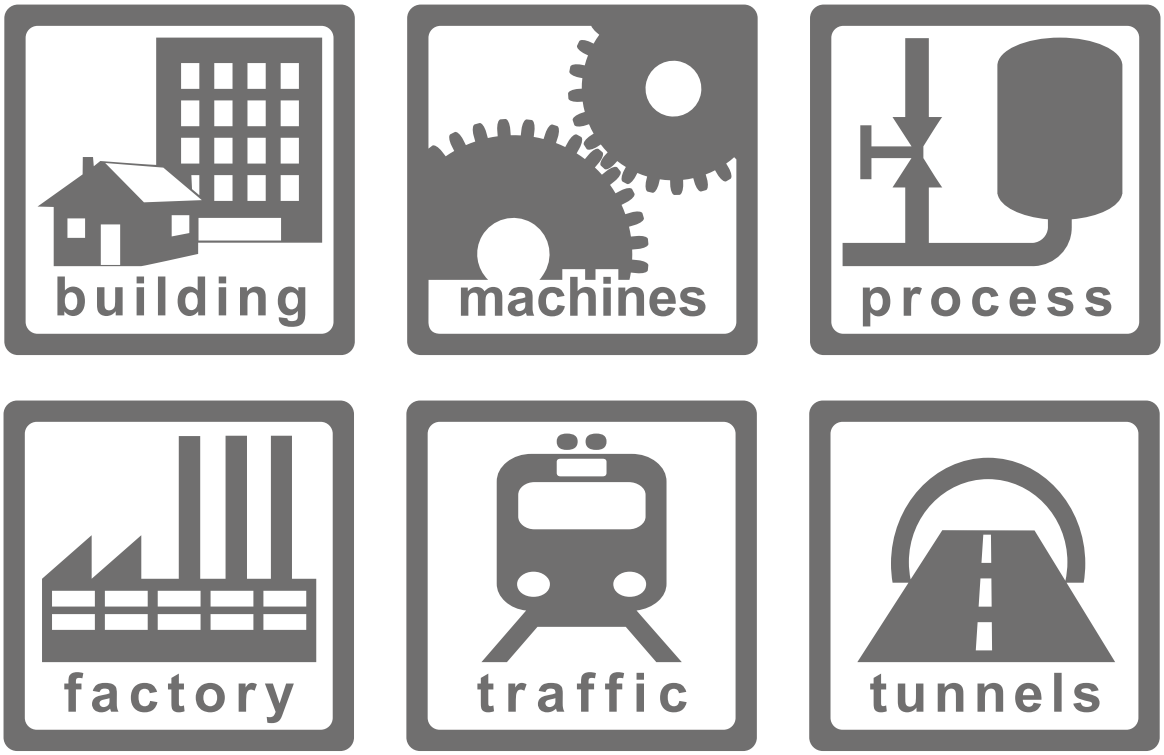
Teco Reference Book



TECO
Advanced Automation

We are Teco a.s., a leading Czech manufacturer of industrial control systems and intelligent building control systems. Our tradition dates back to 1919. You may find our systems in more than fifty countries around the world. The systems we develop and manufacture successfully operate and control demanding industrial environments under the most difficult conditions that exist in the engineering, mining, food and oil industries. Our systems also control large water projects in the Iranian desert or even the production of beer. You will also find our systems installed in the Czech heritage monument - the Karlštejn Castle. Tens of thousands of other applications starting with ordinary family houses and ending with large commercial or industrial buildings utilize our control systems. Our systems are simply popular all over the world and it is thanks to their exceptional reliability, great parameters and an affordable price.

40TH ANNIVERSARY
Development and manufacturing Programmable Logic Controllers




HVAC
control Smith Medicals,
Czech Republic

Apartament Tri veze,
Bratislava, Slovakia

Residential House,
Hungary

Air-conditioning
and ventilation
VBW, Gdansk, Poland

Villa, Corfu Island,
Greece

Hotel Van Der Valk
Veenedaal, Netherland

Residential House
Düsseldorf, Germany

Residential Houses
Ecomodula, France

Hotel My Story,
Lisbon, Portugal

Czech Pavilion
EXPO 2015
Milan, Italy

Control Systems Tecomat Worldwide

TECO
Advanced Automation

Samsung, LED Displays
Manufacturing,
Korea

Showroom, Sao Paulo,
Brasil

Data Metering,
Gas Meters,
Istanbul, Turkey

Museum of
Cypriot Theater,
Limasol, Cyprus

Health Care Center,
Jeddah, Saudi Arabia

Oil&Gas Terminal, Black
Sea Terminal,
Poti, Gorgia

110 km Water Supply,
Larestan, Iran

Control Cabinets
Manufacturing,
India

Autoparts
Manufacturing,
China

MVE Fujishida,
Japan

Air-conditioning, Public
Hall, Astana,
Kazakhstan

Parking Lots,
Tichin, Ekaterinburg,
Russia

Boiler House,
Lviv, Ukraine

Combustion
Boiler House,
Kohila, Estonia

Liberty Technology
Park, Cluj, Romania

Processes

galvanizing lines, chemical plants, oil industry, furnaces, annealing processes, glass casting, cement plants, brickyards, concrete production plants, vulcanization, de-dusting systems, mills, malt houses, bakeries, breweries, water treatment plants, wastewater treatment plants, reconstructions and environment friendly plants, animal feed production, boiler rooms, transfer stations, energy, substations, consumption optimization processes, gas distribution, substations and special applications

Buildings

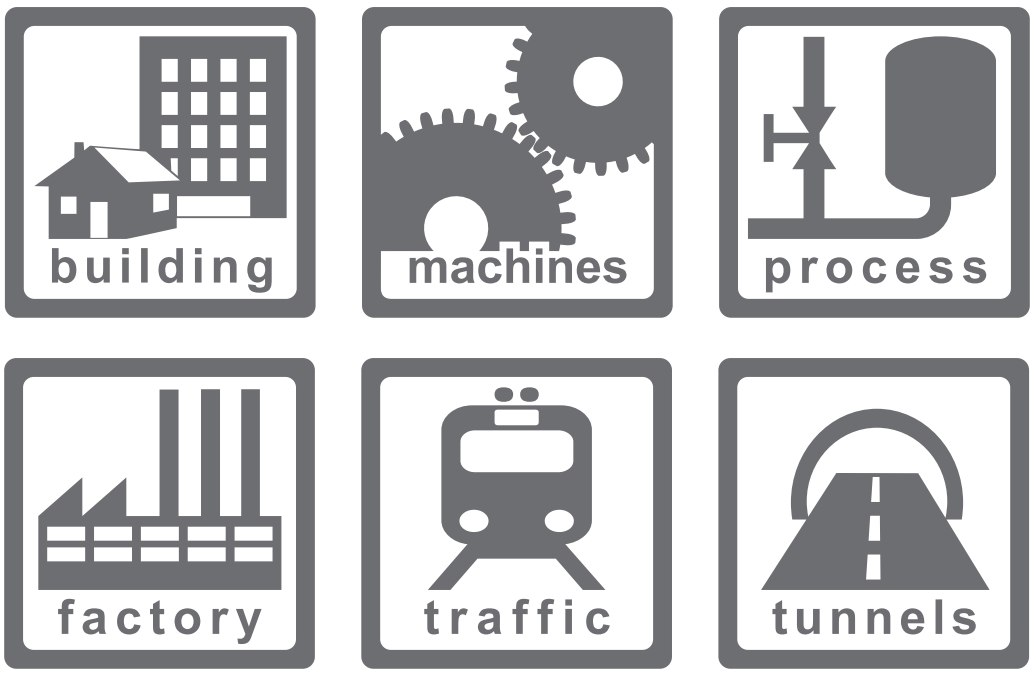
management and control of buildings, air conditioning, biomass combustion, cooling systems, air conditioning, swimming pool technologies, clean rooms, intelligent buildings, visualization, remote supervision, remote control

Machines

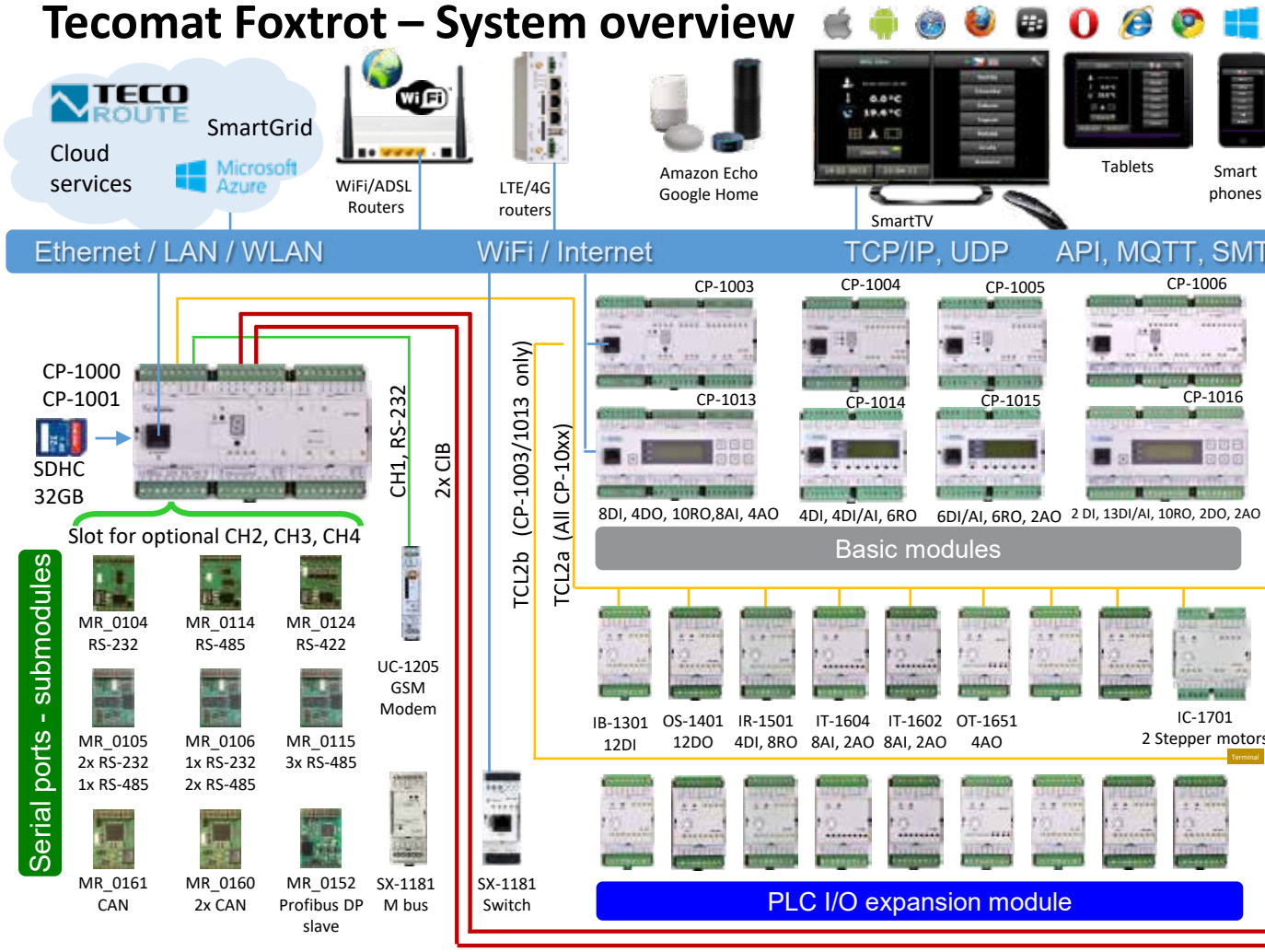
production lines, presses, compressors, forming machines, dividing and cutting machines, cranes, mining machines, testers, rolling mills, wood processing, meat processing plants, bioreactors, warehousing, small hydropower plants, wind power plants

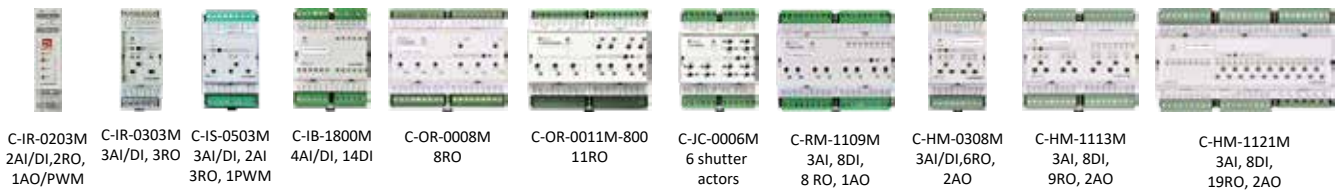
Transportation and shipping

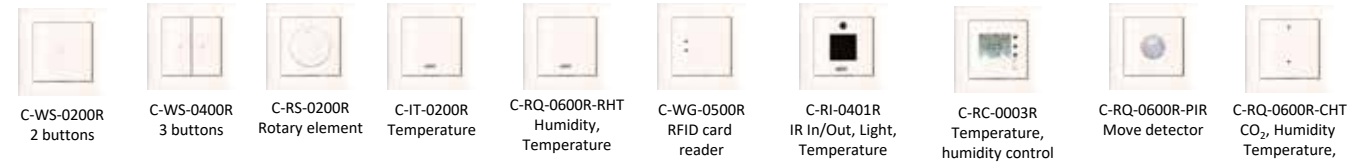
tunnel management and control, traction, telematics, trams, trains, subway technologies, navigation, traffic signs, information systems



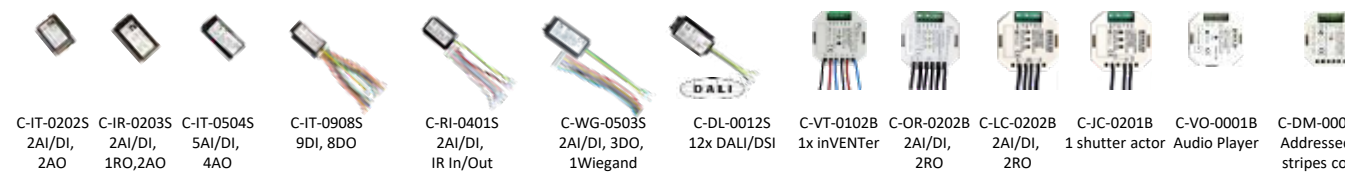
Tecomat Foxtrot – System overview

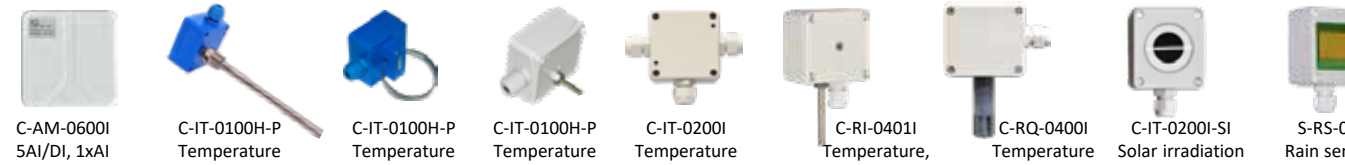




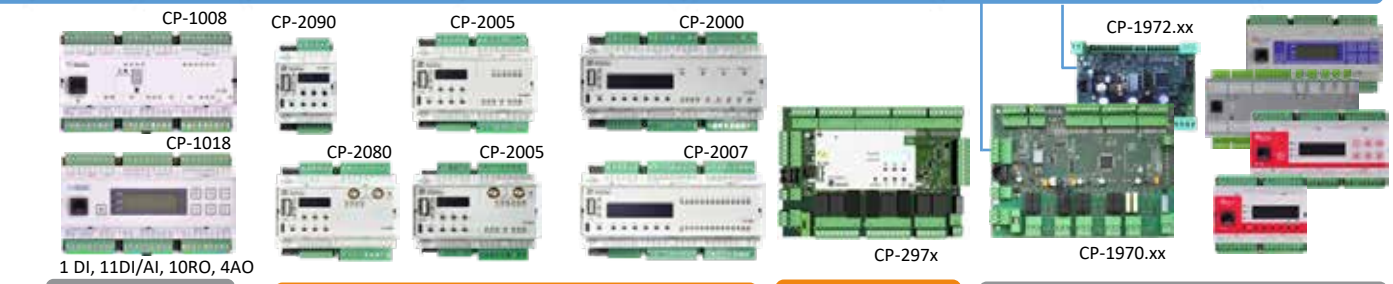


Available in designs : LOGUS90 OBZOR ABB legrand bticino GIRA JUNG B. Schneider Electric merten

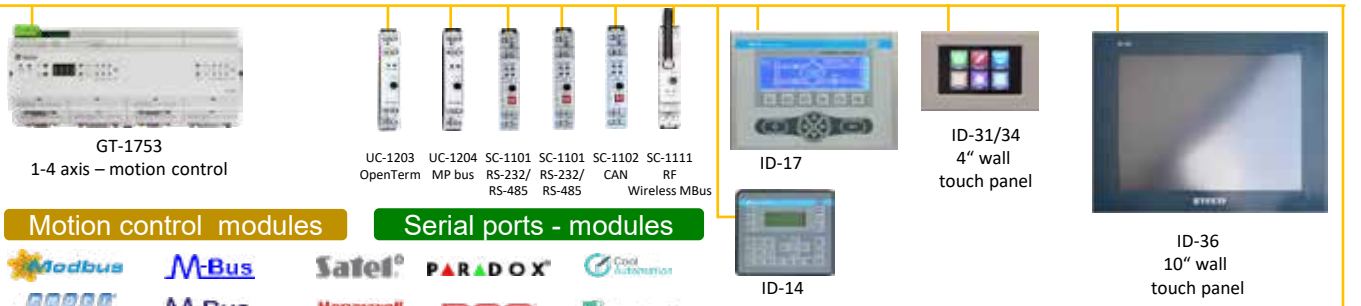




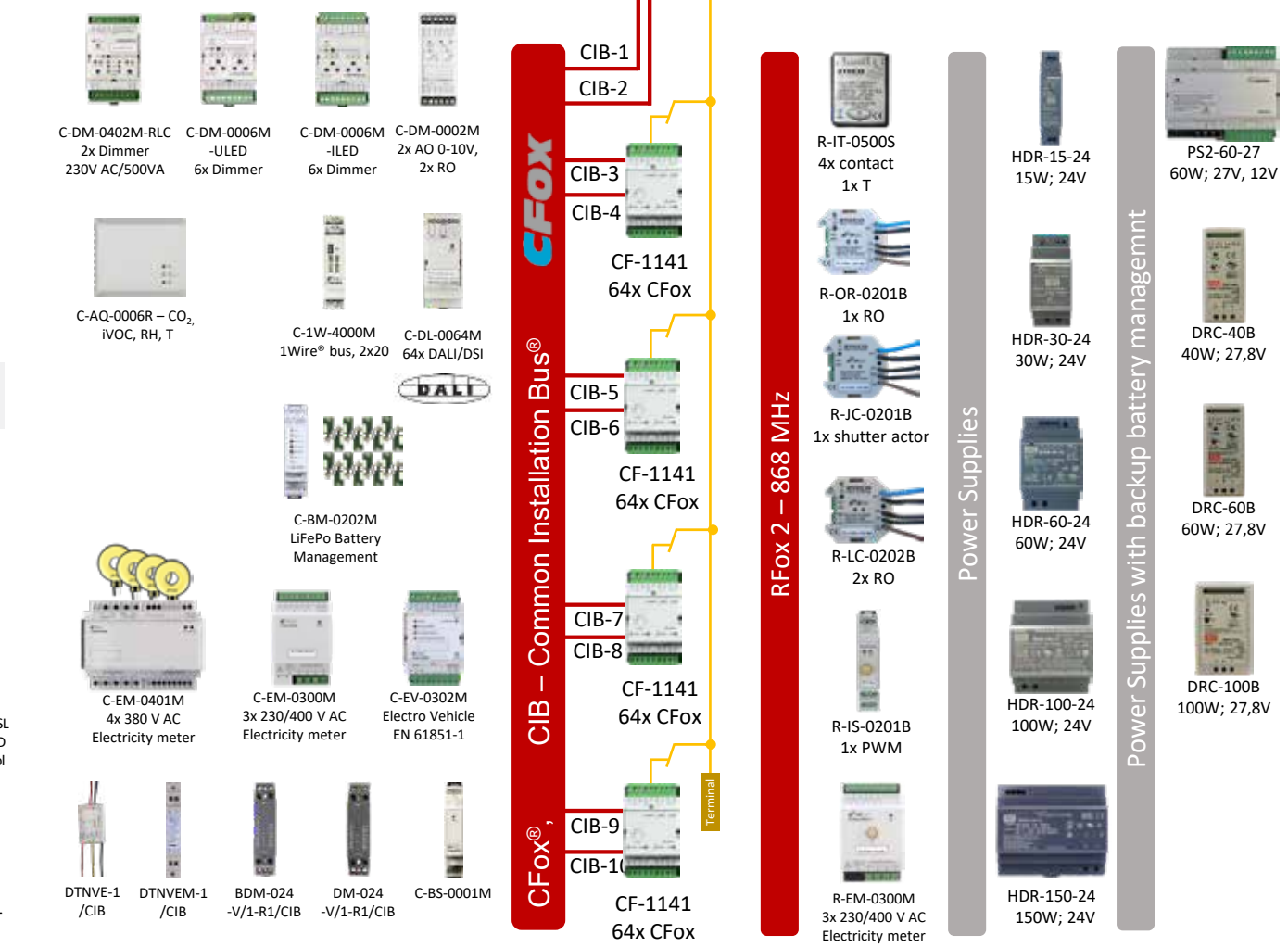
TP, SNTP, HTTPS, WEBSOCKET, MODBUS TCP, IEC-61870-5-104, BACNET/IP XML, JSON



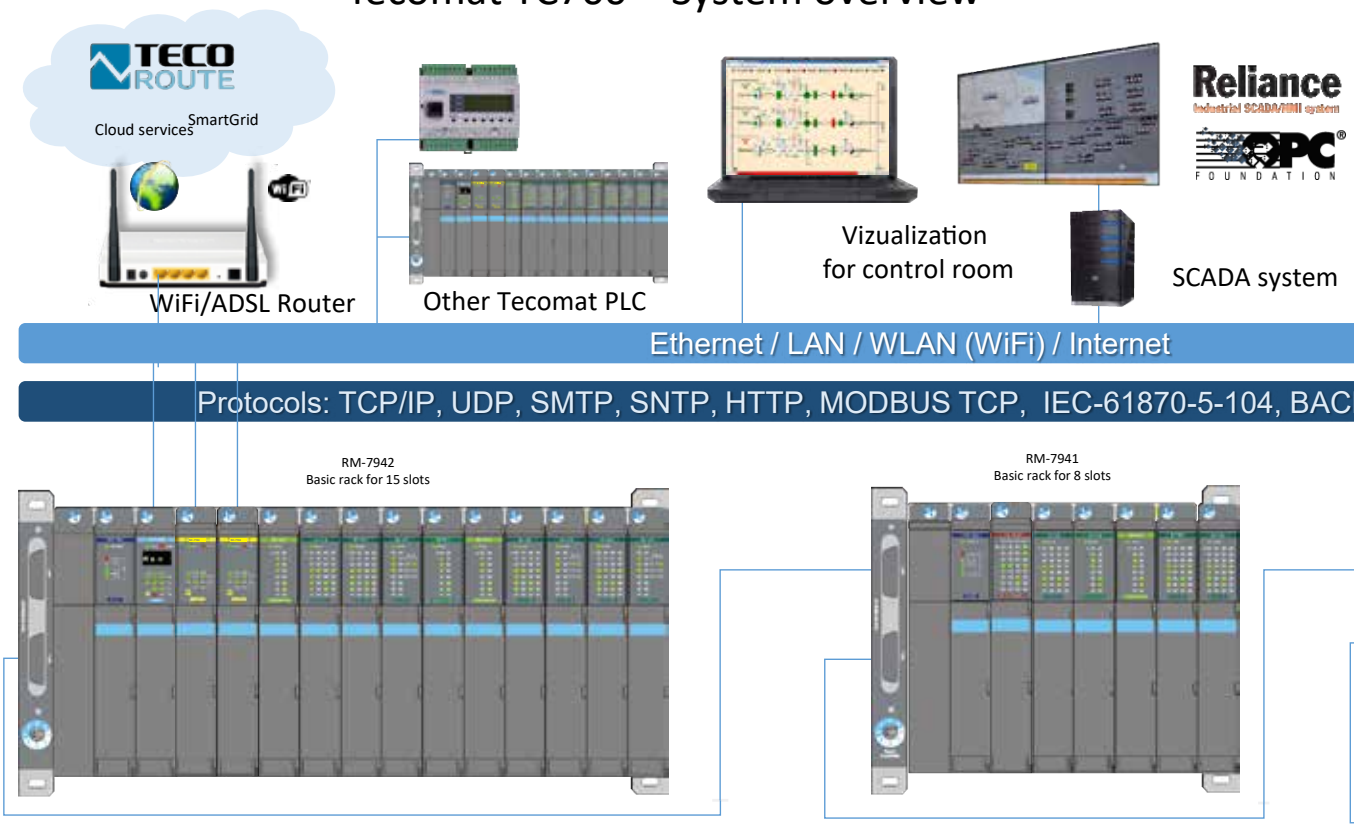
Basic modules | Foxtrot 2 Basic modules | OEM | Basic modules / OEM version

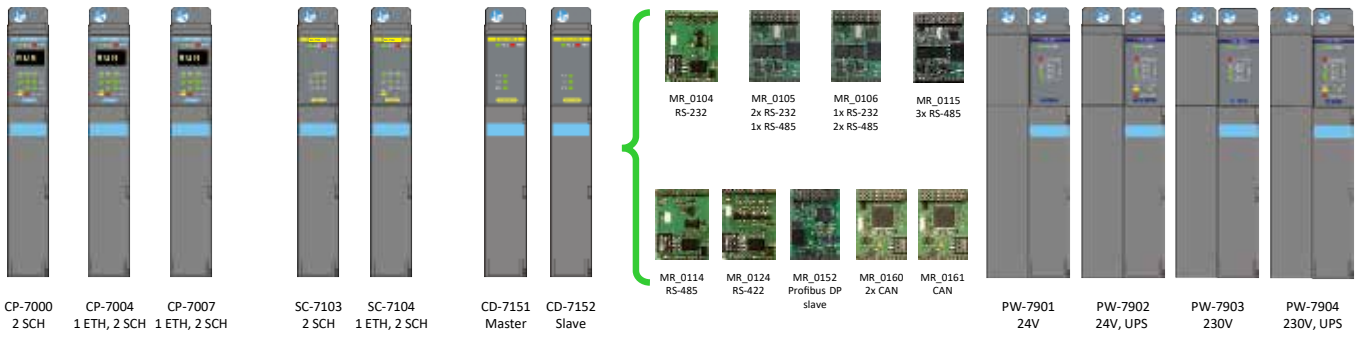


Motion control modules | Serial ports - modules | Operator panels

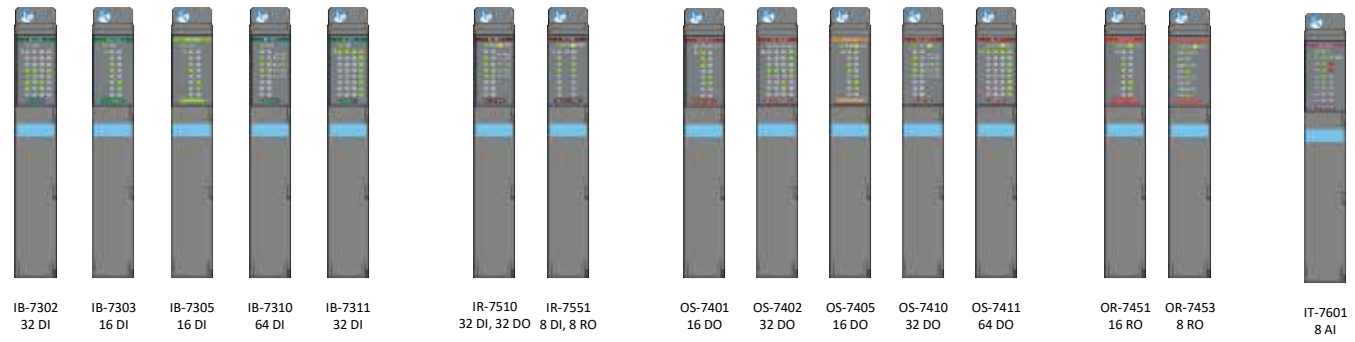


Tecomat TC700 – System overview

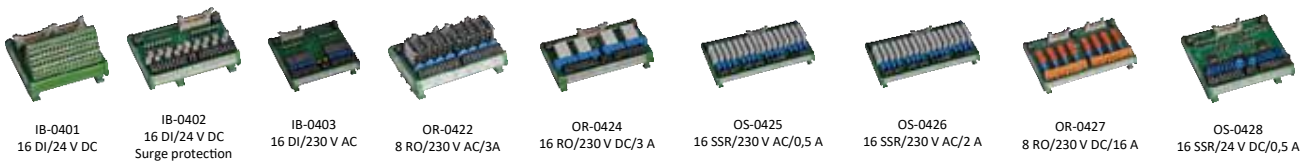




Central modules | Communication modules | Communication submodules | Power supplies



Binary I/O modules



External binary I/O modules

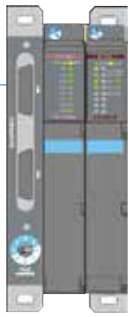
Smart-phones

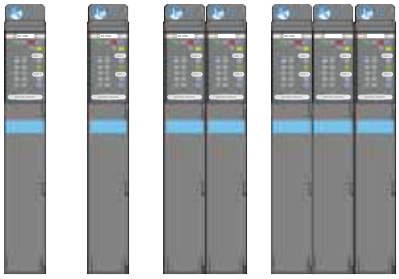
Tablets

ET/IP, XML, JSON

RM-7946
Basic rack for 4 slots

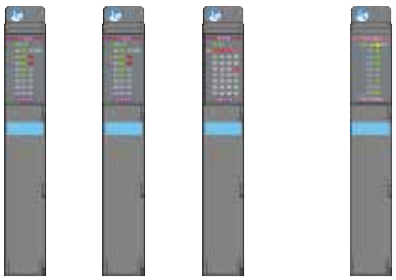
RM-7944
Basic rack for 2 slots





GT-7752 1 Axis | GT-7752 2 Axis | GT-7753 4 Axis | GT-7754 6 Axis

Motion control 1-6 axis



IT-7602 16 AI | IT-7604 8 AI | IT-7606 32 AI | OT-7652 8 AO

Analog I/O modules

IT-0451
4 AI
Surge protection

IT-0453
8 AI, loop supply, fused

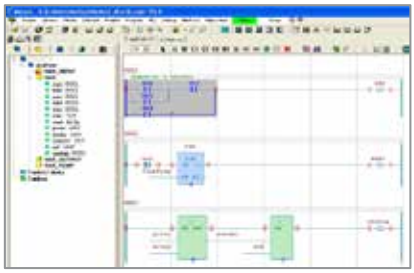
OT-0461
8 AO, loop supply, fused

External analog I/O modules

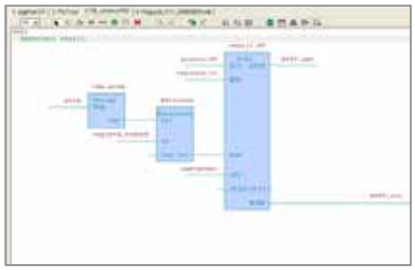
Mosaic – free programming - IEC 61131-3

ST – Structured Text

CFC – Continuous Flow Chart

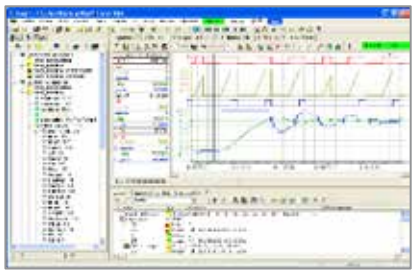


LD – Ladder Diagram



FBD – Functional block Diagram

Target PLC configurator



GraphMaker –signal visualisation

WEB Maker – composer of internal interactive graphic web pages

Firmware Updater

DataLogger

Saudi Arabia - Jeddah | Smart Building | Commercial Building | Scada Reliance | Tecomat Foxtrot

Chronically ill patients Care Centre - central control system

In 2016, a Care Centre for the Chronically Ill was opened in the Saudi city of Jeddah.
In the same year, a Czech company called KYBERTEC implemented a system for visualization and control of the hospital technical equipment.

Control system

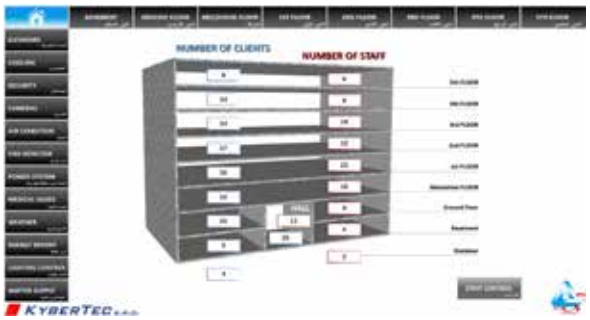
When this project was created, the building for which the visualization system was created was still under construction. Given the pioneering nature of the project, the control system is relatively complex and includes both classic building automation elements (HVAC control and optimization, energy consumption, electrical fire alarm and electronic alarm systems, weather forecast unit) and hospital-specific systems (monitoring of medicinal gases, fire situations, etc.), and also other specific modules (personnel movement control systems, patient family support, asset monitoring and crisis management – for example in case of fire). Another specific feature is the integration of a camera monitoring system which detects the movement of people.

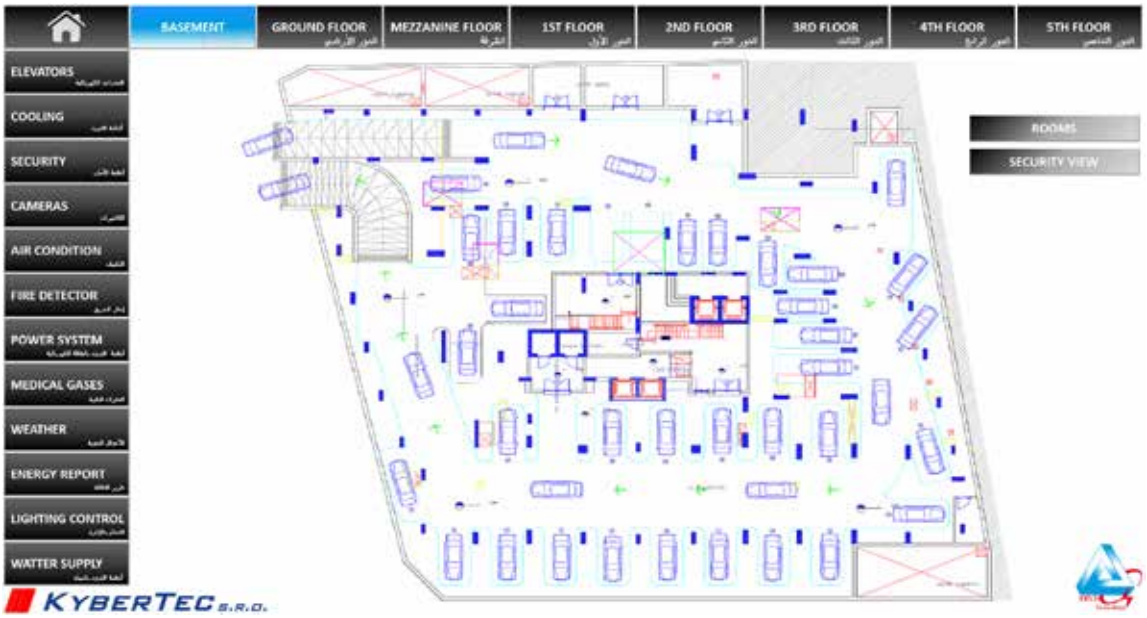
To control the technical equipment in the hospital, 14 Tecomat Foxtrot CP-1000 PLC units were installed in the building. Visualization is provided by the Reliance SCADA / HMI system. The Reliance system plays a key role in the entire management and monitoring system and utilizes other interconnected modules installed across the network of hospitals.

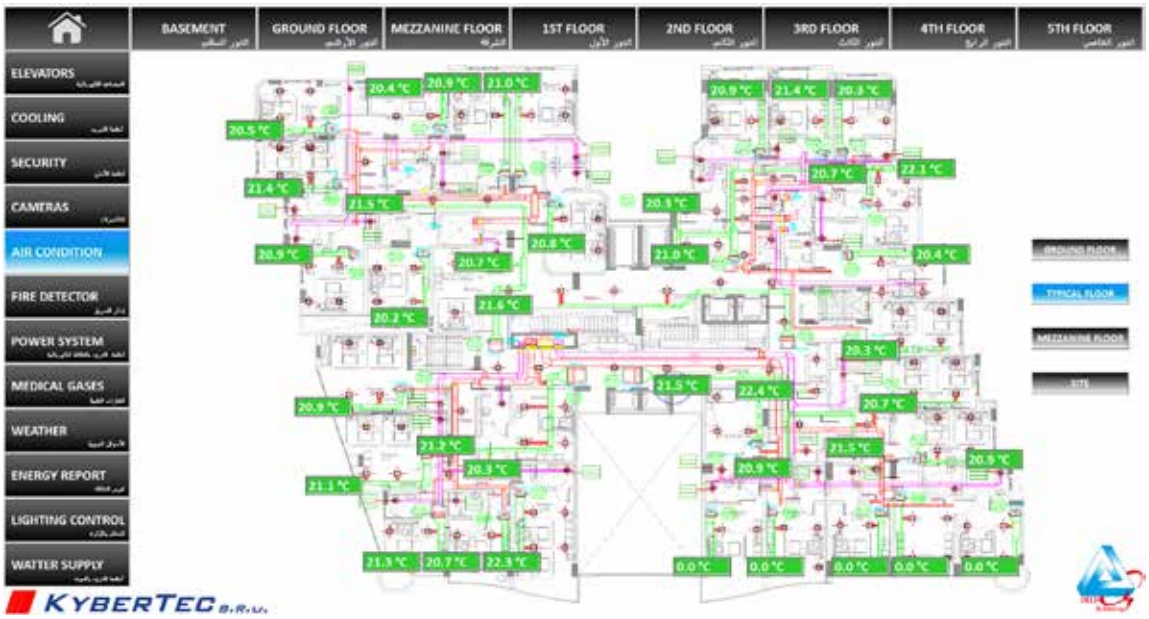
Visualization is available in English and Arabic.

Tecomat Foxtrot controls and integrates the following systems into a single control dispatch room:

- Heating, cooling, air conditioning (HVAC)
- Security systems, surveillance
- Access system
- Fire protection system
- Elevators and lifts
- Water processing and management
- CCTV
- Distribution of medical gases
- Lighting system
- Remote control
- PA system
- Alarm state monitoring system
- Security automation system







Kuwait | Lighting control | Tecomat Foxtrot

Marriot Hotel – lighting control system

During 2016, our Foxtrot was installed to control lighting system at the CrossRoads restaurant in the luxurious five-star JW Marriot Hotel in Kuwait. The installation was performed by our local partner, Gulf Automation Systems Company W.L.L.

Thanks to Foxtrot system, employees can control all lights from one place using a touch panel, including selection of various light scenes. There is also an option to remotely access and control the system - via smartphone, tablet or computer.

The Netherlands | Smart Building | Tecomat Foxtrot

Van Der Valk Hotel – Congress section control

In the Netherlands, along the A 12 highway to Utrecht near the town of Veenendaalen you will find the newest hotel of the Van Der Valk chain. You cannot miss this building. This congress hotel has been in full operation since December 2014. The hotel floor is equipped with 15 congress and social halls, and three Foxtrot systems play one of the most interesting control roles here.
A Dutch partner of Teco a.s. a company called B&R Design has completed a project where Foxtrot systems control and coordinate the distribution of audio and video feeds to all halls, control projectors, screens and large screens with 4K resolution, including control of blinds and shutters, lighting, ventilation and of course the temperature systems installed in each hall. The entire system of congress halls is connected to the reservation system of the ITesso hotel and is able to provide and handle thermal comfort according to Foxtrot event schedule.

Iraq | Access Control | Tecomat Foxtrot

Erbil Hotel – Elevator access control

At the beginning of 2017, our Tecomat Foxtrot system was deployed to control access to elevators at the 5-star Divan Hotel in Erbil, in Iraq. It is a 24-storey building equipped with 4 elevators. The aim was to define access rights for regular guests, employees and VIP guests staying at the Divan hotel. The system was implemented by our local partner in Iraq - a company called Securityco. The integration included connection of RFID readers for Saten cards and the Foxtrot system. To do so, the C-WG-0503S modules with Wiegand interface were used. This allowed RFID readers to be connected via these modules directly to the CIB bus. Two CP-1000 central modules and a CF-1141 expansion module were used in the hotel. Mosaic was used to create the control screens, allowing operation and use according to customer requirements and to control the programme..

Foxtrot system handles the responsive access control as follows:

- Registration of a new card for a specific floor
- It allows or denies access to the relevant floor when RFID card is inserted into the reader in the elevator
- It offers the possibility to define access rights (blocking, free access, etc.) for system administrators (reception, management, …)
- It registers card login data

CR | Lighting control | Tecomat Foxtrot

Hotel Wilson – lightning system control

In the upper corner of Wenceslas Square in Prague below the Museum, you will find a luxurious five-star Wilson hotel, which was built through a reconstruction process. Our Tecomat Foxtrot control system was chosen to control the lighting system and the installation was done by an experienced integrator, ELPRAMO s.r.o.

Tecomat Foxtrot system controls the lighting of common areas of the hotel, which consist of the entrance hall, reception and dining room. There is also controlled lighting system on the facade including outdoor commercial boards. There are a total of 8 dimmable and 54 switching circuits in the system. Switching circuits are combined with various light sources (halogen bulbs, LED strips, LED bulbs, fluorescent lamps). In the dining room and in the reception area, the system uses preset scenes (breakfast, day, dinner, night). The desired scene may be switched on either using a clear and simple graphic visualization on your mobile phone / tablet / PC at the reception, or you may use a wireless key chain.

Lighting system in corridors and outdoor is controlled by time-set scenarios, which can be changed by the user using the supplied visualization interface. As for remote access, the system administrator may also use the Tecoroute.

CR | Smart Building | Scada Reliance | Tecomat TC-700 + Foxtrot

Moravian Library

In 2000, our control systems were installed in the building of the Moravian Regional Library to handle complex energy management in the building.

Controlled and monitored technologies:
exchanger station, domestic hot water heating system (DHW) , cooling engine room, air conditioning for offices, study rooms, book deposits, sanitary facilities, FanCoil unit control system (IRC) - a total of 67 rooms, solar DHW heating system, floor heating and cooling control, natural ventilation system control, facade energy control, monitoring of EPS, elevators, fire doors, etc.

Romania | Tecomat Foxtrot | Lighting control

Liberty Technology Park lighting control

Liberty Technology Park in the town of Cluj, Romania is the first technology park to be built in Romania. On an area of almost 47,000 square meters eight modern buildings are being built, where the headquarters of R&D and IT companies, and the technical brains of the most successful companies in Romania, will be concentrated. The first phase of the project has already begun and more phases are gradually added. In this large centre our Tecomat Foxtrot system controls the lighting in large offices. It is controlled by using ID-18 touch panels. The basis of the system is the control of brightness according to the intensity of illumination sensed by C-RI-0401R sensor. It is controlled to achieve a constant brightness as specified by the relevant standard. Light fixtures are controlled via the DALI bus.

The area of each office is divided into several sectors and the relevant groups of lights are installed above these sectors. Lights may also be controlled separately from the panel. For example, lights above a sector which is not used can be turned off. The heating system is also monitored and controlled. Thermostats, which are currently intended for local control only , are connected via RTU Modbus. Another part of the project includes monitoring of consumption of electricity.

Italy | Heat pump control | Tecomat Foxtrot

Expo 2014 – Czech pavilion

Tecomat Foxtrot system in PEM customer version designed for a company called Regulus was installed in the Czech pavilion where it handles efficient and ecological hot water heating system running in the entire pavilion using solar thermal panels combined with a heat pump.

Mosambik | Access control | Tecomat Foxtrot | Scada Reliance

National Bank of Mozambique - access control

In 2017, Tecomat Foxtrot system was installed in the newly built high-rise building of the State Bank of Mozambique (Sede do Banco de Moçambique) in the city of Maputo, the capital of Mozambique. Foxtrot was installed here by our Portuguese partner a company called InfraSecur. In this 31-storey building, 150 Tecomat Foxtrot CP-1006 central units are installed, and control automatic doors and turnstiles and the actual access system. There is a total of 2,500 data points visualized in Reliance 4 SCADA software.

Portugal | HVAC control | Lighting control | Tecomat Foxtrot

Hotel My Story - Lisboa

The Infrasecur company (now Strong Charnon) see our Tecomat Foxtrot system attractive thanks to its flexibility, which allows integration of virtually anything, and also thanks to the reasonable price of the system. They also appreciate the robustness of the system, proven over many years and in many countries in different climatic conditions. Thanks to InfraSecur, a lot of Foxtrot system installations have already been completed in Portugal and some African countries.

System Foxtrot here controls:
- lighting,
- heat recovery with ventilation,
- fire flaps and alarm,
- energy consumption metering – electricity, water.

Hungary | Lighting Control | Tecomat Foxtrot | Sound control

Museum of János Damjanich

As part of the museum reconstruction project, a rather unique automated guide system was installed in the building. The museum consists of 10 separate halls - exhibition halls, each equipped with a voice system, which may be initiated by pressing a single button. Three halls are also equipped with robotic DMX light reflectors.

Foxtrot controls and integrates the following:

- 3x 4-zone 100V Monacor amplifier
- 3 x 4-zone PAP-PIC voice server (our own development and design)
- 8 x switching lights
- 3 xDMX robotic light reflectors
- 3 x DALI lights- 2 x projectors
- 1 x LCD TV

Slovakia | Tecomat Foxtrot | Lighting control

Tuli Cinema + Congress hotel

In 2017 a new unique multifunctional complex x-bionic ® sphere was opened in the town of Šamorín in Slovakia. In this huge complex you will find three operating sectors, where the control of the lightning system is completely entrusted to our Tecomat Foxtrot system. These sectors includes a cinema, hotel foyer and the congress centre. The system was installed by a Slovak company called CableCom s.r.o. In total, Foxtrot system controls here almost a thousand light fixtures including applicable light scenes.

The Netherlands | Lighting control | Tecomat Foxtrot | Sound control

Fuljhari lighting studio

A Dutch manufacturer of exclusive decorative lighting systems utilizes an interactive showroom in the historic building in Deventer. Our Dutch partner B&R Design has installed our Foxtrot system here which works as an active shopping system, and it allows the user interactively and simultaneously control various lighting fixtures in the showroom together with sound scenes while watching the progress of the light scenes via webcams on the control panel of the visualization system.

Russia | HVAC Control | Tecomat Foxtrot

Hypermarket Lenta - Nizhny Tagil

Lenta is one of the largest retail chains in Russia and the second largest hypermarket chain in the country. It operates 96 hypermarkets in 55 cities across Russia and 21 supermarkets in the Moscow region.

One of the hypermarkets that has just been completed is the one in the town of Nizhny Tagil. It is equipped with our Tecomat Foxtrot control system and with several other systems. Foxtrot handles the heating, lighting, air conditioning and ventilation systems. Our system was deployed here thanks to our local partner dealing with the Ural region called Territoria Kontrolja. All technologies controlled by Foxtrot are connected to a control room equipped with Reliance SCADA software.

Cyprus | Lighting control | Tecomat Foxtrot

Museum of the Cyprus Theatre - lighting system control

Foxtrot system installed in the Cypriot Museum theatre in the town of Limassol controls the lighting system The complete lighting system was delivered by a company called Rhine Line Ltd. The company's task was to create a typical theatrical twilight spots system to emphasize costumes on display and others theatrical artefacts. In order to successfully illuminate the stage and to emphases individual models, PAR36 spotlight halogen lamps were used. Also the combination of halogen and LED lighting was successfully solved as it respects the fragile the nature of costumes and fabrics. To strengthen the gentle LED illumination and to illuminate rare fabric costumes LED spot lights were added. Our Foxtrot system controls 40 dimmable halogen lights and 0-10V LED ballasts and 16 switching outputs. Thanks to the intelligent and flexible system, which allows for easy creation of light scenes, the requirements of both the architect and the curator (project designer) were fully met.

CR | Lighting control | Tecomat Foxtrot

Chodov shopping centre

The Chodov Shopping Centre in Prague is the largest shopping centre in the Czech Republic. In 2011, the shopping centre expanded the facade lighting system allowing the operator to create various colourful sceneries and effects. Variable colours of portal columns and the colour-emphasized contours of the building are an interesting attraction.
To control LED lighting directly, KOMPAR s.r.o. used its KO7000 control system, which is an OEM version of our Foxtrot system that KOMPAR has tuned to meet its implementation needs in the field of lighting technology. The shopping centre operator can customize the colours and transitions between individual colours using an integrated website.

CR | Tecomat NS950 | Scada Reliance | HVAC control

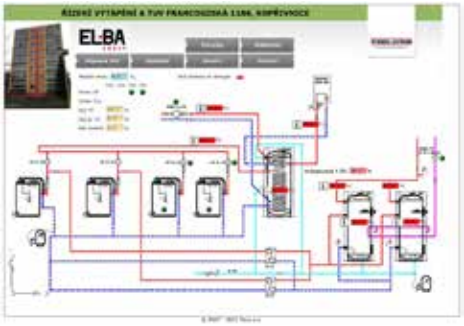
Panasonic Pardubice

In 2001, Matsushita Communications Czech has begun with the construction of a new Panasonic assembly plant located in the industrial zone near Pardubice. At that time it was the largest foreign investment in the Czech Republic.
During the construction a company called DIGIPRO s.r.o. from Rožnov pod Radhoštěm implemented a control system for the heating and air conditioning system installed in the plant. The company produces mobile phones and car radios. The control system includes a total of 13 Tecomat NS950 RAPID systems equipped with CPM-2B central units. MaR circuits ensure optimal heating, ventilation and cooling of the entire assembly of the plant, including office buildings and a warehouse.

CR | Heat pump control | Tecomat Foxtrot

STIEBEL ELTRON – control of heat cascade pumps

EL-BA Group, is a long-term partner of Teco a.s. and focuses on the integration of STIEBEL ELTRON heat pumps. The company faced a problem related to switching several heat pumps to hadle higher power outputs and based on the current needs of the relevant building. For these purposes, the company engineers have selected TECOMAT Foxtrot control system for its modularity, high operational stability and flexibility in programming communication protocols. EL-BA Group has already implemented boiler room control and monitoring systems able to handle heating and cooling in 5 apartment buildings and other non-residential buildings, such as the Casino Caesar, office buildings or wellness centres. A boiler room is always equipped with one basic PLC module Foxtrot CP-1006 and with input and output expansion modules. Data are read from the controller, which is built into STIEBEL ELTRON heat pumps, via CAN bus modules SC-1102.



CR | Wellness control | Tecomat Foxtrot | HVAC control

Tatra Grand hotel

In the Tatra Grand Hotel in Velké Karlovice you can find Foxtrot control units both in the HVAC control system, which was installed by EV Comp, but also in the control systems overseeing the wellness centre and swimming pools, which were installed by Micronic Přerov.

And many other implemented projects

- World of Technology Ostrava - Czech Republic
- Churches - the Netherlands
- Presentation halls - The Netherlands
- Lighting system control in production hall of Andritz Kufferath s.r.o. - Slovakia
- Lighting systems - production halls - Hungary
- Hotel-chateau Ratměřice - Czech Republic
- HVAC control - Sony - Pardubice
- HVAC control - Visteon Autopal
- HVAC - Banquet Hall - Astana - Kazakhstan
- Tichin parking control system - Yekaterinburg - Russia
- Apartment complex Curacao - the Caribbean
- Energy consumption monitoring - Jabel Al Dhannah project
- Lighting system control in Al-Shaheed Park - Kuwait
- Showroom - Erbil - Iraq
- Water and electricity consumption monitoring - Au Dhabi - Mosque - United Arab Emirates
- Temperature monitoring in chemical warehouses - Libya
- Smartlight showroom control - Slovakia
- Lasvit showroom control - Prague
- HVAC control and energy measurements - Marvila - Lisbon, Portugal
- Ventilation and lighting system control - Yekaterinburg, Russia
- Lighting system and lighting scene control system - Cayena Restaurant, Nicosia - Cyprus
- HVAC control in production facilities of Smiths Medical in the town of Hranice - Czech Republic
- Controlling filtration and water heating system in children's pool in the town of Kadaň - Czech Republic

Slovakia | Smart Home | Sound control | Tecomat Foxtrot | Full Integration

Comprehensive control technology for a family house

In a small village of Tvrdošovce situated in southern Slovakia, a stylish bungalow built in southern Italian style with an area of 390 m² has been constructed over the last 2 years. Every detail of this particular style reveals not only the owner's passion for the sun and wine, but also his interest in modern technology. This is evidenced by the use of our Tecomat Foxtrot control system, which combines all individual technologies used in the house into one superior control system overseeing individual technologies and providing the homeowner with a simple and effective tool to control the entire house.

Today's houses are equipped with a range of technological equipment from heating systems, recuperation cooling through lighting, blinds shading, door and gate drives, camera and security systems, but also with swimming pools and other similar comfort-enhancing technologies. All these technologies must be used and controlled efficiently and comfortably in order to serve us but not to enslave us. This is where the irreplaceable role of home automation system comes in, and in this case this role is played by Tecomat Foxtrot control system supplied by Teco a.s.

In this stylish house Tecomat Foxtrot integrates and controls the following technologies:

Lighting - a number of light sources are used in the house, including today's modern, economical and effective LED strips, which are conveniently arranged into groups and circuits allowing the user to set the desired mood or select the lighting scene suitable for the given area using a single button on a touch panel, phone or tablet. The lighting system is also controlled by the time setting, twilight and motion sensors used by the electronic security system.

Outdoor Blinds - outdoor blinds are a great for reducing temperature in overheated houses during hot summer days and there are quite a lot hot days in southern Slovakia. Blinds can save quite a bit of energy needed to cool the house down. Tecomat Foxtrot automatically closes or opens the blinds according to preset times and based data provided by the twilight sensor.

Heating system - the house is heated by a gas boiler. Each room is a separate heating zone, which obtains data on the current temperature from temperature sensors in the floor and on walls. The system compares these data with the desired temperature settings entered by the user in the form of the temperature control programme and heats the house according to predefined values. Of course, the user has the option to easily adjust the heating programme settings at any time. This however, happens very sporadically in real life. It may be done for example when the daily cycle is somehow changed. The user needs to get up at different time and go to work or returns at a different time. Much more often, the user changes the heating cycle simply by heating the house more or by lowering the temperature based on the required heat comfort.

Cooling - the house is also equipped with a central air conditioning system which is distributed and installed in individual rooms. Tecomat Foxtrot system controls the cooling or heating according to current needs of the user and according to the preset desired temperatures based on daily and weekly cycles. Therefore, the user does not have to worry throughout the entire year when and how to heat or cool the house. Everything is managed directly by Foxtrot system.

The air conditioning system in the house consists of 3 separate circuits that can reheat the house by utilizing the gas boiler. The performance of the air conditioning system is controlled by a frequency converter, which is again, overseen by Foxtrot system.

Sauna - is also connected to Foxtrot system. Thanks to this feature the user may switch on or off the sauna and set the temperature in the sauna using his tablet, phone or the relevant website.

Jacuzzi (whirlpool) - yet another device that can be controlled and monitored remotely by Foxtrot. Unlike the pool, Jacuzzi is not permanently filled with water, but if the owner wants to use the Jacuzzi, he may fill it with water from the pool remotely from anywhere using Foxtrot. Water from the pool passes through an exchanger before filling and the boiler heats the water to the required temperature. The entire process may be initiated with one single touch of a button and takes approximately 20 minutes before the Jacuzzi is filled with hot water and ready for use.

Pool technology and solar pool heating - Foxtrot monitors chemical values of the pool water and automatically dispenses chemicals based on predetermined settings to make sure that water in the pool is constantly clean and has the correct PH. At the same time, the system controls solar water heating system to make sure that the water maintains the required temperature during the respective day and during particular hours of the day.

Irrigation - garden next to the house is divided into 11 zones, each of which can be irrigated in a different way, depending on what kinds of plants grow in the given area. Foxtrot irrigates according to a pre-set schedule or according to data received from soil moisture sensors.

Garden pond filtration system - it is yet another device and technology controlled by Foxtrot. Therefore, it also takes place automatically and according to the pre-set requirements. The owner is not required to operate the system at all.

Integration of electronic security system - A certified DSC security system is connected to Foxtrot, and feeds data from motion sensors to the control system. This allows Foxtrot to turn on certain lights at night for example when the owner starts moving around the room. A feature greatly appreciated when you need to get up at night.

Weather station - when you connect a weather station to Foxtrot control system you enable the house to obtain important data on the current weather situation such as the wind speed and direction or temperature, and to use these data to control the heating system and blinds (for example closing the blinds during strong wind) or by pulling a cover over the swimming pool in rain.

Camera system (CCTV) - connecting a camera system to Foxtrot, gives the homeowner the option to record images from individual cameras directly to SD card stored in Foxtrot central unit. The recording occurs when certain conditions are met. For example, if there is a movement in the room while the house is monitored and guarded by the security system. At the same time Foxtrot sends the image from the disturbed object to the house tablet control screen, phone or computer, allowing the owner to see a live feed of what is actually happening in his house.

Control4 audio/video system - by connecting the A/V system to the Foxtrot system (in this case the extended American Control4 system), the homeowner gets an extra option to control the A / V system using Foxtrot's central control screen.

Home Cinema control - the user uses Foxtrot control system to launch a sequence of actions that puts the home theatre to life - by single touch of a button. The system will unroll the screen canvas and closes the blinds (if it is still daylight), will turn on the home Cinema and select the optimum illumination scene. Foxtrot executes the entire procedure in a similar way as when controlling the outdoor garden cinema.

Christmas lights - the owner really thought of everything, so he decided to have the entire Christmas lights system connected to Foxtrot as well. The system initiates automatically before Christmas and stops operating the lights when Christmas is over. This allows the owner to spend precious time before the Christmas by focusing on Christmas gift purchasing adventure instead of preparing and installing Christmas lights.

Frost protection for outdoor palm trees - the mood and setting of a southern Italian house is further enhanced by palm trees that grow around the house. Unfortunately, due to the geographical location of the house in southern Slovakia and due to the colder climate, when compared with countries situated more to the south, the design required an installation of underground heating cables. If the temperature in winter drops below a certain level, which could damage the palm trees, Foxtrot will turn on the heating cables and thus prevents damages to the palm trees.

Tecomat Foxtrot control system utilizes an integrated web server, which means that all technologies connected to the system can be controlled and monitored via a web page, and of course also remotely. Thanks to this platform, the homeowner has access to the house and all the installed technologies through any commonly used devices such as tablets, smartphones, laptops, televisions, etc., regardless of the operating systems these devices may be running and without the need to purchase special applications.

Home automation controlled by Foxtrot performs all tasks automatically and according to pre-set scenarios and programmes. The owner can easily change any programme or settings at any time.

Cyprus | Smart Home | Tecomat Foxtrot | Full Integration

Luxurious Vila

An exclusive villa set in a valley near Larnaca, Cyprus offers soothing and private mood together with beautiful views of the surrounding hills as well as security and comfort. It is a natural atmosphere combined with modern architecture and amenities. The owners of this luxurious residence had an exact idea and requirements on the quality and performance of the smart control system and expected an easy operation of their new home. While the owners were looking for the right supplier of Smart Home automation systems they realized that they will need something more special than the standard system offered in regular stores.

The control system is based on the central module Tecomat Foxtrot CP1014. The necessary expansion modules were divided into two cabinets and installed on the ground floor. Just to control a part of the lighting system our engineers used 70 outputs and only thanks to the range and flexibility of dimming and switching modules of our Foxtrot kit they were able to meet the requirements on all types of lights designed by Archtube lighting designer. The owners proposed a combination, including LED spots, LED strips, fluorescent lamps, basic outdoor lights and accent lights. In addition to the lighting, the owners decided to equip the automatic mode with the option to control blinds, curtains and drapes in the entire house. The house is also equipped with integrated floor heating, pool control and air extractors in bathrooms and toilets.

At the request of the owners, a company called Rhine Line worked closely with suppliers of home security systems. They created a tailor-made connections and programmed predefined settings for situations involving burglary or fire alarm. The villa has been in operation since the end of 2015 and to the full satisfaction of its users.

Germany | Lutron integration

Family house in Düsseldorf

Heating control | Tecomat Foxtrot

In 2014 our Tecomat Foxtrot control system was installed by ELPRAMO s.r.o. and KD Elektronika s.r.o. in a modern apartment in Berlin, where it is connected to Lutron light and blind control system. The primary purpose of Foxtrot is to control the heating system which includes heating radiators, floor heating and fan-coils. Daikin air conditioning units are also installed in the apartment.

Thanks to full connection to the Lutron lighting / shading control system, the user is able to control all these technologies uniformly by using Lutron control elements.

Austria | Tecomat Foxtrot | Smart Home

Family house - Berg

Domotron, s.r.o. has created its Domotron intelligent electrical installation system, which is another standard solution for mass deployment of home automation systems built on our Tecomat Foxtrot.

One Domotron system has been installed with the intention to control technologies in a low-energy new building in the Austrian city of Berg, where the system controls switching, dimming, LED and RGB lighting, floor heating connected to a heat pump, electric blinds, recuperation and garden irrigation systems. Also an independent security system is connected to the control system. The security system receives information needed to control the lighting, heating and shading. The system is controlled via wall bus controllers designed as Logus90, Domotron Tuner and via Domotron application.

SAE | Tecomat Foxtrot | Smart Home

Firex Showroom – Dubai

In Dubai, United Arab Emirates, our partner - Firex Technology - has opened a show-room where you may see all the great possibilities offered by automation systems focusing on the residential segment while utilizing our Tecomat control system.

The showroom displays control and integration of the following technologies: Blinds, curtains and lighting systems - switching on / off / dimming, control options, RGB control, various scenes. Energy consumption monitoring and graphs, temperature monitoring, multimedia system integration, water management and storage tanks, consumption monitoring and integration with camera system (IP cameras, NVR and DVR).

France | Smart Home | Tecomat Foxtrot

Family house in Ecomodula – Nord Pas de Calais

SUP-TECHNIK SPOL. s r.o. and Insight Home, a.s. worked together on an automation project designed to control a number of houses in France, of which we wish to mention this particular project as an example. The required intelligence is provided by Tecomat Foxtrot control system, which ensures comfortable control of lights, blinds, heating and other components and systems, as well as the control of a certified burglar alarm system, camera monitoring system equipped with a recording feature and multimedia server.

The user can remotely control all the installed technologies immediately after connection via a modern visualization interface using tablets and smartphones. The user may even set scenarios, temperature modes and other system parameters. The current method used to control and manage smart homes is based on the individual, and unique solution designed for each individual house or system. This standardized solution uses the same technologies as custom-built smart homes, but comes fully wired and fully programmed. This allows an ordinary electric company or electrician, who does not particularly specialize in smart homes, to install this complex control and full home automation system.

In addition, users also save a considerable amount of money that would be otherwise required for project preparation and programming.

Foxtrot system overseas the following: control of lights, electric blinds, floor heating, Wi-Fi and alarm systems (EZS) by using iPad and phones.

Hungary | Smart Home | Tecomat Foxtrot

Family house in the town of Kadafalva

In the Hungarian town of Kadafalva near Kecskemét, a young customer has decided, during the actual renovation of his house, to purchase a complete control system able to integrate all technologies including remote access. Because the owner travels often, he had specific requirements on automatic operation of all the installed technologies including remote access and monitoring functions.

The entire reconstruction of cable wiring system and the installation of the control system was performed by our Hungarian distributor, Szinusz Épületautomatika Kft.

Our Tecomat Foxtrot system controls and integrates the following technologies:

LED lighting - switching, dimming, light scenes, individual control and unification into individual groups.

Individual and group control of blinds, time-based blinds closing/tilting - based on the position of the Sun.

Individual temperature control in different zones/rooms, floor heating system

RGB lightning system - colour scene setting.

Paradox EVO security system and outputs from sensors were used for additional logic control of the house overseen by Foxtrot system. Touch tablets with controls screens are mounted on walls to allow for easy use and control.

CR | Developer's project | Tecomat Foxtrot | Smart Home

Sky Barandov – developer's project - Prague

One of the interesting projects of low-energy apartment buildings where Tecomat Foxtrot is widely used is the complex of Sky Barrandov designed by a world-renowned architect Eva Jiřičná, which is to be built during spring 2016 in the Barrandov facility in Prague. It consists of two separate apartment buildings and a service house certified as extremely economical buildings, or rather with the highest energy rating - class A.
The team of architects around Eva Jiřičná did not only achieve the highest energy class A rating through proper design, but also thanks to the use of a clever ventilation system. Ventilation system affect energy consumption in large buildings most. As a standard feature, all 108 residential units in the Sky Barrandov project are equipped with top recuperation units Paul, which ensure efficient air exchange in the apartment without the need to open any windows. Triple installation glass windows in combination with other materials and the layout of the building prevent heat losses usually occurring during ventilation process. To further improve the recuperation system new residents often by buy Haida's intelligent control system, which is a modular standardized SW solution based on our Tecomat Fox control system. This allows the residents not only to control the recuperation unit using smart TV, phone or tablet, but also other elements in the apartment, such as the lighting and light scenes, heating and floor heating, window blinds, ventilation and security systems. All apartments in the Sky Barrandov complex have already been preconditioned and prepared for the installation of the control system before passing the final building approval. In practice, this means that the HAIDY can start installing all the necessary equipment in the apartment without making any construction changes to the apartment, as soon as the new occupants decide what they want to control by their intelligent systems. In addition to the above, the Sky Barrandov Residence is also ready for the installation of a camera system and for connection to the central security panel.

Slovakia | Smart Home | Tecomat Foxtrot | Developer's project

Paseo – developer's t project - Košice

Our Foxtrot system is installed and used in a developer project called the Paseo in the town of Košice, Slovakia. It is a 7-storey house which offers 55 above-standard apartments. The building has been designed as a low-energy structure and uses photovoltaic panels, heat pumps, recuperation and intelligent systems. Domotron has decided to equip each apartment with Foxtrot system and expansion modules which control light switching and dimmable lights, floor heating, cooling, recuperation (waste heat recovery system), outdoor blinds, multiroom audio system and also energy consumption. The control is realized by means of bus CIB switches and may also be done by using a mobile app.

Austria | Smart Home | Tecomat Foxtrot

Alpenhau guest house - Pruggern

In 2017 Foxtrot system was deployed at the Alpenhau guest house in Pruggern, Austria as part of a solution implemented by Domotron company. The architect of the project has designed the intelligent control system down to the smallest details. It controls lighting, shading, heating, air conditioning, recuperation and security system. Cameras, motion sensors and smoke, flooding and wind sensors were also integrated into the system. Programmable and user-configurable bus switches, Domotron configuration interface and mobile applications are used to control the system. This allows the owner of the guest house to intuitively and very efficiently control all installed technologies.

And many other implemented projects

- Apartment - De Hofjes - the Netherlands - Comprehensive technology control and management
- Family house - Kazakhstan - Heating system control
- Ecomodula house complex - France - Comprehensive technology control and management
- Villa - Corfu - Comprehensive technology control and management
- Villa - Damascus - Syria - Comprehensive technology control and management
- Showroom - Sao Paolo - Brazil - Comprehensive technology control and management
- Villa - Brno - Czech Republic - Comprehensive technology control and management
- Family house - Warsaw - Poland - Comprehensive technology control and management
- Family house - Berg - Austria - Comprehensive technology control and management
- Villa - Munich - Germany - Heating system control and Lutron integration
- Villa - Berlin - Germany - Heating system control and Lutron integration
- Villa - Győr - Hungary - Comprehensive technology control and management
- Family house - Debrecen - Hungary - Comprehensive technology control and management
- Developer's project Klánovice - Prague - Czech Republic
- Developer's project Struhařov - Prague - Czech Republic
- Developer's project Tatras - Slovakia
- Developer's project Úhonice - Czech Republic
- Developer's project Tábor - Czech Republic
- Developer's project Na Americe - Czech Republic
- Developer's project Mníšek u Liberce - Czech Republic
- Developer's project Vexta - Prague - Czech Republic
- Developer's project HK Dřestav - the entire Czech Republic
- Developer's project Beranka - Prague - Czech Republic

CR | Tecomat Foxtrot

Emerson Reliability Tester

Emerson - a multinational company that operates one of its branches in the town of Kolín next to our production plant and uses our control systems for many of its technologies, and one of them is operational life testing. This is achieved by using reliability testers. A reliability tester puts load or stress on the tested device to determine the service life. It is also used to test stability of products made by Alco Controls spol. s r.o. Our PLC Tecomat Foxtrot (CP 1003) evaluates the measured data (pressure, electric resistance or time) according to preset parameters, and based on these parameters the system starts or ends the individual cycles of the test. The tester contains 8 independent test positions where you may independently test up to 48 different types of products (the product database constantly expands). The machine has been in operation since 2017.

SAE | Tecomat Foxtrot

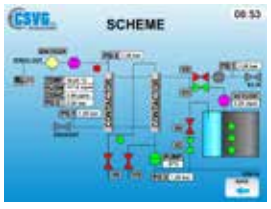
FM200 gas filler

Firex is a manufacturer of fire extinguishers and fire protection systems. To fill fire extinguishers with gas the manufacturer uses Foxtrot system which automates the nitrogen filling process done by FM200 machines. The system allows the user to switch between manual and automatic filling and set a number of other parameters. It also controls filling valves, monitors pressures and other parameters. All required parameters are logged.

South Korea | Tecomat Foxtrot

Machine for controlled dissolution of hydrogen in water designed for Samsung Mobile Displays

A company called CSVG has developed a machine for South Korean company Samsung Electronics – the Samsung Mobile Displays' Division, which handles dissolution of hydrogen in water. The water is then used to rinse OLED displays. Because chemicals cannot be used on the organic structures of OLED displays, H3O + is used instead to remove impurities from the surface of the display. This entire system is overseen by a Foxtrot central unit which is controlled using ID-28 touch screen. To expand inputs and outputs options OS-1401, IT-1604 and IB-1301 units were used. Safety sensors, pump controls and valve controllers are connected to these units. The entire software, including graphical user interface was created in Mosaic and Web Maker.



CR | Tecomat Foxtrot

Vacuum tester in a food production line - Fruta

In a production plant operated by a food company Fruta, a company called Jadrníčka performed several tasks on canned food production lines. These machines deal with inter-operational quality control of the finished product. These quality tests also include checking the air tightness of glass containers (jars) - done by a vacuum tester. There must be a perfect vacuum inside the jars. If the vacuum is not sealed well inside the jar, the air will eventually enter the glass through the leak and will spoil the food. The manufacturer has carried out several tests in the past, but in a way that did not guarantee the necessary reliability. Jadrníček company has innovated the inspection station on the production line by utilizing a completely new test principle - by scanning the profile of the lid using a laser distance meter. Tecomat Foxtrot scans this profile in a fast motion and compares it with the profile of a properly sealed glass. Incompatible glasses with a bad seal are marked for replacement.

Hungary | Tecomat Foxtrot

Ferrous scrap shredding process - MÜ-GO Ltd.

MÜ-GO Ltd. is one of the largest processors of metal waste in Hungary. The main activity of the company is the collection and storage and recycling of metal and iron waste. The company's main plant is located in Budapest on an area of 32 thousand m^2 and processes 100 thousand tons of metal waste per year.
The used hydraulic scrap metal crusher processes certain size of sorted waste in the shredding process. HENSCHEL hydraulic crusher with a pressure of 850 tons is used to do so. Because there were daily breakdowns the crusher control system required a modernization. Frequent outages often required very complex servicing interventions resulting in a significantly reduced productivity.

The control system was modernized by a company called Szinusz Épületautomatika Kft., our Hungarian distributor. The original sensors and actuators have been preserved, only the central unit was replaced. The new crushing process control system is equipped with our Foxtrot CP-1004 central unit and expansion modules on fast bus TCL2.
The original mechanical control interface was replaced. It is now possible to monitor individual work operations and the machine status using any device equipped with a web browser, in this case especially on the operator's tablet.

Slovakia | Tecomat Foxtrot

Automated bar and pole warehouse - Železárny Podbrezová (Ironworks Podbrezová)

Shelf stackers are the basic and necessary equipment of any automated warehouse which are utilized in various sectors. In Železárny Podbrezová - (Ironworks), KPK company, from the town of Martin, has built a warehouse that utilizes cassettes to store metal bars and other metal parts and material. Cassettes are equipped with a side grip and all stored items are properly recorded.

CR | Tecomat Foxtrot

Cable car control - installed in ski resort Pec pod Sněžkou, Krkonoše Mountains

A company called Easy Control Morava deals with reconstructions of cable car control systems and uses Tecomat Foxtrot to satisfy control requirements of its various projects. One of its projects includes a cable car system in Pec pod Sněžkou in the Krkonoše mountains in the ski resort Zahrádky (Gardens) where a cable car line manufactured by Leitner was installed. This cable car was previously used in the Alps in Obertauern. It is a four-seater cable car with cabins which hang on a fast moving rope. When passengers need to get in or out, the cabin is removed from the fast rope and hung on a slow rope to allow comfortable boarding and exit.

Tecomat Foxtrot system controls the drives here and all control and operating elements in the upper and lower station (2 km apart) via CIB bus as well as the control elements of each support poles, which are also connected to the control system. This unique technical approach has increased the overall supervision of each the technical and safety aspects and extended operability and service life. IP camera supervising the upper unattended station is also connected to the system. In addition to other information also data about the wind speed are fed to the system - via CIB bus.

Slovakia | Tecomat Foxtrot

Control system for a carousel lathe Dorries SD 160

The investor's request was to completely reconstruct the electrical part of a carousel lathe manufactured in 1968, which was still in its original but good condition. The existing relay logic system was replaced by PLC Tecomat Foxtrot (1x CP-1014, 4x IB-1301,4x OS-1401), thanks to which new automatic functions , which would have been otherwise impossible, were added to the system.

The control and visualization requirements are achieved by SCADA Reliance software via OPC server. This required replacement of the original control panel which was fitted with old mechanical buttons. The OPC server with Reliance software is mounted on a movable arm on the machine and communicates with Foxtrot PLC mounted in the switchboard. The touch screen is used to fully control the entire machine, to display fault and alarm messages and to set and configure individual parameters. The installation was performed as a turnkey project by company called DEÁK elektro, s.r.o. This included the actual implementation of the project, manufacture and installation of the switchboard, supply of components, and wiring and programming of PLC Foxtrot and SCADA Reliance.

CR | Tecomat Foxtrot

Machine monitoring - Machine shop in Oslavany

In 2016 - 2017, Axomer s.r.o. handled a supervision project for a manufacturing company called Strojírny Oslavany spol. s r.o, whose task was to monitor production machines. The goal of the monitoring was to maximize the utilization of technological and production equipment, to handle operational signalling, outages and failures and also the actual connection to the installed ERP system Helios Orange. This approach represents one of the pillars of the upcoming Industry 4.0 initiative. Because the system had to deal with a wide range of installed equipment and components supplied by different manufacturers, each with different technical readiness and outputs designed for various industrial buses or standards, the designer selected Tecomat Foxtrot system as the universal and variable "status collection system" able to collect and receive information from individual production equipment - for example binary statuses and network protocols - such as Modbus TCP. Machine information is displayed online on the PLC website and at the same time, data are simultaneously sent and stored in the database on a server where they are evaluated and displayed in the form of graphs. The system allows the user to filter information and data according to own needs.

At present, there are 43 machines in 5 production halls connected via 4 PLC units Tecomat Foxtrot. This information may be accessed by the relevant directors and shift masters working in the relevant halls and each of them may use and adjust the information for their own needs. The system is also connected to an ERP system, where the operating hours of each machine are registered and where maintenance plans are processed as well. If a fault occurs, a maintenance service sheet is automatically loaded.

China | Tecomat Foxtrot

Brano machines for the automotive industry - VW and Škoda

The Brano Group is a significant supplier for the global automotive industry and operates several manufacturing plants in many countries. The company's product portfolio includes door systems, car parts (e. g, shock absorbers, horns and heaters), pedal assemblies, etc. These products are then supplied to car manufacturers such as Ford, Volkswagen, Škoda and others. As any other manufacturer, also this customer relies on high quality and wide technical options offered by our Tecomat Foxtrot systems, which the customer has already used to control several hundred single-purpose machines which are producing various company products. One of the places where Foxtrot systems have already been deployed and installed in Brano machines is the manufacturing plant in Shanghai, China. Here, several dozen machines producing door locks for Volkswagen and Škoda vehicles sold on the Chinese market have already been in operation. Long-term cooperation of Brano and the preferential use of Tecomat control systems confirm the superb quality and durability of our systems as they are in high demand in the automotive industry as well in other industries where any outage or defect in production has a significant negative financial and other impact.

CR | Tecomat TC700

Mining machine Stařič - Chlebovice

It is a two-drum machine equipped with a function that allows the operator to separate/disconnect the drums. One drum winds the rope from the top side and the other drum winds the rope from the bottom. This allows one container / bucket to move in one direction and the other container in the opposite direction. When the drums are disconnected it is possible to change the distance between the containers, or in other words, the user may define between what floors, the containers will travel. Tecomat TC700 control system controls the entire mining machine. It also controls the brake system, the service and the emergency brake. Further, the independent control system oversees the operational process and makes sure that applicable mining and machine operational regulations are observed. This includes monitoring of temperature parameters, pressure states on the necessary operational media and speed and safety requirements. The power output of the mining / hoisting motor is 3,500 kW. The motor's current is 4,200 A at a voltage of 900 V. There is a 12-pulse thyristor drive connected in series. The container is able to lift approximately 10 t of load and can reach a depth of 900 m. Reverse movement is done by means of the anchoring circuit of the mining/hoisting motor.

CR | Tecomat Foxtrot

Double blade saw KP 10

An automatic double-disc saw used to trim inlets, exhausts and technological risers on aluminium-cast kitchen containers. The machine uses SK saw blades and cuts inlets up to 50 mm in diameter. It is also equipped with micro-cooling. The control system consists of: CP1004 + MR0104, BP52-01M + DAC2-04M, I B 1 3 0 1 - 3 x, O S 1 4 0 1 - 2 x, Tecon touch screen, pneumatic handling. Feed and speed control of saw blades - 4 x analogue outputs. Implemented by: KASKO Prague

Slovakia | Tecomat TC700

Automatic welding machine for rubber profiles

In 2014 a company called Slovteco has installed a control system for automatic rubber profile welding machine. This machine is designed for thermal curing / welding of various rubber profiles and shapes. The entire set of machines consists of six independently working machines. The welding machine is equipped with four welding jaws, which are heated to the desired temperature. Individual jaws are heated by heating coils until the desired temperature is reached. The jaws move in vertical direction and grab the welded profile. By pressing the profiles together, the welding process is executed and completed. When the preset welding time runs out, the jaws open and the system flashes a green light, which indicates the end of the welding cycle.

The control system consists of a central unit CP-7004 and 15" frame fully fitted with input and output modules, and it handles the heating process and the temperature control of individual jaws. The jaw movement is achieved by means of pneumatic cylinders. Positions of the pneumatic cylinders are monitored and readjusted. If the required position is not reached, the system reports an error by turning on a red warning light, and the machine returns back to its basic position - the display shows error code ID-08.

CR | Tecomat Foxtrot

Wire rewinding machine - Black & Decker

Black & Decker is a multinational manufacturer of electrical equipment, in particular tools and gardening equipment. In 2018, a company called Miras Elektro delivered a new wire-winding machine. The machine is equipped with two stepper motors, one handles proper rows positioning during the winding process and the other motor works as a winder. A central Tecomat Foxtrot module CP – 1003, which contains four fast transistor outputs for the stepper motor was used to control the machine. Two drivers with stepper motors are connected to these outputs. Motors are synchronized to make sure that the new spool is wound correctly and that the wires do not cross. The machine also monitors wire jams and coil jams during the winding process. System visualization is running on an operator panel ID-28 installed directly in the switchboard. The device is connected to the Internet through a secure connection via Teco-Route, which allows the operator to service the machine remotely through an integrated web interface.

CR | Tecomat Foxtrot

Automatic grinder for inside grinding operations

An automatic inner grinder BD 80 NC is designed for cylindrical and conical hole grinding operations, which are required in large series production, while offering a wide working range. If necessary, the machine may also be used to work on single work pieces of course. Tecomat Foxtrot control system was installed to control this machine. Control system consists of the following: CP1005 + FX7812, IB1301-3x, OS1401- 2x, GT1753 Feed control: Z-axis - longitudinal movement, X-axis - transverse movement, handwheel for both axes, Analogue outputs: grinding disk speed and headstock movement.

CR | Tecomat TC650

Honing machine HK 6 - ZKL Prague

KASKO Praha deals with development and production of single-purpose machines and equipment that built on a high degree of automation. KASKO Praha is a long-term customer of Teco and has already installed several generations of our control systems in many machines used in various production processes. One of the applications, where our system is used, is HK 6 honing machine also used for polishing spherical surfaces of inner bearing rings in large series. The machine works in an automatic cycle. The operator simply loads the rings in the input tray. The finished product that comes from the machine is either stored on a pallet or slides onto a magazine bar. The machine is controlled by programmable TECOMAT TC650 controller consisting of TC652 + TC633 + TC625 units. Panel computer Tempo 02 was used as the operator interface. The machine uses a different programme for each ring to control the actual honing process. That means that the computer controls the speed of all headstocks, honing headstock pressures, honing times and honing feeds. All values and parameters may be adjusted according to customer needs. The programmable controller is equipped with analogue inputs, which are used to control the preset values based on the feedback provided by inductive sensors which monitor honing forces. It system also has three analogue outputs which are used to control the speed (RPM) by means of frequency converters. All necessary information related to analogue values of inputs and outputs are displayed on the touch screen. The operator may use several combinations of screens to control the entire machine manually or automatically.

CR | Tecomat Foxtrot

Door key milling machine FZ-18

This machine was made by KASKO Prague for a manufacturing company called TOKOZ. It is a fully automatic machine equipped with an input tray where the keys are placed. The machine uses a programme which generates a random code and this code is used to manufacture different shapes of keys. It also inscribes keys and prints a plastic card for each set of keys. It is also able to produce a set of general master keys according to a specific electronic information. The machine output is 420 keys per hour. Control system: Foxtrot CP1005, MR0161, SX1165, 4x IB1301, 3x OS1401, Easy View touch screen. Disk RPM control : 2 analogue outputs - 3 servo drive, CAN, RS232 - used to enter key identification information for embossing, Ethernet connection used for PLC programming, touch screen, local network - master key entry, printer - prints combinations of different depths of key notches, as well as the type markings and the specification of the security level on plastic security cards.

Ukraine | Tecomat Foxtrot

Casting press - Ternopol

During 2014, our system Tecomat Foxtrot was deployed in the town of Ternopil in Ukraine. It was installed in a production plant that manufactures street lamps. It is one of the control systems of the casting press used for basic production of parts for street lamps. The entire pressing system went through modernization and reconstruction, including the system that controls and monitors the casting process – the process which produces basic parts for lamps. The equipment to produce the body (corpus) by casting was manufactured in Italy by a company called IDRA.

The production of the basic parts utilizes a special alloy casting process, which is done under pressure.

The entire casting production process consists of several consecutive steps. First, the alloy needed for the bodies is melted. Then the required amount of the molten alloy is measured for the given type of lamp and it is pressed into the mould. All of these operations, including cooling of the cast-product and transfer of the product for further processing, are done automatically. An integral part of the lamp production is monitoring of emergency statuses and their evaluation and elimination. All information is displayed on a monitor located at the press line dispatcher station. The system uses Tecomat Foxtrot CP 1003 PLC with visualization unit. The actual visualization is done via a web server and directly in the central unit.

CR | Tecomat Foxtrot

Test equipment for cyclic current loads

Test equipment for cyclic current loads testing is installed in a company called Kabelovna Kabex a.s. and it is used to test cable accessories according to CSN EN 50393 standard. This is done by cyclic heating of the cable core - by means of electrical current flow. The current setting allows the operator to load the circuit of the tested cable accessories with a current of up to 104 A. In the future it is planned to expand this option to use current of up to about 1, 440 A. All important data, such as temperatures, current, number of completed cycles and the current cycle timestamp are logged during the test. Data are recorded each 60-second period to provide complete and comprehensive test data. In the event of an error, fault or a specifically defined event, the fault and the event are recorded asynchronously into the so-called fault and event file, together with the relevant time stamp, which allows the user to perform accurate evaluation of the cause of the fault later.

The entire test equipment may be controlled directly through Foxtrot website via a small control panel. A website may also used to set all parameters necessary for the course of the test or for the control of the test room. The test may be started and stopped, including acknowledgment of fault, simply by using a small control panel, which is located directly on the test equipment.

And many other implemented projects

Milling machines, grinders, presses, bevelling machines, saws, shears, assembly machines for automotive industry, …

Georgia | Oil&Gas | Tecomat TC700 | Scada Reliance

Black Sea Terminal Poti

Tecomat TC700 control system was deployed to control the oil terminal in the Black Sea, in Georgia. The terminal is an important transport node where Azerbaijani oil, diesel and heavy fuel oil from the Caspian Sea is shipped and traded. Technologically, it has been designed to pump oil derivatives transported between Azerbaijan and Georgia by rail in large-capacity reservoirs (tanks) and then it is transferred to sea tankers. The terminal is owned by a company called SOCAR - an Azerbaijan State Oil Company, which is one of the largest companies in the world. The control system was deployed together by our staff and by our local integrator OOO Kontur Avtomatika.

The construction of an oil terminal in Kuleva near the port of Poti on the shores of the Black Sea was a significant milestone and boost for the Georgian economy, as evidenced by the grand opening which was performed directly by Georgian Prime Minister Artur Rasizad. The area of the terminal is approximately 4 km^2 and the capacity of tanks is 320,000 tons and its it planned to be further expanded to 380,000 tons. The transfer capacity of the terminal is 10 million tons per year: 3 million tons of oil, 3 million tons of diesel fuel and 4 million tons of heavy fuel oil. At present, the port is able to fill tankers with approximately 250,000 tons per month. So far, the monthly record is 353,787 tons, which was reached in May 2011. The terminal also boasts another record, which was reached in December 2010, when a 100,000-ton tanker was filled in just 18 hours and 45 minutes instead of the usual 34 hours.

In 2006, Teco supplied a complete control system for this terminal. The control system was installed in a total of 17 nodes interconnected together by an optical network. All nodes are interconnected in the central control room and use Reliance SCADA system. The entire terminal has gradually expanded between 2006 - 2019, and Teco has continuously supplied other modules for Tecomat TC700 system, which constantly expand the control options of this terminal.

To control the entire terminal a two-screen workstation was installed running SCADA Reliance

Special oil feeders must balance the filling level of the tanker as it can drop down up to 18m. The capacity of the anchoring area where the fuelling takes place is 8,000 - 12,000 m^2 / hour.

Dispatch room, two workstations equipped with double screens, Switchboard with glass window and TC 700 control unit supplied by Teco.

Empty tanker anchored and attached

Oil transfer highway running between tanks

Typical set of 2 switchboards for 4 tanks with the relevant group of automatically controlled valves.

CR | Scada Reliance | Tecomat Foxtrot | Oil&Gas

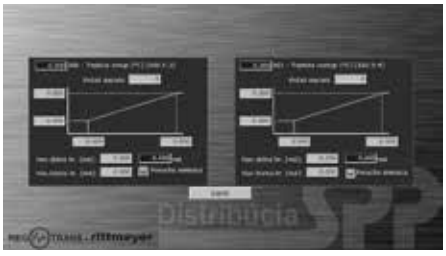
Brandov gas transfer station - Gas converter data monitoring and archiving

Tecomat Foxtrot is used here as a datalogger in the process of visualization and data processing at a transfer station called Gazela gas pipeline in Brandov.
Due to the disputes between Ukraine and Russia in 2009 a gas crisis occurred as gas supplies were suspended. It was later decided to build the Gazela gas pipeline to eliminate dependency of the Czech Republic's on supplies coming from Ukraine. The Gazela gas pipeline is near the village of Brandov and connects to the German Opal gas pipeline. The entire transfer station, as well as the data collection and archiving system installed in Brandov transfer station is operated by NET4GAS, s.r.o., which handles more than 3,600 km of gas pipelines in the Czech Republic. The required solution was supplied by a company called GEOVAP, spol. s r.o. SCADA Reliance system was used for visualization. It communicates with our Tecomat Foxtrot CP-1000 PLC via two PC touch panels and is equipped with an SD card slot where data are stored for archiving purposes and kept for more than one year. At the same time, the data are stored in the PLC remnant memory for the last 14 days, to make sure that no data are lost when the SD card is removed. Data from the PLC are read locally and stored via the integrated industrial PC touch panel. This computer is running Reliance 4 SCADA / HMI system, which is used to archive data and store them in the local database and to handle data presentations in the form of overview charts, trends and visualization of individual cabinets. Thanks to Reliance 4 Web Client module data may also be accessed remotely from anywhere via NET4GAS measuring network.
The PLC and the industrial touch panel are located in a separate switchboard, which is powered by a protected circuit from the Brandov station. The switchboard is also equipped with a separate backup power supply unit and with overvoltage protection.
The solution places maximum emphasis on security, reliability and redundancy, so the loss of measured data is completely eliminated. For this purpose, the entire system loss has been designed using only equipment intended for industrial use to make sure that the individual parts of the system are as independent of each other as possible and may be interchanged easily.
Based on the customer's request, a user programme for peripheral operation and data management was designed. The Reliance system enables NET4GAS employees in Prague to monitor gas consumption remotely using Reliance Web Client modules.

Slovakia | Oil&Gas | Tecomat Foxtrot

Management of a nationwide network of gas transfer stations - State Gas Company

During 2017-18, our Slovakian partner Regotrans has installed Tecomat Foxtrot control system in a network containing approximately 70 transfer stations located across the entire territory of Slovakia. This system was installed for the Slovak state gas company which is handles nationwide distribution of gas.
Each transfer station uses a set of central modules CP-1003 equipped with communication interface MR-0105 (2xRS232, 1xRS485), module IT-1604 and with an application profile which communicates via IEC 870-5-104 slave, through which all Foxtrot stations are connected to the central gas distribution control room in Bratislava. The system monitors pressures, temperatures, quick-release valves, reads data from converters and odorizes, and performs calculations using PLC Foxtrot in line with the AGA NX 19 standard.



CR | Oil& Gas | Tecomat TC700 | Scada Reliance

Management of the energy system in PARAMO, a.s. in Pardubice

Paramo processes and refines crude oil and turns crude oil into various products such as asphalt or lubricating and processing oils, including other types of auxiliary and related products. In 2005, a new system which collects energy consumption data and evaluates the economic impact was installed in Paramo. The existing measuring stations were added with new devices to monitor energy consumption. Data provided by these stations are automatically read at regular intervals and stored in the newly installed central server. The installation was done by PROTECO company, which is also able to expand and services the entire system.

Russia | Tecomat NS950

Galvanizing line in Rosvertol

In 2004, a company called LECOM LEDEČ, a. s. supplied and delivered a complete set of two separate galvanizing lines which are used to anodize parts for the surface treatment division in a leading Russian aircraft manufacturer called ROSVERTOL located in the town of Rostov on the Don River. The control system of each line is equipped with a PC, programmable controller TECOMAT NS 950 unit and ID-08 control terminals. This system allows the user to control the entire range of technological equipment and processes starting with production line preparation, which includes heating of baths to the required temperature, control of cooling units including regulation of the temperature during the process, as well as switch control of galvanic rectifiers (voltage and current control throughout the anodizing process), automatic bath refill and monitoring of the conductivity of cooling solutions, and finally the actual control of transport manipulators which are used to move the goods through the line while maintaining the required parameters (operational hours, gutters, dips, etc.)

SAE | Tecomat Foxtrot

Temperature monitoring in Al Dar Sweets - Abu Dhabi

In 2016, a company called Neptune UAE deployed our Tecomat Foxtrot system to monitor temperature in three refrigerated boxes and freezer cabinets at Al Dar Sweets based in Abu Dhabi, in the United Arab Emirates.

Al Dar Sweets is the manufacturer of the highest quality chocolate confectioneries where the raw materials used for the production must be stored at the required temperatures. If the temperature fluctuates outside the required limits, the system notifies employees by sounding the alarm. This can occur, for example, when the cooling or freezing box is not closed, the power supply is turned off, etc. Temperatures are continuously recorded in charts and are then available for customer audits or for inspections performed by government agencies.

CR | Industry 4.0 | Tecomat Foxtrot

Control of cosmetics production process including drugstore and other chemical and pharmacy products - Cormen

Cormen s.r.o. manufactures cosmetics and various products and chemicals sold in drugstores. Our Foxtrot system, which controls the production according to Industry 4.0 standard, was installed here between 2017 and 2019 by a company called ELEBRO CZ s.r.o.

Raw materials needed for the production are supplied in tanks and then they are pumped, weighed and stored in large tanks. The storage must be done under the required conditions. Brine is produced in other tanks. The amount is measured with ultrasonic meters. The production process also requires water, which Foxtrot gets from artesian wells. Foxtrot manages the raw materials pumping process - from tanks into other tanks, water transfer and demineralization, as well as the production of brine. Throughout the production Foxtrot is measuring the dosages and pumps the raw material into boiling and mixing tanks (6 tanks each capable of storing 6 tons). Foxtrot measures and disposes ingredients according preset recipes. The process also involves abrasive storage units which are used to dispose measured doses of the abrasive material into the production tanks. Boilers are equipped with vacuum pumps and ventilation system, which are also controlled by Foxtrot.

Information needed for the recipes and information about the composition and ingredients is provided by Microsoft Dynamics AX information system. Composition of the recipe is broken down to individual ingredients and Foxtrot uses this information to measure and dispose the raw materials into the production tanks. Foxtrot measures the size of the production batch and raw materials. To do so, Foxtrot uses strain gauges to measure the size of the raw materials and the production dose.

After the batch is completed in each tanker, the product is pumped and transferred to the packaging line, again controlled by Foxtrot, which acts here as a complex control system and directly controls pumps equipped with Schneider AVT 320 frequency converters. In addition to the strain gauges, Foxtrot also handles Festo system which operates the distribution valves.

Belarus | Tecomat TC700 | Scada Reliance

Control of silicon plate etching process performed at the INTEGRAL production plant in the town of Minsk

In 2015, the Integral company has installed two chemical boxes to etch silicon wafers (plates). This process is overseen by our Tecomat TC700 control system. The actual implementation was performed by our customer a company called CSVG, a.s. together with GEOVAP, spol. s r.o., which also participated in the project and supplied the necessary engineering work including the processing software and visualization system SCADA system Reliance.

Tecomat TC700 controls the entire process. First, it removes the photosensitive varnish from the silicon wafers. This layer was placed on the surface through a method called photolithography. This is done to remove any residual dust particles smaller than one micrometer from the surface of the wafer. In this process the control system monitors and replenishes lost hydrogen peroxide in the etching solution and regulates the processing temperature and the level of the solution. In the next step, the control system evaluates the concentration of the solution and, upon request, maintains the concentration, temperature and the solution level at constant values. The physical handling is done by a manipulator, which is also controlled by our TC700 system equipped with a two-axis GT-7752 module.

Ukraine | Tecomat Foxtrot | Scada Reliance

Controlling pump-transfer process at fuel terminals

Between 2014 and 2017, a company called ČP Profikom from Lviv, Ukraine, deployed our Tecomat Foxtrot control system at five GalNeftGaZ fuel pumping terminals, which supply fuel to OKKO gas stations. These terminals cover the entire territory of western Ukraine and supply fuel to OKKO gas filling stations. Terminals are in the cities of Lviv, Uzhhorod, Vinnitsa, Halič and Černěchov and ČP Profikom used our Foxtrot control system to modernize the existing control system overseeing fuel filling transfer from tanks to tanks.
The entire pump-transfer process at these terminals is handled by a central module CP-1003 and by SCADA Reliance 4 software which is used for visualization purposes.

The operator who handles each modernized terminal fills the tanks according to specific parameters, which correspond with the recipe used for the relevant petrol or diesel fuel. Foxtrot system controls and monitors pumps, opens and closes the tank filling valves, makes sure that the tanks are electrically grounded and checks the correct voltage of phases throughout the entire technological process. At the same time, the system uses information provided by measuring gauges supplied by Micro Motion and Emerson to monitor the correct volumes. All data are displayed on the operator's scree, on information boards and at the same time are also transferred to the superior MSSQL server for further use.

CR | Water Management | Tecomat Foxtrot

Water treatment technology - Rajhradice

Tecomat Foxtrot system was deployed in 2011 to control a water treatment plant in Rajhradice. The application controls the operation of the inlet pumps, chemicals dosing devices, automatic cleaning of the filter tank – based on several criteria, the operation of the outlet pump station (pressures, storage tank levels, bypasses, etc.).
The internal web of Foxtrot server handles remote communication with treatment plant operators, who no longer need to be present at regular intervals at the given station, and also communication with the treatment plant owner (daily and monthly pumping logs are emailed by Foxtrot), communication with the customer (flow information and pumping logs). The system also allows the operator to change the treatment plant control parameters remotely. All PLC activity is logged and stored remotely in the supplier's e-mail for later analysis of the system behaviour and for troubleshooting.

The control system consists of a central unit Foxtrot CP-1005 and the necessary I / O units, which are used to measure different values (tank levels, pressures in pump circuits, etc.) and to control dampers in tanks, bypasses and automatic filter cleaning systems, etc. An internal web server is used to meet visualization needs of the control systems (3 public pages are reserved for the customer's needs + 6 pages for the operator where the operator performs configurations and controls the access at three different levels which are protected by a password).

Cyprus | Water Management | Scada Reliance

Water reservoirs in Nicosia and Larnaca

In 2011, our customer received a fully operating a system consisting of 67 monitoring and control stations which manage the water distribution system in the capital town of Nicosia, Cyprus (Water board of Nicosia) and Larnaca - the third largest city on the island (Larnaca Water Board). Each city has its own central server which communicates wirelessly with all stations that belong to its administration branch. These are interconnected via GSM network by means of GPRS technology. The basis of user application builds on the central server, which runs SCADA Reliance 4. Although it is possible to see each station, the status of the equipment in the station and all current values in regular visualization windows, the real advantage of this application is the ability to generate 105 analytical reports by utilizing dynamic queries sent to the SQL database, where also data from all stations are stored. Tables and graphs offer clear overviews and are the most important method of interaction. The Water Board does not operate a typical dispatch centre with a dispatcher, but focuses on short-term and long-term trends in terms of inflows and outflows coming from reservoirs and stations across the water supply system. Should there be an important or an extraordinary event, employees are notified via email or by SMS. Emails are sent both by the Reliance dispatch and by Foxtrots systems installed in the field.
The system also manages a large number of alarms. These are grouped into several groups to maintain clarity and transparency. User rules are defined for each group, and enable the programmer to set who will receive the relevant information and how the information will be passed over, and how these events shall be handled. The application offers prepared scripts capable of automatically generating 105 reports in the form of dynamic SQL queries. These include daily, monthly and annual reports, balance sheet reports for the given accounting period, and summaries of alarms. By analyzing the sums of inflows and outflows, including the actual night flow trends, it is possible to learn whether there are any leaks in the water supply system.

Telemetric station
The station consists of a basic Foxtrot module equipped with several expansion modules. These modules measure the basic water quantities such as flow and pressure before and after the relevant control valve. The station itself is placed in a switchboard, which is installed above the ground near the shafts. There are 35 stations in Nicosia and 32 stations in Larnaca.

And many other implemented projects

- Steam turbine control - Martinská teplárenská - Slovakia
- Heating plant management and control - Synthesia - Czech Republic
- Paramo - a number of technological processes - the Czech Republic
- Control systems for hydroelectric power plants - Kaplan turbine - Czech Republic
- Snow cannon control - Ukraine
- Tire retreading line control - Ukraine
- Water pumping technology control system - Kofola - Czech Republic
- Production line and boiler room management and control - KM Beta - Czech Republic
- Management of remediation and reconstruction technologies used for animal waste processing - Czech Republic
- Control of galvanic coating lines designed for starters used in Škoda Fabia cars - Czech Republic
- Air tunnel technology control in the FIRES certification testing laboratory - Slovakia
- Management and control of glass stone production - Preciosa - Czech Republic
- Control, monitoring and evaluation of drinking water supply - Drogobich, Ukraine
- Control of wastewater treatment plant technology - Doubravice nad Svitavou - Czech Republic
- Control of a wastewater treatment plant: several dozen cities in the Czech Republic
- Water supply control - Larestan - Iran
- Control of the etching process for silicon wafers - INTEGRAL - Belarus
- Apple waste drying process control - Ukraine
- Control of switchboard powder coating plant used in telephone switchboard stations - Czech Republic
- Galvanic plant control - surface treatment - Czech Republic
- Polymerization reactor control - SYNPO - Czech Republic
- Control of vulcanization / curing presses - MITAS a.s. - Czech Republic
- Cord cutting line control - MITAS a.s. - CR
- ATMOS compressors - control system - MELZ - Russia

Czech republic | Charging stations | Tecomat Foxtrot

Control of a large-scale electric vehicle charging infrastructure - Moneta

A large number of charging points usually in large companies, requires technology that allows the user to safely charge many cars at the same time. It also needs a technology that actively limits and controls the preset charging priorities separately for each car. This technology shall be able to simultaneously control the overall amount of energy consumed by car charging based on the current consumption of the entire building or complex and also according to the maximum available supply capacity, or based on other specific criteria. Such complete and flexible system can be built on a uniform basis offered by our Foxtrot system. Thanks to the system's modularity, flexibility in terms of interconnection options and variability of application programmes, the customer may meet all his requirements by installing a single system.

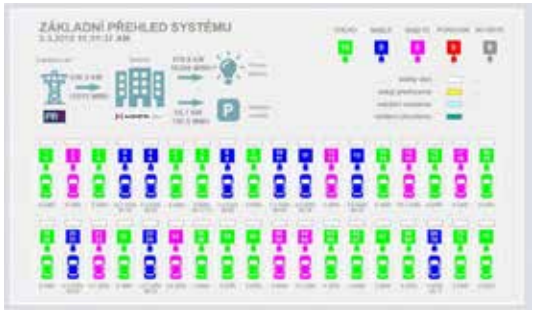
During 2018, a company called PREměření supplied a robust charging infrastructure based on Tecomat Foxtrot system for the newly reconstructed Moneta Bank's headquarters in Prague. A single basic Foxtrot module serves all 36 underground parking spaces. Each is equipped with a charge cable and with RFID reader. Foxtrot is connected online and directly reads the immediate consumption of the entire building. The immediate consumption is read right behind the distribution transformer so the system knows at any time how much energy is available for charging before the limit is reached . The available energy is distributes accordingly and based on the current needs of electric cars that are being charged or based on priorities of individual users.

The installed system utilizes a control structure at two levels. The basic level - level one is handled by Tecomat Foxtrot, for example by a standard PLC, which guarantees maximum charging capacity at any time and works independently of the superior level, while making sure that the relevant limits are not exceeded.

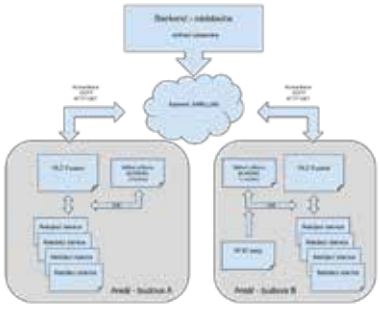
Each wallbox has its own interface shown in the application programme and its own control loop which works in parallel with all the other stations. A wallbox also has its own website which is accessible through the integrated website inside the central PLC Foxtrot. The application uses its own small interactive configuration and overview menu - available and accessible after authorization from any device running a regular browser, for example a mobile phone used by a service worker or garage manager. This approach allows the operator to plan servicing intervention remotely and easily for each individual wallbox or in complex batches for the entire building. Tecomat Foxtrot sends all data/ changes to the server. A web application at the second control level oversees these data and forms a basic user interface utilized by the entire charging infrastructure.

The entire charging infrastructure may be gradually expanded and interconnected with other local infrastructures, which use and build on Foxtrot system - which may be in another building or even in another city. This creates a network of charging stations that are automatically regulated and controlled. This approach allows the operator to avoid power outages or even penalties issued the power distributor while making sure that the customer benefits from automatic energy cost savings, and has a complex overview of all charging stations while being able to control, manage and verify the relevant charging accesses.

Each parking space in the Moneta underground car park is equipped with a charger. The status of the charger is indicated by coloured LED indicator. All chargers are connected by a two-wire CIB bus and Foxtrot controls them online while using a cycle time of up to 150 ms. Thirty six charging stations available now are to be expanded in the near future and shall reach more than 100 stations.



The superior level of the charging infrastructure equipped with Foxtrot is a web application with a user interface, which provides an overall overview of the current charging state, provides historical data and statistics on the use of individual charging stations and it also manages individual users. The system allows the operator to change the limits as needed and based on the fact how the agreed reserved power input in the building changes and progresses.



Block diagram of the charging infrastructure in two facilities, each powered by one supply feed and connected to a single electricity meter, which may be restricted by the maximum allowed current or by the maximum reserved power expressed as the so-called quarter-hour maximum.

Parameters of each wallbox, which is part of the connected system, may be adjusted online.

Japan | Scada Reliance | Tecomat TC600

Controlling a small hydroelectric power plant

In 2004, a small hydroelectric power plant was put into operation in the central part of Japan on the island of Honshu and near the national mountain of Japan, Fujiyyama. The complete technology was delivered from Czech Republic and the delivery included a Francis water turbine, an asynchronous generator, and an inlet flow device plus a complete electrical system equipped with the Tecomat control system. The supplier of the technology was ČKD Turbo Technics – a company belonging to MAVEL. Most of the equipment was designed and manufactured in the Czech Republic.

The basis of the small hydroelectric power plant is a mechanical set composed of a horizontal spiral Francis turbine directly connected by a flexible coupling to the asynchronous generator. Another section of the power plant equipment includes a hydraulic system which controls the turbine and shutters using commands coming from the control unit, the inlet flow device, that is the sluice, sieves, a telescopic sieve cleaning unit and electrical components consisting of a control and power supply part. The control part handles the operating and fault automation system of the mechanical set and it is equipped with TECOMAT TC600 control system and with inputs and outputs which are connected to all relevant sensors, drives and control and operating elements.

SAE | Tecomat Foxtrot | Scada Reliance

Monitoring energy consumption at the JABEL AL-DHANNAH resort in Abu Dhabi

At the beginning of 2017, Orient Protection Systems (OPS) installed our Tecomat Foxtrot control system to monitor energy consumption at the Jabel Al-Dhannah resort in Abu Dhabi.

- Monitoring of all distribution cabinets across the resort
- Real-time monitoring of all electrical network parameters
- Parameter logging needed for historical data analysis
- Data are displayed in several ways: numerically, as a response to a specific time interval entered by the user, historical reports, in the form of bar diagrams offering daily, weekly, monthly and annual display options
- The application generates and sounds the alarm in case of overvoltage, under-voltage or unusual monthly consumption
- The system also monitors water consumption and pressure

CR | Tecomat Foxtrot

Remote control of wind turbines - wind parks Liberec and Trojmezí

In 2014, a company called KYBERTEC s.r.o. has installed our Tecomat Foxtrot control system to handle remote shutdowns of wind power plants in wind parks called Trojmezí and Liberec (Lysý vrch mountain). The system was installed for companies called Farma Trojmezí and Konotech. Individual power plants are equipped with separate Tecomat Foxtrot PLCs, which regulate the power output of the respective wind farm by disconnecting individual power turbines based on the instructions issued by the superior ČEZ system. This control level is subject to the monitoring level, which is equipped with Reliance SCADA systems. This level monitors the current power and operating parameters of individual power plants at several workplaces. The system also monitors any possible requirements coming from the superior system.

CR | Tecomat Foxtrot

Controlling a hybrid photovoltaic power plant

In 2017, Jimi Tore s.r.o. decided to innovate its energy base by building a hybrid photovoltaic power plant equipped with 116 solar panels with installed capacity of 30 kWp. As an energy storage the designers selected a battery pack made by BYD company offering a total capacity of 40 kWh. The battery pack is connected via three Studer hybrid inverters using a method called "AC Coupling". The system is equipped with Foxtrot PLC system which controls energy surpluses and stores them as domestic hot water and also as regular potable hot water. Even though these modifications were installed, the current connection method to the network used by Jimi Tore s.r.o. remained unchanged, including measuring methods. Jimi Tore s.r.o. facility is connected to the existing low-voltage distribution system located in the distribution area belonging to E.ON. The connection is done via an electricity meter switchboard which allows direct measurements.

The superior control of the photovoltaic power plant and the charging station are handled by Foxtrot PLC and offer the following functions:

- balancing current peaks by means of batteries (equipped with a main circuit breaker 63 A which does not allow the current to exceed the preset amount)
- control of electric charging process by means of a charging station (based on the current load currently existing in the property and also based on the production achieved by the photovoltaic power plant)
- maximum use of energy supplied by the photovoltaic power plant
- energy supplied from batteries in case of power failure in the relevant distribution system - DS (so-called prioritization under Back-up mode)
- control of battery discharge process based on weather forecast with the intention to increase battery life (battery cycle control)
- management of electricity by forwarding the surplus of electricity to electric boiler and to the adjoining storage tank to allow heating of domestic hot water - DHW.

Estonia | Tecomat Foxtrot

Control of a boiler room burning wood chips - Kohila

Our Estonian customer - a company called SW Energia is engaged in the construction of boiler rooms used by central heating systems in various cities. The company also supplies automated control and monitoring systems. Thanks for the best value/money ratio SW Energia has chosen our Tecomat Foxtrot control system for its projects. One of the projects handled by SW Energia equipped with our control system is a biomass boiler room in the city of Kohila in Estonia. It was built and equipped in 2014. The heart of the project is a fully automated woodchip-burning boiler offering a power output of 3 MW. The boiler is controlled by one Tecomat Foxtrot unit, which handles frequency converters via Modbus bus.

CR | Tecomat TC700

Coal-burning boiler control - heating plant Veolia in Kolín

In July 2016 our Tecomat TC700 control system was successfully installed, and since then has been controlling the K5 coal-burning boiler in Veolia Energie Kolín a.s. Thanks to our control system Tecomat TC700 the heating plant operator has better options when executing continuous control, regulation and optimization of all coal boiler processes. Visualization of all measured and controlled quantities are done in Reliance 4 system, which gives the operator an accurate overview of the progress of the entire heat-producing process including domestic hot water used by residents in all the districts of the city of Kolín.

Jordan | Tecomat Foxtrot

Electric energy consumption monitoring

Our customer Ametrad Technology Services has installed Tecomat Foxtrot system with the intention to control electrical circuits and monitor power consumption at Carrefour shopping centre in Jordan. Foxtrot monitors voltages, currents, immediate electricity consumption, consumption of individual circuits over a specific period and the power factor.
The system is capable of operating in automatic mode, or individual loads may be switched on manually. The system logs all data allowing users to view data remotely, individually or in groups based on the selected period.

CR | Tecomat Foxtrot

Control of hybrid photovoltaic power plant in GUMEX spol. s r.o.

HORA ENERGY s.r.o. has implemented is the photovoltaic parkland in GUMEX. Basic information about the photovoltaic power plant: system in BACK-UP mode
- installed capacity 41.6 kWp
- 41.4 kWh batteries, Studer XTH 8000-48 chargers, SMA STP CORE 1 50-40 inverter
- PLC Tecomat Foxtrot CP-1094 + SOLAR MONITOR
- Charging station for electric cars - Schneider 2 × 22 kW

Description of the control system:
- Battery charging and discharging based on consumption and on the quarter hour maximum, discharging cycles controlled by seasons and expected sunlight
- Uninterruptible power backup for the office building and computer centre in the event of a electricity distribution network failure
- Prioritization in the use of the existing diesel power plant and battery system based on the capacity of the battery pack and the current consumption
- Power control of the charging station with a power of 2 × 22 kW (socket) based on the current load of the entire consumption point - monitoring of the quarter hour maximum applies as well
- Excess energy directed into 4 tanks (boilers) with a total volume of 1,400 litres based on established priorities
- Air quality control and ventilation + air conditioning system using the energy excess is currently in preparation
- The connection of the PLC with the Solar Monitor is provided by means of graphs and statistical monitoring, including the option to connect to the OTE portal
- A solar monitor also provides emergency power output limitation (on-grid)
- Option to send surpluses to DS or option to prohibit surpluses

Slovakia | Tecomat TC700 | Tecomat NS-950

Steam turbine control – MARTINSKÁ TEPLÁRENSKÁ

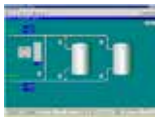
Martinská teplárenská a.s. is one of the largest electricity and heat produces supplying power for the central heat distribution system in Slovakia.
As part of the modernization process, which occurred between 2017 and 2019, the production was increased from 60,000 megawatt hours to 160 - 210 MWh. A number of our Tecomat control systems of various generations have been in operation here for a long time.

At the beginning of 2019, as a part of the modernization process, a new control system was deployed to control the oil management system of the steam turbine. Given the fact that the turbine has been controlled by Tecomat NS-950 system for years, the company has also chosen our current large modular system Tecomat TC700 to organize the turbine oil system.

Slovakia | Scada Reliance | Tecomat TC650

Heating plant dispatch monitoring in the town of Martin in Slovakia

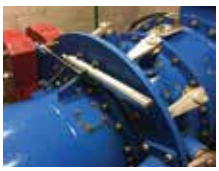
Martinská teplárenská focuses on production and distribution of heat and electricity and supplies power in the Martin region in Slovakia. The company utilizes the principle of combined heat and power generation, which guarantees efficient utilization of the source and a stable price of heat supplied to the system. In 2007, Teco carried out a contract concluded with Martinská teplárenská, which described the construction of a heat control room (dispatch room) designed to control water heating distribution and to measure the actual heat consumption. Programmable Tecomat TC650 controllers together with CONEL radio and GSM modems were used to control the hot water distribution system. Data provided by the heat distribution systems are transmitted via a radio network, which consists of three Tecomat control units plus eight other controllers. The heating plant dispatch room is located in the central building of Martinská teplárenská and consists of one PLC Tecomat TC658 and PC server running Reliance Server application, plus two other computers with the SCADA Reliance 3 system. Tecomat TC658 transfers data from ULTRAHEAT 2WR5 heat meters via radio and GSM network. Data are automatically processed and then read in the Reliance system.



CR | Tecomat Foxtrot

Hydroelectric Power Plant with Kaplan turbine control

Water levels, the network, the power generator and the rake cleaning system are the systems which are controlled and monitored by Tecomat Foxtrot installed to handle a Kaplan turbine operating on the Opava River near the town of Vrbno pod Pradědem. A company called GEEN situated in Brno is engaged in the energy sector and has became the owner of this small hydroelectric power plant. In 2018 GEEN decided to modernize the power plant and connect it to a supervisory control room located at the company headquarters in the town of Brno.



The above-mentioned power plant is equipped with one Kaplan turbine HH 550 SK supplied by Hydrohrom, which was delivered in 2007. The turbine has a flow rate of 1.6 m3 / s and provides a maximum power of 133 kW at the output of the asynchronous generator at 760 RPM. Last year, a reconstruction of the rake cleaning system took place. This is the mechanical part that removes accumulated leaves and other mechanical dirt trapped in the sieves before the water enters the turbine. Together with this reconstruction, the modernization of the control system was performed, and as result the system not only controls and optimizes the turbine-generator set, but also communicates and provides all operational data via the Internet to the company headquarters in Brno.
It is no coincidence that the system was programmed by Ing. Pavel Smílek from Rameco, who has already created for GEEN a monitoring centre equipped with Foxtrot units and with a video wall consisting of 8 large screens. Until now, small and medium photovoltaic power plants were connected to this monitoring centre. However, medium photovoltaic power plants were only monitored by the system, but in this medium power plant, this system not only communicates data but also controls the entire process. The system sends all data to Foxtrots installed at the headquarters, where cold data "are wrapped" into nice graphics and displayed.

CR | Scada Reliance | Tecomat TC700 | Tecomat Foxtrot

Controlling a power unit installed in a small biomass power plant in Kolín

In 2013, the construction of oil presses and a small biomass-burning power plant was completed. These are two types of technological operations which are cleverly connected - the production of vegetable oils from rapeseed and sunflower seeds and the production of electricity and heat by utilizing the so-called cogeneration unit (combined heat and power unit). These units burn biomass produced from oilseeds. The installed control system handles the visualization and control of the power unit. It consists of a steam boiler for biomass combustion with a steam output of 25 tons of steam per hour and a steam turbine with a capacity of 6.3 MW. Five Teco PLCs (1 x Tecomat TC700 and 4 x Tecomat Foxtrot) units were used to control the boiler. The steam turbine is controlled by Siemens SIMATIC S7-300 controller. OPT server DELTALOGIC was used communicated with this unit.

In order to clearly visualize and control the combustion processes, including the production of thermal and electrical energy performed by the power unit, six workstations based on a standard PC and running Reliance SCADA / HMI system were installed in the control room. This entire system is connected via Ethernet network. Thanks to this connection it is possible to remotely access individual machines, servers and workstations and finally, the use of two servers and support for redundancy makes the entire system very reliable and virtually rules out any data losses.

CR | Scada Reliance | Tecomat TC700

Monitoring energy in Plzeňský Prazdroj

Tecomat TC700 was deployed in Plzeňský Prazdroj by our customer MCAT AUTOMATION s.r.o. to handle and manage energy monitoring. This involves monitoring of the immediate consumption and periodical consumption of electricity, water, CO2, steam and air. Individual measuring points are equipped with Inmats which are connected to Tecomat TC700 PLC and from here data are transferred to Reliance software. Reliance also serves as a DDE server for InSQL, where data are archived. The energy monitoring system was supplied by MCAT AUTOMATION, s.r.o., which offers supplies of complex control systems used for monitoring of technological processes in breweries, malt houses, as well as in the mining industry (kaoline), ecological processes and power plants. MCAT AUTOMATION s.r.o. handles and delivers the entire project starting with the actual design all the way to implementation and servicing. This company has been using our Tecomat TC700 and Foxtrot control systems for a long time.

CR | Scada Reliance | Tecomat Foxtrot

Photovoltaic Power Plant monitoring - Vepřek

On September 8, 2010, residents of the town of Vepřek had the chance to witness a grand opening of the largest Czech, and one of the world's largest, photovoltaic power plants, punching out an output of 35 MWp. The control system consists of 26 Tecomat Foxtrot CP-1004 PLCs, which are installed in individual blocks. One Tecomat Foxtrot CP-1004 PLC unit is installed in the main distribution station. This PLC controls and monitors the protection of the photovoltaic power plant and sends SMS with fault messages. All PLCs are connected together via Ethernet network (optical fibre). A computer running Reliance 4 Control Server is located in the central control room. A touch panel also with Reliance 4 Control application is mounted on the switchboard cabinet, and it is connected to the computer in the control room.

CR | Tecomat Foxtrot

Czech self-sufficient house

The mission of the Czech Self-Sufficient House project is to accelerate the expansion of buildings, which are, to varying degrees, considered as self-sufficient and support development of cleaner technologies which may also be used in households.

The project even won the social benefit Energy Globe award which was granted by the United Nations, and the highest award of the European Commission, the so-called EU Sustainable Energy Award. All necessary technologies were put into operation and tested for permanent operation at ELPRAMO headquarters in Prague. The installed display also serves as a showroom for those who may be interested in this type of technologies. The entire operation of the house, including power production and consumption, is simulated in a real environment and the collected data are used for analysis and to optimize the control algorithm. In short, we can say that the test room represents a house designed in real scale. All technologies (including rain simulation) are controlled by the Tecomat Foxtrot system installed and programmed by ELPRAMO. Undoubtedly, a very interesting technical features included in the system is a pellet boiler made by an Austrian manufacturer Ökofen, which uses Stirling engine to recharge the battery pack with an output of approx. 900 W. The most important components of the project are: GWL Power / i4wifi (a leading European supplier of lithium batteries and solar technologies), ELPRAMO (premium electrical wiring and component installation), V-Invest, Teco (advanced Tecomat Foxtrot systems for building automation and control), WAFE (air conditioning systems), Envi-Pur (water management). Every year, the Czech Self-Sufficient House project organizes a national competition of the same name for students of architecture and construction engineers.

And many other implemented projects

- Control system for heat distribution network - Opatovice - Czech Republic
- Energy consumption monitoring - Qassion Mall - Syria
- Control system for hybrid photovoltaic power plant - Gumex - Czech Republic
- Energy system management - Paramo - Czech Republic
- Monitoring of photovoltaic power plant - Kuřim - Czech Republic
- Monitoring of photovoltaic power plant - Mimoň - Czech Republic
- Control of steam turbines and main heat exchanger station - Prague-Hradčany - Czech Republic
- Control of central boiler dispatch room - Prague - Czech Republic
- Control of central heating system in the city of Přerov - Czech Republic
- Control of central heating system in the city of Martin - Slovakia
- Exchanger station technology control with an output of 62MW in Aliachem - Czech Republic

Czech republic | Tecomat Foxtrot | Smart City

Smart switchboard for public lighting system in Prague

A well-thought reconstruction of public lighting system in municipalities and cities does not have to start with a simple replacement of regular discharge lamps with LED lamps. A more systematic approach shall begin with the reconstruction of the switching point infrastructure - public lighting switchboards. This kind of approach was adopted by a company called Technology of the Capital City of Prague which also verified this concept by implementing a pilot projects at the beginning of 2020. This system allows broadband wireless connection (4G / LTE / 5G), provided by some of the operators, and these points may be connected to the system and thus create a basic backbone for IoT (Internet of things) network . The switching point alone can then create its own wireless network under ISM band (868MHz) open licence, and use the so-called mesh technology or gradual retransmissions to cover and handle communication needs of each public lamp connected to slave terminals. Foxtrot 2 is the "ideal building component" for such concept and for any modern switchboard.

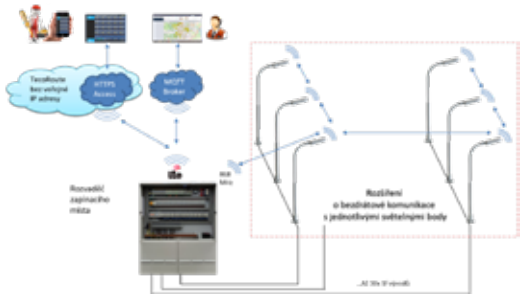
In this scenario, the switchboard may be equipped with an on-line secondary measurement system which measures the switching point not only as a whole, but it may also perform detailed measurement on each outlet. By measuring the instantaneous power input and by comparing it with the nominal value, it is possible to detect failure even of a single lamp. The fault message may then be sent by e-mail or SMS or WEB to a mobile phone of the service personnel. Continuous online monitoring of the condition of circuit breakers, contactors, overvoltage protectors, indoor and outdoor temperature sensors, outdoor lighting including monitoring of the status of backup batteries, auto-diagnostics of the control system and all its communication lines and the option to switch from automatic to manual mode are features which are have been included in the standard system.

A new and important feature is switchboard remote access. Thanks to Foxtrot 2, which is equipped with an integrated LTE modem, it can be easily connected to the Internet. To do so, an internal website is used. For secure, authorized access via any browser, the operator may use TecoRoute service - access via secure https protocol and without a public IP address, or newly via a VPN network. Foxtrot 2 has a state-of-the-art Wireguard VPN integrated. This level of access is sufficient for municipalities and smaller cities that do not intend to integrate access to individual public lighting switchboards under a higher unit or into the system database.

On the other hand, larger cities can use the standardized MQTT protocol, which is popular in the world of the Internet of Things (IoT), to integrate into the existing dispatch of centralized technical services (or even to the one that is being built). Using this protocol, which is part of the basic equipment of the Foxtrot system, the switch-on point sends all the necessary and required data to the superior database (see the first picture).

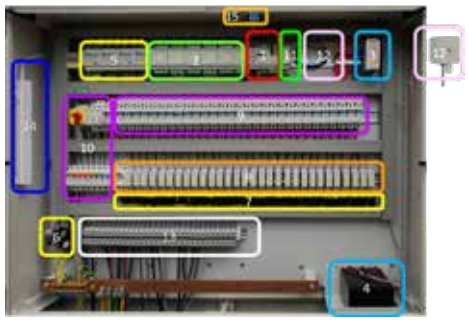
The application programme and the web page settings allow the user to configure virtually any parameter, including control of the content and frequency these parameters are communicated and saved in the superior database. This allows the operator to fully control this system and the operator is not dependent on the supplier's assistance in terms of routine operational changes or servicing.

In the spring of 2020, the concept described above was implemented as part of the project of the Technology of the capital city of Prague at seven locations in Prague. Smooth replacement of old switchboards and quick installation of new ones, constant communication followed by immediate and permanent operation which began at end of April together with the centralized monitoring performed by the company's dispatch room, only confirms the practicality and reliability of the concept described above.

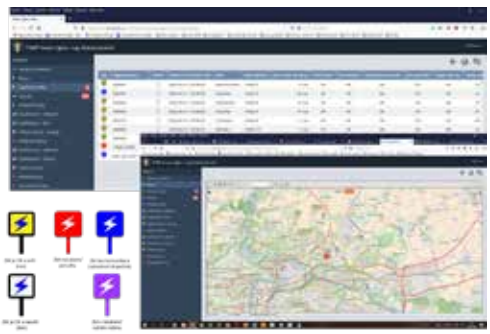


Pic. The concept of wireless communication designed for public lighting switching point communicating with the superior control (dispatch) room, communication with service personnel and communication with each slave lamp. Our new Foxtrot 2 serves as the communication and control centre. Other sensors may also be connected via the network using the 868 MHz band, which allows the user to expand the Internet of Things (IoT) even further.

Pic. Typical and standardized switching point of the Prague public lighting system:
1. *Inlet (supply) section*
2. *Section with electricity meters*
3. *Controlling and monitoring section*



Pic. Modern "Smart" switching point contains the following components:
1. *Control and communication center Foxtrot CP-2005 with LTE modem for connection to VPN or TecoRoute network.*
2. *Expansion modules for additional inputs, outputs*
3. *Power supply 230 V AC / 24 V DC / with UPS feature*
4. *24 V DC backup battery*
5. *36-channel electricity meter (up to 12 three-phase outlets measured at individual phases)*
6. *Measurement of the total 3-phase switchboard consumption*
7. *Measurement of consumption of individual 1-phase terminals*
8. *1f hybrid contactors (switching at 0 - ready for LED loads with capacitive character of the load)*
9. *1f circuit breakers with auxiliary contact*
10. *Main fuse, main switch, lightning arresters*
11. *Manual / Automatic mode - switch*
12. *Temperature and brightness / twilight sensors*
13. *Output terminal blocks of individual directions*
14. *Switchboard - servicing illumination*
15. *Door contact*



Picture on the left: View of the dispatcher screen showing the switching points in the form of a table or a map. Different colours of the icons determine the basic states of the relevant switching point.

Picture on the right: Service web page of the application programme of the switching point showing a clear view of the status and parameters of individual outlets, communications and the entire switchboard.

CR | Tecomat Foxtrot | Smart City | Smart Lighting

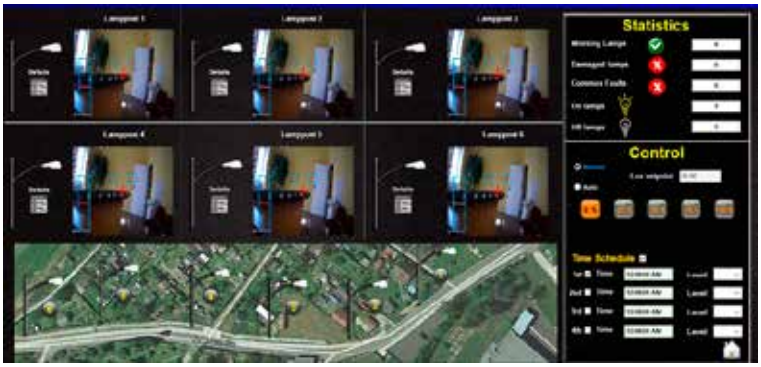
Public Lighting Control - Velký Osek

A deployment of Tecomat Foxtrot system in the pilot project focusing on the control of public street lighting system following the iSmartCity approach produced by Teco has begun in the village of Osek nad Bečvou. The system uses wireless modules to control individual street lamps - type R-SL-0201L-A, which communicate with the central unit Tecomat Foxtort. It is integrated with the I-SAFE information radar made by a Dutch company Icoms, which provides data for the iSmartCity system - online traffic survey data, traffic light statuses at pedestrian crossings at primary schools and data which monitors red light passings overseen by RedCon system supplied by Consymea. The iSmartCity.cz system also receives data from the ICOMS Radar which describes the measured traffic data such as the number of vehicles, their speed, vehicle classification, number of trucks and cars, feedback from pedestrian crossing traffic light at the elementary school - equipment status, program number and controller errors . The red light passing monitoring system RedCon also provides data such as the number of vehicles, photos and recognized vehicle license plates. The iSmartCity.cz system may also be used to control individual streetlamps or group of lamps and to group them into various time scenarios, etc. Other devices may be connected as well providing that these are equipped for such connection and may be safely operated under this regime.

CR | Tecomat Foxtrot | Smart City | Smart Lighting

Public lighting system control - Nová Role

Tecomat Foxtrot systems are also used in the management and modernization of public lighting systems. Our systems are always used for comprehensive solution and centralized management. Turning on a street lamp or adjusting the light intensity of a particular lamp is one thing. The next step is when you wish to minimize the consumption of ballasts when they are not in use. This is why Teco a.s. came up with two novelties in the form of new modules connectable to Foxtrot system. It is a bus and wireless module, each equipped with a relay resistant to the inrush current of up to 800 A and a low-voltage output allowing control of dimmable ballasts. Bus module is also equipped with two wired output channels and one wireless output.
Why is it advisable to disconnect the ballasts when they are not lit (in use) you may ask? A regular public lighting is without power during the day. However, modern street lamps and street lighting poles offer many other functions that must be also available during the day the day.
A company called Q-EL PRO develops such lamps and supplies them to Teco a.s. We have became a technological partner of Q-EL PRO in the field of control and system management. Q-EL PRO came up with the idea to integrate a camera directly into the lamp pole right next to the light source. The camera is nicely inconspicuous, but is able to provide a 360 ° view of the entire area. Another technology that may be installed in street lamps in the future is AC electric car charger outlet. In cooperation with another company called Kooperativa, which is a traditional manufacturer of public street lamps and poles, we have designed a model lamp equipped with an intelligent charger offering standard Type 2 socket (Mennekes). The intelligence of the charger controlled by Foxtrot is the ability to regulate the charging current flowing to the electric car while making sure that the total maximum current reserved for the lightning system branch is not exceeded. Controlling the charging current where there is also an additional load or where there is a limited current provided by the power supply - in addition to the electric car, is one of the domains where Foxtrot system is the master and that is one of the main differences between uncontrolled self-built charging stations with guaranteed maximum current reserved for electric cars only. However, Smart public lighting system does not only include the street lighting lamps and poles, but also their management. That is why, in cooperation with our parent company Geovap, we have developed a dispatch portal for city lighting systems based on Reliance SCADA software.



A part of a smart public land, which is being developed and supplied by the Q-EL PRO, is also an IP camera. The central public lightning control (dispatch) room , which is created in Reliance SCADA system, also contains a camera system which record all events. Monitoring screens used to control the street lamps installed in in the town of Nová Role.
The last screen is an example of the detailed settings available for an individual lamp. At the same time, the system offers streaming online view of the available area covered by the camera in the lamp.

Czech Republic | Tunnel control | Tecomat TC700

Traffic control in Valík motorway tunnel

The Valík tunnel together with the adjacent bridge over the Úhlava river is the last section of the motorway which bypasses the city of Pilsen and the D5 motorway from Prague to Rozvadov. The control system has been designed for this tunnel - the first one in the Czech Republic, and the project was completed using two domestic products - our Tecomat control system and Reliance SCADA / HMI system.

The control system has the following basic structure

- the main control room includes a network of computers of the Police of the Czech Republic and computers of the Directorate of Roads and Motorways (ŘSD) - Road Administration and Maintenance of Motorways (SSÚD) in the town of Svojkovice
- the backup control dispatch room is located in the operational building (PTO) near the tunnel
- the tunnel control system is divided into two parts. The first part oversees the traffic in the tunnel including the adjacent pre-portal sections of the tunnel and the second part is the section of the tunnel which involves technology consisting of a network of programmable Tecomat TC700 controllers (PLC).

The control (dispatch) room is also equipped

- with two separate video surveillance stations equipped with PC with no access rights and located in the ŘSD facility and the SSÚD building in Svojkovice, which are used by ŘSD operational technicians
- with own video surveillance station equipped with own signal transmission coming from the tunnel; mutual interaction between the video surveillance system and video detection system is achieved by direct connection between switchboards and the PTO control system installed in the tunnel
- with a separate DIS SOS station able to communicate with the equipment installed on the motorway and in the tunnel
- with a separate station which measures traffic offenses and section speed including the weight of vehicles capable of communicating with the equipment in the tunnel

Connection and function of the tunnel control system

The traffic in the tunnel, including all supporting technologies, is controlled by a total of seventeen PLCs Tecomat TC700. Eight of them control the motorway portals (variable traffic signs, text-displaying information boards), the other six units control the intra-tunnel portal (variable signs, traffic data collection), and the other PLC units control the transport technologies in the tunnel, auxiliary technologies and air conditioning systems. The system that controls the traffic in the tunnel allows direct interconnection between sensors and action sensors elements and also enables a direct communication with intelligent devices, such as variable traffic signs, video detection, traffic data measuring devices, etc.

These tasks are processed in real time.
In order to strengthen the readiness of the system in the event of communication route failures or in case of a system failure, a redundant connection was designed. Two central processing units (CPUs) in separate racks and with separate power supply continuously synchronize all statues and control data in Hot-Stand-By mode, so that the backup CPU can take over the main control functions at any time. GIO input and output units are taken over by the active CPU within 3 ms.

Main dispatch in Svojkovice

The control (dispatch) room is equipped with two full-size computer workstations and with a graphic screen of the Police of the Czech Republic. This screen is used to control the traffic in the tunnel as well as the technology in the tunnel using Tecomat PLC - 25 km away. Monitoring and control functions are created in Reliance SCADA / HMI system.
The video wall of the control room consists of a 2 × 2 layout shape, which is achieved by using two 50"screens enabling a continuous video surveillance in several modes while using feeds from up to four cameras, and also provide the staff with a clear display of the traffic, and also with information about the technology installed in the highway information system, including SOS (DIS SOS) reporting points. If necessary, the system switches to video surveillance only - this mode offers an enlarged view. The video wall is controlled by an image processor, which uses a separate and specially equipped PC.

Tunnel traffic control system

Serial communication achieved via Tecomat PLC located in MX cabinets is used to control the following systems:

- variable traffic signs
- equipment that displays traffic information (text information for drivers)
- traffic data sensors

The highway information system, including SOS reporting points, is also controlled by the traffic control system. DIS SOS substation located in the technical building is connected via Profibus bus.

The traffic system also controls:

- CityLog video detection - receiving detected events
- sound /audio equipment
- identification of traffic offenses, camera system and traffic status transfer system
- power supply monitoring and communication between all traffic components, including the system itself

Tunnel control system

Tecomat system equipped with a redundant function, which controls all technological systems inside the tunnel, is used to control the technology in the technical building at the tunnel. This includes electrical fire alarm system, which consists of the following elements:
- EPS switchboard connected via a peripheral unit directly to the main and backup CPU
- fibre-laser connected via a serial line and backed by EPS control panels
- detector buttons in SOS cabinets

Further, the control system of the technology handles the following components:
- electrical security alarm system (EZS)
- ventilation system connected via a parallel peripheral unit to the fan power supply cabinets
- accommodation and emergency tunnel lighting connected via a parallel peripheral unit to power supply cabinets of the lightning system

The technology control and management also includes measurements of physical quantities, which:
- determine the air flow speed and direction and the air temperature
- measurement of opacity and CO concentration
- fog detection in front of the tunnel
- data collection provided by brightness meters - monitoring of water level in fire tanks.

CR | Tecomat Foxtrot

Monitoring of base stations (BTS) in the GSM-R system used by the Czech Railways

SŽDC has built many base stations around its backbone and most important train lines. These stations complyi with the GSM-R international standard for mobile network. In addition to the operation of voice services via special telephones, GSM-R is intended to handle data connections with moving trains. SŽDC has chosen Kapsch s.r.o. as the supplier of the relevant components. After thorough functionality tests the company also selected Tecomat Foxtrot as the core of the monitoring system which oversees technological background of each BTS base station. At present, Foxtrot is used by all base stations on the 1st and 2nd National Railway Corridor. The section between Česká Třebová and Přerov section as well as the section from the town of Ostrava to the state border with Slovakia are still under construction.

CR | Tecomat NS 950

Security system control - Prague metro - Florenc

In 2003 a company called Dopravní podnik hl. m. Prague (Transportation company of the capital city of Prague) put into operation a new tram line from Hlubočepy to Barrandov. This line has six new stops. The architect designed the track according to European standards. These standards apply to the number of technologies installed on the track. At first glance, you will notice the most visible passenger information system. Less visible, but no less important are technologies controlling the light signalling devices, traffic control system, rail-switch control system, track lighting, lubrication equipment, pumps, air conditioning, commercial equipment, etc. Power for these devices is provided by a separate power supply system (incl. UPS and air conditioning). In terms of the control system, the line is designed for unattended operation with autonomous control and central control, which is handled from the public transport control room. Based on long-term and positive experience, the existing control system for the new tram line was extended by another Tecomat NS 950 station together with control software RTis supplied by Supervisory Systems s. r. o. Brno, who was the general supplier of our control system. In line with the commissioning of the new tram line, the existing energy dispatch system for trams was expanded by two stations which handle traction power supply.

CR | Tecomat Foxtrot

Portal with operational information

Another telematics-based application controlled by Tecomat was put into operation on the R35 highway near the town of Chrastava in the Liberec region. Implementation was performed by Proteco s.r.o. The installed variable traffic signs and the text-displaying board located on the portal above the road display 3 lines of text and inform drivers about the current situation in front of them. The information is coordinated with the National Traffic Information Center (NDIC). XML messages transmitted by TCP / IP protocol are standardized for two-way information exchange system. XML messages coming from NDIC are processed directly, without the need to go through any intermediate elements, by Tecomat Foxtrot PLC connected via Fast Ethernet to VPN network. The connection with NDIC is achieved by a satellite. Control system: Tecomat Foxtrot, ID-18, Software: Traffox application profile and WEB server. Foxtrot monitors and handles basic switchboard functions such as the power supply, protection, door opening and indoor temperature monitoring. Foxtrot provides all necessary service and diagnostic functions, which are displayed as graphics on a convenient touch panel directly in the switchboard and at the same time also on the Foxtrot web interface. Foxtrot uses the XML_line and XML_Compose functions to read (parse) and to compile XML messages used for direct communication with NDIC. Direct and the shortest communication with NDIC is ensured via TCP / IP protocol through the ŘSD VPN network connected via a satellite.

CR | Tecomat NS 950

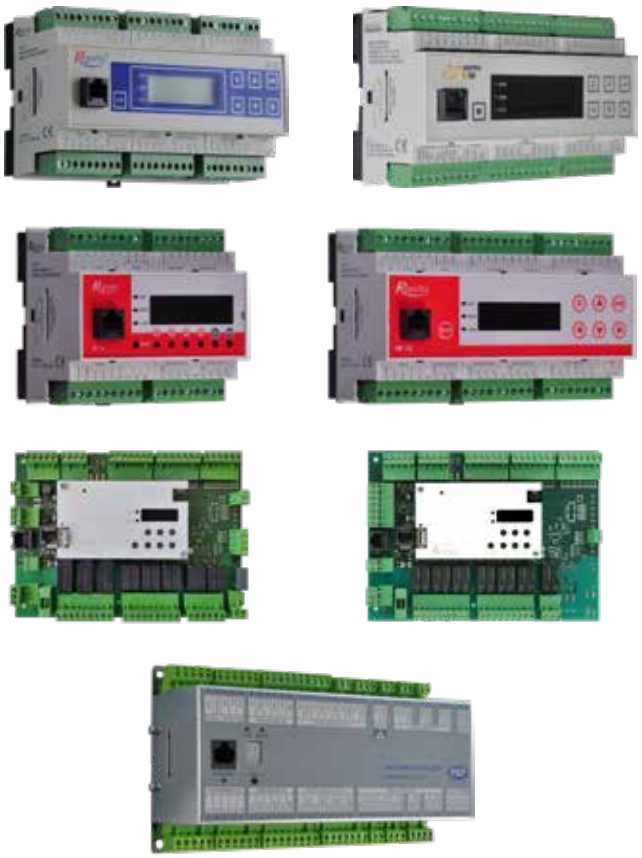
Controlling energy dispatch on tram lines in Prague

In 2003 a company called Dopravní podnik hl. m. Prague (Transportation company of the capital city of Prague) put into operation a new tram line from Hlubočepy to Barrandov. This line has six new stops. The architect designed the track according to European standards. These standards apply to the number of technologies installed on the track. At first glance, you will notice the most visible passenger information system. Traditional poles and message displaying boards were added with the following features. Information displaying windows and ticket vending machines, button that allows passengers to make telephone contact with DP information centre, emergency button, orientation and navigation system for the blind and a touch screen allowing passengers to search through timetables and find the best connections. Each stop is equipped with information clock panels that inform passengers about arrival times and allow passengers to view text displaying current traffic information. Tram arrival times are signalled by a light trail located at the edge of the platform. The track is also equipped with a security camera system.
Less visible, but no less important are technologies controlling the light signalling devices, traffic control system, rail-switch control system, track lighting, lubrication equipment, pumps, air conditioning, commercial equipment, etc. Power for these devices is provided by a separate power supply system (incl. UPS and air conditioning). In terms of the control system, the line is designed for unattended operation with autonomous control or central control done from the public transport dispatch room. Based on long-term and positive experience, the existing control system for the new tram line was extended by adding another Tecomat NS 950 station with control software RTis supplied by Supervisory Systems s. r. o. Brno, This company is the general supplier of our control system. In connection with the commissioning of the new tram line, the existing energy dispatch system for trams was expanded by two stations which handle traction power supply. It was the first time nine stations for monitoring and control of the above-described technologies under DP conditions.

Czech republic | HVAC control | OEM control | Tecomat Foxtrot

Manufacturers of heat pumps and HVAC equipment

Heat pump manufacturers use Foxtrot's free programmability option to write their own control algorithms for their heat pumps. These manufacturers use our Foxtrot control either in the basic variant commonly manufactured for the free market, or as a central unit version equipped with a control panel which shows the company logo and other printed information (name, colour markings) or in the so-called open frame version of the central unit – installed directly on the printed circuit boards which are to be built into the relevant equipment.
Most manufacturers also use TecoRoute service. This allows their devices to be connected to the Internet without a public IP address, which gives the manufacturers the option to control, monitor and perform service interventions remotely. This service significantly improves their control, management and deployment and servicing capabilities. This is a very important feature as some of these manufacturers regularly supply their pumps and equipment to about 100 countries around the world.



Samples of products equipped by system Foxtrot:

Slovakia | Tecomat Foxtrot | OEM control

Cryomed cryosaunas

Slovak cryosauna manufacturer called Cryomed is a global leader in the production of whole-body cryotherapy. All saunas are equipped with our Tecomat Foxtrot control system. Since the beginning of the company establishment the manufacturer has delivered more than 1,700 cryosaunas to more than 70 countries. You can find their products in hospitals, hotels, fitness studios, etc.

Slovakia | Tecomat Foxtrot | OEM control

Ecocapsule

Ecocapsule is a self-sufficient smart micro-house that uses solar and wind energy to cover its consumption needs. People can live in these capsules in remote and secluded places where there is no power network connection, and still enjoy maximum comfort offered by these ecocapsules. Ecocapsule is powered by a dual energy system that combines high-capacity batteries, which guarantee self-sufficiency in terms of energy, even in the event of a power failure. Even shape of the ecocapsule is designed to maximize water collections which is collected and stored in tanks. Water is then filtered and may be used for normal consumption inside the house. All technologies and sensors in ecocapsule are connected and controlled by Tecomat Foxtrot system. A mobile phone application may be used as a user interface to control and provide overall monitoring of the installed technologies.

Ecocapsule was introduced to the market in 2019. USA, Germany, Australia, the Netherlands, Japan and Korea were among the first countries where they were delivered and distributed.

CR | Tecomat Foxtrot | OEM control

JIPA International

A company called JIPA International has been manufacturing multifunctional gastronomic equipment for large restaurants and establishments for 25 years. The company chose Foxtrot system to coordinate all measuring, control and monitoring functions. This decision was based both on the premise of a long-term operational reliability and the flexibility of available inputs and outputs, a large touch screen panel for user control and, last but not least, the option of remote access, control, upgrade and servicing performed via the Internet. This gives the manufacturer the ability to provide ongoing online support to customers - chefs, wherever they might be.

Slovakia | Tecomat Foxtrot | Smart Charging Stations

AgeVolt - smart charging stations

A Slovak manufacturer of smart charging stations used by electric vehicles utilizes our Foxtrot system as the basic control unit for its smart charging stations. The manufacturer supplies these charging stations to several countries. Networks of charging stations are suitable for hotels or administrative buildings, but also for homeowners and electric car owners. AgeVolt stations can measure electricity consumption drawn by different branches of car parking lots, as well as the total consumption at a given power-drawing point while controlling the charging process of individual parking lots and individual electric cars based on the actual consumption, so that the maximum allowed consumption is not exceeded and finally, while making sure that the vehicle charging process is maximized. The operator can set different charging modes for different user groups and fully control the entire process.

Slovakia | Tecomat Foxtrot | Smart Charging Stations

SMINN charging stations

Sminn charging stations manufactured by a Slovak company Sminn are designed both for companies and households. Our Tecomat Foxtrot control system is the basis of each charging station and ensures communication with the vehicle and also with a relevant server. Users will certainly welcome the option to control the process via mobile phone.

The system offers a convenient desktop application where the operator can set up billing and define home users or make stations available on a public map that displays charging locations. Part of the solution also offers the option to prioritize energy produced by photovoltaic plant for the charging process.

CR | Tecomat Foxtrot

Management and control of technologies in agricultural farm Okluky

Farmtec a.s. provides comprehensive services in the field of agricultural or investment projects, especially in animal production and renewable energy sources including design of farm and livestock stables and the actual construction of large animal farms, including management of entire life cycles of various processes occurring at large-scale animal farms dealing with production of meat, milk, etc. Farmtec has chosen our Tecomat Foxtrot systems to manage and control their projects. The company has already implemented a number of large-scale farms in Czech Republic as well as abroad. We shall mention few examples such as the Okluky Farm in Dolní Němčín with two separate operations - a fattening hall for chickens and a cattle farm. In the fattening hall Foxtrot system controls the lighting system, automatic feeding dosages and rotating feeding regimes including water supplies.

This ensures that the day / night mode regimes change automatically several times during 24 hours. This is done to speed up the growth of meat and to increase the feed and water rations so that the needs of the animals / chickens corresponds with the age they reach within their breeding cycle. Foxtrot system controls similar processes on the cattle farm including management of thermal comfort and the actual creation of dew on the cattle skin.

Slovakia | Tecomat Foxtrot

Cactus greenhouse control

In the Slovak town of Modra, you will find a project which was successfully implemented and where our Foxtrot system was used to control the entire and sophisticated cactus greenhouse system to handle cactus growing procedures. In addition to a regular control, the system also handles autonomous and automatic modes.

To do so, it was necessary to install a system capable of handling other functions including remote control and visual inspection. All this is done superbly by our Foxtrot system of course. Lighting system, window opening, heating, irrigation and security features in the greenhouse are controlled by Foxtrot. All functions are accessible via a website, including webcam image streaming which can be watched anywhere in the world where there is an Internet connection. All important statuses are sent via SMS gateway directly to the owner's mobile phone. The implementation was performed by a Slovak company called STRATECH s.r.o.

CR | Scada Reliance | Tecomat TC600 | Tecomat NS950

International dispatch system designed to monitor banana ripening process

In 2003, ELPRO Kolín installed an international dispatch system with the intention to monitor a banana ripening at VVISS company based in the Czech Republic.

The system is equipped with two Tecomat NS950 and TC600 PLCs units which ensure the following:

- cooling process control
- monitoring of the consumption of electricity and monitoring of the quarter hour maximum

CR | Tecomat Foxtrot

Automatic fish feeding

A company ELPRAMO s.r.o., which has already been operating on the market for ten years also delivers and installs control systems for an interesting technology called CarpFeed. It is a unique and modern technology used for automatic fish feeding. The entire technology is produced and supplied by AGRICO s.r.o. The CarpFeed system ensures accurate disposal of feed mixtures into the breeding pond which covers an area of several tens of square meters. This system is regularly installed in tanks or ponds that are equipped with feed mixture tanks. Our Tecomat Foxtrot controls the filling process of the temporary feed hopper, the blower fan - which transports the feed mixture, and up to 9 duct switches which separate individual feeding routes. CarpFeed technology works automatically based on preset daily or rather hourly feeding schedules. Another interesting fact is that feeding also takes place based on the water temperature. Using a clear and simple control interface the operator may set feeding times and dosing times for each branch as well as other system parameters. The entire feeding process may be initiated manually outside the preset schedule. The user interface is available in several language versions. The visualization software runs on the operator panel ID-36 which is mounted directly in the switchboard. The user may also connect to the visualization panel using a web interface and even remotely thanks to TecoRoute service. In the event of a fault, or if there is a pipe clogged with the feed for example, Foxtrot automatically dispatches an email with an error message.

CR | Scada Reliance | Tecomat TC700

Chicken slicing process control - Moravskoslezský drůbežářský závod PROMT (Silesian poultry processing plant)

At the end of 2003, a new chicken slicing line made by a Dutch company MEYN was put into operation at the Moravskoslezské drůbežářské závody PROMT in Modřice. This line allows the operator to increase capacity and process up to 7,000 chickens per hour and divide the production process into separate multi-level transport lines - one able to handle refrigerated meat and the other one frozen meat. The complete reconstruction and assembly of the new cutting line, including monitoring and control, was carried out by a company called ELKING, s.r.o., Brno.

Control system

The control system is located together with the power and control circuits of the drives in a remote substation and the entire cutting line is controlled from the control room running Reliance SCADA / HMI system. Large monitor in the control room allows the operator to see individual transport routes, to set the driver parameters - powered by inverters, and monitor the entire operation at various display levels. Visualization of the operating line can display the entire process including immediate statuses of individual sensors and drives. All data from the operation process are stored for later inspection, including the history of faults and operating states.

Programmable controllers are connected via a communication channel to the central control room, which uses Reliance SCADA / HMI system. A control display is installed near the ripening rooms. That allows the operator to control the ripening boxes and monitor their statuses. The central control room, running Reliance SCADA software, is equipped with NS950 and TC600 PLC units and controls the entire banana ripening process. All operational data are archived allowing the operator to inspect the ripening process. Authorized users may log in and not only control and monitor the ripening process using the local company network (intranet), but also control the process from any PC that is connected to the Internet.

Slovakia

Scada Reliance | Tecomat TC600 | Tecomat TC700

Grain silo technology management

Tecomat control system was installed in the town of Rimavská Sobota by our Slovak distributor SLOVTECO s.r.o. to control a system designed for grain silo technologies operated by GEMERNÁKUP a.s.
Tecomat TC700 control system was installed to control the transport routes of grain through the silo, and Tecomat TC601, TC634 and 6x XH05 systems were used to measure the grain temperature stored in granaries. Traffic routes through which the grain is transported may be programmed on a computer located in the operating room using a control software utility created in Reliance. The new route may be programmed regardless of the routes currently running and used in the silo. After the new description of the route is saved in the computer's memory, the operator may initiate it at any time. When the operator starts the new path, the control system checks for possible collisions with the already running paths. When a collision is detected, it does not allow the new route to be started and the system notifies the operator.

It goes without saying that the system is set to check the operating fault conditions, if there are any. In such scenario, the system stops the conveyor belts, blocks flaps as well as drop chute opening or closing.
Temperature of the stored grains is measured by the original thermal trailers with thermistors. The resistance values of the thermistors are read by the TC600 control unit and further processed by the utility programme, which archives all measured temperatures and reports the status to the operator when the limit values are exceeded.

UAE

Tecomat Foxtrot

Temperature monitoring in Al Dar Sweets

In 2016, a company called Neptune UAE deployed our Tecomat Foxtrot system to monitor temperature in three refrigerated boxes and freezer cabinets at Al Dar Sweets based in Abu Dhabi, in the United Arab Emirates.
Al Dar Sweets is the manufacturer of the highest quality chocolate confectioneries where the raw materials used for the production must be stored at the required temperatures. If the temperature fluctuates outside the required limits, the system notifies employees by sounding the alarm. This can occur, for example, when the cooling or freezing box is not closed, when the power supply is turned off, etc. Temperatures are continuously recorded in charts and are then available for customer audits or for inspections performed by government agencies.

CR

Scada Reliance | Tecomat TC600 | Tecomat NS950

Management of a complete technology used in a malting plant in Nymburk

PROTECO has built an extensive control system for a malting plant located in Nymburk. The vast majority of technological lines are controlled by PLCs made by Teco. Reliance SCADA / HMI system is used to visualize the malting plant.

The operator controls the following technologies:

- receiving and dispatching lines
- storage and transport of barley and malt from silos
- saturation, Lauter Tun, cooling, weighing
- lines designed for cleaning, germination removal, cooling baskets, extraction
- water management of the malting plant
- wastewater treatment plant
- water treatment plant at the remote Sadská-Písty workplace
- monitoring consumption of electricity and monitoring of the quarter hour maximum

CR, Germany

Tecomat Foxtrot

Self-service beer bars technology

2S2B is a trademark representing information and control systems designed for self-service beer bars. The abbreviation is derived from Self-Service Beer Bar. At the same time, 2S2B represents the business strategy this product was designed with. The owner of the 2S2B trademark is a company called MCAT AUTOMATION s.r.o., based in the town of Pilsen, Czech Republic. This company is also the manufacturer, owner and supplier of 2S2B information technology, which is built based on our Tecomat Foxtrot control system.
Combining the 2S2B information system with our Foxtrot control system, which oversees the relevant technologies such as beer distribution, self-tapping and beer tanks, creates a new quality where people can order by themselves directly at their table, order beer and all service functions including food orders, call the attendant (waiter), see beer tap projection, handle billing or even get connected to another bar of this type, virtually anywhere in the world. Thanks to the ability to connect with other bars participating in the chain people can enjoy fun communications with anyone even if they are on the other side of the planet, watching trivia or achieved records and so on. All these functions may be executed from a touch panels at each table. This system has become very popular and today, there are 13 bars in the Czech Republic alone - in Prague, Brno, Pilsen and other cities. (www.thepub.cz)

And many other implemented projects

- Management and control of malting plant - Hodonice - Czech Republic
- Management and control of green malt roasting process at the Malteries Franco-Belges malting plant in France
- Management and control of a mill installed in Unimills Pardubice - CR
- Controlling technology in the Vážla - Hustopeče Meat Processing Plant - CR
- Freezing technology control - BIDVEST / NOWACO - Czech Republic
- Management and control of cooling technologies - Budějovický Budvar - České Budějovice - Czech Republic
- Control of germination plant technology - Sladovna Levice - OSIVO, a.s. - Slovakia
- Management and control of Schneider Group Meat Processing Plant - Plzeň - CR
- Management of malting plant Boortmalt Magyarország Kft. - Dunaújváros - Hungary

The Netherlands | Tecomat Foxtrot

Controlling shooting range at the police academy

Our Dutch partner and distributor B&R Design was asked in 2014 to create a central control system for a new police shooting range. The shooting range building was currently under reconstruction and its inner labyrinth was designed for police and special armed forces exercises. These training areas are very realistic and the participating teams use real weapons and ammunition during the practice. In the initial proposal, the contracting authority considered a solution based on the KNX system, but when engineers of the company found out that by using our freely programmable Tecomat Foxtrot system they can satisfy more requirements and offer more options, they decided to build the entire system on Foxtrot. The engineers made their decision mainly because Foxtrot did not require the use of separate visualization done on a PC and smart WEB interface. In addition, Foxtrot system could be also used to control other technologies installed in the shooting range building - lighting, blinds, camera system, displays and ventilation. The operator may simply use an iPad and activate various scenes and monitor all functions and cameras.

The system is controlled by buttons directly on the switchboard or by a touch panel. In addition, training instructors can control the system with two wireless controllers and use them to trigger a number of different scenes. Thanks to Foxtrot's internal web page, the entire system may also be controlled via iPad. The customer decided to control the lights and air conditioning system as well. The illumination system consists of a number of exterior and interior light sources offering different colour temperatures. Thanks to Foxtrot the operator may create various simulations and light scenes and imitate real situations necessary for shooting practise.

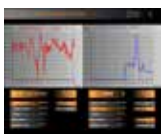
CR | Tecomat Foxtrot

Control and measurement system for pool technology - Ponávka pool, Brno

In 2015, a company called MICRONIC Přerov has completed installation of Tecomat Foxtrot system which was installed with the intention to control and remotely monitor and archive measured values provided by the pool technology installed at the Ponávka indoor pool in Brno.

The control system consists of a distribution box equipped with Tecomat Foxtrot CP-1006 PLC unit and with peripheral modules installed on CIB bus, which are connected to a chemical measuring board in a water treatment unit. All measured values, statuses and information are visualized and available on web pages. The measured values are clearly compiled and grouped into two graphs offering an independent selection of the displayed values. Each graph can be selected separately in the daily view (after 10 min) or in the monthly view (average daily values). All values are backed and saved in the database file for further analysis.

Measured quantities:
value of free chlorine, value of bound chlorine, pH value, Redox value, water temperature, detection of water flow through the measuring plate, measurement of gas level in the chlorination plant which is linked to an acoustic alarm and time information, as well as the state of the chlorine management system.



Outputs:
chemical dosing, valve control, all alarm values are transmitted to e-mail addresses, database of values.

USA | Tecomat Foxtrot

Controlling technologies installed in SLIM 66 catamaran

One of the tens of thousands of Tecomat Foxtrot systems already manufactured in 2013 has become the basic equipment of a Gunboat 66 class catamaran named SLIM. This happened at the shipyards in Cape Town, South Africa. From there the ship crossed the Atlantic and entered the waters of the Caribbean and since then she has been sailing the east coast of the United States.

In cooperation with a company called Capi2 Nederland BV, which equipped the catamaran with all electrical systems, LED lighting and pumps, B&R Design BV designed the complete control system of the yacht by using 10 fixed touch panels while also offering an option to do the same via an iPad - from any location on the boat. Tecomat Foxtrot system installed on the board was completely programmed in the Netherlands and the shipbuilders in South Africa mounted the system in the catamaran. Then B&R Design remotely tuned the application over the Internet.

Foxtrot system constantly controls all technical equipment on the ship. The complete 230V network, including appliances, mast winches, on-board instruments and communications – all these systems may be controlled via a WEB website. The crew also has a clear overview of water and fuel reserve including pump control system. Further, the system controls all lights in the cabin and below deck, air conditioning, refrigerators and freezers and finally, also special 12V sockets.

The Netherlands | Tecomat Foxtrot

Management of audio / video systems in churches

Tecomat Foxtrot system has conquered Dutch churches. An interesting solution was created by our Dutch distributor, where Foxtrot was used to form the basis of a platform intended for a comprehensive control of audio and video systems via a user-friendly web control application. This approach allows the user to control many devices wirelessly without the need for expensive wireless controllers.

Foxtrot's TCP / IP and RS232 ports are used to control LED TVs, PTZ cameras, audio and video mixers and other devices. In order to be able to control Global Cache iTach wireless devices the system connects to a TCP / IP port, where instructions may be sent from three different outputs.

This interesting approach has found an application in churches in the Netherlands, where systems with HD video mixers, PTZ HD cameras, LED screens and cameras are installed and used. All of these devices must be extremely user-friendly and easy to operate, as they are operated by church volunteers. To do so, the designers used Foxtrot CP-1016 central module to control such a system.

All songs, Bible verses, presentations and live cameras are displayed on several LED screens inside the church and are also transmitted over the Internet. From the technical point of view this mean that cameras are connected to an HD video mixer and after the image is processed it is sent to displays and to other devices. The application also includes a master control page where the user may turn on and off all individual devices with a single press of a button – thanks to the internal macro function. Cameras and videomixer may be controlled manually or in a semi-automatic mode. The web application runs on iPad and iPad mini and may be controlled by church volunteers from any location in the church.

The system has already been installed in the Netherlands in a number of churches, for example in the town of Vriezenveen, Gramsbergen and Piershil. Many other projects are also being developed.

The Netherlands | Tecomat Foxtrot

Command vehicles designed for the Fire and Rescue Service of Port of Rotterdam

Our Dutch customer B&R Design B.V. was approached in 2012 by Cosmo Truck and asked to create a monitoring and control system for command vehicles used by the "Port of Rotterdam" fire brigade. The customer ordered three DAF command vehicles - two with complete communication and computer system to handle and manage rescue operations and one for the staff of the individual rescue units.

These vehicles are used in rescue operations at the Port of Rotterdam and provide a mobile operating space for all rescue services - fire brigades, police, paramedics, port service. Thanks to these mobile command vehicles, it is possible to combine the management of rescue operations directly at the scene of the accident. Vehicles are equipped with 42 sensors which monitor various parts of the vehicle, such as all moving parts - retractable antennas, satellite antennas, doors, stairs and storage space - everything is monitored by our Tecomat Foxtrot system. Only if all sensors are in a safe position Foxtrot system will allow the vehicle to go for rescue mission. In addition, Foxtrot also controls the vehicle's air conditioning, ventilation and heating system, Victron backup power supply, Fisher Panda power generator, access system equipped with IP cameras and also the level of diesel fuel in tanks.

Slovakia | Tecomat Foxtrot

Controlling air tunnel technology in a certification testing laboratory

Slovak company Fires s.r.o. is an authorized institute which performs certification, testing and inspection services required to demonstrate conformity of construction products and hole fillings with applicable fire safety requirements. Qualified, impartial testing and evaluation protects lives, health and property of end consumers who use the evaluated products and carry out the relevant processes. The company has many customers not only from Slovakia, but also from many European countries. Our partner company SLOVTECO s.r.o., has installed our Tecomat Foxtrot control system at the company's headquarters to control and manage functions of an air tunnel. Tecomat CP-1004 with expansion modules IB-1301, OS-1401, 3 x IT1601 and IT1602 was chosen as the central unit. Tecomat Foxtrot PLC controls the speed of two independent motors which drive the propellers in the chamber and the motor in the tunnel. Controlling the engine speed in the tunnel regulates the air flow, which is measured at the exit of the tunnel at nine points. The second motor regulates the air pressure in the chamber. Foxtrot uses thermocouples to monitor the ambient air temperature and the air temperature in individual pipes. The measured values are sent from the PLC via the Ethernet interface to the control station, where they are displayed using Reliance 4 SCADA / HMI system. The mass air flow for the individual pipes is calculated from these values. Based on the calculation results it is determined whether the tested product has passed the test and conforms with requirements or not.

CR | Tecomat Foxtrot

Controlling technologies in Permonium amusement park

Foxtrot plays an interesting role and integrates the following:

- Creates interactive management and supervise the park's attractions. Transforms the vision of the authors of the Magic Permon game into the IT world and creates an interactive player interface. The objective of the game is to find the correct code in the park and enter the correct code in the terminal and move on and fulfil other tasks. Interconnect the game with the park accesses (entrances) and with the cash register and the restaurant.
- Provide as simplest control system as possible, so players and operators can easily understand and use the system
- Robust and stable system which offers the possibility to change and expand the system.

A configuration and administration system has been developed to allow for an intuitive understanding and individual creation of game routes. Added graphical user interface for route editing and also an interface that can be used to enter players into the game directly at the box office. The unit is designed as an open SW server-client programmed in PHP. With small modifications this system may be applied in other parks and may be used to create other stories or routes. The basic requirement is a server built on Linux with a database where the route data and the online statuses of players are stored. This gives the operator a perfect overview of the player, e.g. whether the player has entered the correct codes. RFID contactless system 125kHz was installed to manage player identification, access to the park and the restaurant ordering system. This solution has interconnected everything and the customer may use one chip for everything.

In order to display communication information to players, 10" touch tables turned out to be the most suitable solution. Tablets communicate with the server over the local area network. Contactless RFID readers used in game kiosks are connected to Foxtrot system via RS-485 bus. Foxtrot identifies the player participating in the game and communicates with the game server if necessary. Kiosks installed in the park are connected to the server online, and if a specific kiosk is required to display the task, the kiosk displays the required page. Based on the activated programme or input Foxtrot activates outputs - individual attractions. Foxtrot also receives information from the server instructing Foxtrot to run some subroutines. Web interface allows the operator to check the status of the relevant attractions, manage them and adjust them according to the operator requirements.

CR | Tecomat Foxtrot

Monitoring of experiments in the Josef gallery

Since 2007, the Centre for Experimental Geotechnics of the Faculty of Civil Engineering of the Czech Technical University in Prague has been operating a unique workplace - Underground laboratory called Josef. The laboratory is used to teach university students, but also to prepare and implement domestic and foreign research projects in cooperation with the relevant business sphere. It was the staff of the Technical University of Liberec who installed the Foxtrot system in this laboratory (Mezilab) for on-line monitoring and for remote controlling of 2 experiments - heat dissipation (propagation) in granite massif and pumping tests.

Among other things, Foxtrot here clearly demonstrates the advantages that might not be visible and obvious at first glance. The system, which includes a circuit breaker, current breaker and a small power supply unit and fits into a small standard box that provides high level of protection while performing the required measurement and while also allowing the operator to remotely control the experiment via web pages generated by Foxtrot's built-in WEB server, also processes images from IP camera. When you use system that is so versatile all you need is a simple connection to a standard LAN network with IP cameras connected to the Internet - as implemented here in the Josef gallery, or connected directly to a router which has access to the Internet – for example wirelessly via GPRS / EDGE / 3G network.

100 years of Teco history

The historical roots of Teco company – that is an overview of its predecessors who demonstrated how individual companies followed and built on the previous ones, have been presented in our documents only in the form of a dates that define major milestones. This time, on the occasion of the hundred-year anniversary of the establishment of the first electrical engineering company in the Czech Republic by Bohuslav and Karel Prchal, let us show you the history in pictures as well. We were able to found a lot of information thanks to the efforts and care of an archiving clerk Jaroslav Pejša who works for the Kolín Archive.

Pic. The company founder - Bohuslav Prchal – In 1933, a newspaper called "Polabská Stráž" published a full-page article on the occasion of Mr. Prchal's 50th birthday. The article contained many interesting facts and information. Both brothers started in May 1919 with their cousin Karel in a small workshop located on Tyršová street.

Pic. A second building where the company B.K.Prchalové & spol operated. The Prchal's brothers built the building and in 1921 they moved in. The picture is from 1930. The building is still there at 245 Benešova street and is known as the Blue Point.

Pic. The building, which is today located at Havlíčkov 260, was bought by the Prchal's company from a former shoe factory. The entire company moved to the newly bought building in 1932. At that time the company was already know as Prchal, Ericsson & spol.

Pic. Through a merger with L.M. Ericsson Telefonaktiebolaget where Czech shareholders owned the majority of shares, the company in Kolín was given the opportunity to "produce patented world-famous systems of automatic telephones and switchboards of the Ericsson model". The ad is from 1937.

Pic. After 1945, the entire company was nationalized and it operated as Tesla Kolín until 1993. The original building no. 260 was known as the M1 and was reconstructed several times.

Pic. During the period of the existence of Tesla Kolín, the company located in the area called na Havlíčkově 260 has expanded into other buildings. In 1975, a high-rise building M6 (on the left) was built where electronics were assembled. During the company greatest era, Tesla Kolín had approximately 2,500 employees who worked in various and all branches throughout the country.

Pic. Teco a.s. occupied one and half leased floor in the M6 high-rise building for 25 years, from 1993 to the end of 2017. During this time, the number of employees has stabilized and remained at around 85.

Pic. The new Teco a.s. building is situated 1.4 km eastwards from the original building. You can find us now in the Šťáralka Industrial Zone. The view from the drone shows that the building was built on a green field – and it took only 8 months. Although the appears as gray-silver technical structure, the new building actually is green. The building gets 50% of its energy needs for heating and cooling from renewable sources - from twelve deep wells on its own land. It also collects rainwater that falls on its roof and stores it in a tank underneathg and then uses the water for irrigation or flushing. It has been in full operation since the end of November 2017 - three weeks after the entire company has moved in.

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