Contents

CHAPTER 1

Introduction

Introduction

The PCL-841 is a special purpose communication card that brings thc Control Area Network to your PC. With the built-in CAN controller, the PCL-84 l provides bus arbitration and error detcction with automatic transmission repeat function. This drastically avoids data loss and ensures system reliability. The on-board CAN controllers arc located at different positions in thc memory. You can run both CAN controllers at the same time, independently. The PCL-84 1 opcrates at baud rates up to I Mbps and can be installcd directly into thc cxpansion slot of your PC.

Control Area Network

Thc CAN (Control Area Network) is a serial bus systcm cspecially suitcd for networking “intelligent” 1/0 deviccs as well as sensors and actuators within a machine or plant. Characterized by its multi-mastcr protocol, rcal-time capability, error correction, high noise immunity, and thc cxistencc of many different silicon components, the CAN serial bus system, originally developed by Bosch for use in automobiles, is increasingly being used in industrial automation.

Direct memory mapping

The PCL-84 1 is assigned with memory address, which allows direct access to the CAN controller. This is the simplest and fastest way of programming any board in a PC because the board is regarded as standard RAM.

Optical Isolation Protection

On-board optical isolators protect your PC and equipment against damage from ground ioops, increasing system reliability in harsh environments.

Features

- Operates two separate CAN networks at the same time
- High speed transmission up to I Mbps
- 16 MHz CAN controller frequency
- Takes a 4 KB address space, 40 base address adjustable in steps from C800H up to EFOOH
- Optical isolation protection of 1000 VDC ensures system reliability
- Wide IRQ selection for each port includes: IRQ3, 4, 5, 6, 7, 9, 10, 11, 12, 15
- LED indicates Transmit/Receive status on each port
- Direct memory mapping enables speedy access to the CAN controllers
- C library and examples included

Specifications

- **Ports:** 2
- **CAN controller:** SJA-1000
- **CAN transceiver:** 82C250
- **Signal support:** CAN-L, CAN-H
- **Memory address:** From C800H to EFOOH
- **IRQ:** 3, 4, 5, 6, 7, 9, 10, 11, 12, 15
- **Isolation voltage:** 1000 V_{DC}
- **Power consumption:** +5 V @ 400 mA typical, 950 mA max.
- **Connectors:** Dual DB-9 male connectors
- **Operating temperature:** 32 to 1 22º F (0 to 50º C)
- **Dimensions:** 7.25" x 4. 13" (18.4 x 10.5 cm)
- **Shipping weight:** 0.9 lb (0.4 kg)

CHAPTER 2

Hardware Installation

Initial inspection

You should find the following items inside the shipping package (in addition to this manual):

- PCL-841 Dual-port CAN Interface Card
- C Driver and DataMonitor Utility Diskette

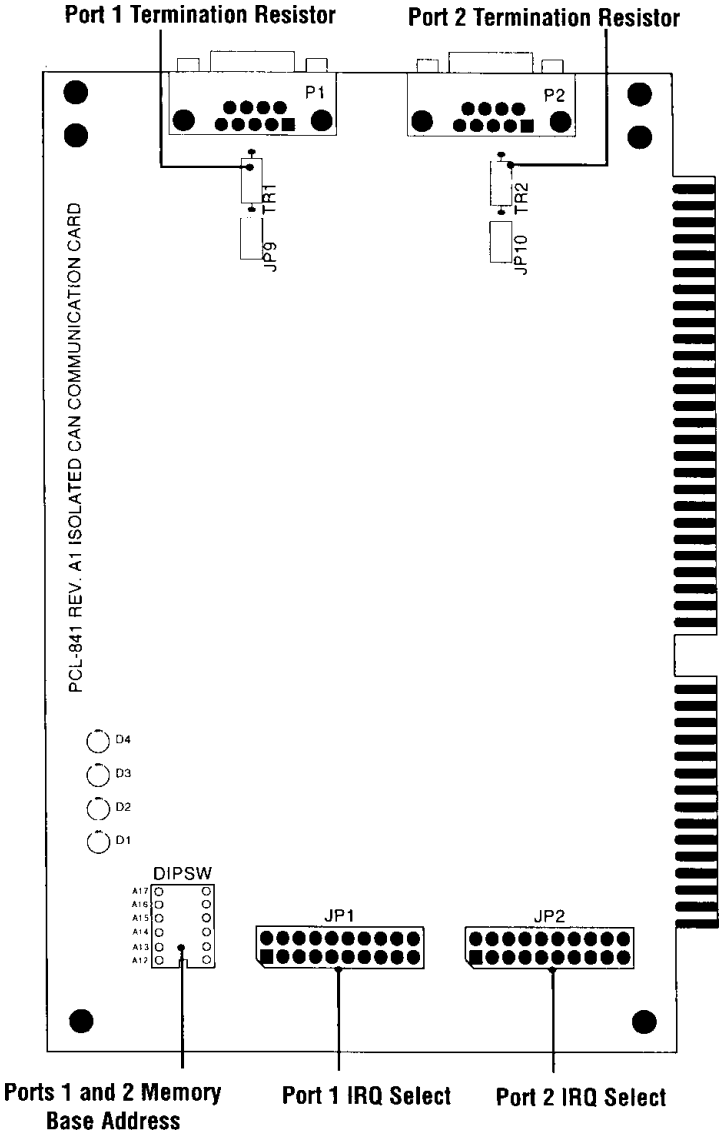
We have carefully inspected the PCL-841 mechanically and electricalIy before shipping. It should be free of marks and scratches and in perfect working order upon receipt.

As you unpack the PCL-841, check it for signs of shipping damage (damaged box, scratches, dents, etc.). If it is damaged or it fails to meet specifications, notify our service department or your local representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection we will make arrangements to repair or replace the unit.

When you handle the PCL-841, remove it from its protective packaging by grasping the rear metal panel. Keep the anti-vibration packing. Whenever you remove the card from the PC, store it in this package for protection.

Warning! *Modern electronic devices are very sensitive to damage from static electricity. Ground yourself before you touch the card. We recommend that you ~use a grounded wrist strap and place the card on a static dissipative mat wheneveryou work with it. At the very least, touch the back of the grounded chassis of the system unit (metal) before you handle the board. Avoid contact with materials that hold a static charge, such as styrofoam. Do not touch the exposed circuit connectors.*

Jumper and switch locations



Card configuration

The PCL-841 has two ports, each with one jumper. The jumpers set the IRQ for the ports, which can be configured separately. A DIP switch sets the memory base address for each port. The following chart shows the function of the jumper and the switch (see the previous page for jumper and switch locations).

Switch and jumper functions	
CAN controllers	
JP1	Po rt 1
JP2	Port 2
Mennory base address	
SW1	Port 1, Port 2

Default settings

Port I is set for COMI (IRQ=12, Memory address=DA00:0000).

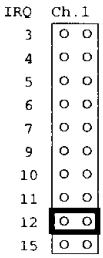
Port 2 is set for COM2 (IRQ=IS, Memory address=DA00:0200). ;

If you need to change these settings, see the following sections. Otherwise, you can simply install the card. Note that you will need to disable your CPU card's on-board COM ports, if any, or set them to alternate addresses/IRQs.

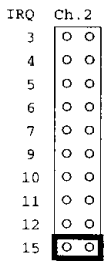
Interrupt (IRQ) setup (JP1 and JP2)

Jumpers JPI and JP2 set the interrupts for Port I and Port 2, respectively. You can choose any IRQ from 3 to 15, except 8, 13 and 14. When you choose IRQs, make sure they are not used for other cards in the system. The following figures show the card's default settings.

JP1: Port 1 IRQ Default



JP2: Port 2 IRQ Default



Memory base address (SW1)

The memory base address for the PCL-841, which requires 4 KB of address space, is made up of the memory segment and its associated offset. The address for the memory segment is set through SWI, a six-position DIP switch. You can choose any base address from C800 to EFOO. The following table shows the DIP switch settings and the corresponding base addresses.

Memory address configUration (SW1)

Address/DIPswitch	A12	A13	A14	A15	A16	A17
C800H	on	on	on	off	on	on
C9OOH	off	on	on	off	on	on
CAOOH	on	off	on	off	on	on
CBOOH	off	off	on	off	on	on
CCOOH	on	on	off	off	on	on
CDOOH	off	on	off	off	on	on
CEOOH	on	off	off	off	on	on
CFOOH	off	off	off	off	on	on

Mennory address configUration (SW1) cont'd						
Address/DIP switch	A12	A13	A14	A15	A16	A17
DOOOH	on	on	on	on	off	on
D100H	off	on	on	on	off	on
D200H	on	off	on	on	off	on
D300H	off	off	on	on	off	on
D400H	on	on	off	on	off	on
DSOOH	off	on	off	on	off	on
D600H	on	off	off	on	off	on
D700H	off	off	off	on	off	on
D800H	on	on	on	off	off	on
D9OOH	off	on	on	off	off	on
DAOOH	on	off	on	off	off	on
DBOOH	off	off	on	off	off	on
DCOOH	on	on	off	off	off	on
DDOOH	off	on	off	off	off	on
DEOOH	on	off	off	off	off	on
DFOOH	off	off	off	off	off	on
EOOOH	on	on	on	on	on	off
E100H	off	on	on	on	on	off
E200H	on	off	on	on	on	off
E300H	off	off	on	on	on	off
E400H	on	on	off	on	on	off
ESOOH	off	on	off	on	on	off
E600H	on	off	off	on	on	off
E700H	off	off	off	on	on	off
E800H	on	on	on	off	on	off
E9OOH	off	on	on	off	on	off
EAOOH	on	off	on	off	on	off
EBOOH	off	off	on	off	on	off
ECOOH	on	on	off	off	on	off
EDOOH	off	on	off	off	on	off
EEOOH	on	off	off	off	on	off
EFOOH	off	off	off	off	on	off

Memory area

Once the memory segment for the base address is selected, the offset will be automatically assigned for Port 1, Port 2, and hardware reset. The following table shows the base addresses of the CAN controllers.

Base address (hex)	CAN controller
base:0000h - base:00FFh	Basic- Port 1
base:0100h - base:01FFh	HW reset Basic - Port 1
base:0200h - base:02FFh	Basic- Port 2
base:0300h - base:03FFh	HW reset Basic - Port 2
base:0400h - base:0FFFh	Not used

CHAPTER 3

Software Programming

Library functions

Quick reference table

The following table lists the available functions and their corresponding syntax and descriptions.

Liorary functions

Function	Syntax (in C)	Description
1	caninitHW()	Sets IROs
2	canExitHW()	Releases settings
3	canReset()	Resets CAN port
4	canConfig()	Controls CAN port settings
5	canNormalR~n()	Sets mode
6	canSendMsg()	Sends message
7	canReceiveMsg()	Reads data

Complete function description

Function 1

Sets an IRQ number for Port I and Port 2.

- **Command** canluitHW (Ul segment, BYTE IRQ I, BYTE IRQ2)
- **Argument** UI segment, BYTE IRQI, BYTE IRQ2
  segment=c000-df00 step 0x100
  IRQI=Port I IRQ number 0 (polling),
  3, 4, 5, 6, 7, 8, 9, 10, 1 1, 12, 14, 15
  IRQ2=Port 2 IRQ number 0 (polling),
  3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15
  0: polling
- **Response** l=successful
  0=fail

- **Example**

```
#include "can841.h"
main()
{
    Ul gSegment=0xDA00;
    BYTE CANl_IRQ, CAN2 IRQ;
    CANI_IRQ=12;
    CAN2_IRQ= 15;
    if (canluitHW (gSegment, CANI_IRQ, CAN2_IRQ)==0)
        printf ("HARDWARE INITIALIZATION ERROR!\n");
}
```

Function 2

Releases all seuings of the CAN card.

- **Command** canExitHW()
- **Argument** None
- **Response** l=successful
  0=fail
- **Example**

```
#include "can84 1.h"
main()
{
    if (canExitHW()==0)
        printf ("CAN RELEASE FAIL!\n");
}
```

Function 3

Resets CAN port and flushes the TX/RX buffers.

- **Command** int canReset (BYTE port);
- **Argument** BYTE port;
  port= port number (0 or 1)
- **Response** l=successful
  0=fail

- **Example**

```
#include "can84 1 .h"
main()
{
    if (canReset (0)==0)
        printf ("RESET PORT I FAIL! n");
}
```

Function 4

Controls the setting of the CAN port's acceptance code, acceptance mask, and bus timing register.

- **Command** canConfig (BYTEport, CAN STRUCTcan);
- **Argument** BYTE port, CAN_STRUCT can;
  port= port number (0 or 1)
  can= CAN struct pointer
- **Response** l=successful
  0=fail
- **Example**

```
#include "canB4 1.h"
main()
{
    CAN_STRUCT canl, can2;
    can 1.acc_code=0;
    can 1. acc_mask=0xff;
    can 1.bt0=0;
    can 1.bt I =0x 1 c;
    if (canConfig(0,canl)==0)
        printf ("CAN PORT I CONFIGURE ERROR!\n");
}
```

Function 5

Sets a CAN port to normal mode for normal operation.

- **Command** canNormalRun (BYTE port);
- **Argument** BYTE port;
  port= port number (0 or 1)

- **Response** l=successful
  0=fail

- **Example**

```
#include "can84 1.h"
main()
{
    if (canNormalRun(0)==0)
        printf ("CAN Port I can't change to Normal Mode!\n");
}
```

Function 6

Tells the CAN port to send a message.

- **Command** canSendMsg (BYTE port, MSG_STRUCT send msg);
- **Argument** BYTE port, MSG_STRUCT send_msg;
  port= port number (O or 1)
  send msg= send buffer pointer
- **Response** l=successful
  0=fail

- **Example**

```
#include "can84 1.h" main()
{
    MSG_STRUCT smsg 1;
    Ul i;
    smsg 1.id=0x015;
    smsg l.rtr=0;
    smsg l.dlen=8;
    for(i=0; i<smsg l.dlen; i++)
        smsg l.data[i]=i;
    if (canSendMsg(0,smsg 1)==l)
        printf ("TRANSMISSION SUCCESSFUL!\n");
{
```

Function 7

Read data from CAN port input buffer.

- **Command** int canReceiveMsg (BYTE port, MSG STRUCT *msg ptr);
- **Argument** BYTEport, MSG_STRUCT *msg ptr;
  port= port number (O or 1)
  *msg_ptr= input buffer pointer
- **Response** l=message received
  0=no message received
- **Example**

```
#include "can841.h"
main()
{
    MSG_STRUCT rmsg2;
    if(canReceiveMSG, *rmsg2)==1)
    {
        printf ("Port2 receive: ID=%3X RTR=%ld
            Length=%ld", rmsg2.id rmsg2.rtr, rmsg2.dlen);
        for (i=0; i<rmsg2.dlen; i++)
            cprintf (" %2X", rmsg2.data[i]);
    }
}
```

Example program

The following example program, can84 I.lib, implements the sending and receiving of messages over the CAN controller. The program is written in C.

```
#include "can841.h" /*Library function declaration*/
/*-----------------------------------------------*/

/* CAN controller interrupt connection */
#define CAN1_IRQ 12 /* 0 means polling */
#define CAN2_IRQ 15 /* 0 means polling */
#define PORT1 0
#define PORT2 1
#define FAIL 0
#define SUCCESS 1

void main(void)
(
  /* Declare the CAN card segment address. */
  UI gSegment=OxDA00;
  CAN_STRUCT canl, can2;
  MSG_STRUCT smsql, smsg2;
  MSG_STRUCT rmsql, rmsg2;
  UI i;

  if(canInitHW(gSegment,CANl_IRQ,CAN2 IRQ)==FAIL)
     {
        clrscr();
        cprintf("\n\n Hardware Initialization Error.');
        return;
     }

     /* Reset CAN controller */
     canReset(PORT1);
     canReset(PORT2);

     canl.acc_code=0;            /*                    */
     canl.acc mask=Oxff;         /*                    */
     canl.btO=03;                /* baud rate lMbps    */
     canl.btl=0xlc;
     if(canConfig(PORTl,canl)==FAIL)
     {
        clrscr();
        cprintf("\n\n CAN Port %d Configuration Error",1);
        return;
{
```

```
    memcpy(&can2, &canl, sizeof(CAN_STRUCT));
    if(canConfig(PORT2,can2)==FAIL)
    {
      clrscr();
      cprintf("\n\n CAN Port %d Configuration Error", 2);
      return;
    }
    canNormalRun(PORTl); /* Put CAN1 into normal mode. */
    canNormalRun(PORT2); /* Put CAN2 into normal mode. */

    clrscr();

    smsgl.id = 0x015; /* Set ID =8 */
    smsql.rtr=l; /* Data lengths =8*/
    smsgl.dlen=8;
    for(i=0; i<smsql.dlen; i++)
    smsgl.data[i] =i;
    while(l)
    {
      canSendMsg(PORTl, smsgl); /* Send to CAN1 */
      if(canReceiveMsg(PORT2, &rmsg2)==1)
      {
         cprintf("PORT2 receive:ID=%3X RTR=%ld Length=%ld",
           rmsg2.id,rmsg2.rtr, rmsg2.dlen);
         for(i=0; i< rmsg2.dlen; i++)
           cprintf(" %2X",rmsg2.data[il);
         printf("\n");
      }
      if (kbLit())
      {
         getch();
         break;
      }
    }

    /* Reset CAN controller. */
    canReset(PORTl);
    canReset(PORT2);
    canExitHW();
    clrscr();
}
```

CHAPTER 4

DataMonitor Utility

Software overview

The PCL-841 comes with a utility disk with the following software capabilities:

- CAN controller configuration
- CAN transmission monitoring
- Terminal emulation

Main Menu

Run DataMonitor at the DOS prompt. DataMonitor's main menu screen will appear as shown below:

The main screen consists of:

A. Menu bar: Lists the available functions. From the main menu you can select Configuration, Monitoring, and Terminal.

B. Monitor screen: Shows monitored data, including message index, CAN device ID, data length, and data.

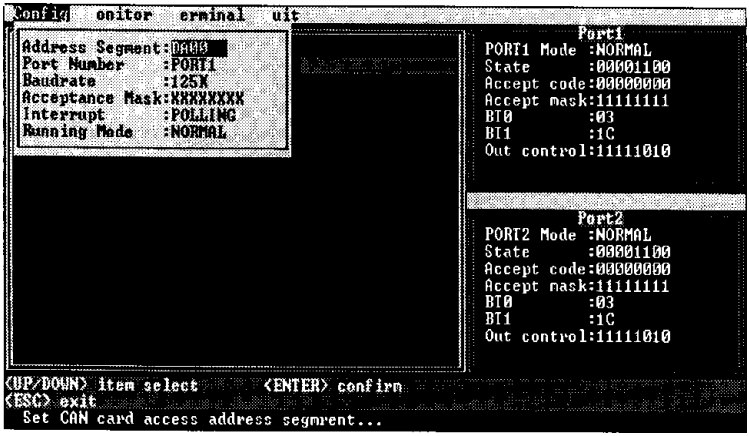
C. Status fields: Display the status of the two ports and the stanus register of the CAN controllers.

D. On-line help/message bar: Shows various key commands and states the function of the currently highlighted item.

Configuration

Before you transmit a CAN object, you must configure the CAN controller by selecting the <Config> menu with the cursor keys and pressing <Enter>. The Configuration function determines the ports to be used and their communication parameters.

The port configuration window is shown below.



The parameters below need to be configured for each CAN controller:

Address segment: The base address (address segment) of the PCL-j 841 is normally adjusted during the installation process. The selection of the address segment needs to be the same as that of the hardware configuration.

Port: Select the port you want to configure.

Baud rate: The baud rate must be coordinated with the CAN network. Choose the appropriate one from the list of baud rates.

Acceptance code: Specifies the value of the 8 most significant bits of the identifier (ID 10 ... ID 3)

Acceptance mask: Specifies the bit positions which are "relevant", for acceptance filtering.

Note: The acceptance code and acceptance mask are configured through eight digits (I digit per bit) using 0 or 1.

Value	Definition
0	This bit position will accept only a'.relevantl message.
1	This bit position will not screen messages.

Example: Acc Code = 11111111
AccMask= 11111111

The shown acceptance filter will accept every received message.

Interrupt: Sets the interrupt for each port. Be sure that this setting matches the IRQ already selected for the PCL-841, which accepts values between IRQ3 to IRQ15, except 8 and 13.

Running mode: During the normal configuration and communication process, select Normal Mode. When the system fails, you can hit <Enter> to reset the CAN controller. Hit <Enter> again to return to Normal Mode to further execute your configuration.

Monitor

Select the port to be monitored from the <Monitor> pull-down menu. Press F3 to start and stop the monitoring process.

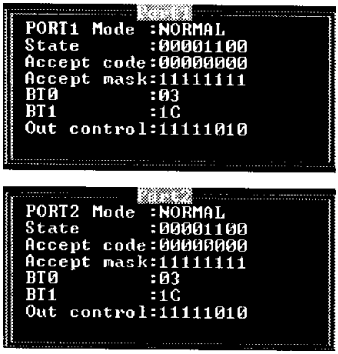
Monitor screen

The monitored data for a selected port appears in the monitor screen (see area B in the diagram under Main Menu section.)

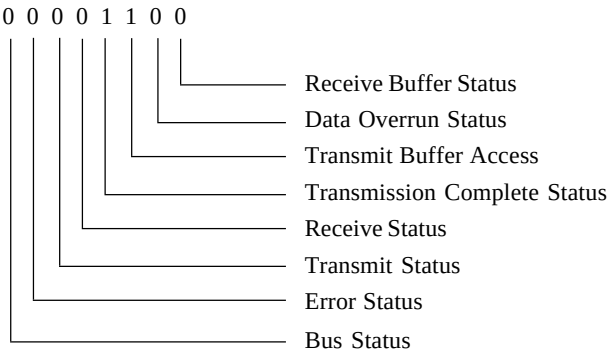
If the CAN controller is configured correctly and the transmission has been successfully completed, every CAN object will be shown inorder of appearance.

status Fields

Status fields at the right of the screen display the status of the two ports:



The status fields show information including the Mode (Normal or Reset), Acceptance Code, Acceptance Mask, BTR0, BTRI, Output Control Register, and Status Register. The normal value of the Status Register is:



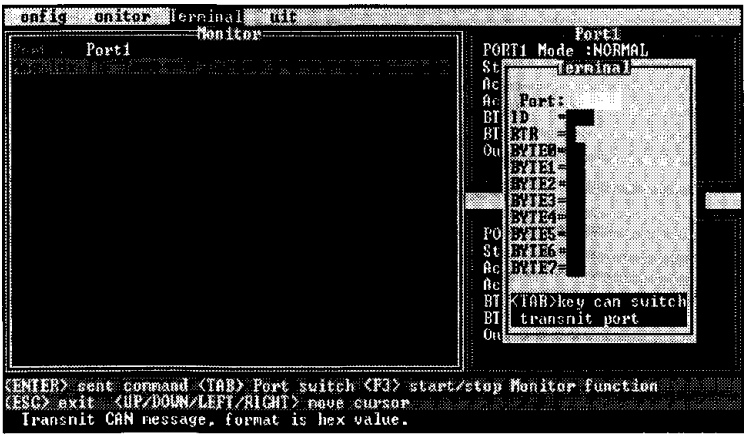
The registers can only be read if the CAN controller is in Normal mode. If the CAN controller operates correctly and the transmission has been completed successfully, the status register will show as the normal value: 00001100. If the Error Status and/or the Bus Status is 1, you have selected the wrong baud rate or the CAN cable is damaged. Also check the correct bus terminator.

Terminal

This function provides a direct way to:

1. Send data over the CAN network.
2. Test CAN transmission.

Select <Terminal> from the menu bar for the following screen:



Transmitting data

To transmit data, the PCL-84 I must be connected to a CAN network with at least one node and the configuration for the card must be complete.

First, select <Terminal> to edit the data. Enter the port, the object ID .and the data bytes as hexadecimal value. Press <Enter> to begin data transmission. If the CAN controller is configured correctly and the transmission has been successfully completed every CAN object will be shown in order of appearance at the left side of the screen.

Testing data transmission

To test CAN transmission without actually sending, connect Port I to Port 2 on the PCL-841. Select <Terminal> and enter port I as trans mitting port. Port 2 will therefore be designated as receiving port.

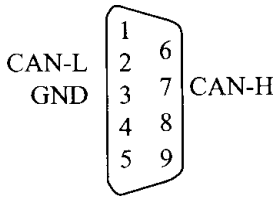
Note: To send Data Frame (Transmit), enter “O” for RTR. If you want to send Remote Frame (Request), enter "1" for RTR.

CHAPTER 5

Wiring

Pin assignments

The following figure shows the pin assignments for the card's DB-9 connectors.

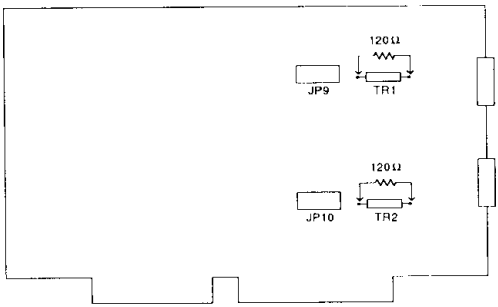


CAN

Termination resistor setup

Terminal resistors are factory installed to allow for impedence matching. These resistors can be enabled by utilizing jumpers number 9 and 10 (shown below). Jumper 9 enables the terminal resistor for port one, while jumper number 10 enables the terminal resistor for port two. The value of the resistor should equal the characteristic impedance of the signal wires (approximately 120 Q).

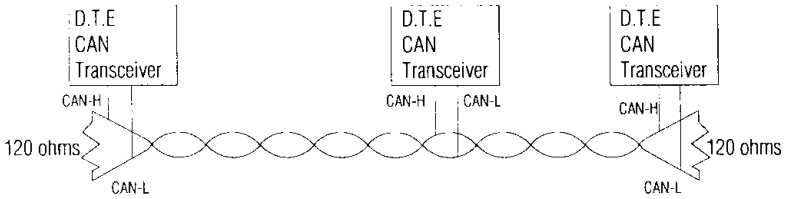
The following figure shows resistor placements.



CAN termination resistor installation

CAN signal wiring

The CAN standard supports half-duplex communication. This means that just two wires are used to transmit and receive data.



CAN wiring topology

Wiring connections are as follows:

PCL-841 DTE (male DB=9)		Terminal DTE
Pin	**Signal**	**Signal**
7	CAN-H	CAN-H
3	GND	GND
2	CAN-L	CAN-L

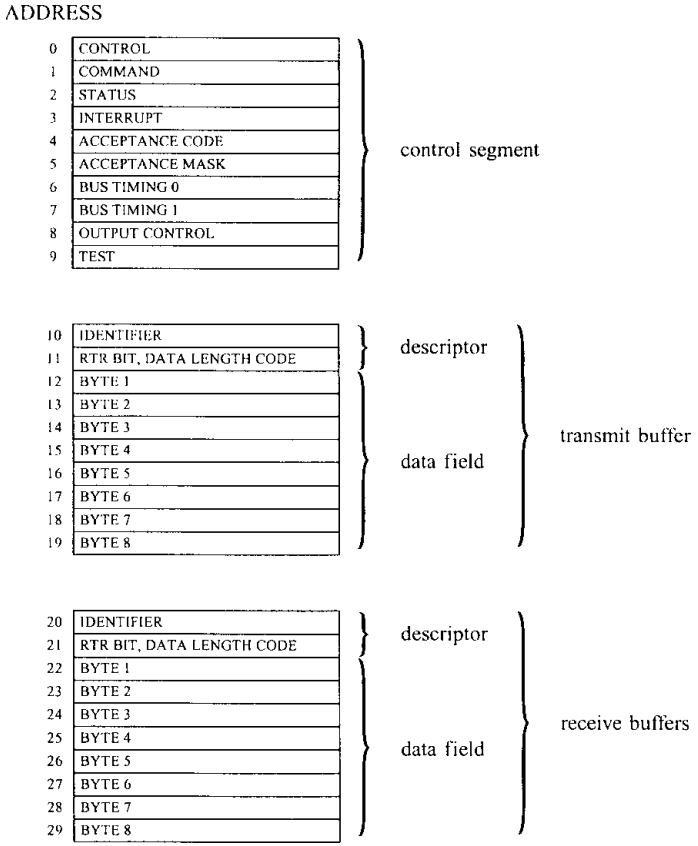
APPENDIX A

Register structure

This appendix gives a brief description of the CAN controller registers. For more detailed information, please refer to the Stand-alone C~4N-eontmller Data Book from Philips Semiconductors Microcontroller Products. (You may also find the information on the enclosed disk under the “Manual” directory, in the Word 6.0 file: REGISTER.DOC.)

CAN controller address allocation

Philips PCX82C200 CAN controller



Register address map

#	TITLE	ADDR	7	6	5	4	3	2	1	0
Control Segment										
1	Control Register	0	Test Mode	Sync	Reserved	Overrun Interrupt Enable	Error Interrupt Enable	Transmit Interrupt Enable	Receive Interrupt Enable	Reset Requset
2	Command Register	1	Reserved	Reserved	Reserved	Coto Sleep	Clear Overrun Status	Release Receive Buffer	Abort Transmission	Transmission Requset
3	Stauts Register	2	Bus Status	Error Status	Transmit Status	Receive Status	Transmission Complete Status	Transmit Buffer Access	Data Overrun	Receive Buffer Status
4	Interrupt Register	3	Reserved	Reserved	Reserved	Wake-Up Interrupt	Overrun Interrupt	Error Interrupt	Transmit Interrupt	Receive Interrupt
5	Acceptance Code Register	4	AC.7	AC.6	AC.5	AC.4	AC.3	AC.2	AC.1	AC.0
6	Acceptance Mask Register	5	AM.7	AM.6	AM.5	AM.4	AM.3	AM.2	AM.1	AM.0
7	Bus Timing Register 1	6	SJW.1	SJW.0	BRP.5	BRP.4	BRP.3	BRP.2	BRP.1	BRP.0
8	Bus Timing Register 0	7	SAM	TSEG2.2	TSEG2.1	TSEG2.0	TSEG1.3	TSEG1.2	TSEG1.1	TSEG1.0
9	Output Control Register	8	OCTP1	OCTN1	OCPOL1	OCTP0	OCTN0	OCPOL0	OCMODE1	OCMODE0
10	Test Register (note 1)	9	Reserved	Reserved	Map Internal Register	Connect RX Buffer 0 CPU	Connect TX Buffer CPU	Access Internal Bus	Normal RAM Conncet	Float Output Driver
11	Identifier	10	ID.10	ID.9	ID.8	ID.7	ID.6	ID.5	ID.4	ID.3
	RTR, Data Length Code	11	ID.2	ID.1	ID.0	RTR	DLC.3	DLC.2	DLC.1	DLC.0
	Bytes 1-8	12-19	Data	Data	Data	Data	Data	Data	Data	Data
12	Identifier	20	ID.10	ID.9	ID.8	ID.7	ID.6	ID.5	ID.4	ID.3
	RTR, Data Length Code	21	ID.2	ID.1	ID.0	RTR	DLC.3	DLC.2	DLC.1	DLC.0
	Bytes 1-8	22-29	Data	Data	Data	Data	Data	Data	Data	Data

Register descriptions

Control Register (CR)

The Control Register is used to change the behavior of the PCX82C200. Control bits may be set or reset by the attatched micro controller, which uses the Control Register as a read write memory.

Command Register (CMR)

A command bit initiates an action within the transfer layer of the PCX82C200. If a read access is performed to this address, the byte 11111111 (binary) is returned.

Status Register (SR)

The Status Register reflects the status of the PCX82C200 bus controller. The Status Register appears to the microcontroller as a read-only memory.

Interrupt Register (IR)

The Interrupt Register allows identification of an interrupt source. When one or more of this register's bits are set, the INT pin is activated. All bits are reset by the PCX82C200 after this register is read by the microcontroller. This register appears to the microcontoller as a read-only memory.

Acceptance Code Register (ACR)

The Acceptance Code Register is part of the acceptance filter of the PCX82C200. This register can be accessed (read write) if the Reset Request bit is set HIGH (present). When a message which passes the acceptance test is received and if there is an empty Receive Buffer, then the respective Descriptor and Data Field are sequentially stored in ~1:} this empty buffer. In the case that there is no empty Receive Buffer, the Data Overrun bit is set HIGH (overrun).

Acceptance Mask Register (AMR)

The Acceptance Mask Register is part of the acceptance filter of the PCX82C200. This register can be accessed (read write) if the Reset Request bit is set HIGH (present). The Acceptance Mask Register classifies the corresponding bits of the acceptance code as “relevant” or “don’t care” for acceptance filtering.

Bus Timing Register O (BTRO)

The Bus Timing Register O defines the values of the Baud Rate Prescaler (BRP) and the Synchronization Jump Width (SJW). This register can be accessed (read write) if the Reset Request bit is set HIGH (present).

Bus Timing Register 1 (BTR1)

The Bus Timing Register I defines the length of the bit period the location of the sample point, and the number of samples to be taken at each sample point. This register can be accessed (read write) if the Reset Request bit is set HIGH (present).

Output Control Register (OCR)

The Output Control Register allows, under software control, the setup of different driver configurations. This register may be accessed (read write) if the Reset Request bit is set HIGH (present).

Test Register (TR)

The Test Register is used only for production testing.

Transmit Buffer

The Transmit Buffer stores a message from the microcontroller to be transmiued by the PCX82C200. It is subdivided into the Descriptor and Data Field. The Transmit Buffer can be wrinen to and read from by the microcontroller.

Receive Buffer

The layout of the Receive Buffer and the individual bytes correspond to the definitions given for the Transmit Buffer layout, except that the addresses start at 20 instead of 10.