Software Product Description

PRODUCT NAME: IEX-RSX-Driver, Version 2.2 SPD 12.68.05
(Device Driver for RSX–11M, RSX–11M–PLUS, and Micro/RSX)

DESCRIPTION

The IEX-RSX-Driver allows programs written in MACRO–11, FORTRAN–77, FORTRAN IV, and BASIC-PLUS-2, or any other high-level language with a compatible subroutine calling sequence, to communicate with devices attached to an IEEE STD. 488 bus. The driver supports connection to the IEEE bus through an IEQ11-A or IEU11-A interface when IEQ11-A is used with Q–bus PDP–11s and IEU11-A is used with UNIBUS PDP–11s. The communication with the interface is done through the standard RSX QIO mechanism.

The IEQ11-A and IEU11-A interfaces conform to the standards of the IEEE STD. 488 (1978) Programmable Interface Bus system. The interfaces are compatible with both ANSI MC1.1 and IEC 625.1 Standards. All IEEE bus features of the interface are supported by the driver.

An IEEE bus must have one device which is designated as system controller. In addition, at any given time one device must be controller-in-charge. The IEX-RSX - Driver supports all combinations of these features.

Each interface contains two fully independent bus controllers. These controllers can be attached to the same IEEE bus or connected to two separate IEEE buses. The driver treats the two controllers as two units, each with its own controller. The driver allows any unit to be attached to a single task or shared between several tasks.

IEEE bus commands are transferred between the PDP–11 and the IEEE bus via processor requests. Data streams can be transferred via DMA. A maximum data transfer size is 65,534 bytes. Memory addresses of 16, 18, and 22 bits are supported on both UNIBUS and Q–bus PDP–11s.

Features

The driver supports the following IEEE-488 hardware capabilities:

- Controller (C1.C2.C3.C4.C5)
- Talker and Extended Talker (T5.TE5)
- Listener and Extended Listener (L3.LE3)
- Automatic Source Handshake (SH1)
- Automatic Acceptor Handshake (AH1)
- Service Request (SR1)
- Remote/Local (RL1)
- Parallel Poll (PP1.PP2)
- Device Clear (DC1)
- Device Trigger (DT1)

The following driver software functions are available for control of the IEEE-488 interface.

- Write a block of data with optional EOI (End or Identify at last byte)
- Read a block of data with optional termination on byte count, match character, or EOI
- Send IEEE-488 Bus Commands *
- Perform a Service Request **
- Perform Serial Polling *
- Perform Parallel Polling *
- Pass Control to another IEEE-488 Controller *
- Change Timeout Duration
- Recognize external events including:
  - — Service Requests *
  - — Address Changes **
  - — Device Clear **
  - — Remote/Local Change **
  - — Device Trigger **
  - — Parallel Poll Configuration **
  - — Receive Control **
  - — System Controller Functions:
    - Enable/Disable Remotes

- Interface Clear

* Feature only applicable for controller-in-charge

** Feature only applicable if not controller-in-charge

If a request is issued to a unit that is controller-in-charge, then the driver will set the unit to the correct control state and the correct address state, if necessary, before executing the request. For data transfers involving only one other device, the address of the other device can be specified in the data transfer QIO. The driver will then automatically set that device to the appropriate address state. This mechanism is intended to reduce the number of QIOs required for a data transfer.

Simplified User Interface

For users not familiar with the QIO mechanism, a general subroutine package is provided. This package is intended for use with higher-level languages, such as FORTRAN and BASIC.

This package contains the following entry points:

IESTRT	-	Unit initialization
IEPOLL	-	Initialize for serial polling
IESEND	-	Send data to one or more devices
IERECV	-	Receive data from a device
IERQSV	-	Make a service request
IECMD	-	Perform bus control function
IEWFE	-	Wait for event

INSTALLATION

The IEX-RSX-Driver is a software product engineered to be installed by the customer.

HARDWARE REQUIREMENTS

Any valid RSX–11M, RSX–11M–PLUS, or Micro/RSX system based on a Q–bus PDP–11 or MicroPDP–11 with:

- At least one IEQ11-A
  or
  Any valid RSX–11M or RSX–11M–PLUS system based on a UNIBUS PDP–11 with:
  - — At least one IEU11-A

    And
  - — Hardware capable of reading one of the distribution media upon which this product is offered
  - — A minimum of 8KB of user memory for the IEX-RSX-Driver
  - — At least 800 blocks of disk space

OPTIONAL HARDWARE

Up to 3 additional IEQ11-A or IEU11-A controllers (a maximum of 8 IEEE-488 bus controllers)

SOFTWARE REQUIREMENTS

One of the following operating systems:

- RSX–11M, Version 4.6
- RSX–11S, Version 4.6
- RSX–11M–PLUS, Version 4.3
- Micro/RSX (including Micro/RSX Advanced Programmer's Kit), Version 4.3

For the required versions, refer to the appropriate Optional Software Cross Reference Table: RSX–11M (SPD 20.98.xx), RSX–11M–PLUS (SPD 20.99.xx), or Micro/RSX (SPD 20.95.xx).

OPTIONAL SOFTWARE

IEX-RSX-Driver may be used with any of the following compilers:

On RSX–11M or RSX–11M–PLUS Systems

- BASIC-PLUS-2
- FORTRAN IV/RSX
- FORTRAN–77/RSX

On Micro/RSX Systems

- Micro/RSX FORTRAN–77
- Micro/RSX BASIC-PLUS-2

ORDERING INFORMATION

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The following key (3, 5, M, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJS37-X3 sources on RX50.

3 = RX50 Floppy Diskette

5 = TK50 Cartridge

M = 9-track 1600 BPI Magtape

Z = No hardware dependency

ADDITIONAL SERVICES

- Self Maintenance Service (Not available in all countries)
- Software Problem Report Service (SPR)
- Automatic Software Product update service upon new Product release

Table 1
Software Options Chart

OPTIONS	Micro/RSX Systems	RSX–11M/S RSX–11M–PLUS Systems
Single-use source license, sources, documentation, support services	QJS37-X3 QJS37-X5	QJS37-X3 QJS37-XM
Single-use license only option, no sources, no documentation, no support services	QJS37-DZ	QJS37-DZ
Documentation-Only Kits	QJS37-GZ	QJS37-GZ

SOFTWARE WARRANTY

Warranty for this software product is provided by Digital with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.