

# RS232 Commands User's Manual



# RS232 Commands User's Manual

## PC Control of the LCD

- When the RS232 port is installed, the LCD can be controlled from the PC via RS232 port.
- When the connection between the RS232 and PC has been established, you can make various adjustments from your PC; such as select between input signals, adjust volume, contrast and many more. (Complete command sets can be found below.)

### Testing PC to LCD Communication procedure

Connect the RS232 DB9 interface cable to PC.



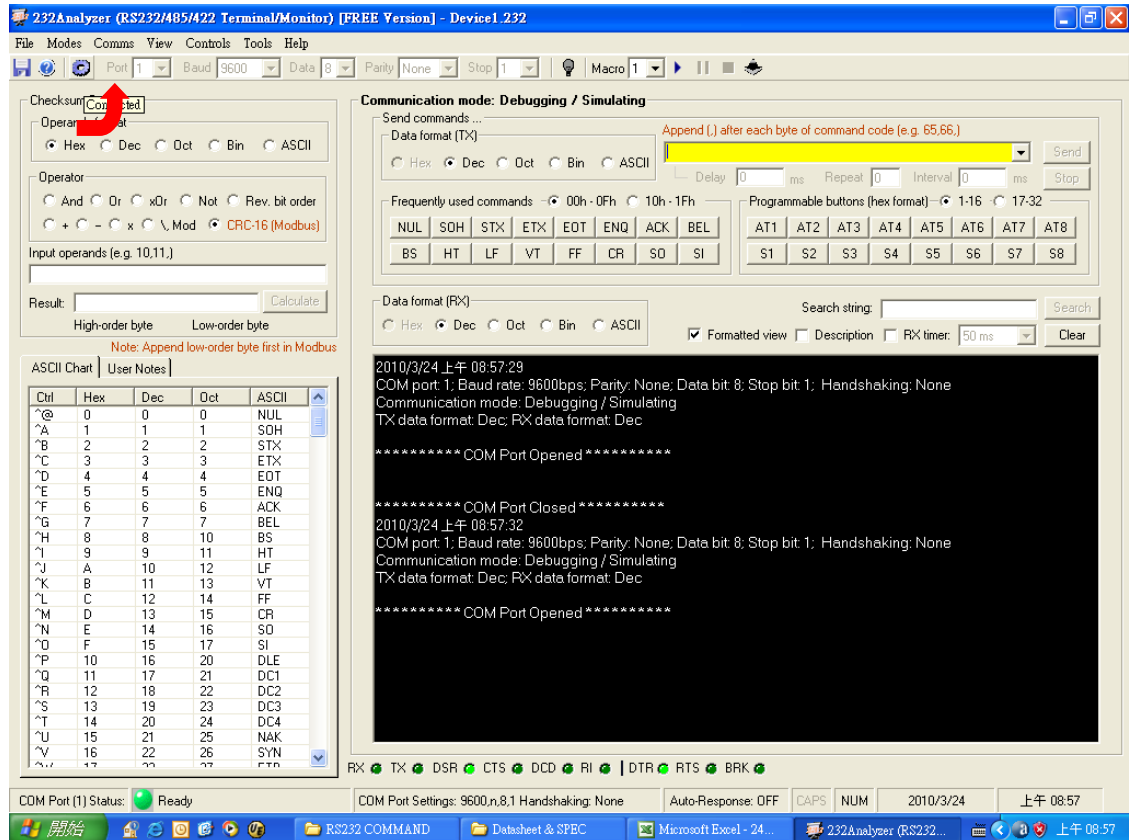
- Install 232analyzer program which was included in your LCD package.  
(Note: 232analyzer is a freeware we use only for testing purpose, feel free to use your own Software.)

Run the 232analyzer program

(Please refer to attached Appendix for 232analyzer user's guide)



- ☒ Click on the open **CIRCLE** which is located on the top left size of the screen( see **RED ARROW**) to connect.

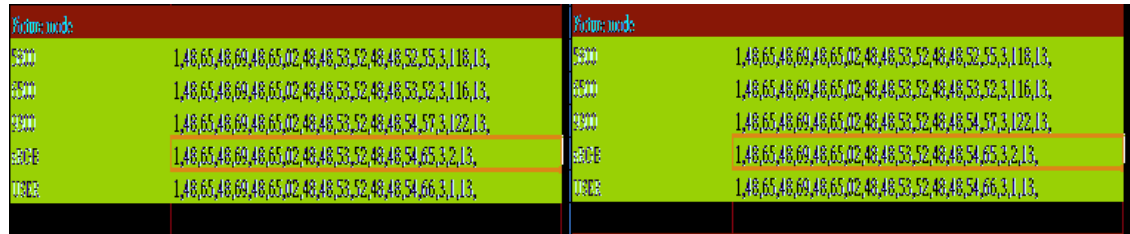


- ☒ When the **CIRCLE** closed, you will see a **COM Port Opened** message at the lower right screen with details of your LCD communication setting. The RS232 port is connected and ready to test!

#### LCD Communication Setting

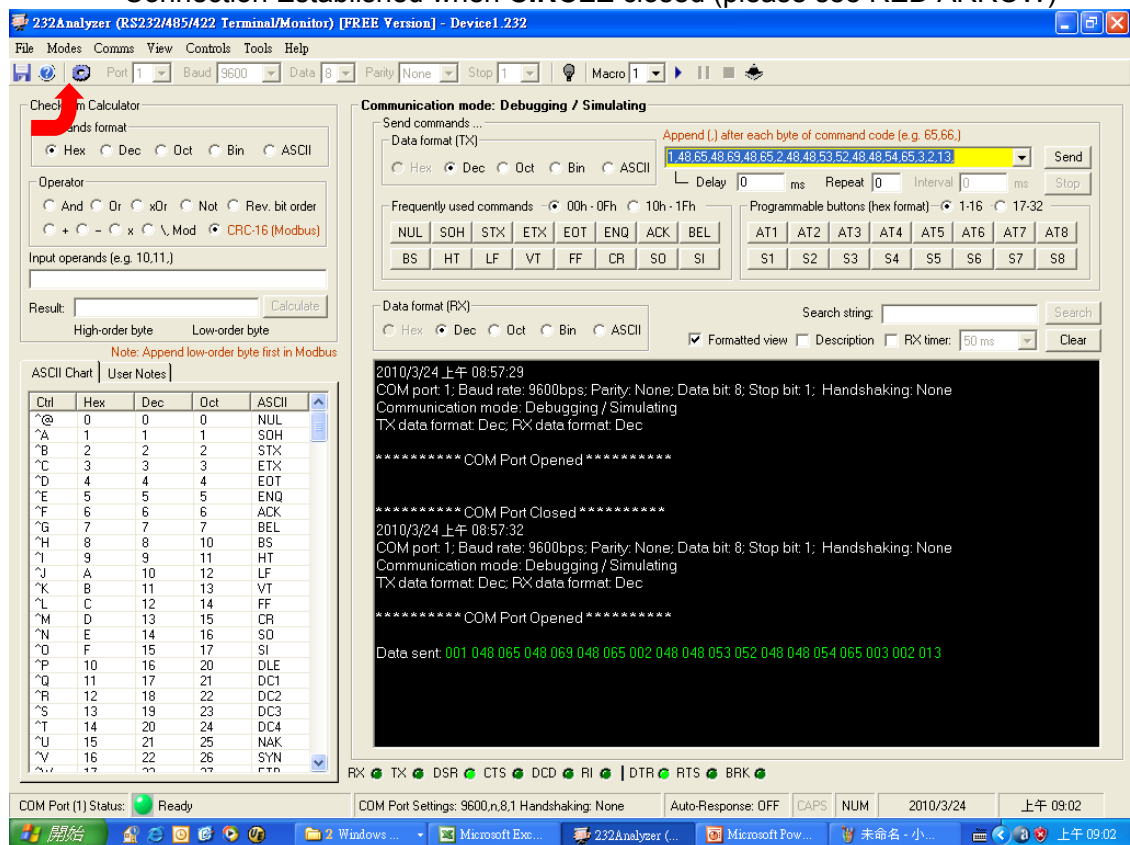
Baud Rate	9,600 bps
Data Length	8 bits
Parity Bit	None
Stop Bit	1

- ☒ Now you are ready to send the control command sets from your PC via Rs232 port.
- ☒ The LCD operates adjustments according to the received command and sends a response message to PC.



- ☒ Copy the desired command and paste them into the yellow open field located on the top right side of the screen, then Press **SEND**. You will see a “Data Sent” message in green when you send the commands; and if the specific function is working properly, it will respond with a message "Data Received" in red as confirmation.

Connection Established when **CIRCLE** closed (please see RED ARROW)



- ☒ LCD will perform adjustments as you **SEND** different command sets.
- ☒ Note: Be sure to enter the complete sets of command or error occurs.

# Command Set

## Functions

## Hexadecimal

Contrast	Command
0%	1,48,65,48,69,48,65,02,48,48,49,50,48,48,48,48,03,119,13,
25%	1,48,65,48,69,48,65,02,48,48,49,50,48,48,49,57,03,127,13,
50%	1,48,65,48,69,48,65,02,48,48,49,50,48,48,51,50,03,118,13,
75%	1,48,65,48,69,48,65,02,48,48,49,50,48,48,52,59,03,120,13,
100%	1,48,65,48,69,48,65,02,48,48,49,50,48,48,54,52,03,117,13,
Picture mode	
5800	1,48,65,48,69,48,65,02,48,48,53,52,48,48,52,55,3,118,13,
6500	1,48,65,48,69,48,65,02,48,48,53,52,48,48,53,52,3,116,13,
9300	1,48,65,48,69,48,65,02,48,48,53,52,48,48,54,57,3,122,13,
sRGB	1,48,65,48,69,48,65,02,48,48,53,52,48,48,54,65,3,2,13,
USER	1,48,65,48,69,48,65,02,48,48,53,52,48,48,54,66,3,1,13,
Source	
VGA1	1,48,65,48,69,48,65,02,48,48,54,48,48,48,48,49,3,115,13,
HDMI1	1,48,65,48,69,48,65,02,48,48,54,48,48,48,48,51,3,113,13,
DVI	1,48,65,48,69,48,65,02,48,48,54,48,48,48,48,52,3,118,13,
POWER SWITCH	
OFF	1,48,65,48,69,48,65,02,48,48,50,48,48,48,48,48,3,118,13,
ON	1,48,65,48,69,48,65,02,48,48,50,48,48,48,48,49,3,119,13,
VOLUME	
0	1,48,65,48,69,48,65,02,48,48,54,50,48,48,48,48,03,112,13,
8	1,48,65,48,69,48,65,02,48,48,54,50,48,48,48,56,03,120,13,
14	1,48,65,48,69,48,65,02,48,48,54,50,48,48,48,62,03,126,13,
24	1,48,65,48,69,48,65,02,48,48,54,50,48,48,49,56,03,121,13,
31(100%)	1,48,65,48,69,48,65,02,48,48,54,50,48,48,49,63,03,126,13,
Brightness	
0%	1,48,65,48,69,48,65,02,48,48,49,48,48,48,48,48,03,117,13,
25%	1,48,65,48,69,48,65,02,48,48,49,48,48,48,49,57,03,125,13,
50%	1,48,65,48,69,48,65,02,48,48,49,48,48,48,51,50,03,116,13,
75%	1,48,65,48,69,48,65,02,48,48,49,48,48,48,52,59,03,122,13,
100%	1,48,65,48,69,48,65,02,48,48,49,48,48,48,54,52,03,119,13,
Color Temp	
Red Gain 0	1,48,65,48,69,48,65,02,48,48,49,54,48,48,48,48,03,115,13,



Red Gain100	1,48,65,48,69,48,65,02,48,48,49,54,48,48,54,52,03,113,13,
Red Gain255	1,48,65,48,69,48,65,02,48,48,49,54,48,48,63,63,03,115,13,
Green Gain 0	1,48,65,48,69,48,65,02,48,48,49,56,48,48,48,48,03,125,13,
Green Gain100	1,48,65,48,69,48,65,02,48,48,49,56,48,48,54,52,03,127,13,
Green Gain255	1,48,65,48,69,48,65,02,48,48,49,56,48,48,63,63,03,125,13,
Blue Gain 0	1,48,65,48,69,48,65,02,48,48,49,65,48,48,48,48,03,4,13,
Blue Gain 100	1,48,65,48,69,48,65,02,48,48,49,65,48,48,54,52,03, 6,13,
Blue Gain 255	1,48,65,48,69,48,65,02,48,48,49,65,48,48,63,63,03, 4,13,

Clock	
0	1,48,65,48,69,48,65,02,48,48,48,69,48,48,48,48,03, 1,13,
100	1,48,65,48,69,48,65,02,48,48,48,69,48,48,54,52,03, 3,13,

Phase	
0	1,48,65,48,69,48,65,02,48,48,51,69,48,48,48,48,03, 2,13,
100	1,48,65,48,69,48,65,02,48,48,51,69,48,48,54,52,03, 0,13,

Mute	
1(ON)	1,48,65,48,69,48,65,02,48,48,56,68,48,48,48,49,03, 9,13,
0(OFF)	1,48,65,48,69,48,65,02,48,48,56,68,48,48,48,48,03, 8,13,

Image size	
0 (full screen)	1,48,65,48,69,48,65,02,48,48,50,49,48,48,48,48,03,119,13,
1 (Original screen)	1,48,65,48,69,48,65,02,48,48,50,49,48,48,48,49,03,118,13,

AUTO	1,48,65,48,69,48,65,02,48,48,50,52,48,48,48,49,03,115,13,
------	---

RESET	1,48,65,48,69,48,65,02,48,48,50,53,48,48,48,49,03,114,13,
-------	---

H_POSITION	
0	1,48,65,48,69,48,65,02,48,48,50,50,48,48,48,48,03,116,13,
20	1,48,65,48,69,48,65,02,48,48,50,50,48,48,49,52,03,113,13,
100	1,48,65,48,69,48,65,02,48,48,50,50,48,48,54,52,03,118,13,

V_POSITION	
0	1,48,65,48,69,48,65,02,48,48,50,51,48,48,48,48,03,117,13,
20	1,48,65,48,69,48,65,02,48,48,50,51,48,48,49,52,03,112,13,
100	1,48,65,48,69,48,65,02,48,48,50,51,48,48,54,52,03,119,13,

## Trouble Shooting

If your monitor fails to operate correctly, consult the following chart for possible solution before calling for repairs/RMA.

Condition	Possible Solution
The screen is not synchronized?	<ul style="list-style-type: none"><li>• Check if the signal cable is firmly seated in the socket.</li><li>• Check if the output level matches the input level of your computer.</li><li>• Make sure the signal timings of the computer system are within the specification of the monitor.</li><li>• If your computer was working with a CRT monitor, you should check the current signal timing and turn off your computer before you connect the VGA Cable to this monitor.</li></ul>
The Picture does not appear?	<ul style="list-style-type: none"><li>• Make sure the power cord is plugged into the power outlet and into the back of the monitor.</li><li>• Check if the signal cable is firmly seated in the socket.</li><li>• Check if the Power is ON at the computer</li><li>• Check if the brightness control is at the appropriate position, not at the minimum.</li></ul>
The position of the screen is not in the center?	<ul style="list-style-type: none"><li>• Press the Auto button. Adjust the image position using the Horizontal Position and/or Vertical Position in OSD Main Controls.</li></ul>
The screen is too bright/dark.	<ul style="list-style-type: none"><li>• Check if the brightness or contrast control is at the appropriate position, not at the Maximum/Minimum.</li></ul>

# Appendix

## 232analyzer User's Guide

### Introduction

232Analyzer is an advanced serial port analyzer which allows programmers, engineers and others to control and monitor serial port (RS232 / RS485 / RS422 / TTL) activities.

232Analyzer supports data input and monitoring in Hexadecimal, Decimal, Octal, Binary and ASCII formats. It also allows you to change / monitor RS-232's line state: RTS, DTR, CTS, DSR, DCD, and RI.

All data and signal flows are logged in the Communication Logging Window, which can be saved as .txt, .doc or .rtf files for further analysis.

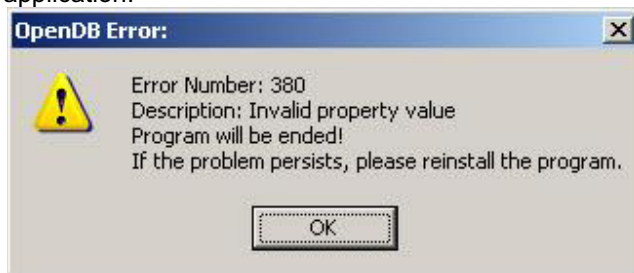
232Analyzer not only allows you to control / monitor RS-232's activities, but, with the right type of converters (e.g. [CommFront CVT-485-1](#), [CVT-485 422-1](#) and [TTL-232-1](#)), you can also control / monitor other serial devices, such as RS-485, RS-422 and TTL.

### Supported Operating Systems

Microsoft® Windows 7/Vista/XP/2000/98

### Possible problems and solutions

- 232Analyzer requires Microsoft Windows Installer, which comes as a default with Windows 7, Vista, XP and 2000. However, previous Operating Systems such as Windows 98, Windows ME and some Windows XP Home Edition (Symptom: "This installation package could not be opened. Contact the application vendor to verify that this is a valid Windows Installer package.") do not come with Windows Installer by default, please download and install the [Microsoft Windows Installer](#).
- For Windows 98 or ME, if you encounter the problem of "Error Code 430 Class does not support Automation or does not support expected interface", please download and install the [MDAC\\_TYP.EXE](#) file from Microsoft's website.
- If you encounter the problem of "Data mis-display", please download and install the [Service Pack](#) or reinstall the driver of your USB/RS-232 converter if you are using Virtual COM port. Please note that 232Analyzer might not work with other remote control programs, such as VNC program.
- If you encounter the problem of "Error 380", please uninstall the program, delete the "CommFront" folder in "[C:\Program files](#)", and then reinstall the application.



### Minimum recommended hardware requirements:

Pentium III or above, 128MB RAM, one or more available COM ports (USB to RS-232 converter also supported). XGA (1024x768) or above monitor and graphics card.



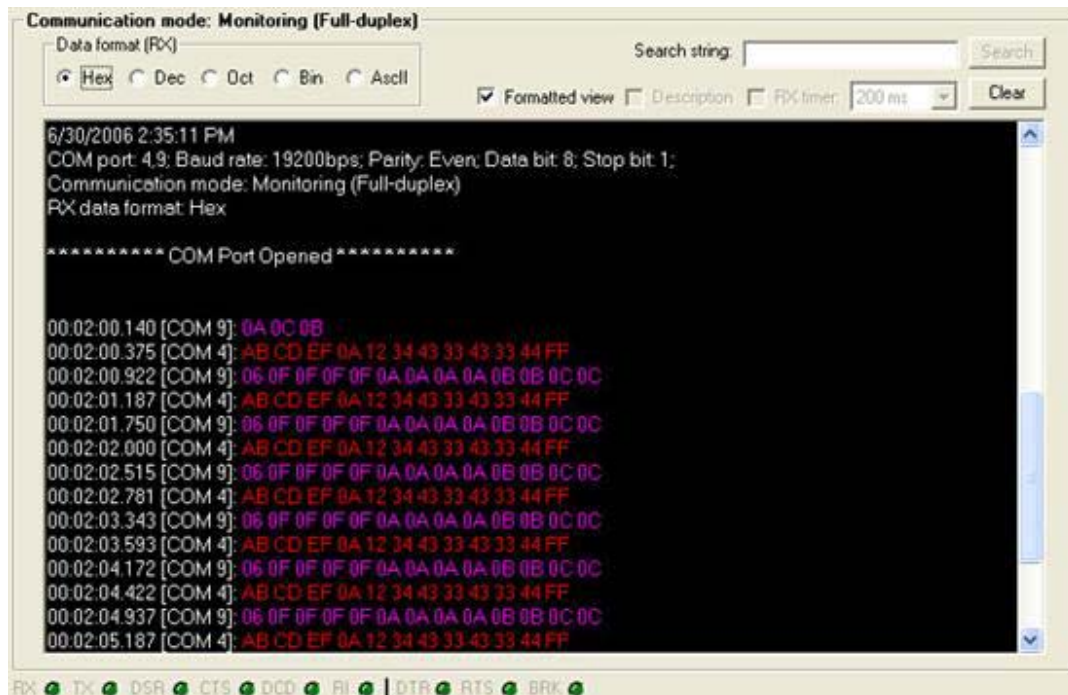
## Software features

- Two operating modes: [Debugging/Simulating](#) and [Monitoring](#) (support both Half-Duplex and Full-Duplex monitoring)
- [Timestamps](#) for the data captured in Monitoring mode
- [Send / Receive data](#) in all formats: Hexadecimal, Decimal, Octal, Binary, and ASCII string
- [Send / Receive signals](#): RTS, DTR, CTS, DSR, DCD and RI
- COM 1 to 16
- Frequently Used Keys: 00h to 1Fh (Total of 32 numbers)
- [Programmable Buttons](#): Send command strings, signals or data sequence with one single button (Total of 32 numbers)
- [Programmable Auto-Response](#): Upon receiving certain data or signal, you can program automatically output data, and/or signals (Total of 16 numbers)
- [Programmable Macros](#): Send sets of data / signals, response to different types of incoming data / signals with timer and sequence (Total 8 x 8 Steps, and 8 x 8 Sub-routines)
- [Virtual LEDs](#): View RS-232 line state and control RTS and DTR, Break communication if necessary
- [Data Logging](#): All communications are logged and can be saved into .txt file for future analysis
- Checksum Calculator: AND, OR, XOR, NOT, Reverse Bit Order, +, -, x, \, MOD, CRC-16 (for Modbus), etc.
- Notation Converter: Convert data from one notation to another
- ASCII chart: All 256 ASCII codes in different formats
- Device Profile: Settings for different devices can be saved individually
- Flexible screen adjustment
- User preferences settings: Color settings, Startup Actions, Exit Actions, etc.
- Customizable colors for Background, TX, RX1 and RX2 (2nd COM port channel when using Full-Duplex monitoring)

## Monitoring mode

This mode allows you to monitor ("see") communications between two devices, such as a touch panel's controller (AMX, Crestron) and projector. It is useful for programmers to understand the controlled device's protocol, or sometimes perform reverse-engineering since some devices do not come with their own protocol manual.





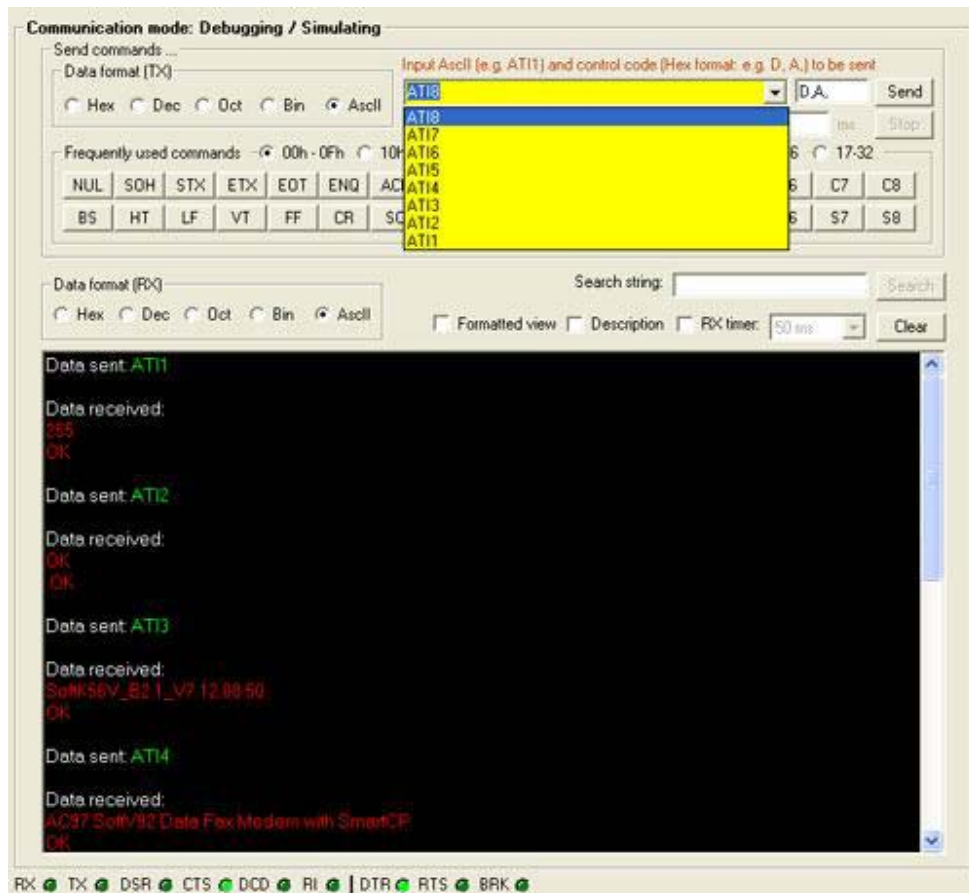
(Data Logging)

### Debugging/Simulating mode

This mode allows you to control serial devices directly from your PC. For example: you can control a projector using this software, it is useful for programmers in developing / debugging their control software.

Frequently used command buttons, programmable buttons and auto-response are highly useful and convenient tools for sending or responding to the commands sent from the controlled device. By using these features together, even a highly complicated serial device can be easily controlled.





## Sending Data

There are many ways of sending commands, including the Send\_Command Pane, Frequently Used Commands, Programmable Buttons, Programmable Auto-Response, and Programmable Macros.

The program allows you to send data in different notation: Hexadecimal, decimal, octal, binary or character string.

As illustrated below, when the "Send" button is pressed, the program will repeatedly send out the command string "41,54,49,31,D,A,", with a 1000ms delay, 1x repetition, and at 500ms intervals.



## Sending Signal

There are also numerous ways of sending signals: From Programmable Buttons, Programmable Auto-Response, Programmable Macros or simply by using the virtual LEDs.

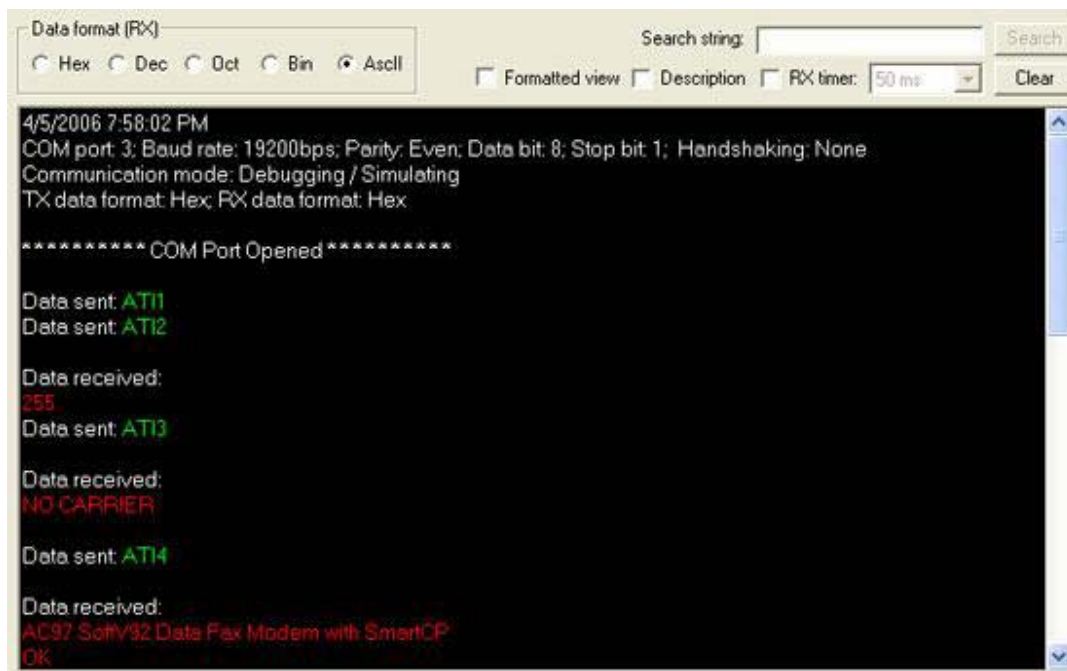
When you click on DTR or RTS LEDs, it will turn ON/OFF the signal respectively. The BRK LED allows you to stop the communication temporarily for 500ms.



(Virtual LEDs)

## Receiving Data and Signal

Data and any signal received will be logged into the Logging Window (as shown below). Data refers to the command strings that are sent to/from external devices, and signal refers to the line state changes. The program allows you to view the incoming data in different notations: Hexadecimal, decimal, octal, binary or character string. Virtual LEDs provide an easy way of knowing the current line state.

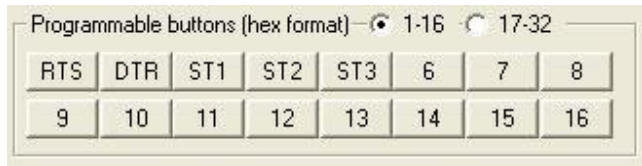


## Programmable Buttons

Programmable Buttons provide an easy way to control external devices. This allows you to store command strings and signal controls into a single button with delay, repeat and interval options. You can also chain different buttons together, so that when the first button's commands are completed, it will continue to send commands that are stored in the following buttons.

Programmable buttons are a very useful feature as some devices need to receive a series of commands in order to perform certain tasks, such as moving a camera's pan/tilt head.

There are a total of 32 possible programmable buttons.



## Programmable Auto-Response

Programmable Auto-Response provides an easy way to control external devices; it allows the program to respond to certain incoming data. For example, when the program receives an Enquiry Code: 5, it can respond with Acknowledgement Code: 6. In addition to code response, the program can also respond to line changes. For example, when the line state changes to DSR ON (external device is ready for receiving data), the program can send out the preset commands.

Programmable Auto-Response is a useful feature that allows the user to communicate with the controlled device more effectively and precisely, especially since some controlled devices require a response within a certain timeframe, e.g. 500ms.

There are total 16 options with Auto-Response.

Auto-Response can be toggled by using the toolbar buttons below.



Auto-Response is currently ON, click to turn OFF



Auto-Response is currently OFF, click to turn ON

## Programmable Macros

Programmable Macros is an advanced feature which provides an easy way for simulation and automation. There are a total of 8 Macros, each one consists of 8 steps and 8 sub-routines.

Steps are the running sequence of each Macro. There are two options in the Step: Send Commands (and/or Signals) or running Sub-Routines.

- Send commands (and/or Signals) allows you to send out commands and/or signals with the options of Delay, Repeat, and Interval. There are total 8x Steps in each macro.
- Sub-Routine allows you to check the incoming data (and/or line state) or signal, then respond accordingly. Three conditions are checked: IF, ELSE IF and ELSE. There are a total of 8 Sub-Routines in each macro.

- Running Macros



Play (Shortcut key: F5)



Pause (Shortcut key: F6) Note: Macro will stop the current Step and resume on next Step if Play button is click later on.



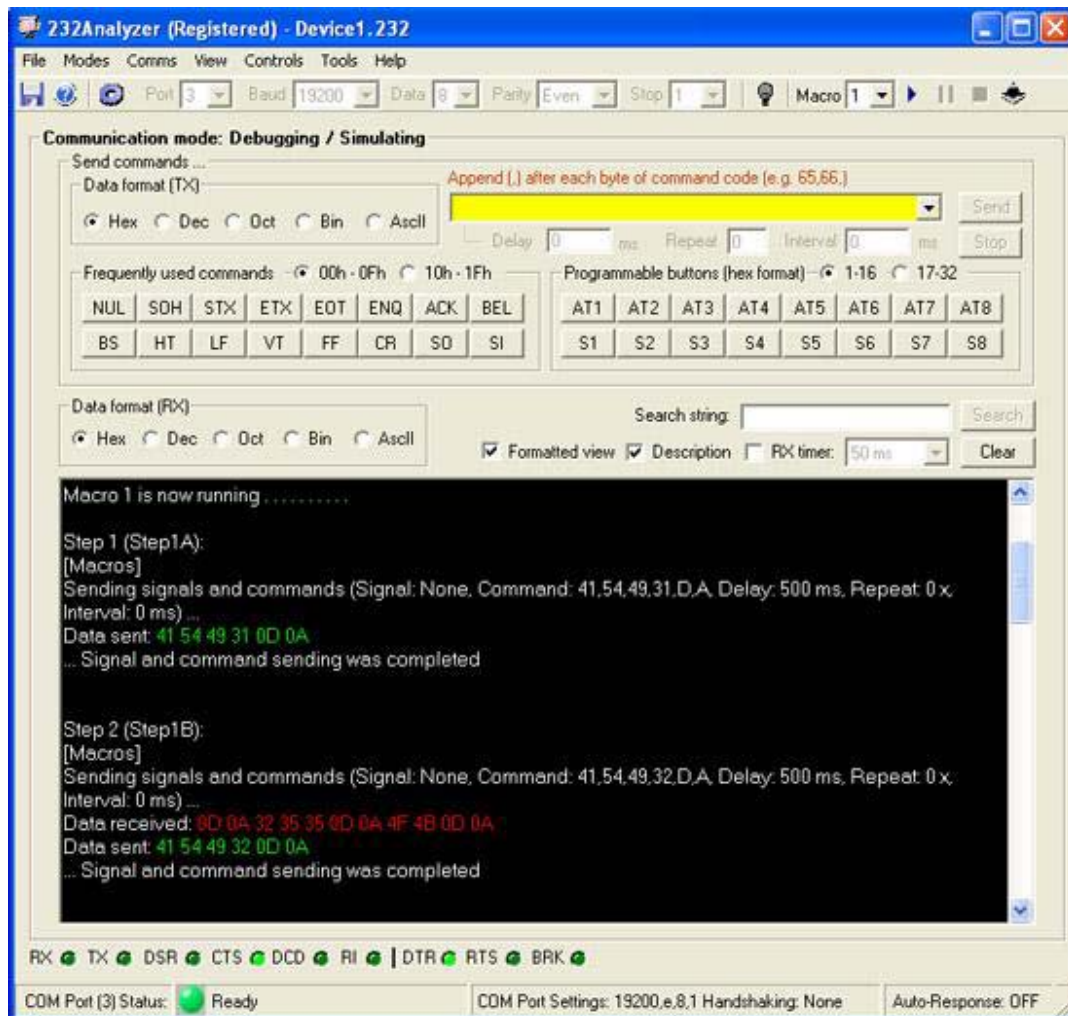
Stop (Shortcut key: F7)



Single Play (currently selected Macro only) (Shortcut key: F8)



Continuous Play (start from currently selected Macro and run until Macro 8) (Shortcut key: F8)



**Applications: Serial port monitor (RS232 RS485 RS422 TTL monitor)**

Serial port monitor is one of the most important features available in the 232Analyzer software.

It allows data monitoring in Hexadecimal, Decimal, Octal, Binary or ASCII format. All data



flows are logged in the Communication Window, which can be saved as .txt, .doc or .rtf files for further analysis.

Not just designed to monitor RS-232 communication, with the right type of serial converters, such as [CommFront's CVT-485-1](#), [CVT-485 422-1](#), [TTL-232-1](#) and [TTL33-232-1](#), 232Analyzer can also be used to monitor RS-485, RS-422 and TTL communications.

All monitoring modes available in 232Analyzer software come with timestamps in milliseconds.

### Serial Port Monitor: RS232 Monitor (RS232 Sniffer / RS232 Tester)

#### 1) With direction indication



By using a Full-Duplex monitor cable (CBL-Full-1A), the 232Analyzer software can capture not only the data and signals flowing between the RS232 devices but also the data direction. See the [screenshot here](#).

List of hardware accessories required:

- 1) 1x CBL-Full-1A (Full-duplex RS232 monitor/control cable)
- 2) 1x USB-232A-1 (USB to dual RS232 converter) \*

#### 2) Without direction indication



Together with a Half-Duplex monitor cable (CBL-Half-1), the 232Analyzer software can capture the data flowing between the RS232 devices.

Note: No data direction will be indicated in the 232Analyzer software.

List of hardware accessories required:

- 1) 1x CBL-Half-1 (Half-duplex RS232 monitor/control cable)
- 2) 1x USB-232-1 (USB to single RS232 converter) \*

#### Serial Port Monitor: RS485 Monitor (RS485 Sniffer / RS485 Tester)

1) With direction indication



By using two units of RS-232/RS-485 converters (CVT-485-1 or CVT-485\_422-1) and a Full-Duplex monitor cable (CBL-Full-1A), the 232Analyzer software can capture not only the data flowing between the RS485 devices but also the data direction. Connect 485+ and 485- of the serial devices to A+ and B- of the converter respectively. Switch to Full-Duplex monitoring mode in the 232Analyzer software.

Note: It is important to know that the CVT-485-1 and CVT-485\_422-1 are port-powered converters, although they can accept external 5VDC power supply, it will damage the converter if the polarity is reversed or the voltage is 5% higher than 5VDC, so be very careful when using the external 5VDC power adapter.

List of hardware accessories required:

- 1) 1x CBL-Full-1A (Full-duplex RS232 monitor/control cable)
- 2) 1x USB-232A-1 (USB to dual RS232 converter) \*
- 3) 2x CVT-485-1 (Port-powered RS232 to RS485 converter)
- 4) 2x PWR-5V\_US-2 or 2x PWR-5V\_UK-2 (5VDC power adapter)
- 5) 2x GCH-9\_MM-1 (9pin Male/Male Gender Changer)

## 2) Without direction indication



Use a RS-232/RS-485 converter (CVT-485-1 or CVT-485\_422-1) to capture the data flowing between the RS-485 serial devices. Connect 485+ and 485- of the serial devices to A+ and B- of the converter respectively.

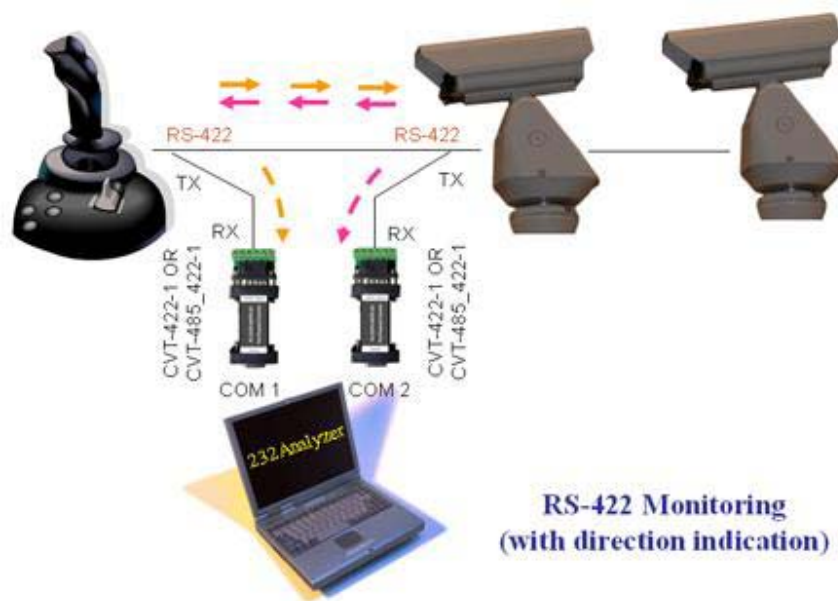
Note: No data direction will be indicated in the 232Analyzer software.

List of hardware accessories required:

- 1) 1x CVT-485-1 (Port-powered RS232 to RS485 converter)
- 2) 1x USB-232-1 (USB to single RS232 converter) \*

#### **Serial Port Monitor: RS422 Monitor (RS422 Sniffer / RS422 Tester)**

With direction indication



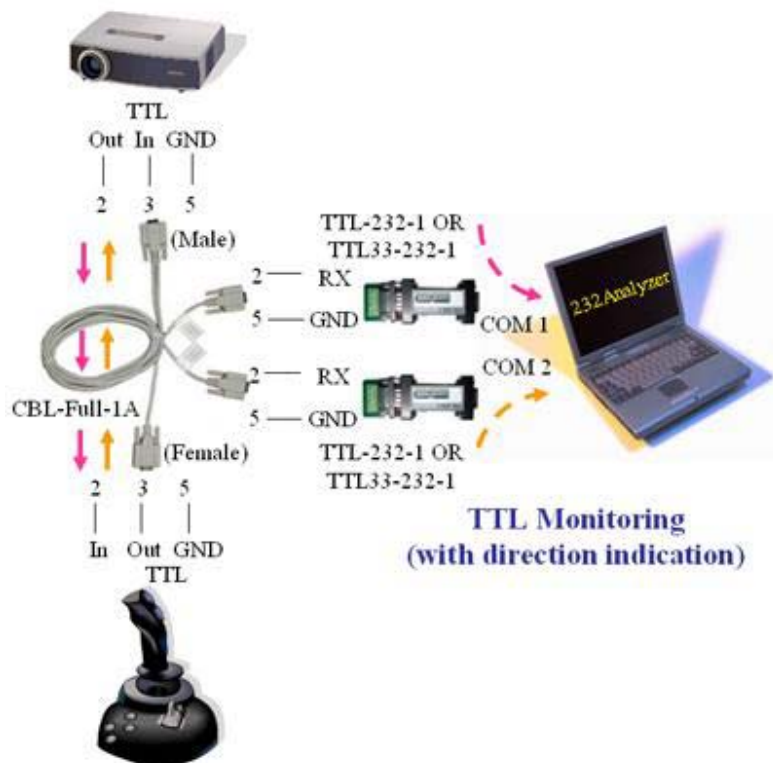
By using two units of RS-232/RS-422 converters (CVT-485\_422-1), the 232Analyzer software can capture not only the data flowing between the RS422 devices but also the data direction. Connect TX+ and TX- of the serial devices to RX+ and RX- of the converters for both sides of the connections. Switch to Full-Duplex monitoring mode in the 232Analyzer software.

List of hardware accessories required:

- 1) 2x CVT-485\_422-1 (Port-powered RS232 to RS422/485 converter)
- 2) 1x USB-232A-1 (USB to dual RS232 converter) \*

#### **Serial Port Monitor: TTL Monitor (TTL Sniffer / TTL Tester)**

With direction indication



By using a Full-Duplex Monitor cable (CBL-Full-1A) and two units of RS-232/TTL converters (TTL-232-1 or TTL33-232-1), the 232Analyzer software can capture not only the data flowing between the TTL devices but also the data direction.

List of hardware accessories required:

- 1) 1x CBL-Full-1A (Full-duplex RS232 monitor/control cable)
- 2) 1x USB-232A-1 (USB to dual RS232 converter) \*
- 3) 2x TTL-232-1 (Port-powered RS232 to TTL/CMOS 5v converter) **or**  
2x TTL33-232-1 (Port-powered RS232 to TTL/CMOS 3.3v converter)

\* Optional, required if your PC doesn't come with RS232 COM port(s).

## Applications: Serial port terminal

**Serial port terminal is one of the most important features available in the 232Analyzer software.**

It allows you to control RS-232 devices right from your PC - with various combinations of COM port settings (Port, Baud rate, Data bit, Parity, Stop bit, and Flow control), and the Line state controls (RTS and DTR). Controlling a RS-232 device is just that simple, no programming or

technical background is required.

With the right type of serial converters, such as [CommFront's CVT-485-1](#), [CVT-485 422-1](#), [TTL-232-1](#) and [TTL33-232-1](#), it is also possible to control other serial devices such as a RS-485, RS-422 or TTL, which have different electrical signals, but follow the RS-232 communication mechanism. Also supported are Virtual COM ports when using USB-Serial adaptors or Bluetooth Serial Port devices.

Virtually any kind of serial device can be controlled from the 232Analyzer, including devices from Industrial SCADA, PLC systems, Commercial Building Automation systems, Pro-Sound Mixers and AV Matrix Switchers, as well as CCTV cameras and Access Control systems.

### Serial Port Terminal: RS232 Terminal - Control/Debug RS232 Devices

#### 1) Control a DCE device



Use a straight-through cable (Half- or Full-Duplex Monitor cable) to control a DCE device.

#### 2) Control a DTE device



Use a straight-through cable (Half- or Full-Duplex Monitor cable) and a Null-Modem converter to control a DTE device.

### Serial Port Terminal: RS485 / RS422 Terminal - Control/Debug RS485/RS422 Devices





Connect a RS-232/RS-485/RS-422 converter (CVT-485\_422-1) to PC's COM port to control/debug RS-485/RS-422 devices.

### Serial Port Terminal: TTL Terminal - Control/Debug TTL Devices



Connect a RS-232/TTL converter (TTL-232-1 or TTL33-232-1) to PC's COM port to control/debug TTL devices.

### Applications: Real-world examples

### Pelco-D Protocol Tutorial / Examples



Pelco-D is the popular PTZ camera control protocol used in the CCTV industry (Click [here](#) to visit Pelco's website).

This page will explain the following topics in details:

- 1) [The format of Pelco-D](#)
- 2) [How to calculate the checksum byte by using 232Analyzer](#)
- 3) [Pelco-D command string examples](#)
- 4) [How to use 232Analyzer to control the Pelco-D cameras](#)
- 5) [Have fun playing with 232Analyzer and Pelco-D cameras](#)

After reading this page and testing the camera with the 232Analyzer software , you should be able to understand the ease of using the Pelco-D protocol, and control any Pelco-D cameras in

five minutes' time.

**Notes:**

- 1) Before you can control any Pelco-D cameras, you need to prepare the following items:
  - A PC running 232Analyzer program
  - A RS-232 port (or USB/RS-232 converter)
  - A [RS-232/RS-485 converter](#)
- 2) Make sure your COM port settings in the 232Analyzer program matches with camera's settings (Pelco-D cameras use No parity, 8 Data bits and 1 Stop bit, baud rate depends on your camera setting)

(Click [here](#) to download the 232Analyzer FREE Version. Click [here](#) to download Pelco-D/P device profiles)

### 1) The format of Pelco-D

Pelco-D consists of 7 hexadecimal bytes (all byte data used in this page are in Hexadecimal format unless otherwise noted)

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Sync	Camera Address	Command 1	Command 2	Data 1	Data 2	Checksum

- Byte 1 (Sync) - the synchronization byte, fixed to FF
- Byte 2 (Camera Address) - logical address of the camera being controlled (Address 1 is 01)
- Byte 3 & 4 (Command 1 and 2) are shown below
- Byte 5 (Data 1) - pan speed, range from 00 (stop) to 3F (high speed) and FF for "turbo" speed (the maximum pan speed that the device can go)
- Byte 6 (Data 2) - tilt speed, range from 00 (stop) to 3F (maximum speed)
- Byte 7 (Checksum) - sum of bytes (excluding the synchronization byte), then modulo 100 (Decimal code: 256)

Command 1 and 2 details

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Command 1	Sense	Reserved	Reserved	Auto / Manual Scan	Camera On/Off	Iris Close	Iris Open	Focus Near
Command 2	Focus Far	Zoom Wide	Zoom Tele	Tilt Down	Tilt Up	Pan Left	Pan Right	Fixed to 0

Example (Command 2):

Pan Left - 0 0 0 0 0 1 0 0, which equals to 04 (both hexadecimal and decimal)

Some other commands

Command	Byte 3	Byte 4	Byte 5	Byte 6
Go to Preset	00	07	00	01 to FF
Set Zoom Speed	00	25	00	00 to 33
Set Focus Speed	00	27	00	00 to 33
Alarm Ack.	00	19	00	Alarm no.

## 2) How to calculate the checksum byte by using 232Analyzer

Suppose you are controlling camera 1 (address 1) to pan left at high speed, the command string of the first 6 bytes would be: [FF 01 00 04 3F 00](#)

**Step 1:** Go to "Checksum Calculator" pane, choose "Hex" as "Operands format" and "+" as Operator. Then take out the first byte FF and key in all other bytes in the "Input operands" box. Remember to add "," after each byte of data. You will then get the result of "44"

Checksum Calculator

Operands format:

☒ Hex ☐ Dec ☐ Oct ☐ Bin ☐ AscII

Operator:

☐ And ☐ Or ☐ xOr ☐ Not ☐ Rev. bit order

☒ + ☐ - ☐ x ☐ \, Mod ☐ CRC-16 (Modbus)

Input operands (e.g. 10,11,)

01,00,04,3F,00,

Result: 44

Calculate

**Step 2:** Change Operator to "\,Mod", and key in the previous result ("44") and modulo parameter "100" in the "Input operands" box, remember to add "," after each byte of data. You will then get the result of "44" in "Remainder (Mod)" box.

"44" would be the result of checksum, now the full string of pan left at high speed command would be [FF 01 00 04 3F 00 44](#)

Checksum Calculator

Operands format

☒ Hex ☐ Dec ☐ Oct ☐ Bin ☐ AscII

Operator

☐ And ☐ Or ☐ xOr ☐ Not ☐ Rev. bit order

☐ + ☐ - ☐ x ☒ \, Mod ☐ CRC-16 (Modbus)

Input operands (e.g. 10,11,)

44,100

Result: 0 44 Calculate

Quotient (\) Remainder (Mod)

### 3) Pelco-D command string examples

Camera Address: 1

Pan Left at high speed: FF 01 00 04 3F 00 44

Pan Right at medium speed: FF 01 00 02 20 00 23

Tilt Up at high speed: FF 01 00 08 3F 00 48

Tilt Down at medium speed: FF 01 00 10 20 00 31

Stop all actions (Pan/Tilt/Zoom/Iris etc.): FF 01 00 00 00 00 01

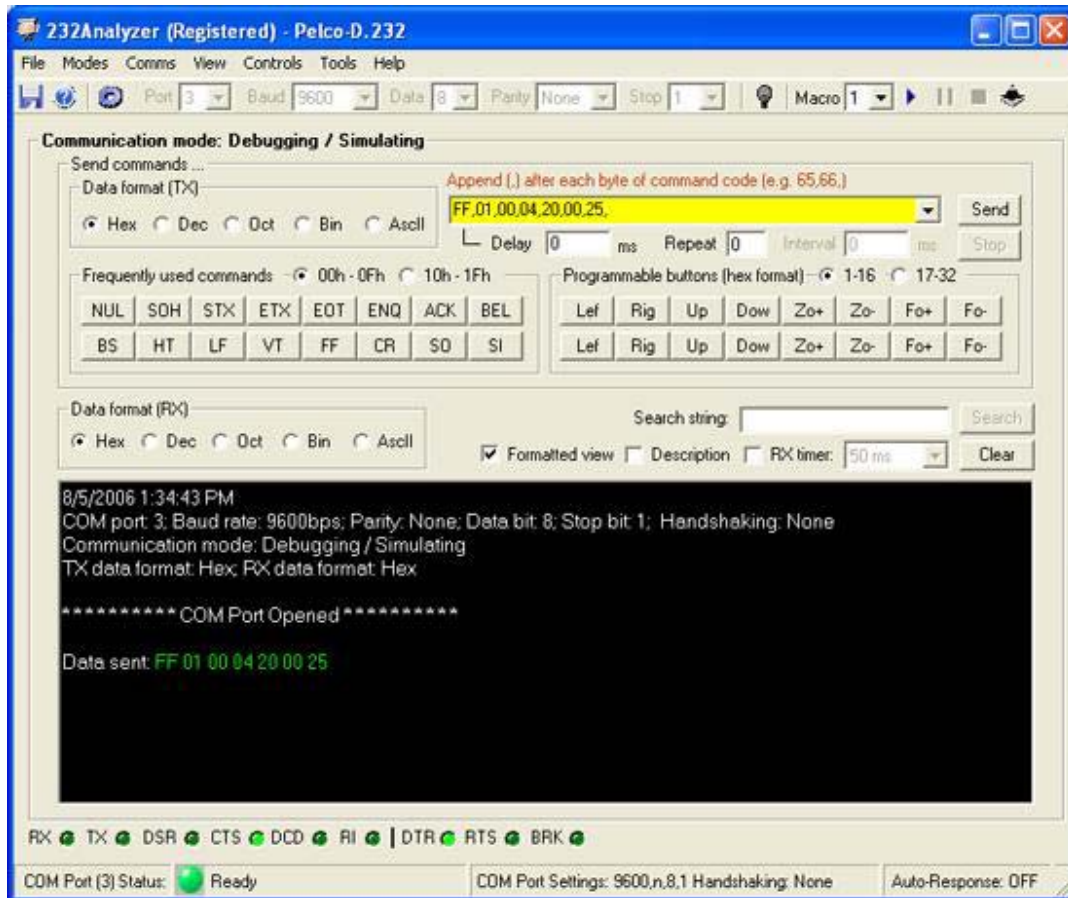
Note: there will be no response from cameras in Pelco-D protocol

### 4) How to use 232Analyzer to control the Pelco-D cameras

Suppose you are controlling camera address no. 1 to pan left at medium speed (command string: FF 01 00 04 20 00 25)

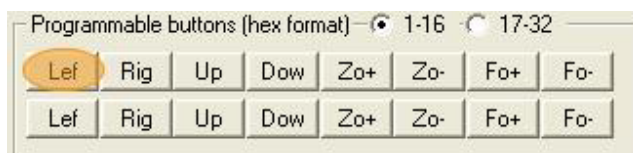
**Way 1:** From the command pane - choose "Hex" as the TX data format and key in the command string "FF,01,00,04,20,00,25," in the input box as shown below. Then click on the "Send" button. The command will then be sent out immediately and you will notice the camera panning left continuously.

Note: If you are using the FREE Version, choose "Dec" as TX data format and key in "255,1,0,4,32,0,37,"



### **Way 2:** From Programmable buttons

Download and unzip the [Pelco-DP.zip](#) file, then open "Pelco-D.232" file from 232Analyzer program. When you click on the first button "Lef", the command will be sent out after 500ms



### **5) Have fun playing with 232Analyzer and Pelco-D cameras**

The programmable buttons 1 to 8 will trigger the camera's action continuously. To stop, you have to send out the "Stop" command "FF 01 00 00 00 00 01" (or "255 01 00 00 00 00 01" Decimal format) to the camera.

"Pelco-D.232" file allows you to send two (2) commands with the click of a button, e.g. when you click on "Lef" button on the second row (button no. 9), the camera will pan left for 500ms and then stop. This is because button no. 9 is linked to button 17, which stores the "Stop" command. (Note: Programmable buttons 9 to 16 will trigger the camera's action for 500ms and will stop automatically).

You may program it in such a way that the camera pans left for 500ms, stops, tilts up for 1000ms, stops, tilts down for 500ms, and then pans right continuously. All sorts of actions can be done through "Programmable Buttons" or "Macros" functions.

**Ref: <http://www.commfront.com/CommFront-Home.htm>**