

# **Line Analyser 2000**

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**Pi Micros**

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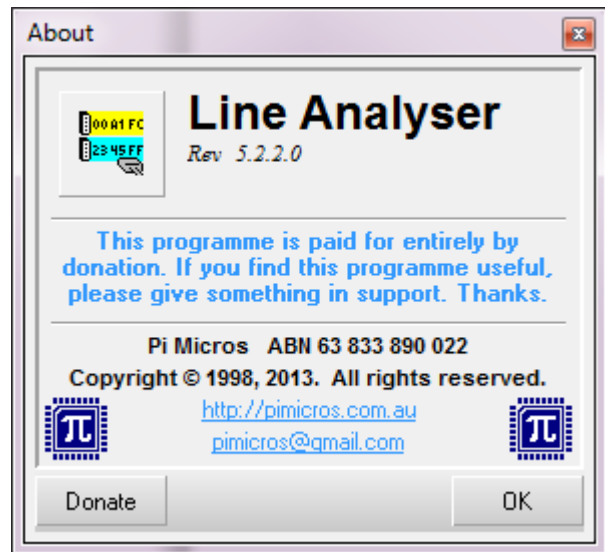
## Introduction

Line Analyser 2000 is an RS232 data retriever and analysis tool for Windows 95/98/NT/2000/7. It can be used to analyse multiple data protocols simultaneously and emulate serial equipment making it a powerful tool for commissioning, software development and fault finding.

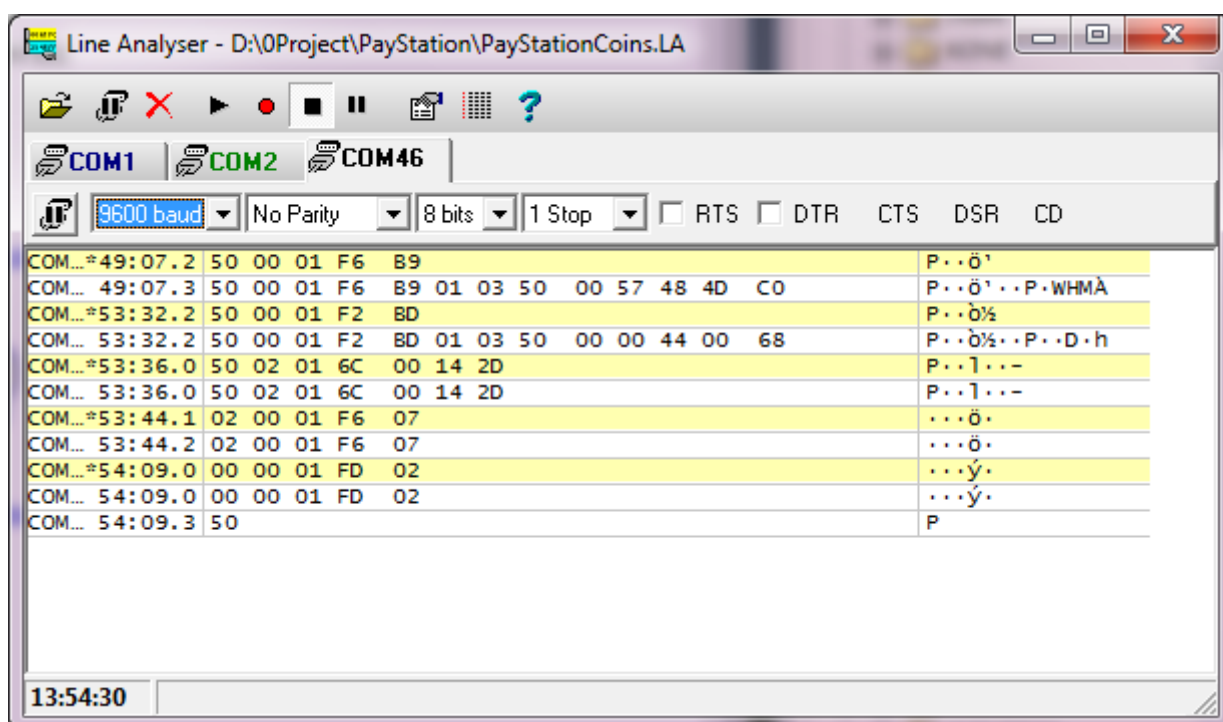
Serial data on all available COM ports is displayed as either data packets (in hexadecimal) or ASCII data. Single characters and complete packets can also be transmitted.

Data can be saved to disk as either hexadecimal packets or raw data. This can subsequently be viewed and edited by any text editor and/or replayed in different modes through any COM port using Line Analyser.

A set of 48 User Packets can be defined which can be transmitted through any COM port as a result of a user command or in response to a Trigger packet. See the User Packets Window.



# Main Window



The Main Window contains a Tabbed Parameter Block, a Packet Display, a Status Bar and the Command Buttons.

## Specifying COM port Parameters

The Tabbed Parameter Block on the top of the window allows the parameters for each COM port to be adjusted, including the states of the RTS and DTR line. The states of the CTS, DSR and CD lines are also displayed here. Each COM port has its own tab.

## Packet Display

This shows all serial data coming in and going out on one common, colour coded, scrollable region. Each COM port has its own colour and transmissions have a highlighting background. Colours can be changed in the Properties Window.

## Transmitting Data

To transmit a single character simply type it. To transmit a User Packet (as defined in the User Packets Window) press the corresponding Function key (ie F1..F12 with/without Shift and/or Ctrl). All data will be sent through the COM port selected in the Tabbed Parameter Block.

## Popup Menu

Right clicking (on a Packet) reveals additional commands:

Copy Packet:

Play Clipboard (raw):

Play Clipboard (as Hex):

Play Selected Packet:

## **Button Commands**

**Open Project:** Port Setting and Macros are saved in .la files for reuse.

**Pause Ports:** This freezes or unfreezes the Packet Display. Another similar button also exists on the Tabbed Parameter Block for each COM port, which not only freezes the selected port but also closes it, making it available to other programmes.

**Clear:** This clears (erases) the Packet Display.

**Play:** This turns ON the packet player. Packet Data files (\*.DAT), Hex filers and Raw Data files can be played. Packets are either played continuously (with or without a gap) or singularly with a Pause operating between every packet. (See the Properties Window).

**Record:** This turns ON the packet recorder. Both Packet Data files (\*.DAT) and Raw Data files can be recorded. Packet Data files contain all the information from the Packet Display, whereas Raw Data files contain only the actual data in binary.

**Stop:** This stops any Play or Record operation.

**Pause:** This pauses any Play or Record operation.

**User Packets:** This opens the User Packets Window.

**Properties:** This opens the Properties Window.

**About:** This brings up the About box.

# User Packets Window

This window provides 48 User Packets which can be transmitted manually or automatically.

To transmit a packet manually, type the corresponding function key (or Control-function key). ie. type F1 to send the first packet.

User Defined Packets

☐ Enable Trigger

☐ Trigger on Part Packet

?

Key	User Packet	Trigger
F1	00 00 01 FD \$B	"Poll, Addr 0=broadcast"
F2	02 00 01 FE \$B	"PollSimple, Addr \$02
F3	50 00 01 FE \$B	"Get Core Data, Addr \$50
F4	50 00 01 F2 \$B	"Request Serial Number"
F5	50 00 01 FD \$B	"Poll, Addr \$50"
F6	50 00 01 F6 \$B	"Request Manufacture ID"
F7	50 00 01 F5 \$B	"Request Equip Cat."
F8	50 00 01 F4 \$B	"Request Product Code"
F9	50 00 01 F1 \$B	"Request SW Rev"
F10	50 00 01 6E \$B	"Request Features"
F11	50 2 01 6C 00 14 \$B	"Flash LED"
F12		
^F1	02 00 01 F4 \$B	"Request Product Code"
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The Trigger packets provide a means of automated packet transmission. When a Trigger packet is received, the corresponding User Packet will be transmitted in response. To enable triggering, tick Enable Trigger. If Trigger on Part Packet is ticked then a received packet that starts with the Trigger will be valid and cause the transmission. Special Case: When the User Packet is blank and the Trigger is received, the control lines RTS and DTR are toggled.

## User Packet Format

Data can be hexadecimal AND/OR ASCII. Hexidecimal data is entered as single bytes separated by a space. To enter ASCII data, enclose it inside quotation marks. Data types can be mixed.

Example: 02 "Hello" 0D 0A

## Moving Packets

Packets can be moved up and down by dragging the far left column with the mouse. This does not overwrite any packets but inserts inbetween packets.

## Popup Menu

Right clicking on a User Packet reveals additional commands:

Play: Play the Packet. This is identical to pressing the corresponding Function key.

Cut: Copies the Packet to the Clipboard and then clears it.

Copy: Copy the Packet to the Clipboard.

Paste: Paste into the Packet from the Clipboard. (replacing the Packet)

Paste as ASCII: as above except printable characters are grouped within quotes.

# Properties Window

Change the way data is displayed and the way packets are Played.

## Display

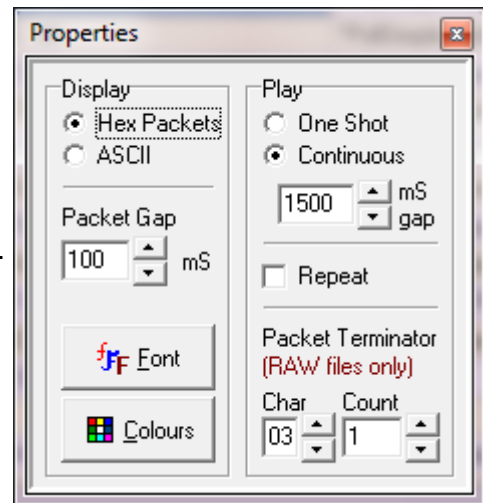
This specifies how the data is to be displayed. When Hex Packets is selected, the data is broken into time-delimited groups in displayed in hexadecimal and ASCII. The time gap required is specified in milli Seconds. When ASCII is selected, the data is displayed as raw characters similar to an ASCII terminal.

## Play

This specifies how the packets player operates: One Shot mode causes a Pause between every packet. The user must click on Pause to play the next packet. Continuous mode causes packets to be played with a constant gap (as specified here in seconds). The Pause button can still be used in Continuous mode. The Terminator is only used when playing Raw Data files and specifies the character that exists at the end of each packet.

## Changing the Packet Display Appearance

The Font and Colours used can be adjusted here. Only fixed space fonts are allowed. Colours which can be adjusted include the individual colours for each COM port, the background colour for transmitted packets and the background colour for received packets containing errors. Select the coloured item to adjust and press Enter, Space or double click.



# Cabling

All diagrams here assume the PC has 9 pin D plugs for the COM ports. If a 25 pin D plug is required:

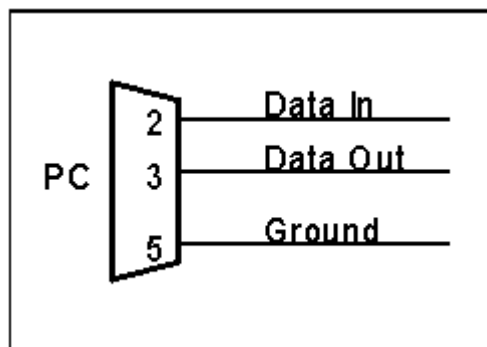
- 1) Use pin 9 for Ground (instead of 5).
- 2) Use pin 2 for Data Out & pin 3 for Data In (ie Swap pins 2 and 3).

The cabling required depends on whether:

- 1) The PC is connected directly to a device / data source OR
- 2) The PC is passive and only spies on the data going between 2 other devices.

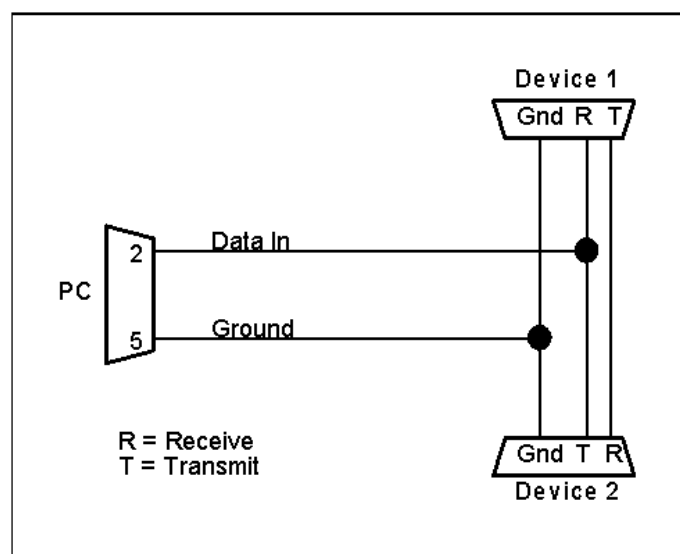
Always ensure that any DataIn (Rx) signal is connected to a DataOut (Tx) signal and that no 2 DataOut (Tx) signals are connected together. A healthy signal will sit at -10 volts.

- 1) Cabling required for simple connection between a PC and a device.



2)

- 2a) Spy cable for listening to a 1 way communication.



2b) Spy cable for listening to a 2 way communication.

