



Predator Traveler Manager™

Features and benefits for electronic work instructions on the manufacturing shop floor

Abstract

This paper outlines the specific features and benefits of implementing a Predator Traveler Manager based solution to automate work instructions for manufacturers worldwide. Predator Traveler Manager can be customized to address the unique requirements of each manufacturer with an off the shelf shrink-wrapped software based solution. Predator Traveler Manager runs stand alone or fully integrated with Predator MDC™, Predator Tool Crib™, Predator Gage Crib™, Predator DNC™ or Predator Desktop™. It can optionally utilize the existing DNC network and Predator PPM™ for parametric part manufacturing with compatible CNC machines. Predator Traveler Manager is a member of a suite of applications all designed to share data and resources. They all share a common design and philosophy based on our unique understanding of manufacturing processes. Collectively they are known as Predator MES™.

This document is based on features in Predator Traveler Manager v1.0.

NOTE: Travelers are often called work instructions, packets, tickets, or routers.

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32 bit Windows based application

What is Predator Traveler Manager?

Predator Traveler Manager is a software application that creates, organizes, releases, and documents manufacturing details, processes and work instructions electronically. With the motto “You can only improve what you document”, Predator Traveler Manager helps improve manufacturing processes by empowering engineers and shop floor personnel with an interactive method of building and deploying electronic work instructions.

Predator Traveler Manager provides real-time answers to many of manufacturer’s toughest questions, including:

- How do we automate JIT, just in time, production of family of parts?
- How do we consistently implement Kaizen methods during the manufacturing process?
- What processes and resources are required to manufacture each part number?
- What if a new process or resource is used, how many part numbers would it effect?
- What tools, cutters, inserts, gauges, fixtures, machines, materials, inspections, etc, are required per traveler numbers?
- How is outsourced production built? How is outsourced assembly done?
- Are parts being manufactured using the latest revisions, processes and electronic files?
- How are ECNs, engineering change notices, and revisions of manufacturing processes tracked?
- Can setup personnel provide first article feedback to engineering in real-time?
- Can shop floor personnel interactively view the latest traveler/job folder/work order in real-time?
- How do we create and maintain customer specific work instructions?
- How do we achieve or maintain FAA, FDA, ISO 900x, Six Sigma, and OSHA requirements as engineering methods continuously improve?

Answers to all of the above can be solved with Predator Traveler Manager and displayed from any PC with the ability to drill down to any level of detail at any of your manufacturing facilities. For example, a manufacturing engineer in the United States can query the status of a machining process in Mexico and find out the current method and then plan an improved method to be rolled out in the next 3 months. Details are kept indefinitely and current results can be compared with previous methods or processes. Real-time answers leveraged against actual production history are becoming critical as enterprises rely more on their engineering and manufacturing resources as they go global. Answers based on actual manufacturing details facilitate faster decisions and increase productivity for every manufacturer.



Traditionally thousands of files, folders, or pieces of paper are used

Why use Predator Traveler Manager?

Historically manufacturers rely on the memory of personnel, sheets of paper in a manila folder or clear envelope, a PC's directory structure with numerous Word and Excel files, an ERP/MRP's router, or some custom application. Predator Traveler Manager is the first shrink-wrapped, open architecture database application that documents, organizes and maintains your shop travelers or manufacturing processes. Traditional paper or file-based methods tend to be easy to create, but very difficult to maintain. For example, it is not uncommon for manufacturers to try and maintain thousands of individual documents or files for work instructions, tool lists, setup sheets, CNC programs, best practices, Six Sigma processes, machine safety instructions, etc. With thousands of files, how does one improve a process or document an engineering change? Typically these systems quickly fall behind what is really happening out on the shop floor and only stay-up-to-date by very dedicated and motivated personnel. Larger companies that have implemented an MRP/ERP system often start with a generic shop floor router and then are required to add additional files or paper to complete the level of detail required. Predator Traveler Manager uses a highly relational database, which introduces structure, simplified input and automates traveler maintenance to a few mouse clicks. New travelers and revisions to existing travelers can be done by one or more engineers in real-time by running Predator Traveler Manager on a Windows-based PC. Interfaces between Predator Traveler Manager and MRP/ERP systems can be developed and implemented on a time and material basis.

In addition, shop floor personnel are empowered to interactively view a traveler to insure that first article setups are done correctly and that production questions are answered.

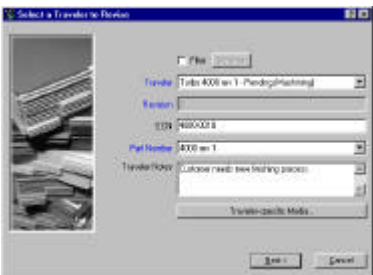
Engineers can continue to design and document improved methods and processes that will be released to manufacturing in the future. All major traveler components include ECNs and revision control. Alternate routings for the same part number allow for completing rush jobs or second shift production. Customer specific travelers can also be used in JIT low volume production and assembly.

An optional family of parts module called Predator PPM, which stands for Parametric Part Manufacturing, bridges Predator Traveler Manager with Predator DNC or Predator Desktop. Predator PPM dynamically modifies CNC programs based on a part number's reference dimensions. Predator PPM can significantly automate the manufacturing process by eliminating the necessity to create individual CNC programs *per part number* by dynamically modifying a single CNC program *per family of parts*. By adding a bar code reader to Predator DNC or Predator Desktop, an operator can trigger the entire process with a single swipe of a bar code.

How does Predator Traveler Manager work?



Predator Traveler Manager documents, organizes and maintains your manufacturing processes. Traditional methods become very difficult to maintain. Predator Traveler Manager uses a highly relational database, which simplifies input and automates traveler maintenance to a few mouse clicks. Input can be done by one or more engineers in real-time by running Predator Traveler Manager on a Windows-based PC connected to an Oracle server. Creating a new traveler is a simple process which has been automated with the use of wizards. The dialog on the left is the first step in the wizard. Several steps later and a finished traveler is complete.



Optionally, each engineer can be responsible for specific areas. For example, Bob heads up the quality department and can be the only one that can create or edit new gauges. While John heads up the tooling department and he has ownership of tools, inserts, and cutters.



Travelers support different levels of detail. For example, an assembly process may have just a few operations with a minimal number of specifics, while a machining process may have 50 operations with hundreds of related components and specifics for every tool and insert. There is no limit to the number of components within Predator Traveler Manager. Many customers have tens of thousands of part numbers, travelers, tools, inserts, etc.

Predator Traveler Manager also allows users to assign any electronic file as a reference attachment to any component or to any specific traveler. For example, a streaming video clip of general machine safety instructions can be associated as a reference attachment. Any operator working with any traveler could then watch the common safety instructions as well as those for the specific CNC machine. This is because Predator Traveler Manager also supports specific attachments. For example, a bitmap of the finished machine setup can be associated as a specific attachment only when the machine is used to manufacture a specific part number.

Travelers can be revised as engineering changes are made with complete date and time based history. Alternate travelers can be created to facilitate expedited or backup routings. In addition, travelers can be rolled back or unreleased from the shop floor. All of these processes can be implemented enterprise-wide with date and time based histories automatically completed with just a few mouse clicks.

Predator Traveler Manager can make dramatic changes to a shop's most basic methods. Instead of maintaining a tool list per part # in a file or setup sheet, Predator Traveler Manager can optionally print a tool list report, export an HTML file, or export an Excel spreadsheet. In a paperless environment, an operator (using the Predator Traveler Manager Client) can simply drill down to the appropriate operation number and click on the tools icon. Should a manufacturing engineer desire to change from a 2-flute HSS end mill to a 4-flute coated cobalt end mill, Predator Traveler Manager will first advise the engineer on how many existing travelers and parts numbers would be affected. Second, Predator Traveler Manager would then allow the engineer to revise *all* travelers or a *subset* of the travelers to use the new tool. Depending on the number of part numbers and travelers that must be maintained, Predator Traveler Manager can save weeks as

manufacturing processes are improved.

Finally, a complete history of changes is maintained for the lifetime of each traveler and part number. The history of changes provides a complete audit trail of every manufacturing process and every first article setup.

What specific data does Predator Traveler Manager organize?



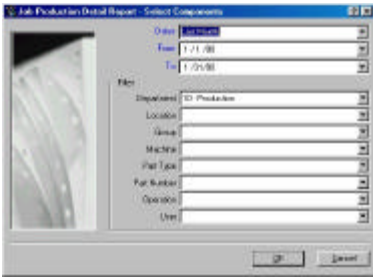
Predator Traveler Manager is designed to track and organize every aspect of the assembly, fabrication, machining, outsourced, and process based set of work instructions. At a minimum each traveler records standard information in a series of step-by-step operations. Up to 150 fields per traveler and/or operation provide an unparalleled level of detail. The highlights include the following:

- Traveler Number
- Traveler Revision
- Traveler Name
- Part Family
- Part Number
- Part Revision
- Notes
- Multi-Media Attachments
- Optional Operation number and Name
- Optional Customer number and Name

For every optional traveler operation, numerous additional details can be appended. The highlights include the following:

- Cost Center
- Setup Time
- Cycle Time
- Number of Operators
- Operations per Day
- Tear-down Time
- Setup Notes and Work Notes
- CNC programs
- Tool Number, Tool Name, Tool Type, Tool Position and Tool Offset
- Tool Inserts and approved alternates
- Tool Cutters and approved alternates
- Material Number, Material Name and Material Type
- Gauge Number, Gauge Name and Gauge Type
- Inspection Number, Inspection Name and Inspection Type

NOTE: An unlimited number of Machines, Tools, Materials, Gauges and Inspections per Operation are supported.



What kinds of reports are included with Predator Traveler Manager?

The following major Predator Traveler Manager reports are included:

- Release, Revision, and General Traveler History
- 26 Component Reports
- 26 Component History Reports
- 19 Where Used Reports
- Components per Traveler Report
- Security Permissions Report
- First Article Signoff Report

NOTE: Each of the above reports has numerous options and filters to drill down to the appropriate data. For example, the Where Used reports can be filtered to a specific department, location, group and machine.

All reports can be exported to Microsoft Excel or HTML documents for further analysis or processing. Additional Predator Traveler Manager Client applications can be licensed just for the shop floor or to view specific TM reports. Custom reports and graphs are available via several third party report and charting applications such as Crystal Reports.

Predator Traveler Manager supports a unique interactive traveler viewer that allows manufacturers to truly run in a paperless environment. Predator Traveler Manager can eliminate the need to create and distribute paper-based travelers. As needed paper-based travelers may be printed for high volume areas that have a just a few part number changeovers.

One of many

Predator Traveler Manager is a stand-alone database driven application built on Predator's common database platform. This common platform is a shared foundation to an entire suite of Predator applications. Shared common data improves overall productivity and minimizes implementation time when adding additional applications. For example, edit a machine's properties and every Predator application is immediately updated including Predator Traveler Manager, Predator MDC, Predator DNC, Predator Desktop, Predator Tool Manager and Predator Gauge Manager.

Predator's common database platform is an open architecture structure and independent of the actual database server. Currently, it can range from Microsoft Access to Oracle depending on the customer's requirements. Predator's common database platform is fully relational and supports powerful object-based design to support an unlimited number of events, parts, personnel, machines, departments, etc.

What are the main features of Predator Traveler Manager?

One of its major design goals is to provide a flexible traveler or electronic work instruction

environment that supports the manufacturer of any discrete part or assembly and enabling them to work more productively. The following features achieve this goal:

- Powerful object-based database design to support an unlimited number of parts, operations, travelers, tools, blueprints, gauges, media, etc.
- Open architecture database support with MS Access, MS SQL Server, and Oracle.
- Supports assembly, fabrication, machining, process and outsourced based travelers.
- Complete revision tracking of parts, operations, and travelers.
- Common components include tools, gauges, blueprints, inspections, machines, materials, parts, and all associated files and media.
- Includes a formal release and edit in-process travelers process.
- Comprehensive history of edits/changes for every component.
- Easy to use Traveler Explorer interface for individual travelers, traveler families, and revision history.
- User and Group permissions to control security down to each menu pick.
- Edit common components with an automatic traveler update. For example, change a tool and every related traveler that referred to that original tool is updated.
- Query and print travelers based on common components. For example, display all travelers that use a particular tool.
- Linked media can include a file on the network with additional viewers for Microsoft Excel and Word, AutoCAD, IGES, HTML, text and bitmaps.
- Linked media supports HTML and Predator Traveler Manager includes a *secure* browser based on Microsoft Internet Explorer for corporate Intranets.
- Includes shop floor traveler viewer.
- Shop floor and administrative printing of travelers and work instructions.
- Shares data with:
 - Predator DNC.
 - Predator Desktop.
 - Predator PPM – Parametric Part Manufacturing.
 - Predator Tool Manager.
 - Predator Gauge Manager.
 - Predator MDC - Manufacturing Data Collection.
- Includes over 75 standard reports.
- Custom reports and graphs are available via several third party report and charting applications.
- On-line help and documentation that leads the industry