



Onboard Fleet Management System Overview

Optimizing Fleet Efficiency

XATA ONBOARD is a state-of-the-art onboard information system that integrates onboard computing, real-time communications, global positioning, and advanced fleet management software into an enterprise-wide logistics solution for America's largest fleets.

XATA ONBOARD combines 15 years of experience and expertise in delivering onboard application software with state-of-the-art technology and platforms that provide a path to the future.

Transportation professionals confirm again and again the pivotal role of onboard technology in helping fleets improve their productivity and profitability. In order to achieve measurable increases, fleet managers must integrate onboard technology into the fleet management process. The XATA System does just that. Its combination of ease-of-use and greater functionality has led to overwhelming acceptance by such nationally known fleets as AmeriServe, BOC Gases, Coca-Cola, EOTT, Safeway, Supervalu, Ruan, Ryder, Penske, Unisource, and Whirlpool.

XATA's onboard computer is an essential productivity tool for the professional driver that helps him contribute to the overall success of the company. The onboard computer and powerful fleet management software unifies drivers and fleet managers into a single team with the power to drive out cost and drive up service.

System Components

The XATA System consists of six basic components:

- Driver Computer
- Data Station
- Driver Key
- XATA Application Module
- OpCenter
- SmartCom

Each component of the XATA System has a basic function that it performs as part of its role in the total system.



Driver Computer

The Driver Computer has a large, touch-sensitive, easy to read, user-friendly screen which provides instant feedback to the driver. It requires little training and interacts with the driver by simply touching the screen. The Driver Computer has a very high level of acceptance among drivers because it makes the job so much easier. For starters, you have a paperless interactive trip plan, paperless state fuel tax data capture, and a DOT certified paperless driver's log. It is a professional system for the professional driver, not a vehicle recording system that is used by a driver. Besides the easy onboard operation, the XATA system gives the driver important information about each day's routes. The system tells the driver where to go, when to be there, and what to do. The trip plan is always available for the driver's review. All data that is captured by the Driver Computer is presented to the driver first. The driver can read and interact with the system at all times. It's as if each driver has their own onboard advisor.



Driver Key

Each driver has an electronic key which stores the driver's identity, the driver's log, dispatch data, and trip data. It has the capacity to hold multiple trips. Besides serving as a data storage device, the Driver Key transports information to and from the Driver Computer and Data Stations for collection purposes, utilizing the key receptacles built into both devices. Because each key contains a computer memory chip, the Driver Key provides a portable, powerful, efficient and secure method for transporting information in a paperless, electronic format.

Data Station



Data Stations contain the same hardware as the Driver Computer, but utilize different software. The Data Stations are located where trips begin and end. The data station gives the driver his dispatch data on a Driver Key at the beginning of trips and offloads actual trip data from the driver's key at the end of trips. The Data Station connects directly to a PC or to a modem, giving you the capability to transfer information to or from your PC or from any remote site. Drivers can access the Data Station at any time, allowing them to operate on their schedule without the need to physically interchange paper with management.

XATA Application Module

The XATA Application Module (XAM) is the most technologically advanced onboard computer available on the market today. The XAM and our Driver Computer form an advanced client/server architecture that extends the life of our customer's existing onboard computer system and enables the deployment of new applications in the future using this powerful platform.

Using this client/server architecture, the XAM contains and executes multiple onboard applications in a multi-tasking real time environment while providing extensive connectivity to vehicle networks, peripheral devices, and other server devices. The XAM serves as the primary application platform for our onboard computer system by:

- Providing processor and memory resources for more advanced applications.
- Supporting connectivity to multiple peripheral devices.
- Providing the architecture to support the use of GPS and real-time communications.
- Increasing the level of systems integration in the vehicle.
- Creating an architecture that is modular, scaleable, expandable, and open.



The XAM is a small, rugged dome that mounts outside the vehicle. Inside is a state-of-the-art onboard computer, GPS and optional wireless communications.

OpCenter

In an open, multi-user, Windows environment, OpCenter collects, validates and processes data recorded by a fleet's network of XATA onboard computers – then stores the information in an open SQL database for further analysis and reporting. It also automatically delivers this information in a user-friendly, intelligent format over an interactive desktop interface. OpCenter provides a decision support environment for the entire distribution team that reduces operating costs, improves safety, streamlines compliance reporting, and automates data collection for other systems.

By integrating all fleet operations under one Windows based desktop, this family of intelligent applications helps users more efficiently measure fleet performance, resolve exception conditions, monitor ongoing operations and perform detailed analysis when time permits.

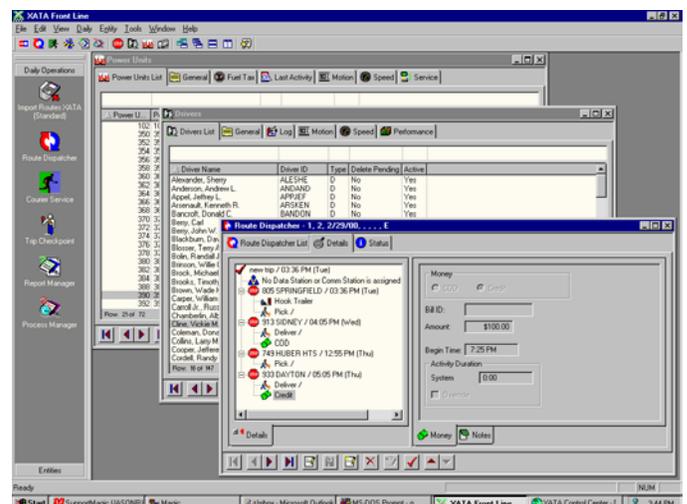
The OpCenter modules – Frontline™, Control Center™, Courier Station™ and Task Force™ – are tailored to specific job functions:

- **Frontline.** Frontline streamlines data collection, processing and reporting through automatically generated, standard reports.
- **Control Center.** Control Center controls security, configuration and system management, and can be customized to meet the needs of a single site or an enterprise-wide distribution network.
- **Courier Station.** Courier Station is a powerful communications management application that collects and distributes data to wired and wireless networks including spread spectrum, terrestrial and satellite networks.
- **Task Force.** Task Force is a collection of fleet management applications designed to support information delivery and analysis.

OpCenter fleet management software gives you access to all of the information captured by your Driver Computers. The software serves as an expert system that learns about all of the important factors in your fleet's operation. It collects trip information from the Data Stations and oversees every aspect of dispatch, cargo management, and driver management. The data import and export capabilities provide the carrier headquarters with compliance data and domicile comparisons. It provides your MIS department with accurate data for billing, payroll, incentives, and routing. It uses its learned knowledge and your company guidelines to detect and report exceptions. Automatic reporting, that you set up, provides you with your most usable information on a consistent schedule. More extensive detail reports are also available when you need to "zoom" into the detail for any reason.

With more than 100 standard reports, and a powerful query tool that lets users create customized graphical reports, OpCenter provides instant access to the information and analysis fleet managers need. XATA's OpCenter suite is the only fleet management software on the market that automatically retrieves, transforms and delivers onboard information throughout the enterprise in an intelligent, interactive, exception-based format.

In addition to OpCenter's four modules, users may also select optional software applications to expand OpCenter's capabilities to meet their individual needs. These optional applications are described in detail below.



OpCenter is a robust fleet management suite that provides powerful decision support for your entire fleet.

XATA

System Functions

The XATA system offers functionality unmatched by any other system on the market today, including the software applications described below. These applications can be mixed and matched to provide a specific solution for your fleet.

Onboard Fuel Management

Every XATA Driver Computer has “real time” fuel management. Fuel consumption is sensed 10 times per second, electronically captured, and continually displayed for the driver. Drivers can use this information to alter speed and gear shifting to improve fuel economy.

Onboard Electronic Logs

Every XATA Driver Computer automatically maintains a complete electronic driver log that is in compliance with Department of Transportation regulations. Driver logs can be recalled for the prior 8 days at any time. The driver's available driving time is constantly displayed. Best of all, no paper is required anywhere, not onboard, not at the domicile, and not at carrier headquarters.

Electronic State Fuel Tax

All of the electronic data concerning fuel consumption is captured by the Driver Computer and transferred directly to your fuel tax processor. All fuel consumption and mileage driven is electronically captured, and all fuel purchases by state and all state crossings are entered by the driver as they occur.

Exception Management

XATA's expert system software works in the background of OpCenter analyzing every event, then offering suggestions to improve your productivity. Instead of having to process every piece of information yourself, the XATA system alerts you to only the problems that occur. It's called “management by exception”, and it allows operations personnel to spend more time interacting with drivers and customers, and less time dealing with all of the information being collected. This type of decision support is available only from XATA.

Learned Standards

The XATA System compiles a learned operational standard for every element of your fleet, including: locations, legs, routes, drivers and power units. This “learned history” can be used to establish exception reporting guidelines or used as an ongoing measurement against the standards set by fleet management.

Position Plus GPS

Position Plus™ is a suite of application software that uses a XATA Application Module with a built-in GPS (Global Positioning System) receiver to add the date, time and vehicle position to traditional onboard computer data in order to enhance and extend the benefits provided by our existing system. Position Plus™ consists of four applications:

- **Hands Free State Crossing**—automatically acquires and records vehicle locations at state line crossings to support completely automated fuel tax reporting.
- **GPS Logs**—automatically acquires and records vehicle position at driver log status changes to support automated driver logs.
- **GPS Locations**—automatically acquires and records vehicle position during trips to identify customer, fueling, rest, and service stops.
- **Onboard Compass**—vehicle direction is available to assist the driver when traveling unfamiliar routes via a compass heading displayed on the Driver Computer.



SmartCom

SmartCom™ is a suite of communications applications that complement XATA's industry-leading onboard logistics applications and fleet management software. SmartCom provides intelligent and immediate access to critical onboard information at multiple levels within fleet operations by integrating "real-time" communications throughout our suite of logistics applications.

SmartCom's real-time notification is triggered by onboard exception conditions, defined and selected by users, ensuring only critical information is reported to fleet management.

By detecting and processing exception conditions onboard – 'in-the-truck' – instead of back at the office, our customers minimize transmission costs and control the recurring communication charges that can negatively impact return on investment.

By enabling real-time identification and communication of exception conditions, SmartCom helps drivers, dispatchers and fleet managers work together to improve customer service and operating efficiency. SmartCom's inherent design minimizes message size and traffic by providing only critical information with the most operational benefit.

XATA's SmartCom provides customers with the flexibility to choose from several different communication modes to find the least costly, most efficient means to send and receive fleet information. XATA designs its logistics applications to minimize transmission costs through the intelligence built into the system.

Smart Route

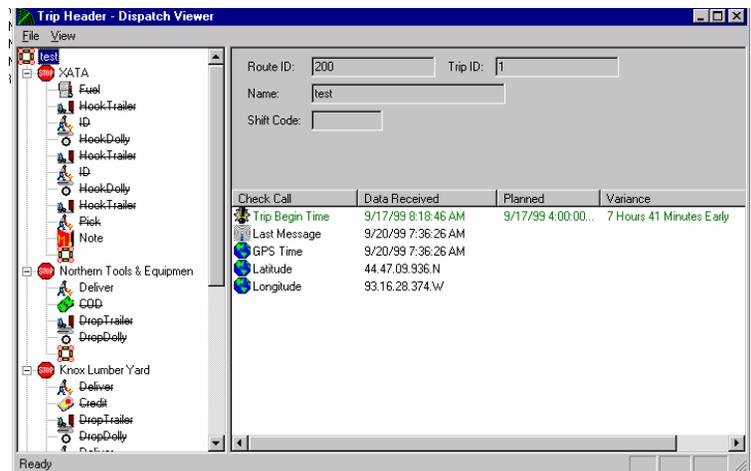
Every XATA Driver Computer is capable of receiving complete trip plan data from the Route Dispatcher subsystem, and during the route, collects comprehensive stop and leg information. This allows for comparison between planned and actual data. The Driver Computer can receive dispatch data that guides drivers through their routes with step-by-step instructions.

Smart Check

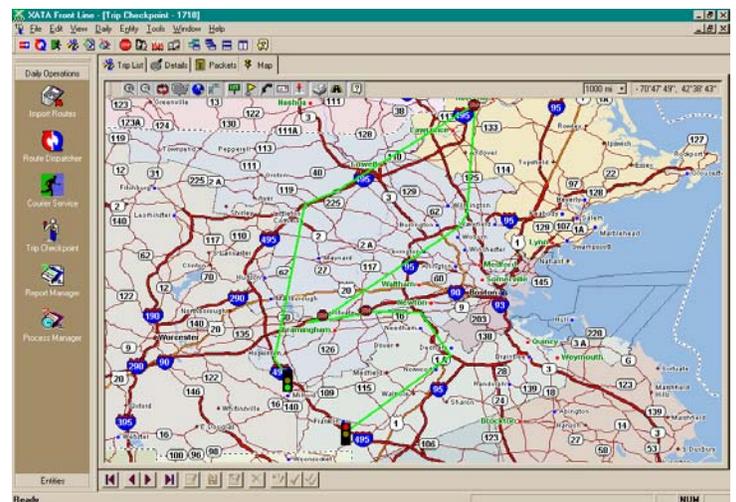
SmartCheck automates check calls, enabling dispatchers and fleet managers to automatically receive updates from drivers when pre-defined conditions or events occur, or to request an update from SmartRoute, an integrated dispatching application that monitors route progress.

Smart Messaging

SmartMessaging streamlines two-way messaging between drivers and fleet operations by predefining the most common messages, and providing a means to send free form text messages when necessary.



Smart Check enables automatic notification from vehicles when certain predefined conditions or events occur.



Smart Route Viewer gives you up to date status of all your routes or the option of viewing a single route on a map.

System Benefits



It is not only your drivers that benefit from the XATA system, but your entire transportation team, and most important of all—your customers. The XATA system provides solutions for every area functional area that involves your fleet, from drivers to dispatchers to management.

Drivers

Drivers like the fact that the system keeps them abreast of specific truck performance, maintenance needs, and fuel consumption. It eliminates 15 to 20 minutes each day which was previously needed to complete driver paperwork. It validates a driver's activity and allows him or her to record unplanned events and abnormal conditions. In other words, the system is based on the principle that the information supplied by the driver is as important as the information supplied by fleet management.

Fleet Management

The XATA system provides a continuous flow of information that communicates fleet objectives to your entire transportation team. The system learns the profile of your fleet; every driver, every vehicle, every customer; and collects operational data that can be used by management for recognition, analysis, and reporting.

Dispatch

Dispatchers find that the XATA system improves dispatching through the accurate learned route detail that is automatically captured by the system. Accurate leg detail and accurate stop detail by site support the improvement of future routes that are optimum for the business and achievable by the drivers.

Safety

Compliance and safety personnel like the system because it relieves the extensive paper work required for compliance

data gathering and reporting. More importantly, the system provides the accurate detail from which the safety department can assure that their operation is operating within the safety guidelines established by the fleet and by the DOT. Driving habits that could lead to problems or accidents are detected and reported before they become problems. And if problems do occur, the data is readily available and accessible to investigate the incident.

Customer Service

The XATA system collects and distributes mission-critical customer service information that can be used to increase satisfaction and communication with your customers. Fleet management can establish pickup and delivery windows by customer (and even by product type), display a planned time of arrival to the driver enroute, display an estimated time of arrival that constantly updates for the driver, and measure on-time delivery percentage when the trip is completed. Information collected can be used to further analyze delivery windows, routes, delays, times, rates and costs.

Maintenance

The XATA system provides your maintenance personnel with valuable information to help with repairs and predicting potential problems. The system utilizes on-the-road warning diagnostics that are captured by the Driver Computer; conditions are detected and reported before they turn into a disabled vehicle problem. The system also monitors idle time, distinguishing between engine miles and road miles to help reduce wear on the engine.

M.I.S.

MIS will find the XATA system invaluable for billing, payroll, maintenance, and customer records. Because the data handling and entry is reduced and data is extended to and from the vehicle, the savings are considerable. XATA system software integrates easily into your existing corporate information network to assist you in collecting and distributing critical logistics data.

R.O.I - Return on Information

Customer after customer has achieved an immediate and measurable return on investment. These significant fleet savings include:

- Increased fuel economy
- Improved routing and scheduling
- Reduced driver, clerical and compliance paperwork
- Reduced maintenance costs
- Improved driver performance and safety
- Increased driver productivity
- Increased asset utilization
- Better customer service

FOR MORE INFORMATION

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XATA

XATA Application Module (XAM) Installation

XM-05xx PARTS LIST		
QTY	PART NO.	ITEM DESCRIPTION
1	SA-00xx-xx	XATA Application Module
4	HW-0010-11	¼-20 x 0.75" Bolt
4	HW-0010-12	¼" Washer
1	VK-100x	Onboard Electrical Kit (shipped separately)
1	CA-000x	XAM Drop Cable Assembly (shipped separately)
1	XP-000x	Driver Display Kit (shipped separately)
1	ME-0039-0x	XAM Mounting Bracket (shipped separately)
1	VK-032x	ORBCOMM Antenna Kit (shipped separately if required)

Before the Installation

Record the following information for entry into the Host System:

XAM Serial Number	
Vehicle ID	
Odometer Reading	

Plan the locations of the parts that make up the Onboard System

The Onboard System consists of these components: the XAM; the XAM Mounting Bracket; the Electrical Kit; the Drop Cable; the Driver Display Kit; and, if required, the ORBCOMM Antenna Kit (see the individual installation guides). The Drop Cable connects the XAM to the XATA Interface Module (XIM) in the Electrical Kit. The wires or cable in the Electrical Kit connects Power, Ground, and J1708 Signals to the XIM. The cable in the Display Kit connects the Display to the XIM. **It is best to install the Electrical Kit first, followed by the Driver Display Kit, and then the XAM.**

XATA Application Module Location

1. The XAM must be mounted above any large metal surfaces. The XAM Mounting Bracket should be installed directly to the cab and positioned away from other Antennas on the cab. If the XAM has ORBCOMM communications see special mounting instructions in the ORBCOMM Antenna Installation Guide. Optional mounting brackets may be purchased from XATA. Figure 1 shows two typical mounting locations.
2. Securely fasten the XAM Mounting Bracket to the vehicle. Use lock washers on the bolts.
3. Securely fasten the XAM to the Mounting Bracket with the included bolts and washers.
4. Remove the protective cap on the XAM connector and connect the Drop Cable to the XAM. To keep moisture out of the connector it is very important that the cable is hand tighten securely and then using a pliers on the connector tighten the connector an additional 1/8th of a turn. The XAM connector has a Corrosion Preventive Compound on the contact pins.
5. Route the Drop Cable between the XATA Application Module and the XIM. Use an existing opening in the cab or drill a 7/8" hole and install the included grommet to protect the cable.
6. Secure the Drop Cable along the way with the included cable tie bases and cable ties. Clean and dry the area where the cable tie bases are placed. Stay away from sharp edges, moving parts, hot surfaces, tight bends, and cable stress. Do not damage the cable by over tightening the cable ties. Verify the Drop Cable does not interfere with the normal operation of the vehicle.
7. Connect the Drop Cable to the XIM and hand tighten the connector securely. The XAM is now installed and it will power up. The XAM will be fully operational in seven minutes.
8. If the Driver Display is installed it will display WAITING FOR VEHICLE SETUP.
9. To send a Vehicle Setup to the XAM the vehicle needs to be outside in an area with a clear view of the sky.

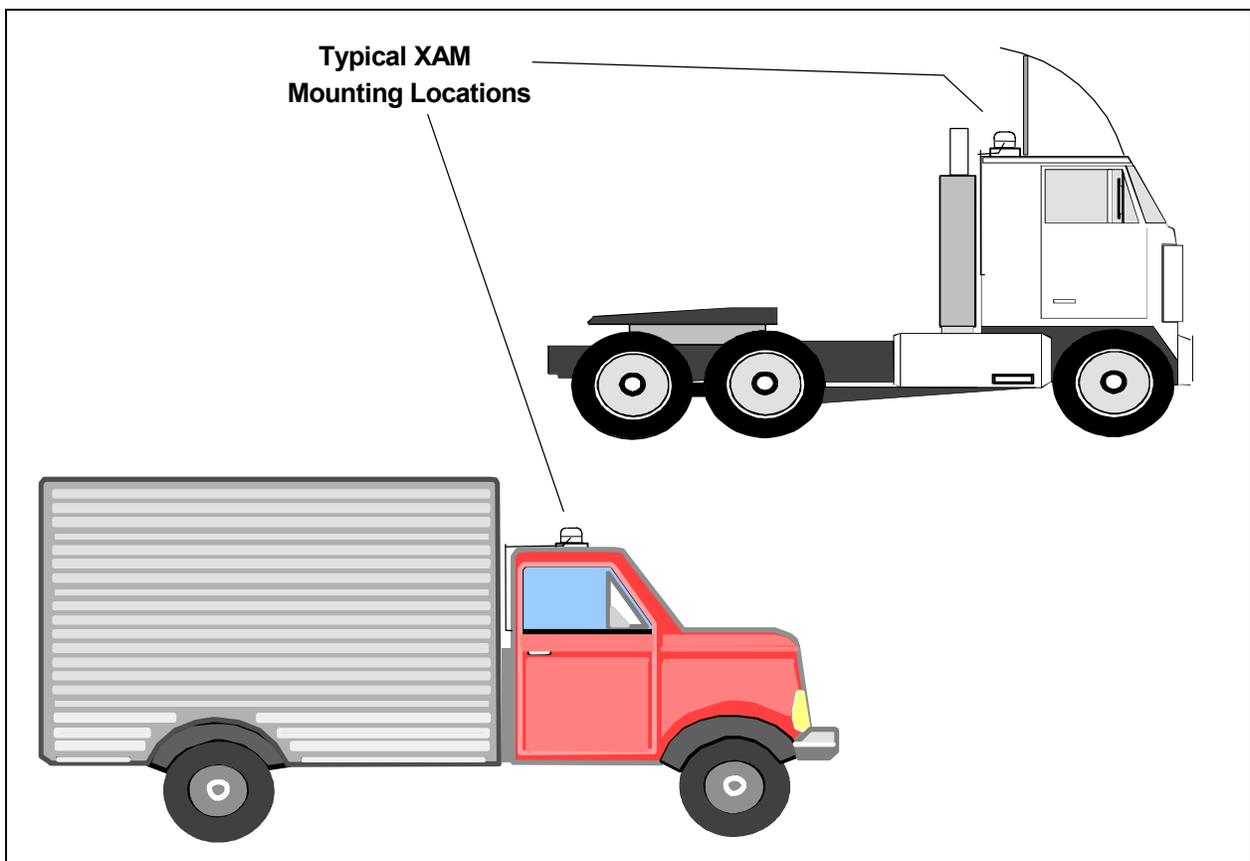


Figure 1. Typical XAM Mounting Location on Straight Truck and Tractor

Warning:

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

RF Exposure Warning:

When installed as directed, this equipment complies with radiation exposure limits for general population/uncontrolled exposure. To ensure user's safety and to satisfy RF exposure requirements for mobile transmitting devices, this unit must be installed so that a minimum separation distance of 20 cm is always secured between the transmitting structure and the body of the user or nearby persons.

NOTE: This equipment has been tested and found to comply with the limits for Class B digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced Radio/TV technician for help.

XATA Application Module (XAM) Installation to a VIMX4

XM-04xx PARTS LIST		
QTY	PART NO.	ITEM DESCRIPTION
1	SA-00xx-xx	XATA Application Module
4	HW-0010-11	Bolt, ¼-20 x 0.75"
4	HW-0010-12	Washer, ¼
1	CA-000x	XAM Drop Cable Assembly (shipped separately)
1	ME-0039-0x	XAM Mounting Bracket (shipped separately)
1	VK-032x	ORBCOMM Antenna Kit (shipped separately if required)

Plan the locations of the parts that make up the Onboard System

The Onboard System consists of these components: the XAM; the XAM Mounting Bracket; the Onboard Installation Kit; the XAM Drop Cable; the Driver Computer; and, if required, the ORBCOMM Antenna Kit (see the individual installation guides). The Drop Cable connects the XAM to the VIMX4 (from the Installation Kit). The wires or cable in the Electrical Kit connects Power, Ground, and Vehicle Signals to the VIMX4. The VIMX4 DC Cable connects to the Driver Computer. It is best to install the Installation Kit first, then the Driver Computer, and then the XAM.

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2. Securely fasten the XAM Mounting Bracket to the vehicle. Use lock washers on the bolts.
3. Securely fasten the XAM to the Mounting Bracket with the included bolts and washers.
4. Remove the protective cap on the XAM connector and connect the Drop Cable to the XAM. To keep moisture out of the connector it is very important that the cable is hand tighten securely and then using a pliers on the connector tighten the connector an additional 1/8th of a turn. The XAM connector has a Corrosion Preventive Compound on the contact pins.
5. Route the Drop Cable between the XAM and the VIMX4. Use an existing opening in the cab or drill a 7/8" hole and install the included grommet to protect the cable.
6. Secure the Drop Cable along the way with the included cable tie bases and cable ties. Clean and dry the area where the cable tie bases are placed. Stay away from sharp edges, moving parts, hot surfaces, tight bends, and cable stress. Do not damage the cable by over tightening the cable ties. Verify the Drop Cable does not interfere with the normal operation of the vehicle.
7. Connect the Drop Cable to the XATALink connector on the VIMX4 and hand tighten the connector securely. The XAM is now installed and it will power up.
8. To check the operation of the XAM the vehicle needs to be outside in an area with a clear view of the sky and the Driver Computer Service Parameters must be setup.
9. To check GPS operation touch the READY FOR NEW TRIP screen on the Driver Computer to display the following sequence of screens:

NEW-TRIP	SERVICE
COMM-MSGS	MESSAGES
EXIT	

DIAGNOSTICS	
	CLEAN
SET-UP	ADJS

GNRL ENGIN	XID
SPEED EVNT	
FUEL GPST	MEM
BRAKE WCOM	ATA

STATUS:NORMAL
LAT = 044° 46' 48.546" N
LON = 093° 48' 08.120" W
DATE:05-23 10:50:45

10. Touch *SERVICE* on the screen shown at the left, touch *DIAGNOSTICS* on the next screen, then touch *GPST* on the Diagnostics Menu to display the GPS Status screen. The status line shows *INITIALIZING* or *OBC NO RESP* while the XAM is powering on and *BLOCKED* while the GPS is acquiring satellites. This can take up to seven minutes. The status should then change to *NORMAL* and a latitude / longitude reading should be displayed. If the status remains *BLOCKED* the XAM may not be properly positioned.

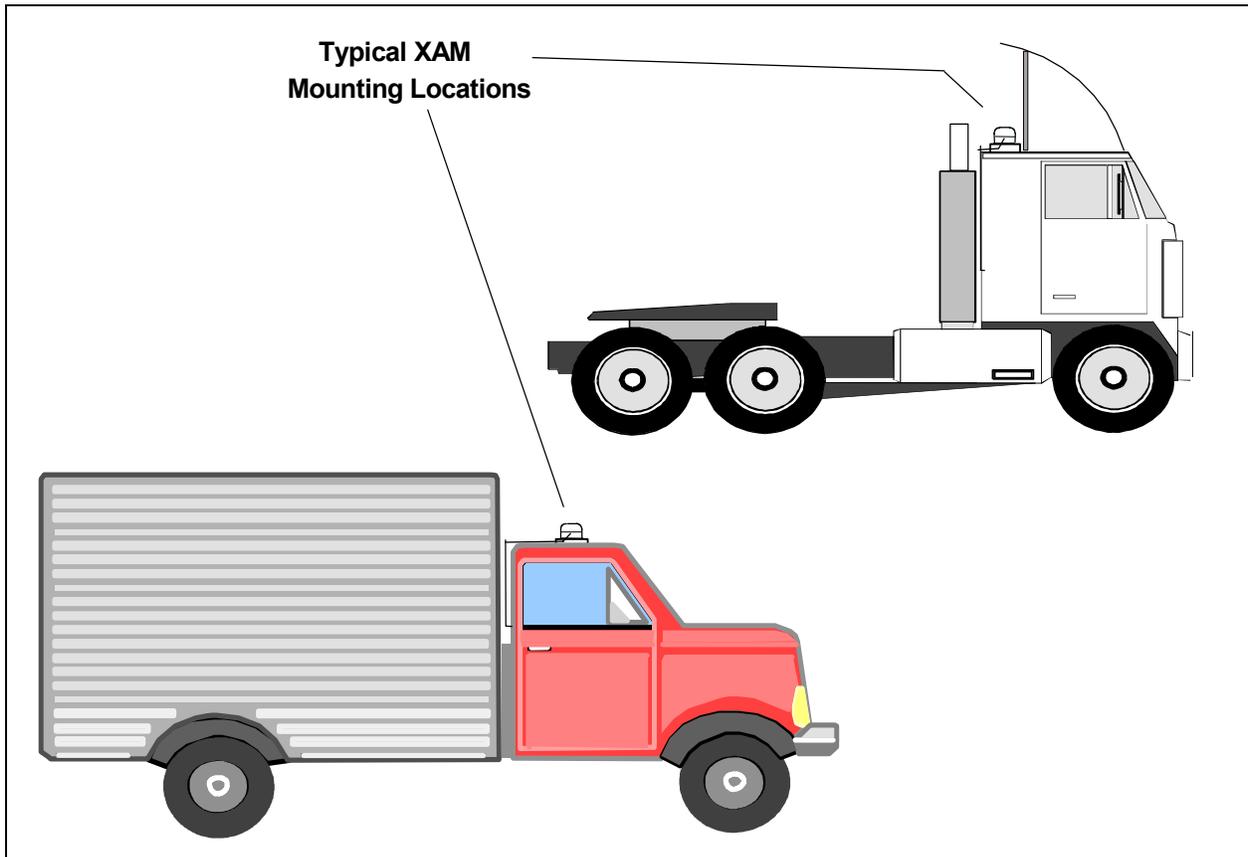


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