USB-7230/7250

USB 2.0-based Digital I/O Module

User's Manual



Manual Rev.: 2.50

Revision Date: Aug. 3, 2016

Part No: 50-1Z138-2010

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Advance Technologies; Automate the World.

Revision History

Revision	Release Date	Description of Change(s)
2.00	Nov. 16, 2012	Initial Release
2.50	Aug. 3, 2016	Designation errata resolved

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Preface

Copyright 2016 ADLINK Technology, Inc.

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.

Disclaimer

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.

Environmental Responsibility

ADLINK is committed to fulfill its social responsibility to global environmental preservation through compliance with the European Union's Restriction of Hazardous Substances (RoHS) directive and Waste Electrical and Electronic Equipment (WEEE) directive. Environmental protection is a top priority for ADLINK. We have enforced measures to ensure that our products, manufacturing processes, components, and raw materials have as little impact on the environment as possible. When products are at their end of life, our customers are encouraged to dispose of them in accordance with the product disposal and/or recovery programs prescribed by their nation or company.

Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000


NOTE:

Additional information, aids, and tips that help users perform tasks.


CAUTION:

Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.


WARNING:

Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Table of Contents

Revision History ii

Preface iii

List of Figures vii

List of Tables ix

1 Introduction 1

1.1 Overview 1
1.2 Features 1
1.3 Applications 2
1.4 Specifications 2
1.4.1 General Specifications 2
1.4.2 Digital Input (DI) 2
1.4.3 Digital Output (DO) 3
1.5 Software Support 4
1.6 Driver Support for Windows 4
1.7 Utilities for Windows 5
1.8 Schematics and Dimensions 6
1.8.1 Module 6
1.8.2 Module Stand 9
1.8.3 Rail Mounting 15
1.8.4 Wall Mounting 19
1.9 Connector Pin Assignment 21

2 Getting Started 25

2.1 Unpacking Checklist 25
2.2 Connecting the USB-7230/7250 Module 25
2.3 Device ID 26

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3 Operations 29
3.1 Isolated Digital Input 30
3.2 Change of State (COS) Detection 31
3.3 Optical Isolated Frequency/Event Counter 33
3.4 Digital Filtering 35
3.5 Isolated Digital Output (USB-7230 only) 36
3.6 Relay Output (USB-7250 only) 37

Important Safety Instructions 39

Getting Service 43

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

List of Figures

Figure 1-1: USB-7230/7250 Module Rear View 6
Figure 1-2: USB-7230/7250 Module Side View 7
Figure 1-3: USB-7230 Module Front View 8
Figure 1-4: USB-7250 Module Front View 9
Figure 1-5: Module, Stand, Connector, and USB Cable 10
Figure 1-6: Module, Stand, & Wall Mount Kit Side View (w/ connections) 11
Figure 1-7: Module in Stand Front View 12
Figure 1-8: Module Stand Top View 13
Figure 1-9: Module Stand Side Cutaway View 14
Figure 1-10: Module Stand Front View 15
Figure 1-11: Rail Mount Kit 16
Figure 1-12: Module Pre-Rail Mounting 17
Figure 1-13: Module Rail-Mounted 18
Figure 1-14: Wall Mount Holes 19
Figure 1-15: Module with Wall Mount Apparatus 20
Figure 2-1: Device ID Selection Control 26
Figure 3-1: USB-7230 Functional Block Diagram 29
Figure 3-2: USB-7250 Functional Block Diagram 30
Figure 3-3: USB-7230 Isolated Input 31
Figure 3-4: USB-7250 Isolated Input 31
Figure 3-5: COS Detection Architecture 32
Figure 3-6: COS Example 33
Figure 3-7: USB-7230/7250 Optical Isolated Frequency/Event Counter 33
Figure 3-8: Frequency Counter Example 34
Figure 3-9: Frequency Counter Error % 35
Figure 3-10: Digital Filter Example 36
Figure 3-11: USB-7230 Isolated Output 37
Figure 3-12: Form C Relay 37
Figure 3-13: Form A Relay 37

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

List of Tables

Table 1-1: USB-7230 Pin Assignment 21
Table 1-2: USB-7230 I/O Signal Description 22
Table 1-3: USB-7250 Pin Assignment 23
Table 1-4: USB-7250 I/O Signal Description 23

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1 Introduction

1.1 Overview

The USB-7230/7250 USB-based digital I/O modules feature high voltage ON/OFF control and monitoring, and isolation voltage supported up to 2500V_{RMS}. The USB-7230 provides 32-channel isolated digital I/O and 2-channel frequency/event counters, and USB-7250 provides 8-channel isolated digital inputs, 8-channel electromechanical relays, and 2-channel frequency/event counters.

The USB-powered USB-7230/7250 have removable screw-down terminals for easy device connectivity, and the included multi-functional stand fully supports desktop, rail, or wall mounting.

The USB-7230/7250 are suitable for industrial I/O control applications requiring high voltage and excellent protection. High isolation voltage protects against damage from accidental contact with high external voltage and eliminates troublesome ground loops. U-Test, a free ready-to-use testing program, is included to enable operation or testing of all ADLINK USB DAQ series functions with no programming requirement.

1.2 Features

- High-speed USB 2.0
- USB-powered
- USB-7230: 16CH isolated DI, 16CH isolated DO, 2CH frequency/event counters
- USB-7250: 8CH electromechanical relays, 8CH isolated DI, 2CH frequency/event counters
- Programmable digital filter removing unexpected glitches on input channels
- Programmable initial DO status
- Up to 2500V_{RMS} isolation voltage
- Removable screw-down terminal on module
- Lockable USB cable for secure connectivity
- Ready-to-use testing application (U-Test) included

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1.3 Applications

- Automotive testing
- Laboratory research
- Industrial I/O control
- Signal switching

1.4 Specifications

1.4.1 General Specifications

Physical, Power, and Operating Environment	
Interface	High speed USB 2.0 compatible, mini-USB connector
Dimensions	156.5 (L) x 114 (W) x 41.3 (H) mm (6.16 X 4.49 X 1.63 in.)
I/O Connector	Two 20-pin removable screw-down terminals
Power requirement	USB power (5 V @ 400 mA)
Operating environment	Ambient temperature: 0 to 55°C Relative humidity: 10% to 90%, non-condensing
Storage environment	Ambient temperature: -20 to 70 °C Relative humidity: 5% to 95%, non-condensing

1.4.2 Digital Input (DI)

	USB-7230	**USB-7250**
Optical Isolated Input		
Number of channels	16	8
Polarity	Bi-directional (non-polarity)	
Logic level	VIH=5~24V, VIL=0~1.5V Or dry contact	
Input resistance	2.4k @ 0.5W	
Isolated voltage	2500V_{RMS} (channel to system)	
Min. pulse width for change of state (COS) detection	20.83 ns (software programmable)	
Data transfer	Programmed I/O	

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

	USB-7230	USB-7250
Optical Isolated Frequency/Event Counter		
Number of channels	2	
Logic level	VIH=5~12V, VIL=0~1.5V	
Event counter width	32-bit	
Max. input frequency (DC coupled)	1 MHz	
Min. input frequency (DC coupled)	0.1 Hz	
Max. frequency error	0.5% (f≤50kHz) 1% (50kHz<f≤500kHz) 2% (500kHz<f≤1MHz)	
Data transfer	Programmed I/O	

1.4.3 Digital Output (DO)

USB-7230

Channels	16 (optical isolation)
Output type	Open drain MOSFET
Supply voltage	5-35VDC
Max. sink current	250 mA @ 100% duty (/channel)
Data transfer	Programmed I/O

USB-7250

Channels	8 (electromechanical relay, non-latching)	
Contact rating (/channel)	Max. switching power	60 W, 125 VA
	Max. switching voltage	220 VDC, 250VAC
	Max. switching current	2 A
Relay ON/OFF time	Operate time	2 ms
	Release time	1 ms
Contact resistance	75mΩ (max.)	
Expected lifetime	50 VDC 0.1A (resistive), $1x10^6$ operations	
Breakdown voltage	1000 VAC	
Data transfer	Programmed I/O	

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1.5 Software Support

ADLINK provides comprehensive software drivers and packages to suit various user approaches to system building. In addition to programming libraries, such as DLLs, for most Windows-based systems, ADLINK also provides drivers for other application environments such as LabVIEW® and MATLAB®. ADLINK also pro vides ActiveX component ware for measurement and SCADA/HMI, and breakthrough proprietary software. All software options are included in the ADLINK All-in-One CD.

Be sure to install the driver & utility before use.

1.6 Driver Support for Windows

UD-DASK

UD-DASK is composed of advanced 32/64-bit kernel drivers for customized DAQ application development. USB-DASK enables you to perform detailed operations and achieve superior performance and reliability from the data acquisition system. DASK kernel drivers now support Windows 7/Vista® OS.



NOTE:

Only UD-DASK versions 1.0.5 and later support the USB-7230/7250 module.

DAQPilot

DAQPilot is a SDK with a graphics-driven interface for various application development environments. DAQPilot represents ADLINK's commitment to full support of its comprehensive line of data acquisition products and is designed for novice to most experienced programmers. As a task-oriented DAQ driver, SDK and wizard for Windows systems, DAQPilot helps shorten development time while accelerating the learning curve for data acquisition programming. Download and install DAQPilot from:

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

http://www.adlinktech.com/TM/DAQPilot.html



Only UD-DASK versions 2.3.4.1109 and later and later support the USB-7230/7250 module.

1.7 Utilities for Windows

U-Test

U-Test is a free and ready-to-use utility assisting instant testing and operation of all ADLINK USB DAQ product functions with no programming requirement. In addition to data collection and monitoring functions, U-Test also supports basic FFT analysis and direct control of analog output and digital I/O with a user-friendly interface.

Download and install U-Test from:

http://www.adlinktech.com

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1.8 Schematics and Dimensions

NOTE:

All dimensions shown are in millimeters (mm)

1.8.1 Module

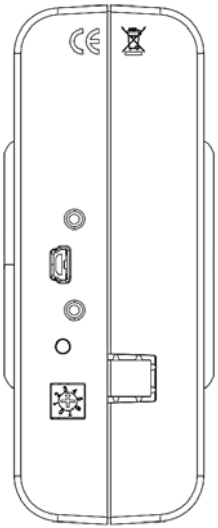


Figure 1-1: USB-7230/7250 Module Rear View

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

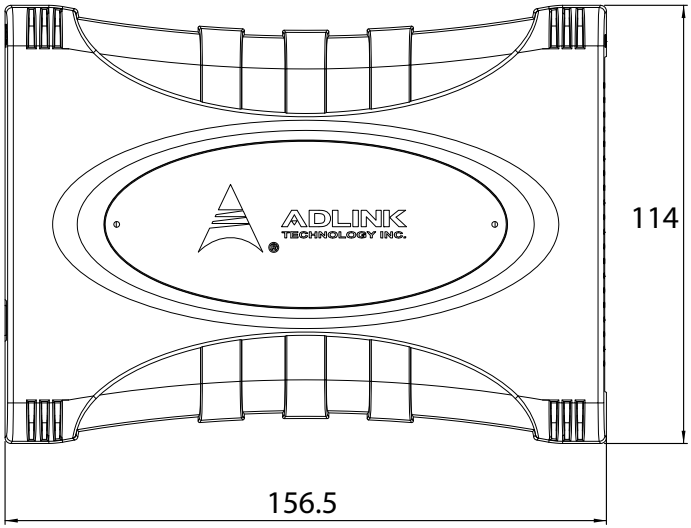


Figure 1-2: USB-7230/7250 Module Side View

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

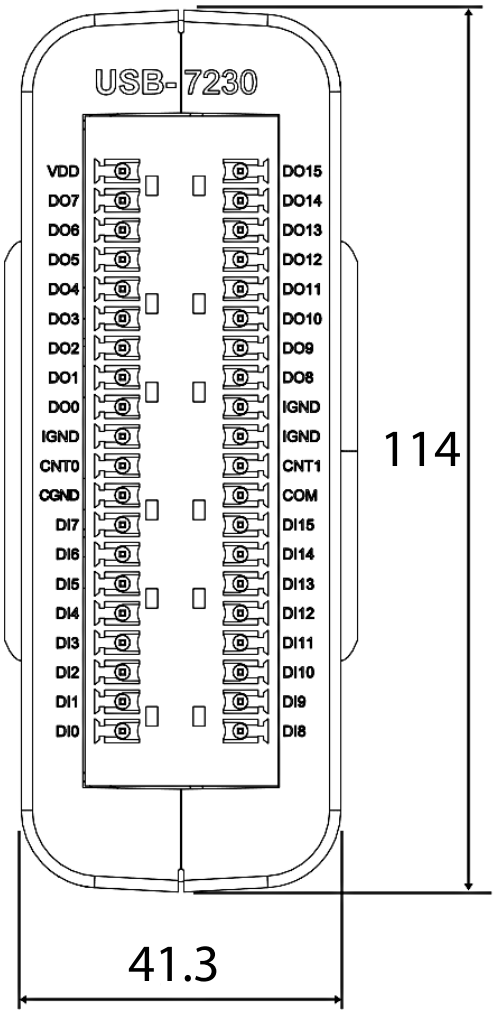


Figure 1-3: USB-7230 Module Front View

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

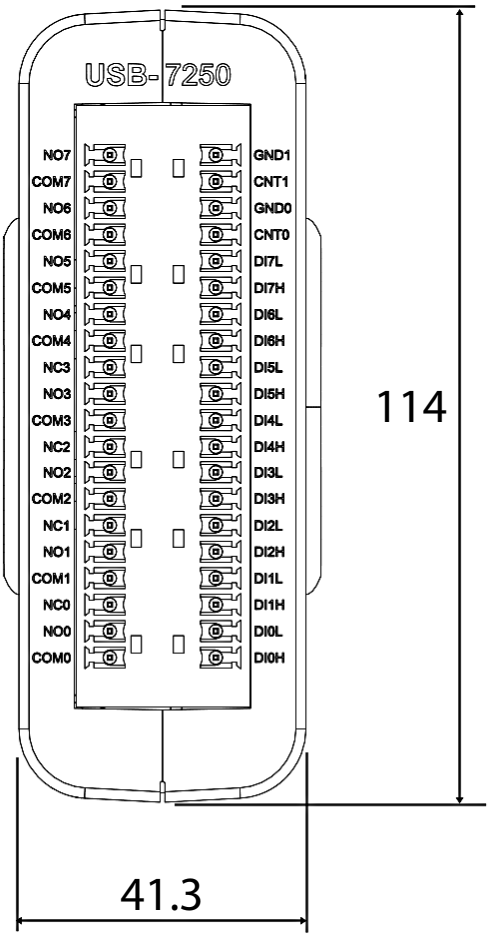


Figure 1-4: USB-7250 Module Front View

1.8.2 Module Stand

The multi-function USB-7230/7250 stand is compatible with desk, rail, or wall mounting. To fix the module in the stand, slide the module body into the stand until a click is heard. To remove the module

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

from the stand, twist the bottom of the stand in a back-and forth motion and separate from the module.

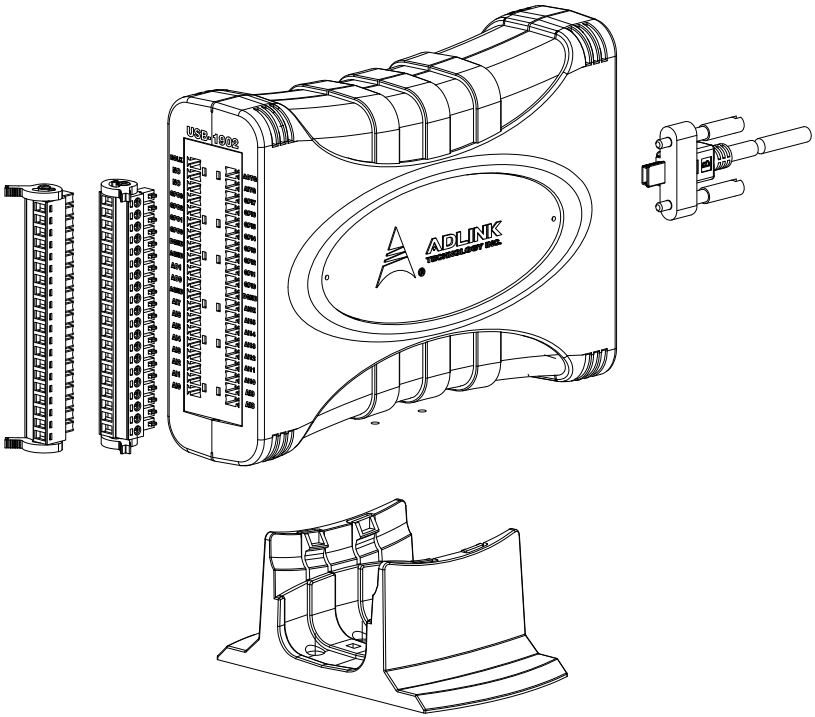


Figure 1-5: Module, Stand, Connector, and USB Cable

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

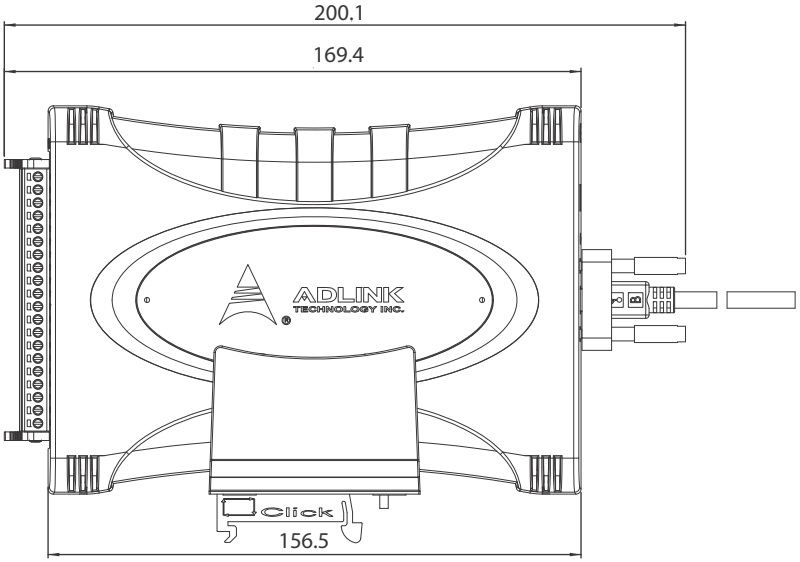


Figure 1-6: Module, Stand, & Wall Mount Kit Side View (w/ connections)

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

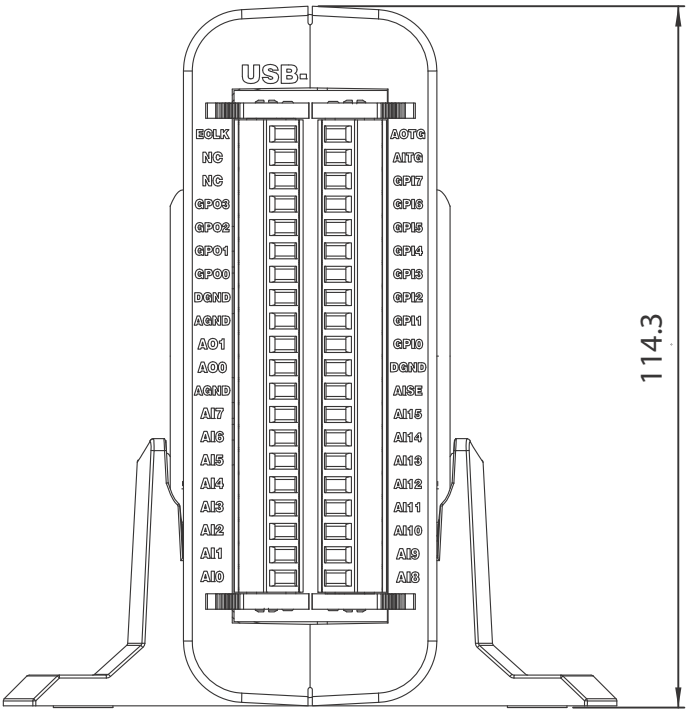


Figure 1-7: Module in Stand Front View

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

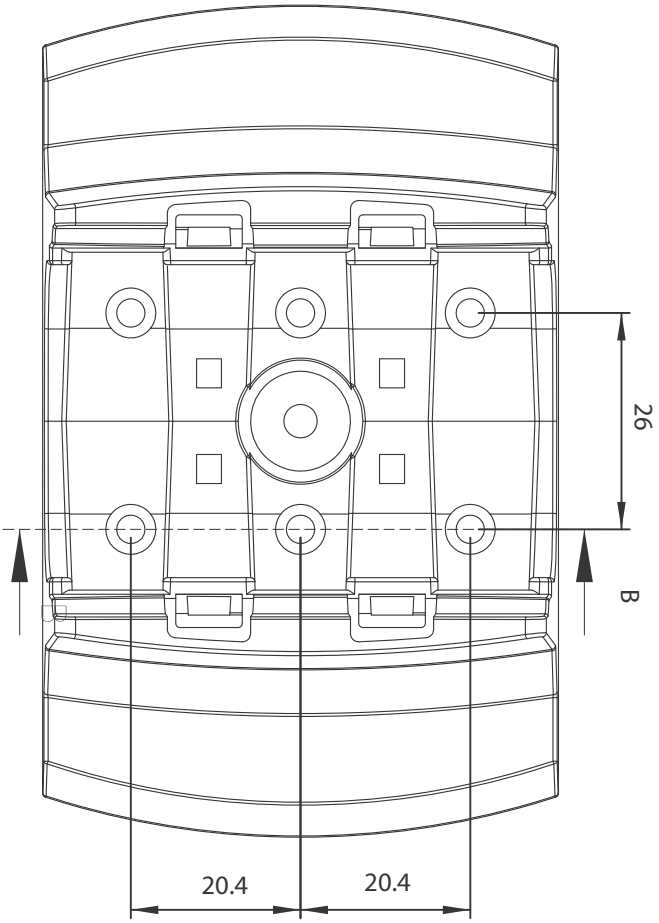


Figure 1-8: Module Stand Top View

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

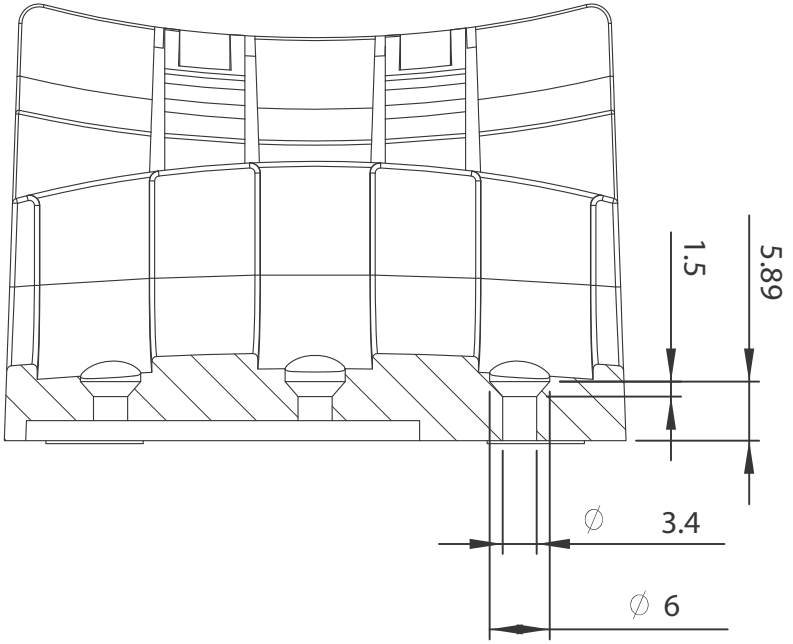


Figure 1-9: Module Stand Side Cutaway View

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

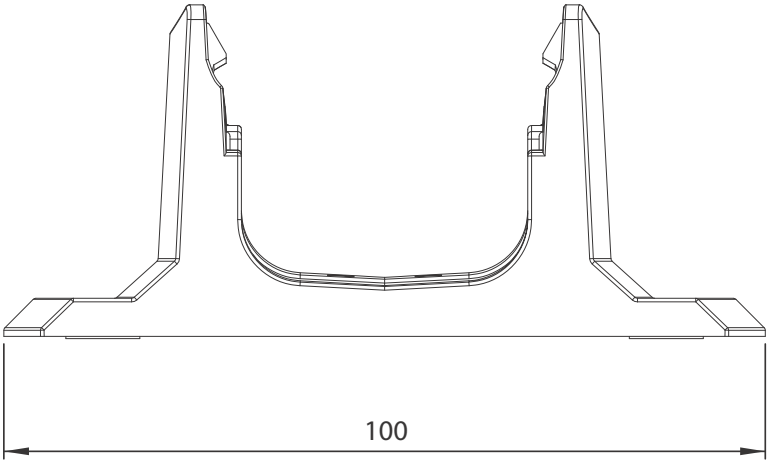


Figure 1-10: Module Stand Front View

1.8.3 Rail Mounting

The multi-function stand can be mounted on the DIN rail using the rail-mount kit as shown.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

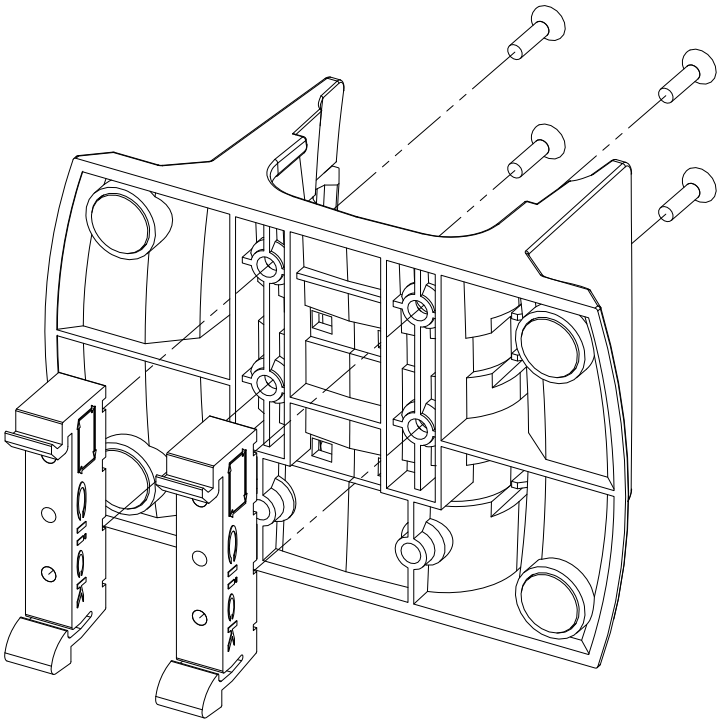


Figure 1-11: Rail Mount Kit

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

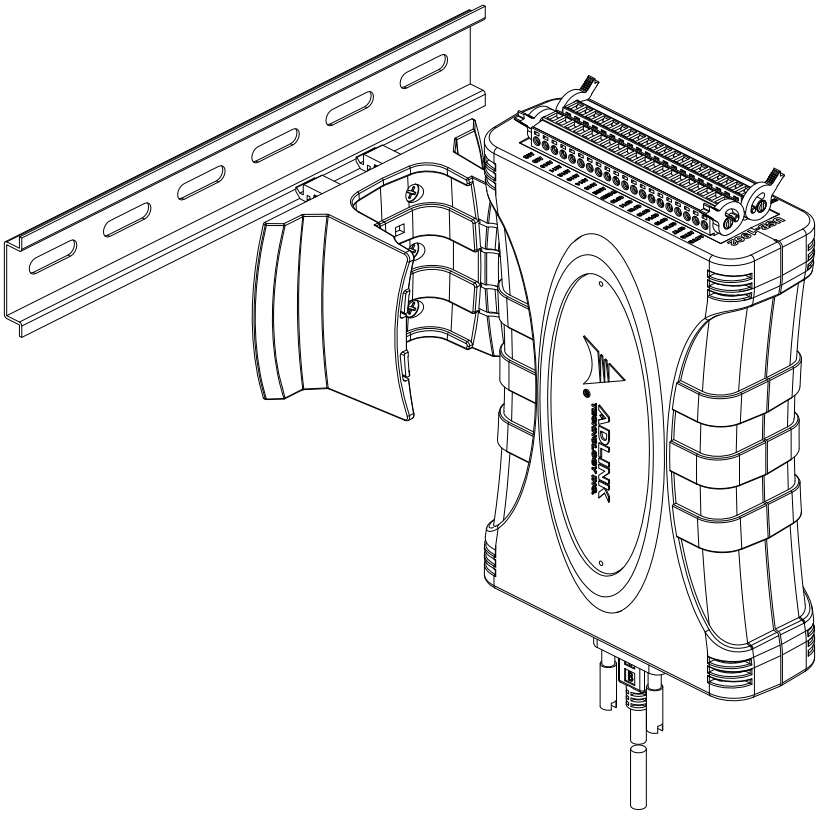


Figure 1-12: Module Pre-Rail Mounting

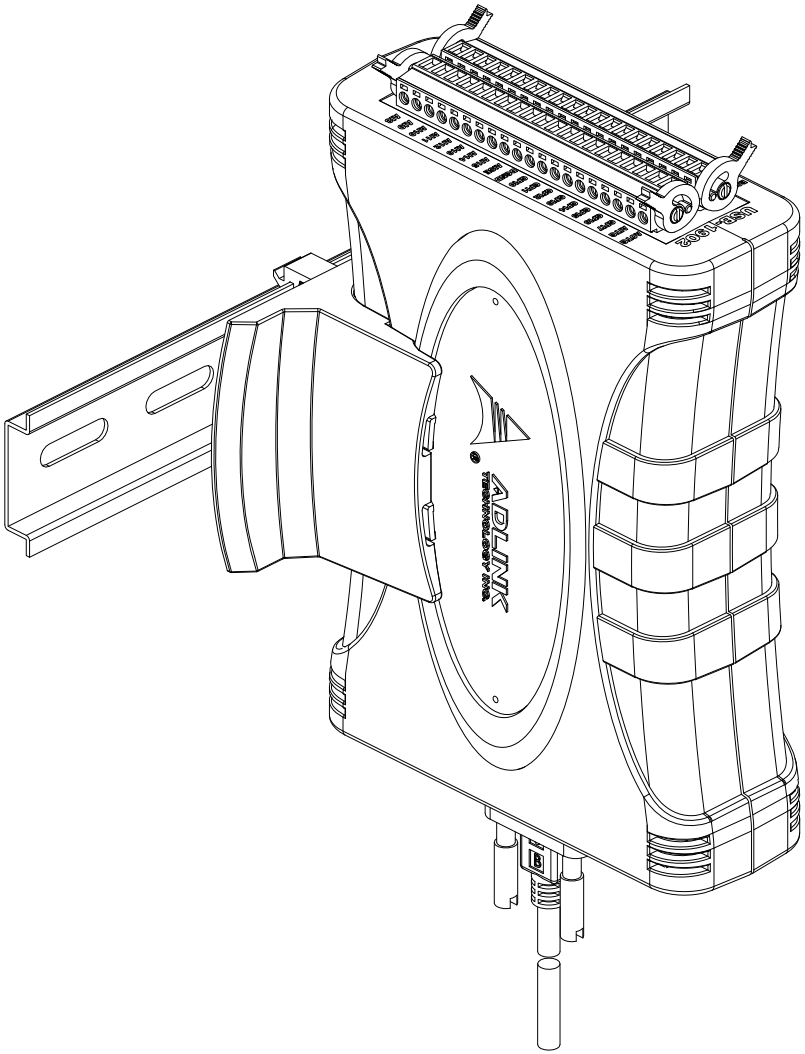


Figure 1-13: Module Rail-Mounted

1.8.4 Wall Mounting

The multi-function stand can be fixed to a wall using four flush head screws as shown. The four screw holes should be approximately 3.4 mm in diameter.

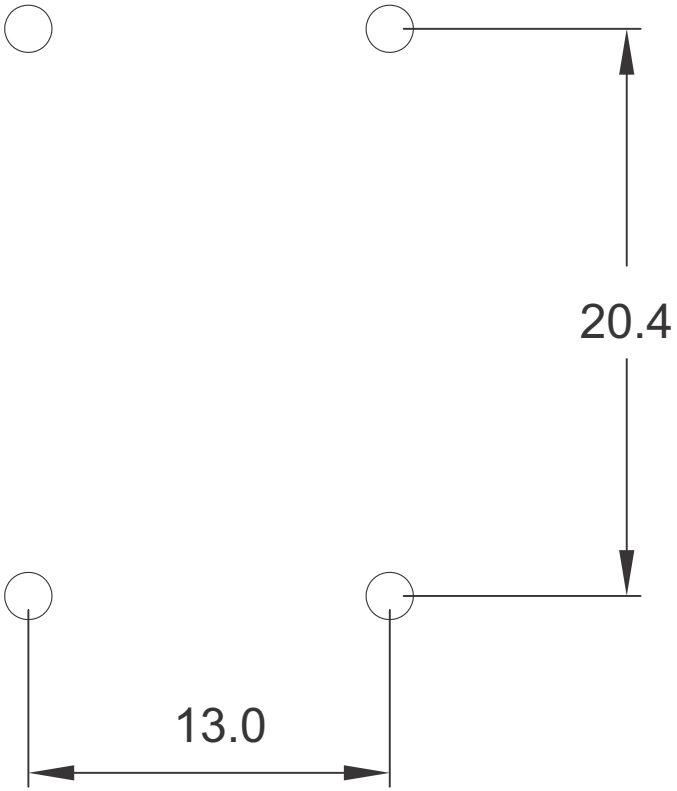


Figure 1-14: Wall Mount Holes

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

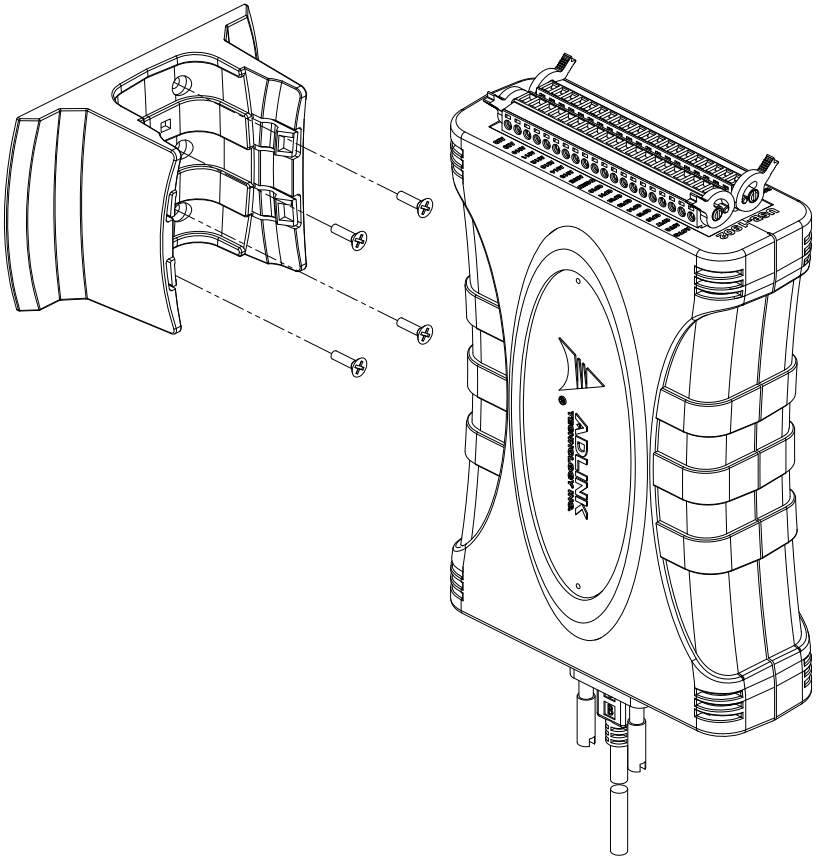


Figure 1-15: Module with Wall Mount Apparatus

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1.9 Connector Pin Assignment

The USB-7230/7250 module is equipped with 40-pin removable screw-down terminal connectors, with pin assignment as follows.

Pin	Function	Pin	Function
20	VDD	40	DO15
19	DO7	39	DO14
18	DO6	38	DO13
17	DO5	37	DO12
16	DO4	36	DO11
15	DO3	35	DO10
14	DO2	34	DO9
13	DO1	33	DO8
12	DO0	32	IGND
11	IGND	31	IGND
10	CNT0	30	CNT1
9	CGND	29	COM
8	DI7	28	DI15
7	DI6	27	DI14
6	DI5	26	DI13
5	DI4	25	DI12
4	DI3	24	DI11
3	DI2	23	DI10
2	DI1	22	DI9
1	DI0	21	DI8

Table 1-1: USB-7230 Pin Assignment

Signal Name	Reference	Direction	Description
DI<0..15>	COM	I	Isolated digital input channel

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Signal Name	Reference	Direction	Description
COM	--------		Common ground or common power of isolated digital input channel
CNT<0,1>	CGND	I	Frequency/event counter channel
CGND	--------		Ground of Frequency/event counter
DO<0..15>	IGND	O	Isolated digital output channel
IGND	--------		Ground return path for isolated output channel
VDD	IGND	I	Common power input junction for isolated output channel

Table 1-2: USB-7230 I/O Signal Description

Pin	Function	Pin	Function
20	NO7	40	GND1
19	COM7	39	CNT1
18	NO6	38	GND0
17	COM6	37	CNT0
16	NO5	36	DI7L
15	COM5	35	DI7H
14	NO4	34	DI6L
13	COM4	33	DI6H
12	NC3	32	DI5L
11	NO3	31	DI5H
10	COM3	30	DI4L
9	NC2	29	DI4H
8	NO2	28	DI3L
7	COM2	27	DI3H
6	NC1	26	DI2L
5	NO1	25	DI2H

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Pin	Function	Pin	Function
4	COM1	24	DI1L
3	NC0	23	DI1H
2	NO0	22	DI0L
1	COM0	21	DI0H

Table 1-3: USB-7250 Pin Assignment

Signal Name	Reference	Direction	Description
COM<0..7>	----------	I	Common pin of relay <0..7>
NO<0..7>	COM<0..7>	I	Normal open pin of relay <0..7>
NC<0..3>	COM<0..3>	I	Normal close pin of relay <0..3>
DI<0..7>H	DI<0..7>L	I	High input of isolated differential digital input
DI<0..7>L	--------	I	Low input of isolated differential digital input
CNT<0,1>	GND<0,1>	I	Frequency/event counter channel
GND<0,1>	--------		Ground of Frequency/event counter

Table 1-4: USB-7250 I/O Signal Description

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2 Getting Started



The appropriate driver must be installed before connection to the computer system. See Section 1.5: Software Support for driver support information.

2.1 Unpacking Checklist

Before unpacking, check the shipping carton for any damage. If the shipping carton and/or contents are damaged, inform the dealer immediately. Retain the shipping carton and packing materials for inspection. Obtain authorization from the dealer before returning any product to ADLINK. Ensure that the following items are included in the package.

- USB-7230/7250
- Stand
- Two removable screw terminals
- USB cable (2-meter length)
- Railmount kit
- ADLINK All-in-One CD
- User's manual

2.2 Connecting the USB-7230/7250 Module

1. Turn on the computer.
2. Connect the USB-7230/7250 module to one USB 2.0 port on the computer using the included USB cable.
3. The first time the USB-7230/7250 module is connected, a New Hardware message appears. It will take a few seconds to load the firmware. When loading is complete, the LED indicator on the rear of the USB DAQ module changes from amber to green and the New Hardware message closes.
4. The USB-7230/7250 module can now be located in the hardware Device Manager.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

NOTE:

The USB-7230/7250 module is exclusively powered by the USB port and requires 400 mA @ 5 V. If the USB-7230/7250 module cannot be detected, power provided by the USB port may be insufficient.

2.3 Device ID

A rotary control on the rear of the module (as shown) controls device ID setting and can be set from 0 to 7. The device ID allows dedicated control of the USB-7230/7250 module irrespective of the connected USB port. When more than one USB module of the same type is connected, each must be set to a different ID to avoid conflicts and errors in operation.

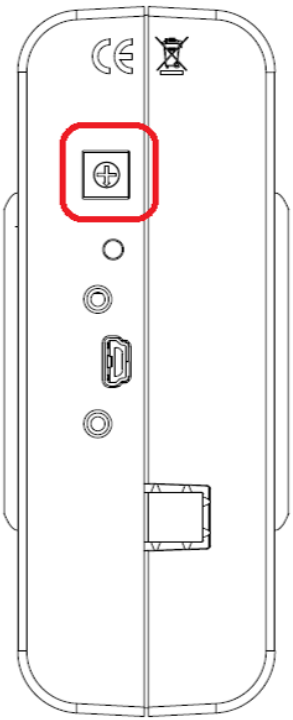


Figure 2-1: Device ID Selection Control

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

All remaining hardware configuration is software programmable, including sampling/update rate, input/output channel, input range, and others. Please see the UD-DASK Function Reference manual for details.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3 Operations

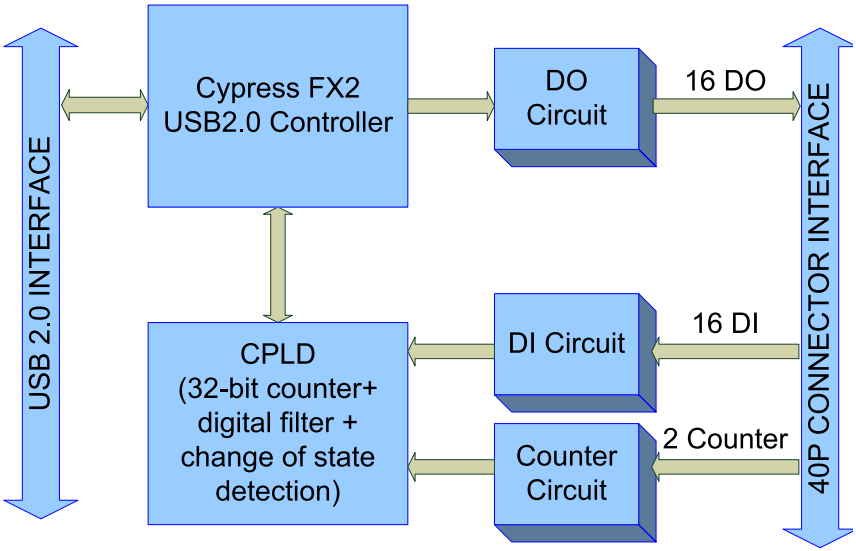


Figure 3-1: USB-7230 Functional Block Diagram

The USB-7250 provides 8CH optical isolation digital inputs, 8CH relay outputs (4CH form C and 4CH form A), and 2CH frequency/event counters.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

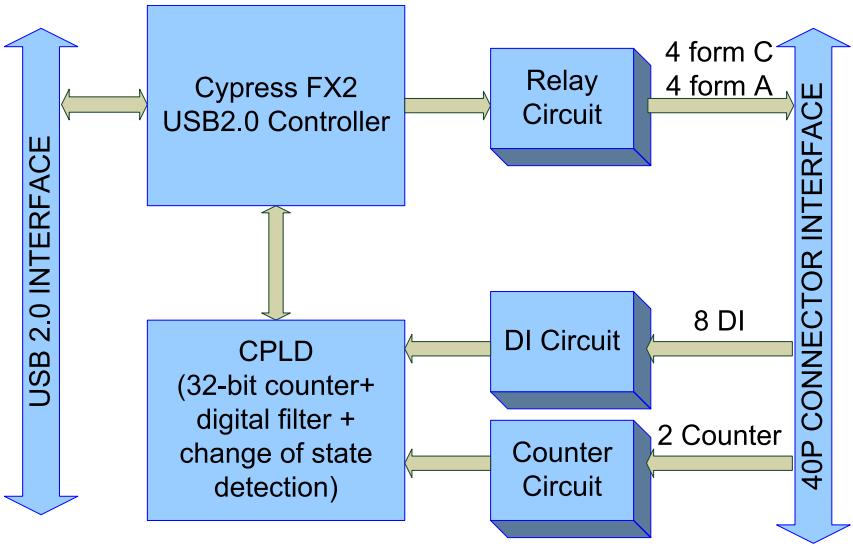


Figure 3-2: USB-7250 Functional Block Diagram

3.1 Isolated Digital Input

The USB-7230/7250 support 16 or 8 opto-isolated input channels,as follows, with digital input first routed through a photo-coupler (PC3H4), and normal input voltage range for high state from 5 to 24V.

NOTE:

For USB-7230, all digital inputs share the same common junction (COM), with connections either common power or common ground, and with USB-7250, each input channel has an individual differential input pair, preventing connections from being polarity sensitive, irrespective of the connected voltage.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

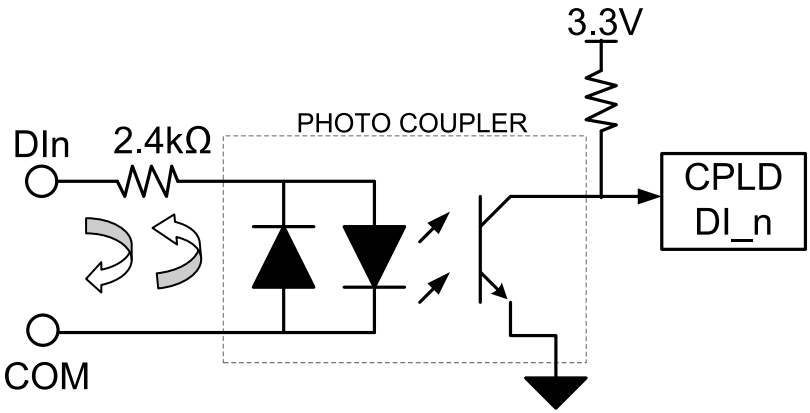


Figure 3-3: USB-7230 Isolated Input

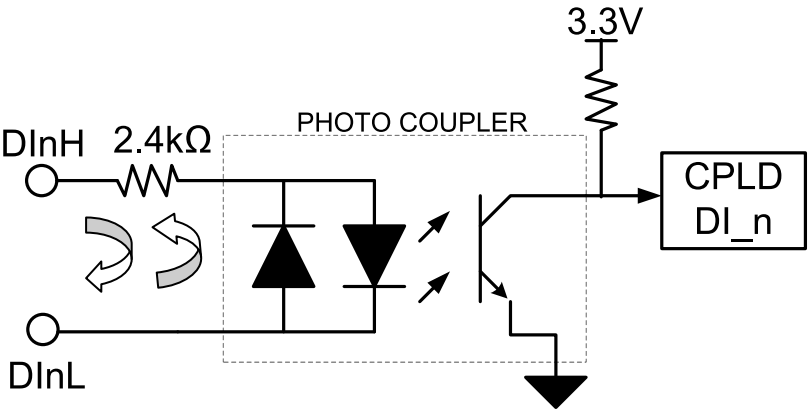


Figure 3-4: USB-7250 Isolated Input

3.2 Change of State (COS) Detection

COS (Change of State) refers to input state (logic level) changing from low to high or vice versa, wherein the COS detection circuit registers the edge of the level change.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

In the USB-7230/7250, the COS detection circuit is applied to all DI channels, with the channel(s) to enable COS detection selectable by software. When an enabled channel changes logic level, the COS detection circuit generates an interrupt request to the USB microcontroller, which, when detected, latches corresponding DI data into the COS latch register. In COS architecture, DI data is sampled by a 48 MHz base clock, such that pulse width of the digital input exceeds 21 ns, or the COS latch register cannot latch the correct input data. The COS latch register is cleared when the register is read out, resuming availability to latch the subsequent COS.

NOTE: Maximum frequency of COS detection depends on software latency and computer performance, and is not guaranteed if COS frequency exceeds 1 kHz.

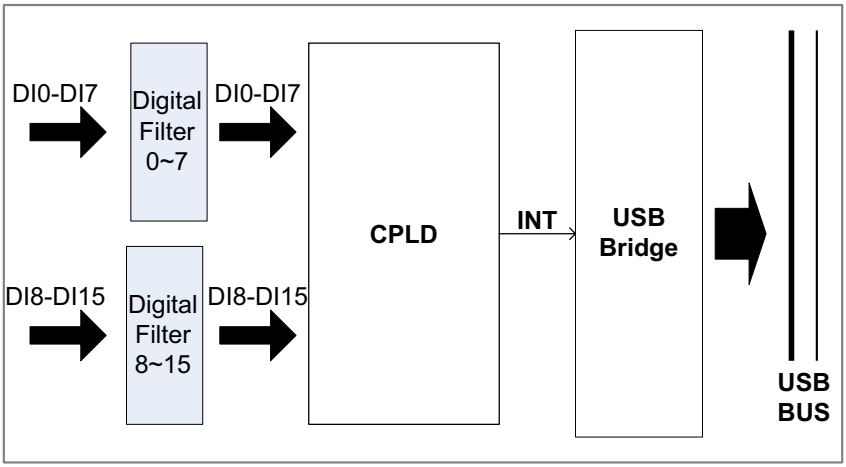


Figure 3-5: COS Detection Architecture

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

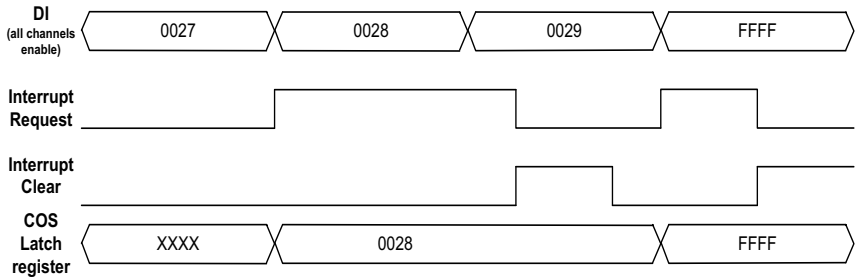


Figure 3-6: COS Example

3.3 Optical Isolated Frequency/Event Counter

Calculates the number of rising or falling edges occurring on the input channel, with counter width of 32 bits counting up from 0. The polarity (rising or falling edge) of valid events is software configurable.

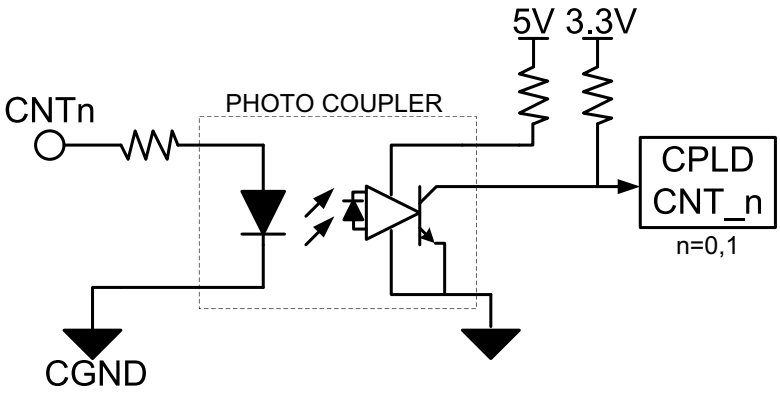


Figure 3-7: USB-7230/7250 Optical Isolated Frequency/Event Counter

The frequency counter base clock is 48MHz. The frequency counter calculates base clocks occurring within a period (rising edge to rising edge or falling edge to falling edge) of the repetitive input signal, which is then converted to frequency value. Counter polarity can be adjusted to rising edge active or falling edge active.

The following example shows frequency measurement of a 1 MHz signal by counter0 with rising-edge polarity and 500 kHz signal by

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

counter1 with falling-edge polarity. Counter value is updated and reset in every period.

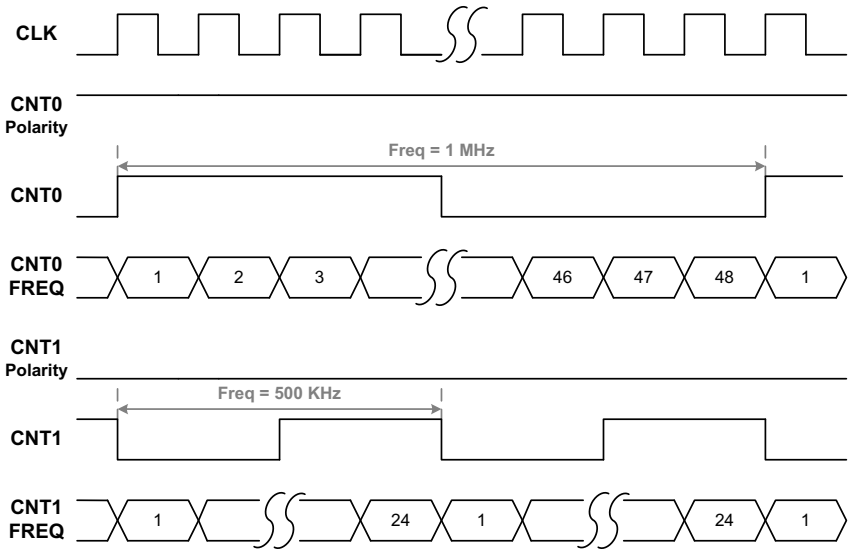


Figure 3-8: Frequency Counter Example

Since the signals are sampled by a 48MHz base clock, latch timing can generate measurement error, maximum error ratio vs. input frequency is as follows.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

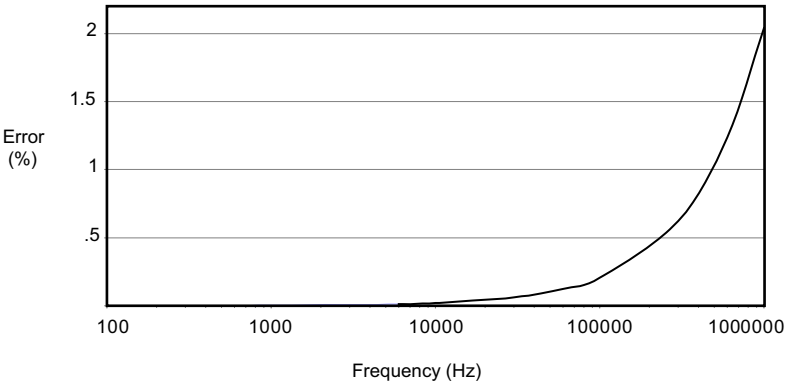


Figure 3-9: Frequency Counter Error %

3.4 Digital Filtering

Filters unexpected glitch signals from the input channels. By default, when enabled, the input channel ignores signal changes from one state to another when not remaining in the state for a pre-defined period. The digital filter function is applied on all DI channels and counters, with the default setting disabled. When enabled by software,it is necessary to configure the minimum pulse-width value. This value represents the minimum period of time guaranteed to pass through the filter when the signal changes. The digital filter uses an internal 16-bit counter to define the specified filter value. Data is sampled by a 48 MHz base clock, with minimum pulse-width value a multiple of 20.83 ns and multiple number from 1 to 65535, representing the minimum pulse-width from 20.83 ns to 1.365 ms.

In an examplary digital filter operation, as shown, data is sampled by a 48 MHz base clock, and filter stage is 10, such that minimum pulse width value is 208.3 ns. The pulse width of the first two signals is 180 ns, shorter than the specified filter value 208.3 ns. Accordingly, the first two pulses are ignored, and the next two signals, with pulse width of 230 ns (longer than the specified filter value 208.3 ns) are recognized. When pulse width of last two sig-

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

nals is 180 ns when filter is disabled, definitely, the last two states are recognized.

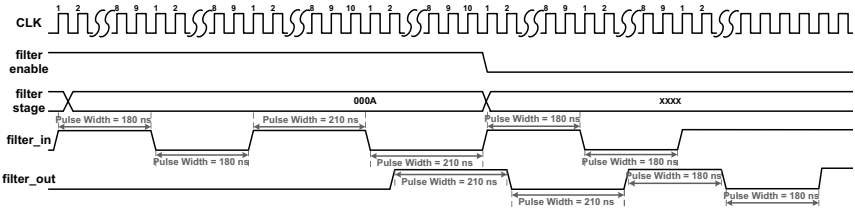


Figure 3-10: Digital Filter Example

To reject a signal deviating from a state for the specified period of time (minimum pulse width), the filter stage must be set to agree with: 20.83 ns × filter stage < minimum pulse Width (ns).

3.5 Isolated Digital Output (USB-7230 only)

As shown, when isolated digital output is ON, sink current is conducted through the power MOSFET, and when OFF, no current flows through the power MOSFET. When the load is of an “inductance nature” such as a relay, coil or motor, the VDD pin must be connected to an external power source, in order for the flywheel diode to form a current-release closed loop, protecting the power MOSFET from high reverse voltage generated by the inductance load when the output is switched. The DO output status is saved in the USB microcontroller and can be read back if necessary. The USB-7230 also features programmable power-up output status,allowing output in a known state when powered on. When the module is powered off (ejected from the USB port), all digital output reverts to OFF.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

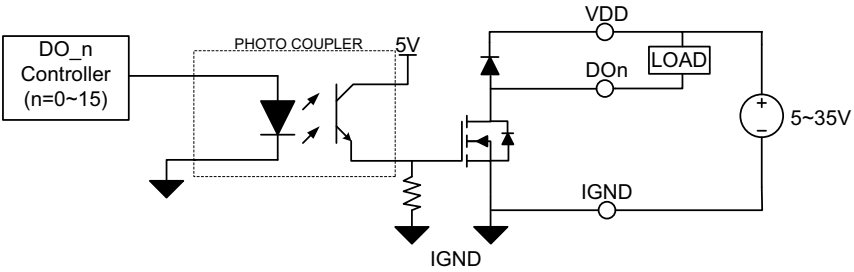


Figure 3-11: USB-7230 Isolated Output

3.6 Relay Output (USB-7250 only)

USB-7250 provides Form C and Form A relays, with channels 0 to 3 Form C, and 4 to 7 form A, as shown.

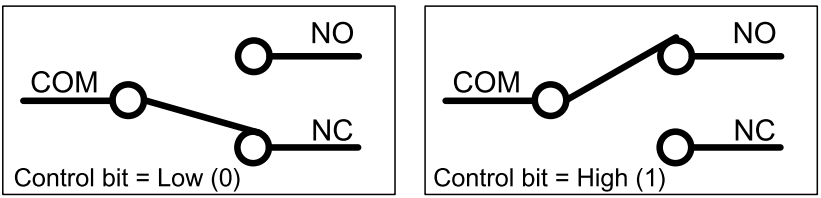


Figure 3-12: Form C Relay

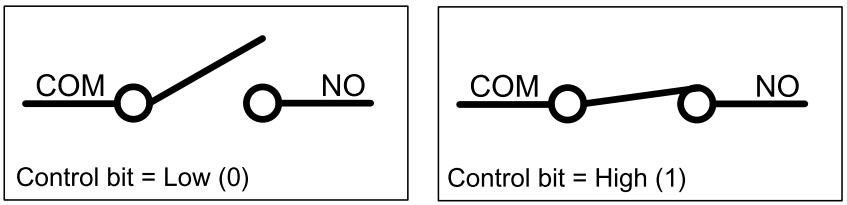


Figure 3-13: Form A Relay

Form C relays have NC (Normal Close), NO (Normal Open), and COM (Common) contacts. The COM terminal, located in the center,must contact either the NO pole or NC pole. When the control bit is high (1), contact is made between the COM terminal and NO pole, and if low (0), between the COM terminal and NC pole. Form

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

A relays have only NO (Normal Open) and COM (Common) contacts. When the control bit is high (1), the COM terminal and NO pole contact. If the control bit is low (0), no contact takes place. Current relay output status can be read back by software, and during normal power up, reset, and power down (ejection from USB port), the relay is low status. In addition, USB-7250 also features programmable power-up output status, providing output state when powered up.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Important Safety Instructions

For user safety, please read and follow all instructions, Warnings, Cautions, and Notes marked in this manual and on the associated device before handling/operating the device, to avoid injury or damage.

S'il vous plaît prêter attention stricte à tous les avertissements et mises en garde figurant sur l'appareil , pour éviter des blessures ou des dommages.

- Read these safety instructions carefully
- Keep the User's Manual for future reference
- Read the Specifications section of this manual for detailed information on the recommended operating environment
- The device can be operated at an ambient temperature of 50ºC
- When installing/mounting or uninstalling/removing device; or when removal of a chassis cover is required for user servicing (See "Getting Started" on page 25.):
  - Turn off power and unplug any power cords/cables
  - Reinstall all chassis covers before restoring power
- To avoid electrical shock and/or damage to device:
  - Keep device away from water or liquid sources
  - Keep device away from high heat or humidity
  - Keep device properly ventilated (do not block or cover ventilation openings)
  - Always use recommended voltage and power source settings
  - Always install and operate device near an easily accessible electrical outlet
  - Secure the power cord (do not place any object on/over the power cord)
  - Only install/attach and operate device on stable surfaces and/or recommended mountings
- If the device will not be used for long periods of time, turn off and unplug from its power source

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

- Never attempt to repair the device, which should only be serviced by qualified technical personnel using suitable tools
- A Lithium-type battery may be provided for uninterrupted backup or emergency power.



Risk of explosion if battery is replaced with one of an incorrect type; please dispose of used batteries appropriately.
Risque d'explosion si la pile est remplacée par une autre de type incorrect. Veuillez jeter les piles usagées de façon appropriée.

- The device must be serviced by authorized technicians when:
  - The power cord or plug is damaged
  - Liquid has entered the device interior
  - The device has been exposed to high humidity and/or moisture
  - The device is not functioning or does not function according to the User's Manual
  - The device has been dropped and/or damaged and/or shows obvious signs of breakage
- Disconnect the power supply cord before loosening the thumbscrews and always fasten the thumbscrews with a screwdriver before starting the system up
- It is recommended that the device be installed only in a server room or computer room where access is:
  - Restricted to qualified service personnel or users familiar with restrictions applied to the location, reasons therefor, and any precautions required
  - Only afforded by the use of a tool or lock and key, or other means of security, and controlled by the authority responsible for the location

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

	**BURN HAZARD** Touching this surface could result in bodily injury. To reduce risk, allow the surface to cool before touching. ***RISQUE DE BRÛLURES*** *Ne touchez pas cette surface, cela pourrait entraîner des blessures.* *Pour éviter tout danger, laissez la surface refroidir avant de la toucher.*

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Getting Service

Ask an Expert: http://askanexpert.adlinktech.com

ADLINK Technology, Inc.
Address: 9F, No.166 Jian Yi Road, Zhonghe District
New Taipei City 235, Taiwan
新北市中和區建一路 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 (China) Co., Ltd.
Address: 上海市浦东新区张江高科技园区芳春路 300 号 (201203)
300 Fang Chun Rd., Zhangjiang Hi-Tech Park
Pudong New Area, Shanghai, 201203 China
Tel: +86-21-5132-8988
Fax: +86-21-5132-3588
Email: market@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 Shang Di East Rd.
Beijing, 100085 China
Tel: +86-10-5885-8666
Fax: +86-10-5885-8626
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, Bldg. 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

LiPPERT ADLINK Technology GmbH
Address: Hans-Thoma-Strasse 11
D-68163 Mannheim, Germany
Tel: +49-621-43214-0
Fax: +49-621 43214-30
Email: emea@adlinktech.com

PENTA ADLINK Technology GmbH
Ulrichsbergerstrasse 17
94469 Deggendorf, Germany
Tel: +49 (0) 991 290 94 – 10
Fax: +49 (0) 991 290 94 - 29
Email: emea@adlinktech.com

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

ADLINK Technology, Inc. (French Liaison Office)
Address: 6 allée de Londres, Immeuble Ceylan
91940 Les Ulis, 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: 〒101-0045 東京都千代田区神田鍛冶町 3-7-4
神田 374 ビル 4F
KANDA374 Bldg. 4F, 3-7-4 Kanda Kajicho,
Chiyoda-ku, Tokyo 101-0045, Japan
Tel: +81-3-4455-3722
Fax: +81-3-5209-6013
Email: japan@adlinktech.com

ADLINK Technology, Inc. (Korean Liaison Office)
Address: 경기도 성남시 분당구 수내로 46 번길 4 경동빌딩 2 층
(수내동 4-4 번지) (우) 463-825
2F, Kyungdong B/D, 4 Sunae-ro 46 beon-gil
Bundang-gu, Seongnam-si, Gyeonggi-do, Korea, 463-825
Toll Free +82-80-800-0585
Tel +82-31-786-0585
Fax +82-31-786-0583
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: #50-56, First Floor, Spearhead Towers
Margosa Main Road (between 16th/17th Cross)
Malleswaram, Bangalore - 560 055, India
Tel: +91-80-65605817, +91-80-42246107
Fax: +91-80-23464606
Email: india@adlinktech.com

ADLINK Technology, Inc. (Israeli Liaison Office)
Address: 27 Maskit St., Corex Building
PO Box 12777
Herzliya 4673300, Israel
Tel: +972-54-632-5251
Fax: +972-77-208-0230
Email: israel@adlinktech.com

ADLINK Technology, Inc. (UK Liaison Office)
Tel: +44 774 010 59 65
Email: UK@adlinktech.com

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000