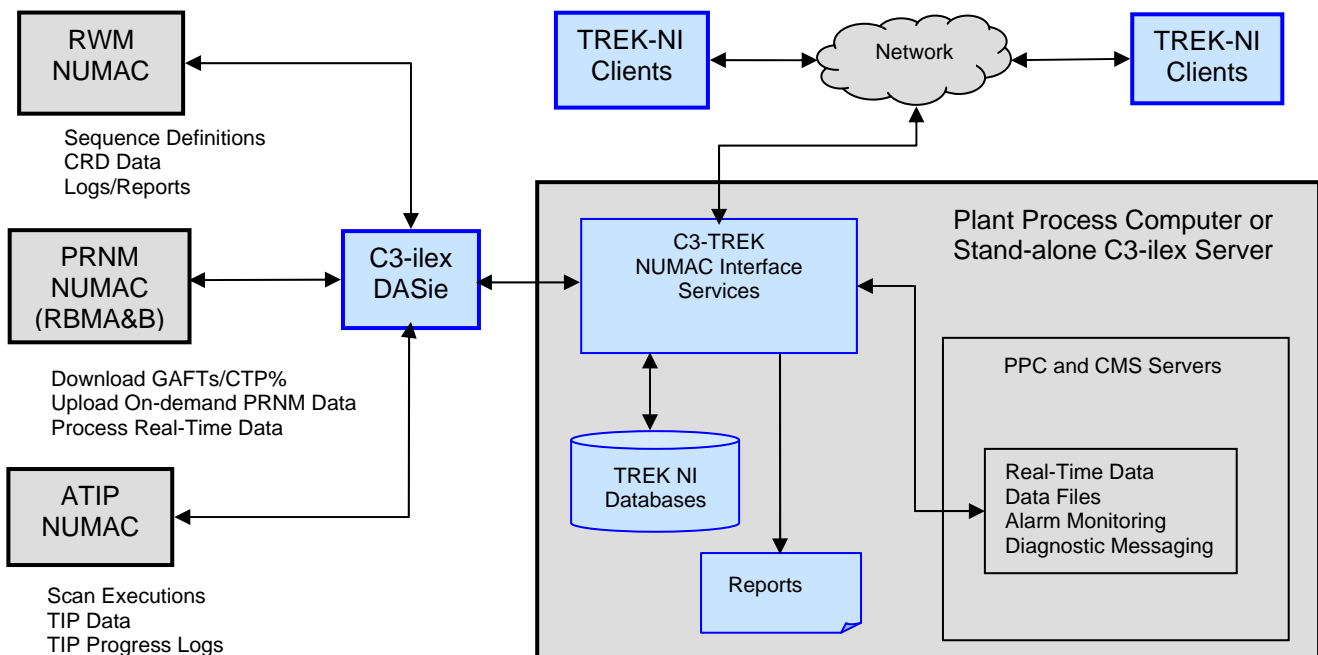


NUMAC Data Interface Functions

For Nuclear Utilities using General Electric NUMAC devices, C3-ilex has developed replacement software for legacy Core Monitoring System (CMS) data interface applications. The C3-TREK-NI functions consist of Windows Services and Windows Client user-interface applications. The NUMAC Interface (NI) Services will usually run on the Plant Process Computer (PPC) or alternatively on a separate PC. Operators will communicate with the NI Services across the network using one or more Client applications. Replacement applications are available for plants using NUMAC RWM, ATIP and/or PRNM devices. For all cases, the Application Service interface to the GE NUMAC equipment is accomplished via C3-ilex's DASie (Data Acquisition System importer/exporter) device.



Features and Benefits

- Available for NUMAC RWM, ATIP and/or PRNM applications
- Provides a replacement platform for obsolete systems, reduces maintenance costs, improves system reliability
- Replaces outdated NUMAC data processing equipment with current technology components
- Modernizes the user interface to a standard Windows look and feel
- Retains the same NUMAC service actions and reports, minimizes user retraining
- Existing software packages re-engineered to run under Microsoft Windows in C-based code developed under Visual Studio .NET
- Runs on standard servers and PCs that support the Microsoft XP Professional or 2000/3 server

DASie/NUMAC Data Interface

The DASie provides the data interface between NUMAC devices and the C3-TREK Servers performing the NUMAC data processing and application services. The DASie consists of one or more Serial Input/Output (SIO) cards installed in a rack-mountable chassis. Each card is capable of handling up to five fiber optic data streams from the NUMAC devices. The DASie provides the output (i.e., message forwarding) and data retrieval communication paths between Core Monitoring applications (e.g., RWM, ATIP, PRNM) and the NUMAC devices. The DASie translates the NUMAC proprietary protocol data streams into ones that can be accessed by network addressable computers using TCP/IP protocols



Demandable Function Region

Core Map Region

RWM Client Window

The screenshot shows the RWM Client Window interface. It features a central grid representing the reactor core map, with individual rods highlighted in different colors (blue, green, yellow, red). To the left of the grid is a 'Demandable Function Region' containing buttons for 'Download Sequence...', 'Upload from RWM', 'Upload Sequence...', 'Substituted Rods List', 'Sequence Alignment Data', 'Bypassed Rods List', 'Rapid Power Reduction Rods List', 'Rod Scan Timing Data', 'Bank Position Withdrawal Sequence', and 'Sequences...'. To the right is the 'Core Map Region' showing the grid. Below the grid is a table with columns: Sequential ID, X, Y, Group/Subgroup, Current Position, and Target Position. The table lists data for Rods 1, 7, 59, and 63. A yellow box labeled 'RWM Client Window' is overlaid on the bottom right of the screenshot.

| Sequential ID | X | Y | Group/Subgroup | Current Position | Target Position |
|---------------|-------|------|----------------|------------------|-----------------|
| Rod 1 | 22-03 | 2/0 | 24 | 48 | 48 |
| Rod 7 | 28-07 | 2/0 | 40 | 48 | 48 |
| Rod 59 | 18-27 | 10/2 | 12 | 48 | 48 |
| Rod 63 | 34-27 | 10/2 | 12 | 48 | 48 |

NUMAC Core Monitor (CMS) Client Services

CMS Client Services is a Windows application providing single screen views of available functions, options and interfaces for specific NUMAC devices. The specific NUMAC functions accessible via the CMS Client Service are independent of each other, and a customer can have any combination of the functions (i.e., RWM, ATIP and/or PRNM).

Features, options and data presentation for each of the specific NUMAC devices incorporates a consistent look and feel and in general consists of three regions of interest; 1) Core Map, 2) Demandable Functions and 3) Information/Status.

RWM Client

- Core Map (CRD Information, Connection Status, User Action Monitoring)
- Demandable Functions (Upload Reports, Download Sequences, Validate/Edit Sequences)
- Information/Status (User Actions, Results, Error Processing)

ATIP Client

- Core Map (TIP Information, Connection Status, User Action Monitoring, Machine Status)
- Demandable Functions (Scan Type, TIP Data, ATIP Processing & Analysis)
- Information/Status (User Actions, Results, Logs, Error Processing)

PRNM Client (Not Shown)

- Core Map (LPRM Information, Connection Status, User Action Monitoring)
- PRNM Demandable Functions (Download GAFTs & %CTP, Upload Selectable PRNM Data)
- Information/Status (User Actions, Results, Error Processing)

ATIP Client Window

The screenshot shows the ATIP Client Window interface. It features a central grid representing the reactor core map, with individual rods highlighted in green and labeled 'DONE'. To the left of the grid is a 'Demandable Function Region' containing buttons for 'Scan Type' (ALL TIPs Scan, SOME TIPs Scan, Rescan Any TIPs), 'Start Scan', 'Abort Scan', 'TIP Data' (Reread from ATCU, Export / Validate, Select for Processing), 'Normal Termination / Save Data', 'Quit/Don't Save', and 'ATIP Processing' (Setup File I/O..., Run Processing...). To the right is the 'Core Map Region' showing the grid. Below the grid is a table with columns: Cautionary Msgs, Scan Error Log, Rod Movement, Unsuccess Log, LowCon Log, LPRM GAFTs, Calibration Currents, LPRM EOL. The table lists data for 4 TRAVERSES WITH LOW CONFIDENCE SCAN RESULTS, 8 TRAVERSES WITH UNSUCCESSFUL SCAN RESULTS, and 1 CONTROL ROD MOVEMENT EVENTS OCCURRED DURING SCANS. A yellow box labeled 'ATIP Client Window' is overlaid on the bottom right of the screenshot.

For additional information on C3-ilex's Event Monitoring Systems, contact your C3-ilex Sales representative at 510 659-8300 (Fremont, CA) or 910 251-1330 (Wilmington, NC) or visit us at www.c3ilex.com