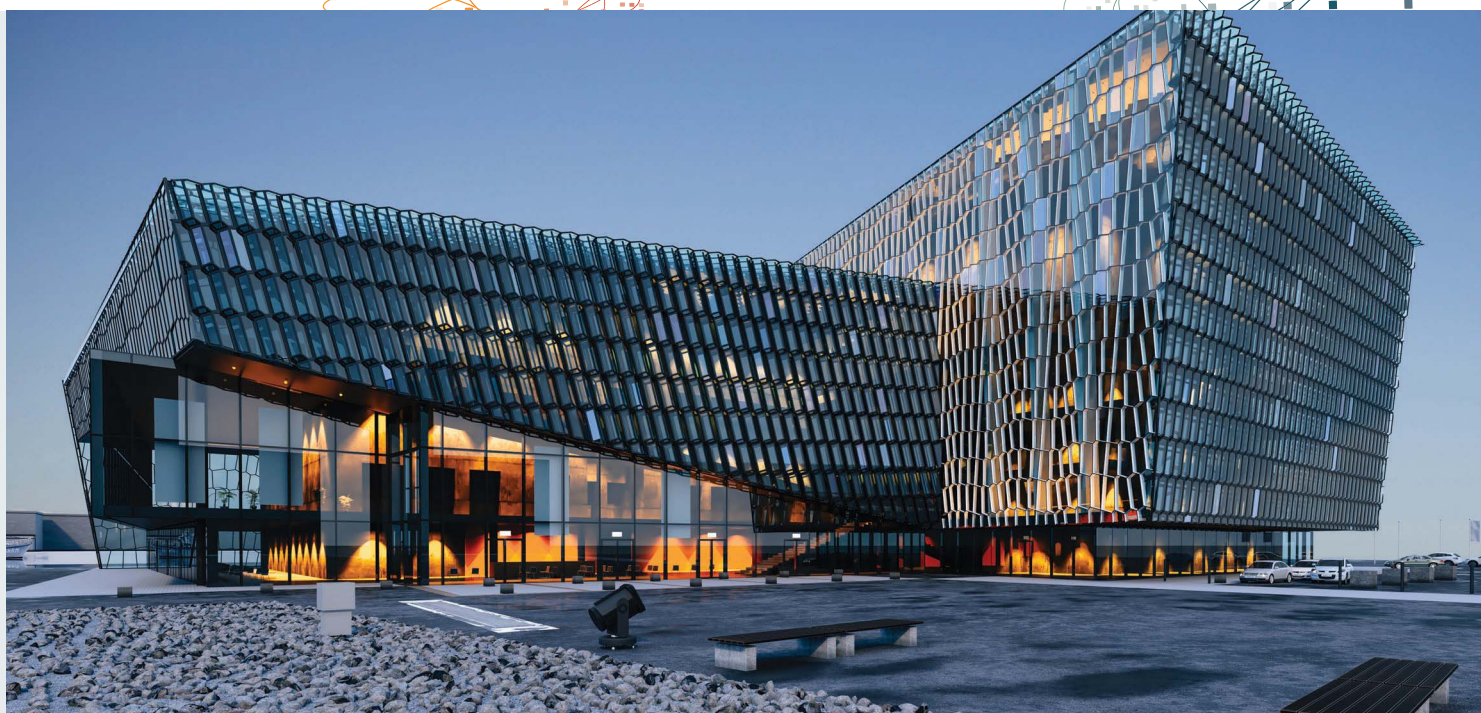




domat

MEMBER OF CEZ ESCO



PRODUCT OVERVIEW

Energy under control

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COMPANY PROFILE

Domat Control System provides a comprehensive range of products and system solutions for building, energy control and measuring systems. The company mission is to develop, produce, and distribute building and industry control systems worldwide. We at Domat Control System focus on reliability, advanced technologies, modern communication features, remote access, and flexibility: the system development is able to swiftly respond to customers' demands which is a must at today's projects. Standard signals, interfaces, and communication protocols are used at all system levels. Therefore, the system is open for a wide range of integrated solutions.

SYSTEM SOLUTIONS

For construction companies, developers, and end customers, Domat Control System offers turnkey installations – calculation, design, cabling, cabinets, installations, programming, commissioning, and service. The company team has long-term experience at both domestic and international projects, executed for global market players in industry, energetics, retail, development and facility management. A special segment are centralised management systems for retail chains, energy production and distribution plants, and other distributed systems.



PRODUCT SALES

Domat Control System delivers a comprehensive range of control components, including input and output peripherals, to system integrators, HVAC manufacturers and other customers. Programmable controllers, converters and individual room controllers, as well as the programming and configuration software, are designed and manufactured in the Czech Republic. All system software tools are free of charge. Domat provides regular trainings and extensive individual technical support. Customers can be sure to finish their projects successfully and on time.



SERVICE AND OPERATIONS

Handing over of a project is in fact the starting point of co-operation with customers. Domat Control System provides warranty and post-warranty service of control systems, and operates technology IT networks and management systems, mainly the ContPort – a cloud service for storage, processing and presentation of energy data. ContPort is used by facility managers and energy systems operators who need to record and interpret operation data, such as temperatures, energy consumptions, environmental data, etc. Regular service of building control systems includes also optional preventive maintenance, periodic seasonal inspections, and out-of-hours service.



DOMAT INTERNATIONAL

Based in the Czech Republic, Domat Control System co-ordinates its daughter company in Slovakia and a network of system partners in Armenia, Austria, Benelux, Croatia, Germany, Latvia and Lithuania, Hungary, Malaysia, Macedonia and Kosovo, Norway, Poland, Portugal, Romania, Serbia, Slovenia, Spain, Sweden, Switzerland, Thailand, Barma, Laos, Cambodia and Vietnam.

PRODUCTS AND SERVICES

- Sales of hardware and software components to system integrators
- Consulting services and design of HVAC controls and building control systems
- Comprehensive, turnkey solutions of HVAC and building control systems and system integrations
- Service and upgrades of turnkey installations
- Technical support and free proofreading of projects and shop drawings containing Domat components
- Free trial of system components and licenses for 30 days
- Free trainings for designers, software engineers, and users



Certificates
ISO 9001:2009
ISO 14001:2005



Member of
Modbus
Organization



BACnet
Vendor

SYSTEM ADVANTAGES

- 1 Web access at automation level, easy-to operate SCADA graphics, flexibility, fast and safe installation
- 2 Open system working on standard platforms, using Ethernet and most of the protocols used by BMS manufacturers
- 3 Possibility of choice of hardware – card or modular, both programmable in a single programming tool
- 4 Dozens of compatible M-Bus meter types, easy extension
- 5 Complete system from room sensors to database applications
- 6 Smart control of energy production and distribution, e.g. based on weather forecast
- 7 **Individual technical support and trainings**
 - Training and Technical Support Center Prague – Klecany
T: +420 461 100 666, E: support@domat.cz, www.domat-int.com

INTERESTING PRODUCTS

Tips for excellent performance/price ratio, or unique market offering:

markMX – compact controller with 88 inputs/outputs, 4 serial ports, Ethernet and graphic web server, programming in Merbon IDE

EPC102 – radiator controller with external temperature sensor, 1×DO, 1×DI, used for evaluation Energy Performance Contracting (EPC)

RO60 – converter Belimo MP-Bus / Modbus RS485 or Modbus TCP with web interface, over the web the MP-Bus units can be configured, addressed and removed, etc.

RO91 – converter DALI / Modbus TCP, multimaster, complete set of DALI commands (the control ballasts can also be configured over Modbus or web) and simple control of ballasts, groups and scenes by direct writing

DIP200 – combined communicative (Modbus RTU) motion and lighting sensor for light control and air conditioning in offices, workshops and public areas

FCRO11 – communicative fan-coil controller, 230 V AC power supply for easier design in systems where it is difficult to install 24 V AC, 2×DI (presence, window) 5×DO, 2×RS485 (for room unit UCO10, and BMS / SCADA)

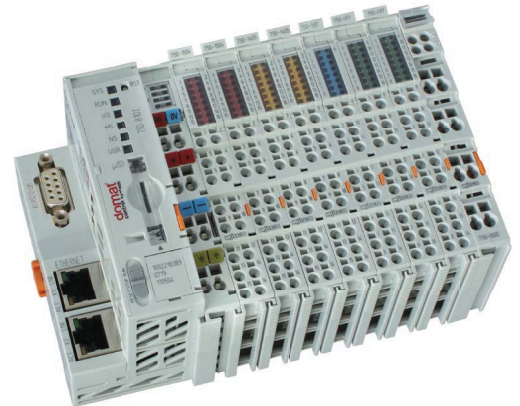
HT200 – operator panel with capacitive touch screen 7“, and Merbon Visual app

HIGHLIGHTS

Domat Control System perceives its commitment to provide advanced solutions and up-to-date technology. As a consequence, we always do our best to introduce new products, services and product updates on a frequent basis. Below please find the list of the most important changes in the product range.

WALL: A series of process stations with a card system

As part of the expansion of application platforms for the Merbon IDE system we launch a control system in the form of a flexible card system. Controllers are available for easier ordering and assembly even in kits already including I/O cards. It is possible to extend the kits by adding standard I/O cards as needed. These are wMX / wMXcom with 88 I/O and wCIO / wCIOcom with 32 I/O. The ...com set contains a controller with integrated RS485/232 communication. The advantage of PLC wall is saving of space in panels and possibility of expansion of the sets with standard I/O cards, including communication cards. This series is fully compatible with other Domat system components such as terminals (HT200, HT102), IRC, the Merbon Visual application, Merbon web, Merbon SCADA visualization, Merbon DB, portal ContPort and other products.



IMIO110 Compact Process Controller

The Mark series process stations have been extended by a new IMIO110 automation station. This is a small programmable controller with 16 I/O and RS485 interface, formerly known as IMIO105 and now in IMIO110 format with 3x16 character LCD display. Perfect for small plants such as domestic heat recovery units, compact heat exchanger stations, etc. The advantage is a combination of local control and remote management over web, Merbon Visual application or Merbon SCADA.

UI3... Communication room controllers with PIR, CO₂ and external temperature sensor

In parallel with the redesign of the UC300 floor heating controller hardware the new UI300, a room unit without a control function, was also created. The UI300 contains 1x digital input, 1x triac output, internal temperature and humidity sensor, and one analog input for Pt1000 temperature sensor. All values are available in Modbus registers as with other UI... controllers. Another model, the UI309, also includes a CO₂ sensor, so it can be used for example in combined systems with floor heating and heat recovery unit. In variants UI310 (same hardware as UI300) and UI319 (same hardware as UI309) a PIR motion sensor is also implemented..



RO65 Modbus TCP - DMX converter

The converter contains two independent DMX512 buses. This means that by writing to the RO65 Modbus table up to 1024 addressable lights can be controlled. It supports web configuration interface for testing, so it is possible to work without prepared application software in a PLC. Users can easily define tricolor (RGB) or four-color (RGBW) lights and adjust them over the web for color tones. The Sniffer mode is also unique: It allows either simple bus diagnostics or reception and processing commands from a DMX master.

Merbon SCADA

Merbon SCADA is a server application that uses web browsers as clients. It is designed for large control rooms as well as local visualization of controlled technologies over the web. Access via web browser significantly simplifies maintenance, licensing and administration. The web access allows modern visualization of floor plans, technological charts, tables or graphs. Linear, column, modulo, differential and carpet graphs assist in historical data analysis and allow users to quickly evaluate the problem and get an immediate overview of the technology. There are also export and data sharing functions (HTML links, images, tables, or text). Merbon SCADA offers easy licensing policy - only 3 types of licenses with unlimited number of users.

merbon
SCADA

SYSTEM OVERVIEW



1 Energy management system
 ContPort is a software package for energy consumption analysis – a customized database client for history data processing. It contains a ticketing system, online data access, statistic modules and benchmarking. ContPort evaluates energy flows in buildings and exports the processed data into enterprise management systems. It is a tool for system optimization, effective energy saving, and performance contracting services.



2 SCADA
 The Merbon SCADA supports both plant graphics and tabular access to the datapoint values and properties. It provides flexible topology, alarm processing and messaging, trend data sampling, and extensive integration potential for Domat Control System controllers as well as for 3rd party PLCs and control systems.



3 Process stations
 The heart of the Domat Control System topology are process stations with the Merbon runtime, free programmable DDC application with both universal and HVAC-specific function blocks. Process stations with touch screens use graphical HMI interface for supervision and control. The platforms used are Windows 7 Embedded, Linux, and dedicated OS, according to communication and performance demands.



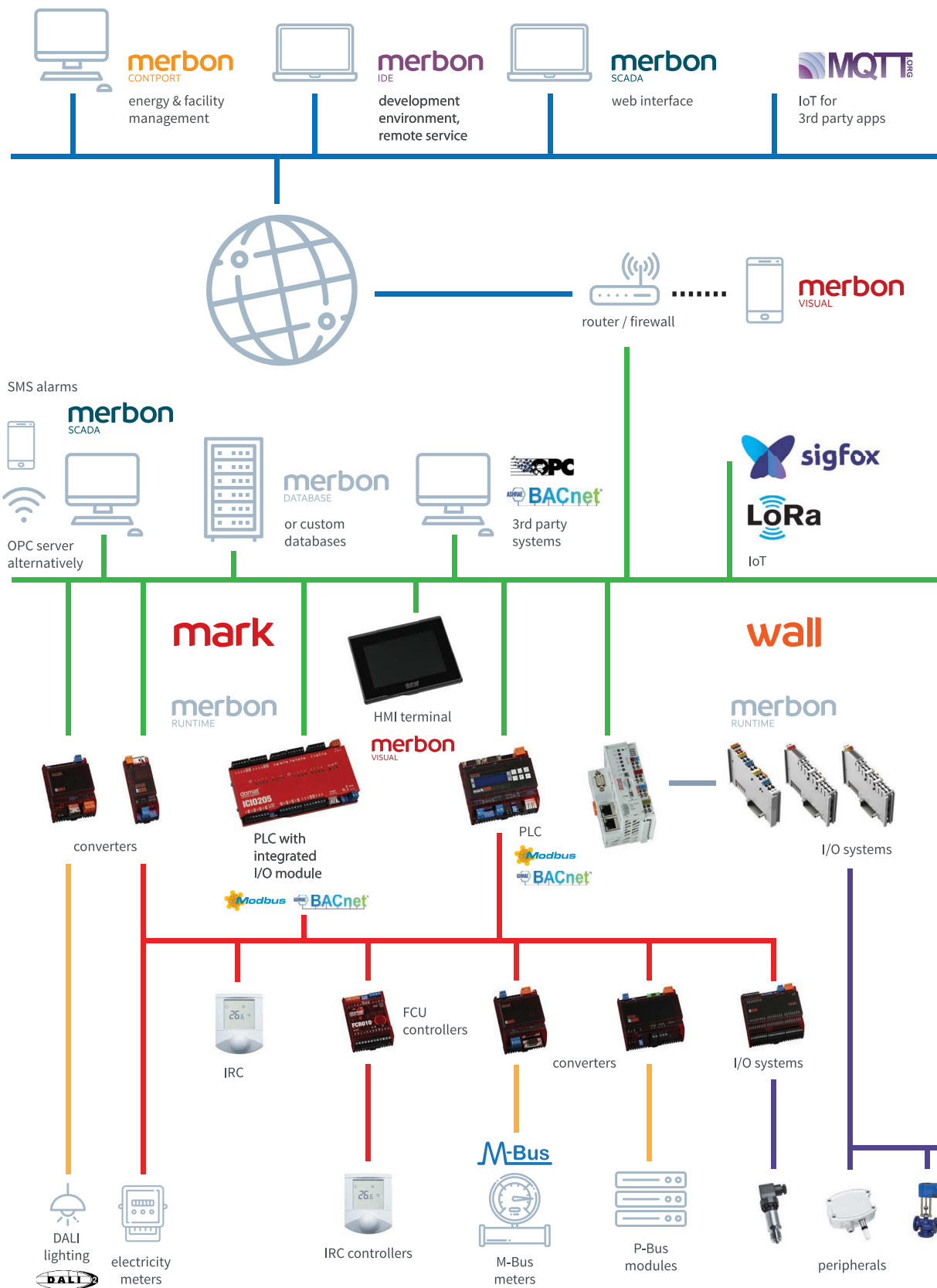
4 I/O moduly
 The Domat Control System input and output modules provide standardized interfaces between the process and the control system. They are used for process controls and for data acquisition in metering systems as well. Standard modules (4/8 DO, 8/16 DI, 8 AI, 8 AO, counters), and compact modules with HVAC-optimized I/O mix are available. Communicative room controllers are also integrated at this system level.



5 Peripherals
 A broad range of Domat Control System peripherals: temperature, humidity, pressure, air quality (VOC, CO₂), and light sensors with standard outputs for both indoor and outdoor usage. Thermostats for air and water, safety elements, and other components provide reliable data for the superset system layers. Elegant room controls and sensors also in customer design.

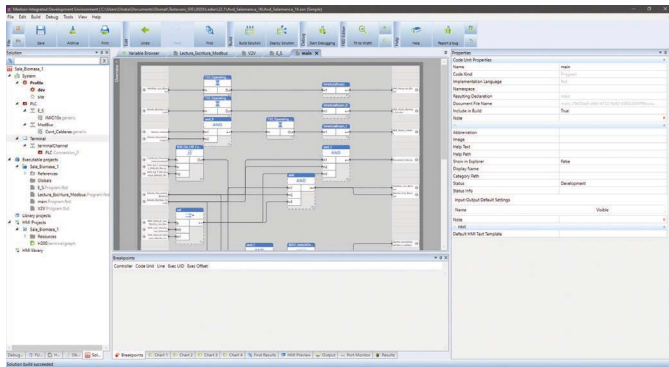
SYSTEM TOPOLOGY

merbon



MERBON IDE DEVELOPMENT ENVIRONMENT

The mark and wall process stations are configured and programmed in the Merbon Integrated Development Environment (IDE). Programming is supported in two languages: function blocks (FUPLA) and structured text (ST) according to IEC 61131-3. Programming with function blocks speeds up development of simple and standard applications, while the structured text is more suitable for complex and special functions.



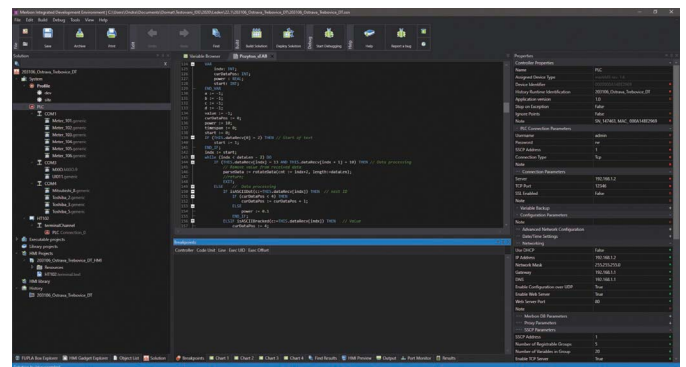
Users may work in Simple mode where most of the functions are preconfigured with lower flexibility, or in Full mode with complete access to all program functions. The Simple mode resembles the SoftPLC IDE functionality: project size is limited to a single process station, there is a single task in the controller, and only programming with function blocks is available. Therefore, it is more suitable for beginners or projects where more engineers will be involved in commissioning: using function blocks increases readability and reduces errors. In Full mode, it is possible to combine both block and structured text programming, but above all to create your own function blocks and functions, again in both languages: FUPLA and ST.

For comfortable commissioning, Merbon IDE contains an intuitive debugger with program tracing, step-by-step debugging, and stepping into procedures and composed function blocks. It is also possible to trend the variables and monitor the serial communication (port monitor), even over the Internet. Merbon IDE thus helps saving service and commissioning costs. Now the PLC can also store historical data in its memory, which can be later downloaded as a CSV file.

The user interface attracts by its ribbon with function buttons which adapts to context and always offers functions which make sense in the current situation. The ribbon helps to speed up the learning curve and engineering. Both menu and help are available in English and Czech with possible translation into other languages. The

project engineering is fast and efficient thanks to predefined functions and function blocks listed in six libraries: analogue, digital, string-oriented, communication, system functions, and HVAC functions. The libraries contain all basic ST blocks and functions according to IEC 61131-3, together with proven function blocks as known from SoftPLC IDE.

Merbon IDE supports Modbus RTU a TCP, both as client and as server, M-Bus, and IEC 62056-21 for metering data readout. Communication between process stations and to SoftPLC controllers is possible. Another attractive feature which is implemented in Merbon IDE is creating customized bus devices. The devices can be modified and copied easily, which speeds up engineering of 3rd party technologies like integrated room controllers, VSDs, meters, etc.



Merbon IDE requires .NET4.5 at Microsoft Windows Vista (Service Pack 2 and above), Windows 7, Windows 8, Windows 8.1, or Windows 10.

MARK... CONTROLLERS

The mark... process stations bring flexibility of freely programmable devices to the I/O module level. Thanks to modern technologies, Domat offers compact controllers IMIO110 (16 I/O, LCD display) and ICIO205 (30 I/O) with Ethernet and RS485 in the new range of PLCs. For larger sites, the markMX with 88 I/Os is the right choice. Compact process stations combine the control unit and I/O modules in one housing, which makes installation easier. It is still possible to extend the system with standard I/O modules over the RS485 interface. The Ethernet interface is used for programming and client communication, such as SCADA, web browser, or 3rd party programs.



Process station with no integrated I/Os can be used both in standard control system with I/O modules, and as freely programmable protocol converters and communicators. Models with one RS485 port (mark100, mark125, mark220), with two RS485 and two RS232 ports (mark320), and with integrated M-Bus converter for up to 10 M-Bus slaves (mark150/485) are available. These process stations are perfect for small sites, such as compact heat exchange stations, small home controllers, or heat pump and small AHU controllers.

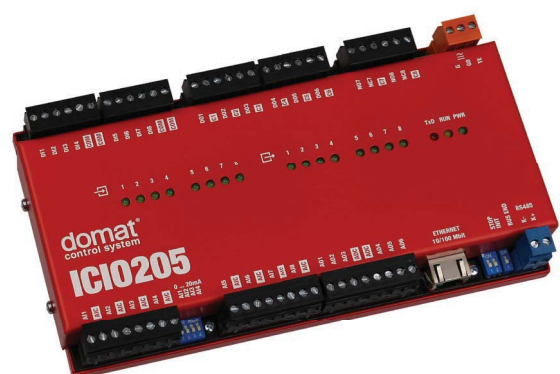
Type	Display	RS232	RS485	I/O	Others	Performance	Remote I/Os
mark100	No	-	1	-		*	30
mark125	LCD 4x20	1	1	-		**	150
mark150/485	No	-	1	15	M-Bus	*	30
IMIO105	No	-	1	16		**	100
IMIO110	LCD 3x16	-	1	16		**	100
ICIO205	No	-	1	30		**	100
mark220	LCD 3x16	-	1	-		***	400
mark320	LCD 3x16	2	2	-		***	400
markMX	No	2	2	88		***	400

The controllers use different operating systems depending on the processors used in the hardware. ARM® Cortex® with real-time operating system FreeRTOS is used at the smallest platforms (for about 20 to 30 physical datapoints), in the more powerful process stations MPC5200 with OS Linux can be found. Controllers for panel door installation (mark125) are also available.

The mark... process stations are part of the open controller range by Domat Control System. Free OPC server is supplied for easy 3rd party integration. It is possible to integrate heat, electricity and water meters, as well as other technologies (e.g. VSDs and heat pumps) at the automation level, as the process stations support standard protocols – IEC62056-21, M-Bus client and Modbus RTU / TCP client and server. More powerful types include BACnet client and server.

All process stations feature a web server for customer visualization. The web pages are presented in HTML5 standard, which ensures compatibility with all modern browsers. The web pages editor has the same look & feel as the SoftPLC HMI Editor, so the transition from an older version is seamless. The new version of the web offers a list of alarms, event logs and historical data in the form of graphs.

All controllers have an Ethernet interface for client connection, web access and configuration. The SSCP protocol, which is used for configuration, programming, and process data communication, is fit for Internet communication because of authentication. It also makes possible to upload new software to the controllers on a remote basis, even over the SSCP protocol / RS485, which can be used at refurbishments of old sites where it is not possible to set up an Ethernet network. The controllers also support direct writing into Merbon DB database and Proxy server, which simplifies communication to controllers which are located in corporate networks where neither NAT mapping nor VPN communication is possible.



I/O MODULES

The I/O modules and peripherals are connected to serial ports either directly, or over separating interface converters. The I/O modules are powered by 10 to 30 V DC or 12 to 24 V AC. Inputs and outputs, power part and communication are optically separated from each other which prevents the rest of the bus from damage in case of overvoltage at one module. Each module is addressed by a configuration software, or by Merbon IDE when commissioning. Analogue inputs are entered with their measuring range: either they are declared as active (0..10 V, 0(4)..20 mA) or passive for connection of all common temperature sensor types (Pt100, Pt500, Pt1000, Ni1000-5000, Ni1000-6180, T1). For special sensor characteristics, each input can be separately linearized with freely defined linearization curve.

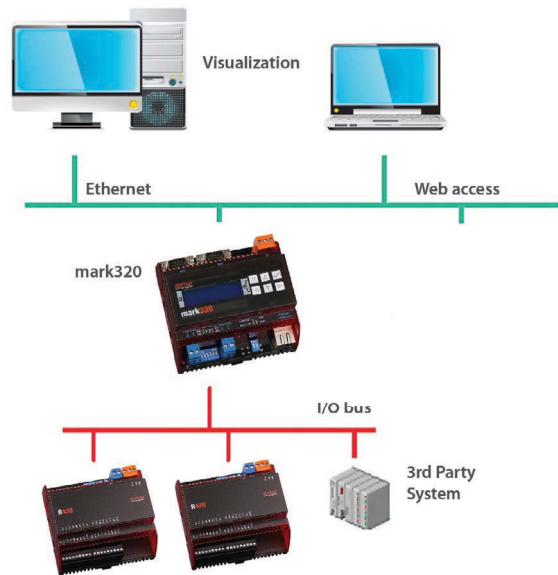
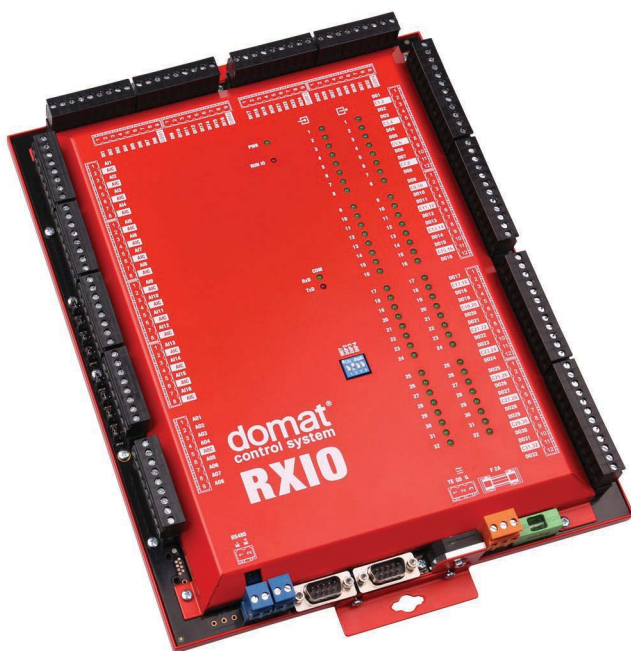
Digital outputs with relays can switch directly 230 V AC low voltage, so that for small loads no separate contactors / relays are necessary. Digital inputs and outputs statuses are indicated by LEDs.

The modules communicate over a separated RS485 bus with Modbus RTU at configurable baudrate. Using a standard protocol, they provide an open I/O bus also for 3rd party manufacturers. All Modbus tables are available at www.domat.cz. The other way round, 3rd party devices, such as variable speed drives, IRC controllers, and energy meters using one of the supported protocols can

be integrated directly into the process station. Sometimes they can be even connected to the same I/O bus as the I/O modules, providing integration at the I/O level. The process station is usually installed at a place accessible for the maintenance staff. As the I/O bus may reach up to 1000 m, data from the whole building can be linked to one process station, or more panels with I/O modules can be connected together to one process station, which saves cabling costs.

For installation outside of the panel, small I/O modules are the right choice: MW240 for lights and blinds control with flush-mounted box installation, or MLIO – the distributed module for installation on a cable tray or on a wall.

A Modbus client, ModComTool, allows to address, set up, and check the functionality of I/O modules. It is free for download at www.domat.cz. To connect the I/O bus to the computer, use a USB/RS485 converter (Domat RO80 or any other type) or Modbus TCP/RTU router, e.g. RO35. Fast addressing and remote setup can be done by any Domat PLC switched to Converter mode.



WALL... CONTROLLERS

As part of the hardware platform extension program for the Merbon system, we prepared a modular solution for stations with runtime Merbon under the name wall. The stations are programmable in the Merbon IDE, like all other platforms.

To simplify logistics and design, the PLCs are available in packs together with I/O card mix, with optional extensions by standard I/O cards on-site. In addition to the w750-8101 and w750-8102 base units, over 30 other types of I/O cards are available. The complete list of cards can be found in the current price list.

Budget sets with I/O packs optimized for most common HVAC applications:

Type	AI	AO	DI	DO	RS232/RS485
wCIO	8	8	8	8	-
wMX	16	8	32	32	-
wCIOcom	8	8	8	8	1
wMXcom	16	8	32	32	1

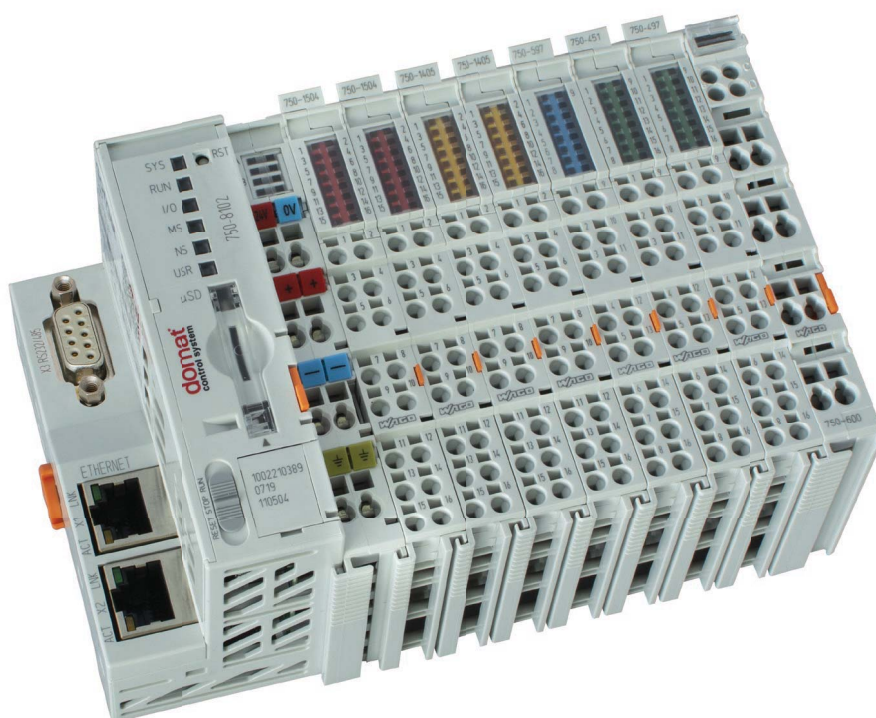
Full support of the wall process stations is part of the new Merbon IDE release published together with the wall series market introduction in January 2020. The main advantages of the wall PLCs is less occupied space in the panel together with possible extensions by standard I/O cards, inclusive communication cards (in the introduction phase the RS485 card with galvanic separation).

wall

The basic processor unit concept, complete with I/O cards, saves space in the rack and allows you to assemble the I/O mix exactly according to technology needs. Modular units are very suitable for installations with a non-standard I/O pattern and wherever space saving is necessary. The controllers are certified for the most demanding environments, including shipping.

The process stations have been deployed at pilot projects since March 2019, and AutoCAD and EPLAN macros for designers are available at the Domat website.

The new wall series is fully compatible with other components of the Domat system, such as terminals (HT200, HT102), mobile application Merbon Visual, Merbon SCADA, Merbon DB database, energy management portal ContPort, and other products. As with other Merbon PLCs, BACnet server, Modbus TCP server, OPC server or native SSCP libraries are available for integration into third-party systems.



ROOM UNITS AND CONTROLLERS

Design range of communicative room units and controllers brings new dimensions in room controls. Large LCD display (60 x 60 mm) displays room temperature and status so that the data are visible up to 5 m distance. With a push/turn knob both temperature correction and operation mode changes are easy, as is multi-level parameter setting inclusive weekly schedule plan.



For air handling units, small boilers, A/C units and other complicated devices, universal room units are the best choice. They provide basic functionality (room temperature, room set-point, operation mode setting) as well as more

complex functions: heating curve selection, setting the outdoor temperature at which it starts to heat, DHW temperature setting, relative display and setting humidity, displaying five other arbitrary values, etc. The set of functions to enable is configured at the commissioning time. For example, the set of operation modes may be residential (Day, Night, Auto, Off, Party mode) or hotel/office (Comfort, Standby, Off). Each mode provides separate setpoints for heating and cooling. To make configuration easy, a convenient program is available free of charge for addressing and setting drivers and controllers. CO₂ sensor controllers, types UI90..., are used where air quality-controlled ventilation is required. The rH sensor is now standard at all UI... controllers. A new feature is the UI300 with analog input for an external temperature sensor.

Universal controllers are also available with two inputs and two outputs for collecting signals from the presence sensor or window contact and controlling typically heating (radiator head) and possibly cooling. In this case, the control logic is configured in the controller and the algorithm is fully under the control of the application author.

Individual room controllers then represent a solution where the firmware already contains the PI control algorithm and logic for operating mode switching. Thanks to the default preset values, there is no need to set the controllers in addition to addressing, but individual functions (valve protection, change-over, selected operating modes) can be enabled or disabled via the bus.

The UC102 room controller provides one SSR PWM output to control a thermic actuator or electrical heater, UC200 features two outputs for heating and cooling. Both versions also have two potential-free inputs for the presence signal (eg from the access card reader) and a window contact or dew point sensor for

systems with cooling panels. Underfloor heating is precisely controlled by the UC300, a communicative controller with an additional analogue input for the floor temperature limitation sensor Pt1000 and the same controls as the other devices in the series.

To control fan-coil units, choose FCRO10 with room unit UCO10. The controller has 3 relays the fan-coil stages, two outputs for heating and cooling, and two inputs for presence sensor and window contact. The controller communicates with the room unit over a RS485 bus. The FCRO13 has a 0...10 V analogue output for EC fan control, and the FCRO15 with room unit UC905 is ready for VAV box control according to CO₂ concentration in a room, induction units and other combined systems by assigning control sequences or combinations thereof to individual outputs.

Controllers and room units may feature a blue display and knob backlight. The backlight can be controlled either automatically by the knob or over Modbus.

Other controllers of the same design are temperature and humidity sensors and controllers with Ethernet interface and Modbus / TCP communication, with or without display, or other customized devices. Ethernet drivers and sensors are also available as PoE, which greatly simplifies installation and enhances the application field.

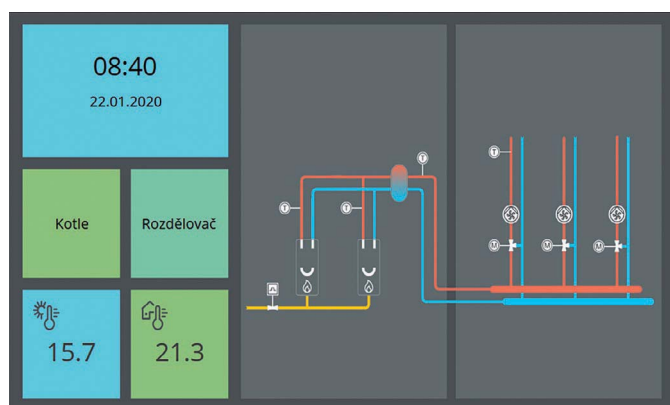
Controllers and room units can be integrated either into process stations to communicate heating/cooling demand signals to control the primary units or receive a central depression signal, or directly into the visualization over a Modbus RTU / TCP router.

All controllers and room units are not only compatible with the Domat Control System PLCs. They can also be integrated into other control and SCADA systems thanks to the open Modbus RTU protocol and wide voltage supply range. UB100 controllers for heating control (with changeover function) and UB200 controllers for radiators and cooling panels communicate via the BACnet MS/TP protocol. All are available in three colors (white, gray and anthracite).



USER INTERFACE MERBON VISUAL

The graphical user interface (HMI) is an important part of the projects. The graphics editor for websites and all kinds of terminals is now in the Merbon IDE development environment. Templates, i.e. panels with graphics or text menus, can be assigned to different types of terminals and web servers. The panels contain objects with text, images, control buttons, graphs, values and other functions. Transparency of objects is also selectable. Panel resolution is optional, so either choose one of the predefined sizes as the default screen format, or enter your own resolution. All data is saved in vector format, and browsers adjust the panel size to the current resolution, so there is no need to redraw the project when changing the display resolution. Generic websites, such as an overview of alarms or events, do not need to be configured at all.



Entering values can be protected against unauthorized access by a four-digit code. Alarm acknowledgment can be set as unprotected, which sometimes proves to be an advantageous option for less trained or occasional operators.

The stations also allow the control of technologies by means of time programs. These are defined in the runtime as required and are set by using the graphical dialog. Three types of time programs are available: binary, multi-state and analog, which allows entering any values within the given limits. There are also exception programs for defining holidays, etc.

An important part of the application is a module for sending alarm e-mails and SMS messages. A separate message can be created for each alarm with a defined addressee, subject, message content, etc.

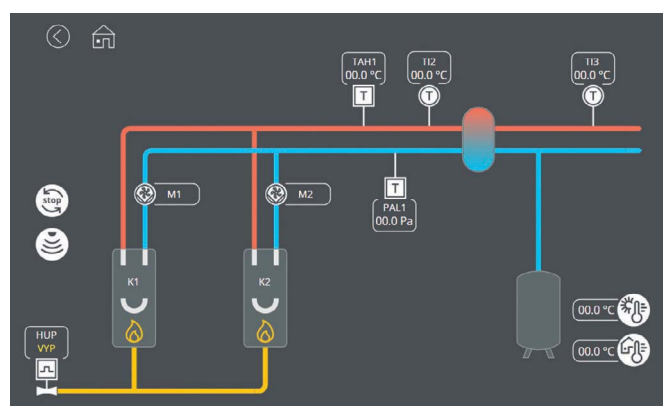
Creating a project in the editor is very easy. Users appreciate the intuitive environment, extensive copying and swapping of the texts, as well as mass changes to object properties, making project creation easier and faster. The finished project can be exported for the web by touching of a button. The panels are accessible via a web browser anywhere on the network, including embedded graphs and the ability to change values. The application also exists for iOS, OSX, Linux, Android and

Windows environments, making process data available for tablets, communicators and other portable devices.

In addition to HMI application, an OPC server can be installed on the top of a SoftPLC or Merbon runtime. It is a fast and cost-effective way to integrate data from a SoftPLC or Merbon runtime into any visualization system which supports OPC technology. Modbus / OPC server, BACnet / OPC server, M-Bus / OPC server etc. can be installed at the price of SoftPLC or Merbon runtime license with minimal engineering costs. Unlike conventional OPC servers, mathematical and logical operations (e.g. average, sums and differences, maximum / minimum, counters, unit conversions, etc.) can be executed in the runtime using function blocks or structured text.

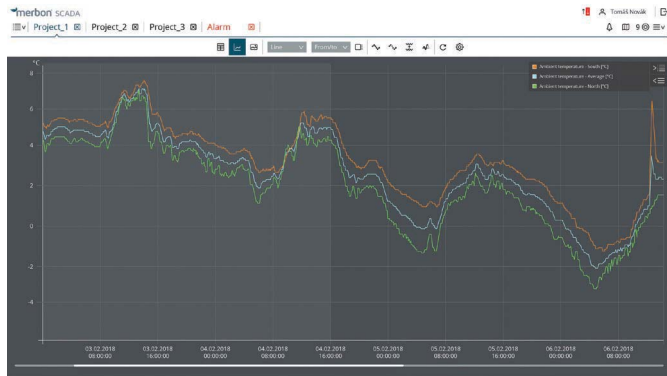
Modbus RTU or TCP server can be used for data transfer to process controllers with serial communication: over a RS232 or RS485 line or Ethernet interface, data from Merbon runtime (i.e. from PLC) can be shared with other PLCs which communicate as Modbus RTU clients.

Merbon Visual application, designed for mobile devices with iOS and Android operating systems, is now able to download definition of graphic or text menu directly from Merbon PLC. All you need to do is enter your connection parameters and sign in. The application enables reading and setting of values and time programs as well as working with alarms in process stations with both Merbon and SoftPLC runtimes. It connects to the PLC via the Internet. It is free to download on the App Store and Google Play. Merbon Visual supports connection to multiple PLCs and can be configured for access from a local network or the Internet. Switching between local and remote access is easy and fast, the entire application is optionally password protected for added security.



VISUALISATION MERBON SCADA

The operator must always have up-to-date and accurate information about the status of the relevant technology, be it a boiler room, a network of heat exchangers, an individual room control system in an office building or hotel, a PV plant or system of energy resources which make up a virtual power plant.



This information is provided by process visualisation (SCADA). Data are available as tables and schemas offering current values, graphs, alarm and event overviews as well as other information. The application consists of a server, and client stations. The server communicates with process level (PLCs), acquiring online data, and with databases, which provide history data (trends). The server then provides all clients with schemas of technologies and floor plans, tables, etc., which display the data. Clients use web browsers, which simplifies maintenance, licensing, and workstation management.

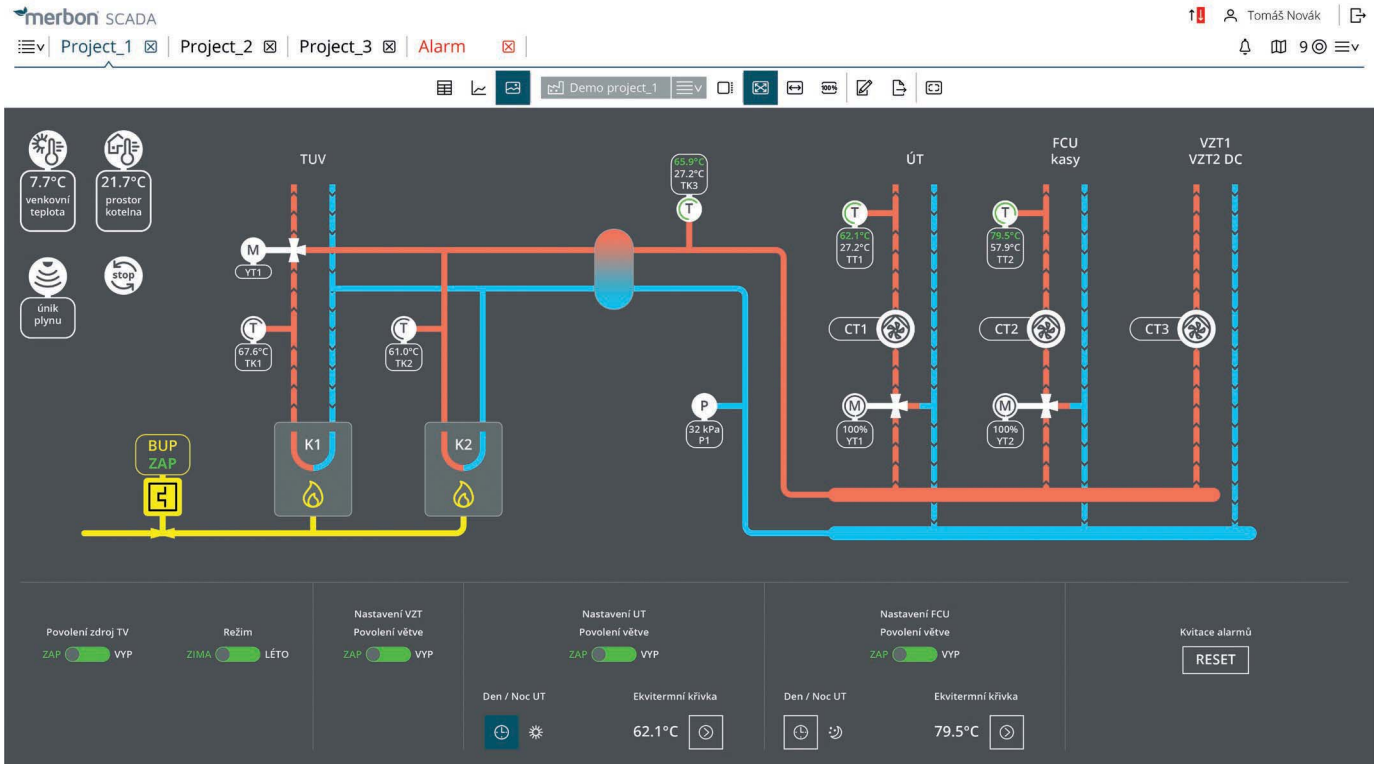
A graphic workstation allows to display and record data not only from Domat-based control systems. As far as larger projects and installations are concerned (where technology is gradually refurbished or expanded based on the investment abilities of the operator), we are able to integrate visualisation with other control systems such as process stations, photovoltaic inverters, cooling equipment, boilers or energy meters. For this purpose, Domat offers a wide range of software components and drivers which allow communication with control systems produced by other manufacturers, either via standard protocols such as Modbus, BACnet, M-Bus or OPC, or via company-specific protocols developed by other manufacturers. This allows us to display values at central management stations.

Panels with technology schemas, which are the main tools for data presentation, may contain animations, static images, texts, user notes, setters, links to other panels, etc. Design is fully in the hands of the graphics creator. A modern library of technology symbols from building management is available free for download. Merbon SCADA includes extensive user and role management.

Alarm management is processed at the process stations or via the SCADA computer - based on system size, and alarm forwarding and routing requirements. Alarms may be reported/displayed on a screen, via SMS, e-mail or through other ways.



VISUALISATION MERBON SCADA



Part of the Merbon SCADA is the Merbon Alarm Server, which sends events to users according to predefined criteria depending on priority, technology unit, device location and preferred communication channel. It is thus possible, for example, to report all alarms on the computer screen during working hours and to send the user only critical alarms such as SMS requiring confirmation after the shift (according to the schedule or information from the integrated attendance system).

Alarms are available in two views: the active alarm table and event history, again with sorting and filtering options according to number of criteria. System alarms, such as non-communicating devices, are visualized differently from technology alarms. Alarms pass through a state machine and can also be sorted as in alarm, unconfirmed, normal, and undeleted. Thus, the alarm status can affect the technology (for example, it is only possible to allow the device to run after the alarm has been acknowledged and deleted). The number of active alarms is shown in the top bar.

The technical preview is a table with all data points in the system. Each point displays the current value, the time of the last communication, the communication quality, the description and other parameters that are more used for diagnostics. The data points are arranged in a tree structure for easier access and at the same time they can be

searched and filtered. The user can mark selected data points in the table and then display them as a trend, for example.

A very important feature is the evaluation of historical data. Merbon SCADA offers not only classic line and bar charts, but also modulo charts, differential charts and carpet charts. This facilitates rapid problem analysis and provides the operator with a comprehensive picture of the state of all technologies. Trend previews can be saved as templates and referenced for example from graphics. You can export trend data as an image, a spreadsheet, or text.

In simple installations, data files are used to store historical data, i.e. sampled values. For demanding requirements such as storing tens of thousands of values every minute, Domat utilizes its own high-performance binary database optimized for recording industrial process values, Merbon DB, or Influx database. They can handle hundreds of thousands of values per minute. Databases have an open interface (API), so data can be read and used in other systems, such as accounting and ERP programs.

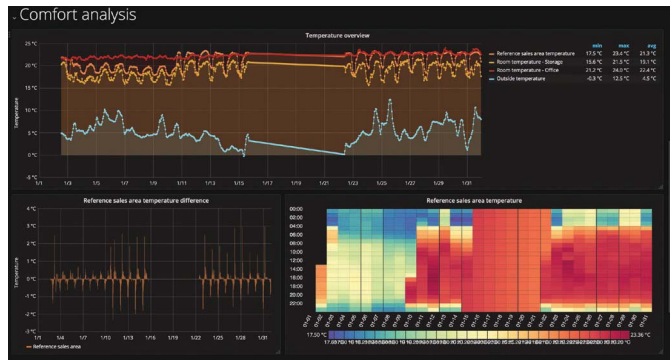


MANAGEMENT PORTAL MERBON CONTPORT

ContPort is a management tool which helps with introduction and long-term operation of energy management in a company or at a manufacturing plant. It is a comprehensive cloud application available over the web from any device. Thanks to ContPort, corporate targets can be checked, energy consumption monitored, and reports received on a regular basis. The tool provides wide functionality for data analysis and processing, and reporting – customized visualisation. The service module gives control both of service subcontractors and the internal team who takes care of plant management. ContPort is also used as a data bank of information on managed properties and technologies, and data storage for documents, such as audit reports, manuals, and images.

The service module (helpdesk) and maintenance offer comprehensive archiving of both technical and sales documentation and workflow of warranty, post-warranty, and predictive servicing and maintenance. The module contains a ticketing system for subcontractors and internal employees. There are all relevant documents stored in the system necessary for safe and economical operation of technologies and buildings: project documentation, service and operation agreements, safety audit reports, etc. The workflow of a service event starts with reporting of a problem – either manual over a web interface, or automatic, generated by an alarm from the control and monitoring system. The service event is then processed, closed and invoiced. Preventive maintenance is planned in advance and service events are generated automatically.

speed etc.), process and comfort values (temperatures, flows...), and energy consumptions (electricity, gas, heat, water). Values are presented on a management level in dashboards and long-term planning tools. Key performance indicators can be specified and monitored by ContPort as well. Dashboards can be compiled into screens and monitored on daily basis. The KPIs are presented as graphs, carpet plots, semaphores, tables, colour indicators, and other graphic elements.



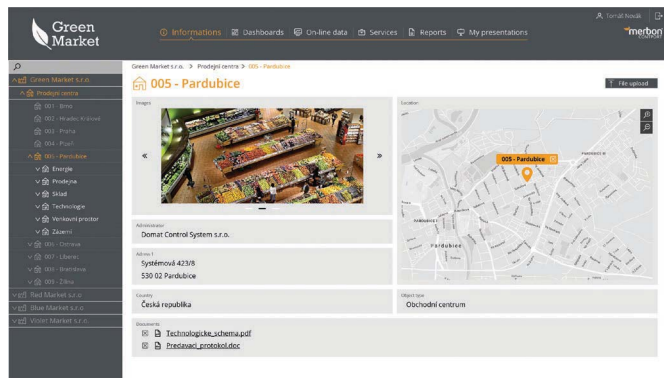
The module for reporting and economical evaluation works with data acquired in the previous modules or imported from other resources (such as automatic import of meteo data from the Internet or .csv files). Various report types can be defined, from the simple ones, like operation costs of a plant for a time period, to more complex benchmarking of similar plants in different locations, related to specific units (m2, kWp, years). Reports may be sent to the recipients automatically by e-mail.

Thanks to these functions, data from old and difficult to maintain Excel tables can be imported into the system and controlled from any device.

ContPort is hosted in data centers with availability of 99.9 % and data backup at two locations. Its application core is based on Microsoft Dynamics CRM, with application layer and web portal on the top. User interface is available in several languages, and users can switch between them.

ContPort was designed for service and facility management companies and for investors managing different technologies – in general, for users who need to have a comprehensive overview of costs and efficiency. Service companies mostly use the application part, while their subcontractors access the system using the ContPort web portal.

The connection to ContPort is encrypted and data access is limited according to user access policies. Your data and functionalities are safely preserved from unauthorised access.



The on-line data acquisition module collects data from technologies either directly from PLCs and I/O modules, external databases, or from energy meters. It uses rich company know-how in 3rd party integration and communication using serial protocols (M-Bus, Modbus, IEC 62056-21) and APIs. The values are displayed on the portal and saved in a database. Users then have access to the entire history, anytime. Data also can be entered and edited manually, e.g. for manual energy readouts.

These data show how efficient the plant operation is: consumption of plants and plant parts, environmental values (outside temperature, solar irradiation, wind

CASE STUDIES

Nuclear Research Institute Řež – high temperature hydrogen decomposition

In November 2015, the high-temperature hydrogen decomposition plant was installed in the Nuclear Research Institute in Řež, Prague. The aim of the plant is to learn about possible heat recuperation from hydrogen production when using high-temperature water electrolysis.



The core of the plant is a heated cell with an electrolyser to which either hot steam (in the electrolyser mode) or hydrogen (in the cell mode) is brought. The operation of the plant is controlled in several steps. After the basic function check, the parts are heated to their operation temperatures. The most important part is the furnace with the electrolyser which is heated to 800 °C and above. As the electrolyser is sensitive to rapid temperature changes, the heating follows with a 1K/min slope. After the plant is heated up, it is possible to operate it and conduct the experiments. Finally, the plant is controlled so as to cool down slowly. The control system monitors the plant status, and when major problems at the field devices are detected, the plant is automatically brought to standby to prevent damage.

The main control element in the system is the Linux-based Domat IPLC510 controller. The system communicates with a BK Precision controlled load over RS232 interface using a driver developed for this project. On the top of the system there is a RcWare Vision SCADA to monitor, sample and store all measured values and setpoints.

The high temperature hydrogen decomposition plant is the second project with Domat which was installed in the Řež Nuclear Research Institute. The scientists enjoy especially its wide 3rd party integration facilities and easy programming, as the control algorithms are adapted continuously to the latest know-how and research requirements.

The Doha Metropolitan, Qatar

Since 2016, Domat Control System takes part at the supply of components for building management sys-

tem of the Doha Metropolitan, Qatar. As this was one of major international projects for Domat, let's have a look at some of its features.

The entire metropolitan is planned as four lines with 85 stations in total, three lines being in construction. The first line is about to be completed in 2019. Domat supplied to Lysys, the local partner, room cooling controllers for shopping and office areas. More than 1000 fan-coil controller and the same amount of room units have been shipped so far.

The FCO25 hardware origins from the FCO20 fan coil controller. The FCO20 controls a three-stage fan and, unlike the smaller FCO10, contains also analogue inputs and outputs and more binary inputs.

The controller also features two RS485 interfaces with Modbus RTU: one for the UCO10 room unit and optional slave controllers, one for integration to a BMS (Building Management System). The communicative room unit UCO10 may be replaced or enhanced by a passive temperature sensor and optionally a potentiometer to set a room setpoint correction.



The second type of controller, FCO26, has customized hardware. Instead of a three-stage fan in this configuration, the EC fan is controlled by a continuous 0.. 10 V signal. EC (Electronically Controlled) fans have been an excellent modern alternative to conventional three-stage fans in recent years - they are easier to plug in, can be controlled continuously from 0 to 100% speed and do not contain capacitive ballasts that have often been a source of problems.

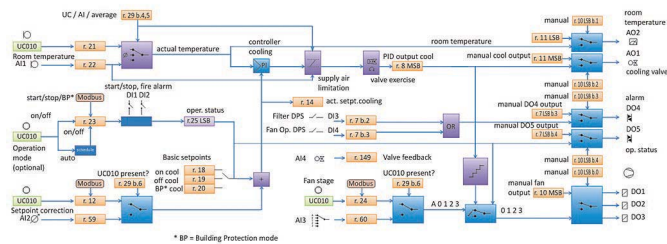
The fan-coils are used for cooling only. For European conditions, unconventional data points are inputs for sensing the valve position, for the differential pressure filter and for blocking the function from the EPS system.

The technical support was easier thanks to the fact that the controllers are set up over a serial line and a simple configuration program. It allows to export the complete setting of a controller into a file which can be sent by e-mail to the support engineer who is able to duplicate the exact setting of a controller at his desk. After parameter correction or setup change, the file is

CASE STUDIES

sent back and simply uploaded to the controller by the customer. This was how some problems due to wrong binary inputs configuration were discovered and explained.

The whole project was slightly more demanding than projects of similar magnitude in Europe, but it was successful in the end and we believe that also the other Doha Metro lines climate will be controlled by the Domat room controllers.



Domat Control System – leader in retail chains technology management

Domat Control System is one of the largest suppliers of building management systems for retail chains and retail in the countries of Central and Eastern Europe (Czech Republic, Slovakia, Slovenia, Croatia, Hungary, Poland, Romania). For large shopping centers, such as the Prague shopping center Harfa, the customer is the developer of the building. Domat regulation can be found in Billa and Penny stores in the Czech Republic,



Burger King and KFC restaurants in Slovakia, in Austria in Austria Starbucks cafes (pilot projects), Kaufland stores in Slovakia, DEK building stores in the Czech Republic and Slovakia, Sportisimo sporting goods stores (CZ, PL, SK, RO), and Decathlon (Hungary). In these cases, the supply is realized directly for the retail chain using our system integrators.

The common feature of these applications is not only the supply of control systems at the branches, but also the central dispatching, where all the branches are in-

tegrated. Depending on how the chain is organized, there are national headquarters (Interspar in Hungary, Slovenia or Croatia) or a central dispatching center common to all stores across countries. Customers, who also deal with energy management, choose the cloud system ContPort over the headquarters (SCADA). In this way, the energy company has an overview of environmental parameters and energy consumption inter-



nationally, which can provide interesting incentives for technological innovation and energy savings.

In retail shops, two concepts are most often encountered: they can be found as smaller buildings, usually detached, with a sales area of up to 1000 m², as well as large shopping centers with a dominant supermarket of 3000 m² and other shops and services in the common hall. A separate chapter are the giant shopping centers, for example the Černý Most Center, Westfield Chodov shopping center, etc.

Heating is usually handled by an air handling unit, which is also used for ventilation. Underfloor heating is not used, although it would make sense considering the available low-potential waste heat from commercial cooling. The problem is that the sales area is occupied by shelves with goods, which both reduces the possible heating area, and on the other hand, the goods could lose their quality because of the heat. Often, the cash register area, which is usually near the entrance, is often discussed: previously, radiant panels were installed in this zone to achieve the comfort of cashiers. But they did not work well, because the radiant heat could not compensate for the cold air flowing from the entrance. The current solution consists in better air distribution in the area of cash registers together with hot air curtains. Ideally, however, would be the local heating directly in the cash booths.

The central air handling unit for the sales area is controlled by a time schedule according to the shop's operating hours, often in combination with a fresh air regulation using CO₂ sensor.

For cooling the sales area, warehouses and other operating areas either separate systems are used, similar to office buildings, or split air conditioning units, so

CASE STUDIES

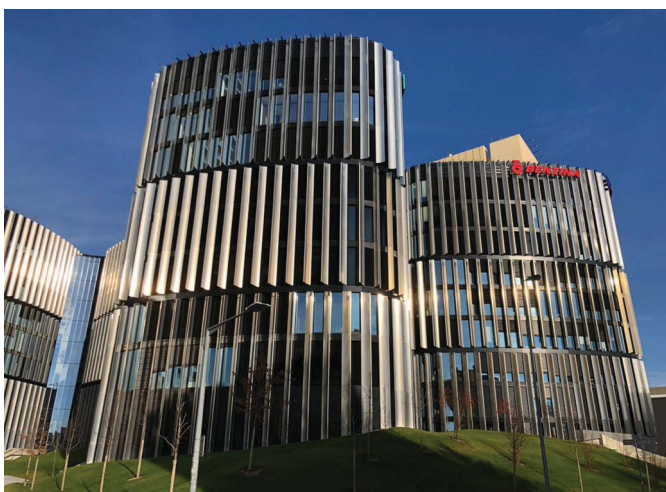
popular for its simple assembly, low cost and easy billing (only electricity consumption is measured, tenants need not install calorimeters). Specialized suppliers of commercial refrigeration, however, also offer a comprehensive solution where heat pumps produce both refrigeration for food and air conditioning as well as heat for heating and hot water.

Traditionally, the lights on the sales area are managed in groups. About a third is switched by the time program as the first stage and the rest a few minutes before the start of the sales period. In places where daylight is also used, it is worth installing dimmable lights (e.g. with DALI interface) and controlling them in addition to the time program also according to the outdoor light sensor. For large stores, up to 20 – 30 circuits are independently controlled by time programs, including outdoor advertising lighting, parking lots, ramps, etc.

In smaller shops, it is not worth training any local staff, the systems are parametrizable, and all technology is operated by a dedicated team of technicians at the headquarters. For large shopping centers, one local SCADA station is installed at the central control room of the building, which is used by the maintenance personnel to deal with common operational situations, while long-term data evaluation is the responsibility of an energy specialist.

V-Tower and MPP, Prague

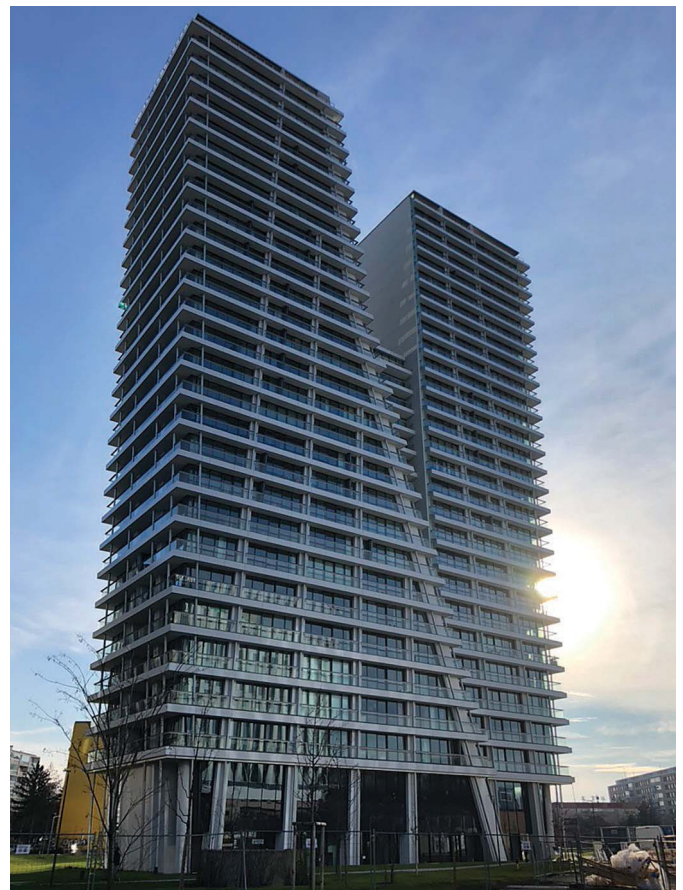
The latest landmarks of Prague's Pankrác Plains are two buildings completed during 2019: Main Point Pankrác (MPP) and V-Tower.



The MPP building was designed with the aspiration to obtain the LEED Platinum certificate. It is ventilated by air conditioning while maintaining the possibility of natural ventilation through the windows. There are three air-conditioning engine rooms in the building. The air-conditioning units have suction and outlets installed through facade blinds and building ventilation ducts, so that only roof outlets from restaurants, toilets and

garages are terminated on the roofs. The air from the offices is recycled to the garages.

The rooms are cooled by induction units in the office parts and by fan-coil units in the rental part. Additional cooling technology and local server rooms are provided by smaller units with direct cooling. The heat source is a heat exchanger station connected to district heating networks. The office space is fitted with floor convectors, the other space with panel or fin radiators. During



the construction, a heat pump was added to the heating system to extract heat from the waste water of the neighboring V-Tower.

The building management system includes 23 freely programmable stations, mostly Domat markMX, and more than 500 zone controllers (including 156 fan-coils and induction controllers and 356 radiators and cooling panel controllers). In SCADA, this represents more than 6000 data points. The Merbon SCADA software was used as a visualization program.

Since the building was being completed and rented gradually, commissioning was possible with fewer technicians than is normally the case for such an event. However, this was not the case for assemblies – they were practically simultaneous throughout the building.

With its 104 meters, V-Tower has become the tallest apartment building in the Czech Republic. It has 130 apartments located in two towers (east and west, up to the 28th floor) and in the central part (up to the 15th

CASE STUDIES

floor). Primary technologies (heat and cold production, 44 air handling units for common space ventilation and integration of foreign equipment) are controlled by ten powerful markMX and mark320 process stations, with a total of nearly 3000 data points. Furthermore, there is one markMX controller in each apartment with about 120 data points, so only the apartments represent more than 15000 data points. The building management system also monitors the swimming pool technology located on the roof of the building in the penthouses.

In the apartments, emphasis was put on noise insulation, so that air handling units had to be set up individually. Each unit has individually calculated and controlled inlet and outlet pressure parameters. Some of the flats were supplemented with steam humidifiers according to the owners' wishes, while others were customized. This meant that the original concept of several type wiring disintegrated into an individual project and control software for each apartment.

Each apartment has water meters for hot and cold water, heat meters for measuring heat and cold and another meter for cooling consumption of the air conditioning. Nearly 150 electricity meters are installed to measure electricity consumption in common areas and garages. In total, there are about 800 M-Bus meters in the V-Tower, connected to data concentrators, from which the values are brought into the visualization.

The V-Tower and MPP project has historically been one of Domat largest contracts. Despite the common problems of coordination, lack of time and constant changes in the technical solution, we managed to finish the event on time. This created a project that combines modern technology, comfort and energy efficiency.

F. X. Šalda Theater, Liberec

The F. X. Šalda Theater in Liberec has been standing since 1883. In 2019 it was reconstructed, and the technology of the building was also realized. The theater now has 27 air-conditioning units and 14 heating circuits.

The Liberec heating plant serves as a heat source, which supplies heat to the building through the heat exchanger station thanks to the central heat supply system. It is a steam/water transfer station, the total reserved power for the whole theater building is 540 kW. The distribution of thermal energy into the theater interior can be divided into radiators and hot-air heating. The system has a total of 14 heating branches, of which 8 branches are for radiators, 5 branches are for HVAC equipment and one branch for parapet fan-coil units in the entrance hall and foyer area.

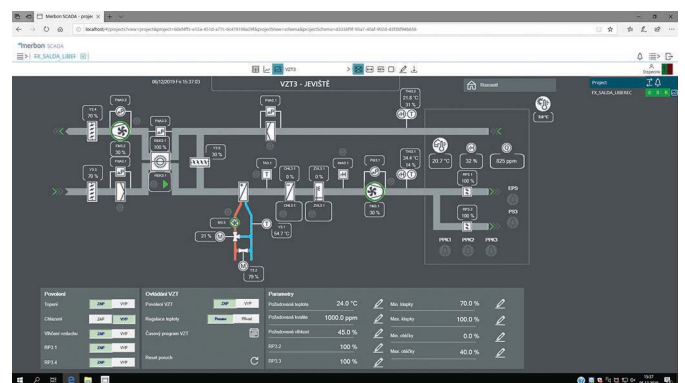
Hot-air heating was left in the theater auditorium and bar on the 3rd floor. Newly it was designed for the theater stage, entrance areas and foyers and side represen-

tative staircases, where this principle was restored in the spirit of historical design from the time of the foundation of the theater. On the other hand, the radiators are mainly used in the facilities of employees and performers of the theater, in toilets and inside corridors and staircases. Part of the bodies are in cast iron, with retro design.



(Source: <https://www.saldovo-divadlo.cz/>)

The source of cold is the outdoor condensing unit in the English backyard at the southwest facade of the theater building. The outdoor unit is connected to three indoor units with which it is connected through refrigerant piping. The required output of the cooling source is 36 kW, it is a multi-split system. The theater auditorium will be cooled by means of a water cooler (adiabatic cooling), which is part of two air conditioning units in the basement of the theater building.



The building management system with automation stations and modules was supplied on a turnkey basis by Warmnis, a company based in Liberec, with which Domat has been working since years. In four racks, there are four markMX automation stations and additional I/O modules, representing over 1,000 data points in the Merbon SCADA graphics.

On Tuesday, October 15, 2019, the building was handed over, and on Saturday, November 4, the theater was

CASE STUDIES

ceremonially reopened after a nearly six-month reconstruction with the soloist gala concert and the orchestra of the opera of the Šalda Theater.

Czech Embassy in Tokyo

Shibuya is most probably the busiest district in Tokyo with many department stores, restaurants, bars, and music clubs. It is also the place where the Czech Embassy together with the Czech Centre are located. The Czech Centre is a government-funded institution which opens a dialogue with Japanese public and media, and represents the Czech Republic in Japan. It organises activities and events focused on Japanese public, supports exchange projects, and cooperates with renowned cultural institutions across the country. In 2010, architect Jaroslav Kačer created the project for reconstruction of the building, part of which are also building technologies. Domat Control System won the contract for the turnkey supply of the building control system.



There are 26 air handling units in the building, from those supplying offices and exhibition rooms to exhausts from technical rooms. The fans are mostly controlled by variable speed drives according to air quality or to a constant value depending on the operation mode. In the air ducts there are more than 140 fire dampers which are monitored and displayed in the SCADA. Heating and cooling is provided by a system of 16 heat pumps, connected in groups: three outdoor units for apartments, and one for the embassy and the Czech centre each. The domestic hot water is heated by two boosters, which are heat pumps in principle. The boosters are independent units communicating with the control system over analogue and digital signals.

The control system is installed in 8 panels interconnected in an industrial Ethernet network. In the control room there is a PC with RcWare Vision SCADA software. This means that the system topology is a standard one, like at other similar sites. Twenty six water meters are

integrated over M-Bus together with 39 power meters for consumption metering in apartments in 2nd to 5th floors. The M-Bus to RS232 converter is connected to the network over a RS232/Ethernet terminal server.



What is definitely worth noticing is the power grid system in Japan: for historic reasons, the north-eastern part of the country uses 50 Hz frequency while the western part operates with 60 Hz. This bifurcated power system is a holdover from the 19th century when local power distributors, working with DC current, moved into AC. Some of them imported the equipment from what later became AEG, using 50 Hz, while local power providers in Osaka brought in 60 Hz generators from the United States, supplied by the predecessor of General Electric Company. The grids grew, with 60-Hz power generation emanating from Osaka and 50 Hz electricity spreading out from Tokyo, until eventually the entire country was wired. The frequency frontier is delineated by the Fujigawa and Itoigawa rivers. A very important part of the infrastructure are frequency converter stations which enable connecting the two systems together and increase grid stability. Nowadays, three stations operate with combined capacity of about 1 GW, and works are in progress to increase the capacity.

Tokyo itself uses two separate power grids, apparently for the sake of higher power safety in case of blackouts and natural disasters. One of them, Power, is used for power appliances, operating with three-phase 200 V / 50 Hz current with interesting connection where one phase represents the neutral line at the same time. Line-to-line voltage and line-to-ground voltage are thus the same, 200 V. In the panels there are three phase conductors plus PE. The second network is called Light – for illumination – with one-phase 100 V / 50 Hz power, using 1 phase conductor + N + PE. The control panels had to be designed accordingly together with power supply for the control system. For the Domat engineers, it was a very interesting experience not only from the technical point of view, but also because they learned about everyday life in Japan.

PRODUCT OVERVIEW

I/O MODULES / PROCESS STATIONS / INTEGRATED ROOM CONTROL / SCADA / ENGINEERING TOOLS / PERIPHERALS

HOW TO USE THE PRODUCT OVERVIEW

Each price list item contains Type identification which is used for ordering in the default configuration. This is detailed in the Brief description part. If the item has more configuration options, they are listed in the right column and each group of options is marked with an asterisk. **Example:** In case of the room combined sensor the default type RFTF-U provides one active 0.10 V temperature output, however, passive temperature sensors can be delivered instead, e.g. RFTF-U Pt1000. Another option are 4...20 mA outputs instead of the 0.10 V outputs. The sensor type ID is then RFTF-I and – as it is set in bold letters – the price is same as that

of the default type, RFTF-U. The type ID RFTF-I Ni1000-5000 then provides a 4...20 mA output for humidity, and Ni1000-5000 passive temperature sensor.

At each of the options, there may be a LCD display to display measured values, e.g. RFTF-U Pt1000 display. The prices of all basic types as well as options are listed in the Domat Control System price list or communicated upon request (customized cable lengths etc.).

All data are subject to changes.

Type ID
RFTF-U

Brief description
Room humidity and temperature sensor
Capacitive element, 20.80 %RH: ±2 %, 0.100 %RH: ±3 %
Temperature 0.50 °C, output 2× 0.10 V, power supply 24 V AC / DC
Wall mounting, dimensions 85 × 85 × 27 mm

Bold type identification = same price
* RFTF-I: 4...20 mA (only DC power)
* display
* passive temperature sensor Pt100, Pt1000, Ni1000-5000, Ni1000-6180, NTC1.8kOhm

*Possible options, each marked with the * symbol. Their prices may differ from the prices of the basic type. See details in the price list.*

PROCESS STATIONS, CONTROLLERS

PROCESS STATIONS MARK WITH MERBON RUNTIME

mark100
DDC controller, RS485
Ethernet, web, RS485, programming in Merbon IDE. ARM M4 STM427 168 MHz, 256 kB RAM, 3 MB FLASH, 4 kB NVRAM. Supply 24 V AC/DC ± 20 %; max. 3 VA. DIN rail mounting, dimensions 98.7 × 61 × 36.2 mm

mark125
DDC controller, RS485, RS232, display
Ethernet, web, RS485, RS232, 4 × 20 LCD display, programming in Merbon IDE. ARM Cortex M4 168 MHz, 10 MB FLASH, 256 kB SRAM, 4 kB NVRAM, 8 MB external SDRAM. Supply: 24 V AC/DC ± 20 %; max. 5 VA. panel door mounting, IP65, dimensions 158 × 106 × 36 mm

mark150/485
DDC controller, RS485, M-Bus
Ethernet, web, RS485, M-Bus for 10 meters, 4 AI, 4 DI, 3 CI, 4 DO, programming in Merbon IDE. ARM M4 STM427 168 MHz, 256 kB RAM, 3 MB FLASH, 4 kB NVRAM. Supply: 24 V AC/DC ± 20 %; max. 10 VA. DIN rail mounting, dimensions 158 × 90 × 58 mm



IMIO105

DDC controller, 16 I/O, RS485

Ethernet, web, RS485, 4 AI, 2 AO, 4 DI, 6 DO, programming in Merbon IDE. ARM Cortex M4 168 MHz, 10 MB FLASH, 256 KB + 8 MB SRAM, 4 KB + 64 KB NVRAM. Supply: 24 V AC/DC ± 20 %; max. 5 VA. DIN rail mounting, dimensions 98 × 67 × 102 mm

Use terminal HT102 or HT200 for local operation on front panel door.



IMIO110

DDC controller, 16 I/O, RS485, display

Ethernet, web, RS485, 4 AI, 2 AO, 4 DI, 6 DO, programming in Merbon IDE. ARM Cortex M4 168 MHz, 10 MB FLASH, 256 KB + 8 MB SRAM, 4 KB + 64 KB NVRAM. Supply: 24 V AC/DC ± 20 %; max. 5 VA. DIN rail mounting, dimensions 98 × 67 × 102 mm

Use markPLC KIT to install the controller into a front panel.



ICIO205

DDC controller, 30 I/O, RS485

Ethernet, RS485, web, 8 AI, 6 AO, 8 DI, 8 DO. Programování v Merbon IDE. ARM Cortex M4 168 MHz, 10 MB FLASH, 256 KB + 8 MB SRAM, 4 KB + 64 KB NVRAM, napájení: 24 V st/ss ± 20%; max 10 VA. Rozměry 217 × 115 × 40 mm

Use terminal HT102 or HT200 for local operation on front panel door.



mark220

DDC controller, RS485, display

Ethernet, web, RS485, 3 × 16 LCD display, programming in Merbon IDE. MPC5200, 400 MHz, 128 MB RAM, 64 MB FLASH, 128kB NVRAM FRAM. Supply: 10..35 V DC / 14..24 V AC, max. 5.5 VA. DIN rail mounting, dimensions 98 × 67 × 102 mm

Use markPLC KIT to install the controller into a front panel.



mark320

DDC controller, 4 ports, display

Ethernet, web, 2× RS485, 2× RS232, 3 × 16 LCD display, programming in Merbon IDE. MPC5200, 400 MHz, 128 MB RAM, 64 MB FLASH, 128kB NVRAM FRAM. Supply: 10..35 V DC / 14..24 V AC, max. 5.5 VA. DIN rail mounting, dimensions 98 × 67 × 102 mm

Use markPLC KIT to install the controller into a front panel.



markMX

DDC controller, 88 I/O

Ethernet, web, 2× RS232, 2× RS485. 16 AI, 8 AO, 32 DI, 32 DO, programming in Merbon IDE. MPC5200, 400 MHz, 128 MB RAM, 64 MB FLASH, 128kB NVRAM FRAM. Supply: 24 V AC/DC ± 10 %. Mounting on panel backplane. 265 × 292 × 40 mm

Use terminal HT102 or HT200 for local operation on front panel door.

PROCESS STATIONS, CONTROLLERS

PROCESS STATIONS WALL WITH MERBON RUNTIME



w750-8101

DDC controller

2× Ethernet, web, programming in Merbon IDE. ARM Cortex A8, 600 MHz, 12 MB RAM, 64 kB NVRAM. Supply 24 V DC (-25...+30%), DIN rail mounting, dimensions 71.9 × 61.5 × 100 mm

Use terminal HT102 or HT200 for local operation on front panel door.



wCIO

DDC controller, 32 I/O

2×Ethernet, 8DO, 8DI, 8AO, 8AI, web, programming in Merbon IDE. ARM Cortex A8, 600 MHz, 12 MB RAM, 64 kB NVRAM. Supply 24 V DC (-25...+30%), DIN rail mounting, dimensions 71.9 × 121.5 × 100 mm

Use terminal HT102 or HT200 for local operation on front panel door.



wMX

DDC controller, 88 I/O

2×Ethernet, 32DO, 32DI, 8AO, 16AI, web, programming in Merbon IDE. ARM Cortex A8, 600 MHz, 12 MB RAM, 64 kB NVRAM. Supply 24 V DC (-25...+30%), DIN rail mounting, dimensions 71.9 × 158 × 100 mm

Use terminal HT102 or HT200 for local operation on front panel door.



w750-8102

DDC controller, RS485

2xEthernet, RS485, web, programming in Merbon IDE. ARM Cortex A8, 600 MHz, 12 MB RAM, 64 kB NVRAM. Supply 24 V DC (-25...+30%), DIN rail mounting, dimensions 71.9 × 121.5 × 100 mm

Use terminal HT102 or HT200 for local operation on front panel door.



wCIOcom

DDC controller, 32 I/O, RS485

2xEthernet, RS485, 8DO, 8DI, 8AO, 8AI, web, programming in Merbon IDE. ARM Cortex A8, 600 MHz, 12 MB RAM, 64 kB NVRAM. Supply 24 V DC (-25...+30%), DIN rail mounting, dimensions 71.9 × 121.5 × 100 mm

Use terminal HT102 or HT200 for local operation on front panel door.



wMXcom

DDC controller, 88 I/O, RS485

2xEthernet, RS485, 32DO, 32DI, 8AO, 16AI, web, programming in Merbon IDE. ARM Cortex A8, 600 MHz, 12 MB RAM, 64 kB NVRAM. Supply 24 V DC (-25...+30%), DIN rail mounting, dimensions 71.9 × 158 × 100 mm

Use terminal HT102 or HT200 for local operation on front panel door.

I/O MODULES WALL



w750-600

Terminating module of the internal bus.



w750-496

8 analog inputs module – current

8 AI, 0/4...20 mA, configurable, two-wire connection



w750-497

8 analog inputs module

8 AI, 0...10 V / ±10 V, configurable, two-wire connection



w750-1515

8 binary outputs module

8 DO, 24 V DC, 0.5 A, two-wire connection



w750-1506

8 binary inputs/outputs module

8 DI/DO, 24 V DC, 0.5 A, configurable



w750-559

4 analog outputs module

4 AO, 0...10 V DC



w750-1504

16 binary outputs module

16 DO, 24 V DC, 0.5 A



w750-597

8 analog outputs module
8 AO, 0...10 V / ±10 V DC, configurable



w750-451

8 analog inputs module – resistance
8 AI, resistance, configurable, two-wire connection



w750-458

8 analog inputs module – resistance
8 AI, thermocouples, configurable, two-wire connection



w750-1415

8 binary inputs module
8 DI, 24 V DC, 3 ms, two-wire connection



w750-1405

16 binary inputs module
16 DI, 24 V DC, 3 ms



w750-638

Counter module
2-channel counter (up – down), 24 V DC, 500 Hz



w750-450

4 analog inputs module – resistance
4 AI, resistance, configurable, 2/3/4-wire connection



w750-457

4 analog inputs module – voltage
4 AI, ±10 V DC



w750-556

2 analog inputs module – voltage
2 AI, ±10 V DC



w750-515

4 relay outputs module
4 DO, relay 250 V AC, 30 V DC, 3 A

COMMUNICATION MODULES WALL



w750-652

Serial interface RS232/RS485, configurable



w750-642

EnOcean radio receiver



w753-646

KNX/EIB/TP1 interface



w753-647

DALI Multi-Master

PROCESS STATIONS, CONTROLLERS

PROCESS STATIONS WITH SOFTPLC RUNTIME



IPCB.1

Process station with no display

PLC incl. SoftPLC Runtime, no display, Intel Atom D2550, 1.8 GHz, 2 GB RAM, 2x RS232, 2x USB, 2x LAN, VGA, Audio Out, 9...36 V DC, aluminium case, Windows



IPCT.1

Process station with 8" touch screen

PLC incl. SoftPLC Runtime, iPC 08 118T, SSD 32 GB, Windows

PROCESS STATIONS, CONTROLLERS

PROCESS STATIONS WITHOUT RUNTIME AND OS



iPC 08 118T

Process station, 8" LCD touch screen

PC, LCD 8" 800x600, Intel Celeron N2930 1,83 GHz, 4GB DDR3L RAM on board, 2x COM, 2x USB 3.0, 2x GbE LAN, aluminium body, 9...36 V DC



iPC 10 118T

Process station, 10" LCD touch screen

PC, LCD 10" 1280x800, Intel Celeron N2930 1,83 GHz, 4GB DDR3L RAM on board, 2x COM, 2x USB 3.0, 2x GbE LAN, aluminium body, 9...36 V DC



IPC 12 118T

Process station, 12" LCD touch screen

PC, LCD 12" 800x600, Intel Celeron N2930 1,83 GHz, 4GB DDR3L RAM on board, 2x COM, 2x USB 3.0, 2x GbE LAN, aluminium body, 9...36 V DC



IPC 15 118T

Process station, 15" LCD touch screen

PC, LCD 15" 1024x768, Intel Celeron N2930 1,83 GHz, 4GB DDR3L RAM on board, 2x COM, 2x USB 3.0, 2x GbE LAN, aluminium body, 9...36 V DC



IPC 18 118T

Process station, 18" LCD touch screen

PC, LCD 18" 1280x1024, Intel Celeron N2930 1,83 GHz, 4GB DDR3L RAM on board, 2x COM, 2x USB 3.0, 2x GbE LAN, aluminium body, 9...36 V DC



IPC 21 118T

Process station, 21" LCD touch screen

PC, LCD 21" 1920x1080, Intel Celeron N2930 1,83 GHz, 4GB DDR3L RAM on board, 2x COM, 2x USB 3.0, 2x GbE LAN, aluminium body, 9...36 V DC



IPC 00 160

Process station with no display

PC, Intel Celeron N2930 1,83 GHz, 4GB DDR3L RAM on board, 3x COM, 4x USB 2.0, 2x USB 3.0, 2x LAN, 1x VGA, Audio Out, 9...36 V DC

PROCESS STATIONS, CONTROLLERS

PROCESS STATIONS – ACCESSORIES



markPLC kit

Mounting frame for markPLC

For fixing of markPLC into front panel: cut a 103 x 46 mm aperture and holes for the screws in the front door, then use a 150 mm DIN rail to mount the MiniPLC from inside. The frame covers the aperture on the outer side.

PROCESS STATIONS, CONTROLLERS

INDIVIDUAL ROOM CONTROLS



UC102

Heating controller, RS485

Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, real time clock, status indication and switching, 2x DI (presence, window), 1x DO (24 V AC radiator valve), Modbus / RS485 galv. separated

Replacement of UC100 – extension by 2 digital inputs, full backward compatibility. Use ME210/ME220 for more actuators.

** no display, no knob – UC102/DK*

** backlit display – UC102/BL*



UC200

Heating/cooling controller, RS485

Display 60 x 60 mm, push / turn knob, temperature sensor, setting of values, real time clock, status indication and switching, 2x DI (presence, window), 2x DO (24 V AC radiator, cooling panel), Modbus / RS485 galv. separated

** backlit display – UC200/BL*



UC300

Floor heating controller, RS485

Display 60 × 60 mm, push / turn knob, temperature sensor, 1× AI for ext. Pt1000 floor sensor, setting of values, real time clock, status indication and switching, 1× DO (24 V AC thermic actuator), Modbus / RS485 galv. separated



FCR010

Fan coil controller, RS485

2× DI (presence, window), 2× DO triac 24 V AC for thermic valves (heating, cooling), 3× relay for three-stage fancoil, 1× Modbus slave / RS485 for SCADA/primary controller, 1× Modbus master / RS485 for UCO10

Use UCO10 or galvanically separated UCO11 as a room unit.



FCR011

Fan coil controller, RS485, power 230 V AC

2× DI (presence, window), 2× DO triac 230 V AC for thermic valves (heating, cooling), 3× relay for three-stage fancoil, 1× Modbus slave / RS485 for SCADA/primary controller, 1× Modbus master / RS485 for UCO10

Use UCO10 or galvanically separated UCO11 as a room unit.



FCR013

Fan coil controller for EC motors 0...10 V, RS485

2× DI (presence, window), 3× AO 0...10 V, 2× DO SSR 0.4 A, 1× Modbus slave / RS485 for SCADA/primary controller, 1× Modbus master / RS485 for UCO13

Use UCO13 as a room unit.



FCR015

VAV controller, communicative

VAV box (CO₂) controller, 2× DI (presence, window), 2× DO triac 24 V AC, 3× AO 0...10 V (VAV controller, heating and cooling valves), 1× Modbus slave / RS485 for SCADA/primary controller, 1× Modbus master / RS485 for UC905

Use UC905 as a room unit.



UC010

Room unit, RS485

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of operation mode, fancoil stages and setpoints, status indication and switching, Modbus / RS485 communication

Room unit for FCR010 or FCR011 fan coil controller
* UCO10/DK: no display, no knob (for schools, corridors etc.)
* backlit display - UCO10/BL



UC011

Room unit, RS485

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of operation mode, fancoil stages and setpoints, status indication and switching, Modbus / RS485 galv. separated

Room unit for FCR010 or FCR011 fan coil controller
* backlit display - UCO11/BL



UC013

Room unit for FCR013, RS485

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of operation mode, fancoil stages and setpoints, status indication and switching, Modbus / RS485 galv. separated

Room unit for FCR013 fan coil controller
* backlit display - UCO13/BL



UC905

Room unit with CO₂ sensor for FCR015, communicative

Display 60 × 60 mm, push / turn knob, temperature and CO₂ sensor, setting of operation mode, VAV mode and temperature setpoints, status indication and switching, Modbus / RS485 galv. separated

Room unit for FCR015 VAV controller



UB100

Heating controller, BACnet MS/TP

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of values, change-over, RTC, status indication and switching, 2× DI (presence, window), 1× DO (24 V AC valve actuator), BACnet MS/TP galv. separated



UB200

Heating and cooling controller, BACnet MS/TP

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of values, RTC, status indication and switching, 2× DI (presence, window), 2× DO (24 V AC valve actuator), BACnet MS/TP galv. separated



UC150

Heating controller, Ethernet

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, 1× DO (24 V AC thermic valve - radiator), web access, Modbus / TCP



UC250

Heating and cooling controller, Ethernet

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of values, real time clock, status indication and switching, 2× DI (presence, window), 2× DO (24 V AC thermic valve - radiator, cooling panel), web access, Modbus / TCP



US100

Heating controller, blinds control, RS485

Display 60 × 60 mm, 5× button, temperature sensor, setting of values, status indication and switching, 3× DO (24 V AC radiator, Blinds up, Blinds down), Modbus / RS485 communication galv. separated



EPC102

Heating controller with external temperature sensor, RS485

External room temperature sensor, 1× DI (window), 1× DO (triac 24 V/1A AC radiator valve), Modbus / RS485 galv. separated

No operating elements, for schools, public buildings etc. The room sensor is part of delivery.

PROCESS STATIONS, CONTROLLERS
COMMUNICATIVE ROOM UNITS AND SENSORS



UIO10

Room unit, RS485, temperature, rH

Display 60 × 60 mm, push / turn knob, temperature and rH sensor, setting of values, status indication and switching, Modbus / RS485 communication

** blue backlit display - UIO10BL*



UIO11

Room unit, RS485, temperature, rH

Display 60 × 60 mm, push / turn knob, temperature and rH sensor, setting of values, status indication and switching, Modbus / RS485 communication galv. separated

** no knob - UIO51, no knob / display - UIO71*

** blue backlit display - UIO11BL, UIO51BL*



UI012

Room unit, RS485, temperature, rH, 2DI, 1DO
 Display 60 × 60 mm, push / turn knob, temperature and rH sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 2× DI, 1× DO triac 24 V AC

** no knob - UI052, no knob / display - UI072*
** blue backlit display - UI012BL, UI052BL*



UI020

Room unit, RS485, t, rH, 2DI, 2DO
 Display 60 × 60 mm, push / turn knob, temperature and rH sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 2× DI, 2× DO triac 24 V AC

** no knob - UI055, no knob / display - UI075*
** blue backlit display - UI020BL, UI055BL*



UI300

Room unit, RS485, t, rH, 1DI, 1DO, 1AI
 Display 60 × 60 mm, push / turn knob, internal temperature and rH sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 1× DI, 1× DO triac 24 V AC, 1× AI for a Pt1000 external temperature sensor.

** no knob / display - UI300DK*
** blue backlit display - UI300BL*



UI309

Room unit, RS485, t, rH, CO₂, 1DI, 1DO, 1AI
 Display 60 × 60 mm, push / turn knob, internal temperature, CO₂ and rH sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 1× DI, 1× DO triac 24 V AC, 1× AI for a Pt1000 external temperature sensor.

no knob / display - UI309DK
** blue backlit display - UI309BL*



UI310

Room unit, RS485, t, rH, PIR, 1DI, 1DO, 1AI
 Display 60 × 60 mm, push / turn knob, presence, temperature and rH sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 1× DI, 1× DO triac 24 V AC, 1× AI for a Pt1000 external temperature sensor.

** no knob / display - UI310DK*
** blue backlit display - UI310BL*



UI319

Room unit, RS485, t, rH, CO₂, PIR, 1DI, 1DO, 1AI
 Display 60 × 60 mm, push / turn knob, internal presence, temperature, CO₂ and rH sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 1× DI, 1× DO triac 24 V AC, 1× AI for a Pt1000 external temperature sensor.

** no knob / display - UI319DK*
** blue backlit display - UI319BL*



UI900

Room unit, RS485, temperature, CO₂, rH
 Temperature, rel. humidity, and CO₂ sensor, communication Modbus / RS485 galv. separated.



UI901

Room unit, RS485, t, CO₂, rH, 2DI, 2DO
 Display 60 × 60 mm, push / turn knob, temperature, CO₂ and rH sensor, setting of values, status indication and switching, Modbus / RS485 galv. separated, 2× DI, 2× DO triac 24 V AC, Function of thermostat, hygrostat or CO₂-stat.

** no knob - UI903*
** blue backlit display - UI901BL, UI903BL*



UI905

Room unit, RS485, temperature, CO₂, rH
 Display 60 × 60 mm, push / turn knob, temperature, humidity and CO₂ sensor, setting of values, status indication and switching, Modbus / RS485 galv. separated.

** blue backlit display - UI905BL*



UI511

Room unit, Ethernet, temperature

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, Modbus / TCP

** no knob - UI551, no knob / display - UI571*



UI512

Room unit, Ethernet, temperature, 1DO

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, Modbus / TCP, 1× DO triac 24 V AC

** no knob - UI552, no knob / display - UI572*



UI520

Room unit, Ethernet, t, 2DI, 2DO

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of values, real time clock, status indication and switching, Modbus / TCP, 2× DI, 2× DO triac 24 V AC

** no knob - UI555, no knob / display - UI575*



UI541

Room unit, Ethernet, temperature, rH

Display 60 × 60 mm, push / turn knob, temperature / humidity sensor, setting of values, status indication and switching, Modbus / TCP

** no knob - UI561, no knob / display - UI581*



UI542

Room unit, Ethernet, temperature, rH, 1DO

Display 60 × 60 mm, push / turn knob, temperature / humidity sensor, setting of values, real time clock, status indication and switching, Modbus / TCP, 1× DO triac 24 V AC

** no knob - UI562, no knob / display - UI582*



UI545

Room unit, Ethernet, t, rH, 2DI, 2DO

Display 60 × 60 mm, push / turn knob, temperature / humidity sensor, setting of values, real time clock, status indication and switching, Modbus / TCP, 2× DI, 2× DO triac 24 V AC

** no knob - UI565, no knob / display - UI585*



UI611

Room unit, Ethernet, PoE, temperature

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, Modbus / TCP, Powered over Ethernet



UI612

Room unit, Ethernet, PoE, temperature, 1DO

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of values, status indication and switching, Modbus / TCP, 1× DO triac 24 V AC, Powered over Ethernet



UI620

Room unit, Ethernet, PoE, t, 2DI, 2DO

Display 60 × 60 mm, push / turn knob, temperature sensor, setting of values, real time clock, status indication and switching, Modbus / TCP, 2× DI, 2× DO triac 24 V AC, Powered over Ethernet



UI641

Room unit, Ethernet, PoE, temperature, rH

Display 60 × 60 mm, push / turn knob, temperature / humidity sensor, setting of values, status indication and switching, Modbus / TCP, Powered over Ethernet

** no knob - UI661*



UI642

Room unit, Ethernet, PoE, temperature, rH, 1DO
 Display 60 × 60 mm, push / turn knob, temperature / humidity sensor, setting of values, real time clock, status indication and switching, Modbus / TCP, 1× DO triac 24 V AC, Powered over Ethernet



UI645

Room unit, Ethernet, PoE, t, rH, 2DI, 2DO
 Display 60 × 60 mm, push / turn knob, temperature / humidity sensor, setting of values, real time clock, status indication and switching, Modbus / TCP, 2× DI, 2× DO triac 24 V AC, Powered over Ethernet

* no knob / display – UI685



UX011

Room unit, RS485, temperature
 Display 60 × 60 mm, 5× button, temperature sensor, setting of values, status indication and switching, 1× DI, 3× DO (triac 24 V AC), Modbus / RS485 communication galv. separated

MANAGEMENT STATIONS

PC



PCD1

Management station PC
 Configuration for RcWare Vision, HDD 500+ GB, LCD 17”, colour printer, keyboard, mouse, OS.

MANAGEMENT STATIONS

VISUALISATION MERBON SCADA AND DATABASE



Merbon SCADA 5 000

Licence for server SCADA. Fully web-based visualisation, up to 5 000 datapoints. Alarm module, historical trends based on file system, events and map background integration.



Merbon SCADA 50 000

Licence for server SCADA. Fully web-based visualisation, up to 50 000 datapoints. Alarm module, historical trends based on file system, events and map background integration.



Merbon SCADA unlimited

Licence for server SCADA. Fully web-based visualisation, unlimited number of datapoints. Alarm module, historical trends based on file system, events and map background integration.



Merbon DB 40 000

Database system for time-series data storage.
 Powerful database for connecting of PLC Runtimes and SCADA server, up to 40 000 datapoints. Including API for third party systems integration. For large applications where native SCADA file system is not sufficient.



Merbon DB + 10 000

Merbon DB database extension by 10 000 data points

ENERGY MANAGEMENT SYSTEM

ENERGY MANAGEMENT PORTAL MERBON CONTPORT



CP-Config

ContPort configuration

Installation of customer data on the ContPort server, device configuration, definition of data points and technologies, user training.



CP-Admin

ContPort administrator licence

The administrator has rights to configure other users, assign user rights, configure data and technology structures etc.



CP-Storage

ContPort data storage

Data storage of the CRM part - contracts, documents, schemas, floor plans etc.



CP-User

ContPort client licence

User access to ContPort - users can display trend and statistics data, work with the ticketing system etc.



CP-OnData

Online data in ContPort

Recording of data for a data point (max. 4 samples per hour)

MODULES AND CONVERTERS

I/O MODULES



R220

12 relays output module

max. 8 A / 250 V AC or 8A / 24 V DC, DIN rail mounting, dimensions 98 × 105 × 61 mm. Supply 24 V AC ± 20 %, Modbus RTU / RS485 galv. separated



R312

8 triac outputs module

To control 8 groups of 24 V thermic actuators, output current max. 0.5 A per output. The PWM signal is generated in the module, controlled as 0..100 %. DIN rail or 2 screws mounting, dimensions 98 × 70 × 35 mm. Supply 24 V AC ± 20 %, Modbus RTU / RS485 galvanically separated.

If there are more than 2 actuators per output use triac amplifiers ME210, ME220.



R313

8 triac outputs module, 230 V AC

To control 8 groups of 230 V thermic actuators, output current max. 0.5 A per output. The PWM signal is generated in the module, controlled as 0..100 %. DIN rail or 2 screws mounting, dimensions 98 × 70 × 35 mm. Supply 24 V AC ± 20 %, Modbus RTU / RS485 galvanically separated.



R320

16 digital outputs (OC) module

open collector, 50 V DC, 0.5 A, DIN rail mounting, dimensions 98 × 105 × 61 mm. Supply 24 V AC ± 20 %, Modbus RTU / RS485 galv. separated



R330

32 digital outputs (OC) module

open collector, 50 V DC, 0.5 A, DIN rail mounting, dimensions 98 × 105 × 61 mm. Supply 24 V AC ± 20 %, Modbus RTU / RS485 galv. separated



R420

16 digital inputs module 24 V

24 V AC / DC, 15 mA, common ground for each 8 inputs. DIN rail mounting, dimensions 98 × 105 × 61 mm. Supply 24 V AC ± 20 %, Modbus RTU / RS485 galv. separated



R430

32 digital inputs module 24 V

24 V AC / DC, 15 mA, common grounds for 24 and 8 inputs. DIN rail mounting, dimensions 98 × 105 × 61 mm. Supply 24 V AC ± 20 %, Modbus RTU / RS485 galv. separated



R500

8 analogue inputs module

8× AI (± 10 V, 4...20 mA), 16 bit. DIN rail mounting, dimensions 105 × 90 × 58 mm. Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galv. separated



R560

8 analogue inputs module

Pt1000, 20..5000 Ohm, 0...10 V, 4...20 mA, 16 bit. DIN rail mounting, dimensions 98 × 70 × 61 mm. Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated



R610

8 analogue outputs module

0..10 V, max. 10 mA, optically separated, common ground. DIN rail mounting, dimensions 98 × 70 × 61 mm. Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galv. separated



R710

4 pulse counters module, battery backup

for dry contacts / OC (12V, 15 mA), 4 byte counters, DIN rail mounting, dimensions 98 × 70 × 61 mm. Ready for load shedding (E-Max). Supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated

For signal source with 24 V open collector: **R710/24V** – please specify in your order



MW240-B

Control module for 2 lighting groups or a blind

2x DI for dry contacts (switches or buttons), 2x DO relay 230 V AC / 5 A ohmic load. Flush box mounting, dimensions 49 × 49 × 30 mm. Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galv. separated



MW241

Control module for 2 LED lighting groups

2x DI for dry contacts (switches or buttons), 2x DO SSR 230 V AC / 1 A AC1 load. Flush box mounting, dimensions 49 × 49 × 30 mm. Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galv. separated

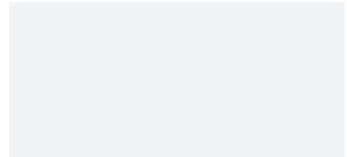
For switching of LED power supplies with capacitive load



RMIO

Combined I/O module, 17 I/O

4× AI (Pt1000 or potentiometer, 2× 0..10 V or 0..20 mA), 4× DI dry contact, 2× AO 0..10V, 5× relay (230 V AC / 5 A), 2× DO triac (24 V AC / 0.4 A). DIN rail mounting, dimensions 90 × 105 × 58 mm, supply 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated



RCIO

Combined I/O module, 30 I/O

8× AI (0..10V, Pt100, Pt1000, Ni1000, T1, 4× 4..20 mA), 6× AO (0..10V), 8× DI (24V), 8× DO relay (230V/5A). DIN rail mounting, dimensions 217 × 115 × 40 mm, supply 24 V AC ± 10 %, Modbus RTU / RS485 galv. separated



RXIO

Combined I/O module, 88 I/O

16× AI (Pt100, Pt1000, Ni1000, T1, 8× 0..10V, 4..20 mA) galv. sep., 32× DI 24 V, 8× AO 0..10V galv. sep., 32× DO relay (230 V AC / 5A). Dimensions 265 × 292 × 40 mm, supply 18..35 V DC / 14..24 V AC, Modbus RTU / RS485 galv. separated

See also markMX in the Process stations section.



MLIO

Module for distributed inputs/outputs, 7 I/O

4× AI (Pt1000, 0..5000 Ohm, 0..10 V or DI for a dry contact), 1× AO 0..10 V, 2× DO relay (230 V AC / 5 A ohmic load). Dimensions 162 × 120 × 72 mm. Power 10..35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated

Installation on a wall or to a conduit.

MODULES AND CONVERTERS
COMMUNICATION CONVERTERS



R005

Sauter EY2400 – RS232 converter

For integration of Sauter 2400 controllers into IPLC5xx, IPCT., IPCB... Galvanic separation, max. 20 controllers on the bus, 2× LED. Power 230 V AC. DIN rail mounting, dimensions 98 × 105 × 61 mm



R012

RS232 / RS485 converter

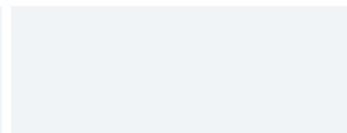
Baudrate 1200..19200 bit/s, bus termination switch, optical separation, 3 LEDs Rx, Tx, Power. Supply 10..35 V DC / 24 V AC. DIN rail mounting, dimensions 98 × 35 × 61 mm



R025

RS232 / Ethernet converter, Modbus router

Terminal server up to 230400 bit/s, modem emulation, serial bridge. COM port driver for Windows and Linux. Modbus RTU / TCP routing functionality. Supply 24 V AC ± 10 %, 1.5 VA. DIN rail mounting, dimensions 98 × 35 × 61 mm



R035

RS485 / Ethernet converter, Modbus router

Terminal server up to 230400 bit/s, serial bridge. COM port driver for Windows and Linux. Modbus RTU / TCP routing functionality. Supply 24 V AC ± 10 %, 2 VA. DIN rail mounting, dimensions 98 × 35 × 61 mm



R040

RS232 / WiFi converter

Terminal server, up to 230400 bit/s. COM port driver for Windows and Linux. Supply 24 V AC ± 10 %, 3 VA. DIN rail mounting, dimensions 98 × 35 × 61 mm





R060

MP-Bus / Modbus RTU/TCP converter

For control of up to 8 Belimo actuators on MP-Bus over Modbus TCP or Modbus RTU/RS485. Optical separation, power 24 V AC/DC ± 15 %, 3 VA. MP-Bus service connector RJ11. Dimensions 98 × 70 × 31 mm.



R065

DMX512 / Modbus TCP converter

For control of up to 2× 512 DMX lights over Modbus TCP. 2× DMX port. Power 24 V AC/DC ± 15 %, 3 VA. DIN rail mounting, dimensions 98 × 70 × 31 mm.



R080

USB / RS485 converter

Small and handy USB powered converter for service and commissioning. Optically separated, 3× LED (PC link, Rx, Tx). Inclusive driver and comfortable universal Modbus RTU / TCP client SW. 49 × 34 × 20 mm, USB cable 140 cm.

The client software ModCom-Tool and R080 USB drivers are available at www.domat.cz



R085

P-Bus / Modbus RS485 converter

Landis & Gyr P-Bus to Modbus RTU / RS485 converter for integration of PTM..., PTK... module bus into any Modbus compatible PLC. Native support in SoftPLC IDE and Merbon IDE. Power supply 230 V AC, 32 BE (P-Bus load units). DIN rail mounting, dimensions 98 × 105 × 61 mm.

*R086: 64 BE (P-Bus load units)



R091

DALI2 (multi master) / Modbus TCP converter

Control of up to 64 DALI ballasts over Modbus TCP, with switchable DALI bus supply. Web access for commissioning and service. DALI short circuit protection, auto reset. Power supply 24 V AC/DC ± 20 %, 6 VA. DIN rail mounting, dimensions 98 × 70 × 61 mm.



R095

M-Bus / RS232 converter, 25 devices

Supply 20...24 V AC, 6 VA max. 25 M-Bus meters, short-circuit protection with auto reset, RS232 screw terminals + CANNON 9M. DIN rail mounting, dimensions 98 × 70 × 61 mm.



R096

M-Bus / RS232 converter, 60 devices

Supply 20...24 V AC, 6 VA max. 60 M-Bus meters, short-circuit protection with auto reset, RS232 screw terminals + CANNON 9M. DIN rail mounting, dimensions 98 × 70 × 61 mm.

MODULES AND CONVERTERS
DISPLAY UNITS, ACCESSORIES



HT102

Merbon operator unit

LCD display 4 × 20 characters, 6 pushbuttons, for up to 4 Merbon (mark, wall) runtimes, ARM Cortex M4 168 MHz, 10 MB FLASH, 256 KB SRAM, 4 KB NVRAM, communication over Ethernet, power supply 24 V AC/DC ± 10 %, 3 VA. Panel mounting, IP65, dimensions 175 × 105 × 40 mm



HT200

Touch screen operator unit

Terminal with touch screen 7", 800×480, ARM Cortex A8 600 MHz, 256 MB FLASH, 256 MB DDR3 DRAM, Ethernet, microSD slot (card not included), Linux, power 24 V DC ± 10 %, 7 W, power supply not included



PWR010

Transformer 230 / 24 V

Safety transformer 10 VA, installation to a DIN rail.



PWR011

Transformer 230 / 24 V, 2x triac

Safety transformer 10 VA, installation to a DIN rail. On-board are 2× 230V / 0,5 A triacs controlled by external 24 V AC signal for separation and pull-up of 2 PWM signals.



ME200

Power relay module

For connecting of the UX... room unit to the blinds actuator. 2× relay 250 V / 5 A. Mounts in a flush box. Dimensions: 49 × 49 × 30 mm.



ME210

Triac amplifier

To connect more actuators to UC..., FC..., and UI... Provides 1× triac output 24 V / 2 A. Flush box mounting, dimensions 49 × 49 × 14 mm.

Up to 4 thermic actuators may be connected to the output.



ME220

Triac amplifier, 2 triacs

To connect more actuators to UC..., FC..., and UI... Provides 2× triac output 24 V / 2 A. Each output may be controlled separately. Flush box mounting, dimensions 49 × 49 × 14 mm.

Up to 4 thermic actuators may be connected to each of the outputs. If IN1 and IN2 inputs are connected in parallel, ME220 may control up to 8 valves with one signal.

PERIPHERALS

DOMAT DESIGN SENSORS



UT001

Room temperature sensor

Wall-mounted, dimensions 90 × 107 × 26 mm
Measuring element Pt1000



UT051

Outside temperature sensor

Wall-mounted, dimensions 90 × 107 × 26 mm, -20...70 °C, IP 43
Measuring element Pt1000



UT090

Room sensor, temperature, CO₂, 2x O₂..10V

Internal range setting 0...2000 / 0...5000 ppm, temperature 0...50 °C. Power 10..35 V DC / 24 V AC. Wall-mounted, dimensions 90 x 107 x 26 mm, IP 43



UT100

Communicative temperature sensor, Modbus RTU

For external Pt1000 measuring element (not supplied). Measuring range -30...100 °C. Power 10..35 V DC / 24 V AC. Dimensions 70 x 63 x 34 mm, IP 43



UT200

Communicative temperature sensor, Modbus RTU

Inclusive Pt1000 measuring element. Measuring range -30...100 °C. Power 10..35 V DC / 24 V AC. Dimensions 70 x 63 x 34 mm + stem 25 mm, IP 43

PERIPHERALS

DOMAT STELIX SENSORS



DIP200

Communicative motion and lighting sensor

Modbus RTU / RS485. Motion: IR sensor, lighting: photodiode 2...3000 lx. To control air-condition and lights in offices, workshops etc. Power 12...24 V DC.

Exchangeable fixtures and lenses for various installations and sensor characteristics.

PERIPHERALS

TEMPERATURE SENSORS, PASSIVE



RTF1

Room temperature sensor

Wall-mounted, dimensions 98 x 98 x 33 mm
Measuring element Pt1000

* Pt100, Ni1000-5000,
Ni1000-6180, NTC1.8kOhm



ALTF1

Strap-on temperature sensor

-35...105 °C, IP54, dimensions Ø 6 x 50 mm, contact metal sheet. Strap band 300 mm, for pipes Ø 13...92 mm. Measuring element Pt1000

* Pt100, Ni1000-5000,
Ni1000-6180, NTC1.8kOhm
* silicon cable - up to +180°C



ALTF02

Strap-on temperature sensor

-30...110 °C, IP65, dimensions 72 x 64 x 39.4 mm. Strap-on metal band 300 mm, for pipes Ø 13...92 mm. Measuring element Pt1000

* Pt100, Ni1000-5000,
Ni1000-6180, NTC1.8kOhm



TF-43

Temperature sensor, IP43

Measuring element Pt1000, -30...150 °C, dimensions 72 x 64 x 37.8 mm + stem. Brass TH08-MS or stainless steel TH-VA pocket 1/2" (as immersion sensor) or flange MF-15-K (as duct sensor) must be ordered separately.

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* length 50, 100, 150, 200, 250, 300 mm



TF-65

Temperature sensor, IP65

Measuring element Pt1000, -30...150 °C, dimensions 72 × 64 × 39.4 mm + stem. Brass TH08-MS or stainless steel TH-VA pocket 1/2" (as immersion sensor) or flange MF-15-K (as duct sensor) must be ordered separately.

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* length 50, 100, 150, 200, 250, 300, 400 mm



TH08-MS

Pocket for immersion sensors, nickel-plated brass

1/2", 150 mm, 10 bar, Ø 8 mm. To be ordered with TF-65 or TF-43 in corresponding length.

* length 50, 100, 150, 200, 250, 300, 400 mm



TH-VA

Pocket for immersion sensors, stainless steel

1/2", 150 mm, 40 bar, Ø 8 mm. Stainless steel VA 1.4571. To be ordered with TF-65 in corresponding length.

* length 50, 100, 150, 200, 250, 300, 400 mm



MF-15-K

Mounting flange, plastic

To be ordered with TF-65 for installation of sensors into air ducts. 56 × 84 mm.



ATF1

Outside temperature sensor

-50...90 °C, dimensions 72 × 64 × 37.8 mm
Wall-mounted, IP65
Measuring element Pt1000

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm



ATF2

Outside temperature sensor

-50...90 °C, dimensions 72 × 64 × 37.8 mm
Wall-mounted, sensor in external stainless steel pocket, IP65.
Measuring element Pt1000

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm



MWTF

Mean value temperature sensor

-30...80 °C, dimensions 72 × 64 × 37.8 mm + stem 400 mm.
Copper plastic-coated stem Ø 6 × 150 mm, IP65.
Measuring element Pt1000

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* length 0.4, 3, 6 m or customized up to 20 m



HTF50

Cable temperature sensor

-35...105 °C, dimensions Ø 6 × 50 mm + cable 1.5 m.
Stainless steel tube, IP54.
Measuring element Pt1000

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* silicone up to 180 °C, cable length on request
* IP65, IP68



HTF200

Cable temperature sensor, silicone cable

-35...105 °C, dimensions Ø 6 × 200 mm + silicone cable up to 180 °C, 1.5 m.
Stainless steel tube, IP54. Measuring element Pt1000



RPTF1

Pendulum room temperature sensor
 -5...60 °C, dimensions Ø 16 × 140 mm + cable 1.5 m.
 Stainless steel tube, IP65.
 Measuring element Pt1000

* Pt100, Ni1000-5000,
 Ni1000-6180, NTC1.8kOhm
 * cable length 3 m, 6 m or cus-
 tomized



RPTF2

Pendulum room temperature sensor
 -5...60 °C, plastic globe Ø 50 mm, cable 1.5 m.
 For air temperature and radiating temperature metering.
 Measuring element Pt1000, IP65

* Pt100, Ni1000-5000,
 Ni1000-6180, NTC1.8kOhm
 * cable length 3 m, 6 m or cus-
 tomized



RSTF

Room radiation temperature sensor (semi-global)
 -30...75 °C, plastic globe.
 For air temperature and radiating temperature metering.
 Measuring element Pt1000, IP30

* Pt100, Ni1000-5000,
 Ni1000-6180, NTC1.8kOhm

PERIPHERALS
TEMPERATURE SENSORS, ACTIVE



TH08-MS

Pocket for immersion sensors, nickel-plated brass
 1/2", 150 mm, 10 bar, Ø 8 mm. To be ordered with TF-65 or TF-43 in correspond-
 ing length.

* length 50, 100, 150, 200,
 250, 300, 400 mm



TH-VA

Pocket for immersion sensors, stainless steel
 1/2", 150 mm, 40 bar, Ø 8 mm. Stainless steel VA 1.4571. To be ordered with TF-
 65 in corresponding length

* length 50, 100, 150, 200,
 250, 300, 400 mm



MF-15-K

Mounting flange, plastic
 To be ordered with TF-65 for installation of sensors into air ducts. 56 × 84 mm.



RTM1-U

Room temperature sensor
 0...50 °C, dimensions 85 × 85 × 27 mm.
 Wall mounting, output 0..10 V, power supply 24 V AC / DC.
 Housing ABS, colour pure white RAL9010

* **RTM1-I**: 4..20 mA (only DC power)
 * RTM1-U,D: with display
 * other measuring ranges
 * stainless steel cover



RPTM1-U

Pendulum room temperature sensor
 0...50 °C, dimensions 72 × 64 × 378 mm + probe 1.5 m.
 Output 0..10 V, power supply 24 V AC / DC

* **RPTM1-I**: 4..20 mA (only DC power)
 * other measuring ranges
 * cable length 3 m, 6 m or custom



RPTM2-U

Pendulum (globe) room temperature sensor
 0...50 °C, dimensions 72 × 64 × 378 mm + probe 1.5 m,
 plastic globe Ø 50 mm
 Output 0..10 V, power supply 24 V AC / DC

* **RPTM2-I**: 4..20 mA (only DC power)
 * other measuring ranges
 * cable length 3 m, 6 m or custom

PERIPHERALS

HUMIDITY SENSORS



KFF-U

Duct humidity sensor

Capacitive element, 20..80 %rH: ±2 %, 0..100 %rH: ±3 %
 stem Ø 16 × 230 mm, IP65
 Output 0..10 V, power supply 24 V AC / DC

* **KFF-I**: 4..20 mA (only DC power)
 * display



KFTF-U

Duct humidity and temperature sensor

Capacitive element, 20..80 %rH: ±2 %, 0..100 %rH: ±3 %
 Temperature -35..80 °C (switchable ranges), stem Ø 16 × 230 mm, IP65
 Output 2× 0..10 V, power supply 24 V AC / DC

* **KFTF-I**: 4..20 mA (only DC power)
 * display
 * passive temperature sensor Pt100, Pt1000, Ni1000-5000, Ni1000-6180, NTC1.8kOhm



AFF-U

On-wall humidity sensor

Capacitive element, 20..80 %rH: ±2 %, 0..100 %rH: ±3 %
 Stem Ø 16 × 55 mm, IP65
 Output 0..10 V, power supply 24 V AC / DC

* **AFF-I**: 4..20 mA (only DC power)
 * display



AFTF-U

On-wall humidity and temperature sensor

Capacitive element, 20..80 %rH: ±2 %, 0..100 %rH: ±3 %
 Temperature -35..80 °C (switchable ranges), stem Ø 16 × 55 mm, IP65
 Output 2× 0..10 V, power supply 24 V AC / DC

* **AFTF-I**: 4..20 mA (only DC power)
 * display
 * passive temperature sensor Pt100, Pt1000, Ni1000-5000, Ni1000-6180, NTC1.8kOhm



KFF-20U

Duct humidity sensor, high-precision

Capacitive element, 10..90 %rH: ±1.8 %, 0..100 %rH: ±3 %
 Stem Ø 16 × 230 mm, IP65
 Output 0..10 V, power supply 24 V AC / DC

* **KFF-20I**: 4..20 mA (only DC power)
 * display



KFTF-20U

Duct humidity and temperature sensor, high-precision

Capacitive element, 10..90 %rH: ±1.8 %, 0..100 %rH: ±3 %
 Temperature -35..80 °C (switchable ranges), stem Ø 16 × 230 mm, IP65
 Output 2× 0..10 V, power supply 24 V AC / DC

* **KFTF-20I**: 4..20 mA (only DC power)
 * display



AFF-SD-U

On-wall humidity and temperature sensor

20..80 %rH: ±3 % 0..100 %rH: ±5 %
 Stem Ø 16 × 55 mm, IP65
 Output 0..10 V, power supply 24 V AC / DC

* display



AFF-20U

On-wall humidity sensor, high-precision

Capacitive element, 10..90 %rH: ±1.8 %, 0..100 %rH: ±3 %
 Stem Ø 16 × 45 mm, IP65
 Output 0..10 V, power supply 24 V AC / DC

* **AFF-20I**: 4..20 mA (only DC power)
 * display



AFTF-SD-U

On-wall humidity and temperature sensor

20..80 %rH: ±3 % 0..100 %rH: ±5 %
 Temperature -35..80 °C (switchable ranges), stem Ø 16 × 55 mm, IP65
 Output 2× 0..10 V, power supply 24 V AC / DC



AFTF-20U

On-wall humidity and temperature sensor, high-precision
 Capacitive element, 10..90 %rH: ±1.8 %, 0..100 %rH: ±3 %
 Temperature -35..80 °C (switchable ranges), stem Ø 16 × 55 mm, IP65
 Output 2 × 0.10 V, power supply 24 V AC / DC

* **AFTF-20I:** 4..20 mA (only DC power)
 * display



RFF-U

Room humidity sensor
 Capacitive element, 20..80 %rH: ±2 %, 0..100 %rH: ±3 %
 Output 0.10 V, power supply 24 V AC / DC
 Wall mounting, dimensions 85 × 85 × 27 mm

* **RFF-I:** 4..20 mA (only DC power)
 * display



RFTF-U

Room humidity and temperature sensor
 Capacitive element, 20..80 %rH: ±2 %, 0..100 %rH: ±3 %
 Temperature 0..50 °C, output 2 × 0.10 V, power supply 24 V AC / DC
 Wall mounting, dimensions 85 × 85 × 27 mm

* **RFTF-I:** 4..20 mA (only DC power)
 * display
 * passive temperature sensor Pt100, Pt1000, Ni1000-5000, Ni1000-6180, NTC1.8kOhm



RPFF-U

Pendulum room humidity sensor
 Capacitive element, 20..80 %rH: ±2 %, 0..100 %rH: ±3 %
 Output 0.10 V, power supply 24 V AC / DC
 Dimensions 72 × 64 × 378 mm, cable 2 m

* **RPFF-I:** 4..20 mA (only DC power)
 * display



RPFTF-U

Pendulum room humidity and temperature sensor
 Capacitive element, 20..80 %rH: ±2 %, 0..100 %rH: ±3 %
 Temperature -35..80 °C (switchable ranges). Output 0.10 V, power supply 24 V AC / DC
 Dimensions 72 × 64 × 378 mm, cable 2

* **RPFTF-I:** 4..20 mA (only DC power)
 * display

PERIPHERALS

PRESSURE SENSORS



SHD-U1

Pressure sensor for liquid and fluid media
 Power supply 24 V AC / DC, measuring range 0..1 bar, output 0.10 V, ext. thread G1/2", stainless steel, overload 2 × measuring range, temp. range -40..100 °C, IP65

* SHD-U2.5, SHD-U6, SHD-U10, SHD-U16, SHD-U25, SHD-U40 (number = measuring range in bar)
 * SHD-I.. output 4..20 mA (only DC power)



SHD692

Differential pressure sensor for liquid and fluid media
 Power supply 24 V AC / DC, output 0.10 V, internal thread 1/8" – 27 NPT, stainless steel, overload 1.5 × measuring range, system pressure max. 25 bar, temp. range -15..80 °C, IP65

* SHD692-900: 0.1 bar, SHD692-907: 0.5 bar, SHD692-912: 1 bar, SHD692-916: 2.5 bar, SHD692-918: 4 bar



DF-010U

Differential air pressure sensor Premasgard -1000..1000 Pa
 Power 24 V AC / DC, output 0.10 V, incl. hose Ø 4/6 × 2000 mm, for non-aggressive and non-combustible gases, dimensions 72 × 64 × 378 mm, IP65

Adjustable range:
 0(-100)..+100 Pa / 0(-300)..+300 Pa / 0(-500)..+500 Pa / 0(-1000)..+1000 Pa
 * **DF-010I:** 4..20 mA (only DC power)



DF-050U

Differential air pressure sensor Premasgard -5000..5000 Pa
 Power 24 V AC / DC, output 0.10 V, incl. hose Ø 4/6 × 2000 mm, for non-aggressive and non-combustible gases, dimensions 72 × 64 × 378 mm, IP65

Adjustable range:
 0(-1000)..+1000 Pa / 0(-2000)..+2000 Pa / 0(-3000)..+3000 Pa / 0(-5000)..+5000 Pa
 * **DF-050I:** 4..20 mA (only DC power)

PERIPHERALS

LIGHT INTENSITY, AIR QUALITY AND CO₂ SENSORS



AHKF-U

Outdoor light intensity sensor

Power supply 24 V AC / DC, output 0..10 V, measuring range 0..500 lx / 20 klx / 60 klx (switchable), wall-mounted, IP65, dimensions 72 × 64 × 39.4 mm

* AHKF-I: 4..20 mA (only DC power)



RHKF-U

Room light intensity sensor

Power supply 24 V AC / DC, output 0..10 V, measuring range 0..500 lx / 1 klx / 20 klx (switchable), wall-mounted, IP30, dimensions 85 × 85 × 27 mm

* RHKF-I: 4..20 mA (only DC power)



RBWF-U

Room motion sensor/presence detector

Power supply 24 V AC / DC, output 230V / 2A change-over, IR, beam angle 360° × 110°, operating range ca. 10 m, timeout adjustable 4 s ... 16 min., wall mounted, IP30, dimensions 72 × 64 × 37.8 mm



KLQ

Duct air quality sensor

Power supply 24 V AC / DC, output 0..10 V or 4..20 mA ~ 100..0 % air quality referred to calibration gas, VOC sensor, IP65

* display



RLQ

Room air quality sensor

Power supply 24 V AC / DC, output 0..10 V or 4..20 mA ~ 100..0 % air quality referred to calibration gas, VOC sensor, IP30, dimensions 85 × 85 × 27 mm

* display



RCO2

Room CO₂ sensor

Power supply 24 V AC / DC, output 0..10 V ~ 0..2000 ppm, optical sensor NDIR, IP30, dimensions 85 × 85 × 27 mm

* display



RLQ-CO2

Room air quality and CO₂ sensor

Power supply 24 V AC / DC, output 2× 0..10 V ~ 0..2000 ppm (CO₂, optical sensor NDIR), 100..0 % AQ referred to calibration gas (air quality, VOC sensor), IP30, dimensions 85 × 85 × 27 mm

* display



RTM-CO2

Room temperature and CO₂ sensor

Power supply 24 V AC / DC, output 2× 0..10 V ~ 0..2000 ppm (CO₂, optical sensor NDIR), 0..50 °C (temperature), IP30, dimensions 85 × 85 × 27 mm



KCO2-U

Duct CO₂ sensor

Power supply 24 V AC / DC, output 0..10 V ~ 0..2000 ppm or 0..5000 ppm

* KCO2-I: 4..20 mA (only DC power)



KLQ-CO2

Duct air quality and CO₂ sensor

Power supply 24 V AC / DC, outputs 2x 0.10 V ~ 0..2000 ppm (CO₂, optical sensor NDIR), 100.0 % AQ referred to calibration gas (quality, VOC sensor), IP65

* display



KCO2-SD-U TYR2

Duct CO₂ sensor

Power supply 24 V AC / DC, output 0.10 V ~ 0..2000 or 0..5000 ppm (CO₂, optical sensor NDIR), 200 mm stem, electronics IP65



KLGf-1

Duct airflow monitor

Power supply 24 V AC / DC, output 0.10 V ~ 0..30 m/s, mounting flange, stem Ø 10 x 140 mm

PERIPHERALS
THERMOSTATS



FST

Frost protection thermostat, mechanical

Output: change-over contact 10 (2) A, 250 V AC, dimensions 126 x 90 x 50 mm, IP65
Setpoint range -10..15 °C, hysteresis 2 K

* capillary length 6 m (FST-1D), 1.8 m (FST-3D), 3 m (FST-5D)



RTR-B121

Room temperature controller, mechanical (heating)

Setpoint range +5...+30 °C, hysteresis 0.5 K
Switching element: bimetal, contact 10 (4) A, 230 V AC
Dimensions 75 x 75 x 25 mm



RTR-B124

Room temperature controller, mechanical (heating)

Setpoint range +5...+30 °C, hysteresis 0.5 K
Switch element: bimetal, contact 10 (4) A, 230 V AC
Dimensions 75 x 75 x 25 mm. Input for depression -5K



RTR-B721

Room temperature controller, mechanical (heating / cooling)

Setting range +5...+30 °C, hysteresis 0.5 K
Bimetal, contacts 10 (4) A, 230 V heating, 5 (2) A cooling
Dimensions 75 x 75 x 25 mm



RTR-B747

Room temperature controller, mechanical (heating / cooling)

Setting range +5...+30 °C, hysteresis 0.5 K
Bimetal, contacts 10 (4) A, 230 V AC heating, 5 (2) A cooling
Dimensions 75 x 75 x 25 mm, internal setting



ALTR-060

Strap-on temperature controller 0...+60 °C
 Temperature range 0...+60 °C, hysteresis 5 K
 Change-over contact 16 (4) A, 24...250 V AC
 Dimensions 38 × 48 × 103 mm, IP40, external setting

** internal setting: ALTR-060U*



ALTR-090

Strap-on temperature controller 0...+90 °C
 Temperature range 0...+90 °C, hysteresis 5 K
 Change-over contact 16 (4) A, 24...250 V AC
 Dimensions 38 × 48 × 103 mm, IP40, external setting

** internal setting: ALTR-090U*



ALTR-1

Strap-on temperature controller -35...+35 °C
 Temperature range -35...+35 °C, hysteresis 5 K
 Change-over contact 16 (1.5) A, 24...250 V AC
 Dimensions 73.5 × 70 × 108 mm, IP65, external setting



ALTR-3

Strap-on temperature controller 0...+60 °C
 Temperature range 0...+60 °C, hysteresis 5 K
 Change-over contact 16 (1.5) A, 24...250 V AC
 Dimensions 73.5 × 70 × 108 mm, IP65, external setting



ALTR-5

Strap-on temperature controller 0...+90 °C
 Temperature range 0...+90 °C, hysteresis 5 K
 Change-over contact 16 (1.5) A, 24...250 V AC
 Dimensions 73.5 × 70 × 108 mm, IP65, external setting



ALTR-7

Strap-on temperature controller 0...+120 °C
 Temperature range 0...+120 °C, hysteresis 5 K
 Change-over contact 16 (1.5) A, 24...250 V AC
 Dimensions 73.5 × 70 × 108 mm, IP65, external setting



ETR-060

Built-in temperature controller 0...+60 °C
 External setting temperature range 0...+60 °C, hyst. 3 K
 Change-over contact 10 (1.5) A, 24...250 V AC, IP65
 Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

** internal setting: ETR-060U
 * stainless steel pocket*



ETR-090

Built-in temperature controller 0...+90 °C
 Internal setting temperature range 0...+90 °C, hyst. 3 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

** internal setting: ETR-090U
 * stainless steel pocket*



ETR-0120

Built-in temperature controller 0...+120 °C
 External setting temperature range 0...+120 °C, hyst. 5 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

** stainless steel pocket*



ETR-50140

Built-in temperature controller +50...+140 °C
 External setting temperature range +50...+140 °C, hyst. 5 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

* stainless steel pocket



ETR-R6585

Built-in temperature controller +65...+85 °C
 External setting temperature range +65...+85 °C, hyst. 15...20 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

STB function, restart after cooling down and manual reset
 * stainless steel pocket



ETR-R90110

Built-in temperature controller +90...+110 °C
 External setting temperature range +90...+110 °C, hyst. 15...20 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

STB function, restart after cooling down and manual reset
 * stainless steel pocket



ETR-O60R85

Built-in temperature controller two-step
 Temperature range 0...+60 °C and +65...+85 °C, hyst. 3 and 15...20 K
 Change-over contacts 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

upper step: STB function, restart after cooling down and manual reset
 * stainless steel pocket



ETR-O90090U

Built-in temperature controller two-step
 Internal setting temperature range 0...+90 °C and 0...+90 °C, hyst. 3 and 3 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

* stainless steel pocket



ETR-O90R110

Built-in temperature controller two-step
 Temperature range 0...+90 °C and +90...+110 °C, hyst. 3 and 15...20 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

upper step: STB function, restart after cooling down and manual reset
 * stainless steel pocket



ETR-1

Built-in temperature controller -35...+35 °C
 External setting temperature range -35...+35 °C, hyst. 3 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP65.
 Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

* stainless steel pocket



KTR-O60

Duct temperature controller 0...+60 °C
 External setting temperature range 0...+60 °C, hyst. 3 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

* internal settings: KTR-O60U



KTR-O90

Duct temperature controller 0...+90 °C
 External setting temperature range 0...+90 °C, hyst. 3 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

* internal settings: KTR-O90U



KTR-O120

Duct temperature controller 0...+120 °C
 External setting temperature range 0...+120 °C, hyst. 3 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm



KTR-50140

Duct temperature controller +50...+140 °C
 External setting temperature range +50...+140 °C, hyst. 5 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm



KTR-R6585

Duct temperature controller +65...+85 °C
 External setting temperature range +65...+85 °C, hyst. 15...20 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

STB function, restart after cooling down and manual reset



KTR-R90110

Duct temperature controller +90...+110 °C
 External setting temperature range +90...+110 °C, hyst. 15...20 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

STB function, restart after cooling down and manual reset



KTR-O60R85

Duct temperature controller two-step
 Temperature range 0...+60 °C and +65...+85 °C, hyst. 3 and 15...20 K
 Change-over contacts 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

upper step: STB function, restart after cooling down and manual reset



KTR-O90090U

Duct temperature controller two-step
 Internal setting temperature range 0...+90 °C and 0...+90 °C, hyst. 3 and 3 K
 Change-over contacts 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm



KTR-O90R110

Duct temperature controller two-step
 Temperature range 0...+90 °C and +90...+110 °C, hyst. 3 and 15...20 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

upper step: STB function, restart after cooling down and manual reset



KTR-1

Duct temperature controller -35...+35 °C
 External setting temperature range -35...+35 °C, hyst. 3 K
 Change-over contact 16 (1.5) A, 24...250 V AC, IP65
 Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm



TR-O40

Temperature controller 0...+40 °C
 Temperature range 0...+40 °C, hysteresis 1 K
 Change-over contact 10 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm

** internal setting: TR-O40U*



TR-O60

Temperature controller 0...+60 °C
 Temperature range 0...+60 °C, hysteresis 1.5 K
 Change-over contact 10 (1.5) A, 24...250 V AC, IP54
 Dimensions 73.5 × 70 × 108 mm

** internal setting: TR-O60U*



TR-22

Temperature controller -30...+30 °C
 Temperature range -30...+30 °C, hysteresis (adjustable) 2...15 K
 Change-over contact 15 (8) A, 24...250 V AC, IP65
 Dimensions 73.5 × 70 × 108 mm

** internal setting: TR-22U*



TR-O4040

Duct temperature controller two-step 0...+40 °C
 Temperature range 0...+40 °C and 0...+40 °C, hysteresis 1 K and 1 K
 Change-over contacts 10 (1.5) A, 24...250 V AC, IP65
 Dimensions 73.5 × 70 × 108 mm

* internal setting: TR-O4040U

PERIPHERALS
HYGROSTATS



TW-U

Dew point sensor, active
 Switches when reaching relative humidity setpoint, incl. 300 mm strap-on metal band
 Dimensions 64 × 72 × 378 mm, IP65
 Power supply 24 V AC / DC, output 0..10 V



KW-W

Dew point sensor (condensing)
 Switches at 93 %rH (adjustable), incl. 300 mm strap-on metal band
 Dimensions 64 × 72 × 378 mm, IP65
 Power supply 24 V AC / DC, C/O contact 24 V



RHT-1

Room hygrostat and thermostat
 10..35 °C, 35..100 %rH, power supply 24..230 V AC,
 change-over contacts rH 5 (0.2) A, t 10(4)A, switch
 Dimensions 127.5 × 75 × 28.6 mm, IP30

For flush box installation,
 order inclusive mounting frame
 ARA1.7E



RH-2

Room hygrostat
 25..95 %rH, hyst. 4 %rH, power supply 24..230 V AC,
 change-over contact 5 (0.2) A
 Dimensions 98 × 98 × 39 mm, IP30

* internal setting RH-2U



KH-10

Duct hygrostat, mechanical
 Setpoint 35..100 %rH, change-over contact 24..250 V AC, 15 (8) A.
 Dimensions 108 × 72.5 × 70 mm, stem Ø 19 × 220 mm, IP65

* internal setting: KH10-U
 Accessories (to be ordered
 separately): flange MF-16-K,
 wall installation clamp WH-20

PERIFERIE
MANOSTATS



DS-205F

Differential pressure switch 20..300 Pa
 Contact 1.5(0.4)A, 12..250 V AC, ambient temperature -20..85°C, silicone membrane, di-
 mensions Ø 98 × 57.8 mm, IP54
 Inclusive connecting set: hose 2 m and nipples.

* DS-205B 50..500 Pa
 DS-205D 200..1000 Pa
 DS-205E 500..2500 Pa

PERIPHERALS

SWITCHING SENSORS



KLSW-3

Airflow control switch, electronic

0.1..30 m/s (adjustable), relay 230 V / 10 A, power supply 230 V AC, adjustable switch-on (15..120 s) and switch-off (2..20 s) delay, dimensions 108 x 72.5 x 70 mm + stem Ø 10 x 140 mm

* KLSW-4 power supply 24 V AC / DC



WFS-1EPL

Airflow control switch, mechanical

2.5..9.2 m/s (adjustable), relay 24...250 V / 15(8) A, 108 x 73.5 x 70 mm + vane 80 x 175 mm, suitable for polluted air (oily vapours)

Accessories PWFS-08 - spare vane



SW1-EPL

Flow monitor, mechanical

0.6..90 m³/h (adjustable using different paddle lengths and setpoint knob), relay 24..250 V / 15(8) A, 108 x 73.5 x 70 mm + paddle 29 x 34..167 mm, screw socket 1", suitable for liquid and gaseous media up to 120 °C

PERIPHERALS

ROOM UNITS



RTF LT

Room temperature sensor, button, LED

Wall mounted, dimensions 98 x 98 x 33 mm
Measuring element Pt1000
ABS, colour: white RAL9010

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm



RTF T

Room temperature sensor, button

Wall mounted, dimensions 98 x 98 x 33 mm
Measuring element Pt1000
ABS, colour: white RAL9010

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm



RTF P

Room temperature sensor, setpoint

Wall mounted, dimensions 98 x 98 x 33 mm
Measuring element Pt1000, setpoint potentiometer 1K5

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* setpoint from the R6 range
* various scales / arrow shapes



RTF PT

Room temperature sensor, button, setpoint

Wall mounted, dimensions 98 x 98 x 33 mm
Measuring element Pt1000, setpoint potentiometer 1K5

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* setpoint from the R6 range
* various scales / arrow shapes



RTF PLT

Room temperature sensor, button, setpoint, LED

Wall mounted, dimensions 98 x 98 x 33 mm
Measuring element Pt1000, setpoint potentiometer 1K5

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* setpoint from the R6 range
* various scales / arrow shapes
* LED colors



RTF DP

Room temperature sensor, switch O-I-II-III, setpoint
Wall mounted, dimensions 98 × 98 × 33 mm. Measuring element Pt1000, setpoint potentiometer 1K5, stage switch up to 50 V

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* setpoint from the R6 range
* various scales / arrow shapes
* stage switch with resistors



RTF PW

Room temperature sensor, setpoint, switch
Wall mounted, dimensions 98 × 98 × 33 mm
Measuring element Pt1000, setpoint potentiometer 1K5, on/off switch up to 50 V

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* setpoint from the R6 range
* various scales / arrow shapes



RTF P D5

Room temperature sensor, setpoint, switch
Wall mounted, dimensions 98 × 98 × 33 mm
Measuring element Pt1000, setpoint potentiometer 1K5, switch A-O-I-II-III up to 50 V

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* setpoint from the R6 range
* various scales / arrow shapes

PERIPHERALS
ROOM CONTROLLERS



RTR-SO10

Room controller - heating and cooling
Setpoint +5...+30 °C, P band 1.5 K
Power supply 24 V AC / DC, output 2× 0.10 V / 10.0 V, 5 mA
Dimensions 98 × 98 × 33 mm, IP30



RTR-SO11

Room controller - heating and cooling
Setpoint 21 °C ± 8 K, P band 1.5 K
Power supply 24 V AC / DC, output 2× 0.10 V / 10.0 V, 5 mA
Dimensions 98 × 98 × 33 mm, IP30



RTR-SO12

Room controller - heating and cooling
Setpoint +5...+30 °C, P band 1.5 K
Power supply 24 V AC / DC, output 2× 0.10 V / 10.0 V, 5 mA
Dimensions 98 × 98 × 33 mm, IP30, 2× LED (heat / cool)

Temperature sensor external Pt1000, must be ordered separately



RTR-SO13

Room controller - heating and cooling
Setpoint 21 °C ± 8 K, P band 1.5 K
Power supply 24 V AC / DC, output 2× 0.10 V / 10.0 V, 5 mA
Dimensions 98 × 98 × 33 mm, IP30, 2× LED (heat / cool)

Temperature sensor external Pt1000, must be ordered separately



RTR-SO14

Room controller - heating and cooling, fancoil
Setpoint +5...+30 °C, P band 1.5 K
Power supply 24 V AC / DC, output 2× 0.10 V / 10.0 V, 5 mA
Dimensions 98 × 98 × 33 mm, IP30, 2× LED (heat / cool)

Temperature sensor external / internal Pt1000, manual fancoil switch 230 V O-I-II-III



RTR-SO15

Room controller - heating and cooling, fancoil
Setpoint 21 °C ± 8 K, P band 1.5 K
Power supply 24 V AC / DC, output 2× 0.10 V / 10.0 V, 5 mA
Dimensions 98 × 98 × 33 mm, IP30, 2× LED (heat / cool)

Temperature sensor external / internal Pt1000, manual fancoil switch 230 V O-I-II-III

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