

Allegro[®] Sensor Evaluation Kit Technical Guide

Version 2.0



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Quick Start

Before using the ASEK, Allegro recommends that you read and understand this entire document. However, in most cases, basic configuration can be done very quickly so that you can start to familiarize yourself with the ASEK. The basic steps are described in this section. The configurations described are for operating the ASEK in a direct connection to a personal computer that has an Internet Web browser installed.

To set up the ASEK, perform the following steps:

- 1 Connect the ASEK Main Board module to the computer using either a standard Ethernet crossover cable, or a separately-powered Ethernet hub and two standard Ethernet LAN cables (the computer may be powered-on at any time).

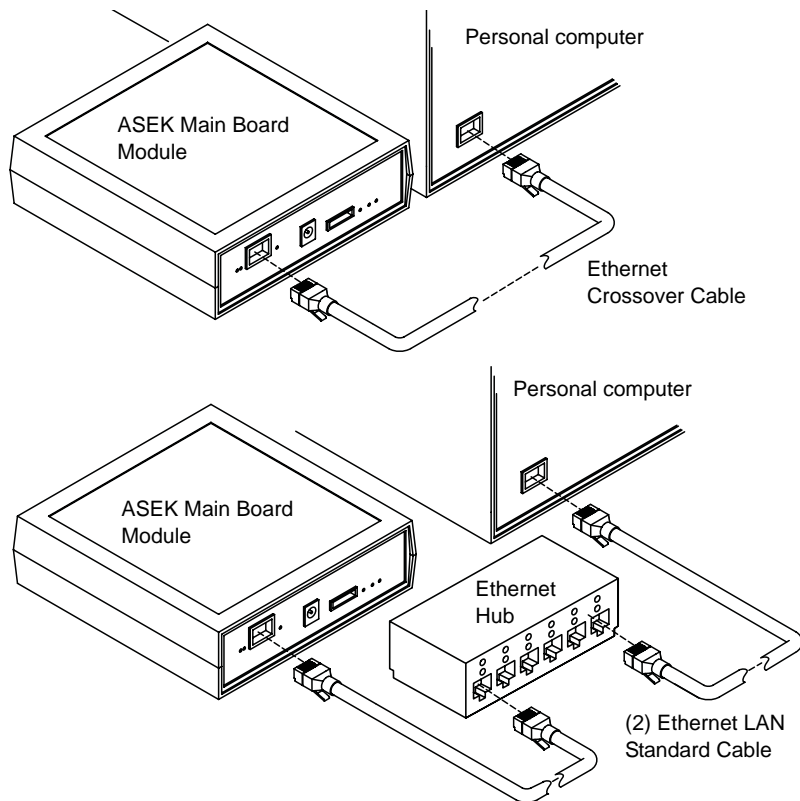


Figure QS-1 Connecting the computer
Direct connection options: Ethernet crossover cable (above), or Ethernet hub and two standard cables (below).

- 2 Solder the device-under-test (DUT) socket to the appropriate ASEK interface board, and connect the ribbon cable between the interface board and the ASEK Main Board module (Figure QS-2). (DUT connection without interface board is described later in this document.)

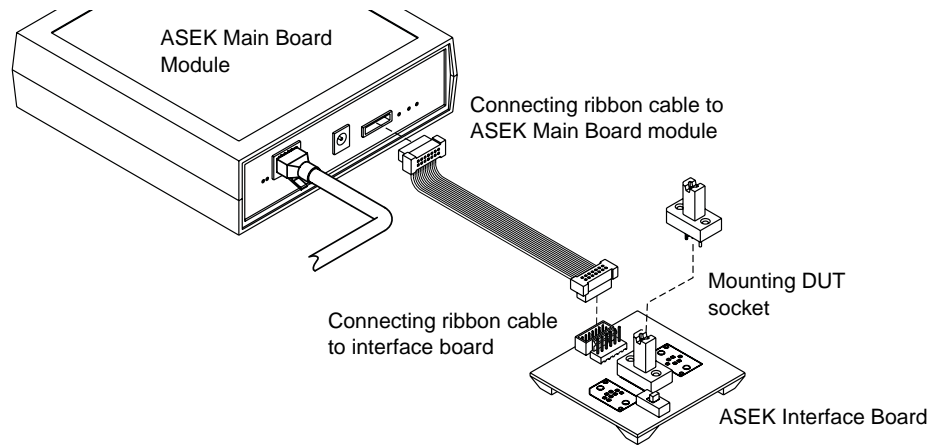


Figure QS-2 Connecting ribbon cable
For data transfer between ASEK Main Board module and an interface board with DUT socket.

- 3 **CAUTION: ONLY USE** the power supply included in the ASEK. Select a regional power plug appropriate for the test facility, and swap it into the transformer body. Then connect the mini plug to the ASEK module and connect the wall plug to the facility power mains. (Figure QS-3) The ASEK powers-on immediately. Allow 30 seconds for the firmware to load.

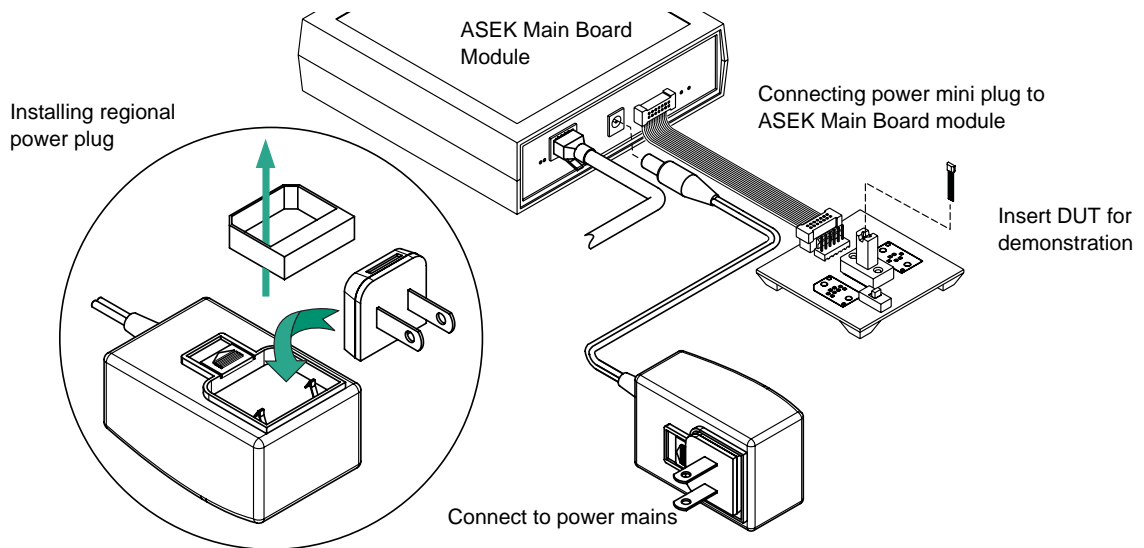


Figure QS-3 Connecting power supply
Powers ASEK Main Board module, peripheral PCBs and a DUT for demonstration.

- 4 Open the Internet Web browser on the computer, and navigate to <http://192.1.2.3>. The ASEK software opens as a Web page.
- 5 Insert the DUT into the socket and use the ASEK software to perform demonstrations.

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Using This Manual

This chapter introduces the purpose and use of this document. It also includes information on contacting Allegro® MicroSystems (Allegro) support groups. Information in this document is subject to change without notice. For additional information, contact your local Allegro field service representative or sales representative, as described in this chapter.

Compatibilities

This guide describes the use of the Allegro Sensor Evaluation Kit (ASEK) Version 2, and applies to the following release levels:

- Allegro Sensor Evaluation Kit firmware and hardware compatible with the ASEK-02 Main Board revision 1

In addition to these releases, certain additional configuration files contain information on specific devices and configurations that may be updated from time to time for compatibility with new products. For information on updated configuration files, contact your local Allegro field service representative.

The ASEK is designed to operate only with the power supply transformer supplied in the kit. Do not use with any other transformer.

The network interface operates on IEEE 802.3, 10/100Base-T Ethernet

The ASEK kit and contents are lead (Pb) free and RoHS compliant.

Outline

The following sections are presented:

- Chapter 1, *Introduction*, provides a reference for the applications covered, kit parts list, system requirements, user-supplied parts specifications, system electrical characteristics, and safety considerations.
- Chapter 2, *Network Configuration*, describes the procedure for configuring the ASEK to connect to the operator computer via LAN or by direct connection.
- Chapter 3, *ASEK Hardware*, describes the ASEK board, power supply, and connections.
- Chapter 4, *DUT Programming*, describes procedures for using the various programming and evaluation tools provided in the ASEK software.
- Chapter 5, *ASEK Main Board Calibration*, describes the use of the Calibration board.

Audience

This guide is intended for:

- Qualified technicians and engineers who are employees of companies that purchase of the corresponding Allegro products.
- Computer network administrators of companies who purchase the kit.
- Allegro field applications engineers.
- Allegro design, sales, and support staff

Assumptions

Users of this guide should have a working knowledge of the Microsoft Windows operating system for using certain of the software modules, Hall effect sensor technology, electronic test and measurement techniques, electrical power supply operation, and have a knowledge of the application being designed.

Relationship to Other Documents


This document replaces all previous user guides for the Allegro Sensor Evaluation Kit, version 2.



CAUTION: Check for the latest version of this manual, on the Allegro On-line Store website at www.allegromicro.com.

The data in this manual constitutes the available documentation on the ASEK-02 kit. The kit is intended to be used as is, and Allegro does not support modifications to the kit, other than those specified in this document.

Using PDF Hyperlinks




When viewed online as an electronic book in PDF format, the cross-references in the text, such as: *see Figure 1-1*, are active hyperlinks. To go to the cited figure, table, or section, click the link text. To do so, position the arrow-shaped pointer over the hyperlink text, and when it changes to a pointing hand  , click to go to the target.

In addition to the links embedded in the text, the page numbers in the Table of Contents and list of figures are hyperlinks. Click the page number to go to the cited page.

The Adobe Acrobat viewer also provides an interactive set of links in the **Bookmarks** tab in the Navigation pane. The Navigation pane is displayed by default, but if it has been closed in the instance that you are using, in the Acrobat main menu, click **View > Navigation Tabs > Bookmarks**, or press the **F4** key.

Document Conventions

The following document conventions are used throughout the documentation set.

Convention	Description
Bold text	Literal text appearing in the interface of the software product
Monospace text	Text that is entered or returned by the software
<i>Italic text</i>	When describing data input, a variable data placeholder (the text is replaced with appropriate text for entry); in other contexts, text to be considered literally
[text text]	Optional fields, with the pipe () character indicating to select one of the alternatives given within the brackets
{text, text}	Mandatory fields, with the comma (,) character indicating to select one or more choices within the braces
	Information about potential loss of data
	Additional information of interest
	Information about potential hazard to operator or equipment

Getting Help

A PDF version of this manual is available on the Allegro On-line Store website.

For additional information on the ASEK system or to report problems, contact your local Allegro field applications engineering office.

Chapter 1

Introduction

Welcome to the Allegro Sensor Evaluation Kit (ASEK). The ASEK boards, together with the Web-based firmware application, provide a powerful and flexible system for evaluation and programming of Allegro Hall-effect sensors. The kit includes a calibration board that provides a rapid and repeatable method for calibrating the ASEK Main Board.

Applications

The ASEK system is intended for use with field-programmable Hall effect devices offered by sale by Allegro. This includes the following types of devices:

- 2-, or 3- or 4-wire switches or latches that are programmed using the supply pin
- 3-wire linear sensors that are programmed using the output pin

The firmware for the kit includes configuration data for specific Allegro devices that are supported at the time of release of the kit. From time to time, as additional devices become available, the firmware may be updated to adapt to those devices, and made available in updated versions of this kit. Contact your local Allegro field applications engineering office for details on supported devices.

The kit is intended for use as:

- a benchtop engineering tool for evaluating individual Allegro sensor devices; it can be used to characterize and understand the performance of the various types of sensor devices
- calibrating field-programmable Allegro devices in small volumes; the device is ideal for characterizing the effects of the various register value increments and for understanding and developing procedures for programming code streams for use on production systems



CAUTION: The ASEK system is intended for low-volume engineering applications. It is not intended to be used in volume production environments, other than for system development purposes.

Additional device development kits for other Allegro devices may be available on the Allegro website, www.allegromicro.com, by following the *On-line Store* link.

ASEK Software

The programs required to access and operate the ASEK are pre-installed as firmware on the Main Board of the ASEK. The firmware falls into the following categories:

- Main Application. One graphical interface provides access to all functions, and it opens automatically upon accessing the IP address of the ASEK Main Board. These functions are summarized in the following items.

- Board Configuration Utility. This module allows a network system administrator to change the LAN address of the ASEK Main Board.
- Board Calibration Utility. This module allows the operator to calibrate the ASEK Main Board.
- Device Demonstrator modules. These are simplified interface applications used to evaluate and program the device under test (DUT). There are three demonstrator modules: for switches (2- or 3-wire), for standard linear devices, and for linear devices with additional programming modes (the 137x family).
- Desktop Utility. This module allows the operator to perform hands-on benchtop and in situ system evaluations of the behavior of various Allegro field-programmable devices. It includes:
 - Desktop Utility. This module provides an interface to sending and receiving data from the ASEK.
 - 136X Utility. This module provides a specific interface for working with linear devices in the A136x family.
 - Configuration File. This contains information about particular devices, used with the Desktop and 136X utilities.

ASEK Hardware

The kit hardware consists of a module housing the main controller and system interface printed circuit board (PCB) assembly, with peripheral PCB assemblies that serve as interfaces for mounting or connecting to DUT sockets. Interconnect cables and a multiregional power supply are also provided. The general layout of the ASEK system is shown in Figure 1-1 on page 1-3.

Allegro Kit Contents

Before opening the ASEK package, ensure that the necessary support items are available, as described in *System Requirements*, on page 1-6. At the minimum, an ESD-resistant pad should be available for placing the contents as they are unpacked.

The ASEK Board kit comprises several circuit board assemblies, with supporting elements, identified in Table 1-1.

When the package is received, immediately compare its contents to Table 1-1. If there are any missing or damaged items, contact your local Allegro field applications engineering office immediately.

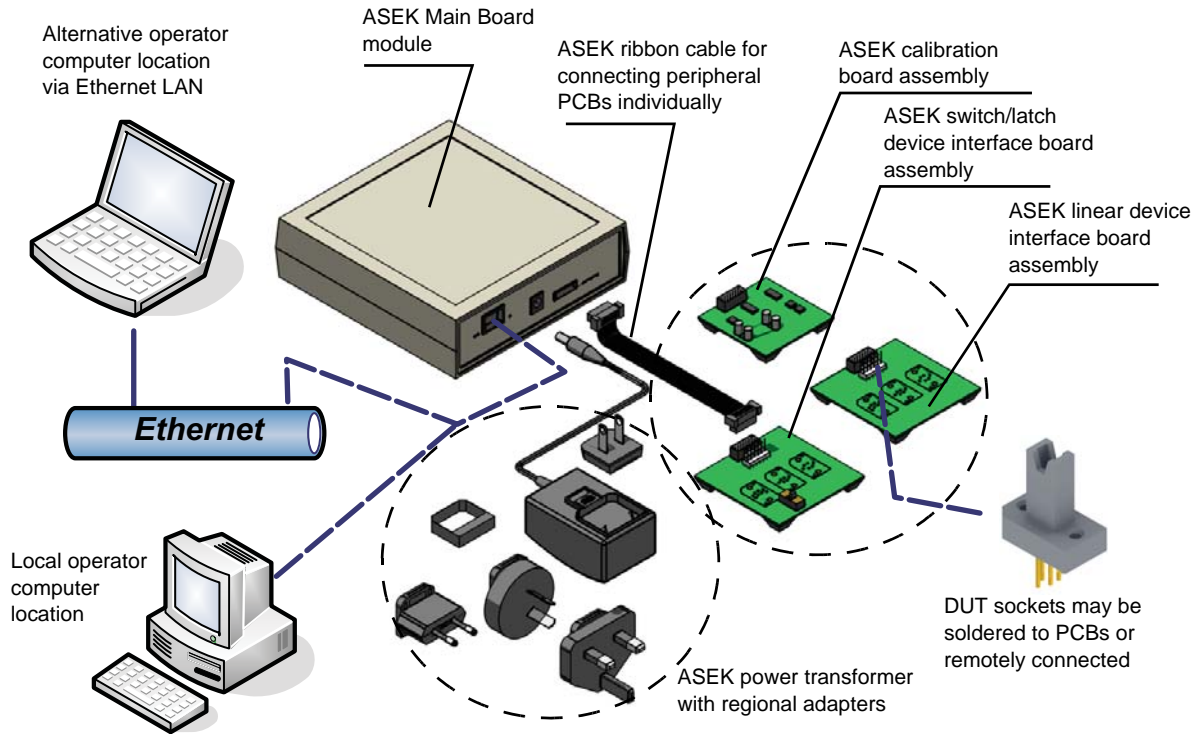


Figure 1-1 ASEK System Configuration

The system can operate over an Ethernet LAN or a direct-wired connection to the Main Board module by addressing the ASEK IP address. The connection is compatible with common process control systems. A ribbon cable connection from the Main Board module can be connected to either of the product interface boards or to the ASEK system calibration board.

Table 1-1 ASEK-02 Parts List

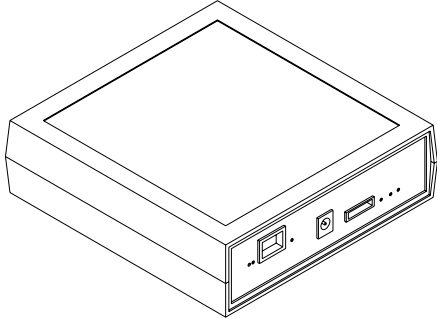
Item	Part Number	Quantity	Description
Allegro Sensor Evaluation Kit	ASEK-02	–	Consisting of the components listed in this table
Application software	N/A	1	Installed as firmware on the Main Board of the ASEK
Main Board module	N/A	1	Primary demonstrator module consisting of the following components
Protective Housing	N/A	1	13 cm x 13 cm, 4 cm overall height approximately; apertures for power supply socket, Ethernet socket, peripheral interface cable socket; windows for power and signal LEDs 

Table 1-1 ASEK-02 Parts List (Continued)

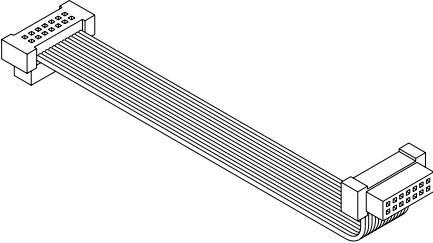
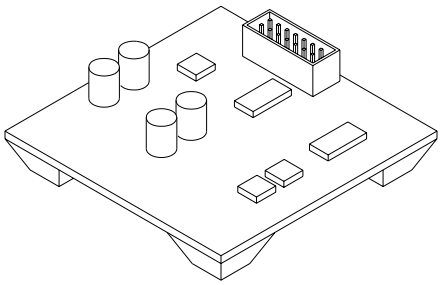
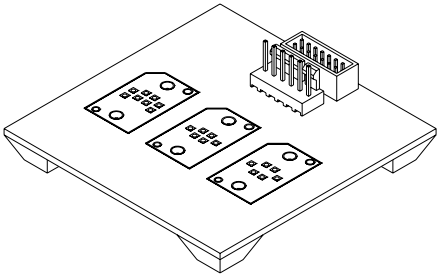
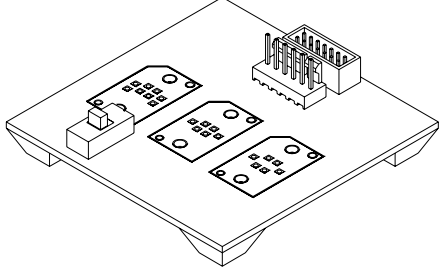
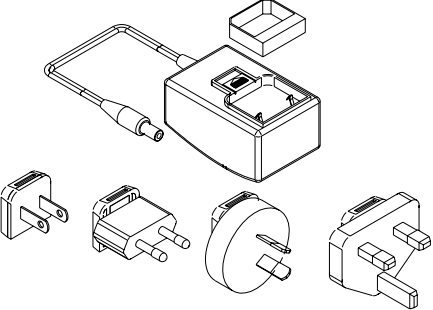
Item	Part Number	Quantity	Description
Main Board	85-0329-001 Rev. 1 (Installed in housing)	1	Main Board should only be operated inside of the protective housing due to the heat generated by the Ethernet interface board. Firmware version is available using the ASEK Desktop Utility.
Peripheral Connection Ribbon cable	85-0329-300 (Installed on housing)	1	10 cm length, with IDC male 14-pin ribbon cable connector each end 
Calibration Peripheral PCB	85-0329-100 Rev. 1 Calibration Board	1	5 cm x 5 cm, IDT female 14-pin ribbon cable header (Molex 87831-1429), used for calibrating the ASEK Main Board 
Linear Device (Output Pin Programmed) Demonstrator Peripheral PCB	85-0329-101 Rev. 1 Socket Board	1	6.3 cm x 6.3 cm, IDT female 14-pin ribbon cable header (Molex 87831-1429), 6-pin solid header 2.54 mm centers (Molex 22-11-2062), 3 device socket areas; used for Allegro linear Hall devices 

Table 1-1 ASEK-02 Parts List (Continued)

Item	Part Number	Quantity	Description
Switch Device (Supply Pin Programmed) Demonstrator Peripheral PCB	85-0329-102 Rev. 2 VCC Programming Socket Board	1	<p>6.3 cm x 6.3 cm, IDT female 14-pin ribbon cable header (Molex 87831-1429), 6-pin solid header 2.54 mm centers (Molex 22-11-2062), 3 DUT socket areas; switch for programming pin selection; used for Allegro switch or latch Hall devices</p> 
External DC Power Supply Module (Wall-mount)	85-0329-400	1	<p>6 cm x 4 cm, 4 cm overall height approximately; 5 VDC 1.2 A 5%, 90-264 VAC, 5.5 mm diameter center positive, mini plug cable, 4 regional power plug adapters, contact protective shroud</p> 

System Requirements

This kit includes hardware and software, and requires additional user-supplied equipment to operate properly.

Network Connections

The ASEK must be operated by a computer, but it is designed to allow the computer to be located either at the test bench using a direct wired connection, or to be located remotely, connected by Ethernet LAN. The ASEK includes an Ethernet port.

Although operation of the ASEK for device demonstrations can be performed either locally or via LAN, changing of the IP address of the ASEK must be performed via direct connection (see *Changing the IP Address*, on page 2-2).

For direct connection to the operator computer, the following alternatives can be used:

- A CAT5e 0.9 m Ethernet crossover cable between the ASEK and the operator computer.
- Ethernet standard LAN cable connected to a local separately-powered Ethernet hub, with a second Ethernet cable connecting from the hub to the operator computer.
- For computers that do not have an Ethernet interface, either type of cable can be connected to the computer by means of a wired USB Ethernet adapter.
- Wireless, serial port, and parallel port protocols are not supported.

Work Area

The work area should allow the printed circuit board assemblies, as well as the DUT (device under test) to be protected from ESD (electrostatic discharge) at all times. Standard temperature and humidity levels should be maintained to suppress ESD.

The boards should be placed on a level work surface, free of objects and obstructions. The surface should be located at an ergonomic height.

The work area should allow the printed circuit board assemblies to be located as near as practicable to each other. For data and power connections between the ASEK Main Board and the peripheral PCBs, the ASEK includes a ribbon cable that is approximately 10 cm in length. It is recommended that the supplied cable always be used as the interface to the peripheral PCBs, and for best results, it should not be extended in length.

User-Provided Equipment

Certain equipment and materials must be provided by the user. These are described in the following tables.

Table 1-2 User-provided Equipment: Computer and Network Peripherals

Item	Description
Computer	<p>CPU and memory: processing is performed primarily on the ASEK Main Board</p> <p>Hard disk space: if the Desktop Utility is used, that requires under 100 kB</p> <p>Interfaces: Ethernet port with RJ45 female connector, or USB 2.0 or higher female port that can accommodate an Ethernet adapter</p> <p>Computer monitor, color; 1024 x 768 pixels minimum recommended for optimum viewing of user interface application</p> <p>Mouse and keyboard</p>
Operating system	<p>Supports a graphical user interface</p> <p>Web browser application installed</p> <p>For use of the Desktop Utility module, Microsoft Windows and .NET Framework 2.0 installed</p>
LAN	<p>Direct connection (required for changing IP address of ASEK): Ethernet crossover cable, RJ45 male/male CAT5e, or Separately-powered Ethernet hub connected between ASEK and operator computer by 2 standard Ethernet connection cables</p> <p>LAN connection: IEEE 802.3, 10/100Base-T Ethernet LAN with standard Ethernet connection cable</p>

Table 1-3 User-provided Equipment: Programming Tasks

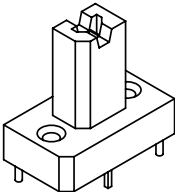
Item	Description
DUT sockets	<p>DUT sockets for standard device package types are available directly from Azimuth Electronics (www.azimuth-electronics.com). Otherwise, as required by the package type of the Allegro DUT.</p> 

Table 1-3 User-provided Equipment: Programming Tasks (Continued)

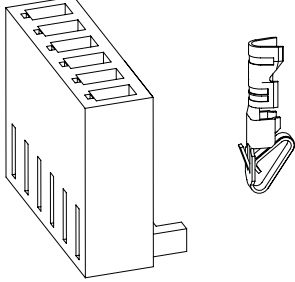
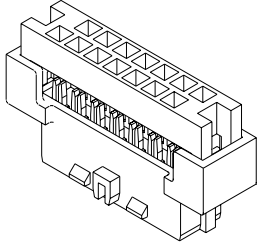
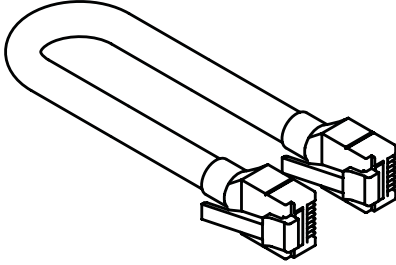
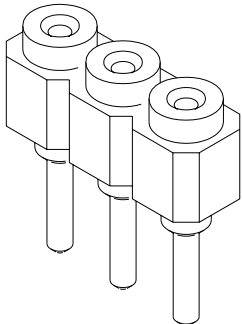
Off-Board Connection	<p>For connection from an ASEK interface PCB to a user-provided DUT socket that is mounted off-board, connection to on-board Molex 6373 series 6-pin solid header (such as Molex 6471 series Crimp Terminal Housing 22-01-2025, accepts Molex 4809 series Crimp Terminals 22-30 AWG, such as 85-50111), shielded cable with 4 to 8 conductors and length as short as possible.</p>  <p>For direct connection from ASEK Main Board to a user-provided DUT socket (without ASEK interface board), connection to on-board Molex 87833-1420 14-pin ribbon cable PCB header, 2 mm centers (such as Molex 87568-1494 IDT cable-to-board receptacle).</p> 
Ethernet Crossover Cable	<p>Used for IP address setting. 0.9 m or shorter, male RJ45 connectors both ends; CAT5e crossover cable; compatible with Ethernet 10/100Base-T.</p> 
Soldering Equipment	<p>DUT sockets acquired from Azimuth Electronics are manually soldered onto the peripheral PCBs. Additional filter components may be required to be soldered to the PCBs for certain applications.</p>
DUT bypass capacitor	<p>As required by application, see DUT datasheet for rating. Recommended maximum rating of 0.1 μF to avoid creating instability in ASEK system, and minimum 50 V.</p>

Table 1-3 User-provided Equipment: Programming Tasks (Continued)


DUT blowing capacitor	<p>As required by application, see DUT datasheet for rating. Capacitor must be capable of withstanding higher voltages required for blowing solid state fuses internal to the DUTs while programming them.</p> <p>This capacitor may be required to be inserted and removed at different stages of programming, and a socket should be used. On the ASEK linear DUT interface PCB, an optional socket is installed with 2.54 mm and 5.08 mm pitch holes, accepts capacitor leads 0.38 mm to 0.64 mm in diameter and 2.54 mm to 3.71 mm in length (Aries series 0513 collet socket).</p> 
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Safety

In order to prevent damage to the operator or to the kit or DUT, only qualified electronics technicians or individuals with equivalent training should operate the product.

Follow the safety precautions required by local laws and regulations, and by the procedures of your company.

The following specific warnings are not meant to be exclusive, or to limit the application of normal safety precautions in any way:

- 
CAUTION: Only use the power supply provided with the ASEK. Do not substitute any other power supply, or damage to the ASEK electronics may occur.

- 
CAUTION: Always take precautions to avoid ESD before handling boards. This includes: using ESD resistant clothing and gloves, and personal conductive straps, properly connected to an earth ground. The work surface should be on an ESD-resistant pad, and the operator should be standing or sitting on an ESD-resistant mat.



CAUTION: To avoid overheating, the ASEK must be located in an open area with adequate circulation of air around all surfaces of the assembly.

The ASEK Main module and the peripheral PCBs must be oriented with the component side upwards to allow conductance of heat away from the board. Failure to do so may cause damage to the assembly.

The ASEK Main module and the peripheral PCBs must be separated from the work surface to allow adequate airflow for cooling the underside of the board. The boards should rest on the standoffs provided with the kit (a minimum of 0.25 inch in height).



WARNING: THERMAL HAZARD

When operated under the normal conditions for the ASEK, the Ethernet interface card operates at a duty cycle that does not normally generate hazardous amounts of heat. However, the Ethernet card is mounted on the Main Board of the ASEK and both are enclosed in a plastic housing. Do not operate the ASEK with the Main Board removed from the housing or with the housing covers removed.



CAUTION: Do not touch any portion of the board or exposed connections when power is connected to the boards.

Chapter 2

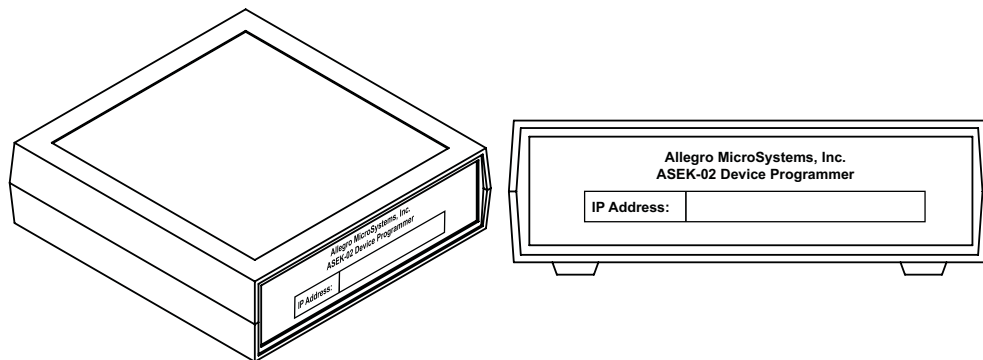
Network Configuration

The ASEK is operated through a Web-based interface, and is accessed through a network connection. The “network” can be a facility LAN, a compatible process control system computer, a simple direct connection by cable from an operator computer, or a connection through a local Ethernet hub. With a valid LAN IP address, the ASEK can be accessed by any of these means. The net submask can also be configured. This chapter describes IP considerations and how to reconfigure the IP address and subnet mask when necessary.



WARNING: Keep an accurate record of the IP address of the Main Board. The ASEK can only be accessed through the IP address. If the IP address is lost, the Main Board module must be returned to Allegro for resetting.

Anytime the IP address is changed, it can be noted in the area provided on the front of the Main Board module housing, shown here.



Using the Default IP Address

A default IP address, <http://192.1.2.3>, and a local subnet mask, 255.255.255.0, are loaded in an EPROM on the ASEK Main Board. If the default IP address is valid on the network (including direct connections to the operator computer), no further address configuration is required. Access the ASEK as described in *Accessing the ASEK Software Interface*, on page 6-1.



Note: It is recommended that the IP address being used for the ASEK always be reserved by the LAN network administrator.

Changing the IP Address

If it is necessary to change the IP address of the ASEK Main Board, complete the procedure described in this section. This procedure applies in any circumstance in which the IP address must be changed. Changing the address may be necessary at initial configuration, if the default IP address in the ASEK firmware conflicts with an existing address on the network. However, changing the IP address can be done at any time, and there is no limit on the quantity of reconfigurations.

IP address reconfiguration requires knowledge of the local area network (LAN) at the facility where the testing will occur. In addition, reconfiguration requires Administrator privileges on the computer used to configure the ASEK. For these reasons, a network system administrator is normally required to perform the IP address reconfiguration.



Note: This procedure requires that the ASEK be directly connected to the operator computer. After the IP address and subnet mask have been set, the ASEK can be reconnected and accessed using that address over any type of “network,” either an Ethernet LAN, or a direct connection via Ethernet crossover cable or local hub.

To change the IP address of the ASEK, the network administrator should perform the following steps:

- 1 Have the following available:
 - ASEK Main Board module
 - ASEK-included power supply
 - Ethernet crossover cable or local hub and two LAN cables
 - Computer
 - If an Ethernet port is not available on the computer, acquire a USB 2.0-to-Ethernet wired network adapter with female RJ45 terminal



CAUTION: When reconfiguring for use with a laptop computer that may not always be hard-wired to the LAN, to avoid possible interference with other LAN port assignments, such as a docking station, do not use the LAN port jack on the laptop to perform IP address configuration. It is highly recommended to instead use an auxiliary USB port on the laptop to perform the IP address reconfiguration, and also to serve as the connection point when operating the ASEK during DUT demonstration tasks.

For the same reason, do not use a wireless LAN connection to the operator computer when performing IP address reconfiguration.

- 2 Prepare the computer:
 - a Power-on the computer at any time.
 - b Disconnect the operator computer from the LAN.
 - c Determine which direct connection method to use (crossover cable or standard cable from a local hub; see *Data Link Configuration*, on page 3-2), and connect the corresponding Ethernet cable to the computer Ethernet port or network adapter.
- 3 Prepare the ASEK Main Board module:
 - a On the ASEK Main Board module, insert the loose end of the appropriate Ethernet cable

into the corresponding jack, labeled *10/100baseT Ethernet*. (For jack location, see Figure 3-1 on page 3-2.)

- b Prepare and connect the power supply for the ASEK main board, as described in *Power Supply Configuration*, on page 3-3



CAUTION: Use only the power supply provided with the ASEK. Use of other power supplies may result in damage to the ASEK.

After powering-on always wait at least 30 seconds to ensure that the firmware is loaded and the IP stack is started.

- 4 Open the ASEK software interface:
 - a On the operator computer, open the Web browser application.
 - b Enter **http://192.1.2.3** as the IP address, and search for that destination. The ASEK software interface Main page appears in the browser. It is shown in Figure 2-1.



Figure 2-1 ASEK software interface, Main page

The Home Page button returns to this page from any other page in the application, and the Refresh Off button prevents real-time update of the values shown in the panel, for V_{CC} and V_{OUT} , to conserve system resources.



Note: If the Main page does not appear, confirm that the ASEK IP address has not already been changed. If the IP address is not known, the ASEK may have to be returned to Allegro for resetting. Contact your local Allegro field applications engineer for assistance.

- 5 Enter the IP address and subnet mask:
 - a In the ASEK interface, click the **Board Configuration** button. The Programmable Linear Demonstrator Board Configuration Utility page opens. It is shown in Figure 2-2.
 - b To accept the default IP address, ignore the **IP Address** text box.

Otherwise, to change the IP address, in the **IP Address** text box, type the new IP address.

 - c In the **Net Mask** text box, enter the mask, if necessary:



Figure 2-2 ASEK software interface, IP address setting page

If the ASEK will be used in a direct connection to the operator computer, designate the local subnet mask by typing:

255 . 255 . 255 . 0

To configure a LAN connection, enter the appropriate subnet mask.

- d Click the **Set Address** button. The changes are written to the ASEK Main Board EPROM, and the ASEK interface Main page reopens.
 - e Close the Web browser to end the session.
 - f Connect the ASEK and computer in their operating configuration and test to ensure that the IP address is working properly.
- 6** The ASEK can now be used for DUT demonstration tasks from the corresponding node on the network.



CAUTION: It is highly recommended that an initial board calibration be performed before performing any DUT demonstrations. For more information, see Chapter 5, *ASEK Main Board Calibration*.

Configuring Simultaneous LAN Connection

An alternative IP address may be configured where necessary to allow access to the ASEK via direct connection while maintaining a connection to the Internet and other IP addresses via the LAN.



CAUTION: This procedure may require Administrator privileges to perform. It is highly recommended that the LAN system administrator perform LAN-related configuration tasks.

To configure an alternative address for the LAN, perform the following steps:

- 1** On a Windows-based operator computer, press the Window key, then click **Settings > Network Connections**. (On some systems, it may be necessary to click Settings > Control Panel > Network Connections.) The Network Connections window opens.
- 2** Locate the hard-wired LAN connection option, and open it. The Local Area Connection Properties dialog box opens.
- 3** On the **General** tab, in the list box, click the option **Internet Protocol (TCP/IP)** to select it.
- 4** Below the list box, click the **Properties** button. The Internet Protocol (TCP/IP) Properties dialog box opens.
- 5** Click the **Alternate Configuration** tab to open it.
- 6** Select the **User configured** radio button.
- 7** In the **IP address** text entry box, type:

192.1.1.2.[x]

where x is any number that makes the IP address unique on the LAN (the entire address must also differ from the current IP address of the ASEK).
- 8** In the **Subnet mask** text entry box, type:

255.255.255.0
- 9** Click the **OK** button to save the changes and exit out of the configuration window.

Chapter 3

ASEK Hardware

This chapter describes the ASEK hardware, including PCBs, cables, and power supplies. Connection of the ASEK hardware must take into consideration the system requirements and safety considerations described in Chapter 1, *Introduction*.

Preparing for DUT evaluation involves configuring the ASEK system by connecting the ASEK hardware to the computer and power supplies, wiring connections appropriate for the particular DUT. Selecting the DUT in the ASEK software, and finally running the demonstration sequences themselves is described in Chapter 4, *DUT Programming*.

To access the ASEK, it must be connected to the network node corresponding to the IP address and subnet mask that has been set in its EPROM. Address reconfiguration is described in Chapter 2, *Network Configuration*.

ASEK Main Board Module

The ASEK Main Board is housed in a protective enclosure, which protects the operator from any potentially elevated temperatures generated by the Ethernet card mounted on the ASEK Main Board. Although at the duty cycles used by the ASEK, temperatures do not reach a hazardous level, the module should never be used with the protective housing removed or opened. To promote proper heat flow, during use, the module must always be oriented with the four external standoff pads in place, and located on the bottom of the module.

The connectors and indicator LEDs are located on the back of the housing, shown in Figure 3-1 on page 3-2. All access to the functions of the Main Board is accomplished through the three connector jacks located on the back of the housing:

- *10/100baseT Ethernet* – RJ45 receptacle for standard Ethernet LAN cables and crossover cables.
- *5V Power* – Mini power connector receptacle for the ASEK power supply cable.
- *Device Connection* – 14-wire ribbon cable receptacle for the power and signal connections to the peripheral ASEK PCBs or user-designed test fixtures.

Adjacent to the connectors are several windows to allow display of the status LEDs that are mounted on the Main Board:

- *Power* – Glows steadily to indicate that appropriate power is being applied to the Main Board.
- *Busy* – Glows intermittently to indicate that the ASEK is currently performing a task, including: initializing, downloading to the peripheral PCBs, or communicating over the network.
- *Short* – Glows steadily to indicate that Main Board has entered a self-protection mode, such as reaching the current limit when supply is shorted to ground on the DUT circuit; continues illuminated until the short condition is removed.

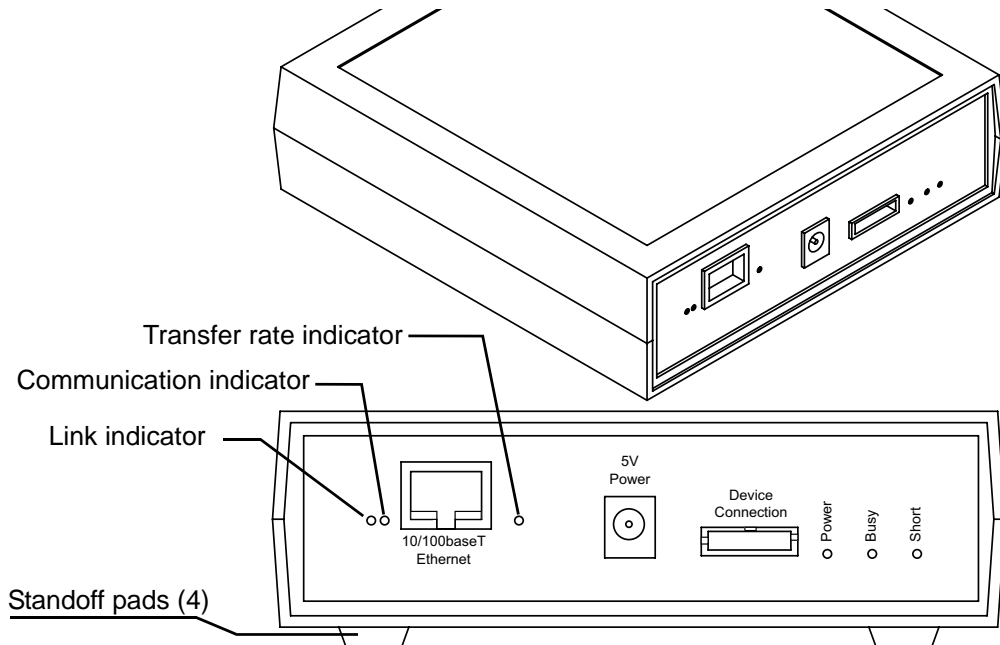


Figure 3-1 ASEK Main Board module, rear view

- Ethernet activity is indicated by the three LEDs adjacent to the 10/100baseT Ethernet jack (for location refer to Figure 3-1):
 - Link indicator – Glows steadily to indicate that a valid connection exists with the network.
 - Communication indicator – Glows intermittently to indicate that data is being transferred over the network.
 - Transfer Rate indicator – When Link indicator is also illuminated, glows steadily to indicate the link is functioning at 100 Mbps, no illumination indicates the link is functioning at 10 Mbps.

Data Link Configuration

The ASEK Main Board module can be connected to the operator computer via a standard Ethernet connection.

The ASEK can also be directly connected to the operator computer using either a standard Ethernet crossover cable, or a separately-powered Ethernet hub linked by two standard Ethernet LAN cables. The alternate configurations are shown in Figure 3-2 on page 3-3.

If there is no Ethernet port on the computer, use a USB 2.0 Ethernet adapter. Insert the loose plug of the Ethernet cable into the adapter Ethernet port, and then insert the USB adapter into a USB port in the computer.

The ASEK allows the computer to be powered-on or -off when the data connections are made.

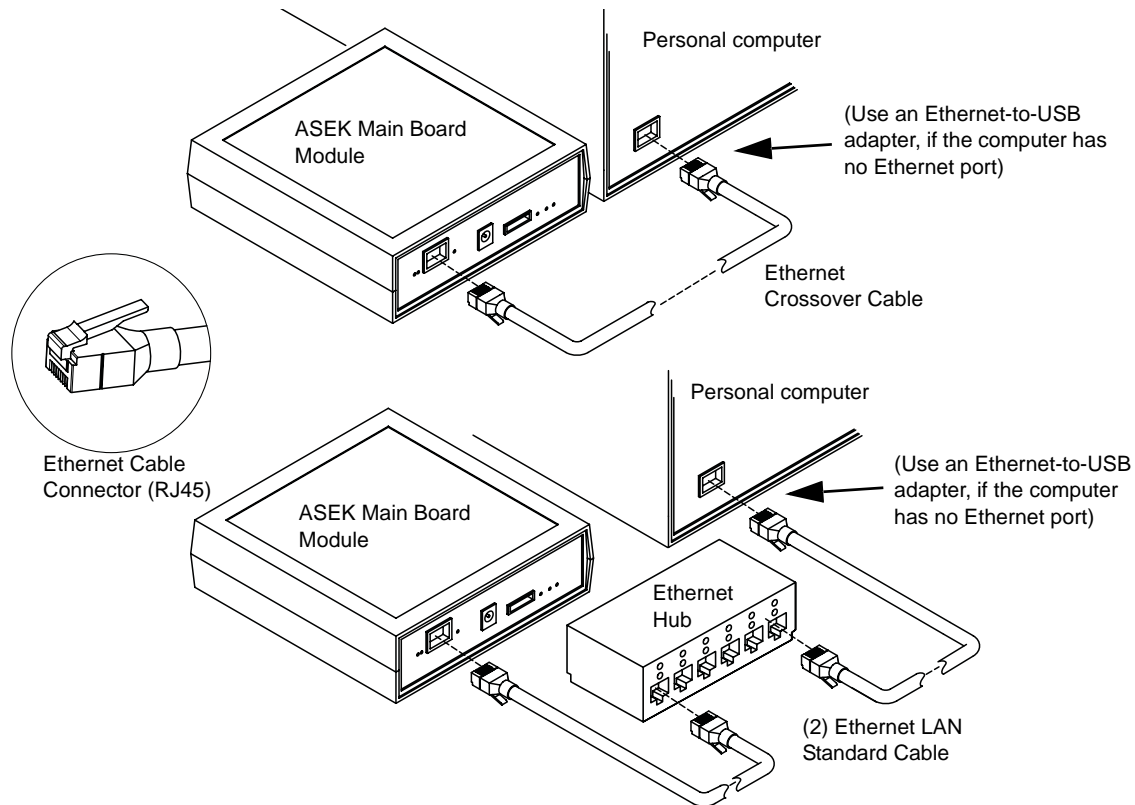


Figure 3-2 Direct connection options
Ethernet crossover cable (above), or Ethernet hub and two standard cables (below).

Power Supply Configuration

The ASEK provides a 5 V power supply that has been selected to match the ASEK electronics. It is connected to the ASEK Main Board module by a mini plug, and powers the ASEK Main Board, the ASEK peripheral PCBs, the DUT, and any DUT sockets connected to the test system.



CAUTION: Use only the power supply provided with the ASEK. Use of other power supplies may result in damage to the ASEK.

The power supply set is equipped with a pin recess that accepts various regional facility power mains prongs. The prong adapters are provided with the transformer in the ASEK kit. The components of the power supply set are shown in Figure 3-3 on page 3-4.

To prepare the power supply, complete the following steps:

- 1 Select the prong adapter appropriate to the facility power supply.
- 2 On the transformer body, slide the latch toward the cable side, and lift the protective shroud out of the pin recess, as shown in Figure 3-4. Release the latch.
- 3 Align the rounded corners of the selected prong adapter with the rounded corners of the pin recess (with adapter prongs facing away from the transformer body).
- 4 Push the adapter base into the pin recess until the latch snaps into the adapter.

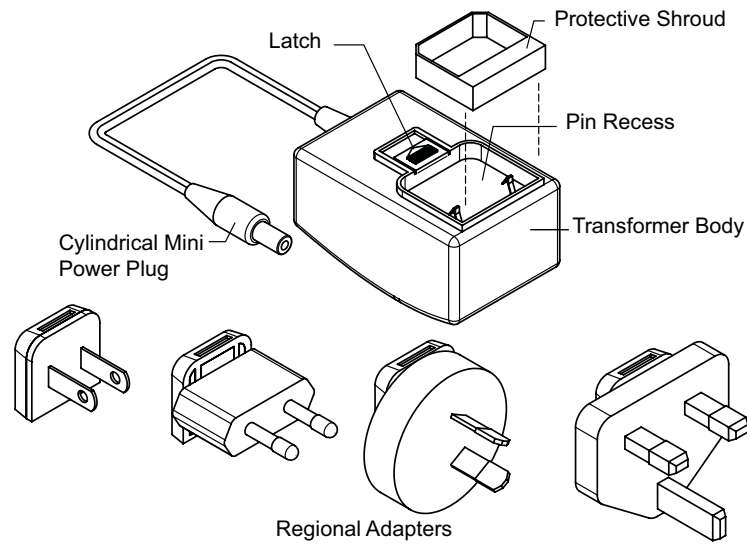


Figure 3-3 ASEK Power supply set
The set includes a transformer and regional power prong adapters.

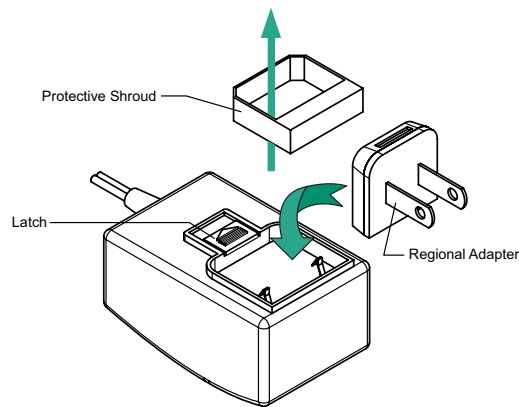


Figure 3-4 Changing power supply prongs
Withdrawing the latch allows the protective shroud to be removed and alternate regional adapters to be substituted.

- 5** Connect the cable of the transformer to the ASEK Main Board module by inserting the cylindrical mini power plug into the module jack labeled *5V Power*.
- 6** Connect the transformer to the facility power supply. The transformer powers-on the Main Board when connected. Firmware initialization occurs automatically.
- 7** Confirm that power is reaching the Main Board by checking the LED labeled *Power*. It should be glowing steadily.

ASEK Interface PCBs

The ASEK provides interface boards that can be connected to the ASEK Main Board and serve as the connection for the DUT sockets, mounted either directly on the interface PCB, or connected through the PCB from a user-defined test fixture.

- For information on installing the pre-designed DUT sockets on the ASEK interface boards, see *On-Board DUT Sockets*, on page 3-9. This is the simplest method for using the ASEK, because line impedances are minimized, required external components are provided, and connection points are available for filter and storage components.
- For information on using the interface boards with DUTs mounted in user-designed off-board test fixtures, see *Off-Board DUT Socket Connections*, on page 3-10. This method benefits by taking advantage of the ribbon cable, on-board external components, and connection points. However, steps may have to be taken to ensure high-quality and low impedance connections to the off-board DUT socket.
- The interface boards can be omitted, and user-designed test fixtures can be connected directly to the ASEK Main Board module, as described in *DUT Connection Without Interface PCBs*, on page 3-11. This method provides the most direct connection between the ASEK Main Board module and a user-designed test fixture. However, steps may have to be taken to ensure high-quality and low impedance connections to the DUT socket.

Each interface PCB is designed to demonstrate several related families of DUTs. Allegro field applications engineers can assist in determining which devices are appropriate for programming using each PCB.



CAUTION: DUTs are primarily classified by the electronic devices they contain, rather than by the physical package. The same physical package may be used for different DUTs, and a DUT may be provided in more than one physical package.

The interface boards accommodate the same physical package types, and so care must be taken to ensure that only the appropriate electronic devices are used with each PCB type.

Appropriate values for programmable parameters, as well as programming protocols, are provided in the datasheets for the individual devices.

Linear Device (Output Pin Programming) Interface PCB

(PN 85-0329-101, Rev. 1; ASEK-02 Socket Board)

This interface PCB is designed for demonstrating DUTs that are programmed using the output pin (usually named *VOUT*) of the DUT. The devices programmed with this PCB have linear response to a magnetic field.

A simplified board layout is provided in Figure 3-5 on page 3-6, and a simplified schematic is provided in Figure 3-6 on page 3-6.

Three standard DUT mounting areas are provided (see *On-Board DUT Sockets*, on page 3-9), and one connector (J1) for connecting off-board DUT test fixtures.

Because linear Hall devices are very sensitive to line voltage levels, this PCB supports Kelvin isolation of the DUT connections (for more information on this method, see *Force/Sense Connections*, on page 3-12). The PCB provides full Kelvin connections for the three on-board DUT

mounting areas. When using an off-board DUT socket, however, the Kelvin force and sense pairs from connector J1 must be tied together at the DUT socket.

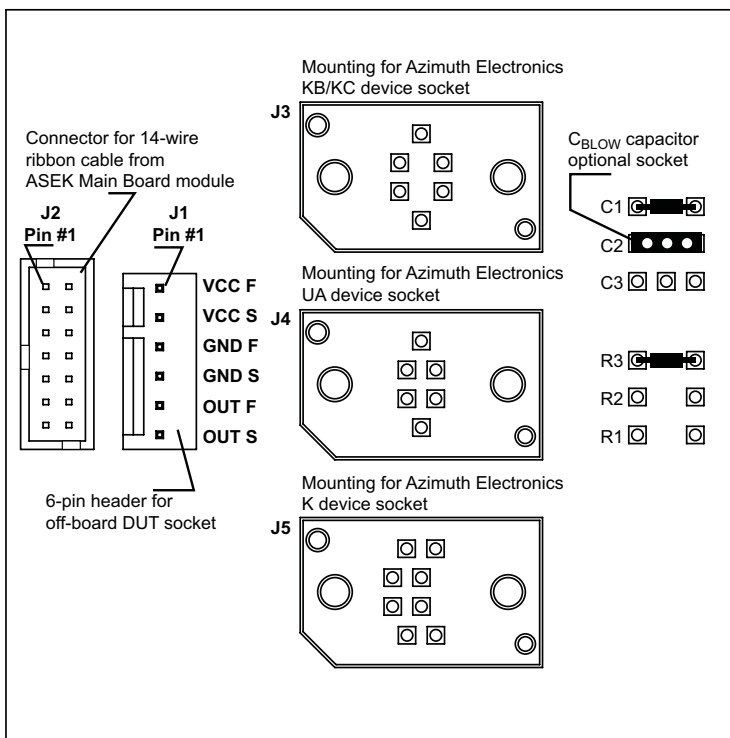


Figure 3-5 Linear device, output-pin programming PCB (PN 85-0329-101) layout

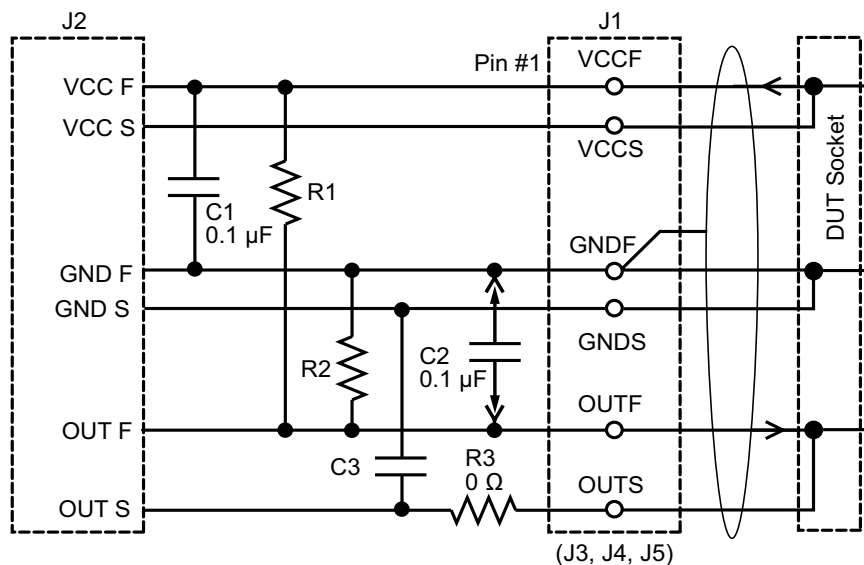


Figure 3-6 Linear device, output-pin programming PCB (PN 85-0329-101) basic schematic
 J1 connects off the PCB, and J3, J4, and J5 are the pre-designed DUT sockets. Optional output filter components (R1, R2, and C3) and can be installed in the field using mounting points on the PCB. For some devices, C_{BLOW} (C2) is inserted and removed during normal procedures. Kelvin force and sense shunting at the DUT socket required when the DUT is mounted off of the PCB.

A user-configured output filter is recommended. As shown in Figure 3-5, mountings are provided on the PCB for the filter components C3, R1, and R2.

A supply bypass capacitor, C_{BYPASS} , is installed at C1.

A socket for a user-supplied fuse blowing capacitor, C_{BLOW} , is installed at C2. For some devices (refer to the datasheet for the specific device), C_{BLOW} is required to be inserted and removed at different stages of programming. In those cases, the use of a socket facilitates the removal of the blowing capacitor during value testing, and its insertion when actually blowing the fuses to provide the required power levels.

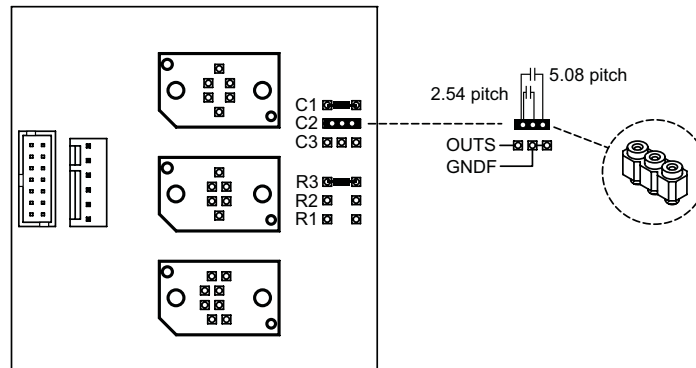


Figure 3-7 Layout of C2, C_{BLOW} , socket on linear device (output pin programming) interface board

The socket accommodates two capacitor pin pitches. One capacitor pin must be inserted in the socket position (OUTS) nearest the center of the PCB; the other capacitor pin can go into either the middle or the outboard socket position (GNDF).

Switch or Latch Device (Supply Pin Programming) Interface PCB

(PN 85-0329-102, Rev. 1; ASEK-02 VCC Programming Socket Board)

This interface PCB is designed for demonstrating DUTs that are programmed using the supply pin (usually named *VCC*) of the DUT. The devices programmed with this PCB are bipolar magnetic switches and latches.

Three standard DUT mounting areas are provided (see *On-Board DUT Sockets*, on page 3-9), and one connector (J1) for connecting off-board DUT test fixtures. When this board is used only to interface to a user-designed test fixture, and none of the DUT socket mounting areas are used, the ground points of at least one of the three socket mounting areas must be shorted. The ground point locations are shown in Figure 3-11 on page 3-10.

A simplified board layout is provided in Figure 3-8 on page 3-8, and a simplified schematic is provided in Figure 3-9 on page 3-8.

The supply bypass capacitor, C_{BYPASS} , is installed at C1. Capacitor C1 also serves as the fuse blowing capacitor, C_{BLOW} , to provide the required power levels when actually blowing the fuses.

A distinguishing feature of this PCB is the support for monitoring the I_{CC} of 2-wire devices. A slide switch (S1) is mounted on the PCB. Place the switch in the *ICC* position to monitor approximate values of I_{CC} , based on R2, a non-precision $10\ \Omega$ resistor. To demonstrate the DUT without monitoring I_{CC} , place the switch in the *VOU*T position.

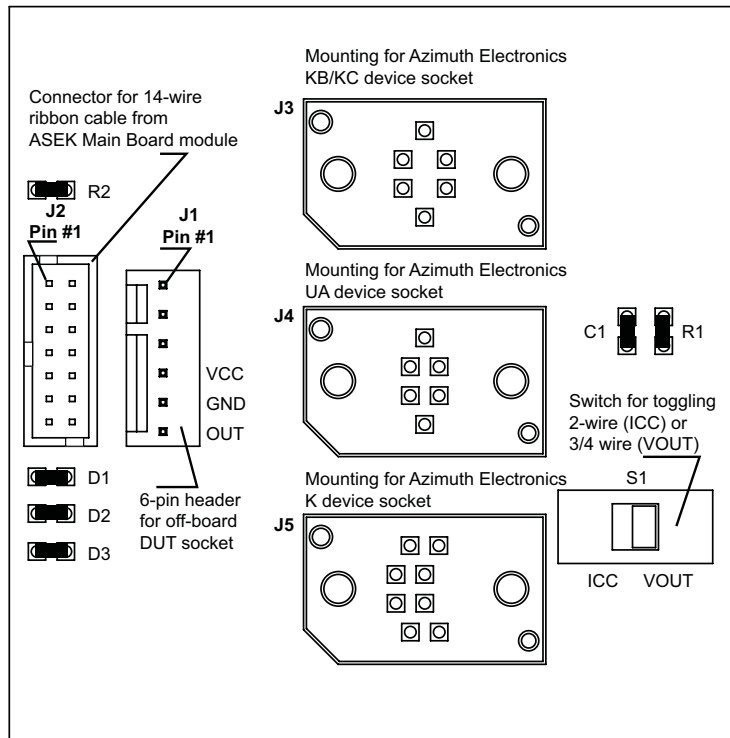


Figure 3-8 Bipolar switch or latch device, supply-pin programming PCB (PN 85-0329-102) layout

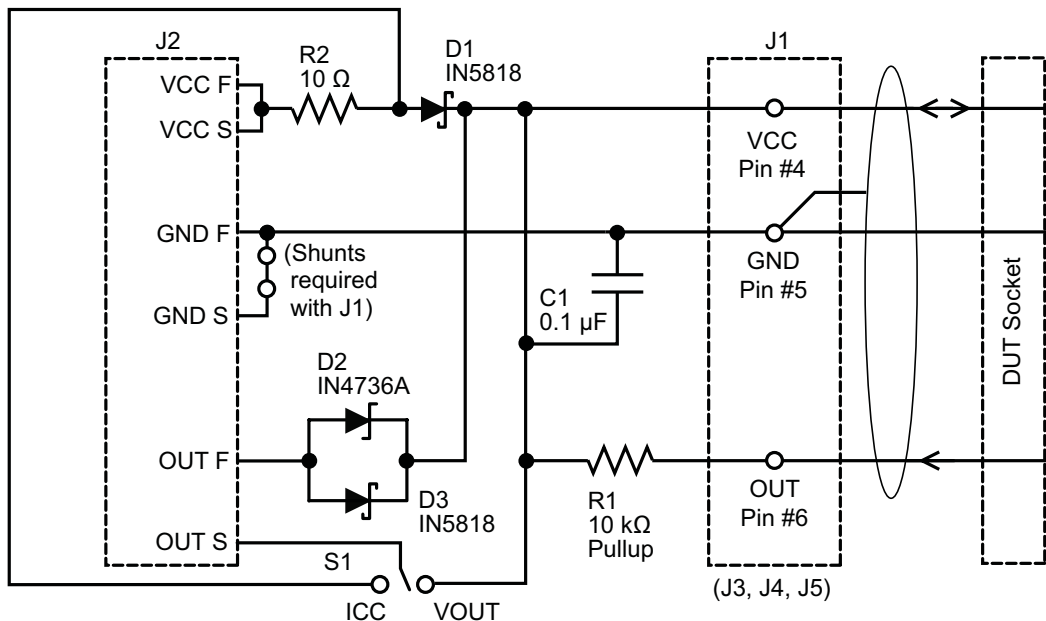


Figure 3-9 Bipolar switch or latch device, supply-pin programming PCB (PN 85-0329-102) basic schematic J1 connects off the PCB (shunts required, see Figure 3-11), and J3, J4, and J5 are the pre-designed DUT sockets.

On-Board DUT Sockets

The ASEK DUT interface PCBs provide three mounting areas for pre-designed DUT sockets. Use of pre-designed sockets allows the operator to perform DUT demonstrations on common packages, without external wiring to DUTs. The three mounting areas are distinguished by the unique patterns of the through holes used to mount the sockets.

Pre-designed DUT sockets are available directly from Azimuth Electronics (www.azimuth-electronics.com). Use of these sockets is shown in Figure 3-10 on page 3-9.

Patterns are provided for the following sockets:

- Package K (Azimuth Electronics PN 63071-3); location J5
- Packages KB and KC (Azimuth Electronics PN 63071-1); location J3
- Package UA (Azimuth Electronics PN 63071-2); location J4

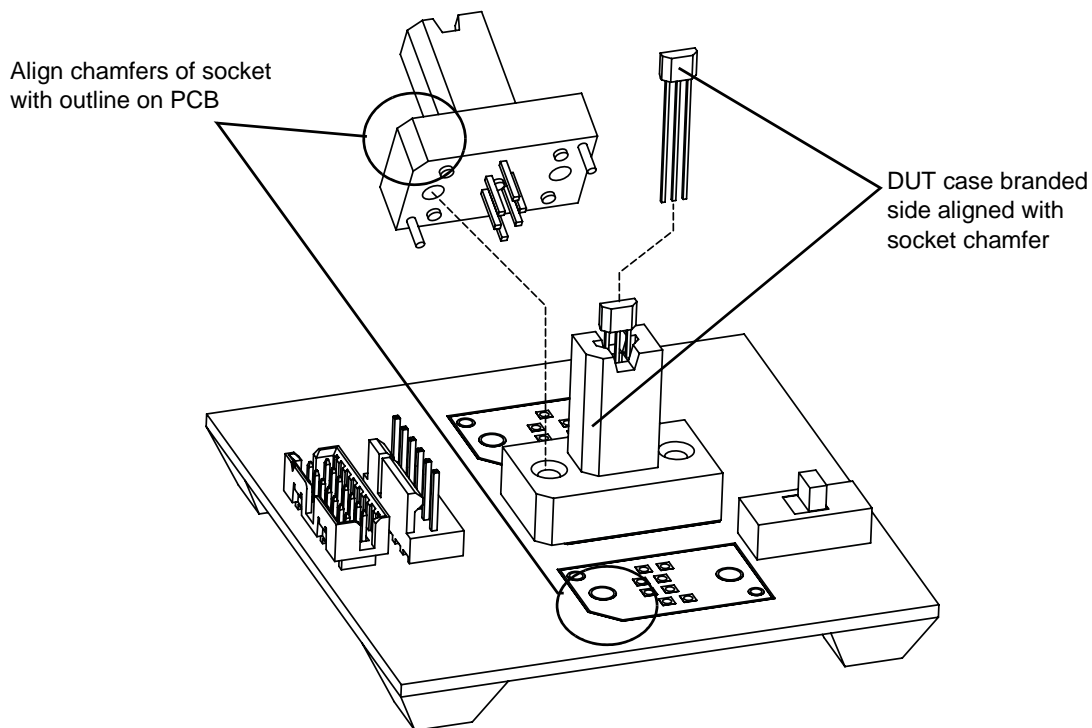


Figure 3-10 Pre-designed DUT socket mounting

These sockets can be soldered directly onto an interface PCB, eliminating external wiring of DUT connections. Each socket has a unique pin pattern with respect to the chamfer, matching the mounting area on the PCB.

Off-Board DUT Socket Connections

The ASEK interface PCBs can be used to connect user-designed DUT sockets or test fixtures that are not mounted on the interface PCB itself. This method offers the advantage of providing the required external components already installed, and mounting positions available for application-specific resistors and capacitors. In addition, the ribbon cable connection to the ASEK Main Board module is already built.

An off-board DUT socket is connected to the ASEK interface PCB through the 6-pin header J1 on the appropriate interface PCB. Connection wires can be crimped onto terminals inserted in a terminal housing that is compatible with the installed header (for specifications, see Table 1-3 on page 1-7).

When using the switch/latch (supply pin programming) interface PCB, because none of the three on-board mounting areas is used, at one of those areas the ground loop terminals must be shunted (shunting at one area shunts all three areas). To do so, solder a jumper wire between the GNDF and GNDS connections in one of the three mounting areas. The ground loop terminals in each area are shown in Figure 3-11.

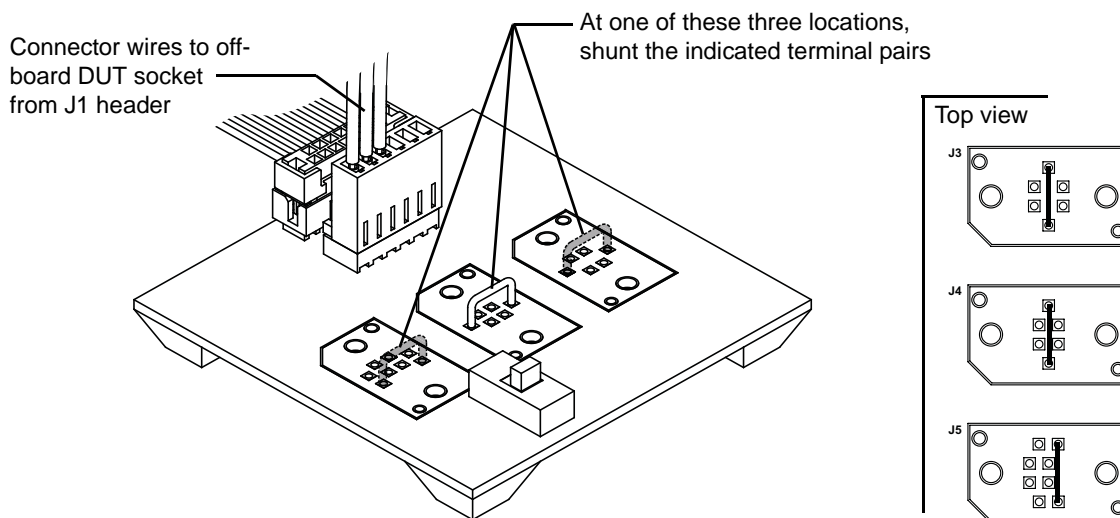


Figure 3-11 Jumping unused GND terminals on the VCC programming PCB

When using the switch/latch (supply pin programmed) interface PCB with an off-board socket, the GNDF and GNDS loops must be closed on the PCB. To do so, solder a jumper wire between any one of the three through-hole pairs shown in this figure. The other two DUT mounting areas can then be left without jumpers.

When using the linear device (output pin programming) interface PCB, ground loop shunting is already provided on the PCB. However, because linear Hall devices are very sensitive to line voltage levels, when using an off-board DUT socket, the Kelvin force and sense pairs from connector J1 must be tied together at the DUT socket (for a schematic illustration, see Figure 3-6 on page 3-6). (For more information, see *Force/Sense Connections*, on page 3-12.)

DUT Connection Without Interface PCBs

The ASEK interface PCBs are not mandatory for using the ASEK, and if a user-designed test fixture is used, it can be connected directly to the ASEK Main Board module using the 14-wire ribbon cable header, labeled *Device Connection*, on the Main Board module.



Warning

The ASEK Main Board is provided with various protection features that can help to prevent damage to the Main Board while the user-defined test fixture is being developed or operated. However, Allegro cannot guarantee that the internal protection functions will be sufficient to protect the ASEK under all circumstances, and cannot take responsibility for damage that may result from using a custom test fixture.

For the location of the Main Board header, see Figure 3-1 on page 3-2.

The pin-out of the Device Connection header is shown in Figure 3-12.

For specifications of the ribbon cable header and connecting receptacle, see Table 1-3 on page 1-7.

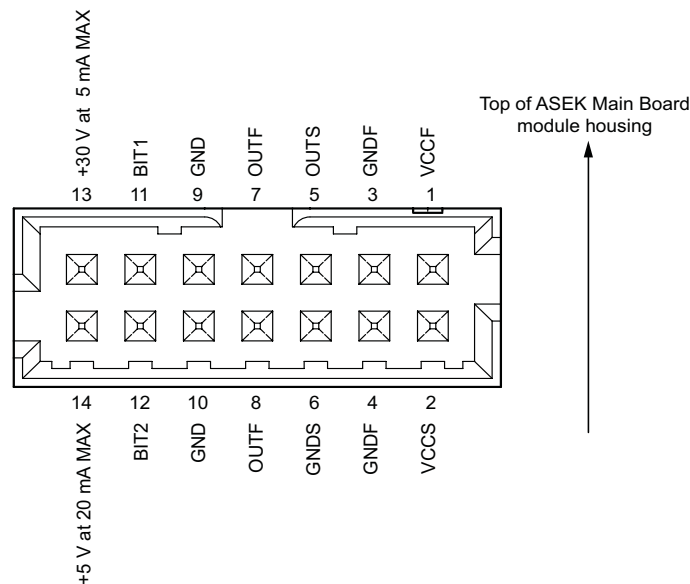


Figure 3-12 ASEK Main Board ribbon cable header pin-out



Note:

As a minimum, the C_{BLOW} capacitor must be included in any user-designed test fixture.

Because linear Hall devices are very sensitive to line voltage levels, Kelvin isolation of the DUT connections should be provided (for more information, see *Force/Sense Connections*, on page 3-12 and Figure 3-6 on page 3-6).

If an overload condition arises, the ASEK will shut down until the fault condition is resolved. To determine if the ASEK has entered a fault shutdown, on the ASEK Main Board module observe the LED indicator labeled *Short* (for location, see Figure 3-1 on page 3-2). If it is illuminated, the ASEK is in a fault shutdown.

Force/Sense Connections

When programming linear sensors, the level of V_{CC} at the device is very sensitive. The force/sense feature of the ASEK allows the operator to configure the system using Kelvin connections, a force/sense paired circuit to measure voltages and currents at either the on-board DUT socket or at an off-board DUT socket.

This feature can be used to improve sensing reliability in higher-precision cases, where line loss in the cable connecting the ASEK PCB and an off-board DUT socket could be significant in the application. Such line losses may result from a resistive cable or from the length of the cable. The ASEK system does not automatically compensate for line losses when delivering a specified voltage to the DUT connections. If the DUT connection cable is kept short enough so that line losses are not significant (approximately 2 feet or less), then it may be unnecessary to use the force/sense feature.

If line loss is not a concern, then place jumpers between all of the force/sense signal pairs, which effectively presents only a single connection to each DUT lead, the force connection. In that case, no connection is necessary from the DUT to the sense terminal of a force/sense circuit pair. The voltage measurement returned by the ASEK is the outbound voltage delivered at the VCCF terminal on the board. It does not take into account any losses that may occur between the board and the DUT.



Note: If there is no corresponding DUT connection for a force/sense pair, then that pair should be shunted to ground, by placing the jumper between the force and sense terminals, and also tying the sense side to the GNDS terminal, normally via a load resistor. A sense terminal should never be left floating.

If line loss is a concern, a connection is made from the DUT to the sense terminal corresponding to the force terminal that is supplying the voltage of interest. In this case, the jumper is removed, but the sense terminal is not connected to GNDS. The voltage measurement returned by the ASEK is the voltage received from the DUT at the sense terminal, after transmission through all interconnect cabling.

Chapter 4

DUT Programming

This chapter describes the procedures for demonstrating and programming a DUT. DUT programming consists of connecting the DUT to the ASEK system, and using the ASEK Web browser-based interface to run evaluations and perform programming.

Programming a DUT requires delivering sequences of pulsed voltages at the particular DUT pin that has been designed to be used for programming, while maintaining operating voltage levels in the DUT as whole. Although any programmable variable power supply can be used to generate the pulsed waveforms, Allegro highly recommends using the ASEK for initial evaluations:

- The ASEK is configured for specific device types; this automatically provides the correct pulse amplitudes, separations, and durations, as well as the operating voltage levels.
- While programming, the ASEK allows the operator to enter total register values in decimal equivalent format, rather than requiring the operator to address individual fuses by bit value.
- Provisional test values can be downloaded for most types of devices, and the results evaluated before actually blowing fuses and setting the values permanently.
- The ASEK automatically generates the specific pulse sequences required for setting modes, addressing registers and bitfields, setting values, and blowing bit field-level and device-level fuses.



CAUTION: Values reported by the ASEK are for evaluation purposes only. If a very high level of precision is required for measurements, use of standalone test instrumentation is recommended.

Setting Up

To set up the ASEK, perform the following steps:

- 1 Prepare the computer:
 - a Power-on the computer at any time.
 - b Determine which connection method to use (LAN or direct connection; see *Data Link Configuration*, on page 3-2), and connect the corresponding Ethernet cable to the computer Ethernet port or network adapter.
- 2 Prepare the ASEK Main Board module:
 - a On the ASEK Main Board module, insert the loose end of the appropriate Ethernet cable into the corresponding jack, labeled *10/100baseT Ethernet*. (For jack location, see Figure 3-1 on page 3-2.)
 - b Prepare and connect the power supply for the ASEK main board, as described in *Power Supply Configuration*, on page 3-3



CAUTION: Use only the power supply provided with the ASEK. Use of other power supplies may result in damage to the ASEK.

After powering-on always wait at least 30 seconds to ensure that the firmware is loaded and the IP stack is started.

Setting up for Programming

Before beginning the procedures described in this section, the ASEK system should be installed and configured for operation, as described in Chapter 2, *Network Configuration*, and in Chapter 3, *ASEK Hardware*. The DUT type should be known, and the system shunted and interconnected with the DUT socket to support that type of DUT.



Programming should only be performed by a qualified electronics technician or an individual with equivalent training.

Before connecting devices or beginning procedures, read and understand this manual completely.

The ASEK Web application provides several dedicated Web pages for programming the various families of Allegro devices. All the pages are accessed through the Main page, which opens automatically when the IP address of the ASEK Main Board module is retrieved using a Web browser on the operator computer.



If the hardware is properly connected, but the ASEK software does not appear when called in the Web browser, confirm that the IP address for the particular ASEK Main Board module is correct.

If the IP address is not known, the ASEK may have to be returned to Allegro for resetting. Contact your local Allegro field applications engineer for assistance.

The pages and usage described in this chapter are the following:

- *Standard Linear*, used for programming Allegro linear devices that have standard programming modes
- *137x Family*, used for programming a family of Allegro linear devices that have advanced programming modes
- *2/3 Wire Switch*, used for programming Allegro switch or latch devices with either 2, or 3 or 4 pins
- *Desktop Utility*, used for more detailed evaluation and programming of various Allegro Hall-effect devices
- *136x Family*, used for programming that family of Allegro devices

Programming Standard Linear Devices

This section details the procedures for evaluating and programming linear devices that have standard programming modes. Contact your local Allegro field applications office to determine which devices should be programmed using this method. Consult the datasheet for the device to determine appropriate values for keys and codes.

Preparing the Board and DUT

This procedure can use the linear device (output pin programming) interface board (PN85-0329-101).

Before inserting the DUT, connect the ASEK to power and to the operator computer, and connect the DUT interface board and DUT socket. The ASEK Web page should be open on the operator computer.



Note: Resulting parameter levels are not reported back to the ASEK. To evaluate results during programming of this type of device, use standalone test instrumentation.

Performing Test and Programming

To program the DUT, perform the following steps:

- 1 In the Main page of the ASEK Web application, click the **Standard Linear** button. (For reference, see Figure 2-1 on page 2-3.)

The *Programmable Hall Effect Device Demonstrator: General Key-Code (Output Programming)* page opens, shown in Figure 4-1.

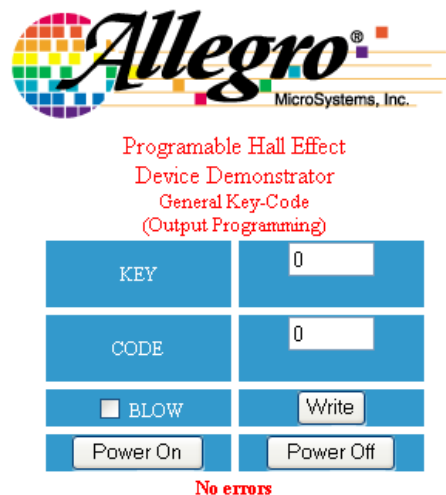


Figure 4-1 ASEK Interface, page for programming standard linear devices

- 2 Click the **Power On** button.

The ASEK applies power to the DUT via the VCCF terminal.

- 3 In the **Key** text box, type the decimal equivalent number for the register to be addressed (refer to the datasheet for values).
- 4 In the **Code** text box, type the decimal equivalent number for the total bit field value to be addressed (refer to the datasheet for values).
- 5 To provisionally download the key and code values to the DUT, click the **Write** button.

The ASEK downloads the data to the DUT registers. If monitoring instruments are available, they can be checked to verify the results of the setting on the DUT.

- 6 Optionally, to try another setting, repeat steps 3 through 5.
- 7 Optionally, to reset the DUT register, repeat steps 3 through 5 using 0 (zero) for the key and code values.
- 8 To permanently set a value:
 - a Verify that the values in the **Key** and **Code** text boxes are correct.
 - b Select the **Blow** check box.
 - c Click the **Write** button.

The ASEK downloads the data to the DUT registers with sufficient energy to blow the corresponding solid state fuses in the DUT, making the setting permanent.

- 9 To lock the device in order to prevent any further programming, repeat the above step and set the Lock bit.
- 10 When all programming of the DUT is complete, click the **Power Off** button.

The ASEK removes power from the VCCF signal.

- 11 Evaluation and programming are complete. Remove the DUT from the socket.

Optionally, power-on the device again, and check the results of the programming.

- 12 To end the session, close the Web browser.

Programming 137x Linear Devices

This section details the procedures for evaluating and programming linear devices that have advanced programming modes, such as the A137x family of Allegro devices. Contact your local Allegro field applications office to determine which devices should be programmed using this method. Consult the datasheet for the device to determine appropriate values for codes. Key values are assigned by the software.

Preparing the Board and DUT

This procedure can use the linear device (output pin programming) interface board (PN85-0329-101).

Before inserting the DUT, connect the ASEK to power and to the operator computer, and connect the DUT interface board and DUT socket. The ASEK Web page should be open on the operator computer.



Note: Resulting parameter levels are not reported back to the ASEK. To evaluate results during programming of this type of device, use standalone test instrumentation.

Performing Test and Programming

To program the DUT, perform the following steps:

- 1 In the Main page of the ASEK Web application, click the **137x Family** button. (For reference, see Figure 2-1 on page 2-3.)



CAUTION: When the 137x Family button is clicked, power is immediately applied to the DUT. Power continues to be applied to the DUT until the session is ended by closing the Web browser.

The *Programmable Hall Effect Device Demonstrator: 137X Linear Tool* page opens, shown in Figure 4-2.



Register	Set Value	Current	Blown
Polarity	0	0	0
TC	0	0	0
Sense Coarse	0	0	0
Sense Fine	0	0	0
Qvo Coarse	0	0	0
Qvo Fine	0	0	0
Clamp	0	0	0
<input type="checkbox"/> BLOW	<input type="button" value="Write"/>	<input type="button" value="New Device"/>	<input type="button" value="Lock"/>

Figure 4-2 ASEK Interface, page for programming A137x style linear devices.

The Set Value column contains active text boxes for code entry, the Current column displays the current setting of the parameter (the sum of both provisional and permanently blown values), and the Blown column displays the permanently set fuse values.

- 2 In the **Blown** column, check for any display of any values that have already been permanently set.
- 3 In the **Set Value** column, type the code for each parameter to be set. (It is not necessary to manually enter key values; they are automatically assigned, to correspond with the parameter indicated in the **Register** column.)
- 4 To provisionally download the key and code values to the DUT, click the **Write** button.

The ASEK downloads the data to the DUT registers. The **Current** column updates to show the sum of the **Blown** column and the provisional code just downloaded. If monitoring instruments are available, they can be checked to verify the results of the setting on the DUT.

- 5 Optionally, to try another setting, repeat steps 3 through 5.
- 6 Optionally, to reset the DUT register, repeat steps 3 through 5 using 0 (zero) for the code values.
- 7 To permanently set a value:
 - a Note the values shown in the **Current** column.
 - b Reset the DUT, as described in step 6.
 - c Type the noted values into the **Set Value** column.
 - d Select the **Blow** check box.
 - e Click the **Write** button.

The ASEK downloads the data to the DUT registers with sufficient energy to blow the corresponding solid state fuses in the DUT, making the setting permanent.

- 8 To lock the device in order to prevent any further programming:
 - a Select the **Blow** check box.
 - b Click the **Lock** button.

The ASEK downloads the data to the DUT registers with sufficient energy to blow the corresponding solid state fuse in the DUT, making all settings permanent.

- 9 When all programming of the DUT is complete, to program another device, click the **New Device** button.

Otherwise, to end the session, close the Web browser.



CAUTION: Power continues to be applied to the DUT until the **New Device** button is clicked or the session is ended by closing the Web browser.

After the **New Device** button is clicked, power is removed from the DUT until the next click of the **Write** button.

The ASEK removes power from the VCCF signal.

- 10 Evaluation and programming are complete. Remove the DUT from the socket.

Optionally, power-on the device again, and check the results of the programming.

- 11 After the **New Device** button is clicked, the values remain in the **Set Value** column. To program another DUT using the same values, insert the DUT in the socket and repeat the above procedure before closing the Web browser.

Programming Switch or Latch Devices

This section details the procedures for evaluating and programming bipolar switch or latch devices. Contact your local Allegro field applications office to determine which devices should be programmed using this method. Consult the datasheet for the device to determine appropriate values for keys and codes.

Preparing the Board and DUT

This procedure can use the switch/latch (supply pin programming) interface board (PN85-0329-102).

Before inserting the DUT, connect the ASEK to power and to the operator computer, and connect the DUT interface board and DUT socket. The ASEK Web page should be open on the operator computer.



Note: Resulting parameter levels are not reported back to the ASEK. To evaluate results during programming of this type of device, use standalone test instrumentation.

Performing Test and Programming

To program the DUT, perform the following steps:

- 1 In the Main page of the ASEK Web application, click the **2/3 Wire Switch** button. (For reference, see Figure 2-1 on page 2-3.)

The *Programmable Hall Effect Device Demonstrator 2/3 Wire Key Code* page opens, shown in Figure 4-3.



Figure 4-3 ASEK page for switch/latch programming.
Reference to the “adapter” is to the optional switch/latch interface PCB.

- 2 Click the **Power On** button.

The ASEK applies power to the DUT via the VCCF terminal.

- 3 In the **Key** text box, type the decimal equivalent number for the register to be addressed (refer to the datasheet for values).
- 4 In the **Code** text box, type the decimal equivalent number for the total bit field value to be addressed (refer to the datasheet for values).
- 5 To provisionally download the key and code values to the DUT, click the **Write** button.

The ASEK downloads the data to the DUT registers. If monitoring instruments are available, they can be checked to verify the results of the setting on the DUT.

- 6 Optionally, to try another setting, repeat steps 3 through 5.
- 7 Optionally, to reset the DUT register, repeat steps 3 through 5 using 0 (zero) for the key and code values.
- 8 To permanently set a value:
 - a Verify that the values in the **Key** and **Code** text boxes are correct.
 - b Select the **Blow** check box.
 - c Click the **Write** button.

The ASEK downloads the data to the DUT registers with sufficient energy to blow the corresponding solid state fuses in the DUT, making the setting permanent.

- 9 To lock the device in order to prevent any further programming, repeat the above step and set the Lock bit.
- 10 When all programming of the DUT is complete, click the **Power Off** button.

The ASEK removes power from the VCCF signal.
- 11 Evaluation and programming are complete. Remove the DUT from the socket.

Optionally, power-on the device again, and check the results of the programming.
- 12 To end the session, close the Web browser.

Programming with the Desktop Utility

This section details the procedures for evaluating and programming Allegro Hall effect devices that are not specifically provided for in the ASEK, as well as providing a more hands-on method for evaluating devices that are eligible for the other programming applications. Contact your local Allegro field applications office to determine which devices should be programmed using this method. Consult the datasheet for the device to determine appropriate values for programming.

Preparing the Board and DUT

This procedure can be used with either the linear or switch/latch interface boards, depending on the device type.

Before inserting the DUT, connect the ASEK to power and to the operator computer, and connect the DUT interface board and DUT socket. The ASEK Web page should be open on the operator computer.



Note: Resulting parameter levels are not reported back to the ASEK. To evaluate results during programming of this type of device, use standalone test instrumentation.

Microsoft NET Framework 2.0 must be installed on the operator computer. If it is not already installed, it can be downloaded from the Microsoft corporate website (a link is provided in the initial page of the Desktop Utility).

Preparing the Desktop Utility

To prepare the Desktop Utility for use on the operator computer, perform the following steps:

- 1 In the Main page of the ASEK Web application, click the **Desktop Utility** button. (For reference, see Figure 2-1 on page 2-3.)

The *Desktop Programming Utility* page opens, shown in Figure 4-4.

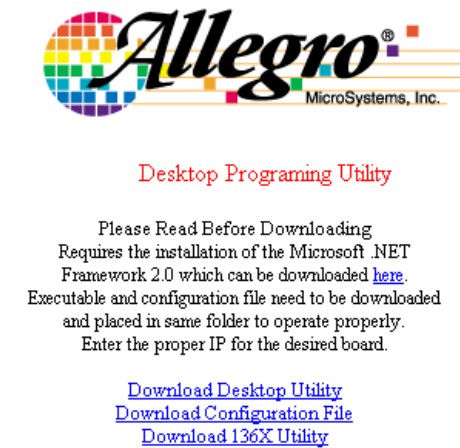


Figure 4-4 ASEK Interface, opening page for the Desktop Utility downloads

- 2 The Desktop Utility must be run on the operator computer. To download the software from the ASEK Main Board to the operator computer, click the **Download Desktop Utility** link.

The utility allows the operator to select a target directory, and then the utility executable file is downloaded. No registration is required. The name of the file is ASEK-2-DT.EXE.

- a A Security Warning window may appear (Figure 4-5 on page 4-10). Click the **Save** button. A file browser window opens.
- b Enter the directory where the files should be stored, and click the **Save** button. The file downloads, and the Download Complete confirmation box opens.
- c The configuration file should be downloaded before running the utility. Click the **Close** button to return to the Desktop Programming Utility page. The Desktop Programming Utility page reopens.

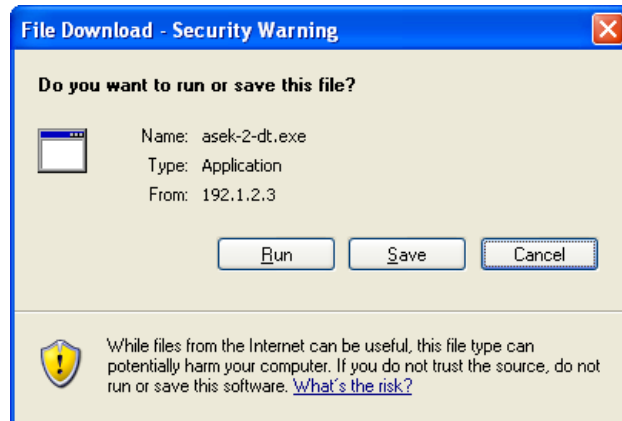


Figure 4-5 Security confirmation box for the Desktop Utility download

- 3 Certain information relating to specific device types is available in a configuration file for the Desktop Utility. It is recommended that the configuration file be downloaded. To do so, click the **Download Configuration File** link.

The utility allows the operator to select a target directory, which should be the same directory as the executable file, and then the configuration file is downloaded. No registration is required. The name of the file is DEVICE.CFG.



Note: The Desktop Utility and its associated configuration file must be located in the same directory on the operator computer. Neither the utility executable file nor the configuration file are registered, and may be moved at any time to a new location, with the condition that they are both in the same directory.

- a A Security Warning window may appear (Figure 4-5 on page 4-10). Click the **Save** button. A file browser window opens.
 - b Enter the directory where the files should be stored, and click the **Save** button. The file downloads, and the Download Complete confirmation box opens.
 - c To run the utility now, click the **Run** button. Otherwise, to run the utility later, click the **Close** button to return to the Desktop Programming Utility page.
- 4 Open the executable file using the operator computer functions.

The *ASEK-02 Desktop Utility* window opens, shown in Figure 4-6. The controls are described in Table 4-1 on page 4-11.

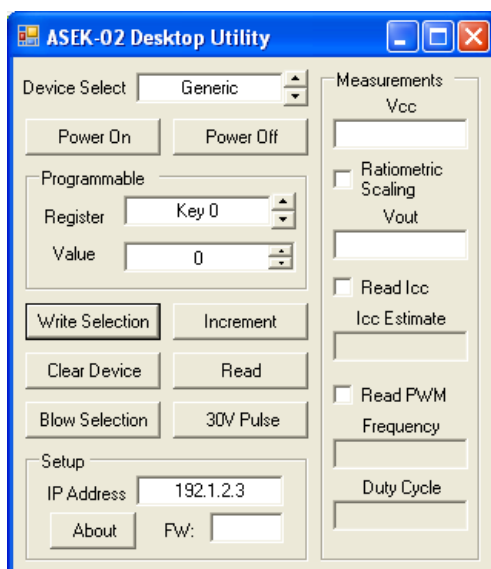


Figure 4-6 ASEK Desktop Utility interface
Used to perform evaluation and programming tasks for generic Allegro Hall effect devices

Table 4-1 ASEK-02 Desktop Utility Controls

Label and Type	Description
Device Select spinner box	If the configuration file has been downloaded, provides a list of device types for which configuration data is available.
Clear Device button	Click to reset all DUT registers to their defaults settings; does not affect bits that have already been permanently blown.
Read button	Click to read the current settings of the DUT registers and update the Measurement option group with the results.
Register spinner box	If the configuration file has been downloaded, provides a list of programmable register identification keys in the device selected in the Device Select spinner box.
Value spinner box	If the configuration file has been downloaded, provides a list of available programming codes for the register indicated in the Register spinner box.
Write Selection button	Downloads the values chosen in the Register and Value spinner boxes to the DUT.
Blow Selection button	Downloads the values chosen in the Register and Value spinner boxes to the DUT and blows the corresponding fuses.
Power On button	Applies power to the DUT.
Power Off button	Removes power from the DUT.
Increment button	Downloads an additional 1 to the code already stored in the DUT register selected.
30V Pulse button	Downloads a pulse of 30 V to the DUT. May result in fuses blowing.
IP Address text box	Use to type the IP address (without "http://" or any network mask) corresponding to the ASEK Main Board being used for programming.
About button	Provides revision information about this utility.

Table 4-1 ASEK-02 Desktop Utility Controls (Continued)

Label and Type	Description
FW display box	Displays the release version of the firmware loaded on the current ASEK Main Board (the board with the IP address shown in the IP Address text box).
VCC display box	Displays the voltage on the supply pin of the DUT, at the time of the last click of the Read button.
Ratiometric Scaling check box	Select to scale the display in the VOUT box by the value in the VCC box.
VOUT display box	Displays the voltage on the output pin of the DUT, at the time of the last click of the Read button; scaled if the Ratiometric Scaling check box is selected.
Read Icc check box	Select to enable reading of the DUT I _{CC} value for 2-wire switch or latch devices (used with the corresponding interface PCB (PN 85-0329-102).
Icc Estimate display box	Displays the current on the output pin of the DUT, at the time of the last click of the Read button; enabled if the Read Icc check box is selected; for 2-wire switch or latch devices (used with the corresponding interface PCB (PN 85-0329-102).
Read PWM check box	Select to enable reading of pulse wave modulated (PWM) output from the DUT.
Frequency display box	Displays the frequency of the PWM signal on the output of the DUT, at the time of the last click of the Read button; enabled if the Read PWM check box is selected.
Duty Cycle display box	Displays the duty cycle of the PWM signal on the output of the DUT, at the time of the last click of the Read button; enabled if the Read PWM check box is selected.

Performing Test and Programming

After the Desktop Utility is readied, as described in *Preparing the Desktop Utility*, on page 4-9, to program the DUT, ensure that the most recent configuration file has been downloaded to the same directory as the utility executable file (for revision information on the configuration file, open the configuration file in any text editor program, and view the Revision key).

To program the DUT, perform the following steps:

- 1 In the **IP Address** text box, type the IP address (without “http://” or any network mask) for the ASEK Main Board being used.
- 2 In the **Device Select** spinner box, select the type of DUT most closely describing the DUT.
- 3 Click the **Power On** button.

The ASEK applies power to the DUT via the VCCF circuit.

- 4 Optionally, to establish a baseline:
 - a Click the **Clear Device** button.

The ASEK downloads the default settings to the DUT.

- b Click the **Read** button.

The ASEK reads the parameters on the DUT pins and displays them in the **Measurements** option group in the in the Utility window.

- 5 To try a provisional value for a register:

- a In the **Register** spinner box, select the register to be programmed.
- b In the **Value** spinner box, select the decimal equivalent of the bit field code to download to the DUT.
- c To provisionally download the key and code values to the DUT, click the **Write Selection** button.

The ASEK downloads the data to the DUT registers.

- 6** To evaluate the results of the register setting:

- a Click the **Read** button.

The ASEK reads the parameters on the DUT pins and displays them in the **Measurements** option group.

- b To fine tune the setting, click the **Increment** button.

The ASEK adds 1 to the current code shown in the **Value** spinner box, and downloads the value to the DUT.

- c To reset the register, click the **Clear Device** button or select a code in the **Value** spinner box, and then click the **Write Selection** button.
- d Click the **Read** button again to update the **Measurements** readings.

- 7** To permanently set a register code:

- a Click the **Read** button and verify that the results are satisfactory.
- b Click the **Blow Selection** button.

The ASEK downloads the code to the DUT with sufficient energy to blow the corresponding solid-state fuses.

- 8** To lock the device in order to prevent any further programming, repeat the above step and set the Lock bit.
- 9** When all programming of the DUT is complete, click the **Power Off** button.

The ASEK removes power from the VCCF signal.

- 10** Evaluation and programming are complete. Remove the DUT from the socket.

Optionally, power-on the device again, and check the results of the programming.

- 11** To end the session, close the Web browser.

Using the 136X Utility

This section details the procedures for evaluating and programming Allegro Hall effect devices that are in the A136x family of linear devices. Contact your local Allegro field applications office to determine which devices should be programmed using this method. Consult the datasheet for the device to determine appropriate values for programming.

Preparing the Board and DUT

This procedure can be used with either the linear or switch/latch interface boards, depending on the device type.

Before inserting the DUT, connect the ASEK to power and to the operator computer, and connect the DUT interface board and DUT socket. The ASEK Web page should be open on the operator computer.



Note: Resulting parameter levels are not reported back to the ASEK. To evaluate results during programming of this type of device, use standalone test instrumentation.

Microsoft NET Framework 2.0 must be installed on the operator computer. If it is not already installed, it can be downloaded from the Microsoft corporate website (a link is provided in the initial page of the Desktop Utility).

Preparing the 136X Utility

To prepare the 136X Utility for use on the operator computer, perform the following steps:

- 1 In the Main page of the ASEK Web application, click the **Desktop Utility** button. (For reference, see Figure 2-1 on page 2-3.)

The *Desktop Programming Utility* page opens, shown in Figure 4-4 on page 4-9.

- 2 The 136X Utility must be run on the operator computer. To download the software from the ASEK Main Board to the operator computer, click the **Download 136X Utility** link.

The utility allows the operator to select a target directory, and then the utility executable file is downloaded. No registration is required. The name of the file is ASEK-2-6X.EXE.

- a A Security Warning window may appear (Figure 4-5 on page 4-10). Click the **Save** button. A file browser window opens.
- b Enter the directory where the files should be stored, and click the **Save** button. The file downloads, and the Download Complete confirmation box opens.
- c To run the utility now, click the **Run** button (the configuration file should already be downloaded, as described in *Programming with the Desktop Utility*, on page 4-8). Otherwise, to run the utility later, click the **Close** button to return to the Desktop Programming Utility page.

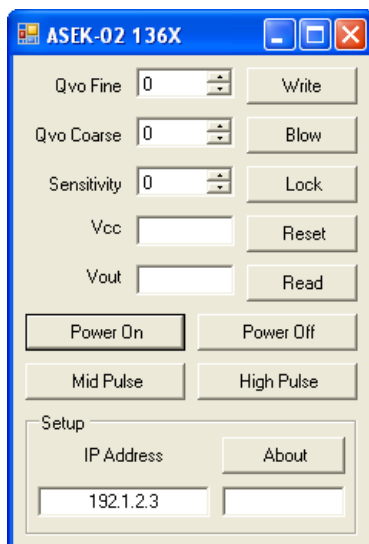


Figure 4-7 ASEK 136X Utility interface
Used to perform evaluation and programming tasks for the A136X family of Allegro Hall effect devices

Table 4-2 ASEK-02 136X Utility Controls

Label and Type	Description
Qvo Fine, Qvo Coarse, and Sensitivity spinner boxes	If the configuration file has been downloaded, each provides a list of available programming codes for this device.
Vcc and Vout display boxes	Displays the voltage on the supply pin and output pin of the DUT, at the time of the last click of the Read button.
Write button	Downloads the values chosen in the Qvo Fine, Qvo Coarse, and Sensitivity spinner boxes to the DUT.
Blow button	Downloads the values chosen in the Qvo Fine, Qvo Coarse, and Sensitivity spinner boxes to the DUT and blows the corresponding fuses.
Lock button	Blows the device-level fuse, preventing any further programming of the device.
Reset button	Clears all registers with intact fuses and sets their bit fields to the default values.
Read button	Analyzes the signals being returned from the DUT and displays the results in the Vcc and Vout display boxes.
Power On button	Applies power to the DUT.
Power Off button	Removes power from the DUT.
Mid pulse button	Downloads an additional 1 mid-level pulse.
High pulse button	Downloads an additional 1 high-level pulse.
About button	Provides revision information about this utility.
IP Address text box	Use to type the IP address (without "http://" or any network mask) corresponding to the ASEK Main Board being used for programming.

Performing Test and Programming

After the A136X Utility is readied, as described in *Preparing the 136X Utility*, on page 4-14, to program the DUT, ensure that the most recent configuration file has been downloaded to the same directory as the utility executable file (for revision information on the configuration file, open the configuration file in any text editor program, and view the Revision key).

Perform the following steps:

- 1 In the **IP Address** text box, type the IP address (without “http://” or any network mask) for the ASEK Main Board being used.

- 2 Click the **Power On** button.

The ASEK applies power to the DUT via the VCCF circuit.

- 3 Optionally, to establish a baseline:

- a Click the **Reset** button.

The ASEK downloads the default settings to the DUT.

- b Click the **Read** button.

The ASEK reads the parameters on the DUT pins and displays them in the **Vcc** and **Vout** display boxes in the in the Utility window.

- 4 To try a provisional value for a register:

- a In the **Qvo Fine**, **Qvo Coarse**, and **Sensitivity** spinner boxes, select the decimal equivalent of the bit field code to download to the DUT.

- b To provisionally download the key and code values to the DUT, click the **Write** button.

The ASEK downloads the data to the DUT registers.

- 5 To evaluate the results of the register setting:

- a Click the **Read** button.

The ASEK reads the parameters on the DUT pins and displays them in the **Vcc** and **Vout** display boxes.

- b To fine tune the setting, click the **Mid Pulse** and **High Pulse** buttons as required.

The ASEK adds 1 pulse of the selected type to the existing pulse train, and downloads the value to the DUT.

- c To reset the DUT, click the **Reset** button

- d Click the **Read** button again to update the **Vcc** and **Vout** display boxes.

- 6 To permanently set a register code:

- a Click the **Read** button and verify that the results are satisfactory.

- b Click the **Blow** button.

The ASEK downloads the code to the DUT with sufficient energy to blow the corresponding solid-state fuses.

- 7** To lock the device in order to prevent any further programming, repeat the above step and click the **Lock** button.
- 8** When all programming of the DUT is complete, click the **Power Off** button.

The ASEK removes power from the VCCF signal.
- 9** Evaluation and programming are complete. Remove the DUT from the socket.

Optionally, power-on the device again, and check the results of the programming.
- 10** To end the session, close the Web browser.

Chapter 5

ASEK Main Board Calibration

Calibration of the ASEK system optimizes the specific system configured by the user. Installation should also include the initial calibration of the ASEK Main Board, and periodic recalibration is recommended.

This chapter provides calibration recommendations and the procedure for automatic calibration using the ASEK Calibration Board. Calibrated settings are stored in EPROMs on the Main Board. Although the calibration settings cannot be adjusted, they can be viewed in the ASEK software Main page, and may serve in evaluating system performance with Allegro field service personnel.

When to Calibrate

The ASEK Main Board can be used as shipped, however, Allegro highly recommends calibrating the ASEK Main Board as the final stage of installation. If the ASEK Board is used only for programming on-off switching devices, it may not be essential to calibrate, but if the system is used for measuring linear output from a DUT, calibration of input and output contributes significantly to the precision of the measurements.

The ASEK Board should be recalibrated periodically, depending on the quality standards required for the application. Certain events also are occasions for recalibration, as shown in Table 5-1..

Table 5-1 Recommended Recalibration Events

Event	Recalibration Recommendation
Installation	Recommended
Changing the ASEK Board Power Supply	Recommended
Significantly changing the ambient temperature of the test area	Recommended

Performing Calibrations

The Allegro calibration application is designed as an automatic utility. There are two primary pages: the Main page (see Figure 2-1 on page 2-3) and the Programmable Linear Demonstrator: Board Calibration Utility page (see Figure 5-1).

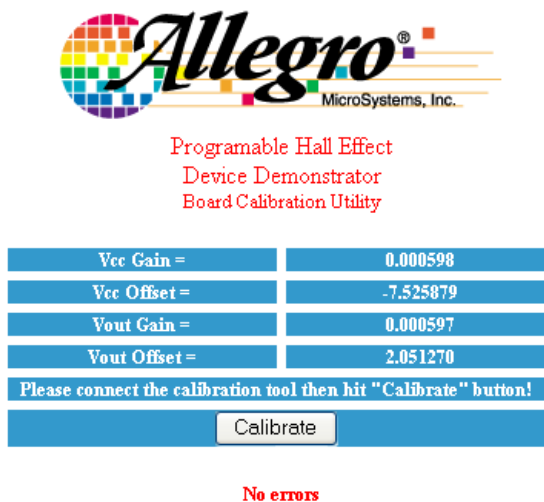


Figure 5-1 Board Calibration Utility page

Preparing the ASEK

Calibration is performed using only the ASEK Main Board module and the ASEK Calibration Board. The software is pre-loaded as firmware in the ASEK Main Board. To prepare for calibration, perform the following steps:

- 1 Have the following available:
 - ASEK Main Board module
 - ASEK power supply
 - Ethernet crossover cable or LAN cables and hub
 - Operator computer
- 2 Prepare the computer:
 - a Power-on the computer at any time.
 - b If connected via the LAN, disconnect the ASEK Main Board module from the LAN. (If in a direct connection configuration, it is not necessary to disconnect the Ethernet cable.)
 - c If normally connected via the LAN, determine which direct connection method to use (see *Data Link Configuration*, on page 3-2), and connect the corresponding Ethernet cabling to the computer Ethernet port or network adapter.
- 3 Prepare the ASEK Main Board module:
 - a Confirm that the corresponding Ethernet cable is connected to the ASEK Main Board module jack labeled *10/100baseT Ethernet*. (For location, see Figure 3-1 on page 3-2.)
 - b Disconnect the ASEK power supply from the ASEK Main Board module.
 - c Disconnect any DUT interface PCB from the ASEK Main Board ribbon cable.
 - d Connect the ASEK Calibration Board to the ribbon cable.
 - e Reconnect the power supply for the ASEK main board, as described in *Power Supply Configuration*, on page 3-3.



CAUTION: Use only the power supply provided with the ASEK. Use of other power supplies may result in damage to the ASEK.

- 4 Open the ASEK software interface:
 - a On the operator computer, open the Web browser application.
 - b In the address box, type the IP address of the ASEK Main Board (see Chapter 2, *Network Configuration*), and execute the link. The ASEK software interface Main page appears in the Web browser. It is shown in Figure 2-1 on page 2-3.
- 5 Perform the calibration:
 - a In the ASEK interface, click the **Board Calibrate** button. The *Programmable Hall Effect Device Demonstrator Board Calibration Utility* page opens. It is shown in Figure 5-1 on page 5-2.
 - b Click the **Calibrate** button. The calibration is performed, and the results are stored in an EPROM on the ASEK Main Board, and displayed in the Main page.



CAUTION: Is any message other than **NDC/passed all tests** is displayed, contact your local Allegro field applications engineering office.

- 6 Prepare the ASEK for operation.
 - a Disconnect the power supply from the ASEK Main Board module.
 - b Disconnect the ASEK Calibration Board from the ribbon cable.
 - c Reconnect any DUT interface board.
 - d If configured for direct connection, the calibration procedure is complete.

Otherwise, if connecting via the LAN:

- Disconnect the Ethernet cable from the operator computer.
- Disconnect the Ethernet cable from the ASEK Main Board module.
- Reconnect the operator computer to the LAN.
- Reconnect the ASEK Main Board module to the LAN.

