

1 Keysight E1406A Command Module Overview

About This Chapter

This chapter contains WARNINGS and CAUTIONS, a functional and physical overview of the E1406A Command Module, and instructions on installing the command module in a mainframe. Chapter contents are as follows:

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Warnings and Cautions

WARNING

SHOCK HAZARD. Only qualified, service-trained personnel who are aware of the hazards involved should install, configure, or remove the multiplexer module. Disconnect all power sources from the mainframe, the terminal modules, and installed modules before installing or removing a module.

CAUTION

STATIC ELECTRICITY. Static electricity is a major cause of component failure. To prevent damage to the electrical components in the multiplexer, observe anti-static techniques whenever removing, configuring, and installing a module. The multiplexer is susceptible to static discharges. Do not install the multiplexer module without its metal shield attached.

Using Keysight VIC

Our goal is to make installation of your C-size VXI system as easy as possible. To do so, Keysight VIC (Keysight VXI Installation Consultant) is provided with the Keysight E1406A Command Module. Keysight VIC is a Microsoft® Windows® program that helps you configure and install the Keysight E1406A Command Module - based on VXI systems. If your system contains an Keysight E1406A Command Module to be controlled by a computer external to the VXI mainframe, it is recommended you configure your system using Keysight VIC.

Apter Power

Command Module Functional Description

The Keysight E1406A Command Module is the foundation of a VXIbus system (see Figure 1-1). Though its role in a VXIbus system is largely transparent (for example, the user need not program its functions) it provides the following key functions:

- Translates SCPI (Standard Commands for Programmable Instruments) commands for Keysight register-based instruments.
- Provides the VXIbus slot 0 and resource manager capabilities.
- Can drive the VXIbus TTLTRG0-7 and ECLTRG0-1 trigger lines. The module contains SMB connectors for placing an external trigger onto the selected line(s), and for routing an internal trigger to a device external to the mainframe.
- Contains an internal clock that allows you to set and read the time and date.
- Is the General Purpose Interface Bus (GPIB) to VXIbus interface.

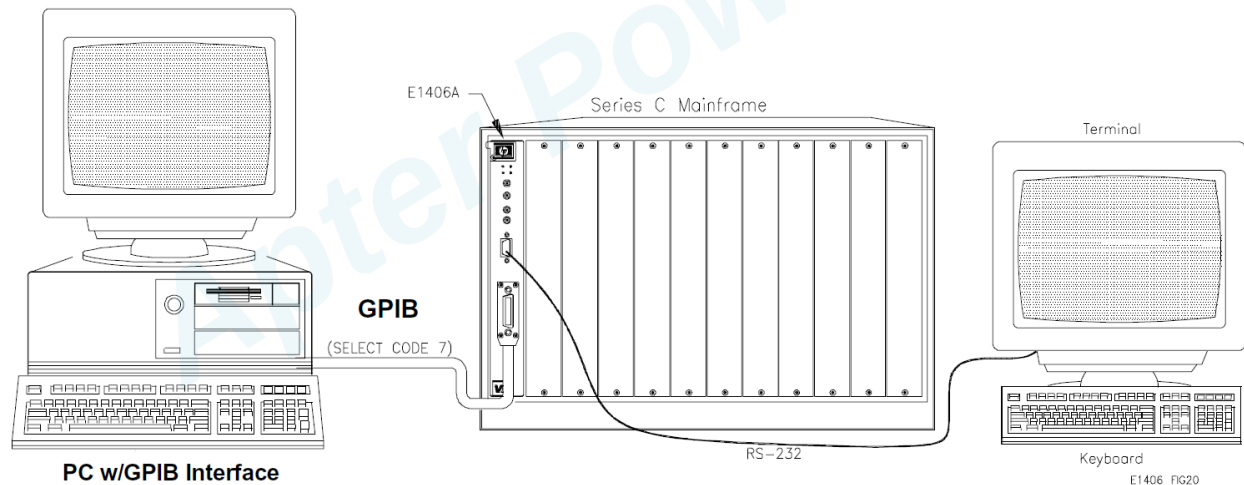


Figure 1-1 VXIbus System

Command Module Physical Description

The Keysight E1406A Command Module occupies one C-size mainframe slot. The faceplate has annunciators, clock and trigger connectors, interface ports, and extraction levers that are described below.

Faceplate Annunciators

There are four annunciators on the Keysight E1406A faceplate which show the following:

Failed Shows that the command module has failed its power-on self-test or has stopped working at some point in time.

SYSFAIL Shows that the SYSFAIL line on the VXIbus backplane is being asserted by the command module when it fails.

Access Shows that the command module is accessing, or being accessed by the VXIbus backplane.

Ready Shows the command module is in the VXIbus normal operation state.

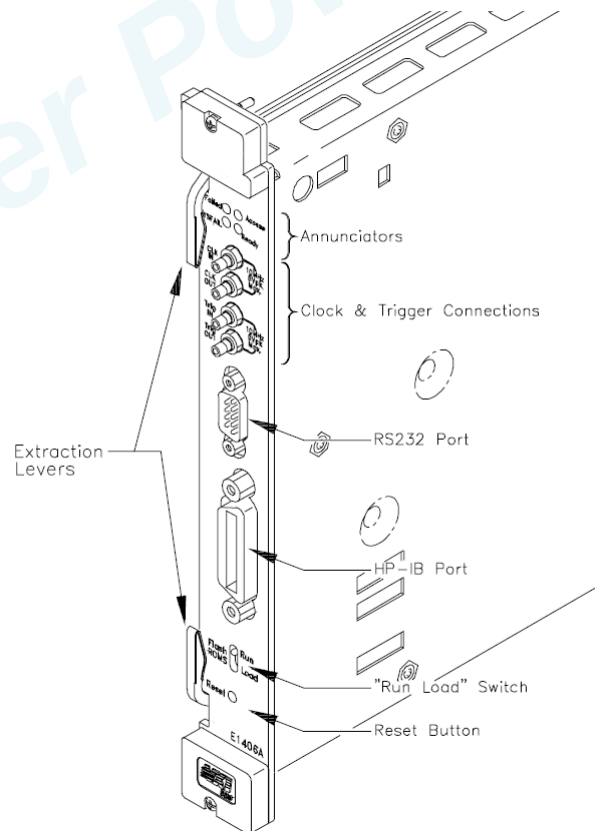


Figure 1-2 E1406A Command Module Faceplate

Faceplate CLK10 and Trigger Connectors

There are four signal connectors on the Keysight E1406A faceplate which function as follows:

Clk In This SMB connector allows an external 10 MHz clock to function as the system's slot 0 CLK10 resource. This is a high impedance input with an input range from ± 40 mV to ± 42.5 V.

Clk Out This SMB connector allows the internal slot 0 CLK10 resource to be routed to other VXIbus mainframes. This output is a TTL level output and drives $50\ \Omega$.

Trig In This SMB connector allows an external trigger signal (TTL levels) to be applied to the system on the trigger line selected (TTLTRG0-7/ECLTRG0-1). The input impedance is $5\ k\Omega$.

Trig Out This SMB connector allows an internal trigger on the trigger line specified (TTLTRG0-7/ECLTRG0-1) to be applied to an external device. This output is a TTL level output and drives $50\ \Omega$.

The GPIB and RS-232 Ports

The GPIB port allows an GPIB cable to be connected from the Keysight E1406A to a computer, or to an external disk drive. The RS-232 port can be used as a user interface, or used for peripheral control if the Keysight E1406A contains Instrument BASIC (IBASIC). The RS-232 port is a 9-pin DTE connector. Supported terminals include: HP 700/92, HP 700/94, HP 700/22, HP 700/43, Wyse WY-30, DEC VT 100, and DEC VT 220.

The Run/Load Switch

The run/load switch is located beneath the GPIB port. This switch lets you activate the loader instrument so that you can reprogram the Flash ROM or download device drivers to the Flash ROM.

The Reset Button

The reset button is located beneath the run/load switch. This button is used to reconfigure your VXIbus system and return it to the power-on state.

Extraction Levers

The extraction levers provide easy insertion into and extraction from the C-size mainframe.

Installing the Command Module in a Mainframe

Refer to Figure 1-3 to install the Keysight E1406A Command Module in a C-size mainframe.

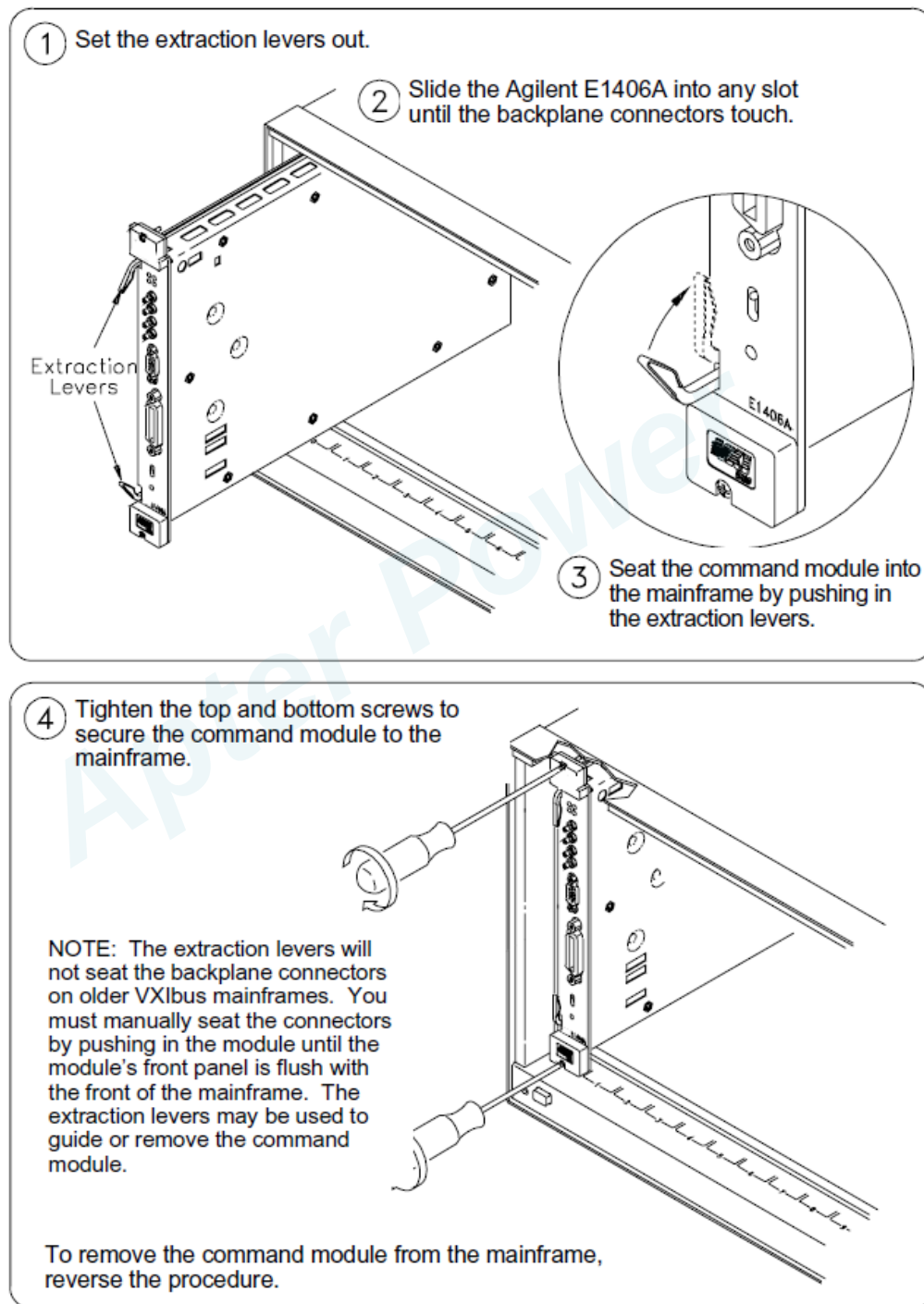


Figure 1-3 Installing the Command Module in a VXIbus Mainframe

Command Module Memory

The Keysight E1406A comes from the factory equipped with 512 KB of RAM and 1.25 MB of Flash ROM. Keysight E1406A Option 010 provides 1.75 MB of Flash ROM and 1 MB of RAM.

For applications which do not require shared RAM, the non-volatile RAM can be configured to a full 2 MB if the extra 512 KB of RAM and 512 KB of Flash ROM has been installed.

Battery Backed Functions

The Keysight E1406A clock and calendar functions, the user non-volatile RAM (NVRAM), and the device driver RAM (DRAM) are backed up by a NiCad battery. For systems with 512 KB of memory this battery has a ten month lifetime and is fully recharged when the command module is in the mainframe and the power has been on for fifteen continuous hours. This battery has a five month lifetime for systems with 1 MB of RAM and 2.5 month lifetime for systems with 2 MB of RAM.

A Keysight E1406A Specifications and General Information

Device Type

This module returns 01416 as the device type in response to a VXI:CONF:DLIS? query if the Keysight E1406A is set up as a slot zero device and 11416 if the Keysight E1406A is set up as a non-slot zero device.

Real Time Clock

Accuracy: 0.005% of elapsed time since last set.

Temperature coefficient: 0.001% to 0.012% of time since last set (per °C change in temperature).

Resolution: 1.0 sec

Non-volatile lifetime: 10 months minimum for a module with 512 Kbyte memory (following a 15 hour battery charge). 5 months for a module with 1 Mbyte of memory. 2.5 months for a module with 2 Mbyte of memory.

CLK10

Input: TTL or low level AC Minimum input level: 40 mVp-p Maximum input level: 42.5 Vp-p Output: TTL

Jitter: 0.03% (-55 dB)

Initial Accuracy: 50 ppm

Maximum Stability: ± 20 ppm/year (0°–55 °C)

Typical Stability: ± 3 ppm/year at 25 °C)

Trigger Input

Levels: TTL

Input load: 5 k Ω , 50 pF

Maximum Rate: 12.5 MHz (TTL), 40 MHz (ECL) Minimum pulse width: 30 ns (TTL), 12.5 ns (ECL) Maximum trigger delay: 30 ns

Memory

256 Kbyte user accessible volatile RAM on a module with 512 Kbyte of non-volatile memory. Memory is expandable to 2 Mbyte. NiCad battery backed (10 month minimum lifetime for modules with 512 Kbyte of non-volatile RAM, 5 months for modules with 1 Mbyte of non-volatile RAM, and 2.5 months for modules with 2 Mbyte of non-volatile RAM following a 15 hour battery charge).

Power Requirements

DC Volts	DC Current	DC Current
+5	3.2A	0.32A
+12V	0.01A	0.01A
-12V	0.01A	0.01A
-5.2V	0.4A	0.04A
-2V	0.01A	0.01A
+24V	0.03A	0.003A

Cooling Requirements

For 10 °C rise 1.5 liters/second 0.4mm H₂O

SCPI Conformance Information

The Keysight E1406A conforms to SCPI-1994.0. The following tables list all the SCPI confirmed and non-SCPI commands that the Keysight E1406A can execute. Individual commands may not execute without having the proper plug-in module installed in the mainframe. Each plug-in module manual describes the commands that apply to that module.

Switchbox Configuration

The following plug-in modules can be configured as switchbox modules. Refer to the individual plug-in User's Manual for configuration information.

<u>Keysight E1345A</u>	<u>Keysight E1353A</u>	<u>Keysight E1366A</u>
<u>Keysight E1346A</u>	<u>Keysight E1357A</u>	<u>Keysight E1367A</u>
<u>Keysight E1347A</u>	<u>Keysight E1358A</u>	<u>Keysight E1368A</u>
<u>Keysight E1351A</u>	<u>Keysight E1361A</u>	<u>Keysight E1369A</u>
<u>Keysight E1352A</u>	<u>Keysight E1364A</u>	<u>Keysight E1370A</u>