Fastracs

Advanced Traffic Management System

Fastracs™ by Fortran Traffic Systems Limited, is a centralized, integrated platform for Intelligent Transportation Systems. Based upon the T2000C real-time, second-by-second Traffic Signal Control System, **Fastracs™** provides system control and information management for your intersections and other ITS initiatives. **Fastracs™** provides easy expansion and allows you to add the modules you need as your requirements grow.

Features and Benefits

- Integrated, centralized control, monitoring and management for up to 2,000 devices (e.g. signalized intersections)
- Full spectrum of traffic control modes available: Local, Time-of-Day, Traffic Responsive, and Adaptive (with optional SCOOT module)
- Multi-protocol, multi-media communications supporting intersection control equipment and other ITS devices
- Modular, open architecture design
- Fully zoomable, GIS-based map interface
- Graphical icons for access to traffic system control, database, real-time displays, and reports
- Comprehensive alarm management: generation, notification, and filtering
- Real-time Time-Space Diagrams, MOEs, and an integrated report generator to facilitate decision making
- Multi-user SQL database management system provides data collection, storage, and integration with external applications/systems
- Optimized for Windows 2000/XP

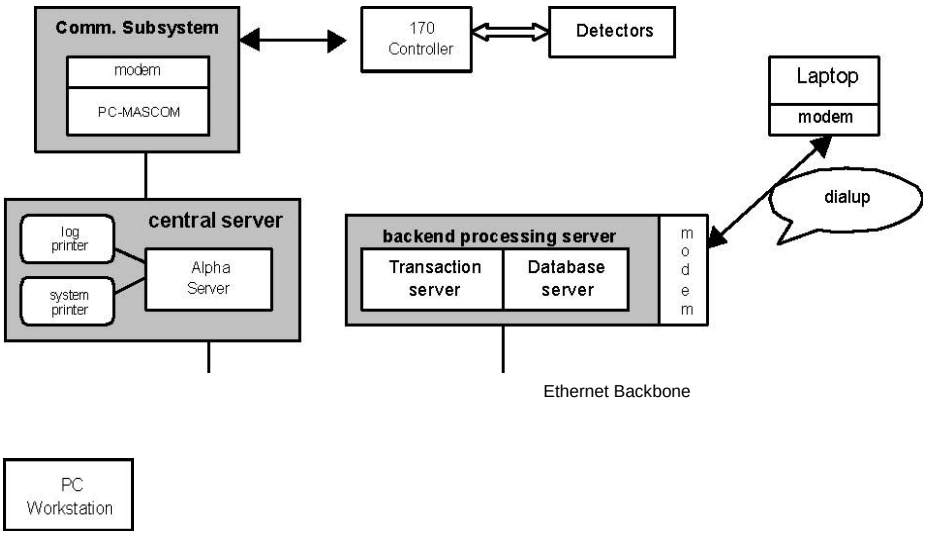
Overview

Fastracs™ is an acronym for **F**ortran **A**dvanced **S**ignal, **TR**ansportation, **A**nd **C**ommunication **S**ystem. It is an Advanced Transportation Management System that represents Fortran's next generation of hybrid central systems. It provides an integrated platform for ITS initiatives including traffic signal control, information management, and graphical data display and manipulation.

Fastracs™ centers around a modular and easy-to-use, map-based graphical user interface (GUI). An intuitive, hierarchical menu system supports centralized transportation management and control of ITS devices (e.g. signalized intersections). The client-server architecture of **Fastracs™** provides improved performance and scalability, including the ability to support a virtually unlimited number of users. The use of standard Intel/Alpha based servers, personal computers, and commercial off-the-shelf software and components allow the system to adapt to changes in technology and the industry. Comprehensive hardware and software maintenance and support ensures that customers are able to capitalize upon these advancements. Support for standard communication protocols (NTCIP) and design flexibility enable **Fastracs™** to be extended to manage other ITS applications and related data with minimal impact on existing system components. Fortran is willing to work with your existing suppliers to provide a truly integrated solution.

System Architecture

Fastracs® is supported across a LAN TCP/IP network for improved performance and architecture flexibility. The use of industry standard Intel (or Alpha) -based NT server hardware combined with standard personal computers, commercial software, and related off-the-shelf components allow the system to adapt to changes in technology and the industry. **Fastracs**® provides easy, incremental expansion with minimal impact on existing components. Each operator workstation has full system access capabilities including your remote dial-in users. By integrating developing standards, such as the NTCIP protocol, **Fastracs**® can easily support numerous controllers types and other ITS hardware. When using manufacturer provided protocols, Fastracs provides cost-effective communication options.



The **Fastracs**® architecture is illustrated above. The **Dedicated Traffic Application Server** provides overall system control and supervision. A **Database/Network Server** is used for system management and data storage. The **Communication Subsystem** includes the **PC-MASCOM** and **modem rack**. The number of PC-MASCOMs required depends on the field equipment requirements and communication network architecture. User interface to the system is provided by **User Workstations** connected to the Traffic Applications Server over the local area network or dial-in facilities.

Each PC-MASCOM supports up to sixty-four (64) communication channels to the field using existing Fortran protocols. Communication protocols support direct or multi-drop channels, and master/slave channels. Communication cost effectiveness can be further improved by using communication concentrators.
The local traffic signal control field equipment can include Peek Transyt 3000 and LMD controllers, and Wapiti W4IKS firmware for 170 controllers, in addition to Fortran RCCU devices. RCCUs have been used to successfully control over twenty brands of controllers including NEMA, 170s, pre-timed, and electromechanical. RCCUs simplify operator tasks by providing a common interface to a variety of controllers while enhancing older controllers by

providing Time-Based Coordination capabilities. In addition, other devices commonly used in transportation management systems can be integrated into a common communication architecture.

Technical Highlights

Overview

- Network-based client server architecture
- GIS-based Map-driven graphical user interface on operator PCs -Windows 2000 or Windows XP user PCs
- OpenVMS Traffic Applications Server
- Supports multiple communication protocols
- Time-proven, solid traffic application software
- Online database changes

Dedicated Traffic Application Server

- DEC AlphaServer running OpenVMS
- Used exclusively for providing traffic application functions
- Controls communication subsystem
  - Up to 8 separate PC-MASCOMs
  - Up to 64 communication channels per PC-MASCOM
- Long-term data storage/retrieval/archive
- Interfaces to SCOOT application server (optional)

Traffic Control Approaches/Models

- Hybrid Central Control
  -Download / Plan selection
- Central Real-Time second-by-second Control/Monitoring
  -Once per second to all intersections
- SCOOT Adaptive Control
  -Adaptive control capability using the SCOOT algorithm
- Distributed Control (TBC)
  -Upload / Download Plans and date/time for local scheduler operation
  -Central override capability
- Traffic Responsive
  Centrally implemented; user-defined equations select plan to be implemented
- Dial-up Remote Upload / Download
  -Local and remote users can dial-up remote RCCUs/controllers directly
- Closed-loop
  -Supports Peek M3000 Masters for closed-loop operation

Traffic Responsive Operation

- User-defined equations define “parameters”
- Selection plan decisions made based on value of parameters
- Supports alternate detectors in case of system detector failure
- Intersection Control Modes
- Central Control
  -SCOOT Adaptive (Optional)
  -Traffic Responsive
  -TOD Scheduler
  -Route Pre-emption
- Remote (TBC) Control
  -TOD Scheduler
  -Dial-up remote access
- Local
  -Intersection Controller
- Offline / Manual
- Closed-loop M3000 Master (Optional)
  -Manual
  -TOD Scheduler
  -Traffic Responsive

GIS-Based Map-Driven Graphical User Interface

- Graphical display of Citywide, area, and intersection data
- Easy-to-use menu system
- Fully zoomable displays
- Supports image backgrounds with graphical overlays
- Import formats supported (sample):
  -BMP (Windows Bitmap)
  -ArcView GIS Shape files
- Used for Citywide, area, and intersection data
  -Intersections
  -Detectors
  -Links
  -Vehicle signals
  -Pedestrian Signals
  -Status
- Placement of dynamic symbols
- User definable dynamic attributes
  -Intersection status
  -Detector status
  -Phase Colour

Citywide Map

- Display selections via menu
- User programmable toolbars for quick access to commonly used functions
- Status, monitoring, and control available via context sensitive shortcut menus
- Intersection status – various displays including on/off, flash, pre-empt, coordinated, main street green, etc
- User-specified pre-set zoom levels
- Increased status/intersection information

Intersection Displays

- Signal Colour Status
  -Phase
  -Pedestrian
- Individual Detector Status
  -System detectors
  -Local detectors
- Simultaneous Real-Time monitoring
- Ability to display multiple intersections at once (separate windows)

Database Management

- Data stored on Database/Network Server
- Online database changes while traffic system is fully operational
- Full upload/download/compare feature for local controller/RCCU data
- Data copy capabilities
- Integrated database backup and archiving

Reports

- Standard and custom reports
- Standard reports can be customized to specific user requirements
- Export to 3rd party software for custom report generation/manipulation
- Operational Status Reports
  -System, groups, intersection, detector, and communications
- Event Log Reports and Log extract functionality
- Graphical/text-based MOE reports

Real-Time Reports/Displays

- Citywide graphic displays
- Intersection graphic displays
- Intersection and Group monitors
- Interactive Time-Space-Diagrams
- Green Split report
- Cyclic Flow Profile

Alpha-Server Hardware Requirements (Optional)

- Alpha Personal Workstation 600au
- 256 MB RAM
- 9.1 GB HD
- CD ROM drive
- 4 mm Digital Tape backup
- 2 Ethernet Interfaces
- 17” Super VGA monitor, 1024 x 768

Database/Network Server

- Intel Pentium III 933 MHz CPU
- 1 GB RAM
- 20 GB HD
- CD-ROM
- Tape drive
- Ethernet Network Interface Card
- 15” Super VGA monitor, 1024 x 768

User Workstation Requirements (For optimal performance)

- Intel Pentium III 800 MHz
- 256 MB of RAM
- 10 GB hard disk
- CD ROM drive
- Super VGA monitor, 1024 x 768, 17” min.
- 8 MB of video RAM
- Ethernet interface
- Windows 2000 SP4 or XP

Communication Subsystem Requirements

- Rackmount Industrial PC, Pentium processor
- 4 MB of RAM
- 200 MB hard disk
- Ethernet Interface
- Up to 4 of 16-port Digiboards
- Appropriate modems for communication media
- Modem power supplies and racks

Other System Hardware

- 8-port terminal server
- Ethernet Hub/Bridge
- Remote dial-in connection port and modems
- UPS and Alarm Panel
- System Clock
- Automatic dialer
- Paging Subsystem (optional)
- Wall Map (optional)
- Video Projection System (optional)
- Various printers for reports and logging

Commercial Software Included

- Alpha OpenVMS base and User licenses
- Windows NT Server and Client licenses
- Microsoft SQL server license
- CONNX for RMS Software including ODBC clients
- ESRI MapObjects and ArcView

For comprehensive technical information, please refer to the Summary of Functions & Features and the User Manual.