

ResMa[®] Energy and Resource Manager

System description



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1. Overview

1.1 Purpose

ResMa® is a software that centrally collects data by means of connectors and offers various evaluation and visualisation options to extract added value from the raw data.

ResMa® is certified by TÜV Süd as energy data management software according to ISO 50 001.



ResMa® has a variety of application purposes, including:

- use as energy data management software according to ISO 50 001,
- process optimisation based on production/process data,
- data collection and provision for external evaluation options, such as AI tools.

1.2 Software Environments

ResMa® and its system extensions can be run on Windows operating systems.

- Windows 10/11
- Windows Server 2016/2019/2022
- Windows IoT Enterprise 10/11

Depending on the system scope and requirements, operation can take place on

- Server
- Virtual machine (VM)
- Industrial PC (IPC)
- Customer's cloud subscription

An MS SQL Server 2017 or later is required to store the data, 1 CAL. If no database instance database instance is provided, we will install an MS SQL Server Express. The restrictions regarding storage space must be monitored by the customer.

The client requires a current browser based on the Chromium Engine to ensure the best user experience:

- Google Chrome
- Microsoft Edge

Support and updates are regulated via separate Service Level Agreements (SLAs).

1.2.1 Application Example IPC

The installation on IPC is suitable for smaller applications up to max. 500 measuring points with a focus on energy management. In this case, data is usually recorded in 15-minute intervals.

Getting started with energy management can be done as inexpensively as possible based on an IPC before initial findings justify a more extensive expansion.

With this solution, the entire portfolio of Weidmüller energy measuring devices with the standard Modbus TCP interface can already be used for data collection and analysis. In addition, devices from third-party devices that have a corresponding Modbus interface can also be analysed.

For the IPC, the following performance features should be considered for a positive user experience.

Technical data IPC

Dimensions	22cm x 15,95cm x 7,1cm
OS	Microsoft Windows 10 IoT Enterprise 2019 64 bit
Processor	Intel Core i5
GPU	Intel® HD Graphics 510
RAM	8 GB DDR4
SSD	60 GB
Interfaces	3 x Ethernet 10/100/1000Mbps; 3 x USB 3.0; 1 x DVI-D; 1 x CFast
Power supply	24 VDC (18 to 32 VDC) isolated
Mounting	Wall
Approvals	CE, cULus LISTED (61010)



1.2.2 Application Example Server / VM / Cloud

The installation on higher-quality hardware is also suitable for applications with more than 500 measuring points. Typically, in addition to energy data, process data is also recorded, which is usually recorded and stored at a higher frequency. Typically, such values are recorded every minute or even every second or when the value changes.

For a positive user experience, the hardware / VM should at least fulfil the following performance characteristics.

- CPU: Intel Xeon E-2234 (3.6GHz/4-core/71W) or similar/better
- RAM: 16 GB or more
- Storage: 500 GB or more (Database)

For applications with over 3 000 data points or very high acquisition rates, the CPU and RAM should be scaled accordingly, as in addition to the performance required for consistent data acquisition, the computing load for data aggregations and reports also usually increases.

2. System

2.1 Data link

There are different options available for data acquisition depending on the requirements and circumstances.

The use of connectors or loggers independently of the server on separate hardware offers the following advantages:

- Decoupling of data acquisition via a self-sufficient device protects against data loss in the event of a failure or maintenance work on the server
- Data loggers can run in different locations and be coupled to the ResMa® Server via a secure connection. In addition, the transmission can be encrypted. In doing so, cross-location scenarios are easy to implement, even with slow Internet connections.

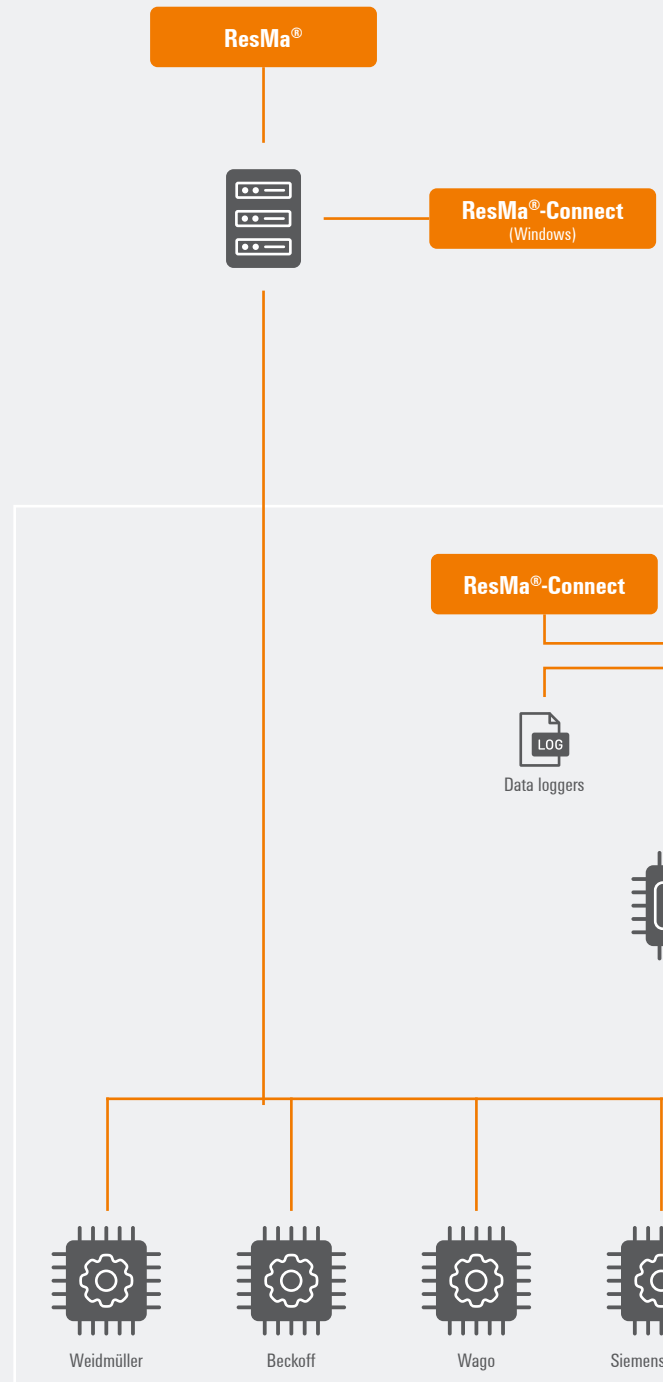
2.1.1 Modbus-Connector

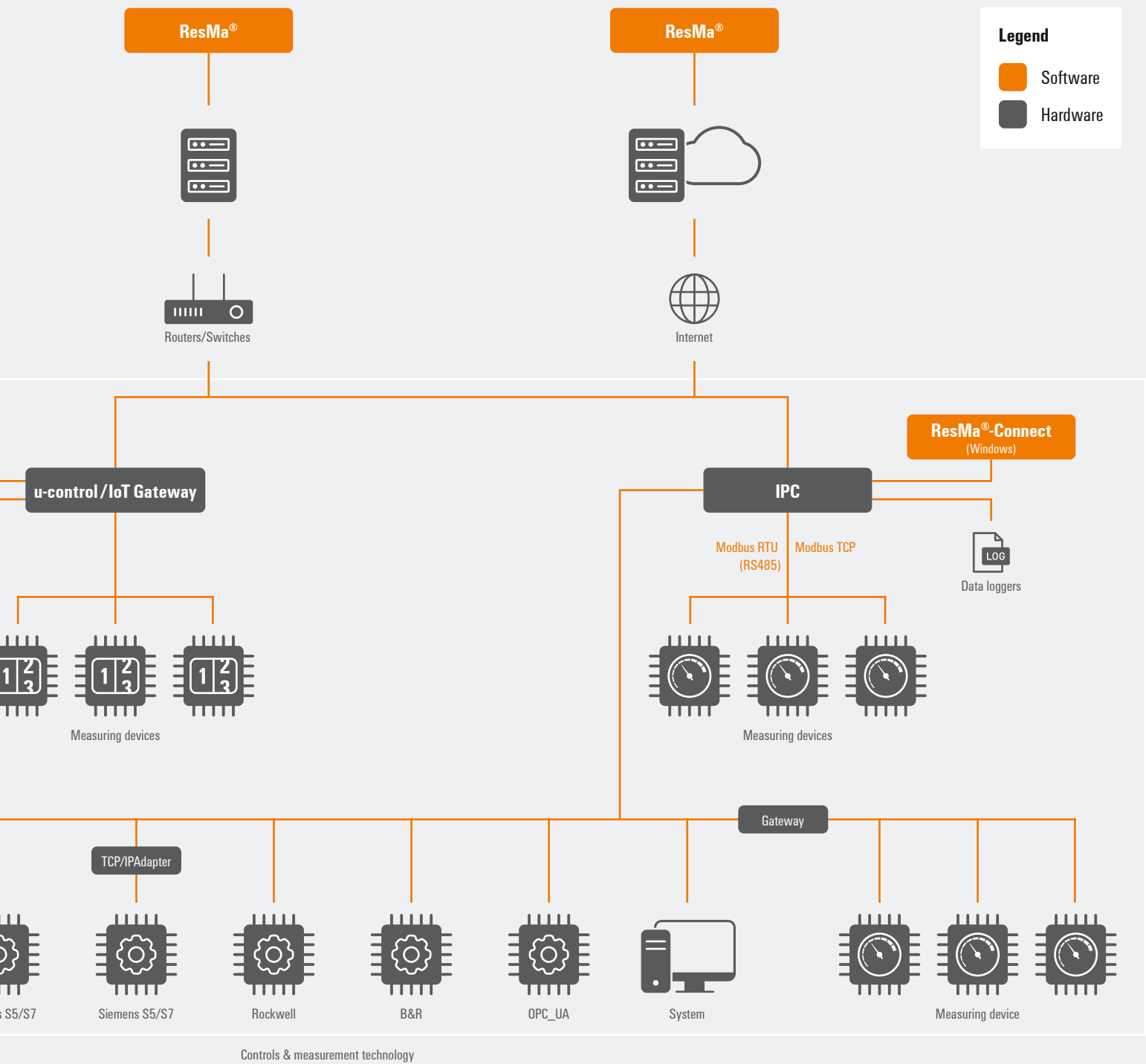
Direct connection of the measurement system via Modbus TCP and Modbus RTU.

2.1.2 PLC-Connector

This connector on PROCON WEB basis is executable on Windows systems. The connection of the following protocols is possible:

- | | |
|---------------------|------------------|
| • Allen Bradley | • OPC Client |
| • Barcode Scan | • OPC UA |
| • Beckhoff Symbol | • RFC 1006 |
| • Beckhoff TwinCAT | • Saia Block |
| • Codesys | • SAIA-PCD |
| • Domino TCP | • Simotion OAMIF |
| • EtherNet/IP | • Tia Portal |
| • IEC 60870 | • Universal |
| • Mbus | • 3S PLCHandler |
| • Mitsubishi MELSEC | |
| • Modbus TCP | |
| • Modbus RTU (COM) | |





2.1.3 PROCON Connect

Runs on Windows and Linux systems as well as u-OS. This enables operation on Weidmüller hardware such as u-Control and IoT Gateway. The driver portfolio for this connector is constantly being expanded. The following coupling options are currently available:

- Allen Bradley
- Codesys
- Modbus
- OPC-UA

2.1.4 Control technology based on PROCON-WEB

The HMI/SCADA solution PROCON-WEB can be configured as a connector for ResMa®.

Protocol support as in 2.1.2 PLC connector.

3. User interface

The ResMa® user interface is an HTML5 web interface. This means that only one modern browser is required on the clients. Besides classic desktop PCs, mobile devices are also supported.

3.1 Structure

The interface provides a display of all the configured measured values in the form of an object tree that enables an application-specific breakdown. The evaluation area is organised using tabs in such a way that the user can open several views at the same time and quickly switch between different views.

3.2 Evaluations

Different evaluation options are available for the analysis. You can store “profiles” for each of these, allowing you to return to your customised view at any time and share it with others in consideration of the authorisation concept. The following information is stored in particular:

- Profile name
- Time range (absolute or relative)
- Selection of measuring points
- Evaluation-specific configurations

3.3 Themes

Four different standard themes are available, which can be used to adapt the global display.

3.4 Internationalisation

Both system content and content added by the user can be translated into any desired language within the software. For cooperation with a translation agency or mass adaptations, the translations can also be exported to Excel and imported again.

The user's chosen language setting also influences the culture-dependent display of thousands and decimal separators.

The software and documentation are completely translated into German and English.

3.5 Customisation

In the dashboard, saved profiles can be arranged as freely designable tiles to form an overview page.

In addition, users can individually determine which evaluations they would like to have open immediately after logging in.

4. Support

With ResMa®, Weidmüller GTI Software GmbH not only offers a comprehensive software solution for energy management in accordance with ISO 50001 and process optimisation, but also provides the necessary support with the integration into the existing automation technology, control technology and building automation as well as integration into the company's IT.

We offer you advice for your project and can take care of all the required services for set-up, implementation and training or instruction of employees. In addition, we offer components for measuring technology and infrastructure.

We cover all the services that are required for setting up and operating an energy management system:

- Installation of the ResMa® software on your server
- User training
- ResMa® administration (backups, restarts)
- Advice on planned expansion of data acquisition
- Coupling of control systems or measuring equipment for each ResMa® Connector
- Configuration of the system with regard to the administration of users, objects and measured data
- Advice on the procedure for analysing the energy requirement and identifying potential savings
- Regular software updates

5. License

Licensing is based on the different quantity structures of the data points to be supported. As demand increases, the licence can be upgraded to the next level accordingly. The previous licence is fully credited.

The functionality of ResMa® can be expanded as required by licensing additional function packages. The licences for the extensions are based on the quantity structure of the ResMa® Basic licence.

Any number of users can be created in the system. Only the simultaneous use of the system is restricted.

In addition to the licence costs, further costs may be incurred for installation, training or setting up the system, which are estimated and recorded individually as part of a quotation.

5.1 Expansion packages

The licensing options listed below are available for ResMa®. The license is a purchase license, which is not limited in time.

The available functions of ResMa® are divided into different function packages, allowing you to customise configuration to suit your needs. We will be happy to advise you with the selection and demonstrate the corresponding scope of services of the extension packages.

Basic	Energy	Production	Import	Regression	Dataset/Recipe Management
Dashboards	SanKey	Order References	Time Series Data Imports	Correlation Matrix	Dataset Management
Charts	Load Analysis	Shift Book	Import automation	Regression Models	Threshold Analysis
Reports	Live Monitor	Live Monitor	CSV Imports	Regression Analysis	SPC Charts
Alerts	Heatmap	Extended Manual Inputs	MS SQL Imports		
Pivots	Tariffs				
Manual Counter Input	Cost Centres				
Basic logic and visualizations	Ressource Management and ISO 50 001	Process optimization	Cyclical import automation	Find dependencies in data and evaluate optimisations	Dataset optimization

You always need the basic package to use ResMa®. Depending on your functional requirements you have, you can flexibly add the following function packages to the basic package:

- Energy package
- Production package
- Import module
- Regression analysis module
- Dataset Management/Recipe Management

ResMa®-Basic is a software for the central recording and processing of multi-site measured values via web interfaces. The data is recorded and stored at different time intervals. Formulas enable the calculation of KPIs and all values can be monitored to trigger messages when value ranges are exceeded. Charts and dashboards as well as reports enable the comfortable presentation and analysis of measured values.

The **Energy package** expands ResMa® Basic with all the functions necessary for an ISO 50001-compliant and certified energy management system. These include an energy flow analysis with Sankey diagram, representations using heat maps, a load analysis, the management of PDCA cycles and the management of tariffs as well as cost centres for an extended cost analysis and Live Monitoring.

The **Production package** extends ResMa® Basic with many functions that are helpful in the analysis of production processes. This is the possibility to add references to products, orders or batches during data entry in order to carry out evaluations according to these criteria. This also includes manual data entry, e.g. for the results of manually performed measurements or laboratory samples. The shift book offers the possibility of documenting downtimes.

The **Import module** enables external data sources (MS SQL, CSV) to be browsed, time series data to be mapped to measuring points, import jobs to be configured and automatically executed cyclically, thus automating the transfer of time series data from third-party systems.

The **Regression analysis module** makes it possible to find dependencies in the time series data using correlation analyses and to determine their type and strength. Transferring the findings to regression models allows references to be created on the basis of which optimisation measures can be evaluated. This fulfils the requirements of ISO 50 006 for the normalisation of key figures in the context of energy management. In addition, the module generally allows the evaluation of optimisation measures with regard to energy or production processes, excluding several influencing variables.

The **Recipe management module** makes it possible to promote standardisation through the use and exchange of recipes, to document specific production processes, to analyse warning and limit value violations, to visualise unstable processes for machine operators at an early stage (LiveValueCache connection), to incorporate the knowledge gained into further developed recipe versions and thus to sustainably increase production quality.

All packages are available depending on the number of data points. The extension packages must match the scope of the basic package in terms of data points.

Basic	Energy	Production	Import	Regression	Dataset/Recipe Management
100 (5 User)					
200 (5 User)					
500 (5 User)					
1.000 (10 User)					
3.000 (20 User)					
10.000 (20 User)					
on request					
Basic logic and visualizations	Ressource Management and ISO 50 001	Process optimization	Cyclical import automation	Find dependencies in data and evaluate optimisations	Dataset optimization

5.2 Connectors

Connectors are licensed individually. This is always a purchase licence. Connector licences are not staggered in terms of quantity.

6. Disclaimer, trademarks and usage right

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