User's Guide

SerialGhost Wi-Fi
SerialGhost Pro Wi-Fi

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Introduction

About the product

The *SerialGhost Wi-Fi* and *SerialGhost Pro Wi-Fi* are compact RS-232 and serial bus loggers with a memory capacity of 4 gigabytes, that may be accessed locally as a USB Flash Drive, remotely through Wireless LAN, or through USB Virtual COM port (*SerialGhost Pro Wi-Fi*). Bidirectional data flowing through the serial bus will be captured and stored on the internal Flash Drive in a special file. This data may be retrieved by switching to Flash Drive mode, giving instant access to all captured data. The Wireless LAN functionality allows receiving logged data as E-mail reports, and on-demand via the local TCP/IP network.

The *SerialGhost Wi-Fi* and *SerialGhost Pro Wi-Fi* also feature a built-in time-stamping module and battery. This enables adding time and date information to the log file. Thanks to the internal battery, the time and date persist even when the device is not powered. The *SerialGhost Wi-Fi* does not require any dedicated software or drivers.

The *SerialGhost Pro Wi-Fi* is an enhanced version of the *SerialGhost Wi-Fi* with Virtual COM port connectivity. It may be controlled by commands sent over the serial port, allowing accessing the stored data and configuring the device. A special application named *KL Tools* is delivered free of charge to demonstrate this functionality.

Features

- Logs asynchronous serial transmission (RS-232 compatible)
- Baud rates up to 115200 bps
- Logs 2 streams simultaneously (RX and TX)
- 4 Gigabytes internal memory
- Powered from a USB port, or external power supply
- No software or drivers required, Windows, Linux, and Mac compatible
- USB Flash Drive mode
- Background connection to the Internet over a local Access Point
- Automatic E-mail reports with recorded data
- On-demand access at any time through TCP/IP
- Support for WEP, WPA, and WPA-2 encryption
- Time and date stamping
- Built-in battery
- Virtual COM port mode (*SerialGhost Pro Wi-Fi*)

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)
- Wi-Fi compliant Access Point coverage (WPA-2, WPA, WEP64/128, or open network)
- Optionally *MS Windows XP/Vista/7/8/10* (only for running *KL Tools*)

Quick Start

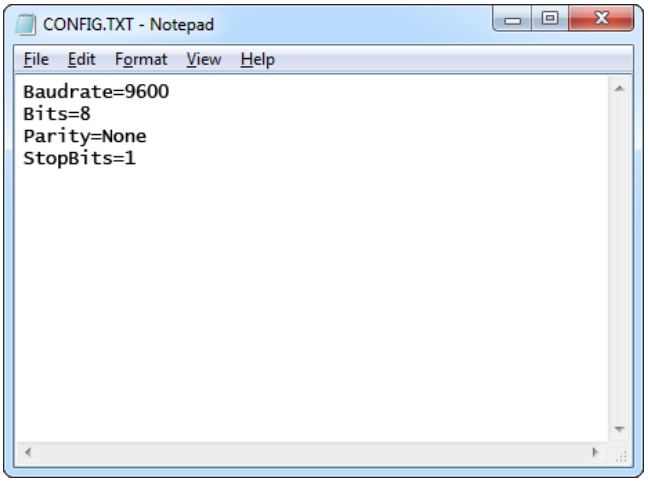
This section contains concise information on basic operation of the *SerialGhost Wi-Fi* and *SerialGhost Pro Wi-Fi*. If you need detailed instructions, please refer to sections **Configuration**, **Recording data**, and **Viewing recorded data**.

Before you start, make sure you have the following information about the serial bus you want to log data from:

- Baud rate (bits per second)
- Number of bits per transfer (usually 8)
- Parity bit configuration (usually not used)
- Number of stop bits per transfer (usually 1)

Step 1. Open a text editor (such as *Notepad*) and create a file named CONFIG.TXT. This file will later be used to configure the device. Use the following template:

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



Replace *Baudrate* with the actual baud rate in bits per second of the serial bus you want to log data from. Replace *Bits* with the number of bits per transfer (5…8). Provide the parity check using one of the following strings: *None*, *Even*, *Odd*, *Space*, or *Mark*. Replace *StopBits* with the number of stop bits per transfer (1, 1.5, or 2).

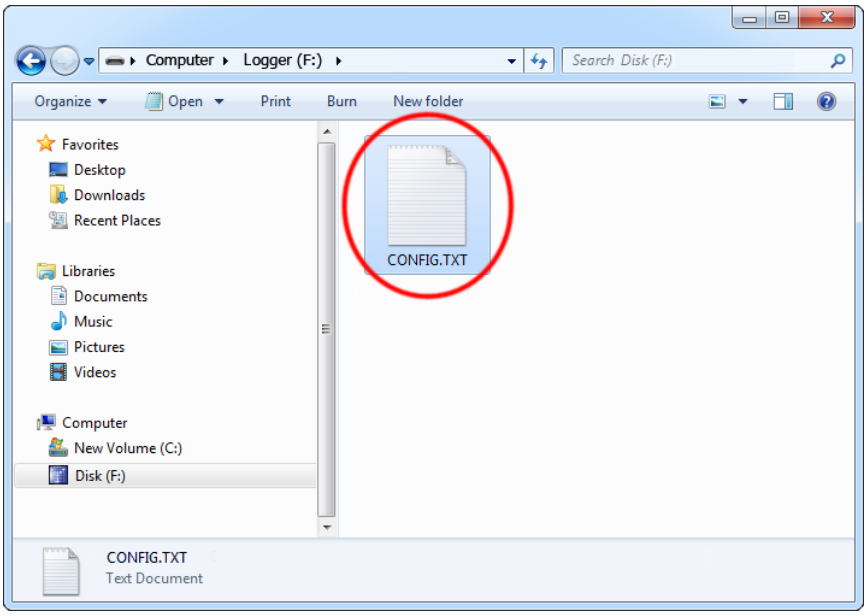
Finally, save the configuration file as CONFIG.TXT.

Step 2. Connect the serial logger and enable Flash Drive mode.

Take the supplied USB cable and connect it to the micro-USB port on the logger's side. Connect the USB cable to a free USB port **using the supplied red USB Key**.

After a few seconds, the *SerialGhost* will automatically get detected as a mass storage device, and pop up as a removable drive.

Step 3. Copy the configuration file CONFIG.TXT to the logger's Flash Drive.



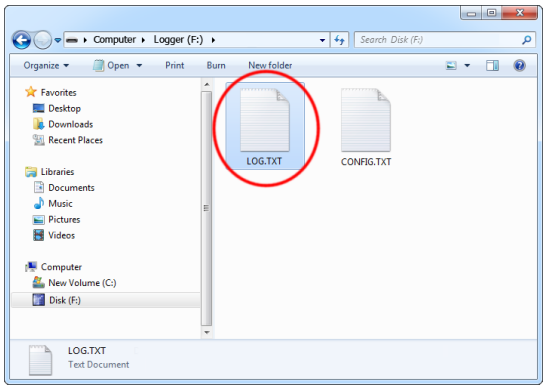
Then, safely remove the device, and disconnect it from the USB port. Disconnect the USB cable as well.

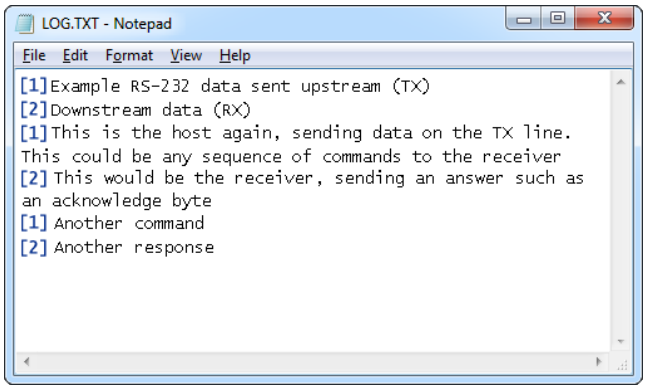
Step 4. To start logging, connect the logger in-line on a serial bus, powering the device through the micro-USB port.

The device may be powered from a standard USB port. **Do not** use the red USB key.

Alternatively, an external **+5V DC** (min. 200 mA) power supply may be used to power the device through the micro-USB port (cell phone chargers with USB connectors are well suited for this).

Step 5. To retrieve the logged data, **enable Flash Drive mode using the red USB Key**, just like in step 2. A removable drive will pop-up, containing the file LOG.TXT with recorded data.





The upstream data (TX) and downstream data (RX) will be differentiated by the markers [1] and [2] interleaved in the log file.

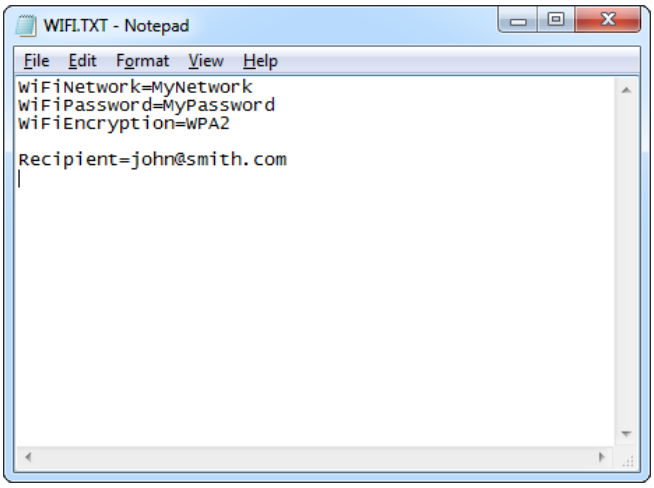
Step 6. To configure the Wireless LAN connection, make sure you have the following data about the Wi-Fi network the device will operate in:

- WLAN Access Point ID (SSID)
- WLAN encryption type (WPA-2, WPA, WEP64/128, or open network)
- WLAN encryption password

Make sure you also have an E-mail address the logger can send reports to.

Open a text editor (such as *Notepad*) and create a file named WIFI.TXT. This file will later be used to configure the device. Use the following template:

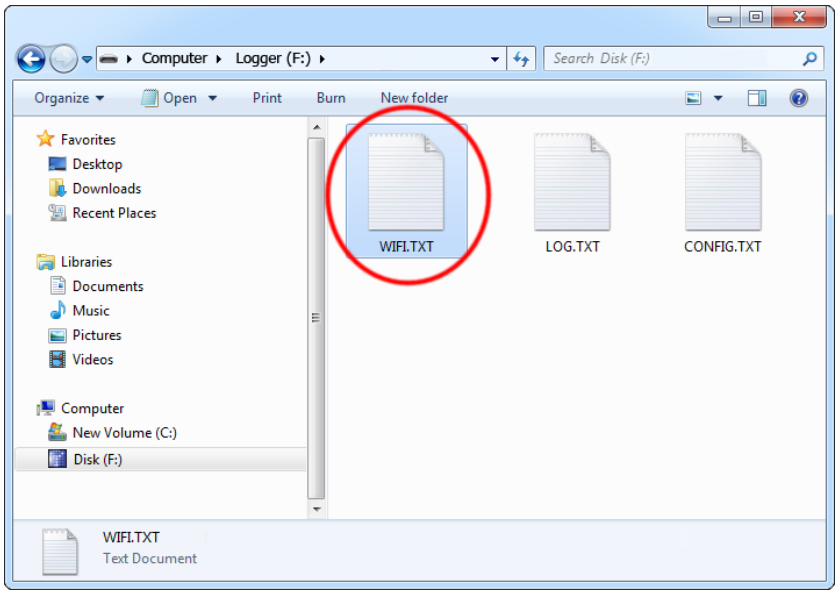
```
WiFiNetwork=MyNetwork
WiFiPassword=MyPassword
WiFiEncryption=WPA2

Recipient=john@smith.com
```



Replace *MyNetwork* with the Access Point ID (SSID). Replace *MyPassword* with the WLAN password. Provide the encryption type using one of the following strings: *WPA2*, *WPA*, *WEP64*, *WEP128*, or *None*. Provide the E-mail address you would like to receive reports to after the *Recipient* string. Make sure you provide all strings in a case-sensitive manner.

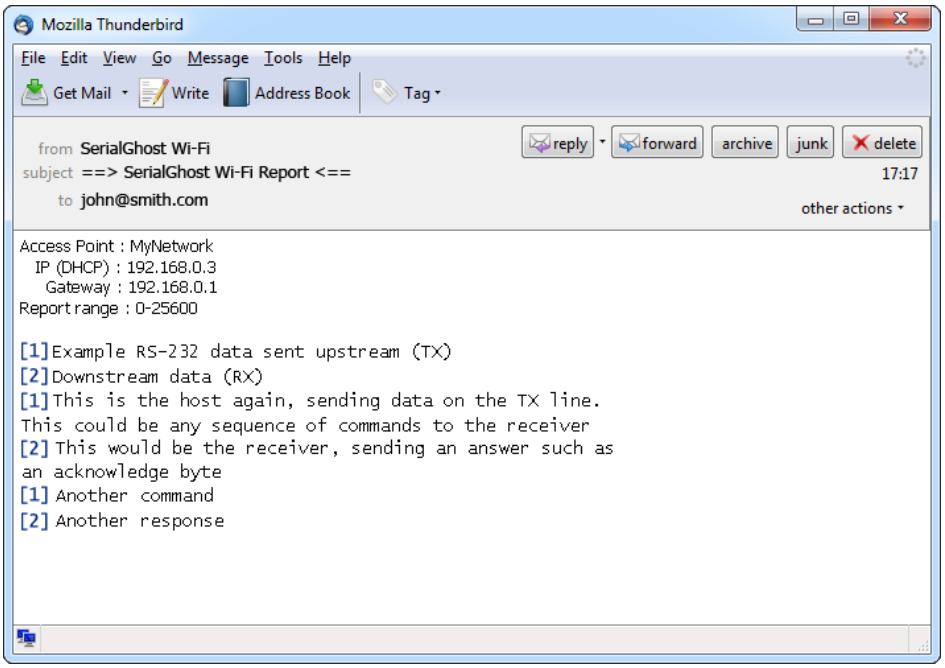
Finally, save the configuration file as WIFI.TXT.

Step 7. Enable Flash Drive mode, as in step 5, and copy the configuration file WIFI.TXT to the Flash Drive.

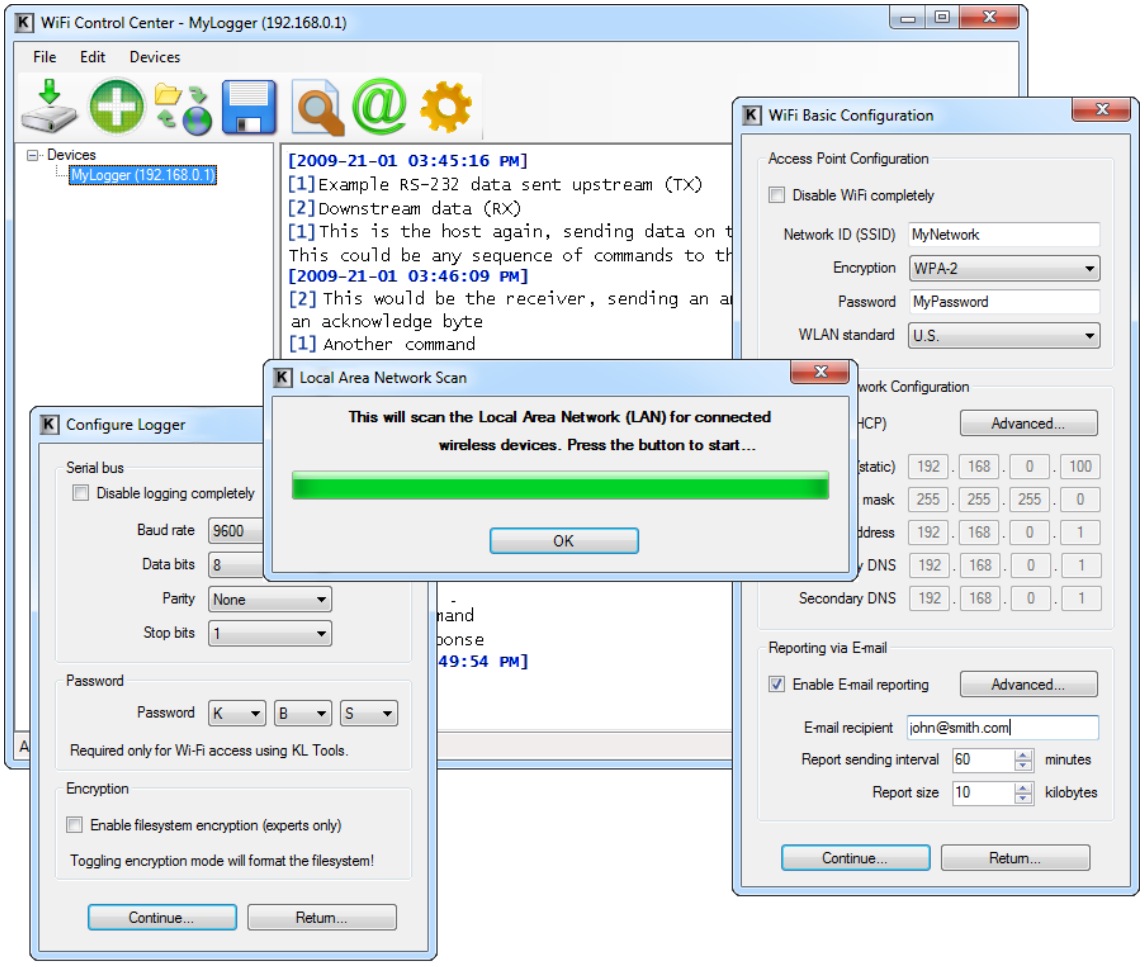


Then, safely remove the device, and disconnect it from the USB port.

Step 8. On the next power-up, the logger will automatically connect to the Access Point defined in WIFI.TXT, and send an E-mail report to the specified recipient address every hour. Besides logged data, the report will contain Access Point information, IP configuration, and time-stamps.



Step 9. If E-mail reporting is not enough, you can take full control over the device from any computer in your Local Area Network. Install the supplied application *KL Tools*, add the logger to the list by its IP number, and explore the available features.



Using *KL Tools* you can communicate with multiple *SerialGhosts*, allowing creating entire networks of wireless data loggers. This solution is particularly recommended for monitoring several devices in a system with a large number of devices using serial buses, such as RS-232.

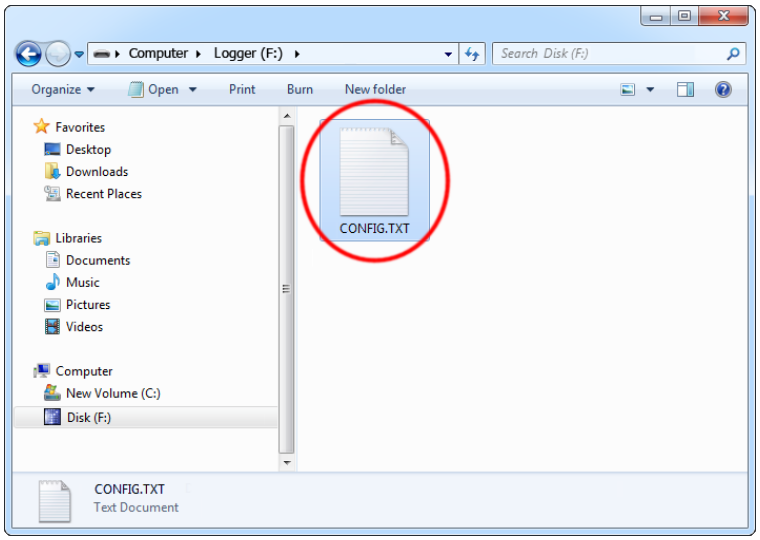
To read more on *KL Tools*, jump to section **Remote access**.

Configuration

The *SerialGhost Wi-Fi* (*SerialGhost Pro Wi-Fi*) may be configured through the file CONFIG.TXT, placed in the Flash Drive 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 in Flash Drive mode. 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*.

Timestamping configures the built-in time- and date-stamping module. Allowed values are *Yes* (timestamping enable) and *No* (timestamping disabled). Default is *Yes*.

TimestampInterval sets the interval of serial bus inactivity in seconds, that will trigger a new time-stamp being logged. Range is 1 second to 9999 seconds. Default value is *10*.

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

Password sets the 3-letter password for remote access over TCP/IP (for example using *KL Tools*). Any three-letter combination is allowed (sequence and case are irrelevant). Default value is *KBS*.

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

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.

UsbMode allows to switching between Flash Drive mode and Virtual COM mode (Pro version only). Allowed values are *Flash* (Flash Drive mode) and Com (Virtual COM mode). Default value is *Flash*.

A full list of parameters is available in section **Configuration files**.

Recording data

Record mode is the default mode of operation for the *SerialGhost Wi-Fi* (*SerialGhost Pro Wi-Fi*) 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 internal Flash Drive in file LOG.TXT.

The *SerialGhost* 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* in record mode is quick and easy, no software or drivers are required. Simply plug it in-line on the serial bus, using the DB-9 connector. The device may be powered from a standard USB port, using the supplied cable. Alternatively, an external **+5V DC** (min. 200 mA) power supply may be used to power the device through the micro-USB port (cell phone chargers with USB connectors are well suited for this).

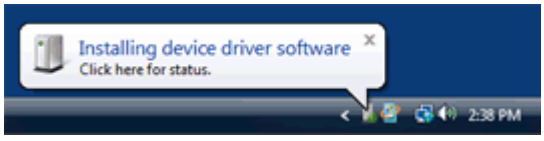
SerialGhost in record mode powered from a USB port.

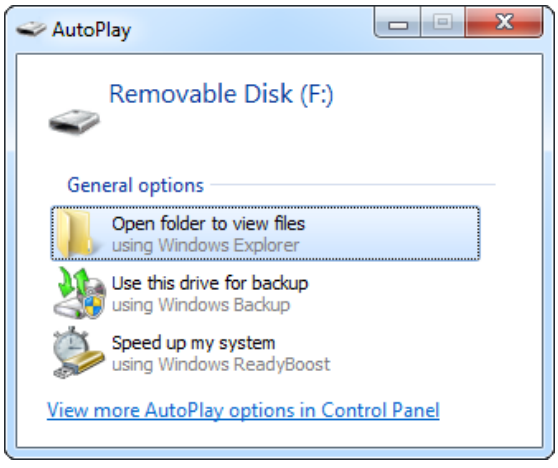
SerialGhost in record mode powered by an external 5V DC (min. 200mA) power supply.

Viewing recorded data

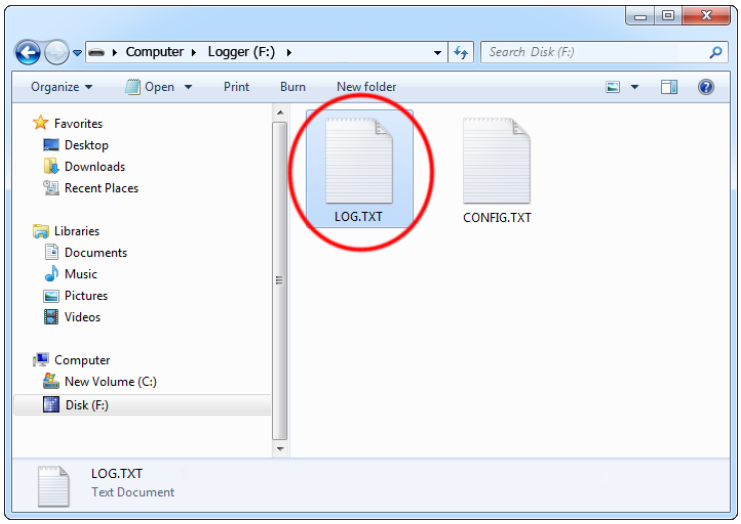
Once serial data has been recorded, it may be retrieved on any computer with a USB port. This is done by switching to Flash Drive mode. Take the supplied USB cable and connect it to the micro-USB port on the logger's side. Connect the USB cable to a free USB port **using the supplied red USB Key**.

After a few seconds, the *SerialGhost Wi-Fi* (*SerialGhost Pro Wi-Fi*) will automatically get detected as a mass storage device, and pop up as a removable drive. The operating system will use the standard built-in mass storage driver (*MS Windows 7* in the following examples).

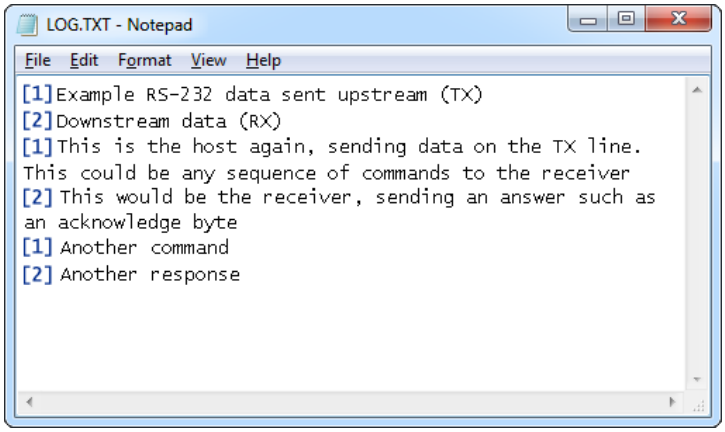




Depending on the drive letters available, the device will be visible as a new drive, for example F:. Use the systems file manager to browse this disk (for example *Explorer*).



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 *SerialGhost* will also interleave time-stamps. The file LOG.TXT can be viewed and searched with any text editor, such as *Notepad* or *MS Word*.



Switching back to record mode can be achieved by a safe software removal of the flash disk. Use the systems standard disk removal procedure. For *MS Windows*, left-click on the *Safe Removal* icon in the system tray and select the appropriate drive. Then reconnect the *SerialGhost* to the USB port, however without the supplied USB Key.

To get the most out of the *SerialGhost*, install the supplied application *KL Tools*. Go to section **Using KL Tools** to find out more.

Remote access

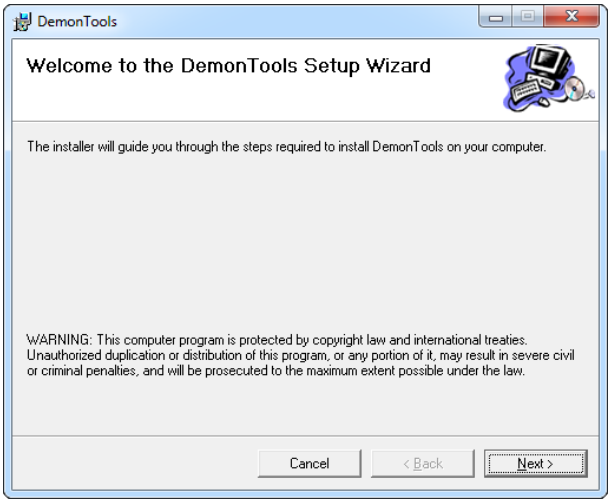
This section guides through enabling E-mail reporting and TCP/IP access for the *SerialGhost Wi-Fi* (*SerialGhost Pro Wi-Fi*) data logger.

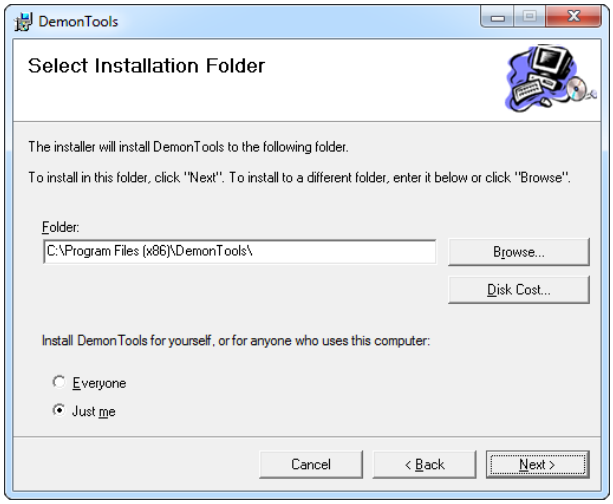
Checklist

Before you start, make sure you have the following data about the Wi-Fi network the logger will operate in:

- WLAN Access Point ID (SSID)
- WLAN encryption type (WPA-2, WPA, WEP64/128, or open network)
- WLAN encryption password

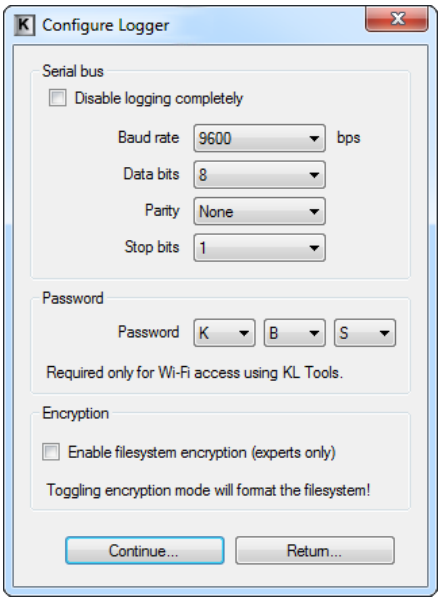
Make sure you also have an E-mail address the wireless logger can send reports to. Finally, to make the configuration process as simple as possible, install the supplied application *KL Tools*. The installation process is straightforward, just follow the wizard and answer a few standard questions.



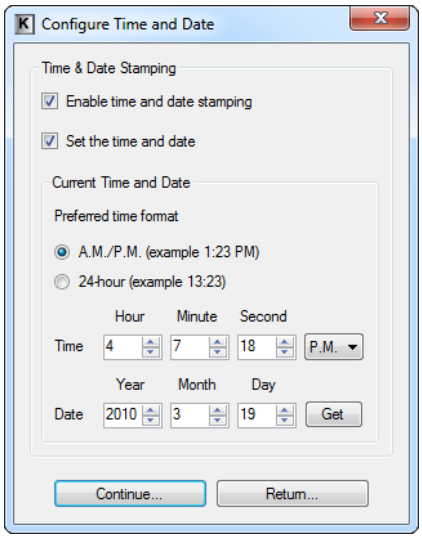


Configuration

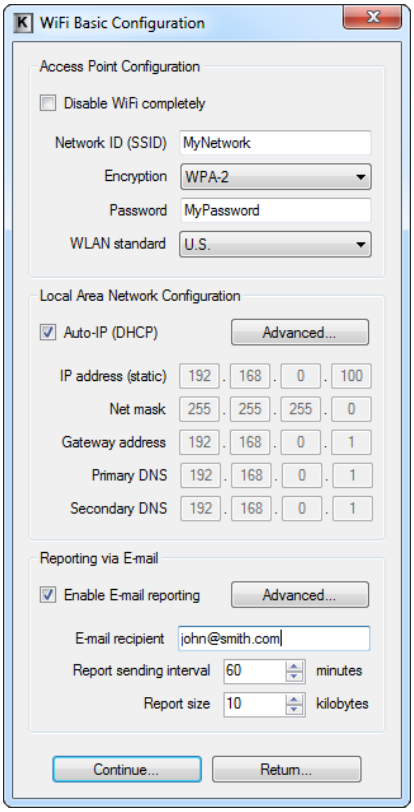
The *SerialGhost Wi-Fi* (*SerialGhost Pro Wi-Fi*) can be configured and operated entirely from *KL Tools*. Launch the application, select the device model, and choose to configure your device. The application will first display a serial bus configuration dialog, and then a time configuration dialog. If changing the default password, memorize or note the new values, otherwise access to the internal memory will not be possible. If unsure about a certain configuration option, leave the default value.



Serial bus configuration



Time-stamping module configuration



Finally, a Wi-Fi configuration dialog will be shown. Enter the data allowing the logger to connect to the WLAN Access Point:

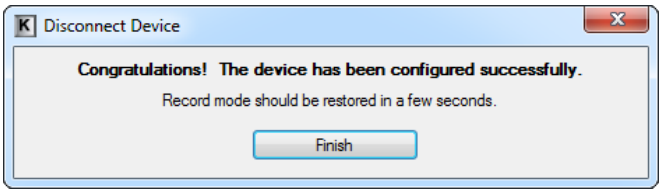
- WLAN Access Point ID (SSID)
- WLAN encryption type
- WLAN encryption password

Remember, that these strings are case-sensitive.

If the WLAN Access Point does not allow Auto-IP configuration through DHCP, provide a static IP address, network mask, gateway address, and DNS information.

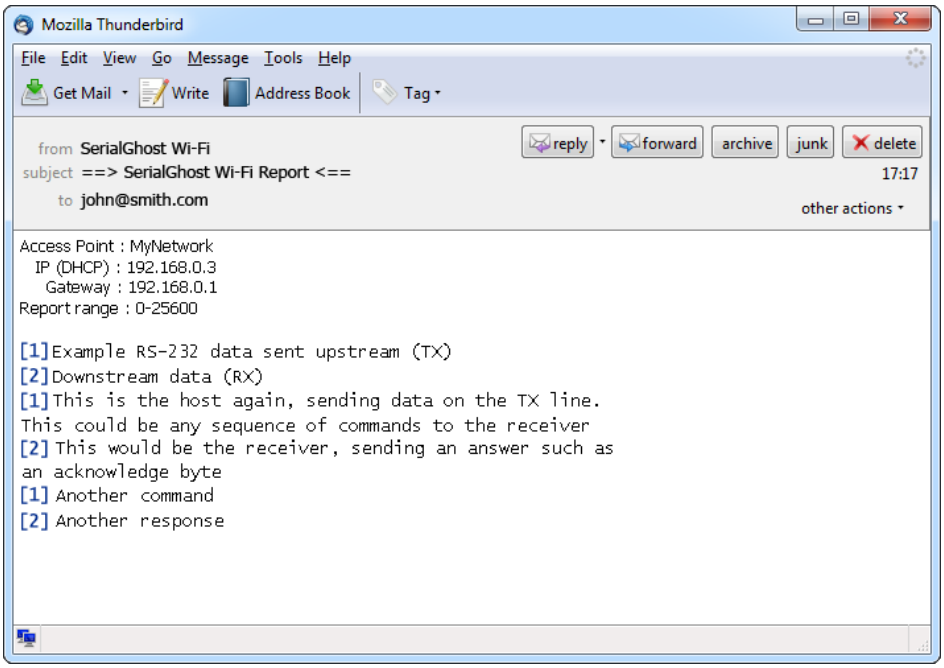
To receive E-mail reports containing serial data, supply your E-mail address. You may adjust the reporting interval and report size.

When finished, make sure the device is connected as in record mode. *KL Tools* will automatically create configuration files (CONFIG.TXT, TIME.TXT, WIFI.TXT), prompt for enabling Flash Drive mode, and copy the files to the loggers Flash Drive.



E-mail reporting

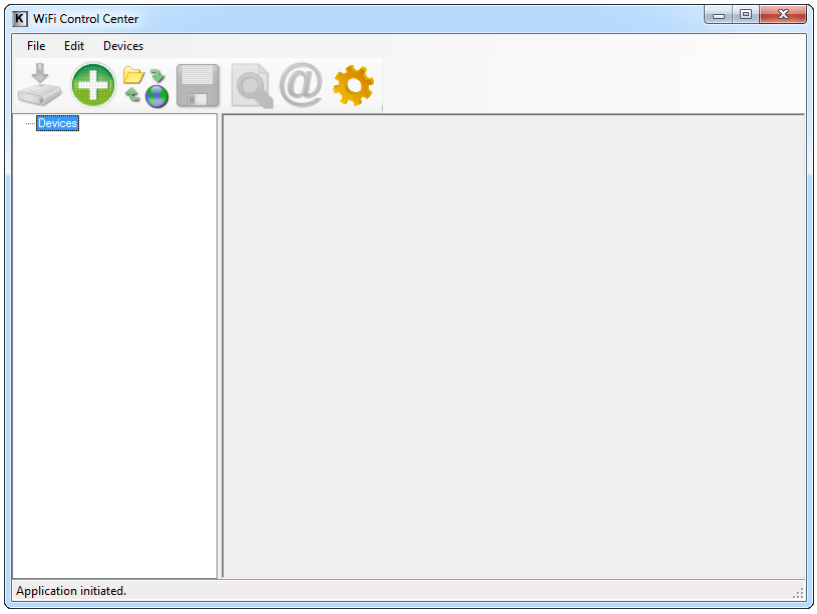
The *SerialGhost Wi-Fi* (*SerialGhost Pro Wi-Fi*) will send E-mail reports to the specified recipient address, by default every hour. Besides logged data, the report will contain Access Point information, IP configuration, and time-stamps.



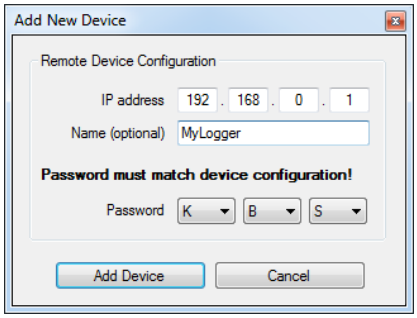
The report size and interval may be set by configuring the logger through the file WIFI.TXT. Use *KL Tools* to do this, or view section **Configuration files**.

On-demand access

The *SerialGhost Wi-Fi* (*SerialGhost Pro Wi-Fi*) offers on-demand access via TCP/IP from any computer connected to the network. This feature is usually limited to the Local Area Network, unless your local network segment is visible globally. To access the logger remotely, launch *KL Tools*, select the proper device version, and navigate through the wizard to remote access. The *Wi-Fi Control Center* will be shown.



A remote device needs to be added first. This can be done by clicking the *Add Device* icon, and supplying the IP address, name (optional), and device password. The password must match the local 3-character combination defined in the devices CONFIG.TXT (K, B, S by default).

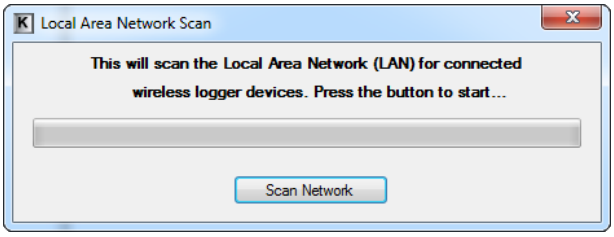


The IP address of the remote device can be obtained in a few ways:

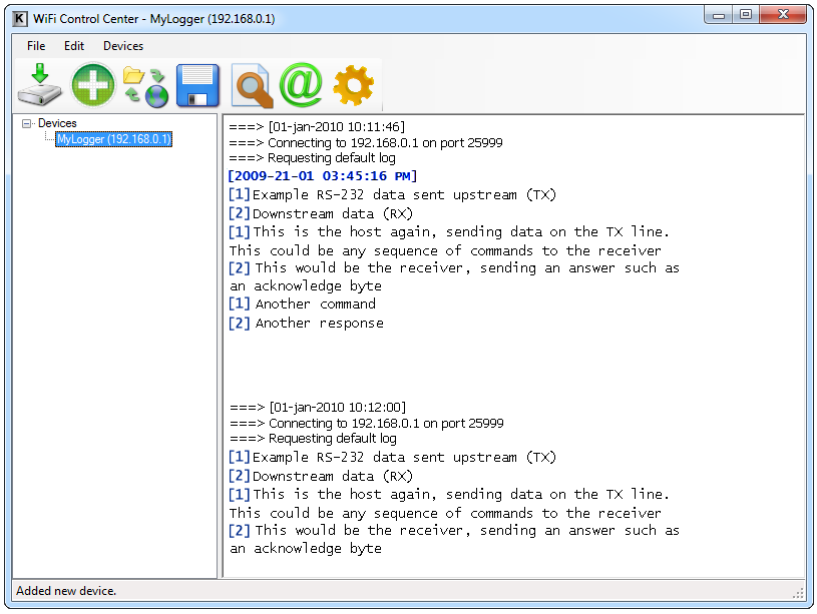
- from an E-mail report (see section **E-mail reporting**)
- from the device configuration (if using static IP)
- from the Access Point configuration (if using Auto-IP)

If the IP address is unknown, the *Search Local Network* option can be used. This feature will send a broadcast signal to all devices in the Local Area Network, to which remote loggers

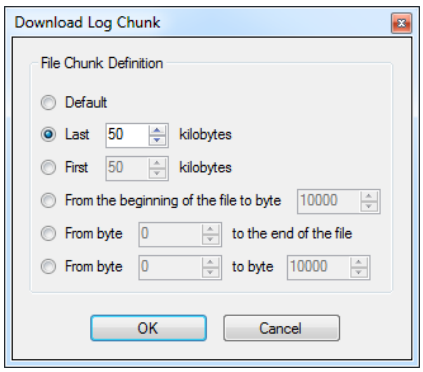
should respond. Make sure that no firewall blocks UDP communication, otherwise the procedure will fail.



Once a remote device is added, the log may be retrieved using the *Download Log* option.



If interested in other parts of the remote log file than the most recent 50 kB, use the *Download Log Chunk* option. This will display a dialog, allowing downloading any part of the remote log file.



KL Tools offers a wide variety of options, available at a single mouse-click:

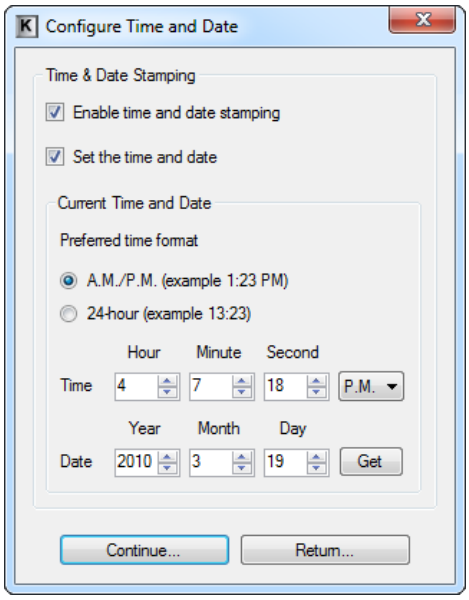
- E-mail and WWW search
- Encoding and layout conversion
- Document searching
- Document exporting
- Communication with remote device
- Multiple device handling

Using *KL Tools* you can communicate with multiple *SerialGhosts*, allowing creating entire networks of wireless data loggers. This solution is particularly recommended for monitoring several devices in a system with a large number of devices using serial buses, such as RS-232.

Clock configuration

It is necessary to configure the built-in clock module for getting correct date and time-stamps. This task can be performed by *KL Tools* (recommended), or can be done manually.

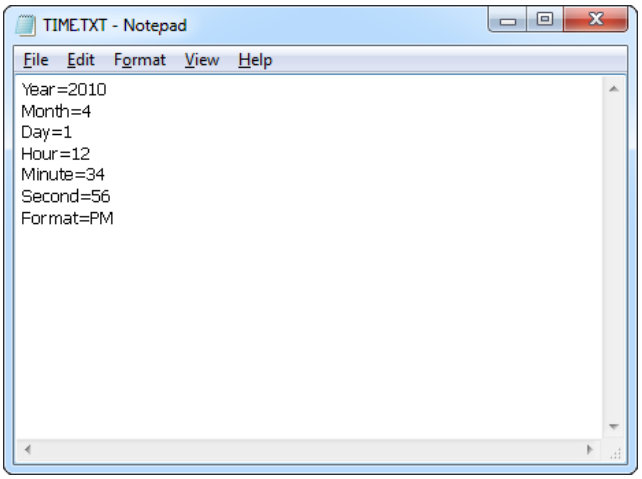
To configure the internal clock using *KL Tools*, launch the application, select the device model, and choose to configure the device. The application will display a time and date configuration dialog. Make sure date and time stamping is enabled, and that the *Set time and date* checkbox is clicked. Select the desired time format, and move to the succeeding dialogs.



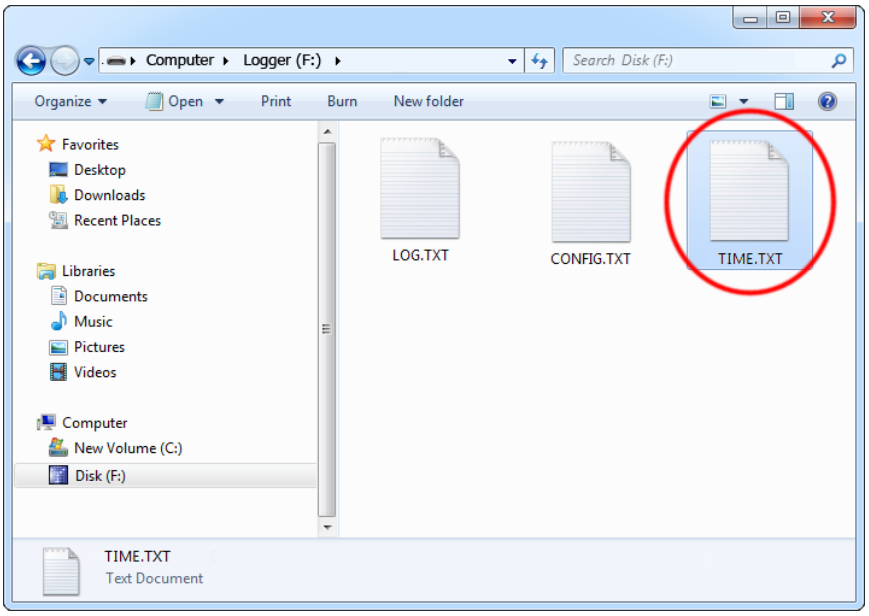
KL Tools will guide you through enabling Flash Drive mode, and placing the configuration file TIME.TXT on the internal flash disk.

The clock can also be configured manually, without using *KL Tools*. To do this, a text file named TIME.TXT should be prepared with the following format:

```
Year=2010
Month=4
Day=1
Hour=12
Minute=34
Second=56
Format=PM
```



The fields should contain the current time and date. The field *Format* allows distinguishing between A.M., P.M., and 24-hour time (use the value *AM*, *PM*, or *24*). After the file has been prepared, switch to Flash Drive mode and copy the file TIME.TXT to the root folder of the flash disk. The USB Key delivered with the device has to be used to switch to Flash Drive mode.



After copying the file, safely remove the Flash Drive. The new clock configuration will be loaded on next power-up.

The clock configuration file must be named TIME.TXT and must be placed in the root folder. Variable and value strings are case insensitive, however they must match the options listed below.

- *Year* sets the clock year value. Valid range is from 2000 to 2099.
- *Month* sets the clock month value. Valid range is from 1 (January) to 12 (December).
- *Day* sets the clock day value. Valid range is from 1 to 31. If the specified day exceeds the maximum number of days in the specified month, the next valid day value will be chosen.
- *Hour* sets the clock hour value. Valid range is from 1 to 12 for 12-hour time (A.M./P.M.), and 0 to 23 for 24-hour time.
- *Minute* sets the clock minute value. Valid range is from 0 to 59.
- *Second* sets the clock second value. Valid range is from 0 to 59.
- *Format* sets the time format. Valid values are *AM*, *PM*, and *24*. If *AM* is chosen, the 12-hour format is selected and the specified hour is treated as before noon. If *PM* is chosen, the 12-hour format is selected and the specified hour is treated as after noon. If *24* is chosen, the 24-hour format is selected and the specified hour is treated as 24-hour format.

Sample TIME.TXT for 12-hour time:

```
Year=2010
Month=10
Day=25
Hour=5
Minute=51
Second=43
Format=PM
```

Sample TIME.TXT for 24-hour time:

```
Year=2010
Month=10
Day=25
Hour=17
Minute=51
Second=43
Format=24
```

Virtual COM mode (SerialGhost Pro Wi-Fi only)

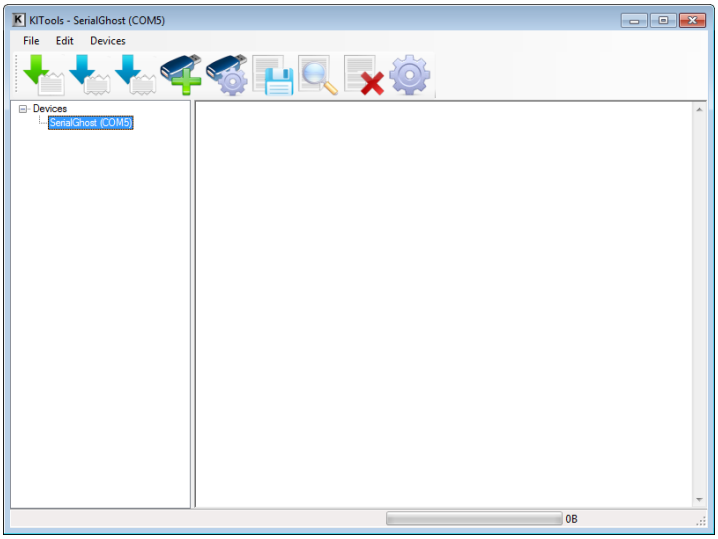
Virtual COM mode is a special mode available in the *SerialGhost Pro Wi-Fi* in which the device connects as a serial COM port. The CDC (Communications Device Class) driver class will be used, which is built-in most operating systems. To enable Virtual COM mode, the following entry needs to be present in CONFIG.TXT (refer to the **Configuration** section for details):

```
UsbMode=Com
```

Make sure the CONFIG.TXT file is properly saved in the Flash Drive root folder. Upon next power-up, the device will connect as a Virtual COM port.

The simplest way of accessing the device in Virtual COM mode is using the application *KL Tools* (refer to the **Using KL Tools** section for details). Upon start-up select the proper device:

Then, use the wizard to access the device using Virtual COM mode. Finally a window will appear, allowing full control of any devices connected in Virtual COM mode. Adding a device will scan all available serial ports, searching for compatible devices.



KL Tools will guide through all features of the device with its intuitive user interface.

Switching the device back to Flash drive mode can be achieved in three ways:

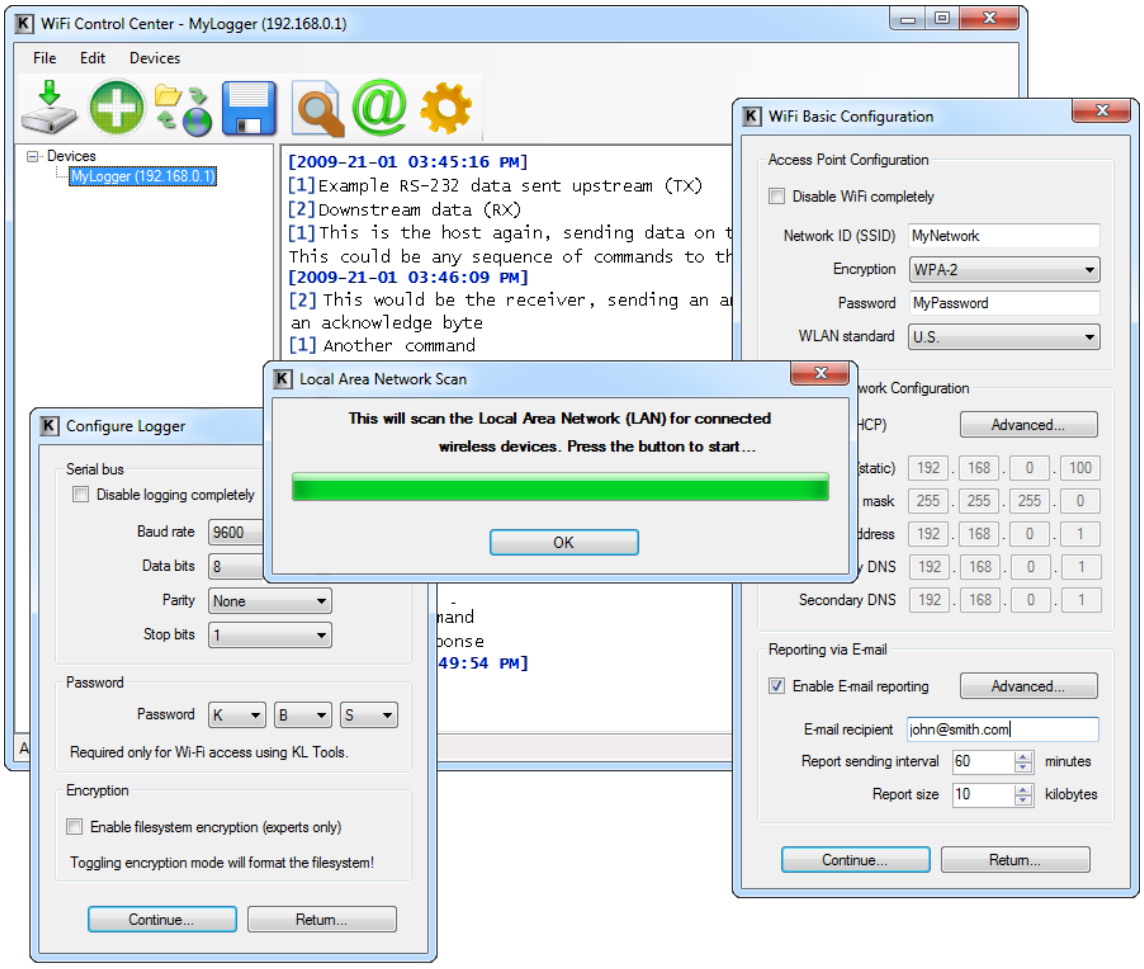
1) For a single session, by using the red USB key during powerup
2) Permanently, by using the device configuration dialog window in *KL Tools*
3) Permanently, by using the red USB key and changing the following entry in CONFIG.TXT to:

```
UsbMode=Flash
```

Using KL Tools

KL Tools is a free application delivered with all *SerialGhost* series devices. *KL Tools* assists in configuring a *SerialGhost* and retrieving the recorded data it contains. It is not necessary to operate the device, but may speed up usage by its intuitive user interface.

KL Tools is available on the CD-ROM attached with the device. Installing *KL Tools* is straightforward. Simply follow the installation wizard and answer standard questions. When initialized, *KL Tools* will ask for the device type, and assist in configuring the device and retrieving the recorded images. There is no special knowledge required to use *KL Tools* – simply follow the instructions displayed by the application.



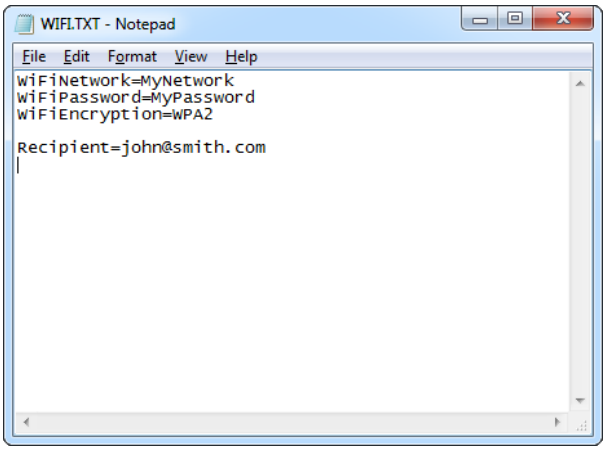
Configuration files

The *SerialGhost Wi-Fi* (*SerialGhost Pro Wi-Fi*) is configured via three text files placed on the internal Flash Drive:

- CONFIG.TXT (configures serial bus parameters)
- TIME.TXT (configures the internal clock for time-stamping)
- WIFI.TXT (configures Wi-Fi functionality)

These files should contain configuration parameters, placed in successive lines in the following format:

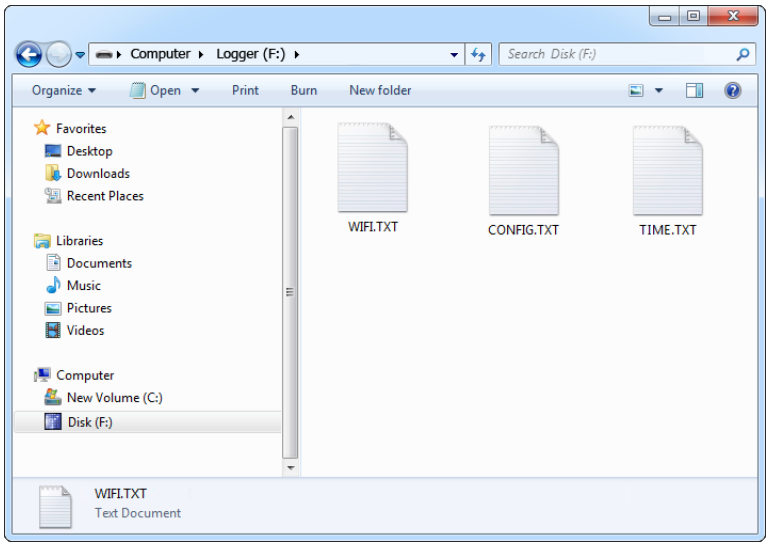
```
Parameter1=Value
Parameter2=Value
Parameter3=Value
…
```



Example of WIFI.TXT

```
WiFiNetwork=MyNetwork
WiFiPassword=MyPassword
WiFiEncryption=WPA2

Recipient=john@smith.com
```

These configuration files must be placed in the device internal memory using Flash Drive mode.



Device configuration can be performed by *KL Tools*, or manually by the user. *KL Tools* performs the same operation as would be done manually, that is creates the configuration files, requests switching to Flash Drive mode, and copies the files to the flash disk.

Creating configuration files manually may be necessary on systems not supported by *KL Tools*, such as *Mac OS* or *Linux*.

CONFIG.TXT

The file CONFIG.TXT is responsible for configuring serial bus parameters.

Parameter	Values	Example	Description
Baudrate	Baud rate in bps (default 9600)	Baudrate=115200	Serial bus baud rate in bits per second (300…115200).
Bits	5 6 7 8 (default)	Bits=7	Number of bits per transfer on the monitored serial bus.
Parity	None (default) Even Odd Space Mark	Parity=Even	Type of parity bit on the monitored serial bus.
StopBits	1 (default) 1.5 2	Parity=1	Number of stop bits per transfer on the monitored serial bus.
Timestamping	Yes (default) No	Timestamping=Yes	Time-stamping disable flag.
TimestampInterval	Timestamp interval in seconds (default 10)	TimestampInterval=1	Interval of bus inactivity which will result in a time-stamp being added.
DisableLogging	Yes No (default)	DisableLogging=Yes	Data logging disable flag.
Password	3-character password (default KBS)	Password=SVL	Three-character combination for accessing the device over TCP/IP (for example using *KL Tools*).
Separator	None Space (default) Comma Tab Newline	Separator=Comma	The separator between data values in Dec/Hex modes.
LogMode	Bin (default) Hex Dec	LogMode=Hex	Data format in log file.
LogStream	Both (default) Rx Tx	LogStream=Tx	Selection of serial data streams to be logged.
UsbMode	Flash (default) Com	UsbMode=Com	USB mode configuration setting, allowing switching between Flash Drive mode and Virtual COM mode. Effective only on device startup.

TIME.TXT

The file TIME.TXT is responsible for configuring the built-in real-time clock.

Parameter	Values	Example	Description
Year	Year value (range 2000…2099, default 2010)	Year=2010	Year setting (range 2000 to 2099).
Month	Month value (range 1…12, default 1)	Month=10	Month setting (1 is January, 12 is December).
Day	Day value (range 1…31, default 1)	Day=15	Day setting (range 1 to 31).
Hour	Hour value (range 1…12 or 0…23, default 1)	Hour=6	Hour setting (range 1 to 12 for A.M./P.M. format and 0 to 23 for 24-hour time).
Minute	Minute value (range 0…59, default 0)	Minute=37	Minute setting (range 0 to 59).
Second	Second value (range 0…59, default 0)	Second=49	Second setting (range 0 to 59).
Format	AM PM (default) 24	Format=24	Time format setting. If AM is chosen, the 12-hour format is selected and the specified hour is treated as before noon. If PM is chosen, the 12-hour format is selected and the specified hour is treated as after noon. If 24 is chosen, the 24-hour format is selected and the specified hour is treated as 24-hour format.

WIFI.TXT

The file WIFI.TXT is responsible for configuring Wireless LAN and TCP/IP functionality. The following tables summarize the available parameters.

Basic parameter list

Parameter	Values	Example	Description
WiFiNetwork	SSID string (no default)	WiFiNetwork=MyWiFi	Access Point ID (SSID), case-sensitive. If omitted, Wi-Fi functionality will be disabled.
WiFiEncryption	None (default) WEP64 WEP128 WPA WPA2	WiFiEncryption=WPA2	Access Point encryption type. If omitted, Wi-Fi functionality will be disabled.
WiFiPassword	Password string (no default)	WiFiPassword=MyPass	Access Point password, case sensitive. If open network, skip this parameter.
IpAddress	IP address string (no default)	IpAddress=192.168.0.100	Static IP address of device. Skip this parameter if using Auto-IP.
NetMask	Network mask string (no default)	NetMask=255.255.255.0	Network mask of device. Skip this parameter if using Auto-IP.
Gateway	Gateway address string (no default)	Gateway=192.168.0.1	Default gateway. Skip this parameter if using Auto-IP.
DnsServer	First DNS address string (no default)	DnsServer= 216.231.41.2	First DNS. Skip this parameter if using Auto-IP.
DnsServer2	Second DNS address string (no default)	DnsServer2= 206.124.64.1	Second DNS. Skip this parameter if using Auto-IP.
Recipient	E-mail recipient string (no default)	Recipient=john@server.com	Recipient E-mail address for E-mail reporting. If omitted, reporting will be disabled.
ReportInterval	Interval value (min. 600 sec. or 3600 sec., default 3600 sec.)	ReportInterval=7200	Interval for E-mail reporting in seconds. Minimum interval is 600 seconds (10 minutes) for custom SMTP server, and 3600 seconds (1 hour) for default server.
ReportSize	Size value (max. 102400 bytes, default 10240 bytes)	ReportSize=20000	E-mail report size in bytes.
DisableWiFi	Yes No (default)	DisableWiFi=Yes	Wi-Fi disable flag.

Advanced parameter list (use only when you know what you're doing!)

Parameter	Values	Example	Description
WiFiStandard	US (default) Canada Europe Spain France Japan	WiFiStandard=Europe	Standard for Wi-Fi operation. Select the region that fits best.
DisableTcp	Yes No (default)	DisableTcp=Yes	TCP disable flag. Disables on-demand access through TCP/IP.
TcpPort	Port value (0…65535, default 25999)	TcpPort=12345	TCP communication port. Must match setting in *KL Tools*.
DisableUdp	Yes No (default)	DisableUdp=Yes	UDP disable flag. Disables answering to broadcasted network searches.
UdpPort	Port value (0…65535, default 25998)	UdpPort=23456	UDP communication port. Must match setting in *KL Tools*.
DisableSmtp	Yes No (default)	DisableSmtp=No	SMTP disable flag. Disables E-mail reporting.
CustomSmtp	Yes No (default)	CustomSmtp=Yes	Custom SMTP flag. Enables user defined SMTP server.
SmtpServer	Server string (no default)	SmtpServer=smtp.mail.com	Custom SMTP server. Defines user SMTP server address.
SmtpUser	User string (no default)	SmtpUser=John	Custom SMTP user. Defines user SMTP user name.
SmtpPassword	Password string (no default)	SmtpPassword=MyPass	Custom SMTP password. Defines user SMTP password.
SmtpSender	Sender string (no default)	SmtpSender=John Smith	Custom SMTP server. Defines user SMTP sender string.
SmtpPort	Port value (0…65535, default 25)	SmtpPort=25	Custom SMTP communication port.

Sample Wi-Fi configuration files:

No encryption, Auto-IP

```
WiFiNetwork=MyWiFi

Recipient=john@server.com
```

WPA-2 encryption, static IP

```
WiFiNetwork=MyNetwork
WiFiPassword=MyPassword
WiFiEncryption=WPA2

IpAddress=192.168.0.100
NetMask=255.255.255.0
Gateway=192.168.0.1
DnsServer= 216.231.41.2
DnsServer2= 206.124.64.1

Recipient=john@smith.com
```

Specifications

Power supply	4.5 V – 5.5 V DC
Max. power consumption	220 mA (1.1 W)
Maximum continuous log speed (approx.)	100 kB/s (both streams)
Memory capacity	4 GB
Data retention	100 years
Device support	Asynchronous serial devices operating at RS-232 logic levels (+/-12V)
Maximum log read speed	1 MB/s
Access Point support	Wi-Fi CERTIFIED™ devices
WLAN encryption support	WPA-2, WPA, WEP64, WEP128
WLAN range	150 m (165 yards) in open terrain, approx. 50 m (55 yards) through one concrete wall
Dimensions including connectors (L x W x H)	62 mm x 31 mm x 16 mm (2.4" x 1.2" x 0.6")

All KeeLog 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.

Troubleshooting

The *SerialGhost* will **not** work with the following hardware configurations:

1. Synchronous serial buses
2. Devices operating at speeds higher than 115,200 bps
3. Serial buses using logic levels different than +/-12V
4. Serial devices using non-standard DB-9 pinouts
5. SPI, I2C, TWI, USB, PS/2, SATA, FireWire, etc. buses
6. Non Wi-Fi-conformant Access Points (Wi-Fi CERTIFIED™)

The SerialGhost does not switch to Flash Drive mode

Please check the following:

1. Are you using the delivered USB Key to connect the device to a USB port?
2. Does the operating system support removable USB flash disks?
3. Have you checked the drive list?
4. Have you tried on a different USB port?
5. Have you checked on a different computer?

I can't find any data after switching to Flash Drive mode

Please check the following:

1. Have you powered the device from the USB port while recording?
2. Did you properly configure the device through CONFIG.TXT?
3. Have you actually transmitted any data over the serial bus while recording?

The SerialGhost always shows up as a removable drive

Connect the USB plug directly to a USB port, without the USB Key.

I'm not receiving E-mail reports

Please check the following:

1. Have you configured Wi-Fi access by using *KL Tools* or creating WIFI.TXT manually?
2. Have you provided a valid recipient E-mail address? Are you checking the recipient mailbox?
3. Is the Access Point ID (SSID) set correctly? Remember, that it is case-sensitive.
4. Have you configured the encryption type and password correctly (case-sensitive)?
5. Is the remote device within WLAN range? Is the signal strong enough? Please verify this by using a second WLAN device located in the same position.
6. Does the Access Point configuration allow Auto-IP? If not, please provide a static IP configuration.

I cannot retrieve the log using KL Tools

Please check the following:

1. Have you added the remote device to the device list in *KL Tools* by providing its IP address?
2. Has the remote device established a connection to the Access Point? Check if you are receiving E-mail reports.
3. Have you performed a communication test? Right-click on the device in *KL Tools* and select *Test Communication*.
4. Have you performed a network search? Run a network search from *KL Tools*.
5. Is a firewall blocking communication? Check if the TCP and UDP ports (default 25999 and 25998) are available for communication.
6. Have you provided the correct 3-character combination? The remote device configuration must match the data entered in *KL Tools* (default values are KBS or KBD).
7. Is the remote device located in the same LAN segment as the host computer? If not, TCP/IP communication will not work.

The SerialGhost Pro Wi-Fi does show up as a Virtual COM device

Please check the following:

1. Have you configured the device to Virtual COM mode? Refer to the **Virtual COM mode** section for detailed instructions.
2. Does the operating system support Virtual COM devices (CDC support)?
3. Have you tried on a different USB port?
4. Have you checked on a different computer?

KL Tools cannot connect to the device ("Device not found!" error)

The *SerialGhost Pro Wi-Fi* has probably not enumerated properly as Virtual COM device. Please check the following:

1. Have you configured the device to Virtual COM mode? Refer to the **Virtual COM mode** section for detailed instructions.
2. Does the operating system support Virtual COM devices (CDC support)?
3. Have you tried on a different USB port?
4. Have you checked on a different computer?

Problems with time-stamps

Set the correct time by creating a clock configuration file TIME.TXT. Make sure you have not disabled time-stamping. Refer to the **Clock configuration** section for detailed instructions.

Can I run KL Tools on Mac OS or Linux?

KL Tools is currently only available for *MS Windows*. For configuring the device under *Mac OS* or *Linux*, the configuration files CONFIG.TXT, WIFI.TXT, and TIME.TXT must be created manually, using a text editor.

I've checked everything, nothing helps!

If you are still experiencing problems, please do the following:

1. Check if the problem appears with a different baud rate and serial bus configuration.
2. Check if the problem appears with a different serial bus driver.
3. Check if the problem appears using a different USB port.
4. Contact the dealer you have purchased the device from. Please supply all necessary information (hardware type, model and manufacturer, OS type and version, and a short description of the problem).

Legal disclaimer

KeeLog 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 KeeLog 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.

For more information on KeeLog products, visit our website:

http://www.keelog.com/

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:

European Office

KeeLog
Lekcyjna 42
PL 51-169 Wroclaw
Poland

http://www.keelog.com/
keelog@keelog.com

U.S. Office

Aqua Electronics
1550 Louis Ave.
Elk Grove Village, IL. 60007
U.S.A

✓RoHS