

AD-Logger

Configuration-based Data Logger

User's Manual

 Manual Rev.
 2.00

 Revision Date:
 March 9, 2009

 Part No:
 50-11239-1000



Advance Technologies; Automate the World.



Copyright 2009 ADLINK TECHNOLOGY INC.

All Rights Reserved.

The information in this document is subject to change without prior notice in order to improve reliability, design, and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

Trademarks

LabVIEW and NI are registered trademarks of National Instruments, Inc.

All product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies.



Getting Service from ADLINK

Contact us should you require any service or assistance.

ADLINK Technology Inc.

Address: 9F, No.166 Jian Yi Road, Chungho City, Taipei County 235, Taiwan 台北縣中和市建一路 166 號 9 樓 Tel: +886-2-8226-5877 Fax: +886-2-8226-5717 Email: service@adlinktech.com

Ampro ADLINK Technology Inc.

Address: 5215 Hellyer Avenue, #110, San Jose, CA 95138, USA Tel: +1-408-360-0200 Toll Free: +1-800-966-5200 (USA only) Fax: +1-408-360-0222 Email: info@adlinktech.com

ADLINK Technology Beijing

Address: 北京市海淀区上地东路 1 号盈创动力大厦 E 座 801 室 (100085) Rm. 801, Power Creative E, No. 1, B/D Shang Di East Rd., Beijing 100085, China Tel: +86-10-5885-8666 Fax: +86-10-5885-8625

Email: market@adlinktech.com

ADLINK Technology Shanghai

Address: 上海市漕河泾高科技开发区钦江路 333 号 39 幢 4 层 (200233)

- Tel: +86-21-6495-5210
- Fax: +86-21-5450-0414

Email: market@adlinktech.com

ADLINK Technology Shenzhen

Address: 深圳市南山区科技园南区高新南七道 数字技术园 A1 栋 2 楼 C 区 (518057) 2F, C Block, Bld. A1, Cyber-Tech Zone, Gao Xin Ave. Sec 7, High-Tech Industrial Park S., Shenzhen, 518054 China Tel: +86-755-2643-4858

Fax: +86-755-2664-6353

Email: market@adlinktech.com



ADLINK Technology Inc. (German Liaison Office)

Address: Nord Carree 3, 40477 Duesseldorf, Germany

Tel: +49-211-495-5552

Fax: +49-211-495-5557

Email: emea@adlinktech.com

ADLINK (French Liaison Office)

Address: 15 rue Emile Baudot, 91300 MASSY Cedex, France

- Tel: +33 (0) 1 60 12 35 66
- Fax: +33 (0) 1 60 12 35 66

Email: france@adlinktech.com

ADLINK Technology Japan Corporation

Address: 151-0072 東京都渋谷区幡ヶ谷 1-1-2 朝日生命幡ヶ谷ビル 8F Asahiseimei Hatagaya Bldg. 8F 1-1-2 Hatagaya, Shibuya-ku, Tokyo 151-0072, Japan Tal: +81 2 4455 2722

Tel: +81-3-4455-3722

Fax: +81-3-5333-6040

Email: japan@adlinktech.com

ADLINK Technology Inc. (Korean Liaison Office)

- Address: 서울시 강남구 논현동 60-12 동성빌딩 4 층 402 호 No.402, Dongsung B/D, 60-12, Nonhyeon-Dong Gangnam-gu, Seoul, 135-010, Korea.
- Tel: +82-2-2057-0565
- Fax: +82-2-2057-0563
- Email: korea@adlinktech.com

ADLINK Technology Singapore Pte Ltd.

Address: 84 Genting Lane #07-02A, Cityneon Design Centre, Singapore 349584

Tel: +65-6844-2261

Fax: +65-6844-2263

Email: singapore@adlinktech.com

ADLINK Technology Singapore Pte Ltd. (Indian Liaison Office)

Address: No. 1357, "Anupama", Sri Aurobindo Marg, 9th Cross,

JP Nagar Phase I, Bangalore - 560078, India

Tel: +91-80-65605817

Fax: +91-80-22443548

Email: india@adlinktech.com



Table of Contents

Та	able o	f Contents i
1	Intro 1.1 1.2 1.3	duction to AD-Logger1What is AD-Logger?1Features and Highlights1Terminology2
2	Softv 2.1 2.2 2.3 2.4 2.5	ware Installation3Where to Obtain AD-Logger3Before You Proceed3Installing AD-Logger4Uninstalling AD-Logger6Launching the AD-Logger6
3	Unde 3.1 3.2	Perstanding AD-Logger7Main Menu7File Menu7Task Menu8Setting Menu8Viewer Menu9Export Menu9Help Menu9AD-Logger Function10Speed Buttons12Buffer Viewer13Task Explorer/Logged Data Viewer14Status Viewer17Data Viewer18Message Viewer22
4	4.1	ing AD-Logger23Configure a DAQ Task23Modify Task23Create Task28Delete Task30
	4.2	Setting DAQ Condition



		Recording Condition	. 34
		Alarm condition	. 35
	4.3	Start Data Acquisition	36
	4.4	Stop and Export Data for post-processing	38
5	Expo	orting Functions	39
	5.1	Export Data to Excel for post processing	39
	5.2	Export Data as a CSV file for Excel for post processing	41
	5.3	Export Data into LabVIEW for post processing	43
	5.4	Export Data into DIAdem for post processing	
	5.5	Export Data into MATLAB post processing	
6	App	endix	69
	6.1		
		DAŠK Header	
		ChannelRange	.71
		Data Block	
		AD-Logger Header	.73
		ChannelRange	



1 Introduction to AD-Logger

1.1 What is AD-Logger?

AD-Logger is a smart and easy-to-use data acquisition software that works with all ADLINK devices which equip with analog input and digital input function. AD-Logger provides an intuitive user interface that helps complete a data acquisition application in only four steps without any programming. Get started by defining a DAQ task with the DAQPilot interactive dialog; then configure the recording conditions, and start logging for online analysis or export the data for offline analysis and post processing



1.2 Features and Highlights

- Logs data based on DAQPilot task configurations
- ► Supports both real-time and historical viewers
- Supports intuitive user interface as a ready-to-run application
- Supports data exporting functions for offline analysis in third party applications, including Microsoft Excel, NI® DIADem, and Mathworks MATLAB®
- Supports all ADLINK DAQ hardware
- Provides basic analysis functions, such as FFT
- Provides monitoring features via a user-friendly toolbox
- Provides a buffer monitoring mechanism to automatically evaluate the system performance to know if the captured data can be processed in real-time



1.3 Terminology

Below are some of the terms used in this document.

Word	Description
DAQ	Data acquisition. The capture or collection of data.
Task	A DAQ task is a complete set of parameters including channels, timing, and trigger properties. A DAQ task represents a type of measurement that you want to perform. You can easily create task, modify task and delete task in AD-Logger.
Tracking	The tracking function is embedded in the DataView for you to easily trace captured data. When the tracking function is enabled, the axes will adjust their min and span values based on the tracking style. In addition to enabling tracking, all cursors will be hidden, and the axes min and span will be restored to their previous values when the axes tracking were initially disabled.
DAQPilot	DAQPilot is a task-oriented DAQ driver comes with an intuitive wizard to assist you in developing cutting-edge DAQ applica- tions in an instant.
Buffer Mechanism	AD-Logger provides a buffer evaluation mechanism to monitor system performance of data acquisition in real-time.
Export	Output data function. You can convert the logged files to other data formats for the further processing.
FFT	Fast Fourier Transform. AD-Logger provides FFT power spec- trum analysis.
Log	Data logging is the practice of saving DAQ data to hard drive.

Table 1-1: Terminology



2 Software Installation

This section provides the installation information before you start to use AD-Logger software.

2.1 Where to Obtain AD-Logger

The AD-Logger evaluation version is available on the All-In-One CD that comes in your DAQ card package. You can also download the latest evaluation version from the ADLINK website through the following URL: http://www.adlinktech.com/MAPS/AD-Logger.html.

2.2 Before You Proceed

Before you starting to use AD-Logger software, make sure your system meets the following requirements.

System Requirements

- Windows 98/NT/2000 or 32-/64-bit editions of Windows XP/ Server 2003/Vista operating system
- ▶ Intel Pentium-class CPU or higher
- ► VGA display or higher
- ▶ Minimum 64 MB of memory
- ▶ Minimum 40 MB of free hard disk space
- Mouse

Please install DAQMaster before other ADLINK software for basic configuration and diagnosis. The ADLINK DAQMaster is a smart device manager that accesses ADLINK data acquisition products (refer to http://www.adlintkech.com/MAPS/DAQ-Master.html).



2.3 Installing AD-Logger

This section provides instructions on how to install AD-Logger in your system. Prepare the ADLINK AD-Logger CD that comes with the card package.

To install AD-Logger:

- 1. Place the ADLINK AD-Logger CD to the optical drive of the computer.
- 2. When the installation window appears, click on the AD-Logger installation button.
- NOTE If Autorun is not enabled in your computer, explore the CD, and then double-click on the SETUP.EXE to display the installation window.
 - 3. When installation is complete, simply launch AD-Logger to log data for further analysis.







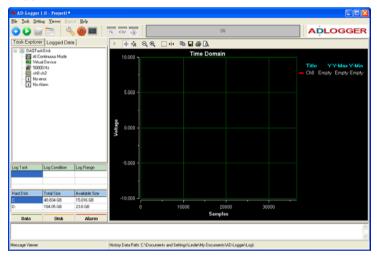


2.4 Uninstalling AD-Logger

Uninstall AD-Logger using the "Add/Remove Programs" tool in the Control Panel in Windows.. Select AD-Logger from currently installed programs and click Change/Remove button to delete the software.

2.5 Launching the AD-Logger

To launch the AD-Logger from the Windows Start menu, click **Start** >**ADLINK**>**AD-Logger**>**AD-Logger**. The main AD-Logger window will appear.





3 Understanding AD-Logger

3.1 Main Menu



Menu	Function					
File	ystem commands					
Task	AQ task commands					
Setting	System configuration options					
Viewer	View commands					
Export	Export log data commands					
Help	Online help and support information					

3.1.1 File Menu

The File Menu provides the following options:

File	Function				
New Task	Create a new DAQ Task				
Open	Open a Task or Log file				
New project	Create a new AD-Logger project to perform data acquisition				
Open project	Open an existing AD-Logger project				
Close project	Close current AD-Logger project				
Save project	Save all current data acquisition task configurations into cur- rent project				
Print	Print current Data				
Print Preview	Preview current Data for printing				



3.1.2 Task Menu

The Task Menu provides the following options:

Task	Function				
New task	Launch the DAQPilot Interactive Dialog to create a new data acquisition task				
Modify task	Launch the DAQPilot Interactive Dialog to modify The selected data acquisition task				
Delete task	Delete an existing data acquisition task from the Task View Panel				
Start tasks	Start to perform all data acquisition tasks on the Task View Panel				
Stop tasks	Stop all data acquisition tasks on the Task View Panel				

3.1.3 Setting Menu

The setting menu provides the following options:

Setting	Function				
Display	Provides the Display configurations of time domain which includes X-axis, Y-axis, Appearance and Channel settings.				
FFT	Provides the Display configurations of frequency domain which includes X-axis, Y-axis, Appearance and Channel settings.				
Recording	Enable/Disable the function of data acquisition task. The Log functions can be stopped by manual, by pre-defined sample and by time. The location to save log data can also be selected.				
Alarm Condition	Enable/Disable the Alarm functions which could be above or below a constant value.				



3.1.4 Viewer Menu

The Viewer Menu provides the following options:

View	Function				
Graph Viewer	Enable/disable the time domain data display of the selected data acquisition task				
FFT Viewer	Enable/disable the frequency domain data display of the selected data acquisition task				
Status Viewer	Enable/disable the display of the system information, log task setting and hard disk space.				
Message Viewer	Enable/disable the display of system commands and message.				

3.1.5 Export Menu

The Export Menu provides the following options:

Export	Function					
Excel	Export the logged data to a Microsoft Excel file					
CSV	Export the logged data to a comma separated value file					
Third-party	Export the logged data for the post-processing in third-party software, such as LabVIEW®, DIAdem, or MATLAB®					

3.1.6 Help Menu

The Help Menu provides the following options

Help	Function			
AD-Logger Help	Get on-line help			
Contact us	Get technical support			
About AD-Logger	Display the ADLINK AD-Logger version and copyright statement			
About my computer	Display the system information such as the operating system version, processor and memory usage status			
Register AD-Logger	Form to input the license number for using a licensed version of AD-Logger			



3.2 AD-Logger Function

ADLINK AD-Logger is designed with six major function blocks that can be enabled/disabled individually for operatiosn. Refer to the block diagram below.

Main Menu (system function)						
1.Speed Buttons 2.Buffer View						
AB	DataView Toolbar					
3.Task Viewer/ History View	5.DataView					
4.Status View						
6.Message View						

TabSheet A for Task View; TabSheet B for History View

🍬 AD-Logger	1.0 - Projectl*								
Ele Isik Sen	ing Viewer Exp	ort <u>H</u> elp							
00 🖬 🛅 🔌 🙆 🔳 🗌			(x CIV x3)			0%			ADLOGGER
	Logged Dat	a	$\rightarrow \pm \diamond$	ର୍ ଭ୍ 🛛) el el 🐚 🖬 🖨	i 🗟			
E Z DAQTa	skūtsk Sontinuous Mode		10.000		Tim	e Domain			
Vitual Device RE 50000 Hz ch0 ch2 I No emor I No Alarm			10.000						Title YY-Max Y-Min Ch0 Empty Empty Empty
			5.000						
			Voltage						
Log Task	Log Condition	Log Range	-5.000						
Hard Disk.	Total Size 44,756 GB	Available Size 4.4395 G8	-10.000						
D:	23.745 GB	13.569 GB			10000	200	100 30	1000	
Data	Disk	Alarm				Sample	5		
Data	UISK	Alarm							
Analog Input Date	8		History Data Pat	h: C:\Document	s and Settings\yinghs	ien/My Docume	nts\AD-Logger\Log\		



Panels	Description		
1. Speed Buttons	Includes four major task operations and related func- tions (such as exporting data).		
2. Buffer Viewer Display the buffer status.			
3. Task /History View	Display the information of existed DAQ task and his- tory log. This part include two tabsheets : "Task Explorer" and "Logged Data"		
4. Status Viewer	Display system information including the task setting, available hard disk and the system resource.		
5. Data View	Display the logged data in time domain and fre- quency domain.		
6. Message View	Display the history commands and task status		



3.2.1 Speed Buttons

These speed buttons are designed with major task commands and exporting functions. The buttons will be dynamically enabled or disabled depends on the operation mode.



Speed Buttons	Description			
Create Task	Launch the ADLINK DAQPilot interactive configuration dialog to create a new data acquisition task. AD-Logger is powered by DAQPilot, so you can finish DAQ applica- tion without any programming effort.			
Start	Start to perform the all data acquisition tasks			
Stop	Stop all data acquisition tasks			
Setting	Launch the setting form for configuration such as Graph FFT, Log, Alarm and ADC.			
Modify	Launch ADLINK DAQPilot interactive configuration dia- log to modify the existed data acquisition task.			
Recording	Enable/disable the recording function.			
FFT	Enable/disable the power spectrum view panel			
Excel	Export the logged data to an Excel file.			
CSV CSV	Export the logged data to a comma separated value file.			
Third Party	Export the logged data for the post-processing in third- party software, such as LabVIEW®, DIAdem and MAT- LAB®.			



3.2.2 Buffer Viewer

AD-Logger provides a data buffer evaluation mechanism. The buffer evaluation mechanism will be automatically enabled to monitor and display the buffer status on the Buffer Viewer when you perform a DAQ task with recording function. The buffer status will be dynamically changed in real-time depending on system performance.

95%	ADLOGGER

Buffer View StatusDescriptionBlue ColorThe system's performance is ample for data logging
with the DAQ tasks. The buffer has more than 50 per-
cent of available space when logging data.Yellow ColorThe buffer usage is sufficient with the the DAQ tasks.
The buffer has 20 percent to 50 percent of available
space when logging data.Red ColorThe buffer usage is running low with the DAQ tasks.
The buffer has less than 20 percent of available space
when logging data.

The Buffer View has following status:



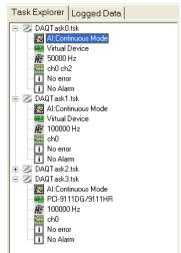
3.2.3 Task Explorer/Logged Data Viewer

The Task/History view Panel is located on the left part of the AD-Logger main window. The View Panel displays the current DAQ tasks in the Tasks panel (page 15) and history log data in the Logged Data panel (page 16).



"Task Explorer" Tabsheet

The Tasks tabsheet displays the all DAQ tasks and related attributes in the project. The task with a blue background color is the selected task which displays logged data in the Data View Panel. You can click the task node to check the task status and doubleclick the task node to modify parameters via the pop-up configuration window.

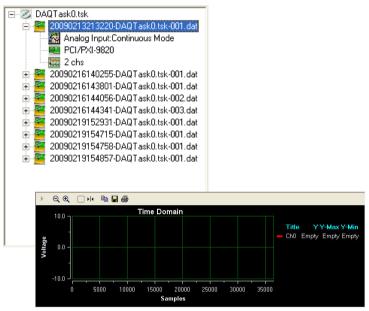


Icons	Description				
Jan Ja	DAQ task name.				
	DAQ tasks type. This icon will be dynamically changed depends on the DAQ task type.				
	DAQ device type.				
ĤĪ	Sample rate of the DAQ task.				
<u>}</u>	Enable channel(s) of DAQ task.				
I	Operation error message.				
i	Alarm status				



"Logged Data" Tabsheet

The "Logged Data" tabsheet displays the logged file(s) which are classified by the task name and sorted by logged time. You can double click the node to display the logged data value in the Data View.





3.2.4 Status Viewer

The Status Viewer consists of three blocks. Each block is described as follows.

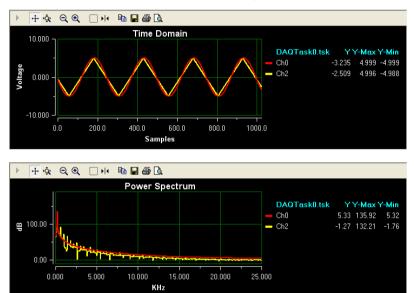
Log Task	Log Condition	Log Range	
DAQTask0.tsk	Stop by User	None	Block 1
DAQTask3.tsk	Stop by User	None	DIOCK
Hard Disk	Total Size	Available Size	
C:	44.756 GB	4.4004 GB	Block 2
D:	29.745 GB	13.569 GB	Brook 2
	-		
Data	Disk	Alarm	Block 3

Status View	Description		
Block 1	Shows the selected log task(s) and its log condition.		
Block 2	Displays hard drive status		
Block 3	 Indicates if the following status is enabled in AD-Logger. ▶ Data: Acquiring data if this label is blinking ▶ Disk: Recording to Disk if this label is blinking ▶ Alarm: Alarm indicator 		



3.2.5 Data Viewer

The Data Viewer displays the logged data in both time and frequency domains. Initially, the selected DAQ task only displays time domain data. User can enable the frequency domain data on demand. Please refer to Section 3.2.1 (Speed Buttons).





The toolbars on the top on the time domain and frequency domain graph both provide the same function to control the data display. The functions are described as follows.

Data Viewer Toolbars	Description				
Resume	The resume button enables tracking function on all axes. When tracking function is enabled, the axes will adjust their min and span values based on the tracking style. In addition to enabling tracking, all cursors will be hidden, and the axes min and span will be restored to their previ- ous values when the axes tracking were initially disabled.				
+ Scroll (Axes)	When the Axes Scroll Mode button is enabled, you can drag the axis and scroll the view. When this button is selected, the Axes Zoom Mode button is correspondingly unselected.				
🔆 Zoom (Axes)	When the Axes Zoom Mode button is enabled, you can drag the axis and zoom the view. When this button is selected, the Axes Scroll Mode button is correspondingly unselected.				
Q Zoom out All Axes	When this button is clicked, all axes are zoomed out by a factor 2x. When this button is clicked, the tracking function on all axes will be disabled and the view data will be fro- zen.				
€ Zoom in All Axes	When this button is clicked, all axes are zoomed in by a factor 2x. When this button is clicked, the tracking function on all axes will be disabled and the view data will be fro- zen.				
Zoom Box	This button allows you to band a region in the Data Viewer for zooming into. The box can start at any point, but must be dragged to the lower right to define a region for zoom function. The zoom action will affect all axes.				
▶I Data Cursor	This button shows or hides all data cursors.				
Copy to Clipboard	This button copies the current plot image to the clipboard.				
Save to File	This button brings up a Save dialog to save the plot image to a file. You can select from bitmap, metafile, or JPEG as the file type.				
Print	This button prints the plot image.				
Rreview	This button launches the Print-Preview dialog before printing out the plot image.				

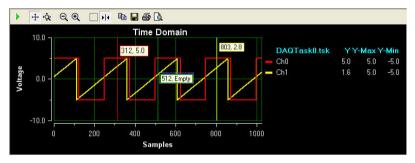


Data Cursor

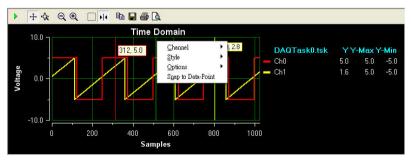
The Data Cursor of the DataView has many useful functions which let you to check the data value on the DataView. You can click the

button to enable the Data Cursor function.

When you enable the Data Cursor function, you can just drag and drop the green line in the middle of the DataView to any position. The x and y value of the Data Cursor will be displayed in real-time.



The Data cursor provides advanced configurations: you can rightclick the mouse on the middle green line to launch the popup menu (as shown below). You can see there are sixteen Data Cursors in each domain in the Data Viewer Panel. You can set all Data Cursors to only a specified channel at a different position, each Data Cursor to each channel, or any style you wish.





The popup menu of the Data Cursor contains the following settings.

Menu	Description					
Channel	Set the Data Cursor to detect which channel you specify.					
	The value of Data cursor can be configured to several styles. ► Value of x-y: Show both the X and Y axes falues.					
	Value of x: Only show the X-Axis value.					
	Value of y: Only show the Y-Axis value.					
Style	 Period: Show a period value of two cursors on the X-Axis 					
	 Peak to Peak: Show the difference in value between two peaks on the Y-Axis 					
	 Frequency: Display the inverse of the instance along the X-Axis or the frequency. 					
	Use Channel Color: Set the cursor's color to channel color.					
Options	Hide Hint on Release: Hide all value styles.					
	Flip alignment: Switch value label to the opposite position.					



3.2.6 Message Viewer

The Message Viewer logs a history of operation command(s) and system messages.

```
< Task > Start DAQ Taks(s) at 18:24:50
< Task > Stop DAQ Taks(s) at 18:24:52
```

The Message Viewer includes the following three types of log messages:

Prefex	Description			
<task></task>	Regarding a DAQ task operation.			
<config></config>	> Regarding Data Viewer, Log, and Alarm configurations.			
<buffer></buffer>	Regarding the Buffer Mechanism status.			



4 Starting AD-Logger

When you launch AD-Logger, there is a default DAQ Task with pre-defined continuous analog input function which works with a Simulated Device. You can easily modify the task for further configurations.

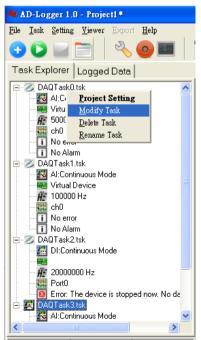
4.1 Configure a DAQ Task

4.1.1 Modify Task

- 1. Choose the task node that you want to modify.
- 2. Click the Modify button

or right-click the task node

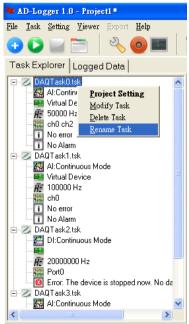
and select "modify task" in the pop-up menu to launch the DAQPilot configuration dialog. The DAQPilot interactive configuration dialog will guide you in configuring the DAQ task.





AD-Logger 1.0 - Projecti *			. 6 🛙
De Da Jone Deve Boort Bry	<u><u>x</u> cy i</u>	01	ADLOGGER
Task Explorer Logged Data	++4 @@ -	++ 📭 🖬 📾 🗛	
Would Device Young Device			vill 158 VV Mee V Me -427 499 -492 -478 499 -493
Log Tesk Log Condition Lo			ankültek YY-Max Y-Min 70 96 28 1 133 -9
Hard Disk Total Size Av		Company Bears C	erent 1
C 44.756.08 4.4 D 29.745.08 12		the local data and the local dat	the second se
		Kitz	M.
Data Disk Alarm			
< Task. > Cancel Modily Task. < Task. > Open DAQPilot to Modily DAQ Task.			0
DAQ Task Verver	History Data Path C1/Documents	and Settings' yangholes' My Documents' AD-Logger' Logi-	

 The Task name will be shown in the DAQPilot interactive configuration dialog as shown in Step 1. If you need to change the Task name, you need to modify it first on the task node on the tree.





4. Select the supported device, then configure the channels

AD Logger 1	0 - Projectl =										8	6 X
The Isk Setting	Yurves Espoit	Help										
00	2 3	0 🔳	IN CITY >				0%			ND.	LOGG	ER
Task Explorer	Logged Data		> + -	4 9.9	- +le 🗈		1					
E Z DAQTasko), tsk. tinuous Mode	Analogator	nt Continuor	waveform (Constitution					1		
Vinual	Device			/	D					ask0.tsk	YY-Mox Y	Min
ch0 ch	2	11			D	AG	Pilc	Л		-4	727 4.999	4.992
I No Ala	613	1			S	elect Devi	ce and Chann	el		4,	788 4.998	4993
E Z DAQTask1	I.tsk knuous Mode			-								
Vitual	Device			Select device								
ch0				- Device			All devices	Inter				
No enc				Vatual Deva	ce .			0				
E DAGTatk2	2.tsk finuous Mode			Channel confi	10000							
B 20000				Chattines contra	Chaunel	Range	RefGround					
Port0		MATERIAL	HALF	• 1-01		+/-10¥ +/-10¥	Single Ended Single Ended					
8 Z DAGTask3		and the second	and the second		AL2	+/-10V	Single Ended					
Al Con	linuous Mode	data acqui	pilot tu isition world	0.8-CB)	DV13	+/-107	Single Ended					
Log Task	Log Condition											
			DLINK		ġ.,	_		_		ask0.tsk	70 96	28
		-			Cogyright	E 2007 ADUN	K Technology Inc.	All Eights Reserve	6.			-9
	Total Size 4	2					+ Back	Best +	Cancel			
					0.0	10.0			230			
Data	Disk	Alarm				KH	z					
(Task > Open DAI	Pliet to Modily DAD											0
< Task > Cancel M	odily Task											~
Create New DAQ Ta	ask		History Data F	ath: C:\Docume	ints and Setting	s\yinghsien\\	ly Documents \AD	Logger/Log/				

The DAQPilot interactive configuration dialog allows you to select the device and define the corresponding channel settings. This configuration window enables you to easily set the Range and RefGround from the drop-down combo box. For more details about using the DAQPilot interactive configuration dialog, please refer to Chapter 3 of the DAQPilot user manual. More information can also be found at http://www.adlinktech.com/MAPS/DAQPilot.html



5. Acquisition Parameters

The next window enables you to set the acquisition parameters. This includes the setting of the clock source, sampling rate, etc.



Click Next when finished.



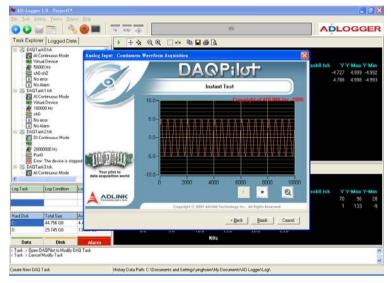
6. Testing the Task

After setting the task parameters, you can use the DAQPilot built-in test panel to check whether the task parameters are

in range and the task works well. Click **I** to begin to test

the task. To stop testing, click 🗾 . You can click 🧕 to

change the setting of instant test panel.



After a quick task verification, you can click the **Finish** button to complete defining your DAQ task and close the configuration interactive dialog and return to the AD-Logger main window.



4.1.2 Create Task

Click the
 button to launch the DAQPilot interactive configu-

ration dialog to create a new DAQ task.

When the DAQPilot interactive dialog appears, right-click the mouse to select the task type/function; then select the task sub-type from the pop-up menu. AD-Logger supports analog and digital input functions as shown in the figures below.







The task types AD-Logger supports are listed as follows.

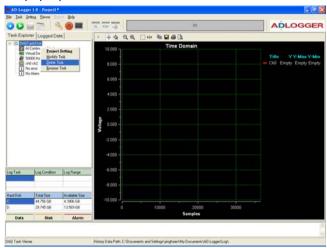
Function	Support Mode
	Continuous Mode
Analog Input Function	Single Shot Mode
	Polling Mode
	Continuous Mode
Digital Input Eurotian	Single Shot Mode
Digital Input Function	Port Mode
	Line Mode

After choosing the task type, please refer to section 4.1.1- to modify the selected task for following setting illustration.



4.1.3 Delete Task

In the Task Tree, you can right-click the mouse on the task node to launch a pop-up menu and choose **Delete Task**.



If there is no task in the **Task tree**, the AD-Logger will automatically be settled in disabled mode. A DAQ task must be created or loaded.

001	1 2	600	IS OV 18		01		ADLOGGE
Task Explo	ver Logged Da	ne	+4 98		2		
			10.000	Time	Domain		
			8.000				
			6.020 -				
			4.020 -				
			2.000 -				
			Aoliaje				
			-2.000 -				
			-4.000 -				
g Task	Log Condition	Log Range	-6.000 -				
			-8 000 -				
and Diak	Total Size 44.756 GB	Available Size 4 3018 GB	-10.020				
	23745.68	4.3018 GB 12.569 GB	0	10000	20000	30030	
Data	Disk	Alarm			Samples		



4.2 Setting DAQ Condition

After creating a new DAQ task, the AD-Logger will automatically open the setting form to configure the Display, FFT View, Recording Conditions and Alarm Conditions settings. If you want to launch the setting form, you can just click the task node and click

Setting Page	
	GER
X-Axis Setting View Number(Samples) Tracking Precision 1024 Scroll Bar X-Axis Title Text Samples Font Show Rotate	Appearance Background Color Grid Lines I Show Color Major Style Minor Style Solid I Solid I
Y-Axis Setting Image: Precision Max : 10 Image: Tracking Precision Min : -10 Scroll Bar Y-Axis Title Image: Text Voltage Font Image: Show	Channel Setting XAxes V YAxes V Y-Max V Y-Min Ch0 Color

The following sections will describe the setting forms.



4.2.1 Display Settings

Display FFT Recording	Alarm Condition		
X-Axis Setting View Number(Samples) 1024 X-Axis Title Text Samples	Tracking Scroll Bar Font	Precision 3 V Show Rotate	Appearance Background Color Grid Lines I Show Color Major Style Minor Style Solid I Solid I
Y-Axis Setting Max : 10 Min : -10 Y-Axis Title Text Voltage	Tracking Scroll Bar Font	Precision 5 V Show Rotate	Channel Setting XAxes V Axes V Y-Max V Y-Min ch0 Color

item	Description
View Number	Set the number of data samples you want to display on the time domain Data Viewer.
Tracking	Enable/disable the tracking function. When the tracking function is enabled, the axes will adjust their min and span values based on the tracking style.
Scroll Bar	Enable/disable scroll bar.
X-Axis Title	Set the X-Axis title.
Max/Min	Set the Y-Axis maximum/minimum display value.
Y-Axis Title	Set the Y-Axis title.
Appearance	Configure the color of background, grid lines and the style of grid lines.
Channel Setting	Enable/disable the display of X and Y-Axis values in legend and set the related channel color.



4.2.2 FFT setting

Display FFT Recording	Alarm Condition		
FFT Setting Power Spectrum	⊂ Enable ⊙ Disable		Appearance Background Color
X-Axis Setting Samples 1024 • X-Axis Title Text Hz	✓ Tracking Scroll Bar	Precision 3 Show Rotate	Show Color
Y-Axis Setting Max : 21 Min : 1 Y-Axis Title Text dB	✓ Tracking ✓ Scroll Bar Font	Precision 3 Show Rotate	Channel Setting XAxes V YAxes Y-Max V Y-Min Ch0 Color

item	Description
Enable	Enable/disable to perform the FFT calculation when capturing data.
View Number	Set the number of data samples to perform FFT calculation and display the result on the fre- quency domain DataView.
Tracking	Enable/disable the tracking function. When the tracking function is enabled, the axes will adjust their min and span values based on the tracking style.
Scroll Bar	Enable/disable the function of scroll bar.
X-Axis Title	Set the X-Axis title.
Max/Min	Set the Y-Axis maximum/minimum display value.
Y-Axis Title	Set the Y-Axis title
Appearance	Configure the color of background, grid lines and the style of grid lines.
Channel Setting	Enable/disable the display of X and Y Axis values in legend and set channel color.



4.2.3 Recording Condition

Display FFT Recording Alarm Condition	
Data Log Log to Disk © Enable © Disable	Recording Condition Stop by user By Sample Number By Time Interval
By Sample Number Number of 1024 Samples	By Time Interval Start 2009/ 3/23 ▼ PM 06:45:59 ÷ Stop 2009/ 3/23 ▼ PM 06:45:59 ÷
Log Data Path C: [] ADLINK AD-Logger C:\Documents and CheckSN	Settings\Leslie\My Documents\AD-Logger\Log\

item	Description
Data Log	Enable/disable to log DAQ data to disk.
Recording Condition	Set a condition to automatically stop log- ging file to disk.
By Sample Number	Set the amount of sample to log data to disk.
By Time Interval	Set the time range to log data to disk.
Set Location	Set a path to store logged data.



4.2.4 Alarm condition

Disable 0 Normal Ch1 Disable 0 Normal			Value (v)	Status Normal	
		Disable 👻			
		 Uisable 🔽	0	Nomia	

ltem	Description
Alarm Condition Settings	You can enable/disable the alarm condi- tion and set trigger value for each chan- nel of the DAQ task. If AD-Logger detects the trigger value you set, the Alarm warning will show in the Status Viewer .



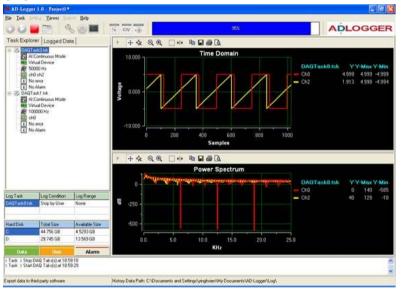
4.3 Start Data Acquisition

After you configure the DAQ parameters in section 4.2, you can

click button in the AD-Logger main window to start data acquisition based on the pre-defined DAQ task.

Display Log Enable Status

If the task start with the recording function. (Section 4.2.3), the **Buffer Monitor Bar** will display the available memory status of buffer (see figure below). When the AD-Logger completes the logging task, the **Buffer Monitor Bar** will switch to a disabled status.





Display Alarm Status

If the task starts with the alarm function (Section 4.2.4), AD-Logger will keep detecting the alarm condition during the data logging until you click the **Stop** button. If AD-Logger detects the trigger condition, AD-Logger will automatically stop the DAQ procedure (figure below). The related task in the Task View Panel will also show the **alarmed** status with a red color.

Log Task	Log Condition	Log Range
Hard Disk	Total Size	Available Size
C:	48.834 GB	18.392 GB
D:	184.05 GB	24.32 GB
Start	Logging	Alarm

You can launch the setting form and switch to the **Alarm Condi**tion tabsheet to configure the Alarm conditions.

AD-Logg	re 1.0 - Paniesti	6								- 6 8
Sh Ish D	other Yeves De			_					_	
001	2 B 2	S @ 1	IN CIV 13				等		A	DLOGGER
Task Explo	ver Logged De	sta.	1 + 4	2 9 9	- Delet - Ba					
N 3 DAGT	Taskill tok.					Time Doma	n.			
* 2 DAQ1		Set	ing Tage					8		
			10001000	7						
					0	0				
			AL		J.	G	90	R		
				4						
		De	play FFT Rec	ording Alarm Co	ndtion			1		
			Nam Condition Setti							
					Value (v)	Status	1			
				Xoable •	0	Normal				
		0	261 0	Xoable •	0	Nomal				
-	L	-								
LogTaik	Log Condition	LogRan								
Hard Dick	Total Size	Avaiable								
Hard Drick:	44.756.68	4.3721 6				_	OK Cance	Apply		
D:	29.745.68	13 569 68	1			Samp	den			
Data	Disk	Alarm	4							
and some statements of	iguration Form Open									
	and the second second	15%								
Project Selling			in a second second			Autochaiten My Docu				
a volance 2 Hourd			mundy Data P.	ant to woodness	a ana setangi	gengenseen Way Docu	nervi vu)-Loggen	elogn.		



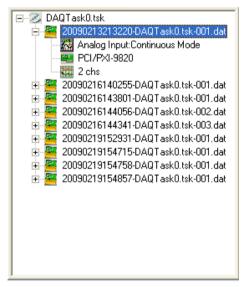
4.4 Stop and Export Data for post-processing

Click the evident to stop the task(s). If you already have data

logged in the system, the log files could be managed in the Logged Data tabsheet.

Switch to **Logged Data tabsheet**; double click the selected log file to display the data in the **DataView Window**.

If the sample number is more than 1024, the scrollbar can be used to switch the data block for display.



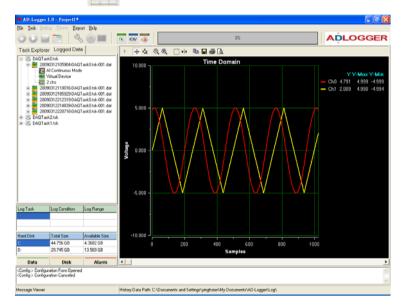


5 Exporting Functions

The AD-Logger log data is in binary files with private data format (Appendix). You can manage log file on AD-Logger "**Logged Data**" **tabsheet** or use the following exporting functions. The AD-Logger provides several data formats which help you to do analysis and post-processing in the third-party applications.

5.1 Export Data to Excel for post processing

- 1. Launch AD-Logger and select the Logged Data tabsheet.
- 2. Double click the log file you want to export.
- 3. Click the show Export Data setting form.





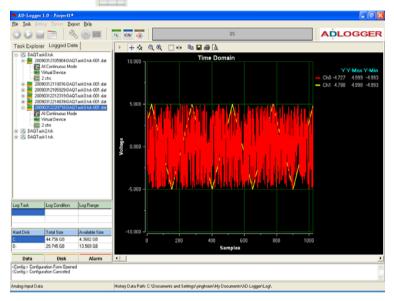
洚 Export Data			
Data Format	C LabView	O DIAdem O	MATLAB
File Name: D:\Untitle.xls			Browser
Range Option		<u> </u>	
Screen Range	C All	C Ra	inge
 Sample Unit 	Start	1	••
C Time Unit	End	225000	••
Export		Close	

- 4. Specify the file name and file path by **Browser** button.
- 5. Configure the **Range Option** and click the **Export button**. The exported data will be automatically loaded and displayed in the Excel tabsheet.



5.2 Export Data as a CSV file for Excel for post processing

- 1. Launch AD-Logger and Switch to the Logged Data tabsheet
- 2. Double click the log file you want to export.
- 3. Click the cov button to show Export Data setting form.





N 1	export Data			
	Data Format	C LabView	C DIAdem	C MATLAB
	File Name: D:\Untitle.csv			Browser
	Range Option © Screen	© All	c	Range
	Range © Sample Unit	Start	1	
	C Time Unit	End	225000	••
	Export		Close	

- 4. Specify the file name and file path by **Browser** button.
- 5. Configure the **Range Option** and click the **Export** button. The data will be exported to a CSV file in the path you specified.



Export Data into LabVIEW for post processing 5.3

This section will demonstrate how to perform Data Acquisition with ADLINK PCI-9221 and do FFT analysis in LabVIEW. Before the post-processing captured in LabVIEW, you need to use AD-Logger Export function to convert the AD-Logger file to LabVIEW compatible format. The process includes three steps:

- Configure DAQ device and Set log conditions.
- Start the data acquisition and Export captured data to Lab-VIFW
- Use LabVIEW to do FFT analysis
- Configure DAQ device and parameters.

Launch AD-Logger and click K Modify DAQ task button

to open DAQPilot interactive configuration dialog. You can configure DAQ device and relative parameters in the following setting dialogs.





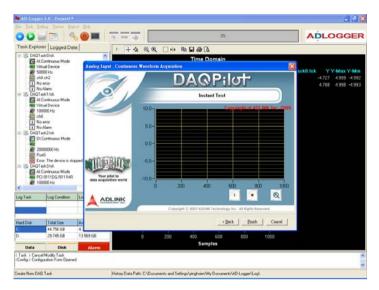


<Interactive Configuration Dialog STEP 1: Select Device & Channel>



<Interactive Configuration Dialog STEP 2: Timing/Trigger Setting >





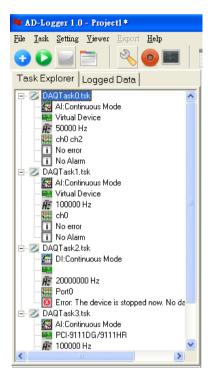
<Interactive Configuration Dialog STEP 3: Get Instant Result>

After quick task verification, you can click **Finish** button to finish the definition of your DAQ task then close the configuration interactive dialog and return to the AD-Logger main window.



2. Set log conditions

Click the Project Setting button to open the AD-Logger setting form.



Change to Log Tab sheet and finish following steps.



Setting Page	X
ADLO	GGER
Display FFT Recording Alarm Condition	
Data Log Log to Disk C Enable C Disable	Recording Condition Stop by user By Sample Number By Time Interval
By Sample Number	By Time Interval
Number of 16384 Samples	Start 2009/ 3/23 ▼ PM 06:45:59 ÷ Stop 2009/ 3/23 ▼ PM 06:45:59 ÷
Log Data Path C:[] ADLINK AD-Loger C:\Documents and C:\Docume	Settings\Leslie\My Documents\AD-Logger\Log\
	OK Cancel Apply

- ▶ Step 1: Set Enable data Log>
- ▶ Step 2: Set Data Log Condition by Sample Number>
- ▶ Step 3: Set 16384 Samples to log>
- ▶ Step 4: Set the Path to save log file to>
- ▶ Step 5: Click OK button to return AD-Logger Main Window>



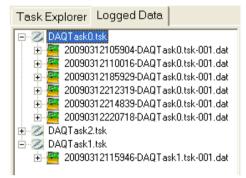
3. Start to DAQ and Export data to LabVIEW file

After configuring DAQ and log parameters, click

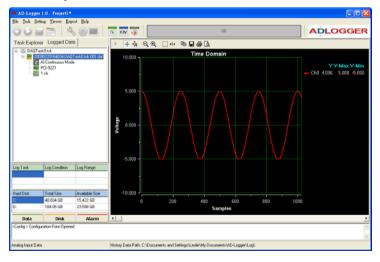


the AD-Logger will start to perform DAQ; the log file will be saved to the path you specified.

Click "Logged Data" change to See history data



The log files will be sequentially list by task name and time in the **Logged Data tabsheet**. Double click the file name in the tree, AD-Logger will display the data value in the Time Domain Data View; then the **Export** buttons will be enabled.





Click the

button to show the Export Data setting form.

- Step 1: Choose LabVIEW data format
- Step 2: Set exported file name and path
- Step 3: Set ALL range data to export
- Step 4: Click Export button

Export Data			X
Data Format	SV 💿 LabView	C DIAdem C I	MATLAB
File Name: D:\LogData\9221	Data.lvm		Browser
Range Option	• 🔊	C Ra	nge
Range			
Sample Unit	Start	1	••
C Time Unit	End	16384	••
Ex	port	Close	



4. Use LabVIEW to do advanced analysis

Load the exported LVM file into LabVIEW.

- Step 1: Open a Blank VI in the NI LabVIEW software.
- ► Step 2: Right click and place a "Read From Measurement File" Express VI in the Block Diagram.

Unlitled I Front Punct * s Edit Hisw Project Oper	an Tools Window Hala		
D Untitled 1 Block Diago			2
	Qpense Iooh Hindow Help 2 2: 40 C of 12pt Application Font	2	
	Practical Depres Provide Provide		
	User L-bancie Scherte VI Simulate Sig Simulate Sig Read Mean Fale Primpt User Fale Daalog		

- Step 3: In the Configure "Read From Measurement File" form, specify the file location that you want to import.
- Step 4: Click "Read File Now" button can preview the data value then close form by click OK button.

File Name					
D.'LogDete/9221Deta.lvm					
File Format		Time Stamps			
 Text (LVM) Read generic text files 		Relative to start of measurem	and .		
Binary (TDMS)		O Absolute (date and time)			
Binary with XML Header (TDM)		Segment Size			
Action		Retrieve segments of original size Retrieve segments of specified size		Sampleo	
				16384	0
• Tab Comma	4.168091 4.125671 4.082489				^
Start row of numeric data	4.036102				
	3.938141 3.882141				
First row is channel names	3.826599 3.768463				
First column is time channel	3.708344				
Decimal Point (dot)	3.645782 3.579712				
(comma)	3.508911				~

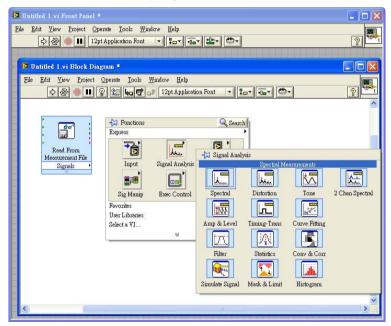


 Step 5: Right click and place a "Spectral Measurements" Express VI of Signal Analysis in the Block Diagram. The "Spectral Measurements" setting form will be opened.

Example: Using FFT function to calculate power spectrum result.

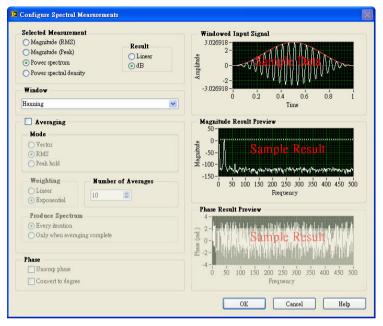
Input Signal = 1022.34 Hz

Sampling rate = 250 KHz





Step 6: There are four measurement functions in the Configure Spectral Measurements, in this case we chose "Power spectrum" function.

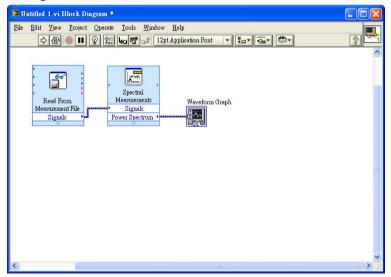




🔽 Untitled 1.vi F	ront Panel *	
	Project Operate Iools Window Help	<u> </u>
	- Controls Q. Search	
	Express	
	Num Ctris Buttons Text Ctris	
	User Ctris Num Inds LEDs	
	🔝 🖓 Graph Indicators	
	Text Inds Graph Indicators Waveform Graph	
	User Controls Select a Control.	
		XY Graph

Step 7: Place a "Waveform Graph" VI in the Front Panel

 Step 8: Finish following signal links in the Block Diagram.





Step 9: Right click on the Waveform Graph VI and choose property of the pop-up menu.

Untitled 1.vi Block Diagram *	
Ele Edit Yiew Project Operate Tools Window Help	
Read From Messurement File Signals Power Spectrum	eform Graph Visible Items Find Indicator Hide Indicator Change to Control Change to Constant Description and Tip Signal Manipulation Palette Create Data Operations Advanced View As Icon Properties
<	>

 Step 10: In the Scales tab, set Name of the X-Axis and Multiplier of Scaling Factors(sample rate).

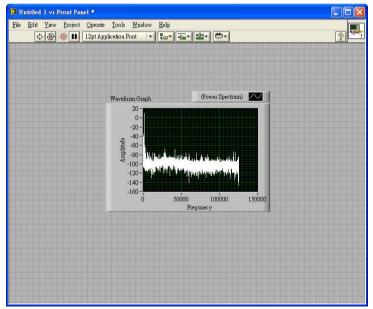
ppearance	Display Format	Plots	Scales	Cursors	Documentation	Data I ⊀	
Time (2	K-Axis)		,	~	0		
Name	Frequency (Hz)						
🗹 She	ow scale label		🗹 Auto	scale	_		
Show scale			0		Minimum		
Log			100		Maximum		
🔲 Inv	reted		Scaling				
			0		Offset		
			250000)	Multiplier		
—Scale St	yle and Colors —			- Grid Styl	e and Colors		
[1.0-]	Major tick				Major grid		
0.5-	Minor tick	ι.		<u> </u>	Minor grid		
	Marker te:	kt					
🗹 Ig	nore waveform time	stamp o	n x-axes				
		030					



Appearance	Display Format	Plots	Scales	Cursors	Documentation	Data I ⊀
Plot 0			•			
Name						
Plot 0						
 У-scale		• • •		<no< th=""><th>7.</th><th>×</th></no<>	7.	×
Amplitud	le (Y-Axis)	~				
X-scale						
	y (Hz) (X-Axis)	~				
🗹 Ignore	e waveform or dyna	umic attril	butes, inclu	ding plot na	unes	
·						

► Step 11: In the Plots tab, enable the following option.

Step 12: Switch to the Block Diagram, start to execute the program will display the power spectrum result.





5.4 Export Data into DIAdem for post processing

- 1. Launch AD-Logger and Switch to the Logged Data tabsheet.
- 2. Double click the log file you want to export.
- 3. Click the solution to show the Export Data setting

Ele De Tos

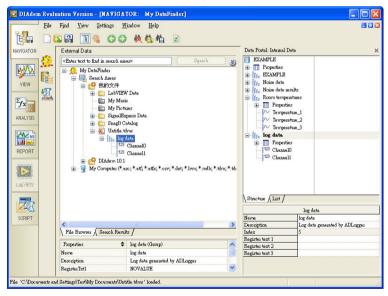
Log1 DAD Hard C D

Expo

for	m.								
A CALL MANAGEMENT	r 1.0 - Proje Varora		Srb.						
01				15 CIV 13		551;			LOGGER
k Explor	rer Logge	d Data		++4 @	. 🔍 🗆 🕂 🐚 🖬	-7			
	Continuous M tual Device 000 Hz 0 ch2 o entr o Alarm ack1 tak Continuous M tual Device 0000 H+			Voltage	1/1	ime Domain		DAQTask0.tsk Ch0 Ch2	Y Y-Mix Y-Min 4.999 4.999 -4.999 1.913 4.996 -4.994
(L)				ġ.		0 600 Samples			
				+ + 4 0	(@, 🗌 + 🐚 🖬	60			
				18-	Po	wer Spectrum			
lack Fack () tok	Log Cond Stop by U		Log Range None	9 - 8 -250 -	and and and interesting			DAQTask0.tsk Ch0 Ch2	Y Y Max Y Min 0 140 -565 40 128 -10
Disk.	Total Size 44,756 GB	0	Available Size 4 5293 GB	-500 -					
-	29.745 68		13 569 GB	0.0.		0 150 KHz			
Data > Stop	DAQ Taks(s) a DAQ Taks(s) a	18.591	Alarm						0
	ind-party softw		9	No. Do Do Co	Documents and Settings/gir		N		
Gala iti e					o occuments and senarginge	gradentery cocontent of	roggeneogr		
	A # 1	ixp(ort Data	L					×
		-Da	ata Forma	at					
		C	Excel	C CSV	⊂ LabVie	w 💿 DIA	dem C M/	ATLAB	
		F 31	. N						
			e Name: \Untitle.t	tdms			_	Browser	
			ange Opti						
		ne	 Geopti Screet 		C AI		C Rang	je	
		Ra	inge						1
		6	Sampl	e Unit	Sta	art 1		• •	
		C) Time L	Jnit	Er	d 225000		• •	
				Export		Close			_
							-		



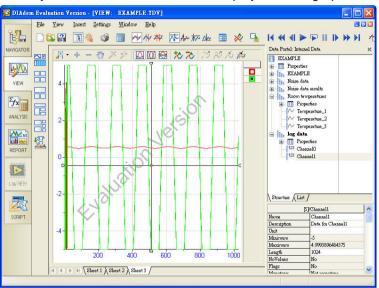
- 4. Assign the file name and file path.
- 5. Click the DIAdem data format.
- Configure the Range Option and click the Export button. The exported data can be found in the path you specified.
- 7. Load the exported data through the **DIAdem NAVIGA-TOR**.
- 8. Drag and drop the **Group Name** of log file into the **Data Portal** window. Then the Group Name will be added in the **Data Portal** for further operations.



 Switch to the VIEW window of DIAdem, select a 2D Axis System in the worksheet.



10.Drag and drop Channel 0 and Channel 1 to the 2D Axis System. The data value will be displayed in the graph.





Export Data into MATLAB post processing 5.5

This section will demonstrate how to perform Data Acquisition with ADLINK PCI-9221 and do analysis in MATLAB. Before the postprocessing captured in MATLAB, you need to use the AD-Logger Export function to convert the AD-Logger file to MATLAB compatible format. The process includes three steps:

- Configure DAQ device and Set log conditions.
- Start the data acquisition and Export captured data to MAT-IAB
- Use MATLAB to do advanced analysis
- Configure DAQ device and parameters.

Launch AD-Logger and click 🤍 Modify DAQ task button

to open DAQPilot interactive configuration dialog. You can configure DAQ device and relative parameters in the following setting dialogs.







<Interactive Configuration Dialog STEP 1: Select Device & Channel>



<Interactive Configuration Dialog STEP 2: Timing/Trigger Setting >



🍓 AD-Logger 1.0 - Project1#					🔳 🖉 🔀
Fir Ish Setting Yerrer Export Hub			0%		
	i civ 🧔		ur.		ADLOGGER
Task Explorer Logged Data) + + & Q @ 🗆	*** 🐃 🖬 🖨 🕼			
E Z DAQTask0 tak		Time Doma	in		
- We Vatual Device Analog - WE 50000 Hz	Input : Confinuous Waveform Acqu	unition		×	sk8.tsk YY-Max Y-Min
- KE ch0 ch2		DAGP	ilot		-4.727 4.999 -4.992
No error		DAGI		-	4.788 4.998 -4.993
E Z DAQTeck1.tok	O	Instant Te	st		
Al Continuous Mode			Committee of ADLS		
# 100000 Hz	10.0		Cummerson of ALILL	NK Ang. 2906	
ch0	1.1.1.1.1			9	
No Alam	5.0-				
DEContinuous Mode					
- 488 - 477 20000000 Hz	0.0-				
Port0	17700 Aug.				
Eror. The device is stopped	-5.0-				
Al Continuous Mode	four plot to				
## 100000 Hz data :	+10.0-	200 400	600 800	1000	
¢		- 200 - 400		Q	
Log Task Log Condition Lo	ADLINK			q	
		Copyright 🛞 2007 ADDINE for he	ology loc. All Rights Rever	red.	
Hard Disk Total Size Av			+ Beck Finish	Cancel	
44.756 GB 4.1		-	- Deer Dann	Conner	
D: 29.745 GB 13.569 GB	0 20	0 400 60	0 800	1000	
Data Disk Alarn		Samples			
< Task > Cancel Modily Task <config> Configuration Form Opened</config>					0
and a study when any shares					Y
Create New DAQ Task	History Data Path: C:\Documents a	nd Settings/yinghsien/My Docu	uments\AD-Logger\Log\		

<Interactive Configuration Dialog STEP 3: Get Instant Result>

After quick task verification, you can click the **Finish button** to finish the definition of your DAQ task then close the configuration interactive dialog and return to the AD-Logger main window.



2. Set log conditions







Change to Log Tab sheet and finish following steps.

Setting Page	
ADLO	GGER
Display FFT Recording Alarm Condition	
Data Log Log to Disk I Disable	Recording Condition
By Sample Number	By Time Interval
Number of 16384 Samples	Start 2009/ 3/23 PM 06:45:59
•	Stop 2009/ 3/23 PM 06:45:59
Log Data Path	
C: [] ADLINK AD-Logger C: \Documents and C: \	Settings\Leslie\My Documents\AD-Logger\Log\
	OK Cancel Apply

- Step 1: Set Enable data Log
- ► Step 2: Set Data Log Condition by Sample Number
- ► Step 3: Set 16384 Samples to log
- ► Step 4: Set the Path to save log file to
- Step 5: Click OK button to return AD-Logger Main Window



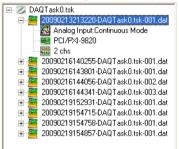
3. Start to DAQ and Export data to MATLAB file

After configuring DAQ and log parameters, click

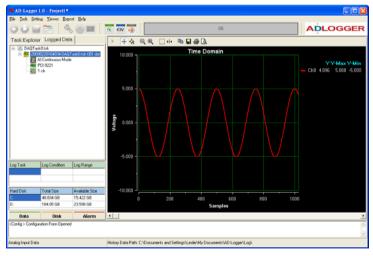


button the AD-Logger will start to perform DAQ; the log file will be saved to the path you specified.

Click "Logged Data" change to History Data View



The log files will be sequentially list by task name and time in the Logged Data tabsheet. Double click the file name in the tree, AD-Logger will display the data value in the Time Domain DataView; then the Export buttons will be enabled.





Click the

button to show the Export Data setting form.

- Step 1: Choose MAT-LAB data format
- Step 2: Set exported file name and path
- Step 3: Set ALL range data to export
- Step 4: Click Export button

ixport Data			
Data Format	C LabView	C DIAdem @	MATLAB
File Name: D:\LogData\D92210)ata.csv		Browser
Range Option	• 🗐	C Ra	inge
Range			
Sample Unit	Start	1	••
C Time Unit	End	16384	••
Expo	t	Close	

4. Use MATLAB to do advanced analysis

Load the exported CSV file into MATLAB.

- Step 1: Set the Current Directory to the exported file saved.
- Step 2: Type "load D9221Data.csv" in the Command Window
- Step 3: An array created with the same name of the exported file in the Workspace.





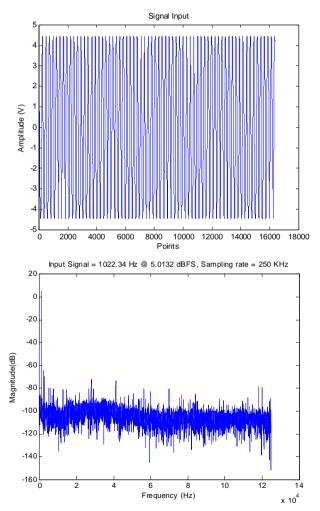
Step 4: You can use this data array to do the advanced analysis like following pictures

Example: Using FFT function to calculate power spectrum result.

Input Signal = 1022.34 Hz

Sampling rate = 250 KHz

The source code is listed in the next page.





```
load D9221Data.csv
Fs = 250000; % Sampling frequency
fin = 1022.34;
numpt = 16384; % Length of signal
notdc = 3;
figure(1);
plot(D9221Data);
title('Signal Input');
xlabel('Points');ylabel('Amplitude (V)');
Doutw = D9221Data.*hann(numpt);
Dout spect = fft(Doutw);
Dout dB = 20*log10(abs(Dout spect));
     % Recalculate to dB
spectP = (abs(Dout_spect)).*(abs(Dout_spect));
     % Determine power spectrum
FFT_freq = [0:numpt/2-1].*Fs/numpt;
FFT spectrum = Dout dB(1:numpt/2);
figure(2);
% Plot single-sided amplitude spectrum.
plot(FFT_freq,FFT_spectrum)
title('Power Spectrum of Input Signal')
xlabel('Frequency (Hz)')
ylabel('Magnitude(dB)')
pll_title = ['Input Signal = ', num2str(fin), '
     Hz @ ',num2str(signal_dBFS),
    ' dBFS',', Sampling rate = ', num2str(Fs/
     1000), ' KHz'];
title(pll_title);
```





6 Appendix

6.1 AD-Logger .DAT File Format

This appendix describes the file format of the .dat files logged through file AD-Logger file system. The data file includes five parts, ADLINK DASK Header, ChannelRange, Data Block, AD-Logger Header and ChannelRange. The file structure is shown in the figure below:

DASK Header		
ChannelRange(Optional)		
DAQ data		
AD-Logger Header		
ChannelRange(Optional)		



6.1.1 DASK Header

The DASK header part records the information related to the stored data and its total length is 60 bytes. The data structure of the file header is as follows:

DASK Header Length: 60 bytes			
Elements	Туре	Size (bytes)	Comments
ID	char	10	file ID ex. ADLinkDAQ1
card_type	short	2	card Type ex. PCI-7250, PCI-9112
num_of_channel	short	2	number of scanned channels ex. 1, 2
channel_no	unsigned char	1	channel number where the data read from (only available as the num_of_channel is 1) ex. 0, 1
num_of_scan	long	4	the number of scan for each chan- nel (total count / num_of_channel)
data_width	short	2	the data width 0: 8 bits, 1: 16 bits, 2: 32 bits
channel_order	short	2	the channel scanned sequence 0: normal(ex. 0-1-2-3)
ad_range	short	2	the AI range code Please refer to ADLINK DASK Function Refer- ence Appexdix B ex. 0 (AD_B_5V)
scan_rate	double	8	The scanning rate of each channel (total samplingate/ num_of_channel)
num_of_channel_range	short	2	The number of ChannelRange* structure
start_date	char	8	The starting date of data acquisi- tion ex. 12/31/99
start_time	char	8	The starting time of data acquisi- tion ex. 18:30:25
start_millisec	char	3	The starting millisecond of data acquisition ex. 360
reserved	char	6	The AD-Logger supports log files which the first byte of reservd ele- ment is "A". Others no used.

*If the num_of_channel_range is 0, the ChannelRange block won't be included in the data file.



6.1.2 ChannelRange

The ChannelRange part records the channel number and data range information related to the stored data. This part consists of several channel and range units. The length of each unit is 2 bytes. The total length depends on the value of num_of_channel_range (one element of the file header) and is calculated with this formula:

Total Length = 2 * num_of_channel_range bytes

ChannelRange Length: 2 bytes			
Elements	Туре	Size (bytes)	Comments
channel	char	1	scanned channel number ex. 0, 1
range	char	1	the AI range code Please refer to ADLINK DASK Function Reference Appexdix B ex. 0 (AD_B_5V)

The data structure of each ChannelRange unit is listed below:



6.1.3 Data Block

The data is written to file in a 16-bit binary format, with the lower byte first (little endian). For example, the value 0x1234 is written to disk with 34 first followed by 12. The total length of the data block depends on the data width and the total data count.

The file is written in Binary format and may not be read by normal text editor. You can use any binary file editor to view it or the functions used for reading files (such as fread) to get the file information and data value. PCIS-DASK provides the DAQCvt utility to convert the binary file. Refer to the PCIS-DASK user manual for details



6.1.4 AD-Logger Header

The AD-Logger header part records the information related to the stored data and its total length is 64 bytes. The data structure of the file header is as follows:

AD-Logger Header Length: 64 bytes			
Elements	Туре	Size (bytes)	Comments
ID	char	10	file ID ex. ADLogger1
task_type	unsigned long	4	The DAQPilot DAQ task type ex. Continuous Wave Acquisition
card_type	short	2	card Type ex. PCI-7250, PCI-9112
num_of_channel	short	2	number of scanned channels ex. 1, 2
channel_no	unsigned char	1	channel number where the data read from (only available as the num_of_channel is 1) ex. 0, 1
num_of_scan	long	4	the number of scan for each chan- nel (total count / num_of_channel)
data_width	short	2	the data width 1: 8 bits, 2: 16 bits, 4: 32 bits
channel_order	short	2	the channel scanned sequence 0: normal(ex. 0-1-2-3)
ad_range	short	2	the AI range code Please refer to ADLINK DAQPilot User Manual ex. 0 (AD_B_5V)
scan_rate	double	8	The scanning rate of each channel (total samplingate/ num_of_channel)
num_of_channel_range	short	2	The number of ChannelRange* structure
start_date	char	8	The starting date of data acquisi- tion ex. 12/31/99
start_time	char	8	The starting time of data acquisi- tion ex. 18:30:25
start_millisec	char	3	The starting millisecond of data acquisition ex. 360
reserved	char	6	No used.

*If the num_of_channel_range is 0, the ChannelRange block won't be included in the data file.



6.1.5 ChannelRange

The ChannelRange part records the channel number and data range information related to the stored data. This part consists of several channel and range units. The length of each unit is 2 bytes. The total length depends on the value of num_of_channel_range (one element of the file header) and is calculated with this formula:

Total Length = 2 * num_of_channel_range bytes

The data structure of each ChannelRange unit is listed below:

ChannelRange Length: 2 bytes			
Elements	Туре	Size (bytes)	Comments
channel	char	1	scanned channel number ex. 0, 1
range	char	1	the AI range code Please refer to ADLINK DAQPilot User Manual ex. 0 (AD_B_5V)