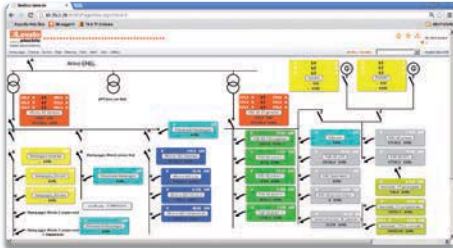


# Synergy



Page 27-6

## SUPERVISION AND ENERGY MANAGEMENT SOFTWARE

- Structure and applications based on MS SQL relational database management system
- Data consulting made through popular programs for Internet browsing
- Highly versatile system, simultaneously accessible to a large number of users/workstations via intranets, VPN or Internet.



# Sam1

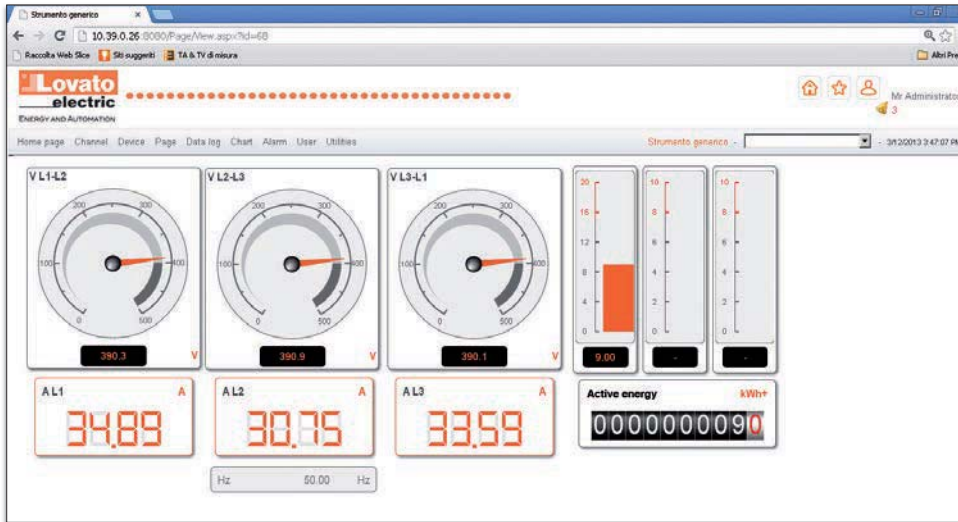


Page 27-7

## SMARTPHONE AND TABLET APPS

- Users can program the controller, view alarm conditions, send commands, read measurements, download statistical data and events and send retrieved data by email
- iOS and Android compatible.

# Synergy



- Web-based and multiclient software
- Management of multiple communication channels simultaneously
- Three level multiuser access using Internet.

**Software**

SEC. - PAGE

Parameterising and enable licences ..... 27 - 6

Applications ..... 27 - 7

# UNCOVER ITS GREAT POTENTIAL!

## Synergy

### ● FUNCTIONALITY

– Serial communication via Ethernet or modem

### ● SIMPLE, GUIDED, INTUITIVE CONFIGURATION

**Synergy** programming does not require any particular computer knowledge since specific configuring instruments have been developed to guide through the configuration of product networks, graphic pages, datalog reports and charts, in a simple and intuitive way.

### ● SERVER-MULTICLIENT SYSTEM

**Synergy** structure and applications are based on MS (Microsoft) SQL Relational Database management system (RDBMS).

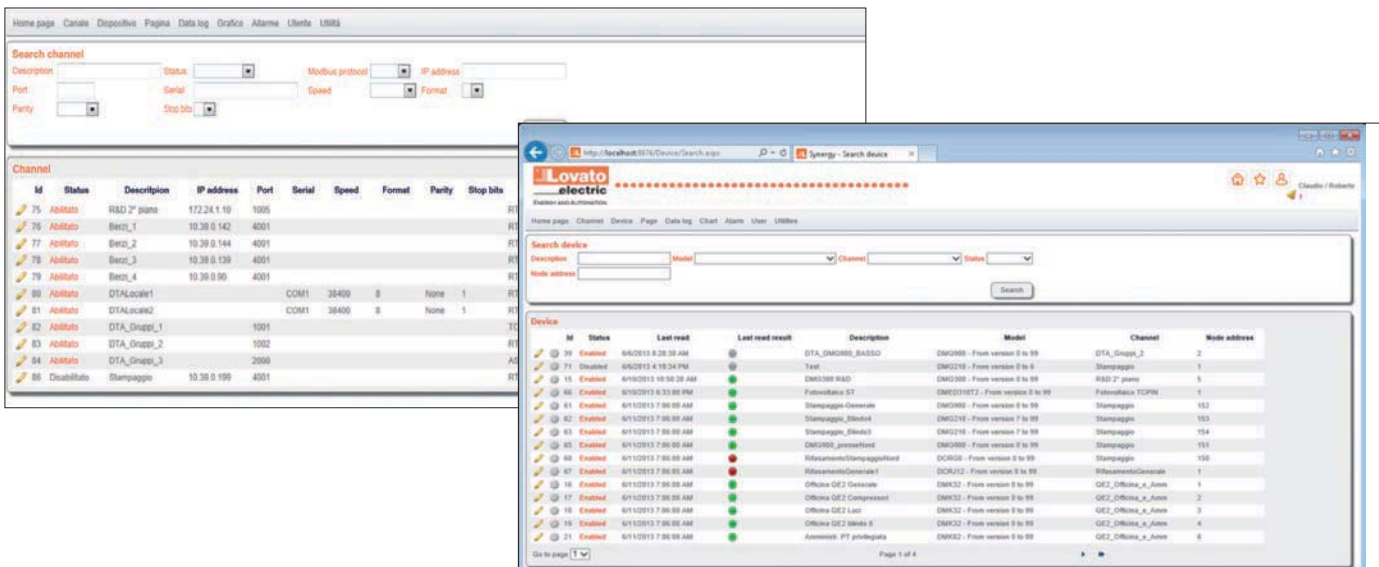
**Synergy** consulting (Client) is made through popular programs for Internet browsing that are available across different platforms and operating systems.

These features allow **Synergy** to be a highly versatile system, simultaneously accessible to a large number of users/workstations, via intranets, VPN or Internet.

**Synergy** is a supervision and energy management web-based software that provides for the monitoring and control of the electrical installation, in a simple and efficient way.

It is a valid software to sustain the activities indicated by the standard EN ISO 5000-1 "Energy management systems. Requirements with guidance for use".

In addition to electrical quantities, it allows to check all environmental and process information (operating status, alarms, etc.), acquired from LOVATO Electric products, equipped with communication port, and thereby to carry out commands and parameterising.



### ● COMMUNICATION NETWORKS/CHANNELS

**Synergy** can interface LOVATO Electric devices only. It simultaneously manages different communication channels with independent configuration for protocol, speed rate, etc. Channels are to be intended as one for each different TCP/IP address and every other communication port RS232, RS485, etc. In addition to wired connections of devices through wired networks (RS232, RS485 and Ethernet), Synergy also permits the management of analog and GSM/GPRS modems.

Available communication protocols are Modbus-RTU, Modbus-ASCII and Modbus-TCP/IP.

LOVATO Electric devices, directly connected to an Ethernet network, can be predisposed to also handle **dynamic TCP/IP addresses**.

### ● MANAGEMENT OF INTERFACED DEVICES

Each device can also be identified by a customised description of the electrical utility/application to which it makes reference to. Using the specific control menu, it is possible to verify if it is correctly communicating and when the last measurement was done.

**Synergy** can query about exclusive data required by datalog files on a regular basis to optimise network data traffic as well as for other eventual information contained in the graphic page viewed in that moment.

With **Synergy**, internal device parameters can be possibly changed or saved on hard disk and retrieved later on for quick configuration duplication in other devices.

## GRAPHIC PAGES

**Synergy** allows to create an unlimited number of pages, to include static images and dynamic indicators of various types and easily configure them.

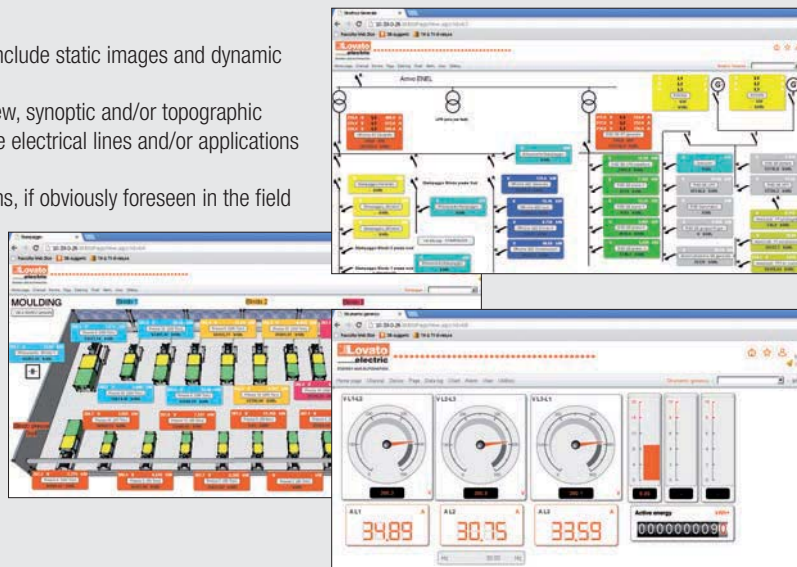
Therefore, the user can create pages with installation overall view, synoptic and/or topographic representations of the electrical network and pages of the single electrical lines and/or applications with all detailed information.

By using pushbuttons, commands can be sent to the installations, if obviously foreseen in the field devices.

Page configuration permits to also interactively browse among these same pages.

The dynamic objects available are:

- Analog instruments at 90° and 270°
- Digital instrumentation
- Digital instrumentation with vertical or horizontal bar graphs
- 10-digit hour counter
- Simple label or with dynamic image
- Multi-measurement panel
- Chart of single measurements
- Harmonic status bar graph.



## ACCESS LEVELS

**Synergy** allows access to a large number of users with different access levels and authorisations.

Three access levels are available:

- **Administrator:**  
Complete access to all functions
- **Power users:**  
Viewing of a limited number of field devices, predefined by the administrator, with possible creating or changing of graphic pages, datalog reports and relative export and change of device setup.
- **Users:**  
Viewing of a limited number of devices, predefined by the administrator, and the relative pages.

## LANGUAGES

**Synergy** is available in the following languages: English, Italian, Spanish, French, Polish and Russian. The up-to-date list of available languages can be consulted at: [www.LovatoElectric.com](http://www.LovatoElectric.com)



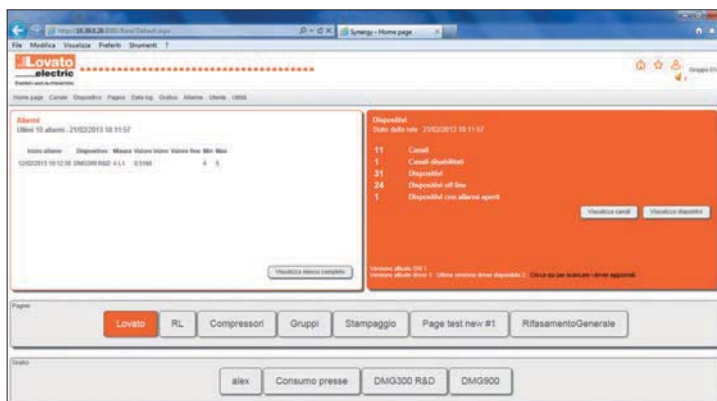
## ALARMS

Data stored in datalog files can be used even to elaborate controls with regards to the correct operation of the installations. Eventual conditions to keep monitored can be linked with alarms, that are recorded in a specific alarm list, highlighted in the **Synergy** headline and conveniently described in the homepage. The same alarms can be transformed into commands and transmitted to the devices for an automatic control of that installation.

## HOME PAGE

Main diagnostic data is concentrated in a single page to allow quick spotting of abnormal conditions of the entire system under control:

- List of last 10 alarms
- Status summary of communication channels and devices
- Link to main graphic pages and preferred charts.





## ● Supervision for industry, shopping malls

- Quality control of power grid supply
- Consumption accounting for cost centres
- Monitoring of machinery/production lines
- Operation monitoring of motors
- Operation monitoring of generating sets
- Monitoring of power factor correction installations
- Monitoring of process/environmental data (values of pressure, flow rate, temperature, ...).



## ● Supervision for chains of stores

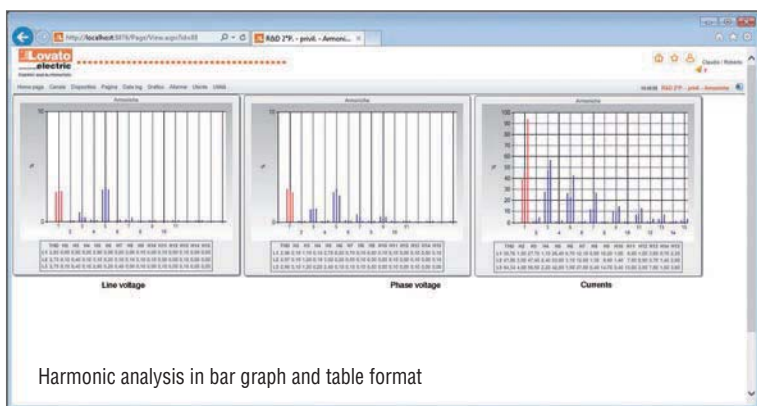
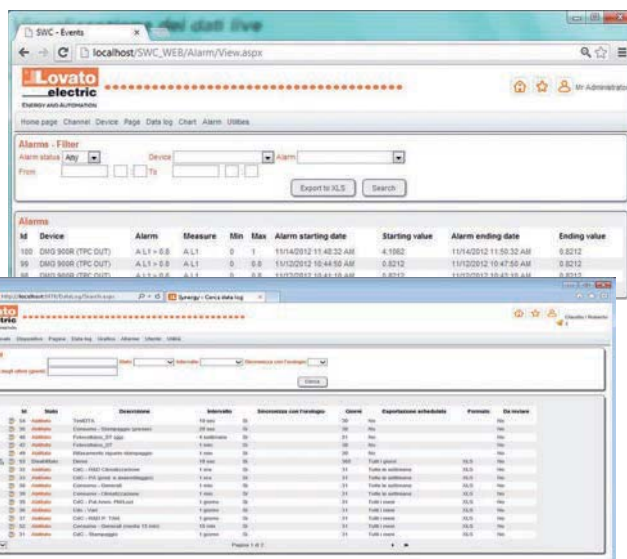
- Monitoring of energy consumption (electricity lines, air conditioning,...)
- Installation diagnostics
- Consumption report for cost centres.

## ● DATALOG FILES

Synergy allows to record data read on field devices in different datalog files (unlimited number), each with freely user-customisable configuration. Therefore, it is possible to gather different information per time sampling (e.g. electric power or gas consumption counts every hour; average active power and current values every 15 minutes and active power and current values every 10 seconds, ...), per each single electric line or grouped together per department or production bay. The recorded measurements by devices can be used as parameters for **mathematical functions** to permit additional calculations or information elaborations not readily or not even available of the installation, for instance the sum of consumption for a certain area so the cost of electricity can be calculated. Automatic export with customisable rate (daily, weekly or monthly) and standard Excel or text format can be defined for each file. The generated files are saved on hard disk and sent by email / FTP wherever required.

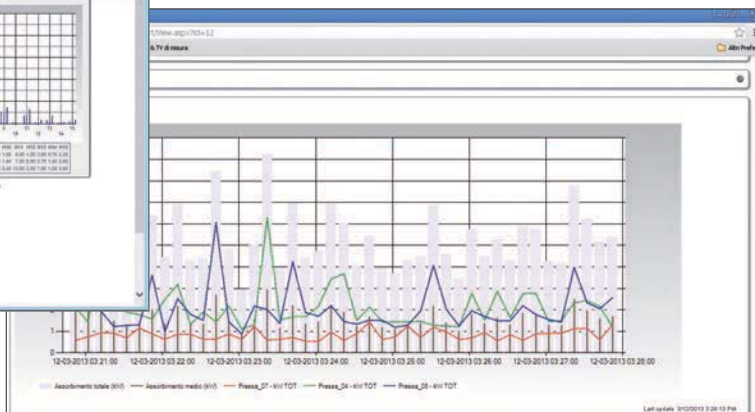
In the case of data networks with potential reliability problems, **separate data storage modules** are available for data logging, to fit exclusively on devices that are expandable with the EXM1030 or EXP1030 unit.

Synergy will provide for **automatic recovery** of stored data when network connection is restored.



## ● CHARTS

Data recorded in datalog files can also be viewed in charts.





● **Supervision of photovoltaic installations**

- Energy monitoring
  - Generated
  - Consumed
  - Exchanged In-Out.



● **Supervision of waterworks and wells**

- Quality control of power grid supply
- Energy accounting
- Operation monitoring of pumps
- Operation monitoring of generating sets
- Monitoring of process/environmental data (values of pressure, flow rate, temperature, ...)
- Monitoring of remote wells.

● **SYSTEM REQUIREMENTS**

**Supported operating system**

- MS Windows XP SP3
- Windows Vista
- Windows 7 32/64-bit
- Windows server 2003
- Windows server 2008.

**PC/Server hardware requirements**

- Dual core CPU, 2GHz
- 2GHz of RAM
- 60GB hard disk (hard disk partition or volume depends on how much data you intend to record)
- SVGA 1024x768 16-bit pixels
- Type and number of communication ports based on use, be they Ethernet, RS485 serial, RS232 serial or modem.

**Supported browser**

- MS IExplorer 9 64-bit
- MS IExplorer 10
- Google Chrome
- Apple Safari
- Mozilla FireFox
- Opera.

The screenshot displays the Lovato electric software interface. On the left, there are several analog-style gauges for monitoring parameters like A1L1, A1L2, A1L3, V1L42, V1L43, V1L41, SW EQV, SW L1, SW L2, SW L3, SW L1, SW L2, SW L3, and PF TOT. On the right, a 'Data log - Filter' window is open, showing a table of recorded data.

M	Data	Device	SWER	ALTE	V1L1	V1L2	SW L1	SW L2	ALD	V1L3	SW L3	SW L4	ALD	V1L4	SW L5	SW L6	SW L7	SW L8	SW L9	SW L10
00076	01/02/2013 9:58:00 AM	Fotovoltaico ST	-0.3640	1.8006	236.27	-2.8902	0.11119	0.8264	2.2460	237.86	0.8602	-0.07205	0.86220	0.126	237.82	0.8483	0.8941	0.8922	0.8922	0.8922
00076	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.36266	1.802	237.44	-2.8895	0.10978	0.82418	2.1880	238.1	0.8600	-0.07186	0.86220	0.126	238.88	0.8421	0.8973	0.8922	0.8922	0.8922
00076	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.36175	1.8023	236.57	-2.8904	0.11020	0.82150	2.232	239.9	0.8607	-0.0720	0.8622	0.1261	237.27	0.8499	0.8970	0.8922	0.8922	0.8922
00076	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.36206	1.8028	236.52	-2.892	0.11058	0.8205	2.2566	239.71	0.8607	-0.0719	0.86220	0.1261	238.88	0.842	0.8974	0.8922	0.8922	0.8922
00076	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.3641	1.79	237.36	-2.8926	0.11020	0.82171	2.239	239.05	0.8608	-0.0718	0.8622	0.1261	238.79	0.8499	0.8970	0.8922	0.8922	0.8922
00080	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.37076	1.8066	232.71	-2.8906	0.10990	0.81645	2.184	237.66	0.8616	-0.07180	0.86220	0.1261	232.52	0.8498	0.8970	0.8922	0.8922	0.8922
00080	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.3647	1.7209	233.08	-2.8894	0.10786	0.81608	2.2766	232.07	0.861	-0.0718	0.8622	0.1261	232.14	0.8498	0.8970	0.8922	0.8922	0.8922
00080	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.36663	1.762	232.65	-2.888	0.10714	0.81662	2.149	232.16	0.862	-0.06948	0.8622	0.1261	232.45	0.8498	0.8970	0.8922	0.8922	0.8922
00087	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.404	1.771	232.68	-2.8899	0.10703	0.81645	2.1425	232.05	0.862	-0.0698	0.8622	0.1261	232.36	0.8498	0.8970	0.8922	0.8922	0.8922
00088	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.4079	1.781	234.47	-2.8898	0.11300	0.81647	2.1461	233.79	0.862	-0.070	0.8622	0.1261	234.04	0.8476	0.8970	0.8922	0.8922	0.8922
00090	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.41023	1.8108	235.01	-2.8903	0.10703	0.81645	2.1461	234.27	0.8618	-0.070	0.8622	0.1261	234.01	0.8498	0.8970	0.8922	0.8922	0.8922
00094	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.3985	1.718	237.78	-2.8912	0.1108	0.81608	2.118	238.86	0.862	-0.0724	0.8622	0.1261	237.23	0.8491	0.8970	0.8922	0.8922	0.8922
00093	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.40058	2.075	236.84	-2.8912	0.09968	0.8161	2.016	238.17	0.8616	-0.0698	0.8622	0.1261	236.69	0.8491	0.8970	0.8922	0.8922	0.8922
00092	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.4008	2.076	237.11	-2.8916	0.0994	0.81616	2.0445	237.1	0.8611	-0.07038	0.8622	0.1261	236.98	0.8491	0.8970	0.8922	0.8922	0.8922
00091	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.47359	2.022	237.78	-2.8919	0.09978	0.81603	2.0403	237.11	0.8612	-0.070	0.8622	0.1261	237.37	0.8491	0.8970	0.8922	0.8922	0.8922
00090	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.4018	2.062	238.82	-2.8916	0.09958	0.81601	2.071	234.06	0.8617	-0.06978	0.8622	0.1261	238.29	0.8491	0.8970	0.8922	0.8922	0.8922
00098	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.4059	1.8208	235.71	-2.8919	0.09976	0.81628	2.0208	235.04	0.8621	-0.06973	0.8622	0.1261	235.28	0.8491	0.8970	0.8922	0.8922	0.8922
00098	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.40245	1.8495	236.28	-2.8908	0.09955	0.816	2.147	234.56	0.8618	-0.06971	0.8622	0.1261	236.05	0.8491	0.8970	0.8922	0.8922	0.8922
00097	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.40139	1.8005	235.62	-2.8913	0.09959	0.81603	2.154	232.72	0.8612	-0.06970	0.8622	0.1261	235.19	0.8491	0.8970	0.8922	0.8922	0.8922
00098	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.4017	1.847	236.32	-2.8914	0.09943	0.81603	2.1463	234.88	0.8615	-0.06970	0.8622	0.1261	236.02	0.8491	0.8970	0.8922	0.8922	0.8922
00099	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.41203	1.7609	234.1	-2.8917	0.0997	0.81619	2.0319	234.05	0.8603	-0.06960	0.8622	0.1261	234.36	0.8471	0.8970	0.8922	0.8922	0.8922
00094	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.4052	1.776	234.42	-2.8916	0.09917	0.81602	2.0493	233.73	0.8609	-0.06974	0.8622	0.1261	234.91	0.8491	0.8970	0.8922	0.8922	0.8922
00093	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.3989	1.7448	234.34	-2.8978	0.09933	0.81628	1.8939	233.88	0.8607	-0.06948	0.8622	0.1261	234.91	0.8491	0.8970	0.8922	0.8922	0.8922
00092	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.39885	1.8765	234.59	-2.8913	0.09942	0.81601	1.9081	233.65	0.8609	-0.06962	0.8622	0.1261	234.86	0.8471	0.8970	0.8922	0.8922	0.8922
00091	01/02/2013 9:59:00 AM	Fotovoltaico ST	-0.39773	1.889	234.27	-2.8916	0.0991	0.81609	1.888	233.83	0.8602	-0.06930	0.8622	0.1261	233.87	0.8491	0.8970	0.8922	0.8922	0.8922

● **PRODUCTS THAT SUPPORT Synergy**

The up-to-date list of LOVATO Electric devices interfaceable with Synergy software is available at [www.LovatoElectric.com](http://www.LovatoElectric.com)

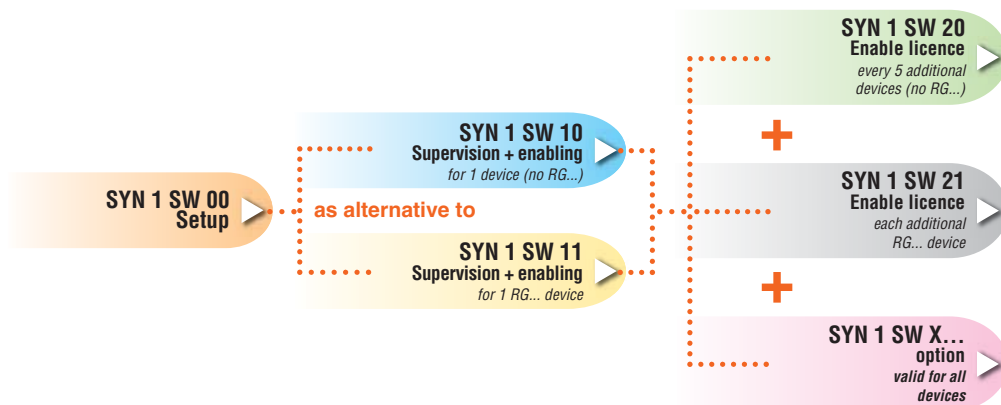
Order code	Description	Qty per pkg	Wt
		n°	[kg]
<b>SYN 1 SW00</b>	Parameterising software for LOVATO Electric devices. Include 60-day trial period of remote control supervision function (measurements, monitoring control and web server) in DVD format.	1	0.210
<b>SYN 1 SW10</b>	Enable licence of supervision function (measurements, monitoring, control and web server). Includes licence for one device (excluding RG series gen-set controllers)	-	-
<b>SYN 1 SW11</b>	Enable licence of supervision function (measurements, monitoring, control and web server). Includes licence for one RG series gen-set controllers	-	-
<b>SYN 1 SW20</b>	Enable licence of supervision for n°5 additional devices (excluding RG series gen-set controllers)	-	-
<b>SYN 1 SW21</b>	Enable licence of supervision function for one additional RG series gen-set controllers	-	-
<b>SYN 1 SW X00</b>	Enable licence for sending emails and FTP files	-	-

NOTE: For the number of licences, only devices equipped with communication port can be considered.

**Synergy** is a remote control and supervision software of LOVATO Electric devices equipped with communication capabilities via serial ports, Ethernet or modem in a simple and reliable way. The supported protocols are Modbus-RTU, Modbus-ASCII and Modbus-TCP. Its structure and applications are based on MS SQL Express that uses a MS IIS Express web server to control the user interface.

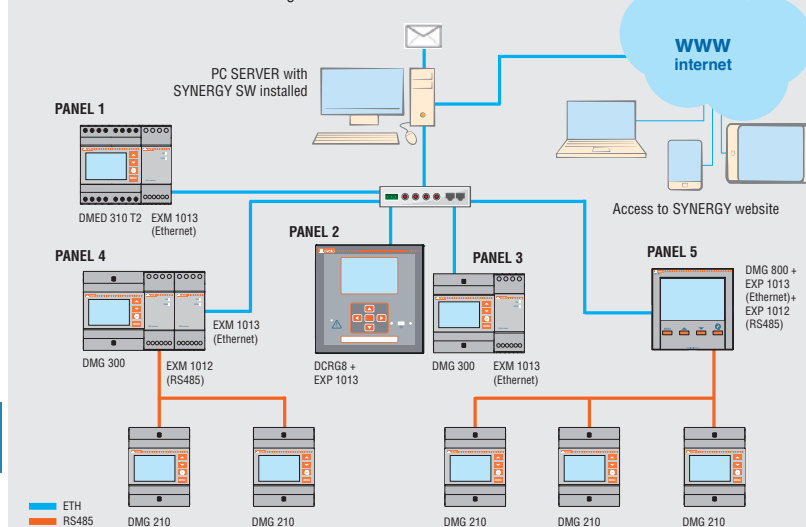
The software is capable of:

- Managing multiple communication channels simultaneously
- Connecting the devices to the various channels
- Collecting data from all the devices and storing them in a database
- Displaying collected data in graphical pages and tables
- Allowing access to the devices and their data according to the rights of the different users.



### Application example - Mixed Ethernet/RS485 networks, Modbus-TCP and RTU protocols

Total of 10 network nodes monitored. Network of multimeters/power analyzers, power factor controllers and energy meters. Extra enable licence for sending emails and FTP.



#### Devices installed

Order code	Qty	Description
<b>Panel 1</b>		
DMED 310 T2	1	3-phase digital energy meter 5A with 2 prog. outputs
EXM 1013	1	Ethernet opto-isolated expansion module
<b>Panel 2</b>		
DCRG 8	1	Power factor controller
EXP 1013	1	Ethernet opto-isolated expansion module
<b>Panel 3</b>		
DMG 300	1	Modular digital multimeter
EXM 1013	1	Ethernet opto-isolated expansion module
<b>Panel 4</b>		
DMG 300	1	Modular digital multimeter
EXM1013	1	Ethernet opto-isolated expansion module
EXM 1012	1	RS485 opto-isolated expansion module
DMG 210	2	Modular digital multimeter with RS485
<b>Panel 5</b>		
DMG 800	1	Flush-mount 96x96mm digital multimeter
EXP 1013	1	Ethernet opto-isolated expansion module
EXP 1012	1	RS485 opto-isolated expansion module
DMG 210	3	Modular digital multimeter with RS485

#### Software/licences to purchase

Number of monitored nodes is 10. In addition, control of logged data email transmission.

Order code	Qty	Description
SYN1 SW 00	1	Setup software
SYN1 SW 10	1	Supervision licence + enable for n°1 device
SYN1 SW 20	2	Supervision licence + enable for n°5 extra devices
SYN1 SWX 01	1	Enable licence for sending emails and FTP

## APP



### General characteristics

#### Applications - APP **Sam1**

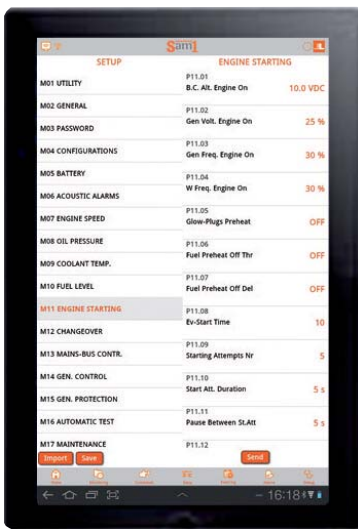
Configuration and maintenance operations, often done in intolerable or awkward ambience due to weather or noisy conditions or narrow places, are now easier to do for all LOVATO Electric devices with communication interface on front, compatible with CX02 dongle. Indeed, tablets and smartphones with Android or iOS operating system can connect to them using the new application called **Sam1** (Setting And Maintenance 1), directly downloadable from Google Play or iTunes. Therefore, it is no longer necessary to connect and switch on a PC using cables to change configurations, set up parameters or even clone device programming.

With this APP, a file previously saved can be uploaded; commands can be sent; measured quantities can be read from LOVATO Electric devices. The events can be viewed and saved in a text file and later copied and sent by email or to FTP servers.

**Sam1** app can be downloaded from Google Play Store or Apple iTunes.



## PARAMETER SETTING



## SEND COMMANDS



## EVENT LOG VIEWING



## MEASUREMENT VIEWING



## ALARM VIEWING

