

CyberTouch

# CyberScan 3232 Controller Serial Scanner

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## **USER INFORMATION**

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## **INTRODUCTION**

This manual has been written for users of the CyberTouch CyberScan 3232 controller board in combination with CyberTouch CyberScan drivers. The touch screen CyberScan controllers have been designed for the CyberTouch touch screen family. The CyberScan 3232 touch screen controller and software described within this document is assumed to be used with resistive touch screen products manufactured by CyberTouch. Touch screens between manufacturers vary with regards to light transmission, sensitivity and electrical characteristics. ALL TOUCH SCREENS DO NOT FUNCTION THE SAME WAY.

# CYBERSCAN 3232

The CyberScan 3232 is an easy to use RS232 compatible touch screen encoder. It scans, debounces, and encodes a maximum of 32 rows by 32 columns. It has the capability of interpolating, so that the actual output will be 63 rows by 63 columns. Whenever two, three or four adjacent cells are pressed at the same time, the CyberScan 3232 will evaluate and calculate the new coordinate. The coordinate is sent with TDI protocol @9600 baud rate unless JP1 is set, then it will be sending data @1200 baud rate. Refer to the Communication with the Host section.

The CyberScan 3232 power requirement is 8-16VDC at 40mA typical, 70mA maximum. We suggest the use of a 9VDC at 100mA external power adapter connected to J3. To take advantage of the protection electronic circuitry, it is necessary to ground the board to chassis. Contact resistance up to 45K Ohms is detectable by CyberScan 3232. It weights 1.3 oz. (36 grams).

## BOARD LAYOUT

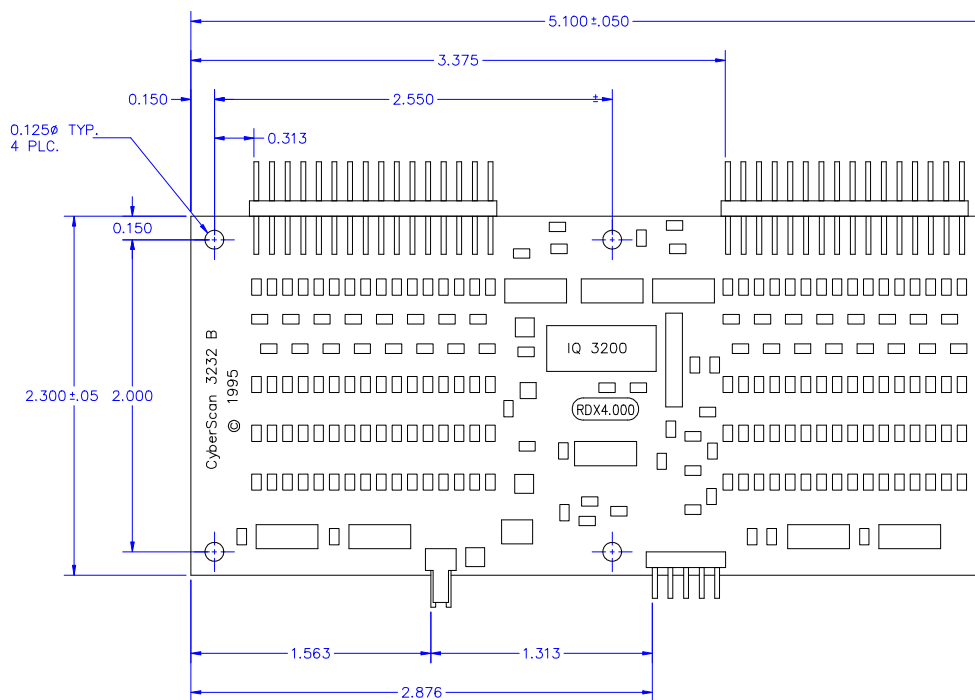


Fig. 1 CyberScan 3232 layout

## Communication with the Host

The scanners communicate with the host computer in the following syntax:

- 8 bit word
- No parity
- One stop bit
- 9600 baud



## DATA FORMAT

Column and row position is encoded into eight bytes.

- Byte 1: ASCII 'T' (84 decimal).
- Byte 2: ASCII 'K' (75 decimal).
- Byte 3: point status:
  - 1 if it is the first point touched.
  - 2 if it is a middle point touched.
  - 4 if it is the last point.
- Byte 4: X high; zero if digital interface.
- Byte 5: X low.
- Byte 6: Y high; zero if digital interface.
- Byte 7: Y low.
- Byte 8: hexadecimal 80, 128 decimal.

*Example:* To calculate the X-Y coordinates after receiving an eight-byte packet and verifying that bytes 1, 2 and 8 are 'T', 'K' and 80h respectively

Use the following formula:

$$X = X \text{ high} * 256 + X \text{ low}; (\text{Byte } 4 * 256 + \text{byte } 5)$$

$$Y = Y \text{ high} * 256 + Y \text{ low}; (\text{Byte } 6 * 256 + \text{byte } 7)$$

## COMMANDS

The scanners will interpolate and can be hardware configured to 1200 or 9600-baud rate through JP1, 1200 when it is jumpered. They all have a bi-directional transmit/receive capability that allows the host computer to verify the controller and touch screen being attached to it.

- To request stop transmitting information, send a ^ S (hex 11).
- To request start transmitting information, send a ^ Q (hex 13).
- To reset the controller, send an ASCII 'G' (hex 67).
- To request for identification, send an 'I' to the controller and it will return one of the following:  
"TDI-3 followed by a 0Dh, if received by CyberScan 3232.

## RS232 CONNECTOR PIN-OUT

A 10-pin IDC connector to DB-9S IDC connector cable will convert the 10-pin connector to the IBM DB-9 serial port standard. The following is the pin-to-pin definition of such a cable:

IDC 10 pin female	IDC DB-9 female
1 _____	1
2 _____	6
3 _____	2
4 _____	7
5 _____	3
6 _____	8
7 _____	4
8 _____	9
9 _____	5
10 _____	N/C



The RS232 connector pinout is defined as follows:

IDC 10 pin female

1	_____	N/C
2	_____	DSR
3	_____	RXD
4	_____	RTS
5	_____	TXD
6	_____	CTS
7	_____	DTR
8	_____	N/C
9	_____	GND
10	_____	N/C

### **CONNECTION TO THE TOUCH SCREEN**

Connection to the Touch Screen is either direct or via an extension cable.

*CyberScan 3232:*

- Connector J4 pins 1 through 16 are rows 1 through 16.
- Connector J5 pins 1 through 16 are rows 32 through 17.
- Connector J6 pins 1 through 16 are columns 1 through 16.
- Connector J7 pins 1 through 16 are columns 17 through 32.

### **STEP BY STEP CONNECTION**

- Connect the rows of the Touch Screen to controller's row connectors and columns to controller's column connectors.
- Connect controller to host computer via appropriate cable.
- Connect the power supply to the board.
- Execute the demo program.
- Touch the Touch Screen for data transmission.

# Troubleshooting

Should you not observe a cell report, check the following items:

1. Check all connectors, scanner to Touch Screen and to computer.
2. Remove the Touch Screen from controller's connectors and manually, via jumper cable, connect a row to a column.

If you observe cell input, the scanner is functioning properly. The problem may be with the extension cable or the with the Touch Screen. If you do not get cell input from the scanner, perform hardware power verification.

To perform a hardware power verification test, while disconnected from the Touch Screen, measure the following voltages:

Points to connect Voltage to be read:

J1 pin #6 (GND) to TP1	+5.0 $\pm$ 0.25V
J1 pin #6 (GND) to TP2	+9.0 $\pm$ 1.0V
J1 pin #6 (GND) to TP3	-9.0 $\pm$ 1.0V

If the above voltages are not valid please contact:

Customer Service

CyberTouch

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# Appendix

Sample C-code for CyberScan 1616, 3232 and 4025:

```
#include<conio.h>                //kbhit, getch, clrscr
#include<dos.h>                   //outportb, inportb
#include<stdio.h>                //printf

#define COM1          0x3f8      //usually COM2=0x2f8
#define BAUDRATE      12        //9600 = 115200/12

void main(void)
{
    unsigned char x, y, byte

    outportb(COM1 + 3, 0x80);     //Access divisor latches
    outportb( COM1 + 1, 0X00 );  //Set MSB of our divisor
    outportb( COM1 + 0, BAUDRATE); //Set LSB of our divisor
    outportb( COM1 + 3, 0x03 );  //8BW + ISB + NPAR
    outportb(COM1 + 4, 0x0b);    //SetACE_OUT+ACE-RTS+
                                //ACE-DTR to power up 8000

via RS232
    clrscr()

    do
    {
        if( inportb(COM1 + 5 ) & 1) //Data ready?
        {
            byte=inportb( COM1      //get port data
            x=(byte>>4) & 0x0f    //x=upper nibble
            y=byte & 0x0f ;       //y=lower nibble
            printf("cell touched: 1/4 l/o&n", x, y);
        }
    }
    while(!kbhit())getch();      //while no key pressed

    clrscr();
}
```



CyberTouch

CyberTouch is the acknowledged industry leader in designing the highest quality resistive touch screens available to the O.E.M market. For the past two decades, we have earned a worldwide reputation of the excellence for state-of-the-art touch screen technology. You will find us a reliable business partner committed to long-term relationships and a ready to support your needs from concept to completion.

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