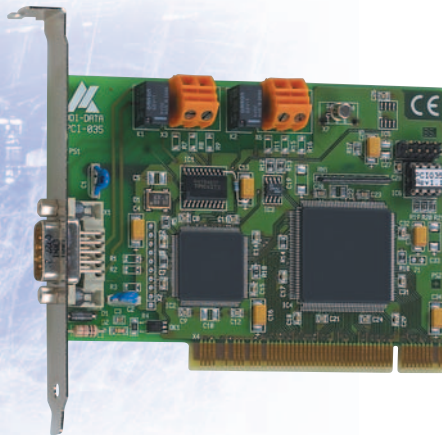# Watchdog board
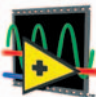# with 4 watchdogs/timers, isolated

ADDI-DATA®

APCI-035

4 watchdogs/timers

2 relays with change-over contacts

1 digital input, 24 V

2 alarm levels

**Temperature monitoring
from - 45 °C to + 135 °C**

LabVIEW™

LabWindows/CVI™

Maximise the reliability of your Telecom, ISP, Voice Mail, File Server or industrial systems under Windows operating systems with the new APCI-035 PCI watchdog board.

The board is equipped with 4 watchdogs which can monitor software and hardware tasks independently from each other.

The PCI watchdog board APCI-035 has a two-level alarm system and can initiate a hardware reset in case of emergency. The principle is based on the computer software having to send signals to the board in regular intervals.

If the board does not receive an expected signal within a certain period of time, the first alarm level is activated. The emergency program is started which determines the cause and tries to remove the error. If this fails, the operating system and, if necessary, external devices are prepared for the hardware reset. The second alarm level is automatically triggered after a defined timeout.

Wachdog 1 can be programmed with 1 of 4 different time units (µs, ms, s, min). The alarm levels are controlled through 1 trigger channel and 4 different time bases.

The internal PC temperature can be monitored through the on-board temperature sensor.

Features

Watchdog
- 4 watchdogs/timers
- 1 trigger channel/gate input (24 V)
- Activation through software
- Configuration through software, readable
- Can be triggered through software or digital input
- Time base for the watchdog/timer: µs, ms, s, min
- Two completely separated programmable alarm levels:
  - Level 1 generates an interrupt or switches the warning relay
  - Level 2 switches the reset relays.
- With the two-level alarm, the operating system can be warned through an interrupt that a hardware reset is going to take place. There is then enough time to close the active tasks.
- The alarm time can be read back at any time, so that the time remaining for further tasks can be established.
- Switching time of the reset relay: 2 s

Defined state after booting
- The watchdogs are switched off through the system reset

Diagnostic
- The status of the 4 watchdogs is readable
- 1 digital input (watchdog trigger or timer gate)
- Watchdog 1 can switch 2 software-controlled relays

Safety
- Optical isolation 500 V

Temperature measurement
- 1 temperature on-board sensor
- Alarm function when a programmable limit value is exceeded

EMC tested acc. to 89/336/EEC
- IEC 61326: electrical equipment for measurement, control and laboratory use

Applications
- Control of industrial PC-based process
- Time measurement
- Timer-driven software applications
- Temperature monitoring

Software drivers

A CD-ROM with the following software and programming examples is supplied with the board.

Standard drivers for:
Linux Kernel version 2.4.2, Windows XP/2000/NT/98
Real-time drivers for Windows XP/2000/NT/98
Die board is supplied with ADDIPACK (see Page 5).

Drivers for the following application software:
LabVIEW 5.01 • LabWindows/CVI 5.01

Samples for the following compilers:
Microsoft VC++ 5.0 • Borland C++ 5.01
Delphi 4.0 • Visual Basic 5.0

Software functions for ADDIPACK:
Interrupt • Watchdog • Timer • Temperature

Current driver list on the web: www.addi-data.com

Watchdog board
with 4 watchdogs/timers, isolated

Specifications

Addressing:	32-bit
Addressing range:	256 bytes
Interrupt:	through BIOS
Optical isolation:	500 V (from the PC to the peripheral)

Watchdog/Timer

Depth:	8-bit
Switching time of the reset relays:	2 s
4 programmable watchdogs/timers:	Time selectable from 2 µs to 255 min.
Time units:	µs, ms, s, min.

Temperature monitoring

Accuracy:	± 2°C
Measurement range:	-45°C to 135°C (Real range of application 0-60°C)
Resolution:	8-bit

Relay data

Type of contacts:	2 change-over contacts
Max. switching voltage:	60 VAC, 48 VAC
Max. switching current:	1 A
Max. switching capacity:	62.5 VA, 30 W
Min. permissible load:	1 mA / 5 VAC
Nominal load:	1 A 24 VAC
Contact resistance:	< 100 mΩ
Contact material:	Ag + Au-plated
Response time:	max 5 ms, typ. 2.5 ms
Release time:	max 5 ms, typ. 0.9 ms
Mechanical life:	5×10^6 operations
Electrical life at 24 V:	10^5 operations
Test voltage:	1000 VAC, 50/60 Hz 5 s between coil and contacts 400 VAC, 50/60 Hz 5 s between the open contacts

Digital input

Nomin. input current at 24 V:	6 mA
Nomin. input voltage:	24 V
Switching threshold:	>16 V for logical "1".

Noise immunity

Test level:	- ESD: 4 kV
	- Fields: 10 V/m
	- Burst: 4 kV
	- Conducted radio interferences: 10 V

Physical and environmental conditions

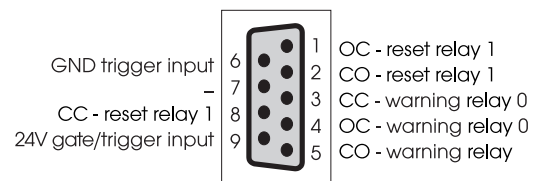|	
Dimensions:	120 x 85 mm
System bus:	PCI 32-bit acc. to specification 2.1 (PCISIG)
Place required:	1 PCI slot
Operating voltage:	+5 V, ± 5 % from PC
Current consumption:	240 mA ± 10 % typ.
Front connector:	9-pin SUB-D male connector
Temperature range:	0 to 60 °C (with forced cooling)

Simplified block diagram
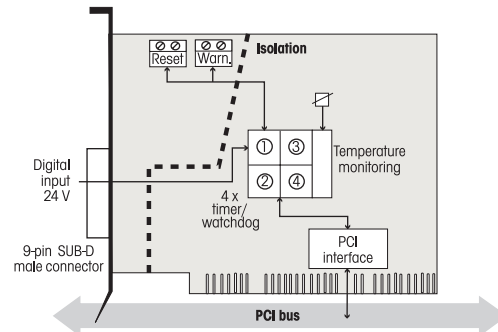
Possible settings of the alarm system

Function settings through software
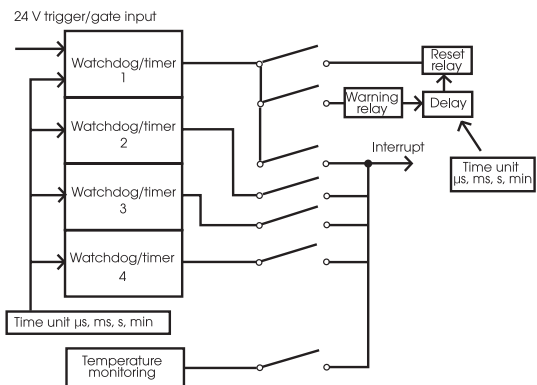
Level 1: Interrupt / warning relay
Level 2: Reset relay / reset generated through reset switch of the PC system

Pin assignment – 9-pin SUB-D male connector

Pin	
GND trigger input	6
–	7
CC - reset relay 1	8
24V gate/trigger input	9
1	OC - reset relay 1
2	CO - reset relay 1
3	CC - warning relay 0
4	OC - warning relay 0
5	CO - warning relay

CO: Change-over contact
CC: Closing contact
OC: Opening contact

ORDERING INFORMATION

ADDIMULTI APCI-035

APCI-035: Watchdog board, isolated. Incl. technical description and software drivers