

outdoor

Systems Agrometeorological monitoring systems



Milano ITALIY

|||| MW9045-ENG 07/2014



r stations

Agrometeorological monitoring systems

Meteorological stations with data logger, sensors and data management for agriculture applications.

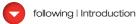
In agricultural applications, a timely measurement of meteorological data is of the utmost importance. The use of data obtained by interpolation over large areas, for example using satellite monitoring, is not always desirable as they lack the required resolution. Specific monitoring stations installed in the area of interest and equipped with all the sensors for the definition of dimension and localization of weather conditions is a more effective approach, specially when it comes to agricultural risk management and insurances.



LSI Lastem has developed weather stations equipped with the sensors for the analysis of the meteorological event in the agro-meteorological field.

Solutions can be customized according to the territory, the type of crops and the parameters to be monitored.

C





Monitorable meteorological events

surface.

or intensity.

Hail



Water frozen in the higher atmosphere and precipitating to the ground in the form of ice grains of different forms and size.

Lowering of temperature below 0 °C due to the presence of cold air masses and/or dew freezing, water vapor sublimation on crops

Frost-Hoarfrost



Strong Wind



Reaching at least the 7° degree of Beaufort scale (speed equal or higher than 50 km./h - 14 m/s), limited to the mechanical effects directed towards the insured crop.

More or less regular or violent movement of warm air masses that may cause negative effects to the product due to its duration and/

The occurrence of the direct impact of sun rays under the effects of high heat (temperatures of at least 40 °C) that due to its duration and/ or intensity, based on the phenological stage of crops, has critical effects on plant physiology with consequent damage of production.

Sirocco Winds



Sun stroke



Thermal Stress



Heavy Rain

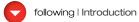


Thermal Stress is defined as a sudden change of temperature that, based on the phenological stage of crops, due to its duration and/ or intensity, has critical effects on plant physiology with consequent damage of production. This extraordinary phenomenon must result, with reference to a daily thermal period (night, morning, afternoon), in a significant decrease or increase in temperature for at least 7 hours, as compared to average temperatures, for the same daily

thermal periods, of the days preceding and following the event.

Heavy Rain is defined as the excess of water on the ground caused by long-lasting rainfalls, meaning by this definition the rain exceeding of 50% the average calculated over a period of ten days, or rainfalls of particular intensity, that is, rain falls equal to at least70 mm of rain in 72 hours that, based on the phenological stage of crops, resulted in damages to the assured productions.

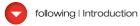
LSI LASTEM S.r.I





Meteorological quantities to be measured according to the analyzed event								
	Hail	Frost Hoarfrost	Strong Wind	Sun Stroke	Sirocco Winds	Thermal Stress	Heavy Rain	Drought
Temperature		٠		٠	•	٠		•
Humidity				9	9	9		
Wind Speed		٠	٠	٠	٠	٠		
Wind Direction			٠		٠			
Rainfall	•						٠	٠
Global Radiation				۰	•			•
Soil Temperature		•		•	•			•
Leaf Wetness								







www.lsi-lastem.com

	Hail	Frost Hoarfrost	Strong Wind	Sun Stroke	Sirocco Winds	Thermal Stress	Heavy Rain	Drought
Precipitation radar/ present weather sensor	٥						۰	
Surface Temperature						٠		
Contenuto idrico terreno								٠



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 in needs. even 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 highefficiency 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 longterm 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:

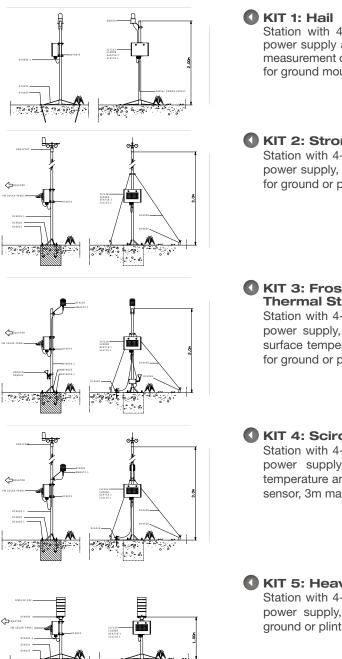
- Cellular telephone network: GSM modem;
- GPRS network: GSM/GPRS modem;
- LAN/WAN network: TCP/IP Converter
- Radio UHF

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.



LSI LASTEM proposes different configurations included in specific sales kits.



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 2	KIT A	KIT 5	KIT 6
Code	Description Data Logger		KII 2	KII 3	KII 4	KII S	
	Data logger 4 inputs, 12 Vcc power supply, 2						
ELO008	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		•	•	•	•	٠
ELF222	IP65 box for data logger housing. 220 Vac power system included.	٠					
DYA074	ELF226 box fastener to diam. 45÷65 mm mast	•	•		0	•	•
	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			٠	٠		۲
DYA230	Anti-radiation screen for DMA672.1 sensor			0	0		0
DYA049	Collar for DYA230 screen fastening to diam. 45÷65 mm met mast			•	0		۲
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					0	0
DYA040	Support to secure the pluviometer on top of mast					۲	
DWA510	10 m cable for pluviometer					0	9
	Mast			No	te 1		
DYA005.1	Met mast H=1,5 m. Ø 50 mm	•				•	
DYA006.1	Met mast H=2m. Ø 50 mm			0			
DYA010.1	Met mast H=3 m. Ø 50 mm		0		0		
DYA020	Tripod base to mount \emptyset 50 mm met mast on a concrete plinth	0					
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		0	0	0	0	9
DYA023	Set of 3 stakes to secure DYA021 base to the ground				0		0

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		•	۹			٠
DYA026	Set of 3 stakes to secure guy wires to the ground		•	•	•		
	GSM/GPRS modem						
DEA718.1	GSM-GPRS Modem.	0		0			
ELA110.1	DEA718.1 modem connection cable to data logger	٠	•	•	•	•	
	TCP/IP Ethernet Converter			Not	e 2		
DEA550	RS232-Ethernet Converter						
	PC Applications			Not	e 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	٠	•	•	•	•	0

- 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÷83	33 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	M L e e (El	2 kΩ potenziom.
Data logger compatibility		R-Log (I	O007-008) ELR515) I 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. The water drops 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

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/m ²
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 quantity2) 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





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 ETD or connections)

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- GPRS class 10	1800 / PCS-1900 MHz Quad-Band.
		Operative temperature	-20÷70°C
	dE-	Power supply	9÷24 Vdc from data logger
	prog	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. R	S232-to-Ethernet converter
		Serial speed	75 bps to 230 Kbps
		Hardware flow control	RTS/CTS
	OB	Software flow control	Xon/Xoff
	- Cr	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)





- 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.

in yaa balaana Galgan Galganian Qi balaanan Jiham Qinnan					
tweet have 1 x	Configurations		N = 11	Deta Benage Conto	
2 ⁴ Salayoutta	-	0101 (+ 82.04.01) - Hann Sada		S Salada	ne academic data Note data anno tinto ta
y minoto ■ minoto ■ crimito ■	Ann In Fain An Internet and Mi and Mi	Demokrin Franç Cartganeter		See Innys - Brenfo - Break - Gales - Hidae - Hidae - Hidae	Securities Invest for Data Konge South Data Konge Data Data Konge Held Data Songe Natifie Data Songe
ant Data Lappor Properties	Domitated aldorated also speci-				
Topets Mail *	Deter O Terris Dominaliei	Lat the set	al data		
ine Serai Roster (20220) Innane Jetan (2034) Sergettin Collgani, 2020 (273 -	110		1		
and the second s			-	*	-

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





Continuent Informations 🔹 🕈	Senial Communication on Port 1	
R. Super-	Sector Communication Discontents Dynal	
Datacientes	(3) Deserves about communities present is used to	(be initiated
Central Parameters	The	104
R Saider	Protocol albert	
teral Connuescent Part 1	Hereage the accessor ingrafficme	3
2.0	 Spent Velastanun olum automati Veraneaun eta 	1400
Send Companies Put 2	2 Rosentaria 2 Roberture	DAY MTS DAYS
R. Assessed	Chains pressed with actualize	No.
	31 Hoden privet up mode (2+ 5/14) protocol taxe	17
B. Denner	5 SPRS adverate transmission rate	- 100 113 (00
and factories 0		
and fathering		

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

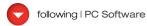
Tapen .	14.0	Photos Int.	- The first states	
Augustus.	100	100	14	
00	32	1000	18	
000	100.0	1000	1	
12.0Minut	100.00	100	380 C	
Automation .	26.12	1.00		
Contraction 11	100		141	10
W.Mittee-	4947	1.1	244	
Williams.	100 March 100 Ma		30	
Printing .	10.5	1.0	199	
980764	141 141 154	1.4	048	
All'anni Millionne		12.1	10	
10,000	304	1.0	1.000	
CONTRACT.	9818		1.84	
International Action	11.			

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.

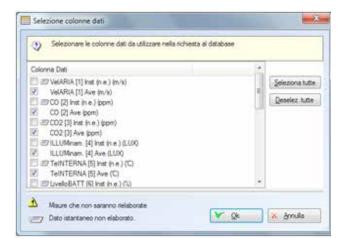
Gidas Viewer SQL database can be installed locally or in PC networks and it is also accessible from third-party software for custom-made software applications and web data display.

ik i i i i i i i i i i i i i i i i i i						11
T Vestimation		090623 - 05/04/3013		The second second		11+3
Ci hores		* + Bythese		on Hullands		
 A ODITODALA - DITODALA A POLIZIAZI - NECHOLINA 	1	and original				
- X 1000007-50401984		Dete .	Geodelis (1) Ave (5)	TacQENamor 30.499/ICI	Valid (A.) () Ana (A.)	Feinitzenki (Kirkerts)
-(5 18/1V208.742	٠	26-94-3812 11 (Brite)	81.8	35.48	0.00	32.20
- K 11010000 J SP 11070575 - US LASTER David Se Rate		15/54/2012 11:01:00	81.4	25.48	8.00	24
201 1100023 - 1100023 215 100020 1115 225 101004 - 1110104 202 1110144 - 1110104 202 110144 - 1110144 202 110144 - 111 202 11014 - 111 202 11014 - 111 202 11014 - 111		05/04/2012 11:82/02	818	25.45	8:00	32.25
		10/04/0012 11:00:00	81.4	2541	0.00	32.09
		25/04/2012 11:04:02	81.4	25.47	0.00	22.41
		15/94/2012 11 20:09	81.8	35.47	0.00	32.65
		25/94/2012 (1.06/02	4U8	25.48	1000	32.56
SL Mala		25/04/2010 11 57/39	818	25.45	8.00	12.11
		25-04/2012 11:50:00	81,1	25,47	8.00	12.48
		15-14-2010 11:09:05	91.i	35.48	8.00	武和
		15-54/2012 11:10:00	918	20.48	4.00	32.14
		00/04/3010 11 11:05	80.1	26.90	2:00	22.07
		8.94203111218	31.1	25.58	0.00	2241
		(5-5x 2012 11 15 55		20.58	8.00	22.44
		25/54/2012 11:14:05	61.0	25.81	003	32.21
		18-94-2012 11 18-02	81.0	26.91	0.00	23-41

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 - Gidas viewer



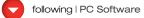
Data selection

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

Interface - Data selection



LSI LASTEM S.r.





U Opzioni di richiesta dei dati -Selezionare la opponi per estrarre i dati dal database, abilitare il fibro delle colonne per selezionare la resure da visualizzare: aggiungere eventuali rate di relaborazione per aggiungere dati relaborazi. 9 Bemerito Valore
 Sorperter
 11070578 - LSI LASTEM Demo Set Radio

 Periodo completo
 06/01/2012 13 49 33 <> 06/04/2012 10:22:00
 Rilevi utente 8 🖵 Opzioni Achiesta dati O De 01/04/2013 00:00 S- e 06/04/2013 10:22:00 S- € 0 Mese corrente . W Utim dat: Utilizza solo dati con percentuale di validità maggiore di 0 4 Abita fibro colonne 📰 Opzioni di relaborazione E Nascondi i dati orginali Rata relaborazone (mnuti) Rate di relaborazione (mnuti) ing galand 60 Minuti 360 Minuti × Bruov A Impostazione data per dati elaborati: Limite superiore 💙 Qe 🛛 λ gerula

In gate your poor	20					1.51				
longerer R.X	21070578-002	11/2012 13:49:33				11.0				
(T) provide particular of	# + > Ra	spins (D) Months P	ante Magners	Times I Ver	anness (2 14)	Fibs +				
II Cal Divert										
24 CE100464 - 02100464 24 - 340,70025 - 101,20025	E Det direpter	1 House 1 19 19 19	ryk)							
A. 1000007-444/104	Des	And BURN	CD 22 Ave Sent	DOT (2) Auto Bonis	KLUMinut HEAve LON	Direction (C)				
- N. 19090000	 A 95 (11) 	100 K 410 - 11	1.7	000000.0	48.71	23.79				
2-52 T107678-18 LAUTON Davie Sal Party TT 18/01/0512 T3 48	06060010	10 (9 (9 (9 , 9 10	1.2	990.3	10.80	23.25				
- GP 1.000021-1100021	18-04-2012	10.16.08 (0.00)	2.4	898.7	42.03	20.38				
a an tritter and the	16-0x 2013	10 11 05 0.00	2.2	102.0	107.08	33.67				
N COVIER No. 418	16-04-2013	1912.05.3.00	1.9	982.1	145.39	24.10				
-3 814	16-04 2013	10.15.05 (8.88	1.8	001.0	10.38	-13.54				
- * CTT	16-04-0213	10 14 05 0.00	1.8	894.2	17.23	- 23.30				
	16-54-2013	10.16.00.0.08	1.9	819.4	21,91	23.89				
	36-0x-0713	10.14.05 (3.18)	14	812.9	10.39	3434				
	06.04.070	1011100 0.00	1.8	834-3	86.57	24.78				
	06-04-0713	10.19.00 (0.0)	2.7	\$25.3	277.81	25.15				
	06-04-0013	10.19-00 0.00	17	3164	118.30	24.18				
	06/04/2012	10.20.00 (3.18)	2.7	067.4	120.00	2433				
	06-04-0212	40.21.00 0.08	2.4	Def.4	167.02	24.0				
	0606000	10.22.00 (9.88	2.9	342.3	120.96	24.51				

Constituent profile remeal

• 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.

	See 1									. 001-00-
	1.00	3.7								LH Lance
-										
-										
-	Date M.	Distance and the second	Test disardiments	line .	-	(his inclusion)	di. Stant	-844		
Ha	Contents	Deliniatese	905	1106	add .					
100	Certeros	Delaterer	905		842					
111.	Correct	(Lateration)	75	1112	16.7			1		
100.	Durrent		01							
100	Deservers		84							
100	Decements.		10.				1	1		
112.	Courses.		10.							
112.	Desirent.		88.					1		
tts.	Correcto	(0.al.mitrosh	712	1100	00			1		
-	Correct		214	0000	8.22			1		
-	Cargonia		211	26.4	000			1		
-										
11	Otherstein	a con del talvat	(Marriel)							
	-			The second second		an alabada 11	Stati and		8/	
	-		Other constitutions	100404-0004	10.00		API	State and agreet.		
	52 1838016	9844	22406/2022 14:00.21	Chanage terrature	(2MBy3	ST2 14 00:00	Scotture deb terror		14	
	12 10 00 h	512-Mar	21/06/2012 16:00.04	Duanary terranary			Sorban dati tere.		1	
	52 10110001		21 (96/2012) (99/01-42)	Dignates tentinates	214842	91218 0030	Soldan bili tere.		C	
	12 11030 B		21,460,001,140,001,06	Chanana temphaha			Sushan Million			
	12 TTODEC	Canally,			04/05/3	01228-0000				
	52 (100010)	Dedit.	23 KBA2 (1920-36	Charles lenses	21/00/3	01214-00-00	Guiltaina ana inne.			
	SP rokets	Cover.	27/06/2012 10:3217	Disatutio ternetata	1160	PT214.00.00	Scalius dal test.			
1.0	Set House		21486-0013 10:37-04	division in the state	21/9/3	012144036	Summer that seen.			
	GPL Y LOUDER	1000.44				1218-100				

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).



Novigatore	12 Configuratione chiamata	
Ruova Configurazone Gruppi Supporti Archiviazone Des Baborat	Ableste Norse: Oxerseta 003	
Atr Das Grupp Stuments	Comunicatione Temporizazione	
Nort-Wet group South-Rat group Constate Constate programmate Constate progr	Modalità IPipealed © One shot Chanata de ogri 00.00.00 (b) a 21.95.95 (b) (c) a ogri 61.000 (b) (c) a (c) a 21.95.95 (c) (c) a Ne goni (c) a (c) a (c) a (c) a (c) a (c) a Ne goni (c) a (c) a (c) a (c) a (c) a (c) a Ne goni (c) a (c) a (c) a (c) a (c) a (c) a Ne goni (c) a (c) a (c) a (c) a (c) a (c) a Plands: (c) a (c) a (c) a (c) a (c) a (c) a Placedosenetti (c) a (c) a (c) a (c) a (c) a (c) a	
	Gruppo Strumenti Descrizione	Carlos Contra
		a Binuovi

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.

Interface - CommNET-EG config





postyr							
Departie	Date del	Conunicatione	Sato & consistements	- Date		Ubeo eros esperato	Storent colegan
ADDRESS.	dendire	Lanerte	Sole & Conferences			Card and age at	Normal Condition
							1.1
Buret							
(er attena å Hortssattene	these answered over						
0 10	Buretti	Description	Utera conuncatore	Staty della comunicazione	Utrov data elaborativ selvato	Tatu tela menorizzatore Utro dat	anse repitrate
1							

Operative service

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

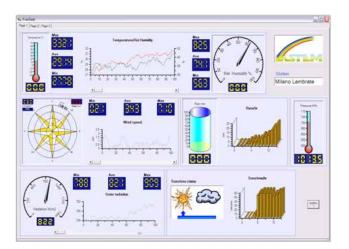
• interface - CommNET-EG config

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.

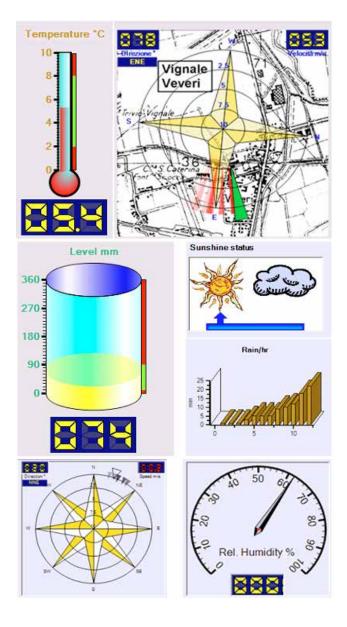


Main

- 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.

Technical features



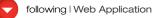
LSI LASTEM web application (DZZDAT3)

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.

				and a
10 million between sur-		- 21.27 (Front	-	
Also get		*		- Anto
Charged Quinter Ch.	and the first of the			
51				
decarineer, Planaeri, 1	Constraints de	non "Personal de las "Prinser result". 187 Lastere	here:	
		1.2550.35		_
CONTRACTOR AND A PROPERTY AND				_
the appropriate of the stationary of these	orio Applicant			
Street and a stre		CONTRACTOR AND		-
And Responsible	4.01	Steams Values Transition Taking Trans		
Concernent State	1.41	Terrar (14)	AL MY	1
The paper and Julia	10.14	on constant of the particular is not played.	ALL AND ADDRESS	1.20
1 Inian tai ing	15.44			
The second second	1.00	Marte Debis		
ff ()				1
			Targe PEC and restations of	Page 10471
		1.0	Assisted (a paging a specific patients)	And the spectrum of
Ereblene ()		Minus valant Manufa	Street State Manhatestre	Maren.
Remaining the Child		141	 (Pallet (Pall) (Palling) 	
		4.20	 Distant period de character Distante period de character 	
Tanianities risk (NI)				
Despective rise, PTL		1.45		
andra pat (N)		international and	A PART MET AND AND A	
and a set of the		19639 (1964,56) (1967)	A 10 100 00 000 A 10 100 00 00 A 10 100 00 00 A 10 100 00 00	
under site [6]		1982.50 URV.AN	A PA NO SEEY CONTINUE A PA NO SEEY CONTINUE	

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





					a = 1D
a service a service of the service o		feltion million	P+OX Deet	and a second	0.00
Google			• 🔙 inena	la manua + 🍁 + - 🎇 Canadoria 🔄 - Alta 20	144.4
E In argues @ WorkChert #	(hereite t	action .			
51					
then dati mawat 🛛 🕄 Dati Merus	- cer	tiaraticha Danary 🛛		nendi 🧮 Radali	
			LSI Lastern		
			1111 / 011111		
			14 A	a service : that sufficiently some to have it and eres, I dail man	14
Questa pagna consente di scansere portaliara.	e ma the rule	e) present rails barry de	1.1 dat gerralar sore to be	a pracie: 1 diel auffirrarii euro da base di se are, 1 del mar	will some my have
Selectoriers is grandeeps its scattor	en (b.anad	ale mobilizative Fondow),	I periods a premium il pulseri	Scattca Dati	
In the second particular of the large second second					
Generalages its selectorers:	-	Grandaute selacionate)	Periode	A partie de (aglerit/wys):	
Temperature net (10)			10me 24 pre-mark *	Inapera ED	
Tempiningfula Assi (*C)				Il partolit menale alle annuale è resetut alle date selle	
Temperature res: (*E) (resider resid (*E)					
Temperature reas (%) presider real (%) Pressure attractions read (%%)				# f(e # tests (TXT)	
Temperature res: (*E) (resider resid (*E)					
Temperatura nasi (%) presidar nasi (%) Presidence anterestretas nasi (%%) Reductore pintes nasi (%%%) Reductore pintes nasi (%%%) Reductore pintes nasi (%%%)				# He il tasto (TXT) © Aujio il valuali il focal (19%) E formato XM, 4 augustato da focal 3F	
Temperature mass (%) (metalar med (%) Pressure amountence heat (%%) Radiacime globan mas (%%*) Radiacime globan mas (%%*) Radiacime globan mass (%%*) Radiacime globan mass (%%*)				 B File is teste (TXT) ○ Pople it colors: if their (OPL) 	
Temperature main (*1) pressione atmosferme read (*144) Realizatione plotper read (*1447) Realizatione glotper read (*1447) Realizatione glotper temperature Realizatione (reade to main (*1477)) Realizatione (reade to main (*1477)) Realizatione (reade to main (*1477)) Realizatione (reade to main (*1477)) Realizatione (reade to main (*1477))				# F(+ it tests (157) ⊕ highs it calcula it (sour (199c) thermals XPL 4 seasonfable dis Excel 39° evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia	
Temperature may (11) present may (14) present atmosferer and (144) franceine plants and (144) franceine plants and (144) franceine plants and (144) franceine plants france (142) franceine plants (144) franceine plants (144) franceine plants (144) franceine plants (144) franceine plants (144) franceine plants (144)				# Fire at testin (TXT) Projin At saturation At Social (SPK.) Interestin SPK. 4 supportatio dis Xecal SP services accessore at all Code/Office	
Theoperature rate (TE) prevent and (TE) Prevent annucleose end (Net) frequencing planes real (Net?) Reductive planes real (Net?) Reductive planes for real (Net?) Reductive planes (Net?) Respective Sciences (Net?)				# F(+ it tests (157) ⊕ highs it calcula it (sour (199c) thermals XPL 4 seasonfable dis Excel 39° evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia	
Theoperature new (TE) Theoperature and (TA) Theoperature and (TA) Theoperature and (TA) Theoperature and (TA) Theoperature and the term (TA) Theoperature and (TA) Theoperature and (TA)	8		a :	# F(+ it tests (157) ⊕ highs it calcula it (sour (199c) thermals XPL 4 seasonfable dis Excel 39° evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia	
Theorem starts near (25) Theorem attractions and (344) Theorem attractions attractions Theorem attractions attractions Theorem attractions attractions Theorem attractions attractions Theorem attr			8	# F(+ it tests (157) ⊕ highs it calcula it (sour (199c) thermals XPL 4 seasonfable dis Excel 39° evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia	
Temperature may (12) present res (1) Present address and (1)(12) Reserve address and (1)(12) Reserve passes and (1)(12) Reserve passes and (1)(12) Reserve address address address Reserve address address Reserve address (1)(12) Reserve ad	1000		8	# F(+ it tests (157) ⊕ highs it calcula it (sour (199c) thermals XPL 4 seasonfable dis Excel 39° evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia	
Temperatura mai (2) menana menafera na (2) menana menafera na (2) menana menafera na (2) menana menafera na (2) menana m	0000		8	# F(+ it tests (157) ⊕ highs it calcula it (sour (199c) thermals XPL 4 seasonfable dis Excel 39° evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia	
Theorem and the results of the interaction and the control of the interaction and the control of the interactions and the control of the interactions patients are any (Wer-2). Interactions patients are any (Wer-2) interactions patients are any (Wer-2) interactions patients and the interactions patients and the interactions patients and the interactions patients (Wer-2) interactions (Wer-2) int	1000		8	# F(+ it tests (157) ⊕ highs it calcula it (sour (199c) thermals XPL 4 seasonfable dis Excel 39° evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia	
Temperatura mai (2) menana menafera na (2) menana menafera na (2) menana menafera na (2) menana menafera na (2) menana m	CCCC		8	# F(+ it tests (157) ⊕ highs it calcula it (sour (199c) thermals XPL 4 seasonfable dis Excel 39° evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia evenum companies a site of ColeCifyia	

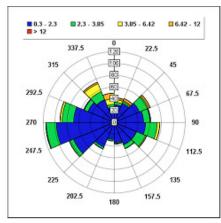
Database

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

a a martine to before a	Trains Star File and Star	And Balling P - C X	E 144	- 107	A38	- Contraction of the Contraction
Gorge			Station in constant i 🔹	+ BCentin @ A	64 W	Inte A
B Strappett @ Hotelliet	an die tenting fittele finnen 🐑					
51						
				701W		
the second in the second	ta Gaiattarialathe Mar	une 11 Doothad de del		dell.		
		the Le	stern			
Contraction of the local data	In the second					-
Contra pagma visualizza i stati at-	and describe in Sect. a dive	ria bar tangenal. Selacoren	le control è premiere i pui	ouris Restra Dati		
Commission of the local division of the loca	100					
Grandespel Temperature van (12)		Periode: Nevalle provider: +		reserved (search	-	
			H partada mata	menterenetis (Second) Menterenetis di teterisis		
	÷	Aproduc Malay provides •	H partada mata	rindrigens): (Norman) die ets annvalle & referier		
	•		H partada mata	rende averalis d'relation		
Senderse Televiser (1)	•		H partada mata	mentrespect: (Second) de altrasticado di tatalita		
	•		H partada mata			
		2. mar	H partada mata			
			H partada mata			Ŧ
	1-1		If periods main			Ŧ
			(2) particular main to Dati			Ŧ
	1-1		(2) particles main			Ŧ
	1-1		(2) particles main			Ŧ

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



Reference List Agrometeorological monitoring systems



Some of the clients that have chosen our systems for "Agro-meteorological Monitoring"

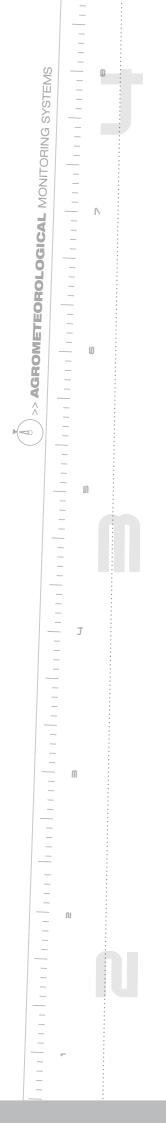
1taly:

-Associazione d'Irrigazione Ovest Sesia - Vercelli -Aimag SpA - Modena

-Consorzio Difesa Produzioni Agricole Provincia Piacenza



-Microensure - USA





Milano ITALY

via Ex SP. 161 Dosso, 9 20090 Settala (MI) Italy **tel:** +39 02 95 41 41 **fax:** +39 02 95 77 05 94 **e-mail:** info@lsi-lastem.it **web site:** www.lsi-lastem.com