

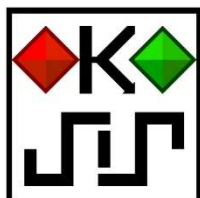


Turbo
SCADA



TurboSCADA

Automation and Control SCADA Software

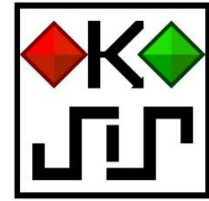


Okosis

Automation and Control Systems
Industries and Commercial Corporation

Introduction

Okosis Automation and Control Systems

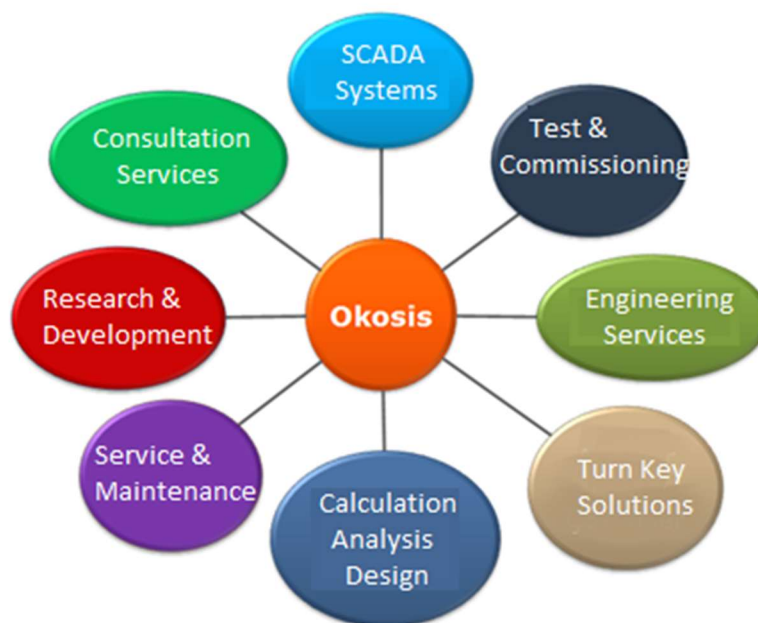


Okosis Automation and Control Systems Company provides consulting, analysis, design, installation, testing and commissioning, technical support and maintenance services in Automation and SCADA systems.

We began our business with the goal of using our technical know-how and experience in Automation and SCADA systems to produce great solutions that meet the highest level of global standards for our valuable clients.

Our innovative and dynamic team has been successfully completed a wide range of domestic and international projects, thanks to great experience and know-how of specialists besides young and dynamic engineering team.

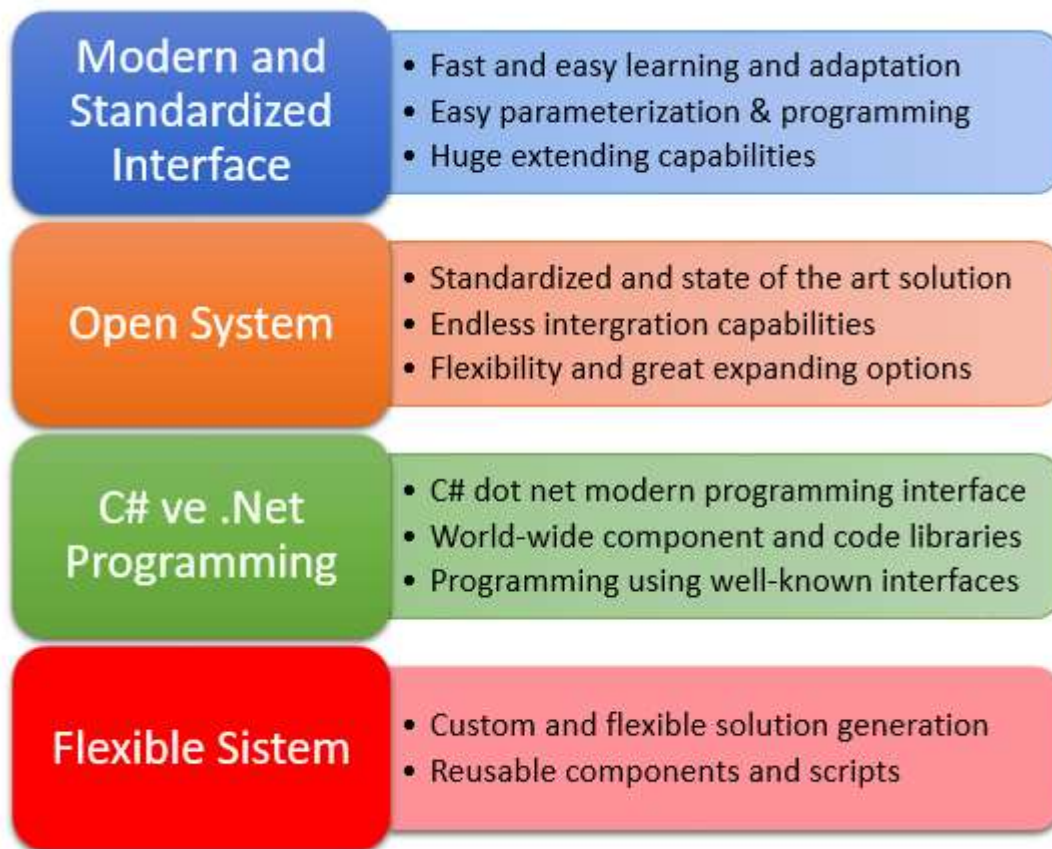
Okosis focused as well in Research and Development of SCADA Systems, Communication Protocol Applications, Automation and Control Systems, Remote Monitoring Systems to create customer oriented solutions to maximize the usage of great opportunities of today's edge technologies.



TurboSCADA

Automation and Control SCADA Software

TurboSCADA is a modern SCADA Software which provides efficient interfaces that allows remote monitoring, visualization and controlling of systems.



User friendly **Modern and standard Interfaces** provides fast and easy learning of designing, parameterization and programming of TurboSCADA system. **Open System** features provide standardized and rich integration and expansion possibilities. **C# .Net Programming** provides integration possibilities thanks to easy to find and widely used and preferred code libraries and component pools. **Flexible System Architecture** provides the ability to easily develop and reuse user-specific custom solutions which accelerates and simplifies project generation.



Highlights

General Features

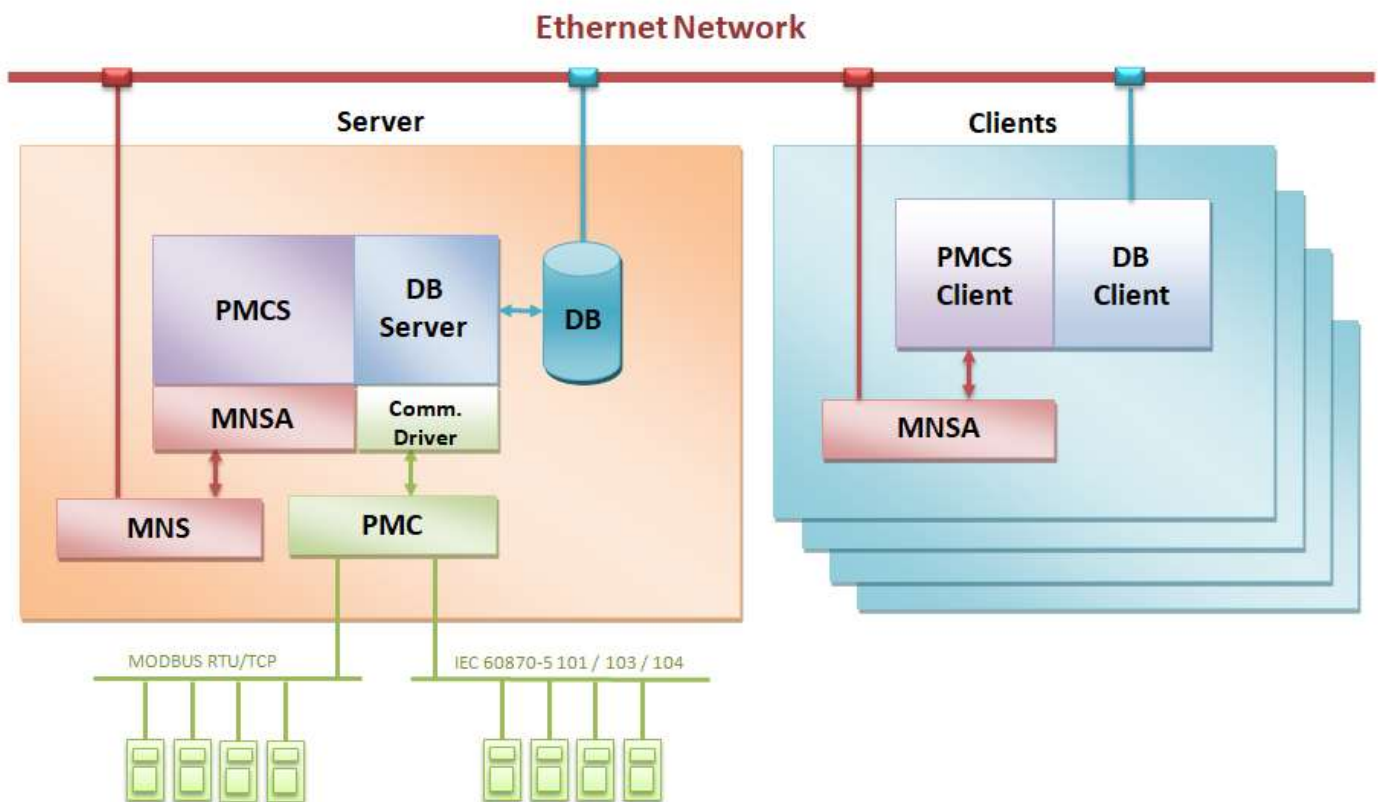
- Flexible monitoring and control options via graphical displays
- Detailed presentation of events coming from the field to the screen
- Ability to save and archive field data in an open relational database
- Graphical and report presentation of current and recorded values
- Control possibilities via remote control and control screens
- Easy communication configuration, fully integrated SCADA interface
- Remote monitoring and control of data collected via communication with various field devices (Relays, analyzers, PLCs, RTUs, etc.)
- Broad communication possibilities as:
 - IEC 60870-5-101 / IEC 60870-5-103 / IEC 60870-5-104
 - Modbus RTU / Modbus TCP
- OPC server and OPC Client integration
- Online and web presentation opportunities via Web Server
- Easy to use modern Windows Operating System
- Compatibility with standard computer hardware and software
- Strong and rich user authorization options
- Easy licensing with product codes / key codes

Special solutions for Energy Automation Systems

- Dynamic Single Line Diagrams and automatic Line Coloring features
- Remote monitoring of various energy data and continuous recording to the relational database (energy, power, current, voltage, etc.)
- Detailed examination and evaluation of faults via time-tagged event and alarm lists with 1ms resolution
- Preparation of energy quality analysis and reports, easy integration with TEIAS system, automatic transmission of detailed info and reports
- Optional Load Shedding and Load Management systems
- GPS time synchronization and transmission of data with time tag
- Provider independent operation, flexible and open configuration

SCADA Architecture – Standard Configuration

TurboSCADA software in The **Standard Configuration** works in a system architecture which consists of a server and multiple client computers. In this configuration, server computer executes several tasks as data collection, storing, web presentation, serving data to the client computers.



PMCS: Power Monitoring and Control SCADA

PMC: Power Monitoring Control drivers

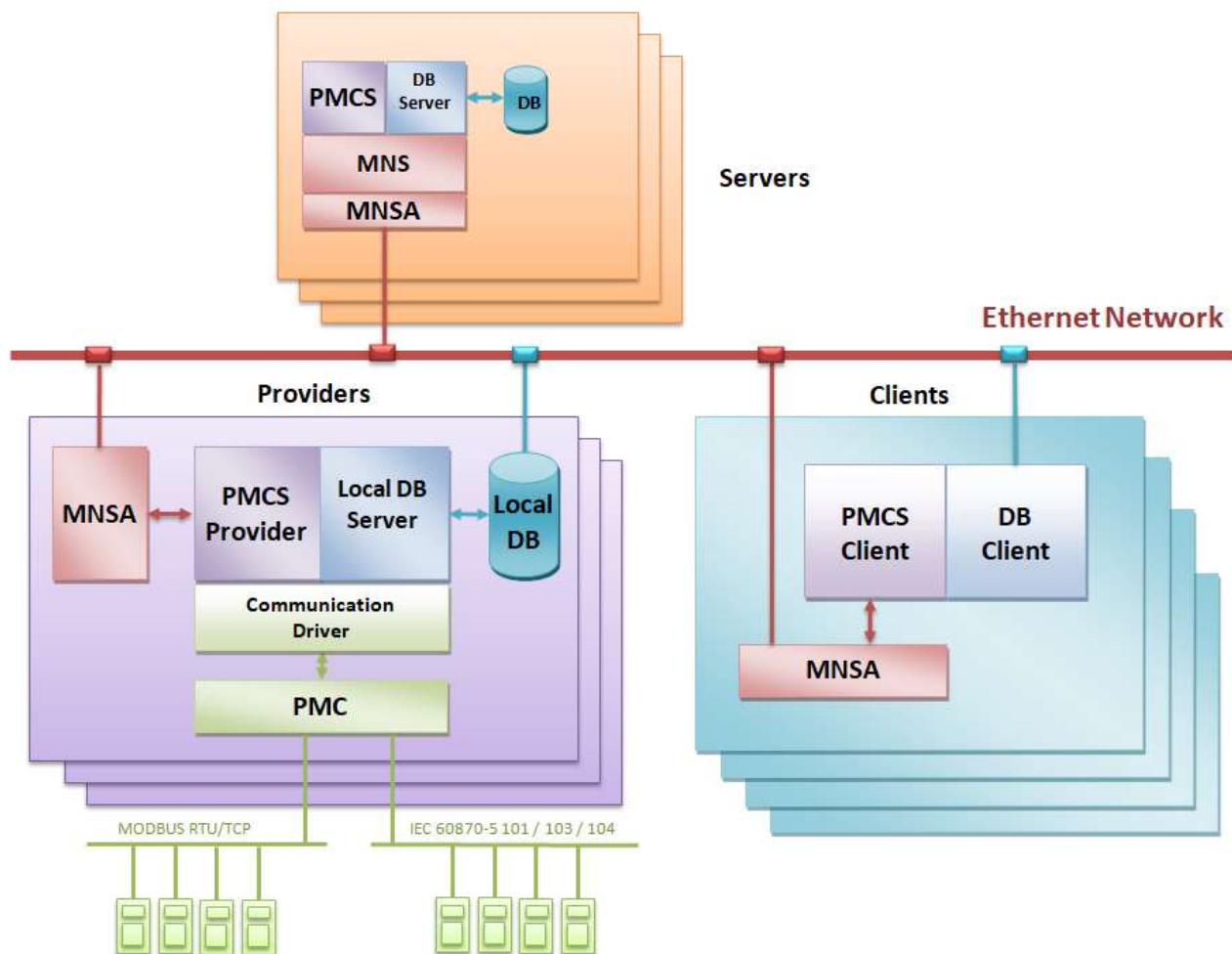
MNS: Multi Network Server

MNSA: Multi Network Server Agent

DB: Database

SCADA Architecture – Redundant Configuration

TurboSCADA software in The **Redundant Configuration** is executed in a network architecture which consists of multiple servers and clients. In this configuration, server computers run redundantly and according to the priority configuration the relevant server takes the responsibility.



PMCS: Power Monitoring and Control SCADA

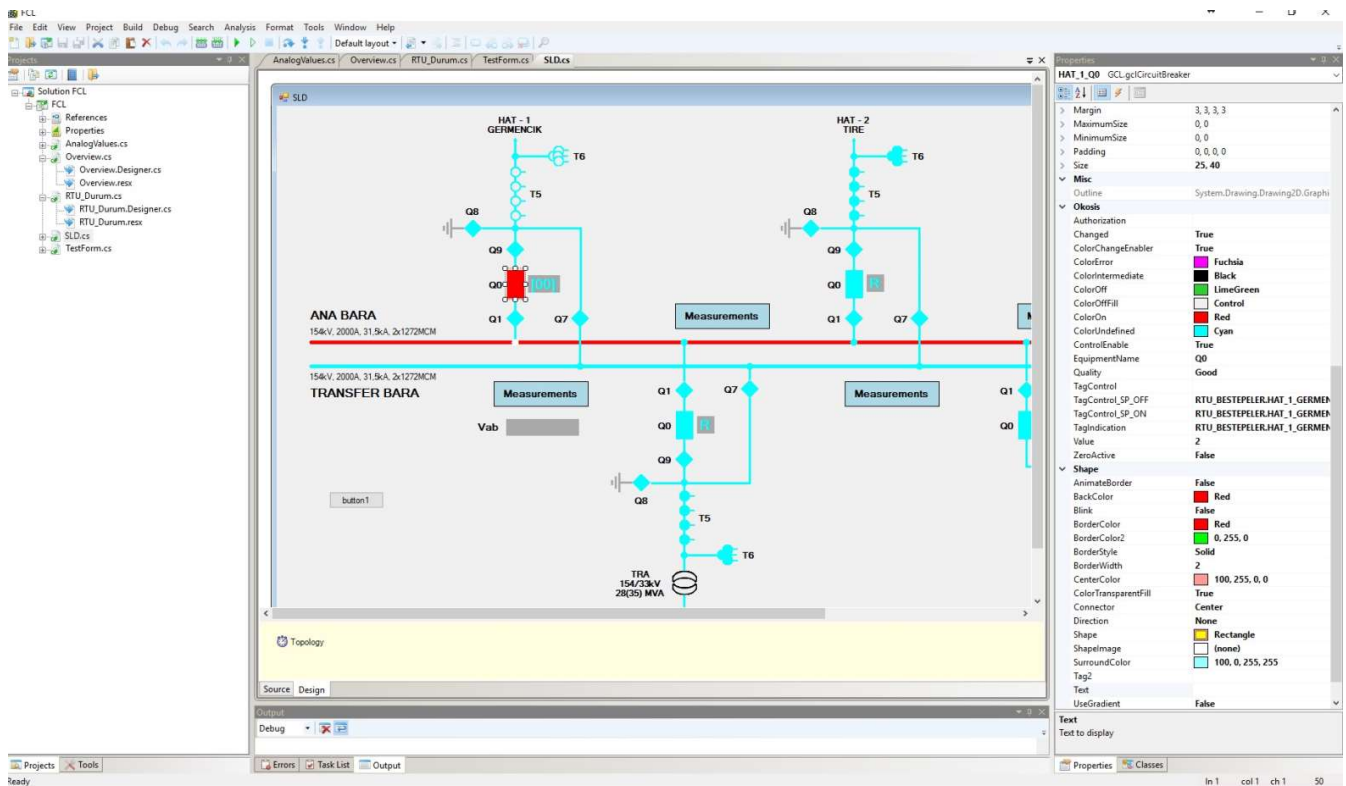
PMC: Power Monitoring Control drivers

MNS: Multi Network Server

MNSA: Multi Network Server Agent

DB: Database

Graphic Display Design and Programming

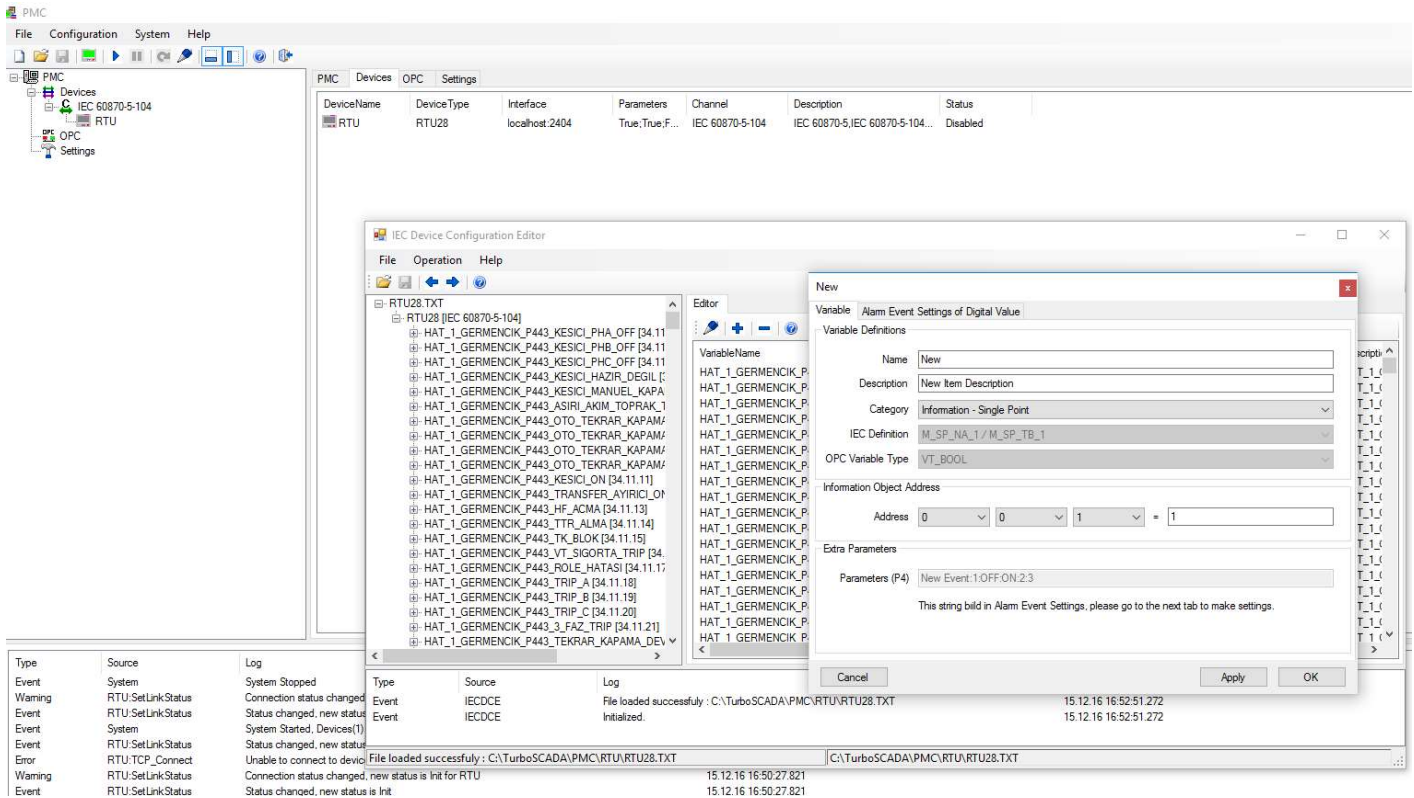


TurboSCADA software has been developed using modern software techniques and infrastructures. It provides modern and easy-to-use design interfaces to create SCADA graphical interfaces. SCADA pages can be easily created and saved in the project file for later use via objects and property screens in the TurboSCADA object menu. It is easy to write custom user codes behind the pages and properties of the graphical components using modern and powerful C# (C Sharp) programming language.

Some of the prominent features of the design interface are listed below:

- User-friendly and modern SCADA page design interface
- Create and save pages quickly using pre-defined objects
- Complete and easy integration with comm. configuration interfaces
- Coding using modern & powerful C # (C Sharp) programming language
- Ability to create unlimited pages and coding and save them as projects
- Ability to use universal C sharp libraries and code fragments

Communication Interface And Configuration



TurboSCADA PMC software provides access to various communication protocols such as **IEC 60870-5-101 / IEC 60870-5-103 / IEC 60870-5-104** and **Modbus RTU / Modbus TCP** through their own interfaces by introducing communication channels. Besides, it is capable of various expansion capabilities compliant with modern open system principles via OPC Server and OPC Client interfaces.

Provides user-friendly functionalities as given below:

- Easy parameterization, thanks to user friendly Tag Management screens in the communication configuration interface
- Easy and fast system configuration through integrated communication driver and SCADA graphic design.
- Define devices as prototypes once and re-use them easily in all of your future projects, no need to redefine again

Control Screens

Welcome Pages Trends Alarm & Events System Exit

Overview SLD RTU_Durum **Hat_1_Germencik** Hat_2_Soke Trafo Transfer BBP Istasyon

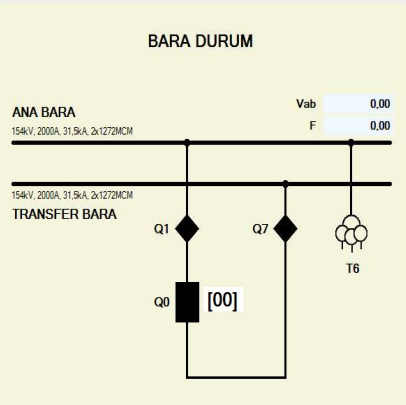
HAT - 1 GERMENCİK

BARA DURUM

ANA BARA
154kV, 2000A, 31.5kA, 2x1272MCM

Vab: 0,00
F: 0,00

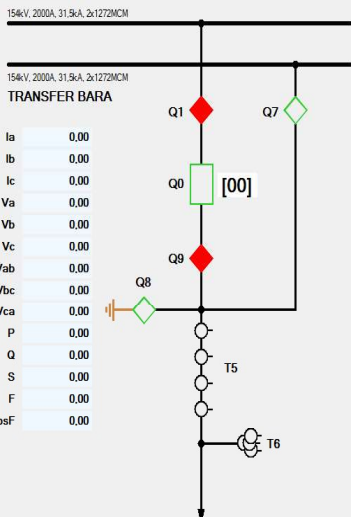
TRANSFER BARA
154kV, 2000A, 31.5kA, 2x1272MCM



154kV, 2000A, 31.5kA, 2x1272MCM

ANA BARA

TRANSFER BARA



Q1 Q7
Q0 [00]
Q8 Q9
T5 T6

la: 0,00
lb: 0,00
lc: 0,00
Va: 0,00
Vb: 0,00
Vc: 0,00
Vab: 0,00
Vbc: 0,00
Vca: 0,00
P: 0,00
Q: 0,00
S: 0,00
F: 0,00
CosF: 0,00

P443

KESICI PHA OFF	RÖLE HATASI
KESICI PHB OFF	TRIP A
KESICI PHC OFF	TRIP B
KESICI HAZIR DEĞİL	TRIP C
KESICI MANUEL KAPAMA	3 FAZ TRIP
AŞIRI AKIM TOPRAK TRIP	TEKRAR KAPAMA DEVREDE
OTO TEKRAR KAPAMA OFF	ZZ TRIP
OTO TEKRAR KAPAMA 1 PH	TRIP
OTO TEKRAR KAPAMA 1+3 PH	FAZ UYUŞMAZLIĞI BLOKAJ
OTO TEKRAR KAPAMA 3 PH	Z3 TRIP
KESICI ON	SENKRONİZASYON OK DEĞİL
TRANSFER AYIRICI ON	GENEL ARIZA İZLEME
HF AÇMA	TEKRAR KAPAMA
TTR ALMA	MESAFE KORUMA TRIP
TK BLOK	HF GÖNDERME
VT SIGORTA TRIP	HF BAŞLATMA

F650

MOTOR ARIZA	TOPRAK AYIRICI ON
SF6 MEKANİK BLOKAJ	RÖLE HATASI
SF6 BASINÇ DÜŞÜK	SENKRONİZASYON İZNI
YAKIN VEYA OFF POZİSYONU	GENEL TRIP
AŞIRI AKIM KORUMA GERİLİM TR. SIG. TRIP	FORWARD INS. ALARM
MESAFE KORUMA GENEL TRIP	TOPRAK TRIP
KESICI TRIP İZLEME HATA	FAZ TRIP

RTU IOM

TRANSFER İZİN	AYIRICI LOKAL SEÇİLİ
ANA BARA-HAT AYIRICI KRANK TAKILI	KONTROL PANOSU SIG. TRIP
ANA BARA-HAT AYIRICI ARA POZİSYONDA	RÖLE PANOSU SIG. TRIP
TRANSFER AYIRICI KRANK TAKILI	MB SIG. TRIP
TRANSFER AYIRICI ARA POZİSYONDA	HF ARIZA
AYIRICI MOTOR ARIZA	

ID	Variable	Explanation	Value	DT	Status	Type	Ack	AckBy	AckDT
124	RTU.HAT_2_SOKE_RTU_AYIRICI_MOTOR_A	HAT 2 SOKE RTU AYIRICI MOTOR ARIZA	ON	2016-12-15 14:49:14.507	raised	Alarm			
123	RTU.HAT_1_GERMENCİK_RTU_HF_ARIZA	HAT 1 GERMENCİK RTU HF ARIZA	ON	2016-12-15 14:49:00.407	raised	Alarm			
122	RTU.HAT_1_GERMENCİK_RTU_MB_SIG_TRIP	HAT 1 GERMENCİK RTU MB SIG TRIP	ON	2016-12-15 14:48:40.737	raised	Alarm			

Visual presentation of the equipments is done on TurboSCADA control screens and remote control option is provided through these screens.

The following information can be displayed on the control screens:

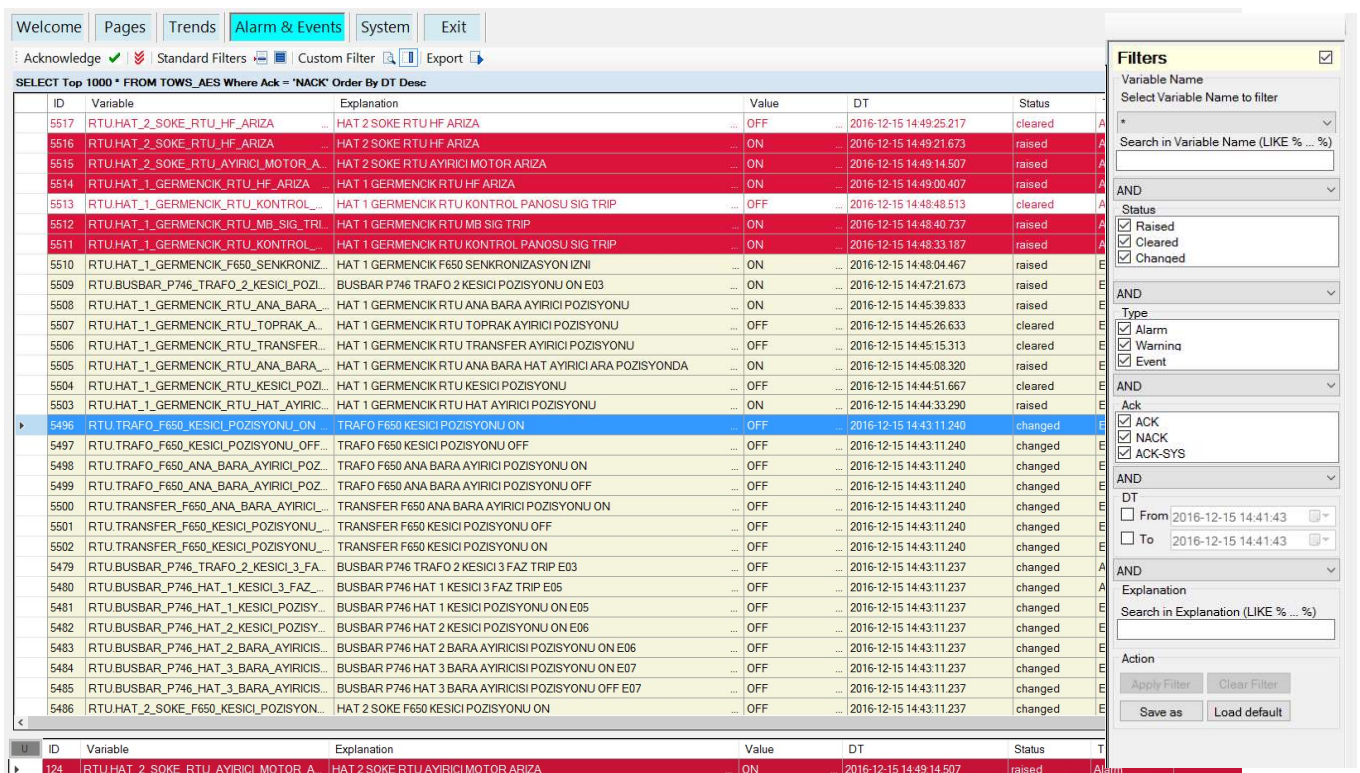
- Automatic line coloring according to the bar voltage values
- Instant display of analog data effectively
- Instant display and control of breaker and breaker positions
- Display of instantaneous position and status of warning signals
- Design the screens once and re-use them easily in all of your future projects, no need to redesign again

Alarm and Event Management

TurboSCADA Alarm / Event screens and all events occurring in the field are shown with **1 ms resolution time stamps** and **listed chronologically**. Information displayed on the alarm / event screen can be easily defined through the settings in the communication configuration software.

Some of the features offered by the alarm screens are given below:

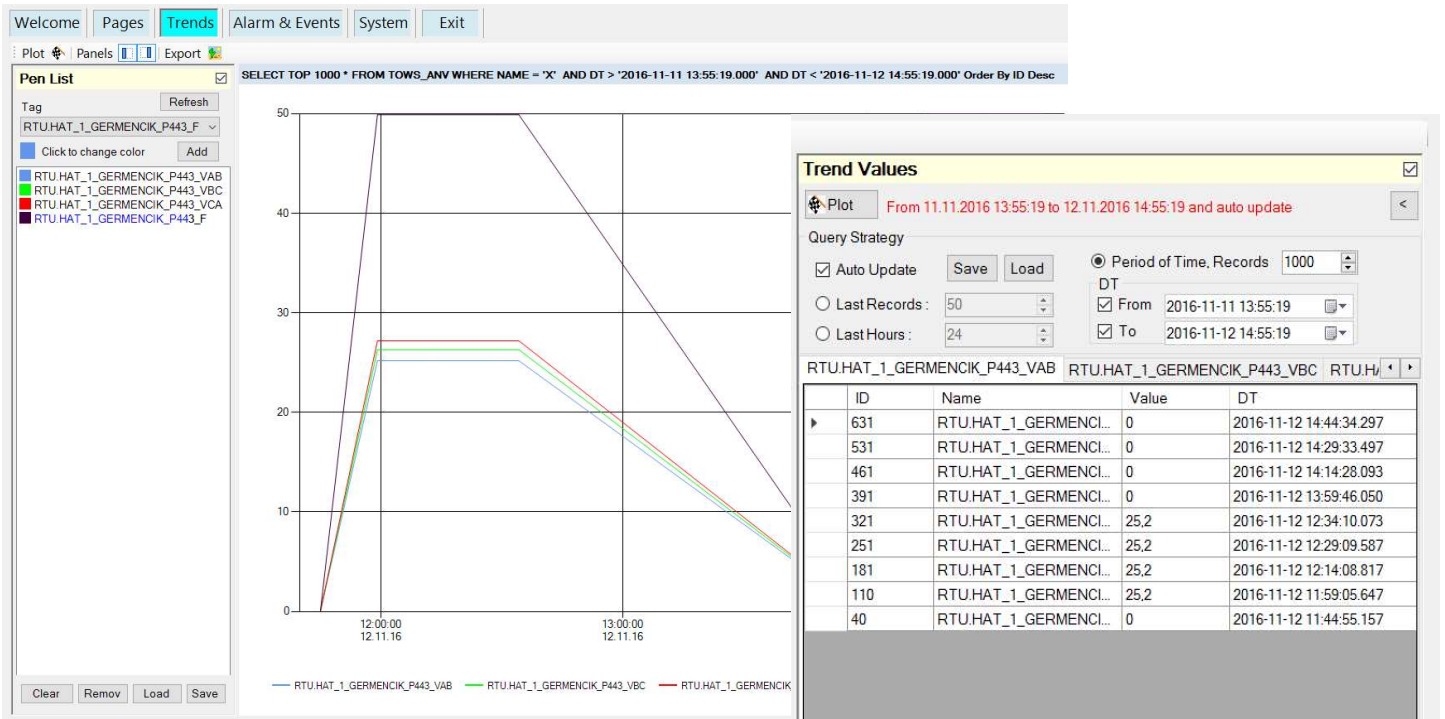
- Events and alarms that are continuously archived
- Chronological ordering of information with accuracy in milliseconds
- Enhanced singular / multiple acknowledgment capabilities
- External recording in XML format of requested alarm records
- Detailed filter screen for finding the desired alarm record
- Alarms with different visual features according to different alarm levels



The screenshot displays the 'Alarm & Events' interface. At the top, there are navigation tabs: Welcome, Pages, Trends, Alarm & Events (selected), System, and Exit. Below the tabs, there are icons for Acknowledge, Standard Filters, Custom Filter, and Export. The main area shows a table with columns: ID, Variable, Explanation, Value, DT, and Status. The table contains numerous rows of alarm records, with some highlighted in red (e.g., ID 5517, 5516, 5515, 5514, 5512, 5511, 5510, 5509, 5508, 5507, 5506, 5505, 5504, 5503, 5496, 5497, 5498, 5499, 5500, 5501, 5502, 5479, 5480, 5481, 5482, 5483, 5484, 5485, 5486). A 'Filters' sidebar is visible on the right, allowing users to filter by Variable Name, Status (Raised, Cleared, Changed), Type (Alarm, Warning, Event), Ack (ACK, NACK, ACK-SYS), DT (From/To), and Explanation. The bottom of the screen shows a partial view of the table with ID 124 selected.

ID	Variable	Explanation	Value	DT	Status
5517	RTU.HAT_2_SOKE_RTU_HF_ARIZA	HAT 2 SOKE RTU HF ARIZA	OFF	2016-12-15 14:49:25.217	cleared
5516	RTU.HAT_2_SOKE_RTU_HF_ARIZA	HAT 2 SOKE RTU HF ARIZA	ON	2016-12-15 14:49:21.673	raised
5515	RTU.HAT_2_SOKE_RTU_AYIRICI_MOTOR_A...	HAT 2 SOKE RTU AYIRICI MOTOR ARIZA	ON	2016-12-15 14:49:14.507	raised
5514	RTU.HAT_1_GERMENCIK_RTU_HF_ARIZA	HAT 1 GERMENCIK RTU HF ARIZA	ON	2016-12-15 14:49:00.407	raised
5513	RTU.HAT_1_GERMENCIK_RTU_KONTROL...	HAT 1 GERMENCIK RTU KONTROL PANOSU SIG TRIP	OFF	2016-12-15 14:48:48.513	cleared
5512	RTU.HAT_1_GERMENCIK_RTU_MB_SIG_TRI...	HAT 1 GERMENCIK RTU MB SIG TRIP	ON	2016-12-15 14:48:40.737	raised
5511	RTU.HAT_1_GERMENCIK_RTU_KONTROL...	HAT 1 GERMENCIK RTU KONTROL PANOSU SIG TRIP	ON	2016-12-15 14:48:33.187	raised
5510	RTU.HAT_1_GERMENCIK_F650_SENKRONIZ...	HAT 1 GERMENCIK F650 SENKRONIZASYON IZNI	ON	2016-12-15 14:48:04.467	raised
5509	RTU.BUSBAR_P746_TRAFO_2_KESICI_POZI...	BUSBAR P746 TRAF0 2 KESICI POZISYONU ON E03	ON	2016-12-15 14:47:21.673	raised
5508	RTU.HAT_1_GERMENCIK_RTU_ANA_BARA...	HAT 1 GERMENCIK RTU ANA BARA AYIRICI POZISYONU	ON	2016-12-15 14:45:39.833	raised
5507	RTU.HAT_1_GERMENCIK_RTU_TOPRAK_A...	HAT 1 GERMENCIK RTU TOPRAK AYIRICI POZISYONU	OFF	2016-12-15 14:45:26.633	cleared
5506	RTU.HAT_1_GERMENCIK_RTU_TRANSFER...	HAT 1 GERMENCIK RTU TRANSFER AYIRICI POZISYONU	OFF	2016-12-15 14:45:15.313	cleared
5505	RTU.HAT_1_GERMENCIK_RTU_ANA_BARA...	HAT 1 GERMENCIK RTU ANA BARA HAT AYIRICI ARA POZISYONDA	ON	2016-12-15 14:45:08.320	raised
5504	RTU.HAT_1_GERMENCIK_RTU_KESICI_POZI...	HAT 1 GERMENCIK RTU KESICI POZISYONU	OFF	2016-12-15 14:44:51.667	cleared
5503	RTU.HAT_1_GERMENCIK_RTU_HAT_AYIRIC...	HAT 1 GERMENCIK RTU HAT AYIRICI POZISYONU	ON	2016-12-15 14:44:33.290	raised
5496	RTU.TRAFO_F650_KESICI_POZISYONU_ON	TRAF0 F650 KESICI POZISYONU ON	OFF	2016-12-15 14:43:11.240	changed
5497	RTU.TRAFO_F650_KESICI_POZISYONU_OFF...	TRAF0 F650 KESICI POZISYONU OFF	OFF	2016-12-15 14:43:11.240	changed
5498	RTU.TRAFO_F650_ANA_BARA_AYIRICI_POZ...	TRAF0 F650 ANA BARA AYIRICI POZISYONU ON	OFF	2016-12-15 14:43:11.240	changed
5499	RTU.TRAFO_F650_ANA_BARA_AYIRICI_POZ...	TRAF0 F650 ANA BARA AYIRICI POZISYONU OFF	OFF	2016-12-15 14:43:11.240	changed
5500	RTU.TRANSFER_F650_ANA_BARA_AYIRICI...	TRANSFER F650 ANA BARA AYIRICI POZISYONU ON	OFF	2016-12-15 14:43:11.240	changed
5501	RTU.TRANSFER_F650_KESICI_POZISYONU...	TRANSFER F650 KESICI POZISYONU OFF	OFF	2016-12-15 14:43:11.240	changed
5502	RTU.TRANSFER_F650_KESICI_POZISYONU...	TRANSFER F650 KESICI POZISYONU ON	OFF	2016-12-15 14:43:11.240	changed
5479	RTU.BUSBAR_P746_TRAFO_2_KESICI_3_FA...	BUSBAR P746 TRAF0 2 KESICI 3 FAZ TRIP E03	OFF	2016-12-15 14:43:11.237	changed
5480	RTU.BUSBAR_P746_HAT_1_KESICI_3_FAZ...	BUSBAR P746 HAT 1 KESICI 3 FAZ TRIP E05	OFF	2016-12-15 14:43:11.237	changed
5481	RTU.BUSBAR_P746_HAT_1_KESICI_POZISY...	BUSBAR P746 HAT 1 KESICI POZISYONU ON E05	OFF	2016-12-15 14:43:11.237	changed
5482	RTU.BUSBAR_P746_HAT_2_KESICI_POZISY...	BUSBAR P746 HAT 2 KESICI POZISYONU ON E06	OFF	2016-12-15 14:43:11.237	changed
5483	RTU.BUSBAR_P746_HAT_2_BARA_AYIRICIS...	BUSBAR P746 HAT 2 BARA AYIRICISI POZISYONU ON E06	OFF	2016-12-15 14:43:11.237	changed
5484	RTU.BUSBAR_P746_HAT_3_BARA_AYIRICIS...	BUSBAR P746 HAT 3 BARA AYIRICISI POZISYONU ON E07	OFF	2016-12-15 14:43:11.237	changed
5485	RTU.BUSBAR_P746_HAT_3_BARA_AYIRICIS...	BUSBAR P746 HAT 3 BARA AYIRICISI POZISYONU OFF E07	OFF	2016-12-15 14:43:11.237	changed
5486	RTU.HAT_2_SOKE_F650_KESICI_POZISYON...	HAT 2 SOKE F650 KESICI POZISYONU ON	OFF	2016-12-15 14:43:11.237	changed

Trend And Graphic Management



TurboSCADA software presents **open architecture** containing **multi servers and clients** besides several **data collecting points** in a harmony.

Tabular and graphical presentation of collected data realized as given below:

- Prepare trend pages that the user can create, customize and save
- Easy interrogation and drawing with a filter window designed to simply filter desired values and draw the trend
- Provides numerical display of data on trend pages drawn at desired intervals and xml output option.
- Enables enlargement / reduction on the trend page.
- Provides option to save trend page as jpeg / bitmap.

References

- **Oyak Renault IT Monitoring System**

TurboSCADA system has been installed and a server system and a web server is used for monitoring and SMS notification with client computers connected in the Oyak Renault, Bursa Nilufer factory.



- **TEİAŞ İkitelli UKM-OKS (Remote Control Center – Event Recording System)**

TEİAŞ İkitelli Remote Control Center acquires data from nine substations GIS SCADA system over ADSL modems. TurboSCADA UKM-OKS server system get data from local SCADA systems installed at substations, Alarm / Event records are received with the MNS Server system and presented via web server.



- **Kubilay JES Substation Automation SCADA System**

As part of the Kubilay JES Energy Automation SCADA system, one TurboSCADA server system and two TurboSCADA Client systems have been installed. One of the clients is used for remote monitoring and the other is used for TEİAŞ reactive power monitoring reporting system.



- **Mehmethan JES Substation Automation SCADA System**

As part of the Mehmethan JES Energy Automation SCADA system, one TurboSCADA server system and two TurboSCADA Client systems have been installed. One of the client systems is for remote monitoring and the other is for TEİAŞ Reactive Power Monitoring Reporting system.

- **Ozmen JES Substation Automation SCADA System**

As part of the Özmen JES Energy Automation SCADA system, one TurboSCADA server system and two TurboSCADA Client systems have been installed. One of the client systems is for remote monitoring and the other is for TEİAŞ Reactive Power Monitoring Reporting system.



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