Teco Introduction

Control systems for Buildings,
Processes, Machines, Transportation
and IoT

TECO
Advanced Automation

Introduction of company Teco a.s.

Dear customers

Let us introduce ourselves:

Teco a.s. (join-stock company) as a Czech company offers you 40 years' experience with development and production of control systems for machines, processes, buildings and transport.

Our control systems have been reliably working in more than 30 countries worldwide. Due to our constant development in accordance with the newest technologies our products allow effective control and automation at the highest level.

We are one of leading Czech producers of PLC control systems (Programmable Logic Controller). We develop, manufacture and test systems according to international standard IEC EN 61131.

We guarantee long-term lifetime of our products, compatibility of control systems and full technical support. We manufacture spare parts for each system at least 10 years after finishing manufacturing of each control system generation.

We ensure high quality of our products and manufacturing processes in accordance with EN ISO 9001 standard. We also achieve the highest quality with consistent product testing in own test facilities.

We reach permanent innovations by our strong development team and manufacturing capabilities. It allows us to hold long-term compatibility of all our control systems.

We are a member of company group that contains the development, manufacturing, distribution and application capabilities: GEOVAP (SCADA/HMI Reliance development) – Teco (PLC development and manufacturing) – Proteco (engineering, system integration, project applications) – Tecont (engineering, system integration, project application).

We deliver our products on the market through applicators, system integrators, design and distribution companies.

We provide to our customers a consulting, advising, technical support and hotline services.

We regularly train our customers, application and design companies and system integrators.

TECO Advanced Automation

Milestones of the company

- 1919: B. K. Prchalove – telephone and telegraph device manufacturing
- 1934: Prchal-Ericsson & Co. – automated telephones and telegraph switchboards manufacturing
- 1945: Integration of Prchal-Ericsson & Co. into TESLA company
- 1966: Development and manufacturing of the first NC control system
- 1976: Development and manufacturing of the first generation PLC control system
- 1989: Development and manufacturing of new generation PLC under the name Tecomat NS940
- 1993: Teco foundation from Industrial Automation Division of TESLA company, beginning of new control system Tecomat NS950 manufacturing
- 1994: Transformation of the Teco company to join-stock company
- 1997: Development and manufacturing of Tecoreg regulation systems and Tecomat TC600 PLC series
- 2003: Development and manufacturing of Tecomat TC700 – new generation of modular PLC
- 2007: Development and manufacturing of Tecomat Foxtrot – the latest generation of the compact PLC from Teco

References

Fields of applications

Processes

galvanization lines, chemical and petrochemical industry, furnaces, annealing processes, glass casting, cement works, brick works, concrete plants, vulcanisation, dust exhaust, mills, malting plants, bakeries, breweries, water treatment plants, sewage treatment plants, sanitation service companies, feeding mixture production plants, boiler houses, heat exchange stations, power engineering, switching stations, substations, consumption optimisation, gas distribution

Machines

production lines, presses, compressors, forming machines, separating machines, cranes, winding machines, testers, rolling mills, wood processing industry, meat packing plants, bioreactors, stock control, small water power stations, wind power stations

Buildings

building management, air conditioning, boiler rooms, cogeneration units, biomass combustion, swimming pool technologies, clean rooms, remote control, vizualisation

Transport

tunnel control systems, transportation systems, tractions, telematics, trams, trains, cableways, subways, navigation, variable information systems, changing traffic signs

Key customers, key contracts

- Kapsch s. r. o.
- AŽD Praha, s. r. o.
- Black Sea Terminal (Socar Azerbajdžan)
- ČEZ, a. s.
- PRE a. s. (Pražská energetika)
- České dráhy, a. s. (Czech Railways)
- Ředitelství silnic a dálnic ČR/ Road and Motorway Directorate of the Czech Republic
- Škoda Auto, a. s. Mladá Boleslav
- Třinec Ironworks, a. s.
- Vítkovice–Tube rolling mill, a. s.
- Škoda Plzeň, a. s.
- OKD a. s. Ostrava
- Dopravní podnik hl.m. Prahy, a. s.
- Dopravní podnik města Brna, a. s.
- Aliachem, a. s., o. z. Synthesia Pardubice
- Paramo, a. s., Pardubice
- International Power Opatovice, a. s.
- Small water power plants in the Czech Republic, Slovak Republic, Poland, Germany, Japan
- Jihočeská plynárenská, a. s.
- Plzeňský prazdroj, a. s.
- Pražské Pivovary, a. s., Staropramen
- Budějovický Budvar n. p. České Budějovice
- Pepsi Cola, a. s., Praha
- Obchodní sladovny, a. s., Nymburk
- Master Foods k. s. Poříčí nad Sázavou
- Masokombinát Schneider Plzeň
- Masokombinát Váhala Hustopeče nadBečvou
- Sewage treatment plant in Hranice na Moravě
- Sewage treatment plant in Žďár nad Sázavou
- National castle Karlštejn
- Moravian regional library in Brno
- Panasonic Pardubice
- Swimming pool Ústí nad Orlicí
- Hospital in Přerov
- Ahold ČR, a. s.
- Dalkia, a. s., Ostrava
- Central heating system of town Varnsdorf
- Central heating system of town Bruntál
- Central heating system of town Bystřice nad Pernštejnem
- Central heating system of town Rychnova nad Kněžnou
- Central heating system of town Pardubic
- Nicosia Water Board – Larnaca – Kypr
- Martinská Teplárenská, a. s., Slovensko
- Czech Technical University Praha
- National Gallery Praha
- Visteon Autopal, s. r. o., Nový Jičín
- PAL Kbely
- KM Beta Kyjov
- Cement Hranice, a. s.
- Cableway to Petřín
- Funiculars in the Czech Republic, Slovak Republic, Poland, Russia
- Enika Łódź tramvaje Polsko
- Zakłady Górnicze Rudna – Polska Miedź Polkowice

Foxtrot

Tecomat Foxtrot is a compact modular control and regulation system with powerful processor, mature communications, original two-wires and wireless connection with intelligent electroinstallation elements and peripherals.

Foxtrot in Ethernet network – LAN/WAN/internet

Foxtrot is based on modern and perspective Ethernet communication. There is integrated FAST ETHERNET 100Mbit/s with RJ-45 connector and it enables direct integration of PLC Foxtrot into standard and industrial Ethernet network. On this fast communication line Foxtrot holds up to 6 connections, for instance with software Mosaic, SCADA visualization system, OPC server, graphical touch panel and concurrently answers to 6 web clients questions to built-in web pages.

Foxtrot and extension modules on CIB bus

Foxtrot is perfectly designed to control intelligent electroinstallations and buildings. For this Foxtrot uses electroinstallation bus CIB – Common Installation Bus with guaranteed response between sensor and actuator to 150 ms. For this bus there is available still expanding amount of modules for interiors in the wall switch and sockets leading manufacturers designs, further modules for the installation into electroinstallation boxes, into lights and under covers of other device as well. Finally there are modules for installation on DIN rail into switchboards like circuit breakers etc.

Foxtrot in mobile network GSM/GPRS/EDGE/UMTS/3G/HSDPA

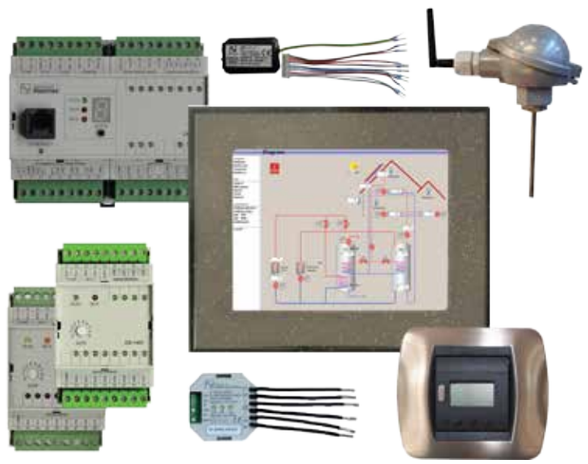
There are two options how to connect Foxtrot into mobile network. The traditional RS-232 connection is used for receiving and sending SMS messages or dial-up connection through AT commands. The progressive way uses GPRS/3G routers connected through Ethernet channel. It allows to use all Foxtrot's tricks, going out of its abilities to communicate direct with IP protocols, like time synchronization with internet servers, direct SQL database storing , internal web pages providing, downloading files stored at high capacity SDHC/SD/MMC cards, sending reports via e-mail etc.

Foxtrot and connecting with audio/video multimedia systems Control 4, Bang&Olufsen and others

Foxtrot is ready to communicate on fast ethernet channel and this allows to connect Foxtrot with nontraditional operator interface – multimedia audio/video systems. One of them is Control 4, another one is Bang&Olufsen. These systems are usually called multiroom systems and allow us to control, choice and distribute audio/video signals from any source to any place. By its control means typical for audio/video they are able to control lights, temperature and safety systems in buildings. And just for these typical functions of electroinstallation, metering, control and electronic safety systems, multiroom systems use Foxtrot for the connection with each element in the building – switch, light, heater, detector etc.

Important features

- High performance
- Modularity
- Installation design („circuit breakers")
- Up to 270 inputs and outputs / 320 modules on CIB bus
- Built-in ethernet, web server, web pages
- On-line programming using Mosaic software
- Possibility of simple parameterization using FoxTool software
- Application software back-up in the internal memory
- Native Reliance 4 SCADA/HMI driver, Tecomat OPC server available
- SD/SDHC/MMC card slot as a high capacity storage mass up to 32 GB
- Support of Modbus RTU/TCP, Profibus DP, CAN, BACnet, HTTP and other standard protocols
- Program and communication compatibility with Tecomat TC700 and older Tecomat types



Tecomat control systems

TC700

Tecomat TC700 is a top powerful modular control system of category PLC according to IEC EN 61131 standards for large scale of middle and large applications in industrial automation, process control, transport or building management systems. In redundancy connection it is perfect solution to applications with increased reliability.

Tecomat TC700 consists of:

- Frames of different size with internal serial bus and connectors
- Power supply with UPS function
- High performance central and communication modules with ethernet communication
- Large scale of peripheral modules for connecting all kinds sensors and actuators

Composition of Tecomat TC700 system:

Variability of Tecomat TC700 system helps user to manage middle complex tasks with modules placed in one frame as well as large systems with many inputs and outputs in multiple racks. If application needs, it is possible to create system with several large racks or large decentralized topology up to 128 modules, where each control node is created by less I/O.
Beside this, there are up to 10 serial communication channels operating in different modes and 2 independent ethernet ports, each with up to 18 independent logical connections in different communication modes.
Central module may operate in redundant connection including power redundancy and communication redundancy.

Important features of Tecomat TC700 system

- High performance and modularity
- CPU redundancy
- Up to 8000 inputs/outputs (analog and digital)
- Ethernet, USB, serial ports
- Web server, web pages
- On-line programming
- Application program back-up in the internal memory
- Software and communication compatibility with Tecomat Foxtrot and older Tecomat systems
- Inputs/Outputs exchange during operation (hot-swap)
- OPC server available
- Remote peripherals connection through optical cable
- Motion control up to 6 axis
- Power supply with UPS function
- Possibility to connect external modules with different kinds of integrated protection and switching circuits
- Modbus RTU/TCP, PROFIBUS DP, CAN, BACnet, HTTP

TC700 and Foxtrot application possibilities

For process control

- Function block libraries for advanced continuous control including auto tune controllers
- Direct connectivity of RTD and thermocouples
- Connectivity of intelligent sensors via HART protocol
- Communication with intelligent probes and analyzers via serial and Ethernet ports
- Frequency converters control via PROFIBUS protocol
- Comfortable debugging and maintenance of applications using a hot swap function of I/O modules or on-line programming
- Remote monitoring and programming through Ethernet/internet
- Redundant connection for the technologies requiring higher operational reliability

For building management systems

- Control of middle and larger technologies for heating, ventilation and air conditioning machine rooms
- Measuring and control of all energy types consumption (Energy Management)
- Integration of the building safety elements (Alarm/Fire-fighting systems)
- Integration of access control systems – doors, gates etc.
- Excellent building processes coordination
- Control optimization ensuring cost savings owing to lower consumption
- Support of TCP/IP and BACnet communication protocols

For machine engineering applications

- Control of up to 6 independent axes in various modes of motion coupling (Motion Control)
- High-speed inputs for a connection of incremental position sensors
- Period, pulse length and phase shift measuring for generator synchronization
- Support for industrial buses via various protocols (PROFIBUS DP, CAN, Modbus RTU/TCP)

For traffic control

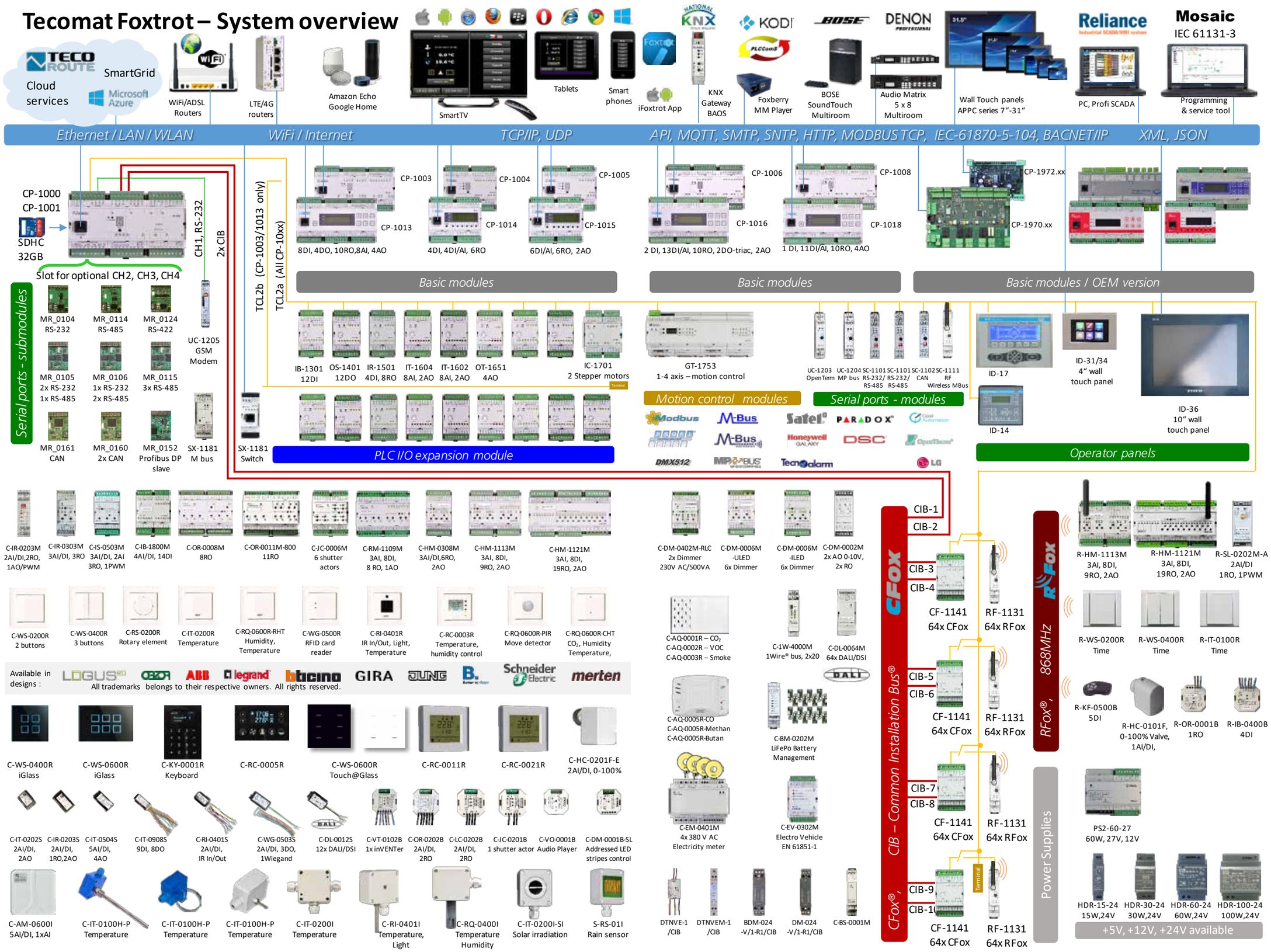
- Mechanical design allowing the operation in the environment with impulses and vibrations
- Enhanced thermal endurance at extreme conditions
- Higher operational reliability thanks to redundancy functions of CPU, power supplies or communication
- Special FSK modems for safe long-distance information transfer (telematics)
- Measuring and control of all energy types consumtion (Energy Management, substations)
- Integration of safety elements of traffic constructions

Tunnel control:

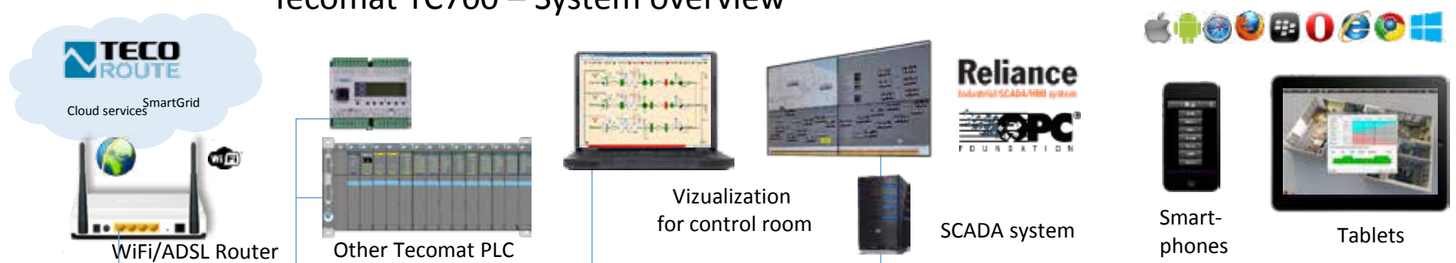
- Variable traffic signs, operational information devices, traffic detectors – speed measurement, vehicles weighing, accommodative and emergency lighting, ventilation, physical quantities measuring – opacity, sound systems, fire-fighting system, SOS announcing point, video supervision signalization

Tecomat Foxtrot

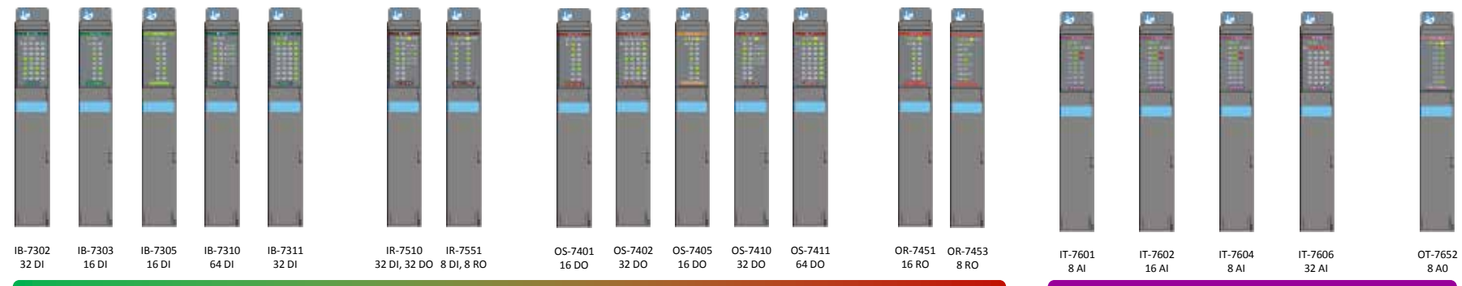
Tecomat Foxtrot – System overview



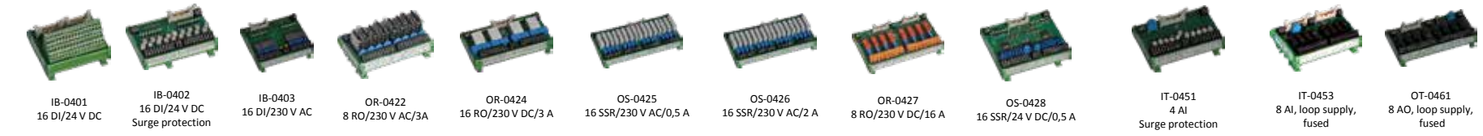
Tecomat TC700 – System overview



Central modules | Communication modules | Communication submodules | Power supplies | Motion control 1-6 axis



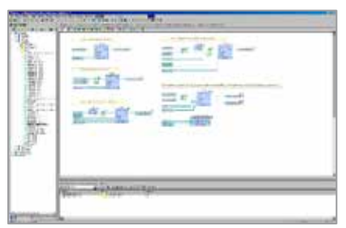
Binary I/O modules | Analog I/O modules



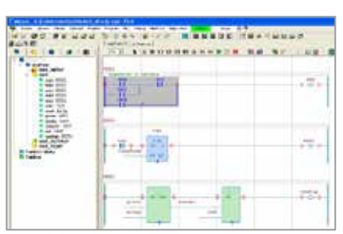
External binary I/O modules | External analog I/O modules

Mosaic – free programming - IEC 61131-3

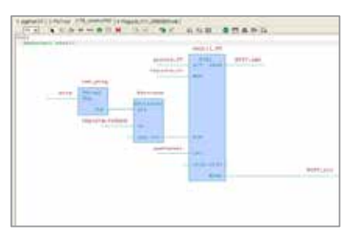
ST – Structured Text



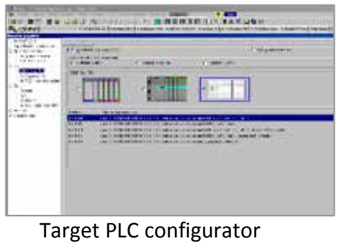
CFC – Continuous Flow Chart



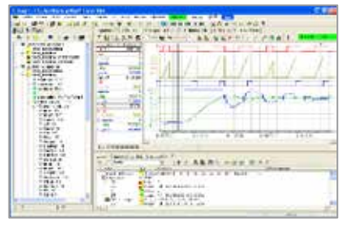
LD – Ladder Diagram



FBD – Functional block Diagram



Target PLC configurator



GraphMaker –signal visualisation

WEB Maker – composer of internal interactive graphic web pages

Firmware Updater

DataLogger

References

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

Certification
in process

Control Systems Tecomat Worldwide

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Certification
in process

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

Software

Mosaic

TECO ROUTE

Reliance
Industrial SCADA/HMI system

Mosaic

Mosaic is a complex development environment for programming of common as well as sophisticated applications of Tecomat systems. Mosaic allows easy creation and debugging of programs, either small or extensive projects involving a large number of control systems or remote I/O modules. Mosaic uses a wide range of modern technologies. The environment architecture and its single instruments respect the IEC61131-3 standard. Mosaic includes tools for creating web pages, operator panel screens, design and PID controller debugging, system diagnostics, data logging etc.

Important features:

- Programming according to IEC 61131-3 standards:
  – IL – Instruction List
  – ST – Structured Text
  – LD – Ladder Diagram
  – FBD – Function Block Diagram
  – CFC – Continuous Function Chart
- Function block libraries
- Project Manager – Project management
- WebMaker – Web page designing
- PanelMaker / GPMaker – for textual and graphical panels screen design
- GraphMaker – diagnostics, graphs
- PIDMaker – PID loop design and debugging
- System and network configuration
- PLCnet – data sharing configuration
- PLC and operator panel simulation
- On-line programming
- Datalogger

TecoRoute

A communication service enabling to connect devices controlled by Tecomat Foxtrot or TC700 to internet without public IP address and without any additional hardware or converter. Devices are securely hidden in local network and are not accessible for attacks from outside. Via this service it is possible to connect devices by user using web browser and for maintenance via Mosaic and Firmware Updater.

Important features:

- Via TecoRoute you can connect Tecomat Foxtrot and TC700.
- Working even at changes in settings and changing of router.
- In mode DHCP Foxtrot connects to TecoRoute automatically.
- Communication with TecoRoute runs via secured protocol.
- Tecomat systems have a unique name and password.
- They can be connected at any time without need of travelling to the place of installation.
- Tecomat systems can be connected conditionally, for instance for maintenance work during the time of maintenance.
- Prices of TecoRoute service are dependent on number of PLC connected under one administration account.
- Users can have different access rights to various PLCs or group of PLCs.
- TecoRoute supports programming in Mosaic, Firmware updater and visualization via WEB browser

Reliance

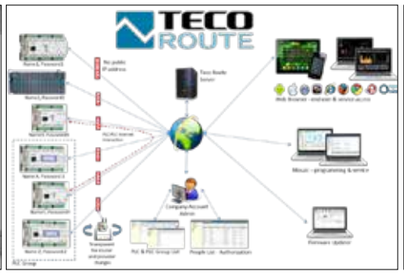
The modern open SCADA/HMI system for real-time monitoring and operating of industrial technologies.
By means of Reliance, it is possible to create graphical user interface between operated technology and the operator. Reliance is high-spectrum, secure and robust system, optimized even for very extensive applications.

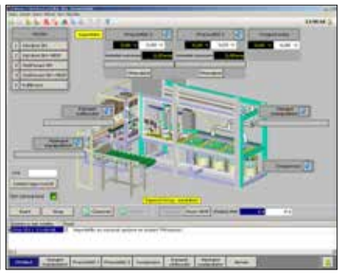
Important features:

- Technology failure minimization via early service warning
- Data flow redundancy
- Subsequent analysis of failure or malfunction
- Continual data access (GSM, internet)
- Easy and transparent development environment
- Range of direct communication drivers
- OPC-client

Basic environment modules:

- Design
- View
- Control
- Control Server
- Server
- Web Client
- Mobile Client





Dealerships

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