enerchart: functional overview

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The functional diversity of enerchart leaves nothing to be desired. You will be surprised by the extremely flexible dashboards, use the multi-client capability to integrate your own customers into the system, automatically read practically every networkable meter, facilitate manual readings with the corresponding mobile app, enjoy a true cross-vendor LoRaWAN integration, or seamlessly integrate enerchart into your product portfolio thanks to its OEM capability.

Discover more at www.enerchart.com

Presentation

- Dashboards with freely placeable elements to facilitate individual design goals
- Unlimited number of dashboards per user with optional sharing with other users/user groups
- Elements in dashboards: tables and graphical charts (interactive live previews of all charts), individual values, text elements (headings, text fields), image files, website embeddings, RSS feeds, news, wizards). Each element has numerous display configuration options
- Image report for overlaying images (e.g. floor plans, neighborhood photos, etc.) with current data from monitoring
- Value and status display with many options for visualization: Numerical value, percentage, substitute text, traffic light, icons, fill bar, speedometer
- Value ranges/states can be visualized via custom images
- Linking between dashboards possible
- Function for duplicating full dashboards or dashboard layouts
- Use variables for data points to easily duplicate dashboards. These can also be used in boxes for value and status displays
- Converting dashboards to PDF
- Automated sending of dashboard PDFs via e-mail in selectable cycles to select recipients (groups)
- Function menu collapsible; full-screen view

- Automatic web slideshows from dashboards (these can also be displayed without a session), optionally with sharing function via email and with invitation link sent regularly
- Group-based selectable start dashboards
- Capability to automatically generate dashboards
- Adding switches (actuators) to dashboards

Analysis and visualization

- Numerous chart types for representing time series: State charts, 15-minute course, continuous curve, counter reading course, scatter chart, carpet plot, Sankey flow chart, ABC analysis, pie chart.
- Comparison reports on average days of the week, months, etc.
- Reports with comparison to fixed reference values (e.g. base years)
- All diagram types can be displayed graphically and/or in tabular form
- Technical indicators (Bollinger Bands, Momentum, Relative Strength Index and MACD) can be displayed in state/progression charts
- Automatic conversion between consumption and curse
- Diagrams for representing states: Image reports (any background images)
- Interactive and extensively configurable map reports with OpenStreetMap, freely definable IoT states and datadriven map markers. Dynamic positioning via sensor data.
- Traffic light visualization of IoT sensors and measuring points with freely definable color thresholds.
- Report on measures
- Automatic or controllable scaling of the measuring unit
- Interactive measuring points (shows data on MouseOver)
- Display of up to 16 measuring points per diagram, as well as different measurement types (Y-axes) and separate or common display of measurement types
- Comparison of up to three different time periods per chart—in each other or among each other.
- Flexible time selection: absolute or relative (e.g., current week) time period. Grid unit, pre-offset, and post-offset.
- Observation of gas consumption over gas-specific time intervals per day
- Fast accounting of producers with consumers (negated summands)
- selection of different compression methods for summands/variables, e.g. to use maximum/minimum values for calculations
- Interactive time selection: zoom in/out, scrolling (12 jump widths selectable)
- Numerous display parameters can be controlled: grid, color inversion, interpolation, fill area, separate or joint display of measured variables, axis dimensions, insertion of measures and threshold violations, insertion of minimum, maximum and average lines, insertion of setpoints, color control (default and, if necessary, individually per chart)
- Transposing tables and carpet plots
- Color limit adjustment for carpet plots
- Modification my drag&drop for Sankey flowcharts
- Controllable point consolidation for regression diagrams
- Export as high-resolution PNG graphic (e.g., for printed products)
- Display of real-time data (flowing curve)
- Limitation of the visualized data to weekly schedules (e.g., shift times) and calendars (e.g., "working days only")

- Creation of unlimited hierarchical measuring point structures as a tree
- Generation and display of any number of virtual (mathematical) measuring points. These can be formed from sums (with additional differential measuring points) or from almost arbitrarily formulatable formulas (e.g., arithmetic operators, trigonometric operators, IF-THEN conditions ...). Formula editor with interactive user interface

Energy management according to ISO 50001 and sustainability

- Documentation of measures and notes on measurement data
- Reminder function for future actions (notification to selectable users (groups))
- Management All measures with statuses/responsibilities and traceable processing status
- Profitability calculation according to DIN EN 17463 (VALERI)
- Flexibly definable and transparent cash flow per efficiency measure
- Evaluation of each measure with linked charts/data points
- Unlimited number of file attachments (per upload) per action/note
- CO_2 balancing Scope 1 to Scope 3 according to the GHG protocol
- Calculation of the Corporate Carbon Footprint (CCF) and the Product Carbon Footprint (PCF)
- Emission activities and factors as time seriesUnlimited number of freely definable conversion factors (e.g., tariffs)
- Dynamic conversions as time series
- Unlimited number of freely definable weekly schedules (for performance mapping, e.g., shift schedules, working hours, and machine operating hours).
- Unlimited number of freely definable calendars (e.g., operating days and holidays)
- Import of calendars via iCal file
- Creation of any key figures via virtual measuring point
- Comparison of key figures relating to other periods
- Function for duplicating data point structures including existing substructures

Monitoring and control

- On the import level: Automatic checking of incoming measurement data for plausibility/gaps incl. alerting of definable users (groups) and the possibility of an automated measured value correction
- Regular analysis of the data completeness check with graphical presentation of all measurement series at a glance and export function for all measurement gaps
- On the analysis level: Free definition of upper and/or lower thresholds, test for static limit or for excessive percentage growth (dynamic thresholds)
- Notification of threshold value violations with definable texts to selectable users (groups)
- List of all threshold violations
- Import function for lists with threshold monitoring for multiple data points
- Control possibility by switching actuators and writing registers at data sources like Modbus, Bacnet, OPC UA and LoRaWAN®
- Limitation of threshold value monitoring to fixed times, weekly schedules, or calendars
- Coupling with the dibalog® load management
- Correction of wrong/missing measuring points incl. automatic documentation (note function).

- Correction possibilities: ignore, replace by static value, take over from existing measuring point (also same) and/or previous period, linear interpolation between meter readings, mark as "meter change" and delete calculated consumption on change, multiply values by fixed factors, import values from CSV, and delete values.
- Automated data correction after plausibility check.

Data acquisition

- Measured units: the time series can be created for practically all common and unusual physical units in various scales for consumption or condition. Besides current, related measured variables, these are, for e.g., temperature, pressure, volume, volume change, speed, frequency, heat quantity, output, and lighting, costs
- Definition of own measured variables (incl. scaling) is possible
- Manual input of data via input fields and upload interfaces optionally with conversion factors
- Upload formats: CSV, MSCONS, XLSX
- MSCONS bindings with extended possibilities (e.g. alternative metering point identification)
- Extended configuration options for MSCONS CONTROL messages
- Transfer of any CSV structures and adaptation via the format editor
- Splitting of data series over several data points at schedulable times, robust even with subsequently supplied measurement data and data corrections
- Definable sequences and reading intervals for manually readable meters and data ("meter lists"), including illustrations, reminder functions, and plausibility checks.
- Freie Beschreibunggsfelder für Datenquellen

Mobile app for meter reading

- For smartphones (Android and iPhone), the enerchart app for data collection and meter reading is available via the app stores
- Confusion-free assignment of the counters/measuring points via QR codes
- Automatic synchronization of the meter lists
- Reminder function for reading
- Registration of meter exchanges
- Automatic transmission of the read meter readings
- Simple and secure login of your own smartphones to the system
- QR code print templates for label sheets
- Multi-client capability

Connectivity

- Automated readout of meters, data loggers, interfaces, IoT clouds, and sensors via interfaces
- Smallest time interval for measured values: one minute (visualization even in real time)
- Driver concept for easy extension with new connections
- Direct connection of TCP-based systems, such as Modbus-TCP, OPC UA, OCPP, SNMP, FTP, SFTP, KNX, BACNET Web Services, June5, MQTT, Homematic IP, and more (*please ask for the current list or concrete drivers*)
- MQTT data sources can be extended with JavaScript snippets for decoding/processing incoming messages
- Function for duplication of (S)FTP data sources

- Connection to APIs and backends of IoT clouds: The Things Network (TTN), The Things Stack (TTS), The Things Industrie (TTI) in Version 3, Actility, Loriot, NB-IoT, Sigfox, Chirpstack, ELEMENT IoT, niota and more (*please ask for the current list or concrete drivers*)
- SQL connections and batch processing via CSV import of SQL queries
- Cross-manufacturer LoRaWAN® integration through own LoRaWAN® payload editor for dynamic and for static LoRa® payloads. This ensures compatibility to almost all available LoRaWAN sensors
- Switching actuators via LoRaWAN (data sinks)
- Import/export of LoRa®-Payload structures
- Input option for a variety of metadata (images, documents, websites) for LoRa® payload descriptions.
- Connection of specific devices/data loggers: Janitza ProData2, EMU M-Bus-Center, Harting SmartPN, and more (*please ask for the current list or specific drivers*)
- Configurable FTP server (e.g. for data loggers with FTP transmission)
- Direct import of data sent via e-mail attachment from SMTP mailboxes along with post-processing
- Individual creation of drivers for APIs or devices quickly and cost-effectively on request
- Automatic homogenization of the measuring intervals
- Measurement of the device catalog to create templates for frequently used devices/interfaces
- Intermediate instances ("intermediaries") for scalable connections of numerous, globally distributed locations
- Optional by development request: Connection to a variety of CRM systems (Salesforce, MS Dynamics, CURSOR EVI, CAS, Pipedrive, vTiger, powercloud ... and many more)

Data backup and data export

- Archiving of measurement data to relieve the database (e.g., delete/archive minute values after one year); the time series remain analyzable at larger intervals.
- Local data protection (backup) with multiple preservation strategies
- External data protection (backup) via FTP, SFTP, RSYNC or SMB. SNMP backup configuration
- On the analysis level: Export of all displayed data as a CSV file
- Export option for each table displayed in the application
- Low-Level-Export: Access to all stored measured values via user-defined SQL-View.
- Automatic backup copy when correcting measured values

Administration

- Delivered as a Debian or Red Hat Linux appliance (vmware or HyperV); application managed via dpgk.
- Updates from enerchart via secure update servers
- Active Directory integration of the user administration
- Sending e-mails via IMAP, SMPT/POP3 or Microsoft Graph API
- Comprehensive rights and role system, release groups incl. role inheritance
- Monitoring of running system services and events
- Central monitoring/reporting of all system-generated emails (Admin)
- Modifiable text templates for system messages

- Configurable password complexity constraints
- Searchable display of log entries (actions, system, importer, push service, error UUID)
- Copy function for authorizations/roles, even across clients
- Extensive setting options for network services
- Certificate management

Further functions and properties

- Dialog language selectable per user. Currently available are English, German, and Spanish (other languages on request)
- Two-factor authentication can be enabled. Second factor can be email or authenticator app (HOTP, TOTP)
- Typable and datable supplementary data for data points, for example for MaLo-ID, device installation date, billing area, ... (metadata system) as a basis for flexible digitization extensions, billing, etc.
- Optional authentication via OAuth2 or Microsoft Graph API for e-mail protocols
- Maintenance of any number of mandators with one enerchart instance, nested mandators structures (multilevel mandators capability), cross-mandator analysis
- Message of Day: Definition of internal messages that are displayed to the user after login or sent by email
- User tracking function for support purposes
- Adaptive web interface (responsive design)
- Integrated, digital user manual
- Optional login page with video animation
- Software updates, online or remotely, are possible.

Available add-on modules (require license extension)

- **E-mobility:** Management of charging processes, transactions, users for OCPP-enabled charging stations. An individual load management and billing system can also be implemented on the basis of this module.
- **Demand Side Management (DMS)**: Module for tariff-controlled, active load management. *(expected to be available from Q4/2025)*

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