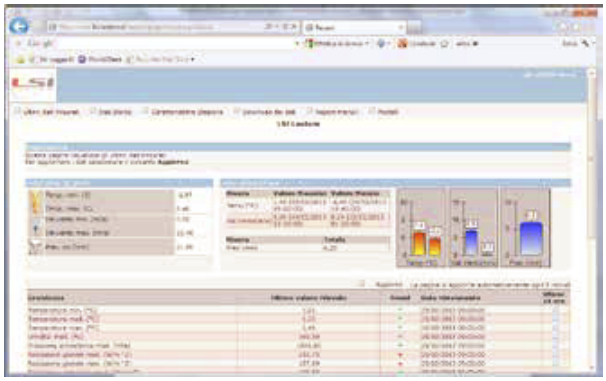
- Instant values controls;
- Wind rose with background map;
- Single or double charts with scrolling feature;
- Visual alarm setup.

LSI LASTEM **web** application

Technical features

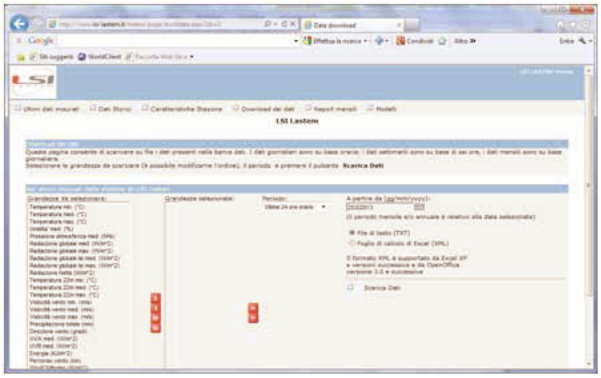
LSI LASTEM **web** application (DZZDAT3)

Our web solution allows the user to access data acquisition unit information from his preferred platform and from anywhere in the world. The web application as well the data communication to the application is managed by LSI LASTEM, which supplies this service under subscription. LSI LASTEM web application is only available for data acquisition systems with GPRS data communication (user should procures a SIM data and check the GPRS coverage) or TCP/IP option. It is possible to check real-time data, get daily, weekly, monthly, yearly reports or download data in open formats in a simple and effective way. The solution provides real-time data publication (10 minutes update) for any registered weather station. You can access your database, get complete reports and download them in ASCII and Excel tables any time.



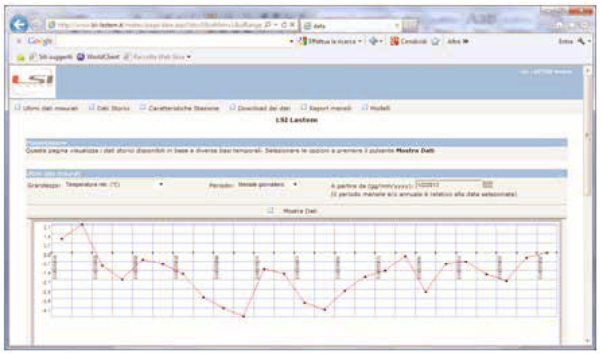
Main

- Data communication from data acquisition unit to web site by GPRS or TCP/IP. For GPRS user should sign a contract with a local telephone service provider. For TCP/IP communication weather station should be connected to an Ethernet LAN with a proper setup.
- Map including data acquisition system's information;
- Data acquisition system's information: site information (name, coordinates, altitude, etc), pictures, sensors list and features.
- Last measurement received: from the data acquisition system and quick connection to the charts and tables of the selected measurements.
- Dashboard with Max./Min values over 24 hrs and 10 days about temperature, total rain and wind speed
- Data Reports on charts and tables.
- Wind rose along with wind distribution table (wind speed classes and wind direction sectors).
- Data downloading on TXT and XLS formats
- Pasquill atmosphere class option when global irradiance and net radiation are available.
- Turc evapotraspiration reports when global irradiance is available.
- Possibility to protect the access by User's name and Password



Database

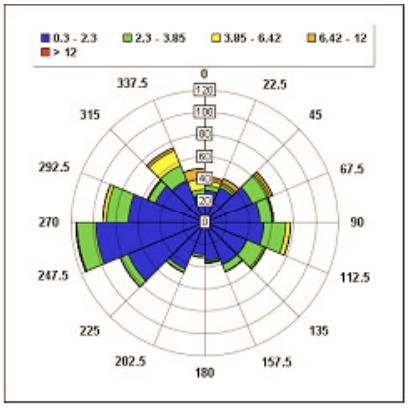
■ Data download from the web application database in ASCII and XLM formats using hourly, daily, monthly selection.



Data reports

■ Data Reports with selected measurements: hourly, daily, monthly, reports in the form of printable tables and charts are available.

■ Wind rose is available along with wind distribution table (wind speed classes and wind direction sectors).



SETTORI GRADI	V1 (< 0.3)	V2 (0.3 - 2.3)	V3 (2.3 - 3.85)
0.0 - 22.5	0.00	14.39	0.00
22.5 - 45.0	0.00	14.39	0.00
45.0 - 67.5	0.00	21.58	0.00
67.5 - 90.0	0.00	43.17	0.00
90.0 - 112.5	0.00	64.75	0.00
112.5 - 135.0	0.00	50.36	0.00
135.0 - 157.5	0.00	86.33	0.00
157.5 - 180.0	0.00	79.14	0.00
180.0 - 202.5	0.00	14.39	0.00
202.5 - 225.0	0.00	71.94	0.00
225.0 - 247.5	0.00	172.66	0.00
247.5 - 270.0	0.00	165.47	0.00
270.0 - 292.5	0.00	7.19	0.00
292.5 - 315.0	0.00	50.36	0.00
315.0 - 337.5	0.00	57.55	0.00
337.5 - 360.0	0.00	35.97	0.00
VARIABILI	0.00	0.00	0.00
CALMA DI VENTO	50.36	0.00	0.00
TOTALE	50.36	949.64	0.00