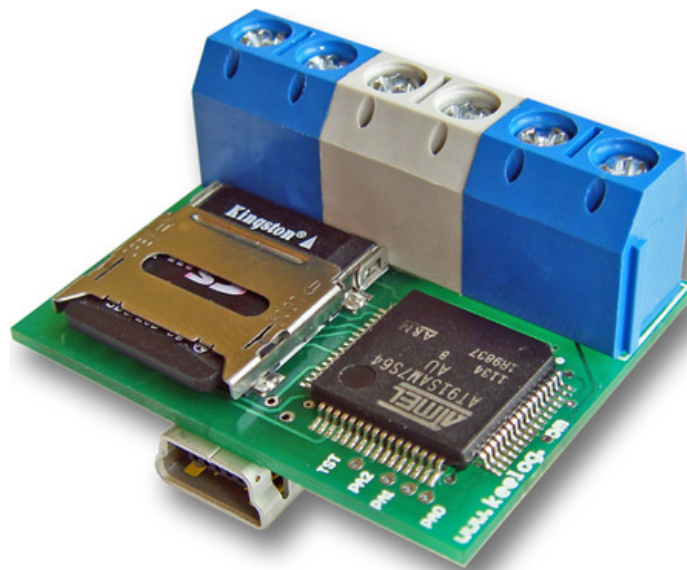


## User's Guide

# SerialGhost Module



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## Introduction

### *About the product*

The *SerialGhost Module* is a modular RS-232 and serial bus logger with a memory capacity of 2GB, that may be accessed as a USB Flash drive. Bidirectional data flowing through the serial bus will be captured and stored on the microSD card in a special file. This data may be retrieved by enabling Flash Drive mode, or removing the card. The *SerialGhost Module* does not require any dedicated software or drivers.

### *Features*

- Logs asynchronous serial transmission (RS-232 compatible)
- Baud rates up to 115200 bps
- Logs 2 streams simultaneously (RX and TX)
- 2 Gigabytes internal memory (microSD card)
- Powered from a USB port, or external power supply
- No software or drivers required, Windows, Linux, and Mac compatible
- USB Flash Drive mode

### *Requirements*

- Asynchronous serial bus with RS-232 logic levels (+/-12V)
- Operating system with USB Mass-Storage device support
- 5V DC power source (external power supply, or USB port)

## Configuration

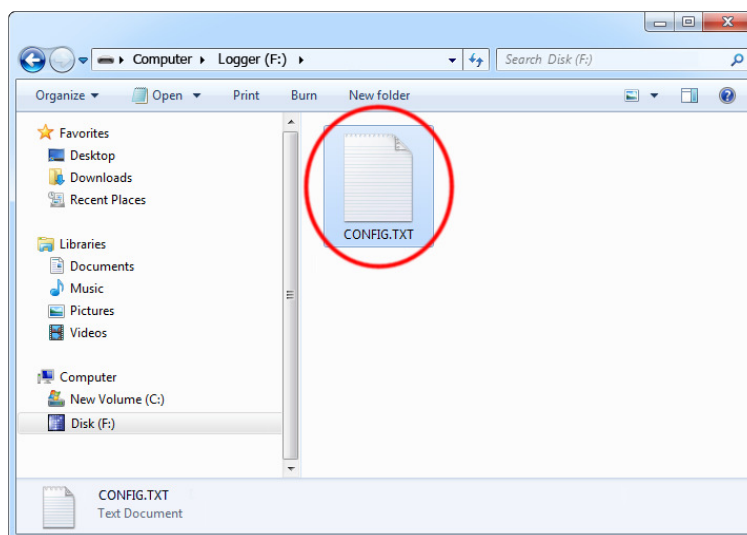
The *SerialGhost Module* may be configured through the file CONFIG.TXT, placed on the microSD card's root folder. Use any text editor to prepare such a configuration file, containing the following text:

```
Baudrate=9600
Bits=8
Parity=None
StopBits=1
```

Copy this file to the root folder of the microSD card. This can be done in 2 different ways:

- Removing the microSD card and using a card reader to access it
- Connecting a computer using the mini-USB connector and USB cable

When the configuration file CONFIG.TXT is copied to the microSD card, the new configuration will be loaded on next power-up.



The following list presents the most common configuration options. All variable and value strings are case insensitive.

**Baudrate** sets the baud rate in bits per second of the monitored serial bus. Range is 300 bps to 115,200 bps. Default value is *9600*.

**Bits** sets the number of bits per transfer of the monitored serial bus. Possible values are 5, 6, 7, 8. Default value is 8.

**Parity** sets the parity bit type of the monitored serial bus. Possible values are *None*, *Even*, *Odd*, *Space*, *Mark*. Default value is *None*.

**StopBits** sets the number of stop bits per transfer of the monitored serial bus. Possible values are 1, 1.5, 2. Default is 1.

**DisableLogging** allows to disable logging. Allowed values are *Yes* (logging disabled) and *No* (logging enabled). Default value is *No*.

**Encryption** enables microSD card encrypting. Encryption will ensure full confidentiality of the stored data, even if the device is physically tampered with. Allowed values are *Yes* (encryption enabled) and *No* (encryption disabled). Default is *No*.

Important: toggling the encryption setting will format the entire microSD card. All data will be lost, including the configuration file!

**LogMode** sets the logging mode. Possible values are *Ascii* (data is logged as ASCII), *Hex* (data is logged as hexadecimal numbers), *Dec* (data is logged as decimal numbers). Default value is *Ascii*.

**Separator** sets the separator character between data values in logging mode *Dec/Hex*. Possible values are *None*, *Space*, *Comma*, *Tab*, *Newline*. Default is *Space*.

**LogStream** configures which serial stream are to be logged. Possible values are *Both* (both RX and TX get logged), *Rx* (only Rx is logged), *Tx* (only Tx is logged). Default is *Both*. If the mode is set to *Both*, the *[1]* and *[2]* markers will be used to differentiate between streams.

The following table presents all possible configuration parameters.

Parameter	Values	Example	Description
<b>Baudrate</b>	Baud rate in bps (default 9600)	Baudrate=115200	Serial bus baud rate in bits per second (300...115200).
<b>Bits</b>	5 6 7 8 (default)	Bits=7	Number of bits per transfer on the monitored serial bus.
<b>Parity</b>	None (default) Even Odd Space Mark	Parity=Even	Type of parity bit on the monitored serial bus.
<b>StopBits</b>	1 (default) 1.5 2	Parity=1	Number of stop bits per transfer on the monitored serial bus.
<b>DisableLogging</b>	Yes No (default)	DisableLogging=Yes	Data logging disable flag.
<b>Encryption</b>	Yes No (default)	Encryption=No	MicroSD card encryption setting (caution: changing this value will re-format the microSD card).
<b>Separator</b>	None Space (default) Comma Tab Newline	Separator=Comma	The separator between data values in Dec/Hex modes.

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# SerialGhost Module

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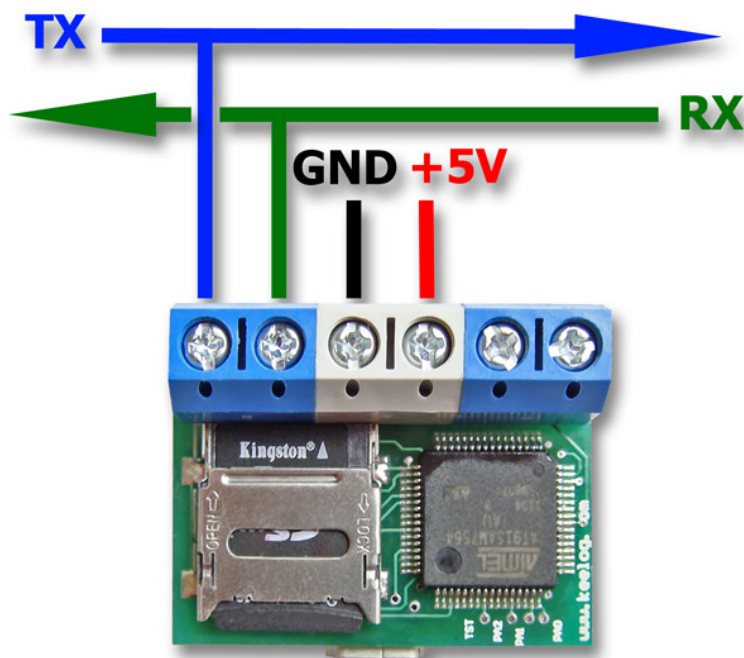
<b>LogMode</b>	Ascii (default) Hex Dec	LogMode=Hex	Data format in log file.
<b>LogStream</b>	Both (default) Rx Tx	LogStream=Tx	Selection of serial data streams to be logged.

## Recording data

Record mode is the default mode of operation for the *SerialGhost Module* data logger. In record mode, the device will silently monitor the bidirectional data flow on the serial bus and store the captured data on the microSD card in file LOG.TXT.

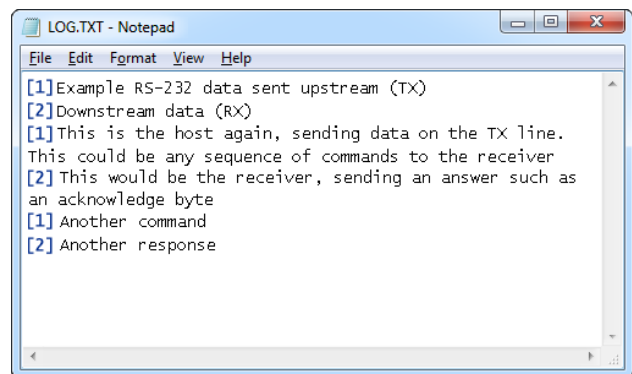
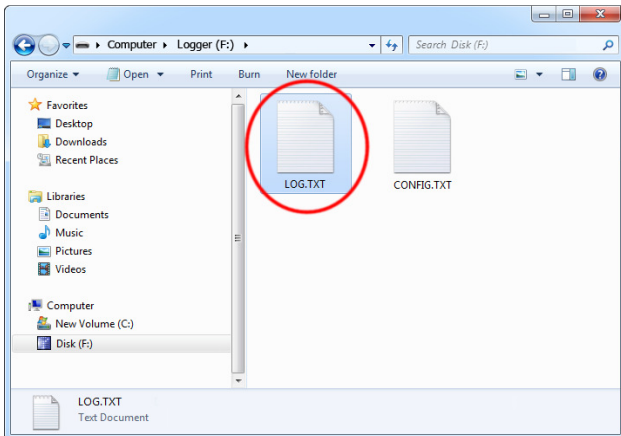
The *SerialGhost Module* must first be configured to the appropriate serial bus parameters, such as baud rate. Refer to section **Configuration** for detailed instructions.

Installation of the *SerialGhost Module* in record mode is quick and easy, no software or drivers are required. Simply connect both serial streams to the RX and TX input connectors. Usually this will be the upstream and downstream line of a serial bus. The device must be powered with a **+5V DC** (min. 200 mA) power supply, through the +5V/GND connectors, or using the mini-USB socket.



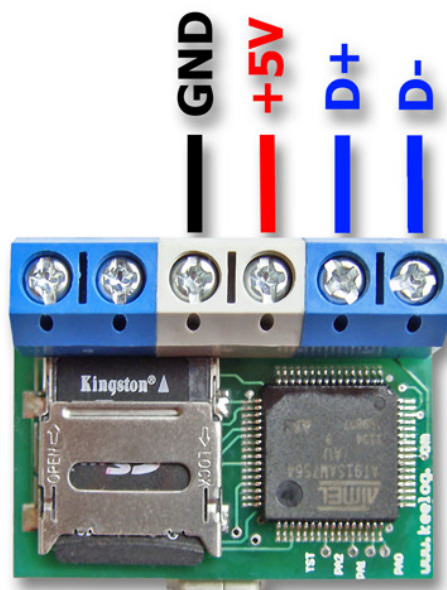
## Viewing recorded data

Once serial data has been recorded, it may be viewed simply by removing the microSD card, and inserting it into card reader. The microSD card is formatted as a FAT16 file-system, and may be accessed as a removable drive. The removable disk will contain the file LOG.TXT with a text log of all captured data. The data is stored in the same format as appearing on the serial bus, without any encoding. The upstream data (TX) and downstream data (RX) will be differentiated by the markers [1] and [2] interleaved in the log file. The file LOG.TXT can be viewed and searched with any text editor, such as *Notepad* or *MS Word*.



Alternatively, a the mini-USB socket may be used to connect the *SerialGhost Module* logger to a computer. The *SerialGhost Module* will then enumerate as a Mass-Storage device, and show up as a removable drive. Accessing the log file is identical, as when using a card reader.

For embedded applications, the USB cable may be replaced with hard-wired connections. Refer to the diagram below for a description of pins.





## Specifications

<b>Power supply</b>	4.5 V – 5.5 V DC
<b>Max. power consumption</b>	65 mA (0.33 W)
<b>Maximum continuous log speed (approx.)</b>	15 kB/s (both streams)
<b>Memory capacity</b>	4-16 GB
<b>Data retention</b>	100 years
<b>Device support</b>	Asynchronous serial devices operating at RS-232 logic levels (+/-12V)
<b>Maximum log read speed</b>	150 kB/s
<b>Dimensions including connectors (L x W x H)</b>	25 mm x 31 mm x 14 mm (1.0" x 1.2" x 0.6")

All Keydemon products come with 1 year warranty against manufacturer defects. Defect products must be shipped by the customer. All warranty repairs and delivery to the customer will be paid by the manufacturer.

## Legal disclaimer

Keydemon does not take responsibility for any damage, harm or legal actions caused by misuse of its products. The user should follow the guidelines contained in this document, otherwise no liability will be assumed. It is the user's responsibility to obey all effective laws in his/her country, which may prohibit usage of Keydemon products. Please also consider, that not knowing the law does not allow to not obeying it. A good example is the U.S. Department of Justice Letter on Keystroke Monitoring and Login Banners, according to which a clear notice should be displayed, warning that user keystrokes may be logged. Please check with your legal representative for logging requirements in your country.

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You should not use this device to intercept data you are not authorized to possess, especially passwords, banking data, confidential correspondence etc. Most countries recognize this as a crime. Please consult a legal representative for logging requirements in your country.

Notes:

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