

FLUKE®

2680A/2686A

Data Acquisition System/Data Logging System

Getting Started Guide

June 2002
© 2002 Fluke Corporation. All rights reserved. Printed in USA
All product names are trademarks of their respective companies.

Limited Warranty and Limitation of Liability

Each Fluke product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is one year and begins on the date of shipment. Parts, product repairs and services are warranted for 90 days. This warranty extends only to the original buyer or end-user customer of a Fluke authorized reseller, and does not apply to fuses, disposable batteries or to any product which, in Fluke's opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation or handling.

Fluke warrants that software will operate substantially in accordance with its functional specifications for 90 days and that it has been properly recorded on non-defective media. Fluke does not warrant that software will be error free or operate without interruption. The software is neither intended nor warranted for use in medical or any other applications where human safety may be a concern.

Fluke authorized resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Fluke. Warranty support is available only if product is purchased through a Fluke authorized sales outlet or Buyer has paid the applicable international price. Fluke reserves the right to invoice Buyer for importation costs of repair/replacement parts when product purchased in one country is submitted for repair in another country.

Fluke's warranty obligation is limited, at Fluke's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to a Fluke authorized service center within the warranty period.

To obtain warranty service, contact your nearest Fluke authorized service center to obtain return authorization information, then send the product to that service center, with a description of the difficulty, postage and insurance prepaid (FOB Destination). Fluke assumes no risk for damage in transit. Following warranty repair, the product will be returned to Buyer, transportation prepaid (FOB Destination). If Fluke determines that failure was caused by neglect, misuse, contamination, alteration, accident or abnormal condition of operation or handling, including overvoltage failures caused by use outside the product's specified rating, or normal wear and tear of mechanical components, Fluke will provide an estimate of repair costs and obtain authorization before commencing the work. Following repair, the product will be returned to the Buyer transportation prepaid and the Buyer will be billed for the repair and return transportation charges (FOB Shipping Point).

THIS WARRANTY IS BUYER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. FLUKE SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES AND/OR PROFITS, INCLUDING LOSS OF DATA, ARISING FROM ANY CAUSE OR THEORY.

Since some countries or states do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any provision of this Warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision.

Safety Information

⚠ Caution

This is an IEC safety Class 1 product. Before using, the ground wire in the line cord or rear panel binding post must be connect to an earth ground for safety.

Interference Information

This equipment generates and uses radio frequency energy and if not installed and used in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation.

Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

There is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of more of the following measures:

- Reorient the receiving antenna
- Relocate the equipment with respect to the receiver
- Move the equipment away from the receiver
- Plug the equipment into a different outlet so that the computer and receiver are on different branch circuits

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal

SAFETY TERMS IN THIS MANUAL

This device has been designed and tested to meet the requirements of EN61010-1 (Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use). It is an Installation Category II device intended for operation from a normal single phase supply. The DIO relay controls are rated to 250 V ac CAT I and should not be used in applications that exceed that rating. This Getting Started Guide contains information, warnings and cautions. Use of this equipment in a manner not specified herein may impair the protection provided by the equipment.

Measurement category I is for measurements performed on circuits not directly connected to MAINS. Examples are measurements on circuits not derived from MAINS, and specially protected (internal) MAINS derived circuits.

Measurement category II is for measurements performed on circuits directly connected to the low voltage installation. Examples are measurements on household appliances, portable tools and similar equipment.

⚠ WARNING statements identify conditions or practices that could result in personal injury or loss of life.

CAUTION statements identify conditions or practices that could result in damage to equipment.

SYMBOLS MARKED ON EQUIPMENT:



WARNING Risk of electric shock.



Ground (earth) terminal.



Protective ground (earth) terminal. Must be connected to safety earth ground when the power cord is used.



Attention. Refer to the manual. This symbol indicates that information about usage of a feature is contained in the manual. This symbol appears on the Universal Input Module and in the following two places on the device rear panel:

1. Ground Binding Post (to the left of the line power connector).
2. Alarm/Trigger I/O and Digital I/O connectors.

AC POWER SOURCE

The device is intended to operate from an ac power source that will not apply more than 264 V ac rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is required for safe operation.

⚠⚠WARNING

Use the proper fuse. To avoid fire hazard, for fuse replacement use only a 1/2 ampere, 250 V time delay line fuse.

DC POWER SOURCE

The device may also be operated from a 9 V to 45 V dc power source when either the rear panel ground binding post or the power cord grounding conductor is connected properly. The input is protected by a 4 ampere fuse internal to the device. This fuse should only be replaced by a qualified Fluke technician.

GROUNDING THE DEVICE

The device utilizes controlled overvoltage techniques that require the device to be grounded whenever normal mode or common mode ac voltages or transient voltages may occur. The enclosure must be grounded through the grounding conductor of the power cord, or if operated on battery with the power cord unplugged, through the rear panel ground binding post.

USE THE PROPER POWER CORD

Use only the power cord and connector appropriate for the voltage and plug configuration in your country.

Use only a power cord that is in good condition.

Refer power cord and connector changes to qualified service personnel.

⚠⚠WARNING

To avoid possible electric shock or damage to the device:

- **Read manual before operating.**
- **Do not position device so that air flow through side vents is restricted.**
- **Do not use in a manner not specified in this manual or safety protection may be impaired.**
- **Disconnect power cord and ALL other inputs before replacing a fuse.**
- **Position the device where power cord can be disconnected.**
- **Do not exceed maximum voltages.**

⚠️⚠️ WARNING

DO NOT OPERATE IN EXPLOSIVE ATMOSPHERES

To avoid personal injury or death, do not remove the device cover without first removing the power source connected to the rear panel. Do not operate the device without the cover properly installed. There is no need for the operator to remove the cover.

DO NOT ATTEMPT TO OPERATE IF PROTECTION MAY BE IMPAIRED

If the device appears damaged or operates abnormally, protection may be impaired. Do not attempt to operate the device under these conditions. Refer all question of proper device operation to qualified service personnel.

DO NOT ATTEMPT TO SERVICE UNLESS YOU ARE A FLUKE QUALIFIED REPAIR TECHNICIAN

To avoid personal injury or death, remove the AC power cord and all analog and digital connector modules before servicing the device.

Note

All signals must be removed from the analog and digital connector wiring before opening the connector modules.

Additional Safety Information

The following table provides additional safety information.

General Specifications

Specification	Characteristic
Size	473 mm (18.6 in) x 423 mm (17 in) x 237 mm (9.3 in)
Weight	2680A/2686A (empty) 8.5 Kg (18.9 lb) 2680A – FAI 0.8 Kg (1.8 lb) 2680A – PAI 1.2 Kg (2.7 lb) 2680A – DIO 0.8 Kg (1.8 lb)
Power	100 – 240 V ac (no switching required), 50 to 60 Hz, 100 VA maximum or optional 9 V dc to 45 V dc, 35 W maximum
EMC	EN50082-2 EN55022-1 EN55011 class A EN610000-4-2,3,4,6,8 EN61326
Safety	EN61010-1, CAT II (DIO is rated CAT I) CSA C22.2 No. 1010.1
Operating Temperature Range	-20 °C to 60 °C (-4 °F to +140 °F)
Storage Temperature Range	-40 °C to 70 °C (-40 °F to +158 °F)
Relative Humidity	90% maximum for -10 °C to 28 °C (14 °F to +82 °F) 75% maximum for 28 °C to 35 °C (82 °F to +95 °F) 50% maximum for 35 °C to 60 °C (95 °F to +140 °F) (3 MΩ range, reduce humidity rating by 25% for 1 hour warm-up. 3 MΩ range meets full humidity ratings with 2 hour warm-up)
Altitude	Operating: 2,000 m (6,561 ft) maximum Non-operating: 12,200 m (40,000 ft) maximum
Warm-up Time	1 hour to rated specifications -or- 15 minutes if relative humidity (non-condensing) is 50% or less.

Table of Contents

Contents	Page
Safety Information.....	i
Introduction	1
Contacting Fluke	2
Additional Information.....	2
Configuring the 268XA.....	3
Reviewing and Setting the Base Channel Number.....	3
Reviewing and Setting the Line Frequency.....	5
Reviewing and Setting the Network Type.....	7
Reviewing and Setting the General Network Socket Port.....	12
Reviewing and Setting the General Network IP Address.....	13
Reviewing and Setting the Subnet Mask and Default Gateway	14
Viewing the Device Ethernet Address.....	16
Host Computer and Network Preparation	18
Installing Host Computer Ethernet Adapter.....	18
Device and Host Computer Interconnection.....	20
Host Computer/Device Direct Connection	20
Interconnection Using 10/100BaseT (Twisted Pair) Ethernet Wiring..	20
Installing Host Computer Networking Software	22
Setting Host Computer Networking Parameters	23
Introducing Fluke DAQ Software	24
Installing Fluke DAQ Software.....	24
Understanding the User Interface	26
Using the Toolbar	26
Understanding the Workspace Area	28
Checking Operational Status.....	29
Device Status Icon	29
Module Status Icon.....	29
Computed Channel Status Icon	29
I/O Module 6	29
Configuration Dialogs.....	30
Network Configuration Dialog.....	30
Device Configuration Dialog.....	30

Module Configuration Dialog	31
Analog Channel Configuration Dialog	31
DIO Configuration Dialog	31
Computed Channel Configuration Dialog.....	31
Communication Dialogs	32
Device Communication and Status Dialog	32
Module Communication Dialog.....	32
Digital I/O Points Dialog	32
Computed Channels Dialog	32
Security Dialogs	32
Trend Dialog.....	33
Alarm Dialog.....	33
Mail and Web Settings Dialogs.....	33
Managing Your Network Using Fluke DAQ.....	34
Inserting and Configuring a 268XA Device.....	34
Inserting and Configuring a Module	39
Inserting and Configuring a Channel	43
Configuring a Computed Channel.....	45
Using Equations with Computed Channels	49
Starting a Scan.....	51
Starting a Configuration Scan	51
Starting a Device Scan	52
Starting a Scan Using Spy.....	53
Viewing Module Measurement Data.....	54
Using the Digital I/O Points Communication Dialog.....	55
Using Trend to View Collected Data	56
Changing the Chart Display.....	59
Viewing Alarms	60
Using Fluke DAQ System Security Features	62
Configuring Web and Alarm Mail Settings.....	63

Getting Started

Introduction

The 2680A Data Acquisition System (DAS) and 2686A Data Logging System (DLS) provide 20 to 120 channels that operate in conjunction with Fluke DAQ software to form a data acquisition system.

The 2686A comes with a removable PC Card (PCMCIA) for stand-alone storage operation. This socket accepts ATA memory cards up to 2 GB in size.

Each 268XA device can hold from 1 to 6 analog modules. These modules are the precision analog module (PAI), fast analog module (FAI), and the digital IO/relay and Totalizer module (DIO). These modules are all isolated from one another. If digital I/O, relay and totalizer capability is required, you can add a digital I/O module to the device in slot 6 only.

The analog modules measure dc volts, ac volts, ohms, temperature, frequency, and dc current. Temperature measurements use thermocouples thermistors or resistance temperature detectors (RTDs). The devices also have extensive computed math capability. Besides using data collected from the analog modules, and digital totalizer, time can also be used in computed channel calculations.

The systems scan the 20 to 120 analog channels and calculate the values for the 60 computed channels. Interval timers, alarm conditions, and/or an external signal input can trigger scans. The Fluke DAQ software configures and controls up to 99 268XA devices via an Ethernet connection. The software provides the means to view scan data and log it into files.

The two analog modules that may be used with the 268XA are the FAI module and the PAI module. The PAI modules emphasize precision with 5 ½ digits of resolution, .02% accuracy, and can withstand up to 150 V common mode voltage (300 V on channels 1 and 11). The FAI modules emphasize increased measurement speed with 4 ½ digits of resolution, 0.04% accuracy, and can withstand up to 50 V common mode voltage.

Additional Information

Refer to the Users Manual provided on the 268XA CD for additional information on configuring and using your 268XA series device or Fluke DAQ software.

The CD contains necessary documentation for proper use and operation of the product. If the CD is damaged or if you are unable to access product documentation on the CD, visit the Fluke Web site or contact Fluke at any of the numbers listed above.

If AutoRun is disabled, from the Start menu, select Run..., (CD-Drive letter):\launch.exe <Enter>.

Configuring the 268XA










You must configure the 268XA device before using it. The following sections provide basic configuration information. Refer to the Users Manual for additional configuration information.

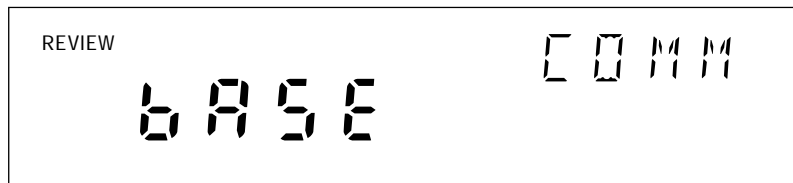
Reviewing and Setting the Base Channel Number

Perform the procedure below to review or set the Base Channel Number (BCN). The BCN identifies the device. The BCN is also the first two digits of the Global Channel Number (GCN), which uniquely identifies each device channel. For example, a GCN of 27116 indicates device 27 and analog channel 116. (See Figure 1 for examples.)

- **BCN Range** The BCN can be any number from 01 to 99. If you plan to install Fluke DAQ software for isolated network operation, each device on the network must have a unique BCN.
- **BCN Review or Set identifier** The REVIEW annunciator displays when reviewing the BCN; the SET annunciator displays when setting the BCN.

Table 1. Reviewing and Setting the Base Channel Number

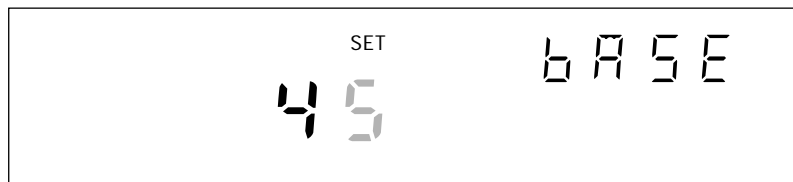
	Press the COMM key to <u>review</u> the Base Channel Number (BCN), or press and hold the COMM key for 3 seconds to <u>set</u> the BCN.
	Press the up/down arrow keys until bASE (Base Channel Number) appears
	in the primary display (COMM appears in the secondary display).
	Press the ENTER key. bASE appears in the secondary display and the current BCN (two digits) in the primary display.
	For BCN <u>set</u> procedures, press the left/right arrow keys to select the BCN 10s
	or 1s digit position (highlighted).
	Press the up/down arrow keys to select the desired number, 0 to 9, for the
	positioned BCN digit. In this manner, set both BCN digits.
	Press the ENTER key to exit. (Pressing any other function key will cancel <u>set</u> operations.)



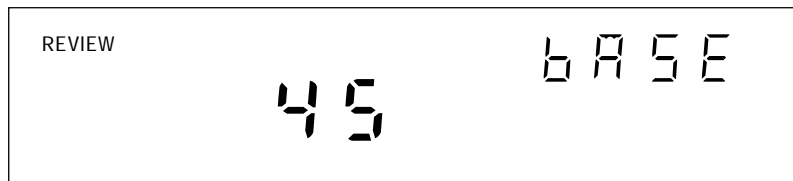
Communications display for reviewing the Base Channel Number (BCN)



Communications display for setting the BCN



Base Channel Number display for setting the BCN 10s digits (for example, 45)



Base Channel Number display for reviewing the BCN number (for example, 45)



Front Panel display for an device with BCN 45








Figure 1. Examples for Reviewing and Setting the BCN

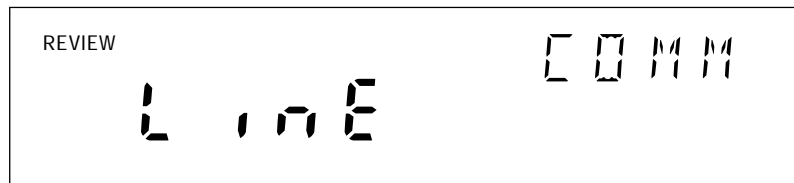
Reviewing and Setting the Line Frequency

Perform the procedure below to review or set the line frequency. Line frequency selection allows the device to optimize internal circuitry for best accuracy. (See Figure 2 for examples.)

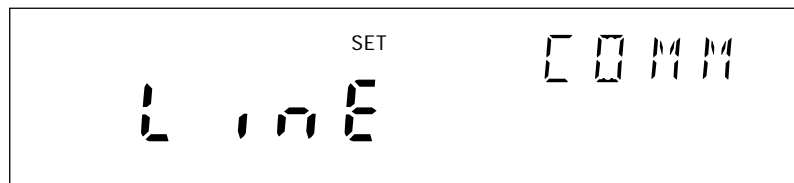
- **Line Frequency Choices** Select 50 Hz or 60 Hz as the frequency of the primary power when an ac source powers the device.

Table 2. Reviewing and Setting the Line Frequency

	Press the COMM key to <u>review</u> the Line Frequency setting, or press and hold the COMM key for 3 seconds to <u>set</u> the Line Frequency.
	Press the up/down arrow keys until LinE (Line Frequency) appears in the primary display (comm appears in the secondary display).
	
	Press the ENTER key. LinE appears in the secondary display and the current LinE frequency setting is in the primary display.
	For Line Frequency <u>set</u> procedures, press the up/down arrow keys to select 50 (Hz) or 60 (Hz) line frequency (current setting appears bright).
	
	Press the ENTER key to exit. (Pressing any other function key will cancel <u>set</u> operations.)



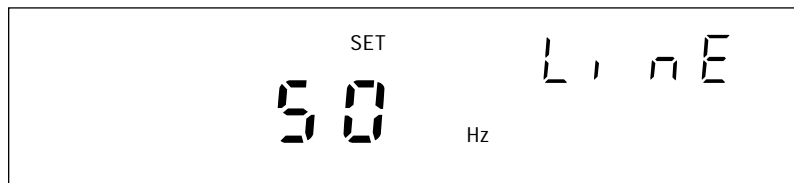
Communications display for reviewing the line frequency



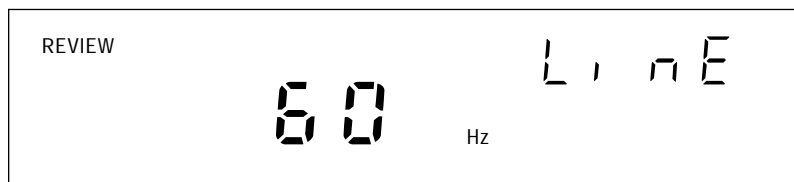
Communications display for setting the line frequency



Line frequency display for setting the line frequency to 60 Hz



Line frequency display for setting the line frequency to 50 Hz



Line frequency display for reviewing the line frequency (60 Hz)








Figure 2. Examples for Reviewing and Setting the Line Frequency

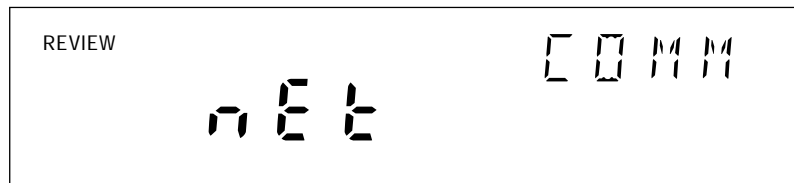
Reviewing and Setting the Network Type

Perform the procedure in below to review or set the network type to isolated. Perform the procedure in Table 4 to review or set the network type to general. An isolated network consists of only 268XA Series and NetDAQ 26X devices and one or more host computers. A general network consists of devices, host computers, and possibly servers, routers, gateways, or other network devices. (See Figure 3 for examples.)

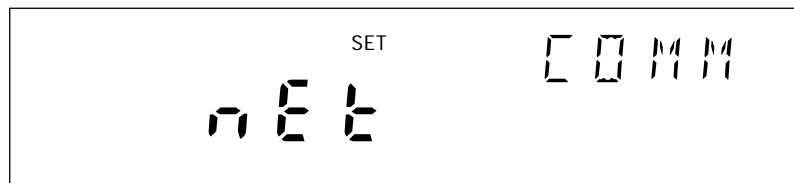
If you use Fluke DAQ software for isolated network operation and set the devices' network type to isolated, you do not need to know or set IP addresses for your devices.

Table 3. Reviewing and Setting the Network Type

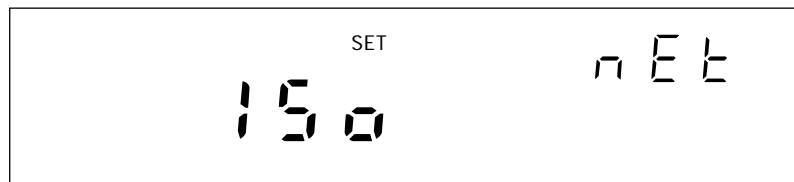
	Press the COMM key to <u>review</u> the network type, or press and hold the COMM key for 3 seconds to <u>set</u> the network type.
	Press the up/down arrow keys until nEt (Network) appears in the primary display (comm appears in the secondary display).
	
	Press the ENTER key. nEt appears in the secondary display and ISo (isolated network) or gEn (general network) is in the primary display.
	To <u>set</u> the network type to isolated, press the up/down arrow keys to select ISo (current setting appears bright).
	
	Press the ENTER key to exit. (Pressing any other function key will cancel <u>set</u> operations.)



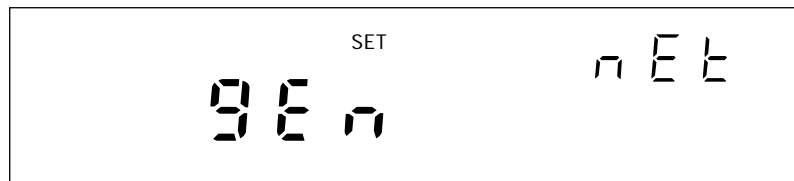
Communications display for reviewing the network type



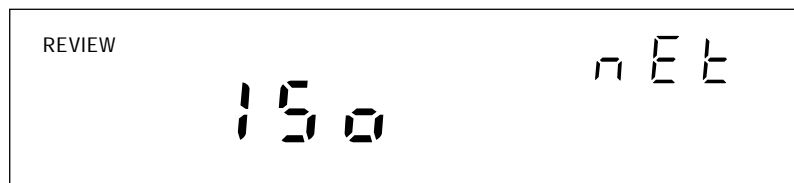
Communications display for setting the network type



Network display for setting the network type to isolated



Network display for setting the network type to general












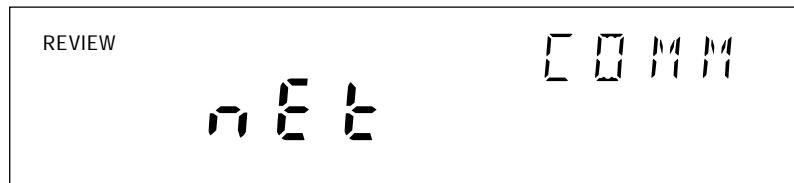
Network display for reviewing the network type (isolated network)

Figure 3. Examples for Reviewing and Setting the Network Type

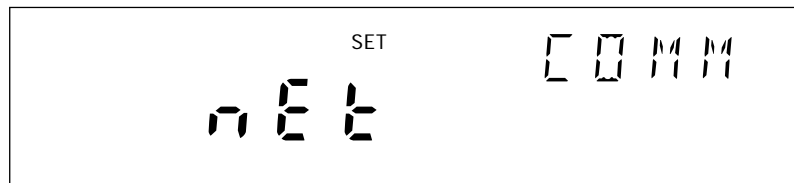
If you set Fluke DAQ Software for general network operation, you must set the network type of each device to general. You will need to enter an IP address, and possibly a socket port, subnet mask and gateway address into each device. Get this information from your network administrator.

Table 4. Reviewing and Setting the Network Type to General

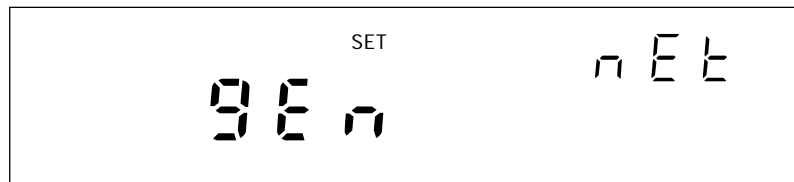
	Press the COMM key to <u>review</u> the network type, or press and hold the COMM key for 3 seconds to <u>set</u> the network type.
	Press the up/down arrow keys until nEt (Network) appears in the primary display (comm appears in the secondary display).
	
	Press the ENTER key. nEt appears in the secondary display and ISo (isolated network) or gEn (general network) is in the primary display.
	To <u>set</u> the network type to general, press the up/down arrow keys to select gEn (current setting appears bright).
	
	Press the ENTER key. (Pressing any other function key will cancel <u>set</u> operations.) This displays the current Socket Port.
	Press the ENTER key. This displays the first digit of the Internet Protocol address (segment IP:0).
	Press the ENTER key to exit. You must set an IP address and Socket Port when using a general network.



Communications display for reviewing the network type



Communications display for setting the network type



Network display for setting the network type to general



Socket Port display for setting the first digit (for the example 04369)

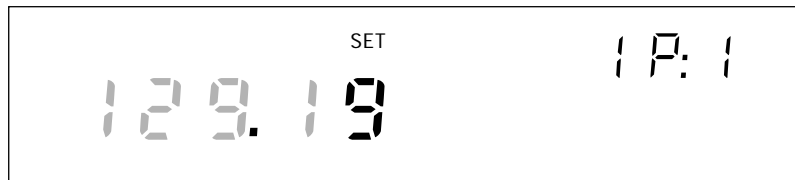


Socket Port display for setting the second digit (for the example 04369)

Figure 4. Examples for Reviewing and Setting General Network Parameters



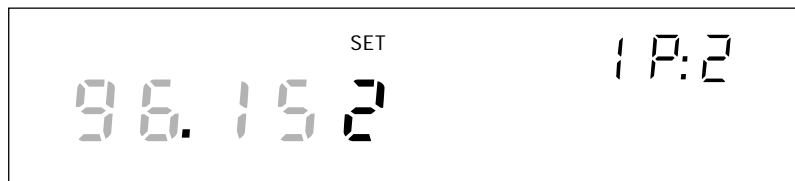
IP address display for setting an IP:0 digit (for example, 129:196:152:101)



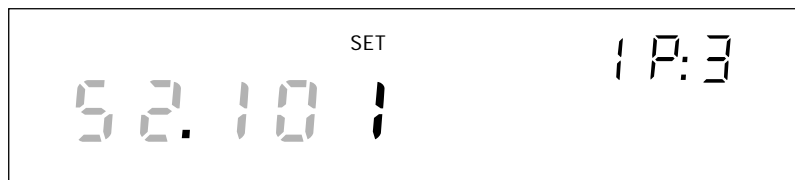
IP address display for setting an IP:1 digit (for example, 129:196:152:101)



IP address display for setting an IP:1 digit (for example, 129:196:152:101)



IP address display for setting an IP:2 digit (for example, 129:196:152:101)



IP address display for setting an IP:3 digit (for example, 129:196:152:101)












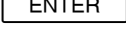

Figure 4 Examples for Reviewing and Setting General Network Parameters (cont)

Reviewing and Setting the General Network Socket Port

Perform the procedure below to review or set the general network Socket Port (1024 to 65535). The default is 04369. In order to communicate with each other, a host computer and an device must use the same socket port number. (See Figure 4 for examples.)

- **General Network Socket Port** Enter the Socket Port supplied by your network administrator.

Table 5. Reviewing and Setting the General Network Socket Port














	Press the COMM key to <u>review</u> the network settings, or press and hold the COMM key for 3 seconds to <u>set</u> the network settings.
	Press the up/down arrow keys until nEt (Network) appears in the primary display (comm appears in the secondary display).
	
	Press the ENTER key. nEt appears in the secondary display and ISo (isolated network) or gEn (general network) is in the primary display.
	To <u>set</u> the network type, press the up/down arrow keys to
	select gEn.
	Press the ENTER key. (Pressing any other function key will cancel <u>set</u> operations.) This displays the current Socket Port.
	To <u>set</u> the socket port, press the left/right arrow keys to select the desired
	digit position (highlighted).
	Press the up/down arrow keys to select the desired number, 0 to 9, for the
	positioned Port digit. In this manner, select all Port digits.
	Press the ENTER key. This displays the first digit of the Internet Protocol address segment IP:0.
	Press the ENTER key to enter the <u>settings</u> and exit the procedure. (Pressing any other function key will cancel <u>set</u> operations.)

Reviewing and Setting the General Network IP Address

Perform the procedure below to review or set the device's general network Internet Protocol (IP) address.

- **General Network IP Address** Enter the IP Address supplied by your network administrator for each BCN. The format is four 3 digit segments: IP0.IP1.IP2.IP3.

Table 6. Reviewing and Setting the General Network IP Address

	Press the COMM key to <u>review</u> the network settings, or press and hold the COMM key for 3 seconds to <u>set</u> the network settings.
	Press the up/down arrow keys until nEt (Network) appears in the primary display (comm appears in the secondary display).
	
	Press the ENTER key. nEt appears in the secondary display and ISo (isolated network) or gEn (general network) is in the primary display.
	To <u>set</u> the network type, press the up/down arrow keys to
	select gEn.
	Press the ENTER key. (Pressing any other key will cancel <u>set</u> operations.) This displays the current Socket Port.
	Press the ENTER key. This displays the first digit of the 12 digit Internet Protocol address (grouped into four 3 digit segments: IP0 . IP1 . IP2 . IP3).
	Press the left/right arrow keys to select the desired number in each segment.
	The selected digit is highlighted and the segment, for example, IP2, appears.
	Press the up/down arrow keys to select the desired number, 0 to 9, for the
	positioned IP digit. In this manner, select all 12 IP digits.
	Press the ENTER key to enter the <u>settings</u> and exit the procedure. (Pressing any other function key will cancel <u>set</u> operations.).

Reviewing and Setting the Subnet Mask and Default Gateway

If communication between the host computer and the 2680 Series passes through a router or gateway, you must set the subnet mask and default gateway address on both the host computer and the device. Get this information from your network administrator.

Perform the procedure in Table 7 to review or set the device network gateway parameters. The network gateway parameters include turning the default gateway feature on or off, setting a subnet mask, and setting an IP address for the gateway attached to the local network.

Note

Set the IP address of the device before setting the gateway parameters. The 268XA device checks the gateway IP address for validity by using the device IP address.

- **Default Gateway Parameters** If the 268XA device and host PC are on different subnets and must communicate through a gateway (router), turn the default gateway feature ON and enter the subnet mask and IP address of the gateway, as supplied by your network administrator. If you do not require a gateway, turn the default gateway feature OFF.
- **Subnet Mask** The subnet mask is a 32 bit binary number expressed as four 3 digit segments, like an IP address. The subnet mask, when masked with the device IP address, determines what the network number is. For example, if the IP address is 129.196.180.93 and the subnet mask is 255.255.255.0, the network number is 129.196.180.0.












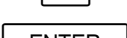





The subnet mask contains a consecutive set of bits, starting at the highest order bit, forming a binary mask value. For example, 255.255.0.0 (binary value FFFF0000 hex) is a valid mask, but 255.255.10.0 (binary value FFFF0A00 hex) is not a valid mask, because the bits are not consecutive. 0.255.255.0 (binary value 00FFFF00 hex) is also not a valid mask, because the bits do not begin at the highest order bit.

The subnet mask must also contain a minimum number of bits depending on the class of the device IP address. The minimum number of bits for a class A address is 255.0.0.0, class B is 255.255.0.0 and class C is 255.255.255.0. For example, if the IP address is 129.196.180.93, a class B address, a subnet mask of 255.0.0.0 is not valid, because there are too few subnet mask bits set.

- **Default Gateway IP Address** The default gateway IP address is the IP address of a gateway (router) attached to the same network as the device. When the device detects that a host PC is not on the same network (using the network number), the data is sent through the gateway to reach the host PC.

The network number of the device must match that of the gateway. For example, if the gateway IP address is 129.196.180.93, and the subnet mask is 255.255.255.0, the network number is 129.196.180.0, and the device IP address must be in the range 129.196.180.1 to 129.196.180.254.

Table 7. Reviewing and Setting the Subnet Mask and Default Gateway








	Press the COMM key to <u>review</u> the parameters, or press and hold the COMM key for 3 seconds to <u>set</u> the parameters.
	Press the up/down arrow keys until dgAtE (default gateway) appears
	in the primary display (COMM appears in the secondary display).
	Press the ENTER key. dgAtE appears in the secondary display, and ON or OFF is in the primary display.
	Press the up/down arrow keys to select either ON or OFF when in <u>set</u>
	mode.
	Press the ENTER key to make the selection (pressing any other key will cancel <u>set</u> operations.). If you select ON, the subnet mask appears. The subnet mask display consists of four 3 digit segments: Sub0. Sub1. Sub2. Sub3.
	Press the left/right arrow keys to select the desired number in each segment. The selected digit is highlighted and the segment, for example Sub:0,
	appears in the secondary display.
	Press the up/down arrow keys to select the desired number 0 to 9, for the positioned subnet mask digit. In this manner, select all 12 subnet mask
	digits.
	Press the ENTER key to make the selection (pressing any other key will cancel <u>set</u> operations). If you enter an incorrect subnet mask, Error appears for 2 seconds, and the subnet mask selection stays displayed. Otherwise, the default gateway IP address appears. The default gateway display consists of four 3 digit segments: gAt0.gAt1.gAt2.gAt3.
	Press the left/right arrow keys to select the desired number in each segment. The selected digit becomes highlighted and the segment, e.g. gAt:0,
	appears in the secondary display.
	Press the up/down arrow keys to select the desired number 0 to 9, for the positioned default gateway IP digit. In this manner, select all 12 default
	gateway IP digits.
	Press the ENTER key to make the selection (pressing any other key will cancel <u>set</u> operations). If you enter an incorrect default gateway IP, Error displays for 2 seconds, and the default gateway IP selection stays displayed. Otherwise, the procedure exits.

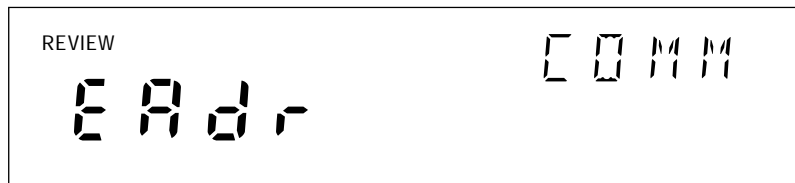
Viewing the Device Ethernet Address

Perform the procedure in below to view the Device Ethernet address. (See Figure 5 for examples.) The network administrator must know the device Ethernet address when the device operates on a general network. You do not need this information when you operate the device on an isolated network.

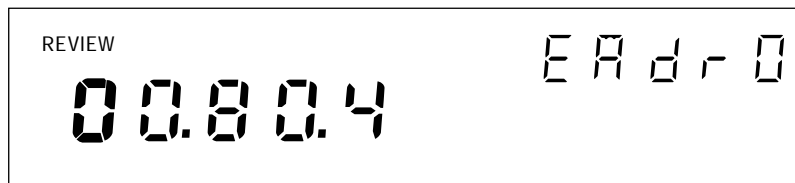
- **Ethernet Address Format** The Ethernet address is a 12 digit hexadecimal number. For example, 00:80:40:12:34:56. The first 6 hexadecimal digits represent a manufacturer, for example, 00:80:40 represents Fluke Corporation. The remaining digits are a sequential number assigned during manufacturing. Ethernet addresses are always unique; they are never altered, reused, or duplicated.
- **Ethernet Address Display** The Ethernet address display consists of six 2 digit segments: Eadr 0 to Eadr 5. In the example above, Eadr0=00, Eadr1=80, Eadr2=40, Eadr3=12, Eadr4=34, Eadr5=56.

Table 8. Viewing the Device Ethernet Address

	Press the COMM key to open the communications display because this is a review process only.
	Press the up/down arrow keys until EAdr (Ethernet Address) appears in
	the primary display (comm appears in the secondary display).
	Press the ENTER key. Eadr0 appears in the secondary display, the first 5 digits of the Ethernet address appears in the primary display (always 00.80.4).
	Press the left/right arrow keys to display each byte: Eadr0 (always 00),
	Eadr1 (always 80), Eadr2 (always 40), then Eadr3, Eadr4 and Eadr5.
	Press the COMM key again to exit. Record the Ethernet address inside the rear cover of this manual.



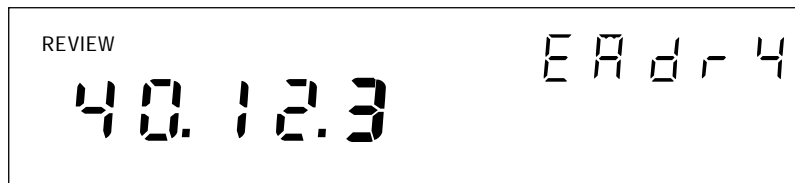
Communications display for viewing the device Ethernet address



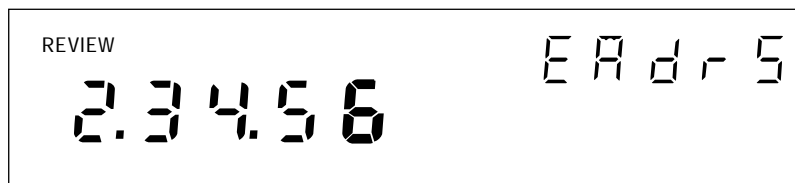
Ethernet address display for viewing byte 0 (for example 00-80-40-12-34-56)



Ethernet address display for viewing byte 2 (for example 00-80-40-12-34-56)



Ethernet address display for viewing byte 4 (for the example 00-80-40-12-34-56)



Ethernet address display for viewing byte 5 (for example 00-80-40-12-34-56)

Figure 5. Examples for Viewing the Ethernet Address

Host Computer and Network Preparation

This section contains information for preparing your host computer and setting up network communication, as summarized below.

Installing Host Computer Ethernet Adapter

Skip this section if you have an Ethernet adapter installed on your computer.

Since the installation procedures for Ethernet adapters change frequently and without notice, you must follow the instructions supplied with your particular Ethernet adapter. If your host computer is already on a network, it probably has an Ethernet adapter already installed.

To install an Ethernet adapter, use the following procedure:

1. Close all applications. Exit Windows and turn the host computer off.
2. Follow the installation instructions in the manual supplied with your Ethernet adapter to install the hardware. Do not install driver software at this point.

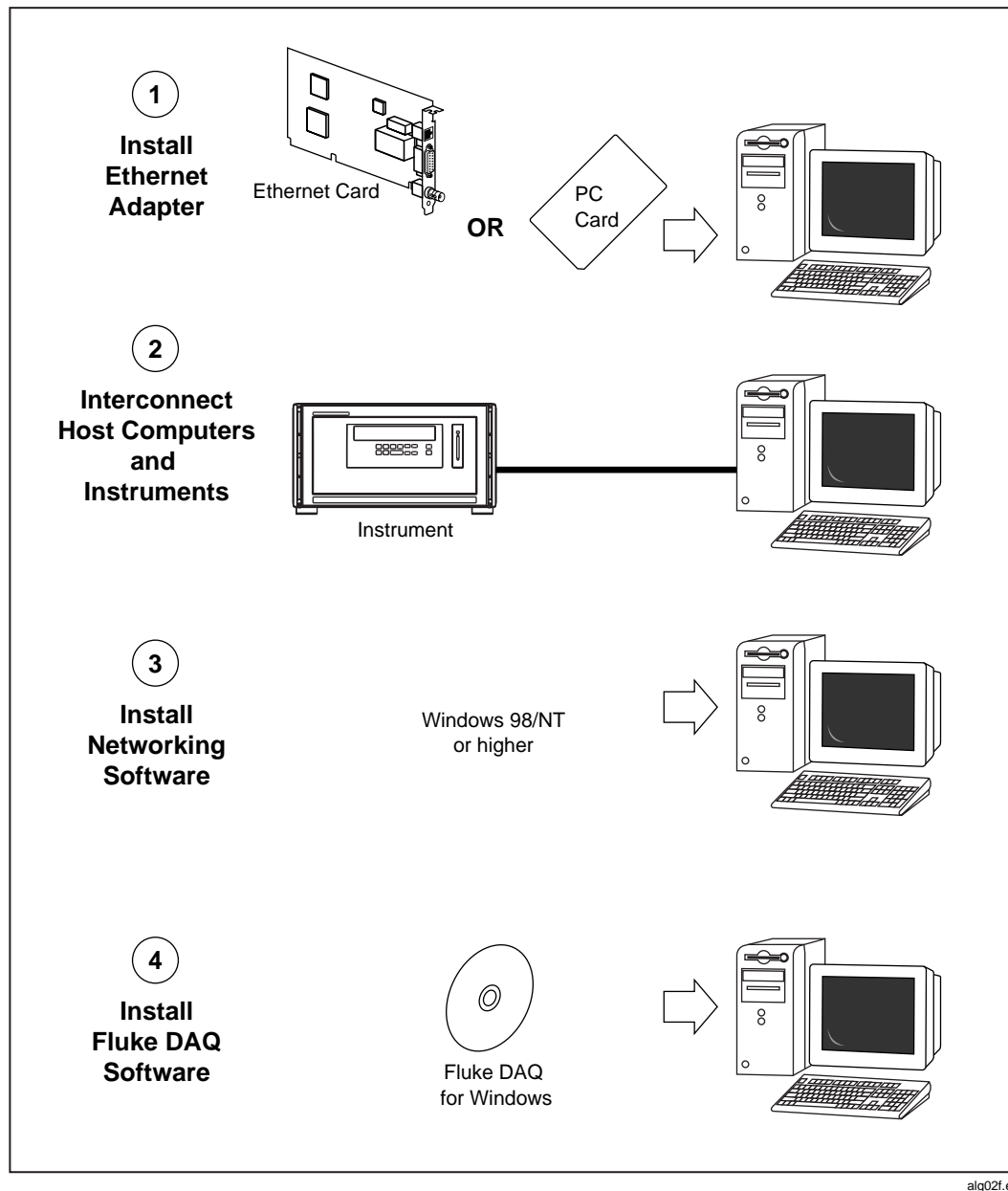


Figure 6. Preparing for Network Operation

Device and Host Computer Interconnection

You may interconnect 268X devices and host computer(s) with 10/100 BaseT (twisted pair) wiring. If your site is already wired, you can use the wire in place. If your site is not wired, you are connecting your device directly to your host computer.

Host Computer/Device Direct Connection

You can connect a single device directly to a host computer using 10/100BaseT cable, but you must use a special cable that has its transmit and receive lines crossed. The crossed lines allow each end to transmit to the receive terminal at the other end.

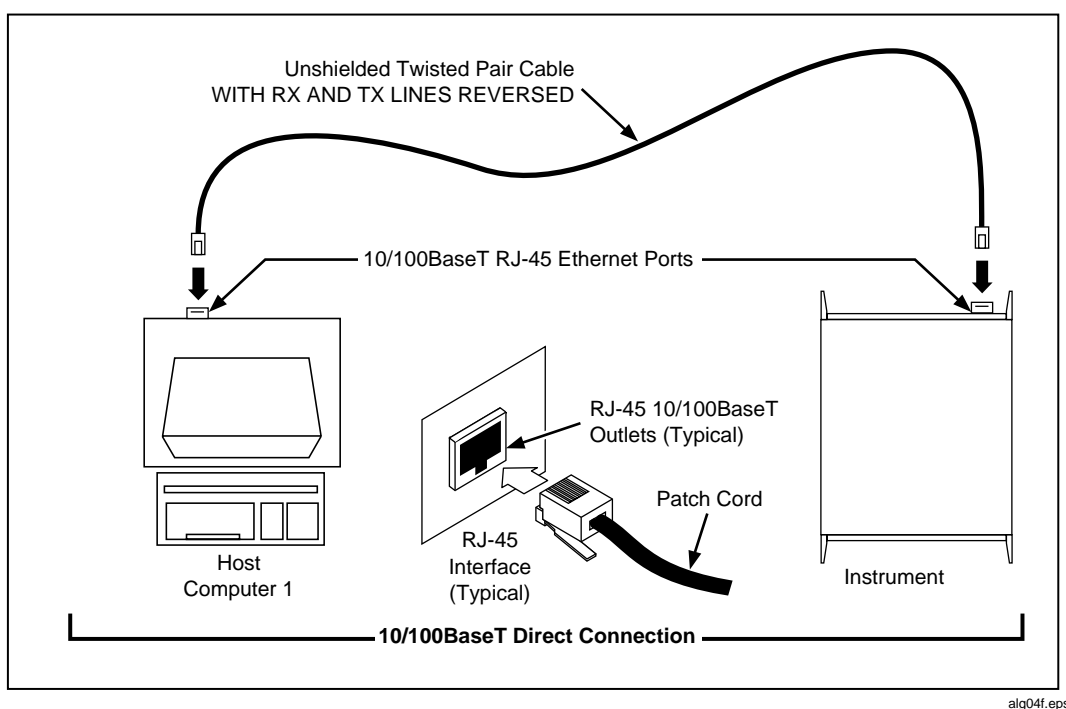


Figure 7. Host Computer/Device Direct Connection

Interconnection Using 10/100BaseT (Twisted Pair) Ethernet Wiring

The devices support connection via twisted pair Ethernet, usually in conjunction with a "hub" for multiple devices. Take care that you use twisted pair wires designed for 10/100BaseT network use (phone cables will not work). Refer interconnection issues to your network administrator.

Direct connection between a single host computer and a single device with 10/100BaseT is possible, but you must use a special cable that has its transmit and receive lines crossed.

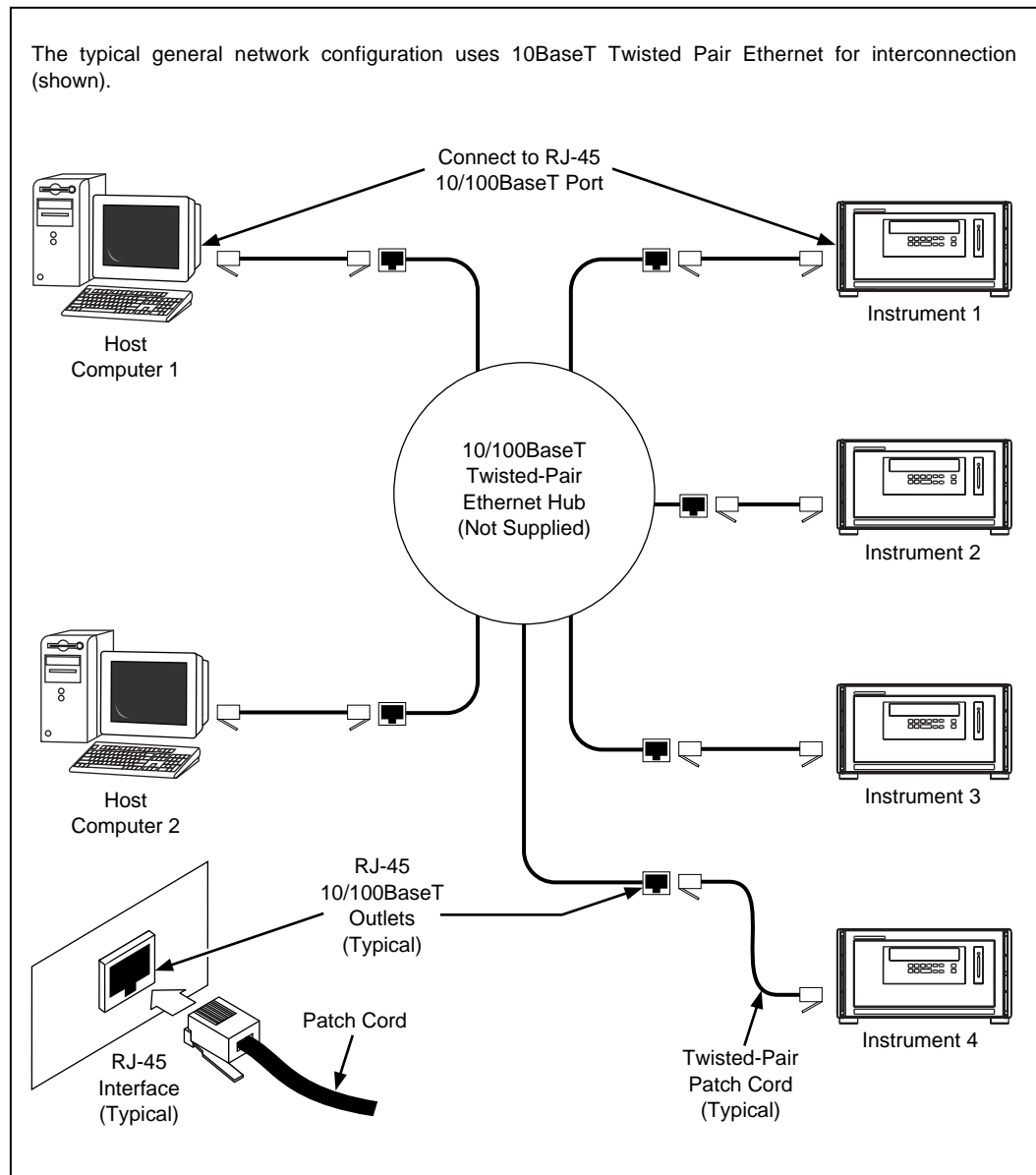


Figure 8. Interconnection Using 10/100BaseT (Twisted Pair) Wiring

Installing Host Computer Networking Software

To establish Ethernet communication in your host computer, you must do the following:

- Install a driver for the adapter
- Install TCP/IP protocol stack
- Set host computer networking parameters

This section discusses installing the adapter driver and the TCP/IP protocol stack. You should install the networking software that is most appropriate for your operating system.

Windows 98, Windows NT (Service Pack 6.0 required), ME, 2000, and XP provide drivers for many Ethernet adapters, in addition to the TCP/IP protocol.

Complete the following procedure to load the Ethernet adapter driver and the TCP/IP protocol stack on Windows 98. Windows NT and Windows 2000 installation is similar. The operating system may have already detected the Ethernet adapter and added it. If so, you can skip steps 2 and 3.

1. Open the Control Panel | Network utility via Start | Settings or My Computer.
2. Click Add; select Adapter, then click Add.
3. Choose the manufacturer and network adapter. Click OK. The support for the adapter gets installed.
4. Click Add, select Protocol then click Add. Select Microsoft TCP/IP. Click OK. The protocol support is installed.

Setting Host Computer Networking Parameters

This section discusses how to set your host computer networking parameters after you install your adapter and networking software. If you plan to use Fluke DAQ software for general network operation, and you are just now enabling networking, you must set the host computer's IP address, subnet mask, and possibly its default gateway IP address. Obtain this information from your network administrator.

If you plan to use Fluke DAQ software for isolated network operation you must set the host computer's IP address to 198.178.246.1xx, and its subnet mask to 255.255.255.0. You can use any numbers for the last two digits of the host computer IP address. Each computer on the network must have a unique number (for example, 198.178.246.101 and 198.178.246.102).

If you plan to use Fluke DAQ software for general network operation and your host computer is already operating on the network, skip this section.

Complete the following procedure to set the networking parameters on Windows 98. The procedure is similar on Windows NT and Windows 2000,

1. Open the Control Panel | Network utility via Start | Settings or My Computer.
2. Highlight TCP/IP and click Properties.
3. Select the IP Address tab. Enter the IP address and subnet mask.
4. If your network administrator supplied a Default Gateway address, select the Gateway tab. Enter the New Gateway address, click Add, and click OK.
5. Click OK to exit Network Setup.
6. Reboot your computer.

Introducing Fluke DAQ Software

Fluke DAQ software provides a graphical user interface (GUI) to the 264XA and 268XA family of data acquisition products. You can use Fluke DAQ software to easily perform the following:

Note

Fluke DAQ supports the NetDAQ devices (2640A and 2645A) as well as the 2680A and 2686A.

- Configure your 268XA network and device settings.
- Download/upload configuration to the devices.
- Send commands to and take readings from analog modules and the optional DIO module.
- Monitor the devices on-line values and alarms.
- Plot trend charts, and a complete historical capability to retrieve historical trends, alarms and export data files in CSV format.
- Record and store scanned data on a PC Card (PCMCIA ATA format).

⚠ Caution

Removing the PC card while the storage LED is on may cause a loss of data. Before removing the card, stop the device scanning. Loss of power while storing data may also result in loss of data.

Note

When a PC card is used for data collection you should erase stored data before using the card again.

Installing Fluke DAQ Software

To install Fluke DAQ software on your computer

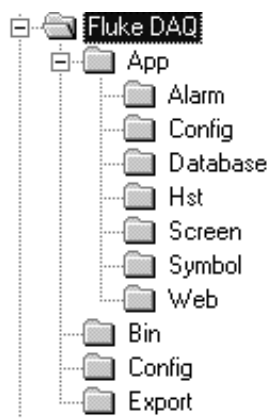
1. Run the Launch.exe command from your distribution CD. The installation program will prompt you for an installation location for the program and will check if there is enough free space on your hard drive for the installation.
2. Click the Next button and wait for the installation to finish. The install time will vary depending on the computer you are using.
3. The installation program creates a shortcut on your desktop when the installation is complete. Double-click the shortcut to start Fluke DAQ.



Note

You will need to reboot your computer after you install the Fluke DAQ software.

During installation, the following directories and files are installed on you PC.



alg100s.bmp

The Fluke DAQ subdirectories contain the following information

Alarm Collected alarm data and format information.

Config Miscellaneous files used in a system configuration.

Database Miscellaneous files that related to the database collection.

Hst Data collected during scanning, one file per channel.

Screen Miscellaneous files affecting the screen layout.

Symbol Bit maps used on Fluke DAQ screens.

Web Miscellaneous files associated with network communication.

Bin Files used to generate the Fluke DAQ application.

Config Saved configuration files.

Export Exported .csv scan data files.

Understanding the User Interface

Fluke DAQ software has a standardized and easy to use interface. This section explains the components of the interface.

Using the Toolbar

A toolbar appears on all of the Fluke DAQ dialogs. Use the toolbar buttons to add and configure devices 268XA devices and to navigate through the Fluke DAQ application. Each button on the toolbar has a tool tip that identifies the button function. Using the mouse, point to a button to view the tool tip.



Table 9. Fluke DAQ Toolbar Buttons









Button	Function
	<p>Logon button.</p> <p>Used to log on to the Fluke DAQ application. The Fluke DAQ administrator (Root user) is able to create user accounts and set up rights to configure devices. Guest users do not have rights to perform configuration tasks.</p>
	<p>Security System Configuration button.</p> <p>The system security configuration feature allows the administrator to add and remove Fluke DAQ users, allow users to configure devices, and to change user passwords. Only the administrator (Root user) can use the security system configuration function.</p>
	<p>Configuration button.</p> <p>Used to configure networks, devices, modules, and channels.</p>
	<p>Communication button.</p> <p>Used to access the Communication dialogs, display the communication status of connected network components, and allow you to interact with those components.</p> <p>The communication icon can also assume three states in the TreeView panel.</p> <ul style="list-style-type: none"> • Dark computer screens on the icon indicates that communication is disabled. • Color on the computer screens on the icon indicates that communication is enabled. • A blinking red X through a computer screen indicates a communication failure.

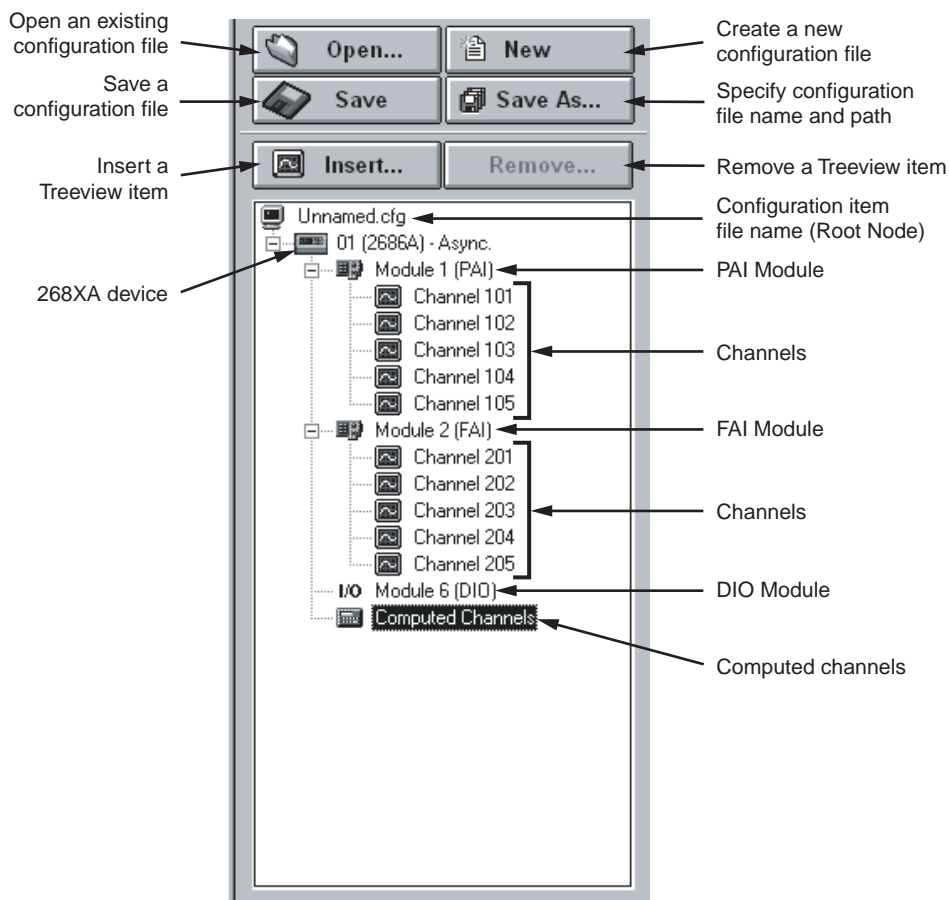
Table 3-1. Fluke DAQ Toolbar Buttons (cont)

Button	Function
	<p>Trend button.</p> <p>Used to access the Trend dialog to view the scanned data collected from 268XA devices.</p>
	<p>Alarm button.</p> <p>You can use the Alarm View dialog to view On Line and History alarms.</p> <p>The Alarm status icon can also assume two states in the TreeView panel. When an alarm is activated the Alarm icon turns red. The icon turns black after you give an Ack command (Last Alarm or All Alarms) in the Alarms dialog.</p>
	<p>Web and Alarm Mail Settings button.</p> <p>Used to enter Fluke DAQ web configuration information and to configure Fluke DAQ to send e-mail messages reporting alarm condition.</p>
	<p>Exit button.</p> <p>Exit the Fluke DAQ application.</p>

Understanding the Workspace Area

The Workspace Area consists of a network TreeView and a set of buttons. Use the Workspace Area to:

- Open, Save, and Remove configuration files. You can also use the Save As button to rename an existing configuration file.
- Insert and Remove devices, modules and channels
- Navigate through the configuration setup dialogs



alg67f.eps

Checking Operational Status

The icons in the TreeView change to indicate the device status. Below are all the possible icons and their meaning:

Device Status Icon

- Yellow or blue device icons indicates the device is not connected.
- Green device icon indicates the device is connected and communicating.
- Red device icon indicates an device error. You can view error information in the Communication dialog

Module Status Icon

- Dimmed module icon indicates the module is not being scanned.
- Green module icon indicates the module is being scanned.
- Red module icon indicates the module is being scanned and a channel is in alarm condition.

Computed Channel Status Icon

- Blue channel icon indicates channels are not being scanned.
- Green channel icon indicates channels are being scanned.
- Red channel icon indicates channel in an alarm condition.

I/O Module 6

- Black digital I/O icon indicates all the channels are turned off.
- Green digital I/O icon indicates a channel is turned on by a external activation or by a user command.
- Red digital I/O icon indicates a channel is activated by an alarm condition.

Configuration Dialogs

The Configuration dialog that appears depends on the node (device, module, or channel) you select in the TreeView panel.

You can also use copy and paste functionality to save configuration time. Channel settings can be copied from one channel to another in the same device, or you can copy a whole module or a group of channel settings from one device to another. To copy a channel, highlight the channel you want to copy, then click the right mouse button and select Copy. Next, highlight the module where you want to add the channel, then click the right mouse button and select Paste. A new channel with the same configuration will be added to the module.

You can also use the same method to change channel settings. Highlight a channel, then click the right mouse button and select Copy. Next, highlight the channel you want to change, click the right mouse button and select Paste to paste the configuration information.

Note

As you move from a Configuration dialog to a Communication dialog, the device that was previously selected in the dialog is still selected. For example, if device 01 is selected in the Configuration dialog and you move to a Communication dialog, the device will only be highlighted if it was selected the last time you were in the Communication dialog. Dialog selections are remembered and are independent.

Fluke DAQ uses the following Configuration dialogs:

Network Configuration Dialog

You can use the Network Configuration dialog to group the devices as in a master/slave arrangement and to select the network type (General or Isolated). The Network Configuration dialog appears when you click on the root node in the TreeView.

Device Configuration Dialog

You can configure your 268XA devices using the Fluke DAQ Configuration dialog. This dialog appears when you select a 268XA device in the TreeView. You can use the Configuration dialogs to:

- Set up the device network settings (IP address and Port number)
- Verify the IP Address and the connection
- Upload and download the configuration from/to the device
- Save and load the configuration to and from the PC card (2686A only)

Note

The Save command saves the actual 2686A configuration to the PC Card. The Load command loads the configuration from the PC Card to the 2686A.

- Set up the device general settings
- Specify which module will control the trigger out signal for master/slave operation

Module Configuration Dialog

A 268XA device can have up to 6 modules with specific configuration settings. The Module Configuration dialog appears when you select a module in the TreeView.

Analog Channel Configuration Dialog

Use the Analog Channel Configuration dialog to set function, range, and alarm information.

DIO Configuration Dialog

Use the DIO Configuration dialog to enter totalizer configuration information. To set relays and I/O pins, see the DIO Communication dialog described later in this Chapter.

Computed Channel Configuration Dialog

268XA devices can have up to 60 computed channels, with all computed channels available for configuration in one view.

Computed channels provide a way to directly use measurement results in a calculation. The calculation results can be used to set alarms or as part of other calculations. A computed channel is inserted in a similar manner as a channel for a FAI or PAI. Highlight the Computed Channel icon and click on the Insert button.

Detailed instructions for using the Configuration dialogs is provided later in this Chapter.

Note

Computed channel values are only updated when scanning is active.

Communication Dialogs

The Communication dialogs display the communication status of connected network components and allow you to interact with those components. Fluke DAQ uses the following Communication dialogs. Using the Communication dialogs you can monitor and interact with:

Device Communication and Status Dialog

You can use the Device Communication and Status dialog to perform the following tasks:

- View device status and reset device errors
- Start/Stop scan and communication with all the modules
- Reset the totalizer and the PC Card status
- Upload scan data from the PC Card, format the PC Card, and remove scan data from the PC Card

Module Communication Dialog

You can use the Module Communication dialog to:

- View the current channel values
- View the alarm conditions
- Start/Stop the module scan

Digital I/O Points Dialog

You can use the Digital I/O Points Communication dialog to set any of the 8 relays or 20 DIO pins active when an alarm condition occurs in the channel.

Computed Channels Dialog

You can use the Computed Channels communication dialog to perform the following tasks:

- View current values of computed channels
- View alarm conditions of computed channels

Security Dialogs

You can use the system security features to protect device configuration information. The system security feature allows the administrator to add and remove Fluke DAQ users, allow other users to configure devices, and to change user passwords

Trend Dialog

You can use the Trend dialog to view the scanned data collected from the 268XA devices. The charts can be On Line or Historical. You can use the Export button to export data to a CSV file that you can manipulate using Excel.

Alarm Dialog

You can use the Alarm View dialog to view On Line and History alarms. You can filter the alarms by device ID, module and channel. When an alarm occurs, the device Icon in the configuration window changes to a red color. As long as the alarm exists, the Icon remains red. In the Alarm window, a red line of information shows the status of the alarm.

Mail and Web Settings Dialogs

You can use the Web and Alarm Mail Settings dialog to enter Fluke DAQ web configuration information and to configure Fluke DAQ to send e-mail messages reporting alarm condition.

The Web Settings portion of dialog is used to specify a URL where scanned values from your 268XA device will be sent.

Managing Your Network Using Fluke DAQ


The following procedures provide detailed instructions for using Fluke DAQ to:

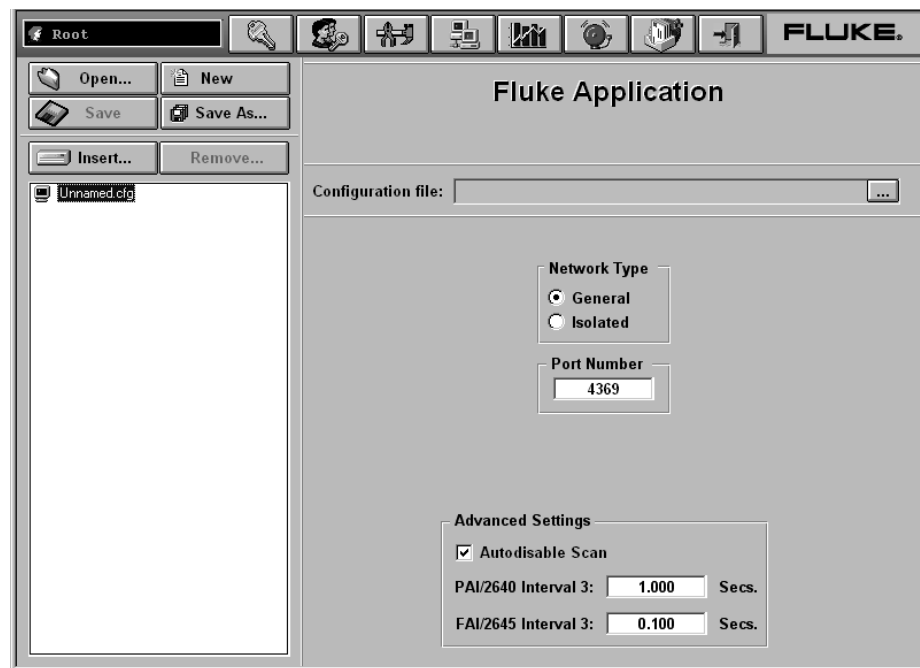
- Insert and configure 268XA devices, modules, channels, and computed channels.
- Start a scan
- View scan data.
- View alarms.

Inserting and Configuring a 268XA Device

To insert and configure a device





1. Double-click the  icon on your desktop to start Fluke DAQ.
2. Specify basic settings in the Fluke DAQ Application dialog.



alg102s.bmp

The dialog box entries include:

Configuration file

Click the  button or the  button to load an existing configuration file.

Network Type

Isolated if the PC is connected directly to the 268XA device or General if the 268XA is part of a network.

Port Number

4369 is the default port number. Fluke recommends that you use the default port number.

Group is externally wired

All devices may be wired together in a master/slave arrangement.

Advanced Setting autodisable scan – Interval 3 (autoscan rate)

Interval 3 is the rate at which alarm conditions will be monitored. If disabled, alarm conditions will be monitored only when the associated channel is scanned during a regular scan interval.

Max 999999 seconds

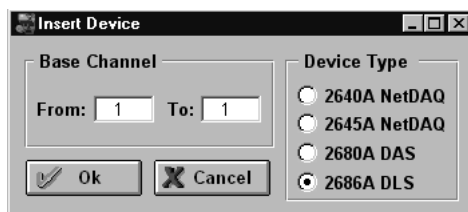
Min 0.001 seconds

3. To insert a device, select the .cfg file in the TreeView panel and click the Insert button.



alg103s.bmp

- Specify the Base Channel (1 to 99) and Device Type and click OK. A device is attached to the new configuration. As part of the insertion process, you can specify a base channel number. This number is used to differentiate channels in different devices. You can insert up to 99 Base Channels of the same Device Type. The Base Channel number auto-increments when you add devices.

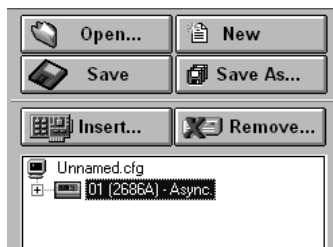


alg104s.bmp

Note

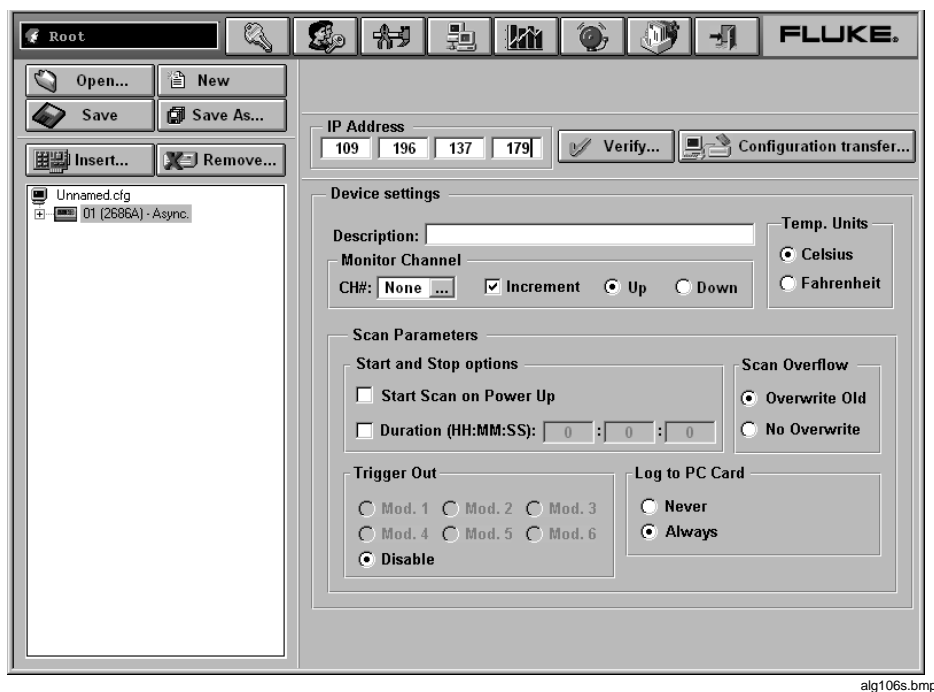
Fluke DAQ also supports 2640A and 2645A NetDAQ devices. Some of the Fluke DAQ configuration dialogs may differ from those for the 268XA.

- In the TreeView panel, select the device you just added.



alg105s.bmp

6. Set the IP Address on the Device Settings dialog. Other fields are optional. You may need to contact your Internet support staff to determine the IP Address.



The dialog box entries include:

IP Address

Enter the IP Address of the device you are adding.

Verify Button

Click the Verify button to ping the device and verify that the IP Address is correct. The device and your PC must both be connected to the network for this to work.

Configuration transfer

You can transfer configuration information from the PC to the device, from the device to the PC, or from a PC Card to a PC or the device. PC Card operations are available only for the 2686A.

Description

Enter a meaningful description of the device. 35 characters maximum.

Temperature Units

Specify Celsius or Fahrenheit. This will automatically select temperature units for all temperature measurements.

Monitor Channel

Select a channel measurement to display on the device front panel. You can also choose to increment through active channels or to automatically scan through all active channels. Default is None.

Scan Parameters

Parameters you can set to start, stop, and save scan data.

Note

You can also select Start Scan on Power Up for stand-alone operation or to automatically start scanning after a power loss.

Scan Overflow

You can choose to overwrite old data or stop receiving data when the buffer is full.

Log to PC Card (2686A only)

Never

Ignore the PC card (default setting).

Always

Always write to the PC card. This selection is useful for stand-alone applications or when you want data backup.

Note

When the card is full, an error message will be generated and scanning will stop.

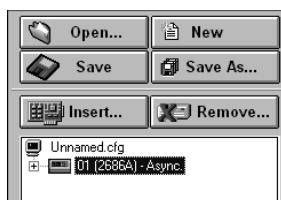
Trigger Out

Used to specify a Trigger Out module. Trigger out is the physical Trigger output of a 268XA device. It is the Trigger Out signal out on the rear panel connector of the mainframe. If you want to set up a master/slave relationship, set a module in a 268XA device to control the Trigger Out signal and wire that signal to the Trigger In of all the slave devices. You will then need to configure a module in a slave device to take a reading when an External Trigger was received. The External Signal is the same as the physical Trigger In located on the back of the mainframe.

Inserting and Configuring a Module

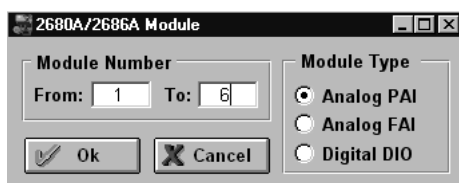
To insert and configure a module

1. Highlight a device in the TreeView panel and click the **Insert** button.



alg107s.bmp

2. Specify the number and type of modules you want to insert in the Module dialog box.



alg108s.bmp

The dialog box entries include:

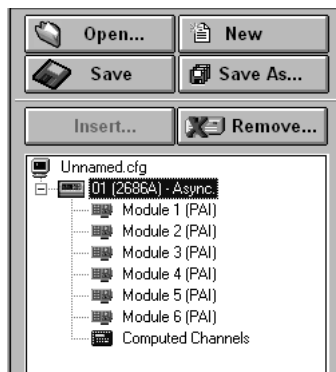
Module Number

You can attach up to 6 modules to the device. You can only have a Digital I/O in Module Slot 6 and can have only one per device.

Module Type

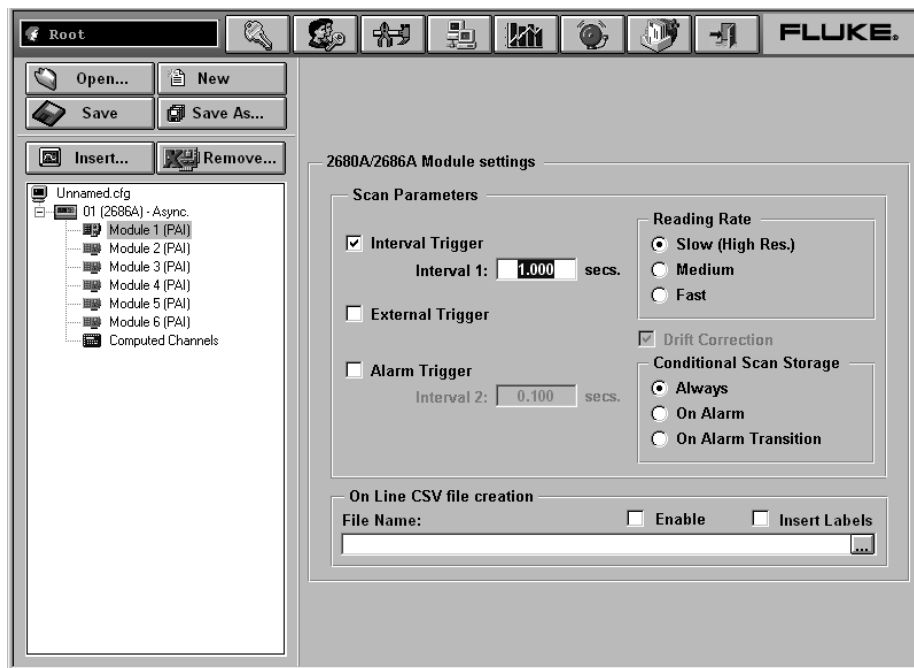
Valid module types are Analog PAI, Analog FAI, or Digital DIO.

3. Click **OK**. The modules are added to the device and appear in the TreeView panel.



alg109s.bmp

4. Select one of the analog modules you inserted and the Analog Module settings dialog appears.



alg110s.bmp

The dialog box entries include:

Interval Trigger

Uses the interval timer (interval 1 timer) to set the scan rate for normal operation in a module. The interval is user settable.

External Trigger

Uses the Trigger input signal to start a scan. Every time the external trigger is activated, another scan is taken.

Alarm Trigger

Uses a second interval timer (interval 2 timer) to start scanning when an alarm condition is encountered by the module. There is an interval timer (interval 3 timer) used to look for alarms. The default for that timer is 0.1 s for the FAI and 1 s for the PAI.

Drift Correction

Automatically selected when you set the reading rate to Slow (High Res.). You can also click to clear the check box. Drift correction is used primarily to compensate for temperature drift. Clearing the check box allows readings to be taken more quickly.

Reading Rate

Select the slow reading rate for high precision or the fast reading rate for high speed. Actual reading rate depends on the function you select.

Conditional Scan Storage

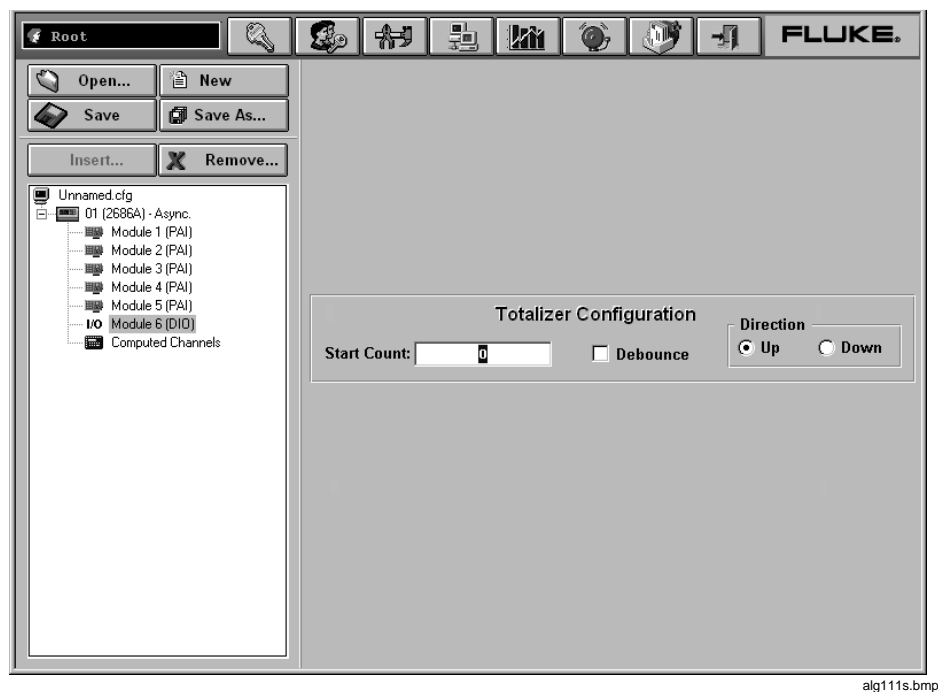
Allows you to specify when to store scan data. Always is the default selection. On Alarm stores scan data as long as the alarm condition exists. On Alarm Transition stores scan data only when the alarm first occurs. On Alarm stores the least amount of data.

On Line CSV file creation

Moves scan data directly to a .csv compatible file instead of storing it first in a binary format.

Note

If you are configuring a DIO module, the Totalizer Configuration dialog appears.



The dialog box entries include:

Start Count


Used to specify a start count.

Debounce

Select debounce to ignore signals with a period less than 2 ms (500 Hz); otherwise, signals up to 5 kHz can be counted.

Direction

If you entered a start count, the start count is reloaded when the totalizer reaches the terminal count. The totalizer can count up or down to zero.

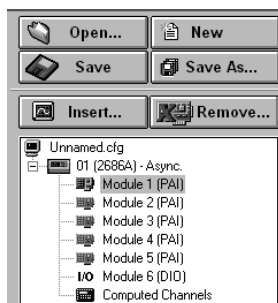
You can also highlight the IO module and click the  button for more DIO settings including digital IO points and relays.

Inserting and Configuring a Channel

After selecting a module, you need to add channels to the module.

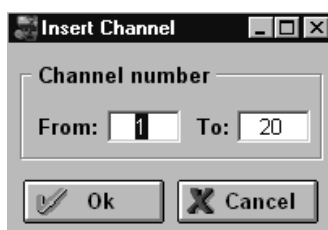
To insert and configure a Channel

1. Highlight a module in the TreeView panel and click the **Insert** button.



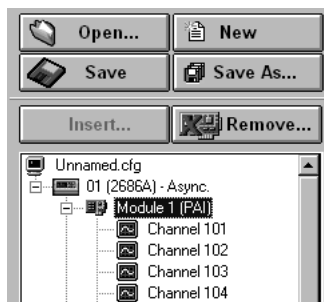
alg112s.bmp

2. Specify the number of channels you want to insert on the Insert Channel dialog box.



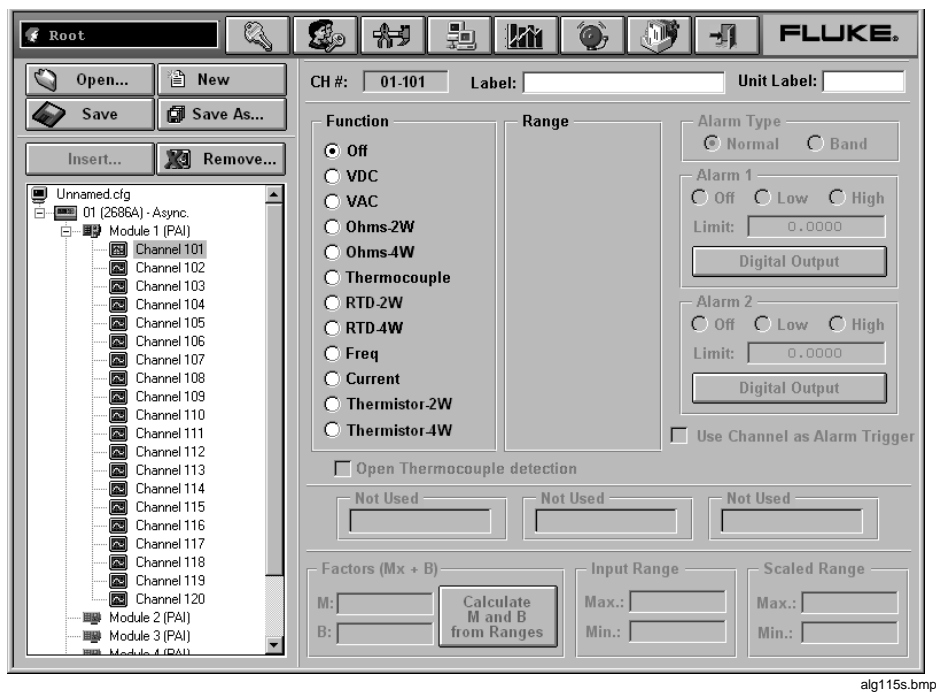
alg113s.bmp

3. Click **OK**. The channels are added to the module and appear in the TreeView panel.



alg114s.bmp

4. Select a channel and the Module settings dialog appears.



The dialog box entries include:

CH #

XX-YYY. The first two digits identify the chassis (01-99). The next digit identifies the module (1-6), and the last two digits identify the channel (1-20).

Label

Use the label field to identify where the channel is used in your application.

Unit Label

Used to identify the unit of measurement (°C or °F).

Function

Identifies the type of measurement being performed.

Range

Amplitude range for the measurement. Use auto when you are unsure of the range.

Alarm Type

Use Normal alarm if the measurement goes above or below the Alarm 1 or Alarm 2 level. Use Band to alarm if the signal falls between two levels.

Alarm 1 or Alarm 2

Each channel has two alarms. You can set the alarms to Off, Low, or High. An alarm condition occurs when a measurement falls below a low alarm value (Low) or rises above a high alarm value (High). Fluke DAQ records all alarm conditions in a data file.

Open Thermocouple Detection

Provides for notification if an open thermocouple is detected.

Factors (Mx+B)

Used to scale measurements. $Mx + B$ scaling multiplies a measurement by a multiplier (M) and then applies an offset (B). For example, $Mx+B$ scaling of $100x+50$ applied to a measured value of 1.15 would result in a reading of $100(1.15)+50=165$.

Input or Scaled Range

Use the M and B values to calculate the Input and Scaled range or you can enter the Input and Scaled range and Fluke DAQ will calculate the M and B values for you.

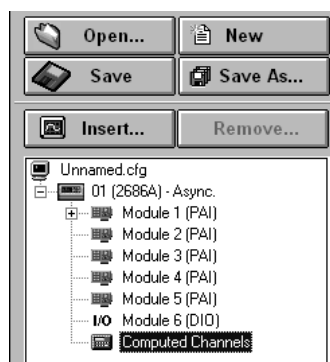
Configuring a Computed Channel

Computed channels provide a means to calculate values based on measurements. For example, if Channel 1 measures dc V and Channel 2 measures dc I, you could use a computed channel to calculate instantaneous power (Channel 1 x Channel 2).

For a computed channel to execute, it must be associated with the scanning of a module. You need to choose a module in the Scan with Module area for this association. The default is module 1.

To configure a computed channel

1. Highlight the Computed Channels icon in the TreeView panel and click the **Insert** button.



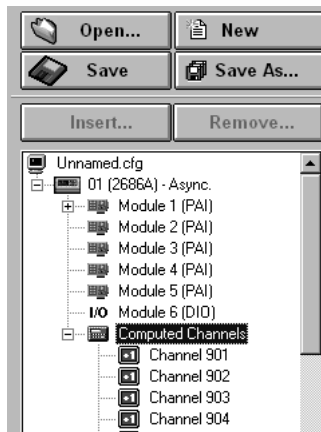
alg116s.bmp

2. Specify the number of channels you want to insert on the Insert Channel dialog box.



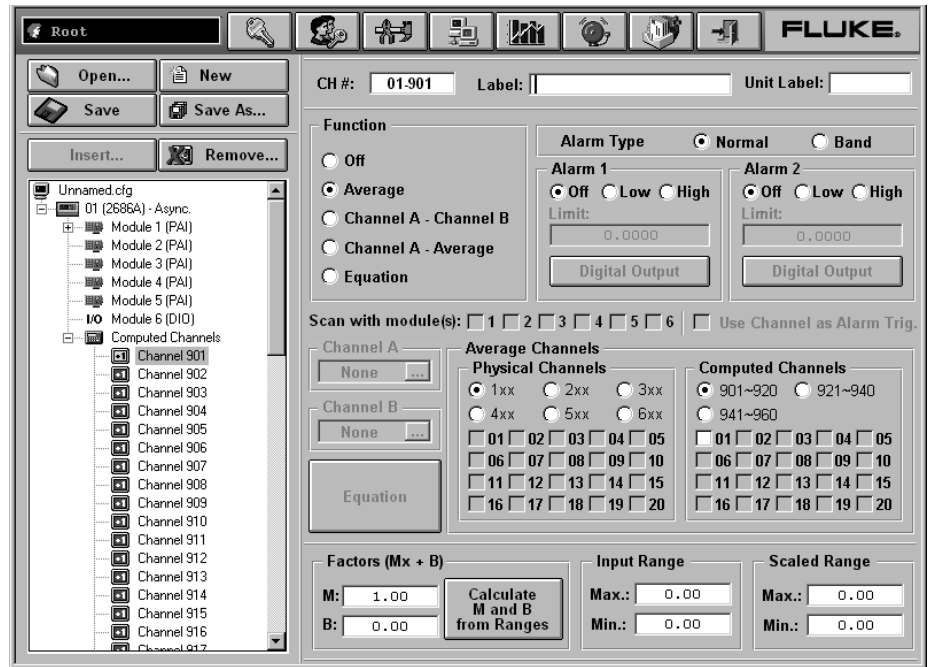
alg117s.bmp

3. Click **OK**. The computed channels are added and appear in the TreeView panel.



alg118s.bmp

4. Select a computed channel and the Computed Channel settings dialog appears.



alg119s.bmp

The dialog box entries include:

CH #

Computed channels are assigned channel numbers from 901 to 960.

Label

Use the label field to identify where the computed channel is used.

Unit Label

The value to apply to the label. For example, you may want the calculated value shown as Watts.

Function

You can take the average reading from one channel, subtract the measurement of one channel from the measurement of another channel, or generate an equation based on measurements.

Alarm Type

Use Normal alarm if the measurement goes above or below the Alarm 1 or Alarm 2 level. Use Band to alarm if the signal falls between two levels.

Alarm 1 or Alarm 2

Each channel has two alarms. You can set the alarms to Off, Low, or High. An alarm condition occurs when a measurement falls below a low alarm value (Low) or rises above a high alarm value (High). Fluke DAQ records all alarm conditions in a data file.

Digital Output

Used to output a digital signal or close a relay if an alarm is detected.

Use Channel as Alarm Trigger

Select if channel reading will be used to trigger an alarm.

Trigger Scan With Module

Calculate the computed channel any time a module is scanned.

Channel A or Channel B

Select from the configured channels in the device.

Note

You cannot select channels in another device.

Equation

See Appendix E for detailed information on computed channel equations.

Average Channels

Select which channels you want to average.

Factors (Mx + B)

Used to enter a linear equation in two ways. You can either enter the slope (M) and offset (B) or enter input range. Scale range, slope, and offset are entered automatically when you press the **Calculate** button. "X" will be replaced with the computed channel number.

Input or Scaled Range

Use the M and B values to calculate the Input and Scaled range or you can enter the Input and Scaled range and Fluke DAQ will calculate the M and B values for you.

Using Equations with Computed Channels

Each computed channel can have an expression of 250 characters but the maximum number of characters available in all 60 channels is limited to 6,000 characters.

For example, you could use an equation to calculate the rate of flow in gallons per second. The rate of flow could be calculated as follows. Since TS is in milliseconds, you need to divide by 1000 to calculate gallons per second. In this example, during the first pass, C902 will not be defined and the result will be not a number (#Inf). However, in subsequent passes, C902 will be defined and will provide the correct result.

C101 = some fake measurement to force the time calculation

C901 = (TOT-C902)/(TS/1000)

C902 = TOT

Note

You need one physical channel configured in the module that you're scanning for this to work even though you're not using the channel in the expression.

Computed channels and the time value are initialized to zero at the beginning of scanning. Physical channels that haven't been measured are still initialized to positive infinity.

To measure the total energy used by a simple system, a calculation could be generated using the equation, energy = $R \times I^2 \times \text{time}$, as follows:

c101 = Ohms

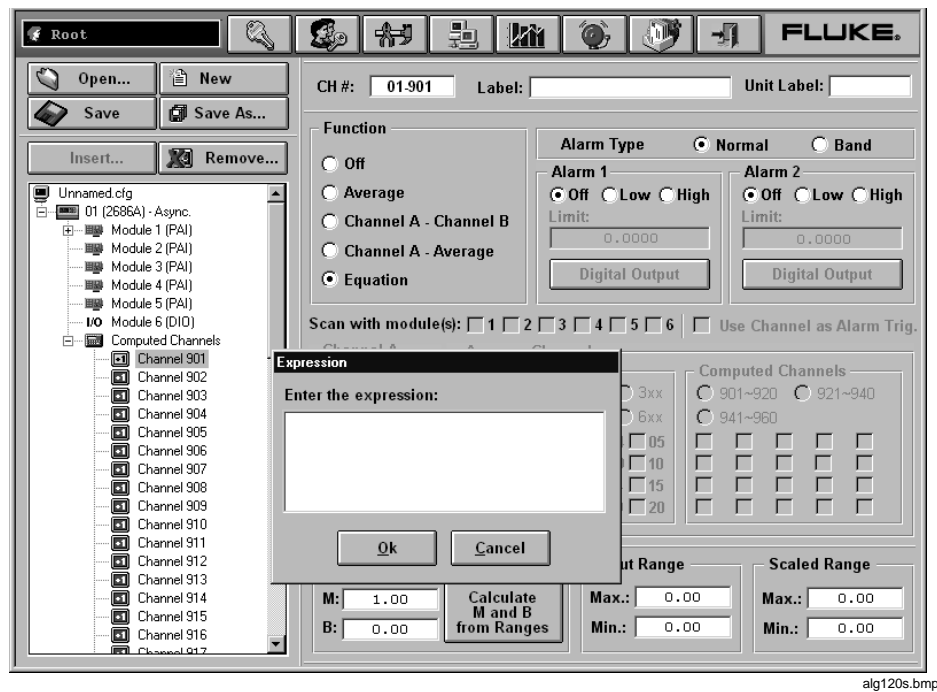
c102 = Current

c959 = c959+c960

c960 = $c101 * c102^2 * ts / 1000$

Note

This equation assumes that the resistance and current are constant for the duration of the time interval. It also does not calculate the energy used in the first increment of time.



The following is a list of the valid notations.

Axxx Alarm on/off (Boolean value of 1 or 0)

Cxxx Any channel measurement

C9xx Computed channel

TS Time since last measurement (milli seconds)

TOT Totalizer

Operators +, -, *, /, **, unary +, unary -, abs, exp, int, ln, log, and sqr.

Starting a Scan




You can scan for data using a configuration scan, a device scan, or by using Spy. All scanning options are available in the Communication window.

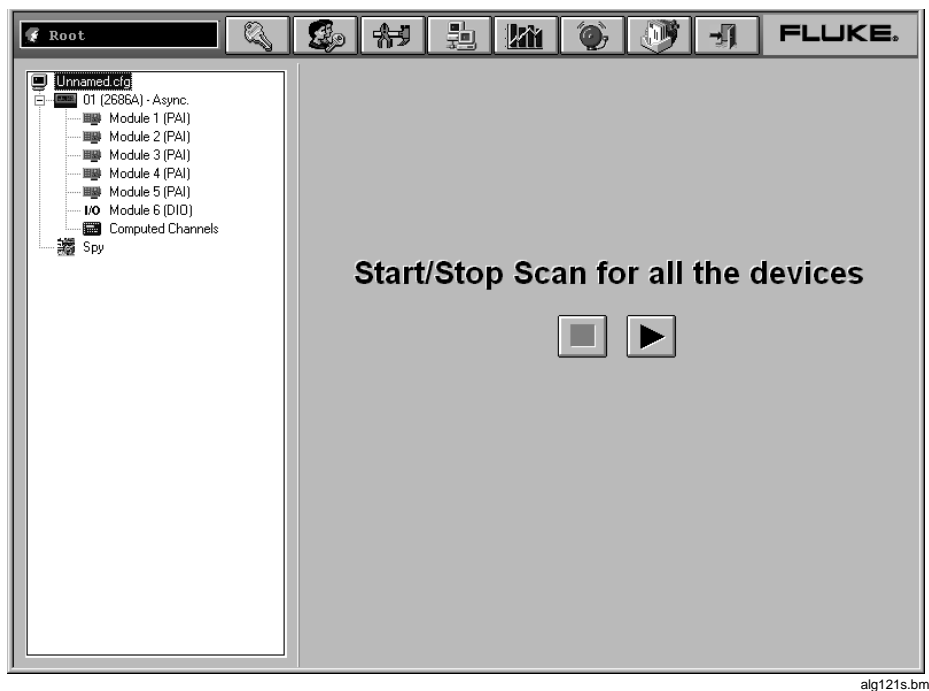
Note

You must have channels configured for operation before starting a scan.

Starting a Configuration Scan

To start a configuration scan




1. Click the  on the Fluke DAQ toolbar and highlight the configuration in the TreeView panel.
2. Click  to start the scan. Click  to stop the scan.

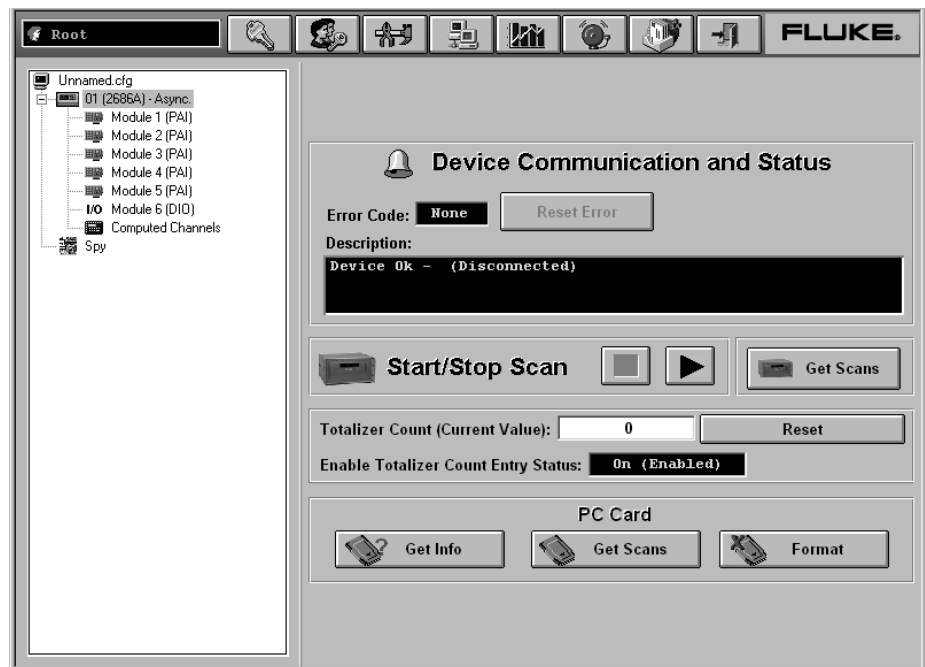


alg121s.bmp

Starting a Device Scan

To start a device scan

1. Click the  on the Fluke DAQ toolbar and highlight a device in the TreeView panel.
2. Click  to start the scan. Click  to stop the scan.




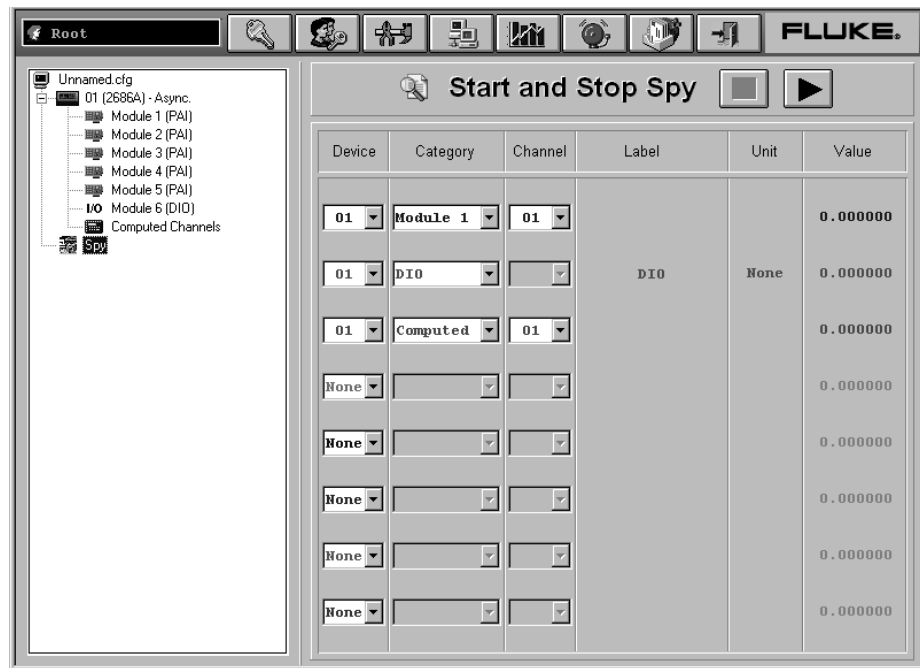
alg122s.bmp

Starting a Scan Using Spy



Spy triggers and collects its own measurements from up to eight channels from any combination of devices. The data is not stored and the devices you are checking do not need to be scanning.

To start a Spy scan

1. Click the  on the Fluke DAQ toolbar. The Spy icon appears in the lowest item in the TreeView panel.
2. Click the Spy icon and the Spy window appears. You may select up to 8 channels, including DIO and totalizer.




alg123s.bmp

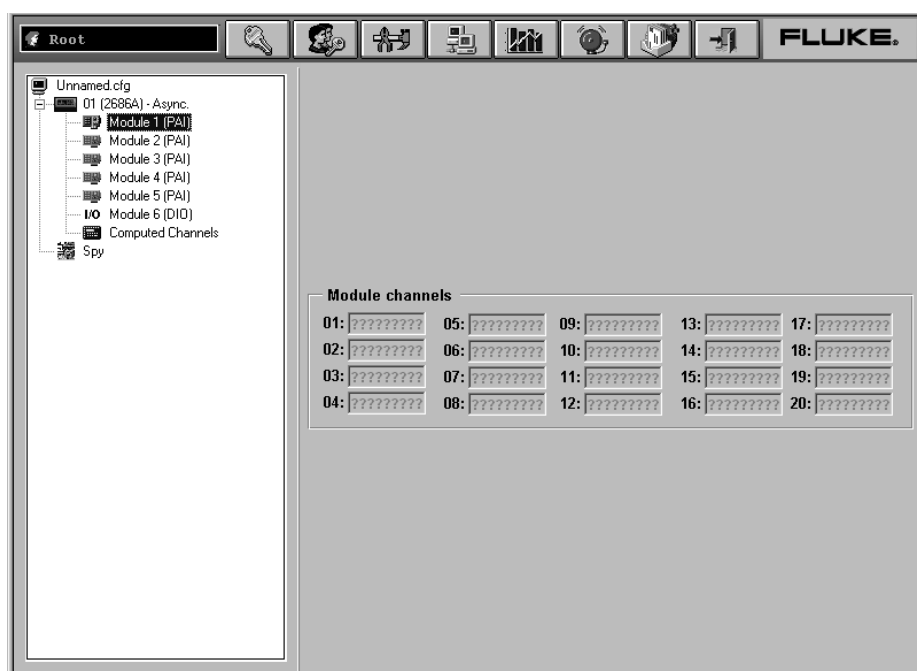
3. Click  to start the scan. Click  to stop the scan.

Viewing Module Measurement Data

You can view measurement data from a module as it is recorded. Selecting a module shows all 20 channels as for the Computer Channels. Modules that have no channels configured display question marks. NC indicates that a channel is not configured.

To view module measurement data

1. Click the  on the Fluke DAQ toolbar.
2. Highlight a module in the TreeView panel and the module measurement data appears.




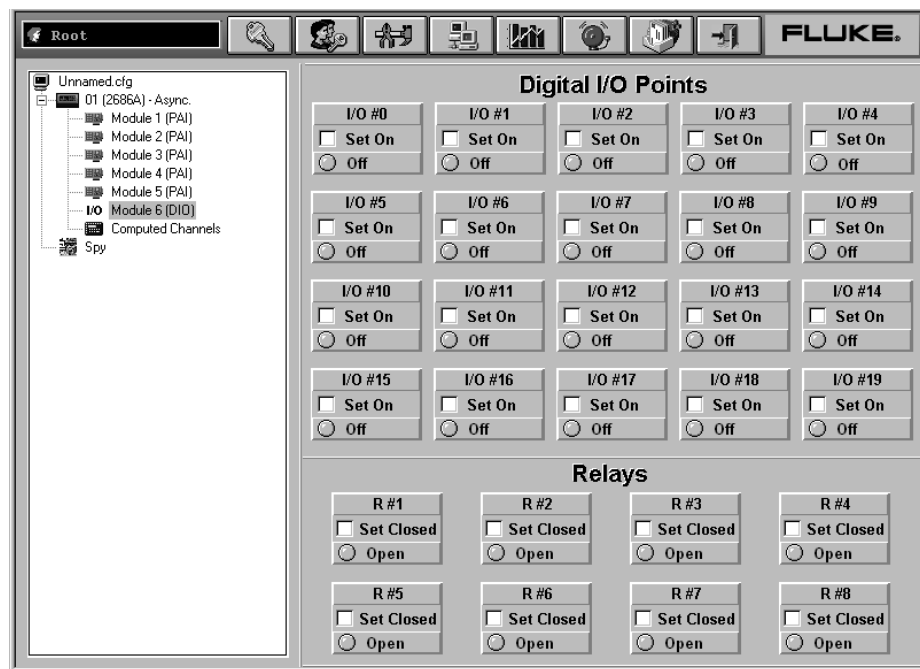
alg124s.bmp

Using the Digital I/O Points Communication Dialog

You can use the Digital I/O Points Communication dialog to set any of the 8 relays or 20 DIO pins active when an alarm condition occurs in the channel. You can also view status of all of the relays and DIO pins and set or clear IO bits and relays. Bits or relays you set display a green dot. Bits or relays set by an alarm have a red dot. A bit set by an external signal has a blue dot. There is no way to set a relay externally. When a relay is set, it has closed contacts. When a bit is set, it has a logic low signal (also called active low).

To view digital I/O points dialog

1. Click the  on the Fluke DAQ toolbar.
2. Highlight an I/O module in the TreeView panel and the Digital I/O Points dialog appears.




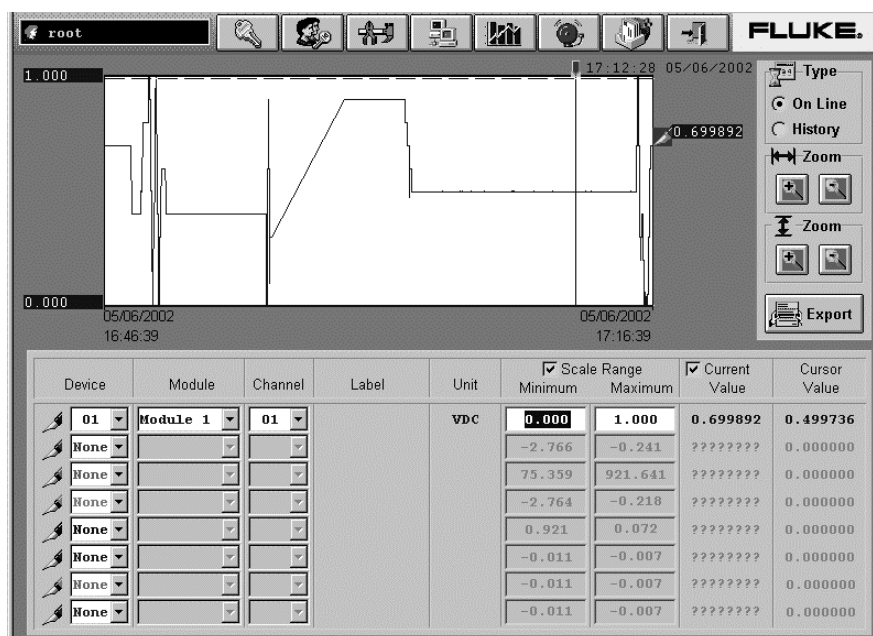
Using Trend to View Collected Data

You can use the Trend dialog to view the scanned data collected from the 268XA devices. The charts can be On Line or Historical. You can use the Export button to export data to a CSV file that you can manipulate using Excel.

You can select up to eight channels to view on the strip chart. If a particular channel is not active, question marks are displayed. A horizontal cursor is used to find the time a signal reached a certain amplitude. A user can use the key combination <CTRL><ALT><Print Screen> to copy a bit map of the chart and paste it to a word processing document. If a device is stopped, the data for all channels in that device that are also shown in the Trend window are replaced with ???????. Channels that are still scanning will continue to show the latest data.

To use the trend feature


1. Click the  button on the Fluke DAQ toolbar and the Trend dialog appears.



alg126.bmp

The dialog box entries include:

Pen

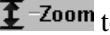
Click  to select the device, module, or channel that you want to view in the chart. You can view up to 8 items on the chart.

Type

Specify On Line or History scan view. History view shows the last set of data displayed with the pens.

Zoom

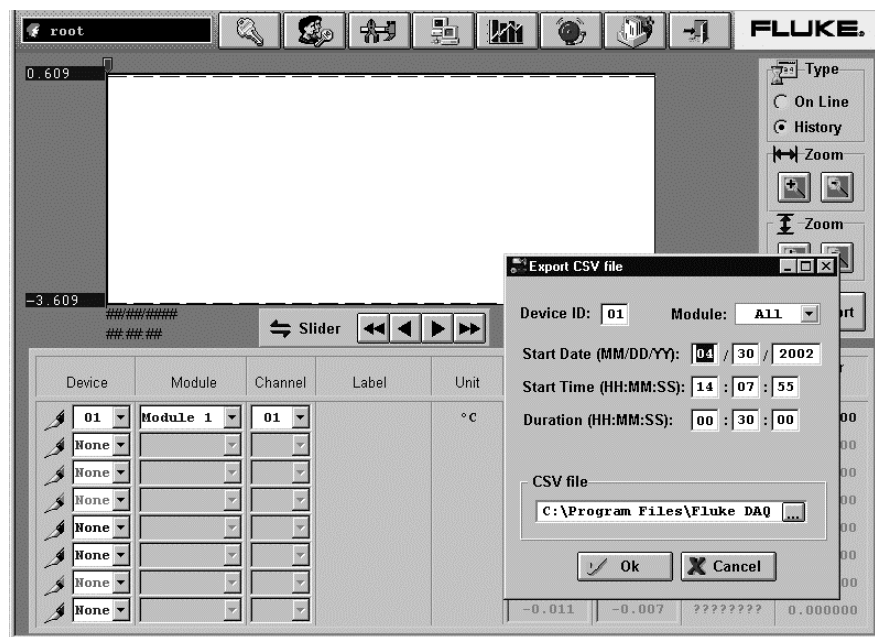
Use  Zoom to expand or compress the time interval you are viewing.

Use  Zoom to increase or lower the amplitude resolution

Export

Press the Export button to generate the Export CSV file dialog shown below. Click the OK button to start the conversion. The "Conversion complete" message appear when the operation is complete. Scanning can continue during the conversion process but the rate at which the new scan data can be uploaded from a device will be slowed.

Export generates several files per module for an export. The export function takes files from the Hst directory and generates new "csv" files in the Export directory. You can select the base name of the files generated. A file is generated for each module. Two files are generated for the computed channels (1-30 and 31-60). A separate file is created for the DIO/totalizer/relay module.



alg127.bmp

Device ID

Any device from 1 to 99.

Module

A specific module in a device or you can select all of the modules.

Start Date/Start Time

Start Date and Start Time are used to select the data. Data is stored with the date the scan began.

Duration

Duration is the amount of time to be converted. Note that the maximum time allowed for the conversion to a .csv file is 24 hours

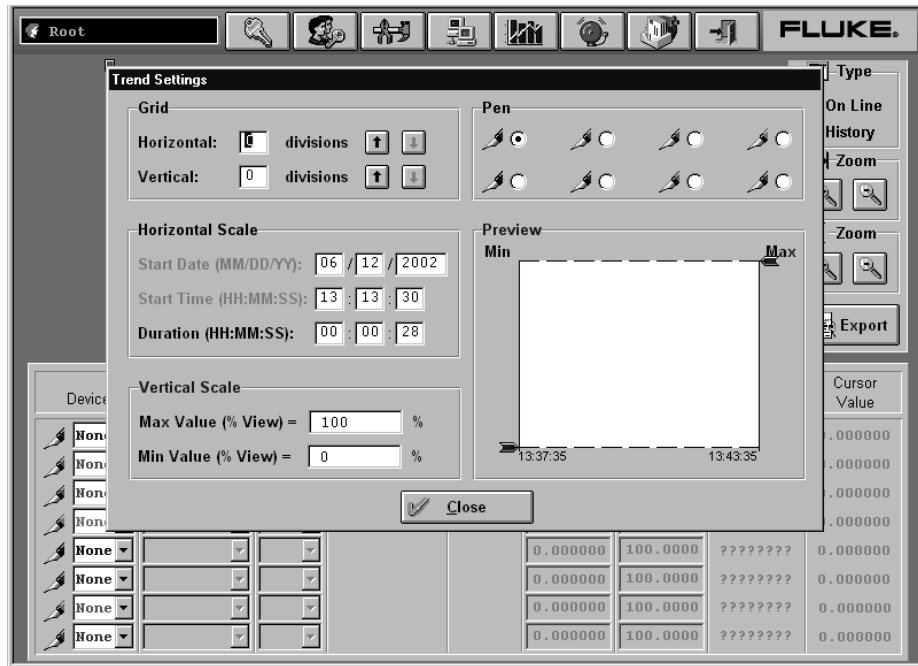
CSF file

The directory where the converted file will be stored.

Changing the Chart Display

To change the strip chart display

- The Trend Setting dialog appears when you double-click on the chart screen. Use the Trend Settings dialog to change the location of the upper and lower boundary points, the scaling seen on the chart, and the color of the plot pens you are using.



alg128s.bmp

Viewing Alarms

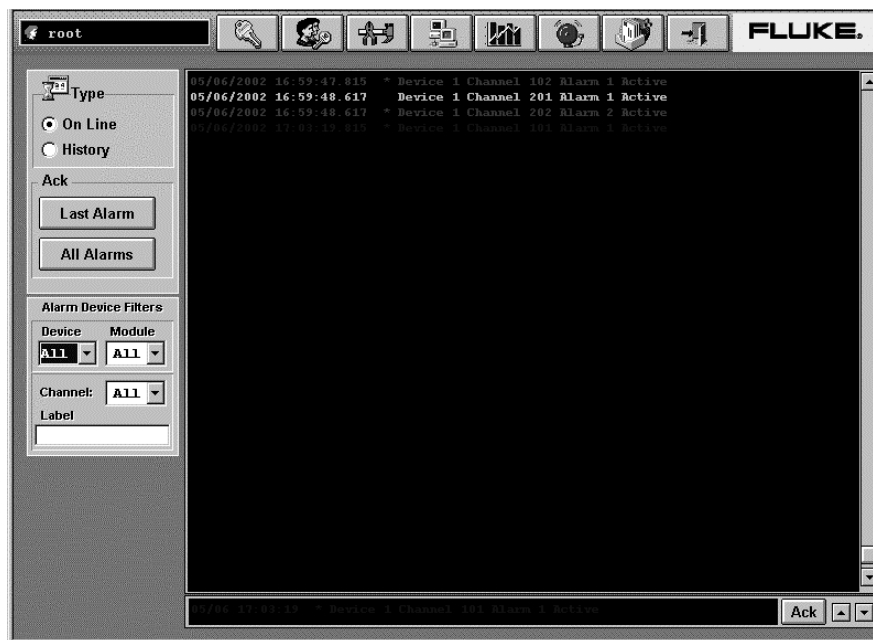
You can use the Alarm View dialog to view On Line and History alarms. You can filter the alarms by device ID, module and channel. When an alarm occurs, the color of the device icon in the configuration window changes to red. As long as the alarm exists, the icon remains red. In the Alarm window, a red line of information shows the status of the alarm.

If the alarm condition goes away before you acknowledge the alarm, the alarm icon changes to blue. When you acknowledge an alarm, it turns green. All alarm conditions are recorded in the Alarm History dialog. If an alarm appears in red in the Alarm History dialog, it will not be duplicated. If an alarm is active, it must be acknowledged before it will be displayed again. When a channel has two alarms, only one alarm can be active at a time. If one alarm becomes active and then a second alarm becomes active, Fluke DAQ will acknowledge the first alarm and show the second alarm as active.

To view alarms

- Click the  button on the Fluke DAQ toolbar and the Alarm View dialog appears.

When you select the On Line option, a red line of text with information about the alarm is printed to the screen when a new alarm is detected.



alg129.bmp

The dialog box entries for On Line include:

Type

Specify On Line or History alarm view.

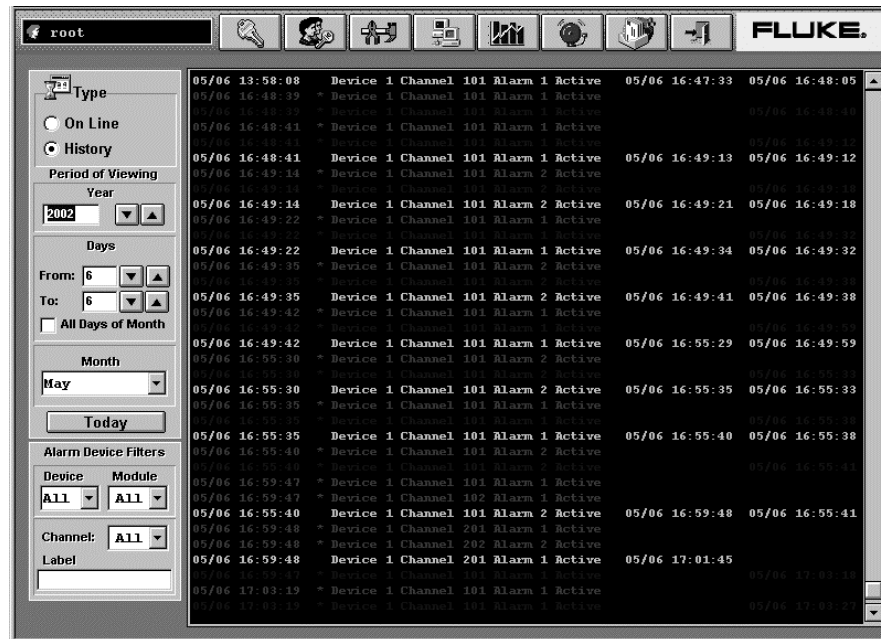
Ack

Click the appropriate button to acknowledge the Last Alarm or All Alarms.

Alarm Device Filters

Choose to view alarms from a select set of devices, modules, and channel.

When you choose the History option, you can view alarms over a period of time. Each time an alarm changes state the new color is added to the history screen. You can view alarms that have occurred over a period of time or for a specific devices, modules, or channels.



alg130.bmp

The dialog box entries for History include:

Type

Specify On Line or History alarm view.

Period of Viewing

Specify the year, day(s), and month that want to view.

Ack

Click the appropriate button to acknowledge the Last Alarm or All Alarms.

Alarm Device Filters

Choose to view alarms from a select set of devices, modules, and channel.

Using Fluke DAQ System Security Features

You can use the system security features to protect device configuration information. The system security feature allows the administrator to add and remove Fluke DAQ users, allow other users to configure devices, and to change user passwords. Only the administrator (Root user) can use the security system configuration function.

Note

The Root password is blank when Fluke DAQ is installed on your PC. Use the system security features to create and remove an administrator password and grant additional access to Fluke DAQ.

To use the system security feature

- Click the  button on the Fluke DAQ toolbar and the System Security Dialog appears.



alg131s.bmp

Configuring Web and Alarm Mail Settings

You can use the Web and Alarm Mail Settings dialog to enter Fluke DAQ web configuration information and to configure Fluke DAQ to send e-mail messages reporting alarm condition.

The Web Settings portion of dialog is used to specify a URL where scanned values from your 268XA device will be sent. Use the Alarm Mail Settings portion of the dialog to configure Fluke DAQ to automatically send e-mail messages reporting alarm condition using the Simple Mail Transfer Protocol (SMTP).

Note

To use the e-mail and web features, your PC must be connected to a network supporting the Transmission Control Protocol/Internet Protocol (TCP/IP).

To enter web and alarm mail settings

- Click the  button on the Fluke DAQ toolbar and the System Security Dialog appears.



Web Settings

Data Server IP Address:

Uniform Resource Locator (URL):

☐ Start Fluke DAQ Web Server on Start Up

Alarm Mail Settings Status: No errors

SMTP Server IP Address:

Originator E-Mail Address:

POP 3 Server IP Address:

User Name:

Password:

Messages' Subject:

☐ Send alarms by e-mail

alg132s.bmp

The dialog box entries include:

Data Server IP Address

The IP address of the computer running the Fluke DAQ application.
Fluke DAQ fills in this field with the first IP address found on the computer.

Note

You must change this setting if you want to use a different interface or if you are using a Dynamic Host Configuration Protocol (DHCP) on your server. If you are using a DHCP server, use the computer name instead of an IP address.

Uniform Resource Locator (URL)

The address where Fluke DAQ web files will be stored on the Internet.

SMTP Server IP Address

SMTP name or IP address. SMTP is the Simple Mail Transfer Protocol, a protocol for sending e-mail messages between servers.

Originator E-Mail Address

Sender e-mail address.

POP 3 Server IP Address

POP 3 name or IP Address. POP is the Post Office Protocol, used to retrieve e-mail from a mail server.

User Name

User name for authentication.

Subject

Subject shown in the e-mail message.

To

Type the names of the people your want to send the message to.

CC

Type the names of the people your want to send a copy of the message to.

BCC

Types the names of people who should receive the message while their names are hidden from other recipients of the message.

Send alarms by e-mail

Select the check box to enable the alarm mail settings feature.

Update

Click the Update button after changing any of the alarm mail settings.