



# Radiological Assessment Display and Control System

## Features

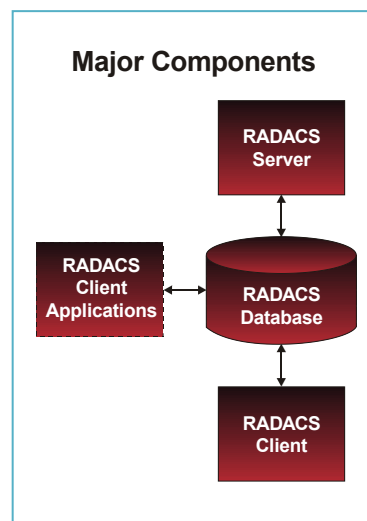
- Fast, real-time data acquisition and control
- Highly reliable communication with remote terminal units
- Collecting, converting, integrating and analyzing data from all monitors
- Detecting, annunciating and storing alarm conditions
- Alarm acknowledgment with audit trail
- Providing current, as well as historical, displays of any channels on operator request
- Graphical and tabular view of data over user selectable time periods and averaging durations
- Providing on-line database and display generation and modification capability
- Abundant user control over configuration from text messages to alarm color-coding
- Multi-user, multi-workstation, password controlled user access
- Extensive reporting capability with export feature in a variety of formats (Excel, PDF, RTF, HTML, ASCII, etc.) for further analysis

## Description

The Radiological Assessment Display and Control System (RADACS™) is designed to collect, manage, store, and distribute information from radiation detection instrumentation, as well as various other types of analog and digital instruments. RADACS is a suite of software applications, which collectively encompass all necessary functionality for managing radiological surveillance operations for a wide range of purposes.

The RADACS suite of software applications are deployed in a variety of configurations to suit the specific applications, including general radiation surveillance (such as Area, Liquid and Gas monitoring at nuclear power plants), research facility monitoring, mobile radiation monitoring, stack monitoring systems, and medical facility monitoring (i.e. P.E.T. systems). Regardless of the application, the technology used at the heart of the system is the same.

RADACS is a client/server technology built around standardized protocols and tools, including SQL databases and TCP/IP communication. Each RADACS installation consists of one or more server programs, along with a host of client applications that access the server programs as well as the databases. RADACS servers are responsible for acquiring information from a variety of devices, performing data processing on the acquired data, and then storing the data in a database. The servers also handle the distribution of information to client applications utilizing TCP/IP communication. This model of operation is used in all RADACS applications.



### RADACS Server

The RADACS Server is the software component that acquires data from a variety of sources and stores this data in the RADACS Database.

### RADACS Database

Data acquired via the RADACS Server, as well as system configuration data, is stored to hard disk and is readily available for on-line access. RADACS Server data is comprised of sensor measurement data as well as sensor and system status information. Configuration data includes data applicable to sensors (such as sensor type, location, and set points) as well as data used to manage the user interface appearance (such as alarm color codes and event message

text). RADACS utilizes Microsoft®'s Access and SQL Server® for the on-line storage of data. The specific database engine chosen is dependent upon the size of the application. Together with a properly sized hard disk, the RADACS database can store many years of monitoring data.

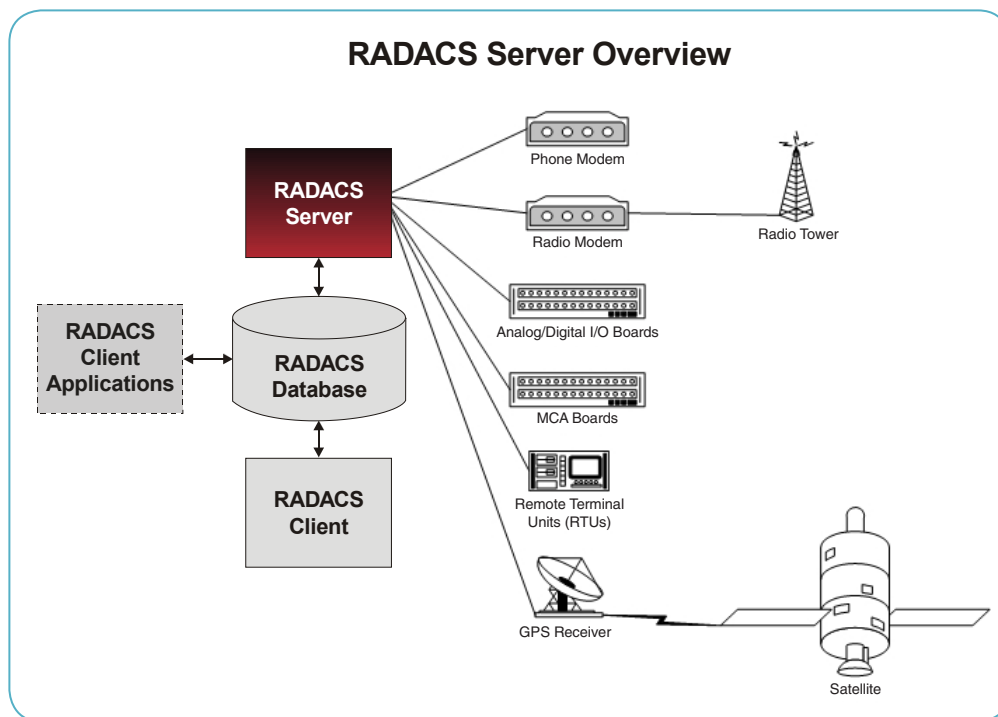
# Radiological Assessment Display and Control System

## RADACS Client

The RADACS client is comprised of functions that present the acquired information in a variety of ways at the discretion of the user. The Console contains the primary user interface functions for viewing both real-time and historical data. The Control Panel and the Database Management Utility are primarily used by the person(s) charged with administering and maintaining RADACS. The Control Panel contains various functions for configuring data acquisition tasks, user security and data view formats. Likewise, the Database Management Utility provides functions for data management tasks such as archiving historical data to off-line storage.

RADACS Server employs several communication methods to access a wide range of devices. Devices can be accessed via serial or Ethernet communication utilizing direct connection, phone modem, radio modem and/or wireless communication equipment. Devices supported by RADACS Server include:

- Remote Terminal Units (CANBERRA ADM)
- Analog and Digital I/O (i.e. National Instruments Field Point I/O)
- GPS (NMEA compliant systems)
- MCA Boards



## RADACS Client Applications

The RADACS Client Applications are software programs that extend RADACS to provide additional functionality for specific applications. This is accomplished through additional screen elements and/or specialized calculations and reports.

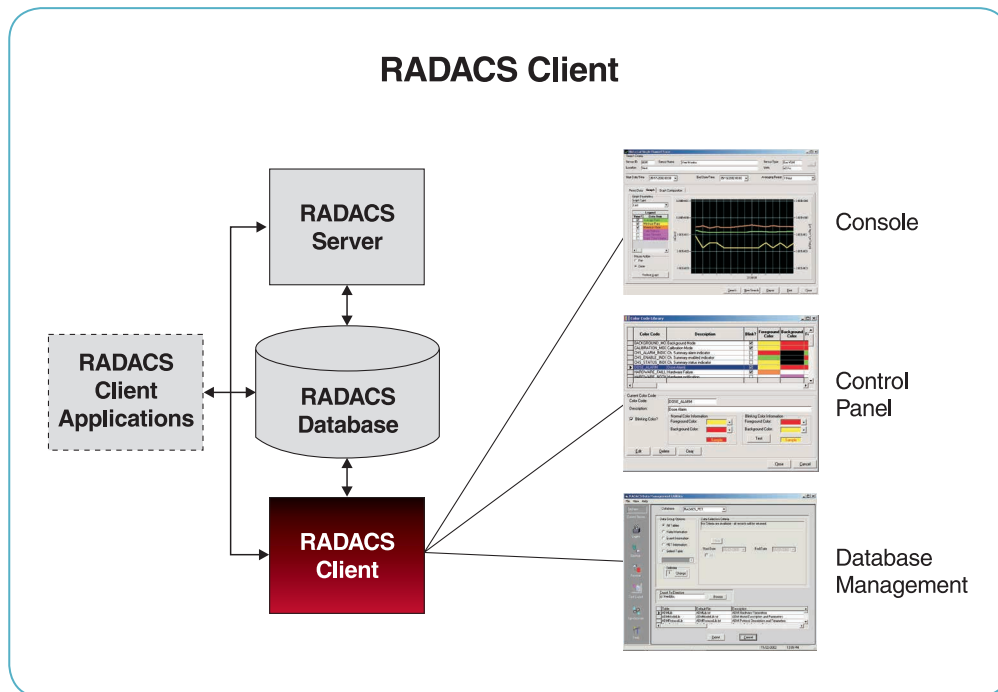
The RADACS Server program is responsible for acquiring real-time data. The acquired data is then stored in the RADACS database on a periodic basis, as well as transmitted to the various RADACS applications via TCP/IP network connections. RADACS Server can also receive commands from RADACS applications for control of the various devices.

## RADACS Console

The RADACS Console is the primary user interface application of the Radiological Assessment Display and Control System (RADACS). The RADACS Console provides a variety of functions that can be used to monitor and manage a wide array of instrumentation.

The RADACS Console communicates with the RADACS Server, as well as the RADACS database. Communications with the Server is achieved utilizing TCP/IP connections for the transfer of both real-time information and commands. Database communication is utilized both for determining the site configuration information as well as retrieval of historical information.

# Radiological Assessment Display and Control System



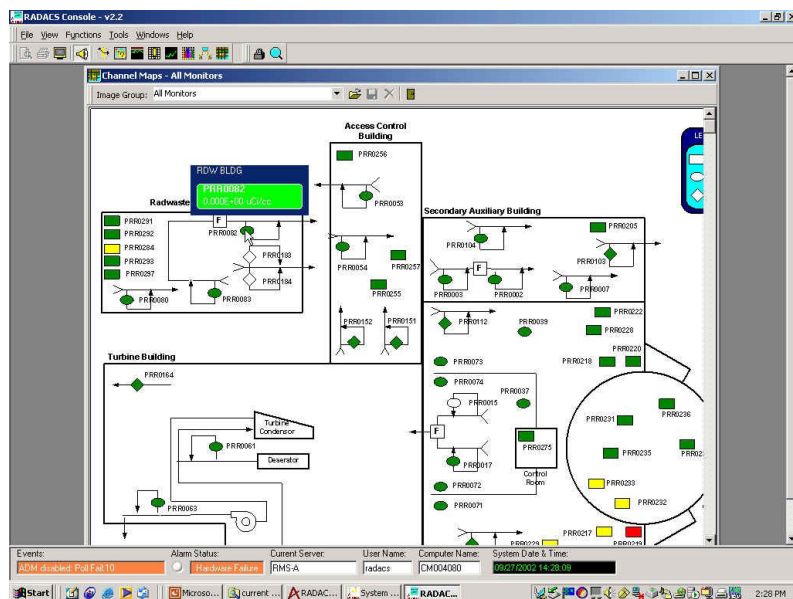
The RADACS Console is rich with functions for the presentation of data. These functions are described below.

## Channel Maps

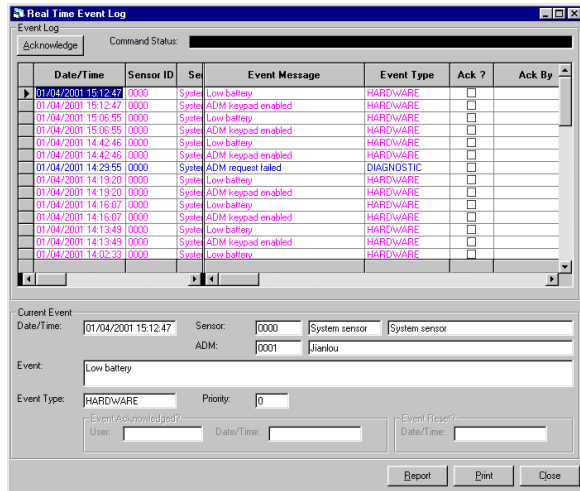
Of the numerous functions comprising the RADACS Console, the Channel Maps function is considered the primary display. This function presents a graphical representation of device locations superimposed over a floor plan or schematic of the facility. The device graphics display current rate and status information and are colored according to the site color scheme for alarm conditions.

## Real Time Event Log

The Real Time Event Log function provides the ability to view system events as they occur, as well as record the acknowledgment of various types of events, indicating that a human being was cognizant of an event occurring.

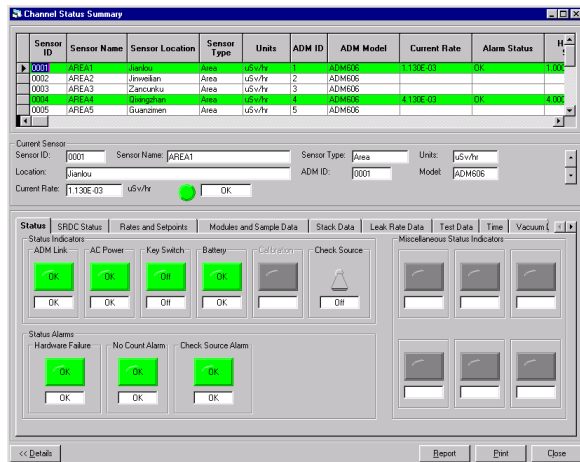


# Radiological Assessment Display and Control System



## Channel Status Summary

The Channel Status Summary function provides a summary for all available channels of rate and status related information. This information is updated in real-time as information is available from the RADACS Server. The function operates in a summary or detail mode. The summary mode lists a grid of various information. The detail mode displays a tabbed dialog allowing views of detailed information for the current selected sensor.



## Historical Event Log

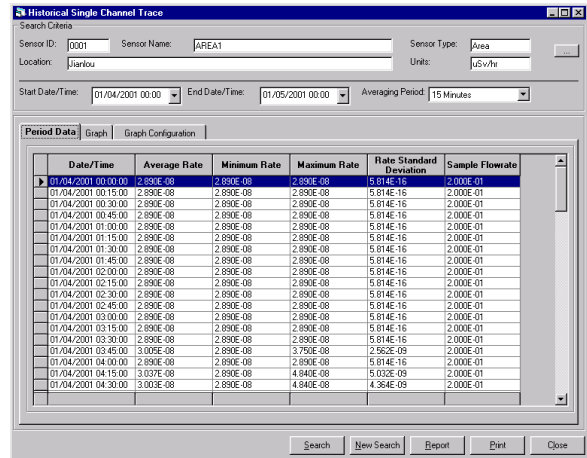
The Historical Event Log provides the ability to review the RADACS event log for any available historical period. Events displayed can be filtered via search criteria such as radiation alarm only events.

## Real Time Single Channel Trace

The Real Time Single Channel Trace function of RADACS displays current rate information in various graphical formats for a single sensor. The Instantaneous Data Tab is displayed upon entry to the function. This tab displays the real-time rate data for the selected sensor. Data is automatically inserted into the grid as it is received from the RADACS Server.

## Historical Single Channel Trace

The Historical Single Channel Trace function provides the ability to graph historical rate information for a given sensor, time period, and averaging period.



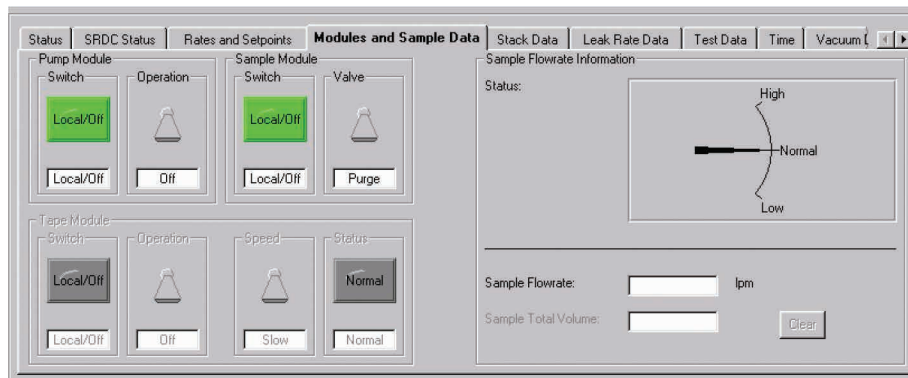
## Historical Multi-Channel Trace

The Historical Multi-Channel Trace function provides the ability to graph historical rate information for multiple sensors over a given time period and averaging period. This function uses search templates for the definition of sensor collections and graphs.

## Channel Management

The Channel Management function provides administrative level users with the ability to manage various parameters, such as setpoints, clock time, module settings, and other miscellaneous hardware parameters.

# Radiological Assessment Display and Control System



## Control Panel

The Control Panel is an application provided with RADACS Client that provides a wide variety of functions for configuring the operation of the software. The database contains numerous tables that the application programs read to determine the hardware configuration at a site as well as to control the behavior of the software. The functions within the Control Panel allow the contents of these database tables to be modified to suit the requirements of a site.

The Control Panel can communicate with the database resident on any server computer. It differs in operation from the RADACS Console, and other applications that handle real-time data, in that it does not use the TCP/IP interface to a server application. Any server computer accessible can be configured using the Control Panel.

## Database Management Utility

The Database Management Utility consists of a set of tools designed to consolidate and simplify many of the common tasks associated with maintaining and administering a database installation. SQL Server includes the Enterprise Manager for administrative tasks, however the Microsoft Data Engine (MSDE)

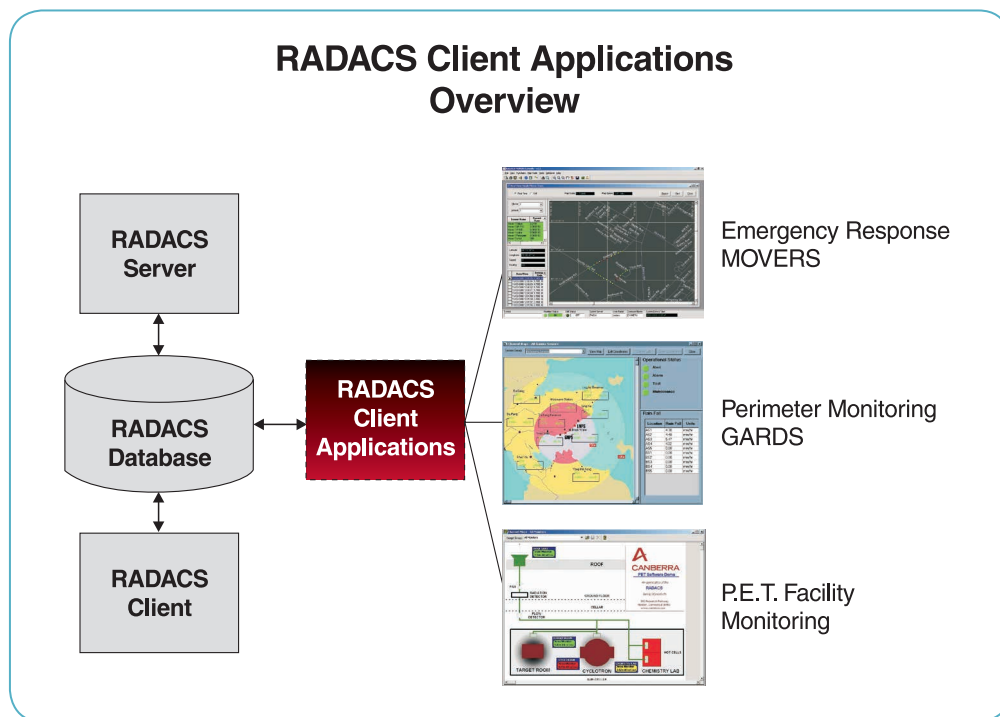
provides no administrative tools whatsoever. The application is designed primarily to address this need, but the utility functions equally well with both the MSDE and SQL Server. A balanced set of features is offered, part of which is the most important subset of the functions available from the Enterprise Manager, but also with modifications and additions to maximize utility. The application provides data management services which are more focused to the typical usage of a RADACS or related database installation:

User account administration capabilities – These are simplified to reflect the typical environment in which the databases are most often used.

Database backup and restore operations – The application extends the normal SQL Server capabilities to allow the use of zip disks and optical media, as well as conventional tape and disk media. Backups can be automated and scheduled using any preferred tool such as the Windows task manager.

Custom data operations – These include exporting data to delimited text files, and synchronization of system parameter tables between two databases.

# Radiological Assessment Display and Control System



## Emergency Response – MOVERS™

MOVERS provides data display and control functions specifically designed to work with the Mobile Vehicle Emergency Response System (MOVERS). MOVERS is a GPS-based vehicle-mounted radiation monitoring system consisting of a gamma detector, an air sampler for particulate and radioiodine detection, a global positioning unit, and a personal computer based data collection and transmission system.

## Perimeter Monitoring – GARDS™

GARDS provides data display and control functions specifically designed to work with the Global Area Radiation Dispersion System (GARDS). GARDS is fixed gamma monitoring system distributed around the perimeter of a facility and off-site locations.

## PET Facility Monitoring

The PET Facility Monitoring application is a program designed to aid in the management and reporting of information related to Positron Emission Tomography (PET) facility cyclotron operations and effluent management. In particular, reporting functions are provided for distribution to regulatory agencies for compliance reporting.

## Specifications

RADACS is a Microsoft® Windows® based product requiring Windows 2000 operating system and the MS Access 2002 or MS SQL Server 2000 database management software. The specific database management choice as well as the size and configuration of the computer hardware are highly dependent on the size and target environment of the overall Radiation Monitoring System.

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