Software Product Description

PRODUCT NAME: DEC Realtime Test Integrator for VMS, Version 2.0 **SPD 28.30.07**

DESCRIPTION

DEC Realtime Test Integrator (RT Integrator) for VMS[1] is an icon-based, graphical programming environment utilizing the subroutine libraries (LIO, LGP and LPS) of VAXlab Software Library (VSL). Instead of using a conventional programming language, users create and run realtime (data acquisition, IEEE-488 and RS-232 instrument control, test and measurement) applications by drawing them graphically as flow diagrams.

Each DEC RT Integrator icon represents a function such as an analog or digital input, an arithmetic operation, or a logical function. The application is built by using the point-and-click method now standard in graphical user interfaces. By pointing and clicking the mouse, icons are moved from the libraries to the worksurface and then connected to the icons with either data flow or signal flow lines. Once the icons are set up, the application is ready to run.

The worksurface acts as a graphical editor, enabling users to move, copy, delete, add, cut and paste icons representing devices and sections of code. This allows users to create and change applications quicker than with traditional programming languages.

Each icon has a set-up menu that allows customization of its function for the application. Once built, the application can be saved and restored without repeating the set-up operations. Since the configuration is saved as an ASCII text file, it can be mailed to any other system running DEC RT Integrator and restored there. This feature allows users to build an application on a VMS system and transport it to an ULTRIX system (if the ULTRIX version of DEC RT Integrator uses icons that are available with both operating systems) or vice versa, and run it with few modifications.

DEC RT Integrator extends its capabilities by allowing users to create and modify icons by following a template and detailed instructions. Since all icons are modular functions, the individually created icons can be used in all future applications.

[1] Formerly VAXlab Software Library

By putting icons together and shrinking them to form a single icon, macros can be built and manipulated like any other individual icon. This feature allows the user to create higher order representations of an application from basic building blocks.

For any DEC RT Integrator application, a control panel can be created using the data display and user input icons. The control panel is a simple user interface representing an instrument control panel that novice users and non-programmers can use to interact with the application. Little knowledge of DEC RT Integrator is required to run an application using the control panel. Building the control panel requires selecting the appropriate icons and positioning the user input devices on the control panel surface.

Every application has two conceptual views: a data flow view and a signal flow view. DEC RT Integrator allows users to switch between both views with the click of a mouse button. In the data flow view, the connections between icons represent the flow of data through the application. The signal flow view displays the application's logic structure.

Context-sensitive, on-line HELP makes the software environment easy to learn. Using the point-and-click method, HELP is provided on the specific icon selected.

DEC RT Integrator was designed to simplify IEEE-488 instrument control. The user directly programs the instrument and needs no knowledge of the bus itself. String manipulation and other support icons simplify the construction of command strings. The service request (SRQ) can be detected as a signal in the signal flow view and the SRQ status byte is available as data in the data flow view. These mechanisms allow instrument events to be detected and serviced with the same graphical programming techniques used to create the rest of the application.

DEC RT Integrator allows users to monitor alphanumeric data as it is being collected, and display it as a line plot, point plot, or scrolling text. Users can insert the display icons in any path of the data flow diagram and use them as a probe to trace the data as it flows through the application. In addition to monitoring the

data, users can also generate PostScript® files of the plots for hardcopy records.

In addition to the traditional mathematical and trigonometric operations, there are icons to perform noise filtering, scaling, multiplexing, or signal processing functions such as FFTs Fast Fourier Transformations and power spectrum analysis. A range check icon allows users to determine if a data value falls outside a given range and take corrective action.

Time generation functions allow users to trigger applications or events using either a realtime clock or a system clock. A time stamp can also be put on each data value as it is stored to a file.

DEC RT Integrator software is compatible with DECwindows so applications can be controlled from or displayed on any workstation, personal computer, or terminal that is compatible with the X Window System.

In addition, the LIO subroutines have the capability to control the Preston Scientific GMAD & EMAD-series analog input subsystems when they are interfaced to the Q-bus via the DRQ3B or DRV11-WA

The LIO subroutines permit the user to do the following:

- Attach a device and set it up for QIO, connect-to-interrupt I/O or mapped I/O
- Specify and verify the setup parameters of an I/O device
- Release a buffer from the user queue to the device queue
- Read a buffer with data from a device
- Write a buffer of data to the device
- Obtain a buffer from a device queue and put it in the user queue
- Enqueue multiple buffers to a device for continuous data transfer
- Detach a device and shut down the I/O process in an orderly fashion

The LSP subroutines perform data format translation, Fast Fourier Transformations (FFTs), signal filtering, interval histogramming, and thermocouple voltage-to-temperature conversions. Routines are also included to calculate power spectra, cross-correlations, autocorrelations, and phase angle and modulus spectra.

The Fourier transform routines handle both real and complex data in one or two dimensions, in both the forward and inverse directions. Filtering algorithms include simple polynomial filtering, nonrecursive filtering, and spectral windowing.

The LGP subroutines are used to plot data in the form of 2-D, 3-D, histogram, contour, and realtime plots. Under a DECwindows environment, the computations may be done on a client while graphics are displayed on a workstation server. The graphs can be output as DDIF files for use with other applications, such as DECwrite.

The LGP subroutines allow the user to perform the following tasks:

- Create a 2-D linear/logarithmic axis system and plot an array
- Update a 2-D plot by erasing old data and adding new data
- Plot additional data sets on a previously defined graph
- Plot a previously stored metafile
- Plot a point in one of 10 geometric shapes
- Print the screen on an attached printer
- Produce a hard copy of the plot displayed on the screen
- Create a 2-D contour projection
- Add an additional contour chart to the existing one
- Create a shaded contour projection
- Draw a histogram
- Write a text string to a specified location on a plot
- Plot standard deviation markers on data points
- Plot a 3-D array with hidden line removal
- Set up the axis system for a 3-D graph
- Clear all or part of a window
- Obtain the coordinates of a cursor or input device
- Compute the autoscaling parameters for linear and logarithmic plots
- Fit a cubic spline to a set of data points
- Return the value selected from a menu
- Prompt the user for a user string
- Collect a series of x-y pairs from an input device
- Collect a series of values with a specified range from a valuator type input device

In addition, users can add support for any foreign device for which a GKS handler exists.

DEC Realtime Test Integrator for VMS supports the IEZ11, which is an IEEE-488 bus-controller for Digital workstations with a SCSI interface. DEC RT Integrator for VMS manages all SCSI and RS232 interactions allowing users to communicate directly with the IEEE-488 bus. This product also supports the VAXBI clock.

Multiple plotting windows are supported on all terminals.

HARDWARE REQUIREMENTS

VAX, MicroVAX, VAXserver or VAXstation configuration as specified in the System Support Addendum (SSA 28.30.07-x).

SOFTWARE REQUIREMENTS

For Systems Using Terminals (No DECwindows Interface):

- VMS Operating System

For Workstations Running VWS (Required to use the LIO realtime plotting device. The icon-based user interface is not available to customers who choose the VWS windowing system):

- VMS Operating System
- VMS Workstation Software

For Workstations Running DECwindows (Required to use the icon-based user interface).

- VMS Operating Systems (and necessary components of VMS DECwindows)
- DEC GKS for VMS
- VAX C is required if the user is developing custom icons.

The DRB32 VMS Drivers are a prerequisite for LIO support of the DRB32 and DRB32W devices and I/O subsystems that interface to the VAXBI through the DRB32 and DRB32W.

The RTC01 BI clock is a prerequisite to use BI devices through LIO I/O support.

Refer to the System Support Addendum (SSA 28.30.07-x) for availability and required versions of prerequisite/optional software and for information regarding components of VMS DECwindows.

ORDERING INFORMATION

Development Option

The Development Kit allows the user to develop realtime applications including data acquisition, IEEE-488 and RS-232 instrument control, and test and measurement. After an application has been developed, it can run on a system which has either the Development Kit or the Runtime Kit installed.

Software Licenses: QL-YWQA9-QB
Software Media: QA-YWQAA-**
Software Documentation: QA-YWQAA-GZ
Software Product Services: QT-YWQA*-**

Runtime Option

The Runtime Kit allows the user to run an application, but not to develop an application.

Software Licenses: QL-B15A9-J*
Software Media: QA-B15AA-**
Software Product Services: QT-B15A*-**

* Denotes variant fields. For additional information on licenses, services, and media, refer to the appropriate price book.

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