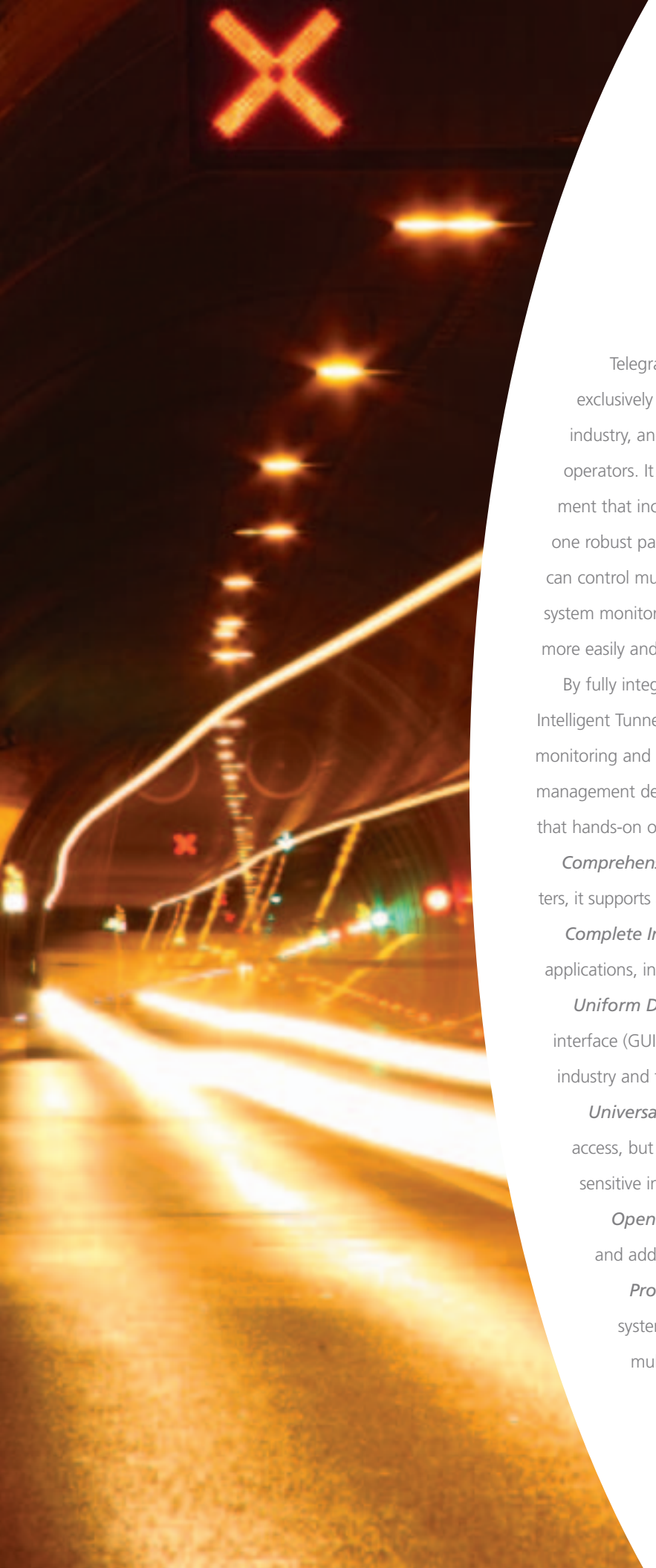
TELEGRA

Smart Traffic Management®

TOP X VIEW™

INTELLIGENT TUNNEL MANAGER™



TOP X VIEW™

Intelligent Tunnel Manager™

Telegra's topXview™ Intelligent Tunnel Manager™ solution is exclusively designed for the Intelligent Transportation Systems (ITS) industry, and specifically tailored to meet the diverse needs of tunnel operators. It is the only comprehensive ITS solution for tunnel management that incorporates all traffic and tunnel infrastructure functions into one robust package. With Intelligent Tunnel Manager, a single operator can control multiple subsystems, including ventilation, fire detection, power system monitoring, video, and communications applications for tunnels, more easily and effectively than ever before.

By fully integrating all installed systems through a single workstation, Intelligent Tunnel Manager offers simple, one-stop control of your tunnel monitoring and management activities. Designed to meet diverse traffic management demands, Intelligent Tunnel Manager has the built-in features that hands-on operators require:

Comprehensive Control Specifically designed for tunnel monitoring centers, it supports all standard applications for control of complex tunnel systems

Complete Integration Integrates all key subsystems required for tunnel applications, including the most advanced video integration in the industry

Uniform Display Presents all systems in user-friendly graphical user interface (GUI) with icons designed specifically for the transportation industry and tunnel operations

Universal Access Gives all tunnel traffic management staff easy access, but offers a hierarchical authorization function to protect sensitive information

Openness Efficient, driver-based system allows easy changes and additions

Proven With more than 20 years of experience, Telegra systems are installed and operating successfully in tunnels in multiple countries throughout the world

DRIVING AUTOMATION FOR THE 21ST CENTURY.

Telegra's Intelligent Tunnel Manager also enables operators to quickly obtain and assess information on road conditions, thereby improving safety and traffic flow in tunnels and on adjacent highways and bridges. These are just a few reasons why Telegra is a leader in tunnel management and the Intelligent Transportation Systems industry.

THE ONE-STOP CHOICE FOR AUTOMATED TUNNEL MANAGEMENT

Intelligent Tunnel Manager has all the key features necessary to automate, analyze and report operations and traffic in tunnels:

Automation Components A wide range of automated, semi-automated and manual scenarios and standard procedures are available

Data Archiving A simple and reliable archiving system can store all relevant data on a hard drive, DVD, CD or other media for future browsing, analyzing and organizing

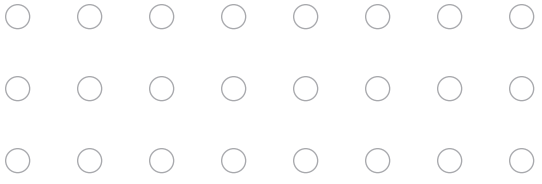
Reports and Graphs Through a database and Web interface, users can access detailed reports concerning all system activities in clear, graphical forms designed according to traffic management process requirements

Accessible Security Telegra's Web interface uses the highest level of security so you can enjoy the benefit of "wherever/whenever" access with the confidence that all critical data is protected

A SINGLE CONNECTION FOR A SINGLE TUNNEL MANAGEMENT SYSTEM

Tunnel managers connect to all systems within the tunnel through the main user interface – the Intelligent Tunnel Manager's central point of interaction. Through a series of drivers, operators control and manage traffic flow, in addition to viewing, analyzing and storing data. As a complete tunnel management ITS tool incorporating all the applications needed for comprehensive traffic management, Telegra's topXview Intelligent Tunnel Manager:

- Integrates data regarding traffic and road conditions in tunnels with data from the local roads, arterial roadways, toll roads, freeways or bridges leading to and connecting with the tunnel
- Controls field devices and subsystems via WAN or LAN by means of fiber-optic, twisted-pair or wireless infrastructure
- Displays real-time data received from field devices and subsystems regarding traffic, road conditions or the operating status and maintenance information of a field device via a graphic user interface
- Uses a software algorithm to supplement data received from field devices and subsystems to disseminate the most accurate information to travelers



INTELLIGENT TUNNEL MANAGER SUBSYSTEMS INTERFACE

The Intelligent Tunnel Manager interfaces with a variety of tunnel and infrastructure subsystems to provide seamless operation of your traffic tunnels. topXview allows complete operational control of critical subsystems such as:

Ventilation

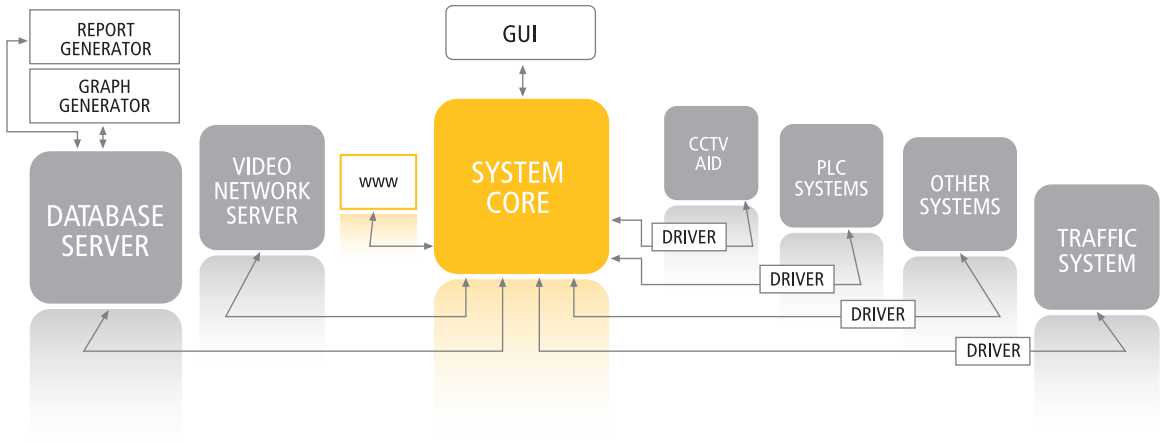
- Controls ventilation equipment installed within tunnels
- Monitors operating status and maintenance requirements in real-time
- Maintains specified fresh air intake within tunnels

Lighting

- Controls lighting equipment installed within and near tunnels
- Controls lighting installed in tunnels
- Monitors operating status and maintenance requirements in real-time

Water Pump

- Controls water pump equipment installed within and near tunnels
- Monitors water levels within tunnels
- Issues alerts if dangerous conditions occur



LED Displays and Variable Message Signs

- Controls sign message data in real-time
- Displays text and images on any size or type of sign, including programmable or variable message signs

Inner Illuminated Signage

- Controls inner illuminated signs within tunnels
- Monitors operating status and issues maintenance alerts

Fire Alarms and Smoke Detectors

- Controls fire alarm equipment installed within tunnels
- Controls smoke detector equipment installed within tunnels
- Monitors operating status and issues maintenance alerts as required in real-time

Power and Power Back-up System Monitoring

- Controls power and power back-up equipment installed within tunnels
- Monitors operating status and maintenance requirements in real-time

Air Quality Measurement and Control

- Controls air quality measuring and controlling equipment installed within tunnels
- Monitors the air within tunnels to maintain specified air quality

Emergency Tunnel Communications

- Interfaces with emergency communications systems within tunnels
- Operates digital recording subsystems
- Engages users with live emergency operator interface

Public Announcement (PA) Systems

- Controls public announcement equipment installed within tunnels
- Stores pre-recorded emergency messages
- Allows emergency operator interface to deliver messages

INTERFACING WITH VIDEO SUBSYSTEMS

The Intelligent Tunnel Manager interfaces with video subsystems to provide operators with real-time video of conditions in and around tunnels, allowing operators to respond swiftly to situations as they occur. The interface includes subsystems such as:

CCTV Systems

- Uses live data input from any type or size of CCTV equipment to produce closed circuit video viewable in real-time in the control center via the graphic user interface
- Operates digital recording subsystems
- Allows emergency operator interface

Automated Incident Detection System

- Receives live data input from any Automated Incident Detection (AID) system and displays data in real-time via the graphic user interface
- Operates digital recording subsystems
- Allows emergency operator interface

License Plate Recognition

- Uses live data input from any installed License Plate Recognition System to display real-time video via graphic user interface
- Operates digital recording subsystems
- Allows emergency operator interface

P/T/Z Camera Control

- Controls video camera equipment displayed on any size or type of sign, including programmable or variable message signs
- Operates single or multiple cameras remotely

COMMUNICATING WITH TRAFFIC MANAGEMENT SUBSYSTEMS

The Intelligent Tunnel Manager interfaces with traffic management subsystems used to manage and operate adjacent roadways and bridges, providing seamless and uninterrupted control of traffic movement. With the topXview Intelligent Tunnel Manager, you can also manage:

Prismatic Message Signs Controls sign message data displayed on prismatic (electromechanical) variable message signs and monitors operating status and maintenance requirements

Traffic Counters and Classifiers Displays and records live data on traffic volume and vehicle classification produced by traffic counters and vehicle classifiers

Weather Station/Road Surface Sensors and Associated Weather Forecast/Warning Systems Receives real-time data input regarding climate related conditions such as rain, snow, ice, mist or fog and posts applicable weather station data on the affected bridge or roadway to alert drivers

Traffic Barriers Operates and monitors traffic control devices used to regulate traffic movement, such as traffic gates or movable barriers

Traffic Signal Heads and Flashers Controls and monitors operating status and maintenance requirements of traffic signalization devices or flashing lights used to regulate traffic movement

Over Height Detectors Controls height detection devices used to monitor and measure vehicles and issues warnings via message signs to non-compliant vehicles

Weigh-In-Motion (WIM) Systems Receives live data input from weigh-in-motion equipment in the field and records truck traffic weight and credential information

Ramp Metering Operates metering devices used on access ramps and controls traffic movement in real-time

Other Traffic Management Centers Connects with other Traffic Management Centers while maintaining all of its capabilities to provide comprehensive Center-to-Center NTCIP operation

PRODUCT SPECIFICATIONS

Certifications	ISO 9001:2000 certification
Communications Interface	Ethernet, GSM/GPRS, Bluetooth, wireless; TLS; RS-232 (any TLS-compliant traffic system)
Database Interface	Server connectivity to worldwide Internet with report and graph generator
Drivers	Both standard and customized available
Functionality	Ergonomically advanced central user interface of traffic management and other roadside systems
Graphical User Interface	WYSWYG-based platform
Hardware Requirements	Windows 2000/XP; 512 MB RAM; Intel Celeron, 2.6 MHz; network ports; serial ports
Internet Interface	Limited to the generation of reports and database access; remote clients are permitted access via secured lines
Main System Components	System core gateway; subsystem drivers, graphical user interface clients; database historian; automation components
Manufacturer Experience	Over 20 years
Message Alert Platforms	Email; SMS; automatic; semi-automatic; manual
Platform Scalability	Unlimited maximum identification numbers of approximately four (4) billion traffic management and control devices of virtually any type or size
Reports and Graphs	Customized to meet traffic conditions and customer requirements
Supported Protocols	NTCIP; MODBUS; ISS AutoScope; various video switches
Supported Systems and Devices	Including but not limited to: ventilation fans; roadway lighting; video cameras; water tanks; environmental systems; security systems; alarm systems; roadside telephone systems; variable message signs; traffic lights; variable speed displays; traffic controllers; barriers; vehicle detectors; weather data; and PLC systems
System Architecture	System core via drivers to database server; PLC systems, traffic systems and other systems
System Requirements	Windows 2000/XP, a minimum of 512 MB of RAM, Intel Celeron 2.6 MHz or better, required hardware interfaces (network, serial ports, etc.)
Traffic Management Features	Including but not limited to interactive algorithm execution and procedural help for operators and maintenance staff
User Application	Ergonomically advanced central user interface of tunnel management and other roadside systems
Warranty	Two years on all software

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European Cerfiticate of Conformity

CE

NEMA

RoHS Compliant

AASHTO

IEEE

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IRF award:

ANSI

TÜV CERT

Quality System According to EN ISO 9001:2000
Certificate Registration No. 04 100 20021575

American Welding Association | ISO 9001:2000 Certification

Telegra is a member of AAAE, AASHTO, ATSSA, IBTTA, IEEE, IMSA, IRF, ITE, ITS America, NEMA, TEAM Florida, TEAM Texas and TRB

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