Distributed Temperature Visualisation and Configuration Software
Charon_02

General

Charon_02 software allows easy configuration of LIOS distributed temperature sensing (DTS) systems and visualisation of temperature data. Charon_02 guides the user during system commissioning and maintenance. Several languages and systems of units are supported. The measurement and configuration data are stored in a database for convenient access. Data visualisation and configuration reports present desired information in a comprehensive shape. The enhanced visualisation options of Charon_02 offer various customisable views of data. Data export, import and software interfaces (DDE, XML) support third party tools. Optional real time thermal rating (RTTR) provides information about energy cable conductor temperature and prediction of critical operation conditions.

Technical Background

 Charon_02 is a multithreaded 32 bit Windows application. State of the art object oriented software techniques are adopted using the Borland Delphi development environment. Measurement and configuration data is stored in a database using the Borland Database Engine and Paradox tables. A standard Windows installation and maintenance procedure can be used for installation, update and removal. Communication with the DTS system can be established over RS232 and TCP/IP connections. Data compression algorithms are applied for efficient communication and minimum use of data storage. Data integrity is guaranteed by CRC data check. The GUI (Graphical User Interface) of Charon_02 is compliant with modern Microsoft Windows standards in order to offer intuitive operation to the user. A concept of user levels with different access rights is used to protect sensitive settings. The display language can be changed easily during normal program operation. Ten different languages are currently supported. Further languages can be easily implemented using the LIOS Technology language tool.

Excellent Visualisation Capabilities

The optional enhanced zone view of Charon_02 enables visualization of zones from different DTS systems on a single screen. Zones can be placed in the standard view using the "Drag and Drop" feature. Data from external point sensors can be stored in the database and visualized in the enhanced view. Charon_02 receives, stores and visualizes data from MODBUS, DNP3 or IEC870 data sources. Details of enhanced views can be zoomed.

Database

Measurement and configuration data is stored in a common database. Database size is minimized by compressing all data. Historic measurement data can be deleted automatically after a user-defined period. With this feature, measurements can be run for unlimited time without overloading the database. Measurements during alarms, fibre breaks, errors and other events can be excluded from automatic deletion.

A hard disk capacity of 100GB is sufficient for about one

year of continuous measurement with five DTS systems. Appropriate configuration of the Charon_02 automatic data base cleanup function serves for an optimum utilisation of storage.

Efficient and Convenient Program Operation

Charon_02 is fully compatible with previous DTS system types and Charon_02 versions including Charon+. It can read CTX and MEX export files from earlier Charon_02 installations.

Configuration data can be displayed in overview reports. Controller entries can be generated in the tree diagram from imported configuration or measurement data. All measurement data displayed can be easily managed using the measurement data explorer. Subsequently recorded measurement data is stored in so called "sessions".

Various data types of a DTS system (e.g. temperature curve, zone view) are always shown synchronously. A list of all events (e.g. alarms, fibre break, error messages) can be displayed for each fibre in the measurement data explorer.

Double-clicking on an event opens the corresponding zone views and the scroll bars for this measurement session are positioned at the correct time. Zones are divided into sub-zones for precise alarm evaluation. The import and export of measurement and configuration data is simple as only one export file is generated during each occasion. ASCII export offers additional formatting options. The temperature history is displayed in real time.

Reports on the results of service measurement can be generated automatically. The Charon_02 message window can be linked to the main window. Double-clicking on a fibre in the tree view opens the corresponding measurement configuration dialog. Double-clicking on a temperature history window moves the scroll bar of the linked profile windows to the selected time. The organisation of the windows menu has been optimized in order to provide the complete overview of all visible windows.

Typical Performance

Charon_02 can manage various connected DTS systems simultaneously. A minimum of five DTS systems can be connected to Charon_02. Further DTS systems can be connected depending on the performance of the PC hardware and software. Ethernet interface allows for maximum data transfer capabilities especially when using multiple DTS systems.

Communication

DTS systems with Ethernet interface can communicate with Charon_02 via the TCP/IP protocol. The reliability of communication via the serial interface is improved by an integrity check on the transferred data. DDE export has been upgraded and simplified. All entries in the message window are tagged with a time stamp. Double-clicking on a DTS system entry in the tree view starts the attendance check.

Point Sensor Data

Point sensor measurement data can be stored and visualised by Charon_02. Each particular sensor needs an appropriate connection. The connections are provided by LIOS Technology. The MODBUS/TCP protocol is used for data import. Please contact our technical support for information on other SCADA protocols.

RTTR - Real Time Thermal Rating

LIOS provides an integrated real time thermal rating (RTTR) evaluation via a well defined interface between Charon_02 visualisation software and a market leading cable ampacity program. These two technologies are efficiently combined for forming a system capable of computing the future cable ampacity based on real-time temperature measurements. The actual maximum temperature reading of each configured cable section and the actual electrical current reading are evaluated for dynamic cable rating based on IEC standardised methods (mainly IEC 60287 and IEC 60853). When the geometry of the installation is not included in the IEC standards, the RTTR evaluation uses finite element methodologies to complement the IEC calculations.

Data Export

Measurement and configuration data can be exported from the data base. The complete information will be stored to a file in order to archive the data or in order to transfer the data to another Charon_02 installation. The data base export contains compressed data in a proprietary format. The ASCII data export can be used to transfer the measurement data to third party software (e.g. Microsoft Excel). Live measurement data can be exported directly over the Microsoft Windows DDE (dynamic data exchange) interface. The WITSML export plug-in can generate XML files which may be automatically transferred by the remote backup process over a SSL encrypted network connection to a remote PC system.

Technical Data

Operating Systems
• Microsoft Windows NT 4.0 (Service Pack 6 or higher)
• Windows 2000 (Service Pack 2 or higher)
• Windows XP
• Windows Vista.

Minimum Hardware Requirements	
For configuration, commissioning and maintenance access only	• PC with Intel Pentium 4 (1 GHz) processor or comparable • 512 MB of RAM memory. • 250 MB of free hard disk capacity.

Recommended Hardware Requirements	
For configuration, commissioning, maintenance access and visualisation	• PC with Intel Pentium 4 (2 GHz) processor or comparable • 2 GB of RAM memory • 250 MB of free hard disk capacity. • UPS (uninterruptible power source or battery backup) for graceful system shut down in case of an unexpected power disconnection. • 19" Screen

RTTR Hardware Requirements	
For configuration, commissioning, maintenance access visualisation and Real Time Temperature Rating	• PC with 3GHz Intel Pentium 4 processor or comparable • 2 GB of RAM memory • 1 GB of free hard disk capacity • UPS (uninterruptible power source or battery backup) for graceful system shut down in case of an unexpected power disconnection • 19" Screen

Display Languages
Danish, English, French, German, Italian, Korean, Portuguese, Russian, Simplified Chinese, Traditional Chinese

Systems of Units
SI, Imperial units

Performance	
Maximum number of OTS configurations	Unlimited
Maximum number of active OTS controllers	5 or more (depending on measurement settings and PC performance)

RTTR (option)	
Real Time Thermal Rating Interface	• Open interface definition • Supports several RTTR engines
RTTR Input data	• DTS temperature data • Unlimited number of point sensor data (e.g. electrical current, soil humidity, wind speed, wind direction)
RTTR output data	• Calculated conductor temperature • Results of emergency calculations

Data Export	
Data base export	• Measurement data in MEX format • Configuration data in CTX format
ASCII	Writes measurement data to a text file.
DDE (option)	Exports live data using Microsoft Windows Dynamic Data Exchange
DVD Export (option)	Exports data in MEX format and automatically writes it to a DVD NERO Burning ROM required
Automatic MEX export (option)	Exports measurement data in regular terms for backup or data transfer in MEX format.
MODBUS TCP (option)	Exports live zone and event data using MODBUS/TCP
WISML export	Exports live measurement data in XML format.
Remote backup	Client Server based data transfer application. Schedules transfer jobs for sending measurement files via a SSL encrypted network connection

Communication	
Data transfer	Temperature profiles, backscattering and frequency raw data, zone minimum, maximum and average values, zone alarms, alarm locations, error messages and notes
RS232 interface	LIOS proprietary communication protocol
Ethernet interface (option)	TCP/IP, Socket RJ45
Communication protocols (option)	MODBUS/TCP

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