

INC,LLC

**USB1770
QUICK START
MANUAL**

Overview:

The USB1770 is a CAN to RS232 and CAN to USB device. The module can be used to monitor and control CAN networks from a PC. The module can also be used to log CAN data directly to a SD/MMC card for later analysis. This document gives an overview of how the module can be configured and used.

PHYSICAL:

Mechanical:

The USB1770 is encased in an extruded aluminum enclosure. The dimensions are approximately 4.2"x3.3"x1.1" (106mmx84mmx29mm).

Connectors:

The USB1770 has three connectors; a CAN connector (Combicon or 5 pin micro), a USB connector (type b), and a RS232 connector (DB-9).

Power:

Power for the module can be provided for the module through either the CAN connector or the USB connector. Unless specifically ordered power for the CAN transceiver **MUST** be provided at the CAN connector. This means that the module can be connected to and configured with just a USB connection, but the CAN status will remain in the BUSOFF state unless power is provided at the CAN connector. If the CAN power is provided, it will also power the CPU and rest of the module. The power provided must be 11-28V at the CAN connector and 5V at the USB connector.

Memory Cards:

When ordered the USB1770 can be populated with an SD card connector and a slot in the case for inserting the card. The module will accept both SD and MMC memory cards. It is recommended that a SD card be used because of the faster write times that may be needed with higher data loads on the CAN network. Currently SD cards up to 2GB are supported.

LEDs:

The **USB1770** has three LEDs to indicate the status of the CAN connection, the serial connection, and the Module itself. The LEDs are labeled NET, MOD, and COM.

NET LED STATE:	INDICATION:
Off	Power Off, CAN offline
Flashing Green	NA
Solid Green	CAN online
Green with Flicker	CAN Receiving messages
Flashing Red	CAN Errors
Solid Red	CAN BUS-OFF
Flashing Green-Red-Green-Red	Power on Self Test.

MOD LED STATE:	INDICATION:
Off	Power Off
Flashing Green	NA
Solid Green	Module OK
Flashing Red	Module Error (minor fault)
Flashing Amber	NA
Amber with Flicker	Storing data in datalogging mode
Solid Amber	File Open in datalogging mode
Solid Red	Module Error (major fault), File error in datalogging mode
Flashing Green-Red-Green-Red	Power on Self Test.

COM LED STATE:	INDICATION:
Off	Power Off, Not connected
Flashing Green	Connecting
Solid Green	Connected (USB or RS232)
Green with Flicker	Connected (USB or RS232) and transferring data to/from PC
Flashing Red	Serial Error (parity error)
Solid Red	Connection error (baud rate etc.)
Flashing Green-Red-Green-Red	Power on Self Test.

Operation:

The USB1770 can be used as a CAN interface to a PC application, a CAN data logger using a PC, or to log CAN data directly to a memory card.

PC Data Logging:

The USB1770 can be used to monitor and log CAN data into a database on a PC. This data can be exported to a file such as a comma separated value (csv) or Excel spreadsheet for further analysis. The database can also be interfaced with directly to allow development of custom applications.

Module Data Logging:

The USB1770 can log CAN data to an inserted memory card. The module must be configured for how to log the data. This can be accomplished by using the INC, LLC. INC_CAN_LOGGER software. The user must configure the CAN baud, CAN Filters, as well as the settings for the file data storage. Also, the user must select how to trigger the module to store CAN data. This can be by storing always, using an external switch connected between DTR and DSR (or RTS and CTS) or by configuring CAN triggers to start and stop the data storage when the module receives a particular CAN frame or a CAN frame with programmable trigger Data values in the frame.

Configuration:

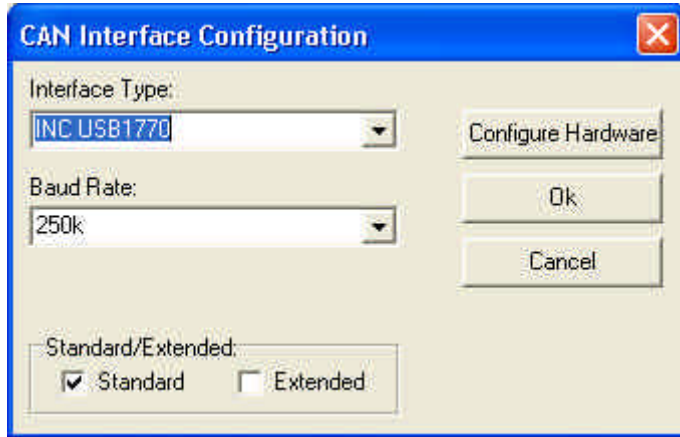
The USB1770 Module Data Logging can be configured using the INC INC_CAN_LOGGER application.

Getting Started using CAN Module Data Logging: (detailed instructions follow)

- 1) Install and run INC_CAN_Logger application
- 2) Insert SD card into USB1770
- 3) Connect USB1770 to PC
- 4) Open CAN interface
- 5) Configure CAN Options
- 6) Configure CAN Interface
- 7) Configure CAN Filters
- 8) Configure Module Logging Options
- 9) Configure CAN Triggers if needed
- 10) Connect to CAN network. Monitor LEDs for proper activity
- 11) Wait for File to be closed (MOD LED will go from Amber to Green).
- 12) Remove SD card and insert into reader.
- 13) Open the named file and the CAN data should be logged into the file. (see Example CAN logging File)

CAN Configuration:

This can be done by clicking on the Network->Configuration item in the Menu. The CAN Interface Configuration window will pop up. The user should select INC USB1770 as the interface type and set the CAN options such as Baud Rate and whether Standard and/or Extended messages should be accepted.

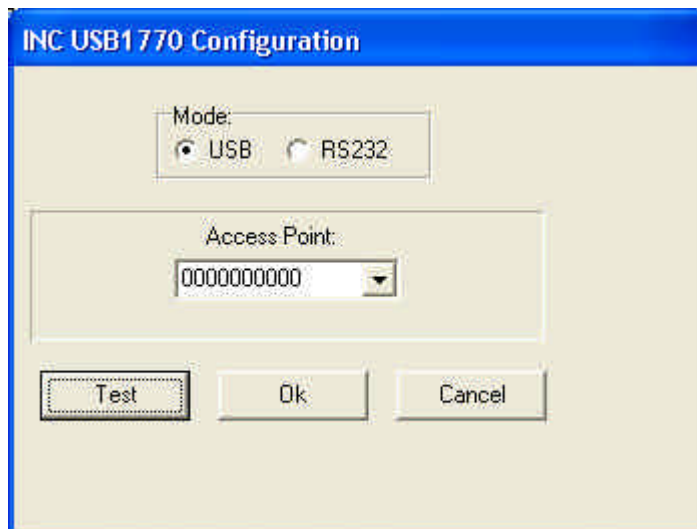


CAN Interface Configuration:

The user must configure the application to tell it how to connect to the USB1770. This can be done by clicking on the "Configure Hardware" button from the CAN Interface Configuration window. The user should select either USB or RS232 mode.

USB

If using USB the user should select the Access Point (which corresponds to the Serial number of the USB1770) this allows the user to have more than one module connected to the PC and be able to connect to the correct module.



RS232:

If using RS232, be sure to set the Comport and baud rate. The module uses an autobaud detection scheme so the user should pick the highest baudrate that their PC can handle.

INC USB1770 Configuration

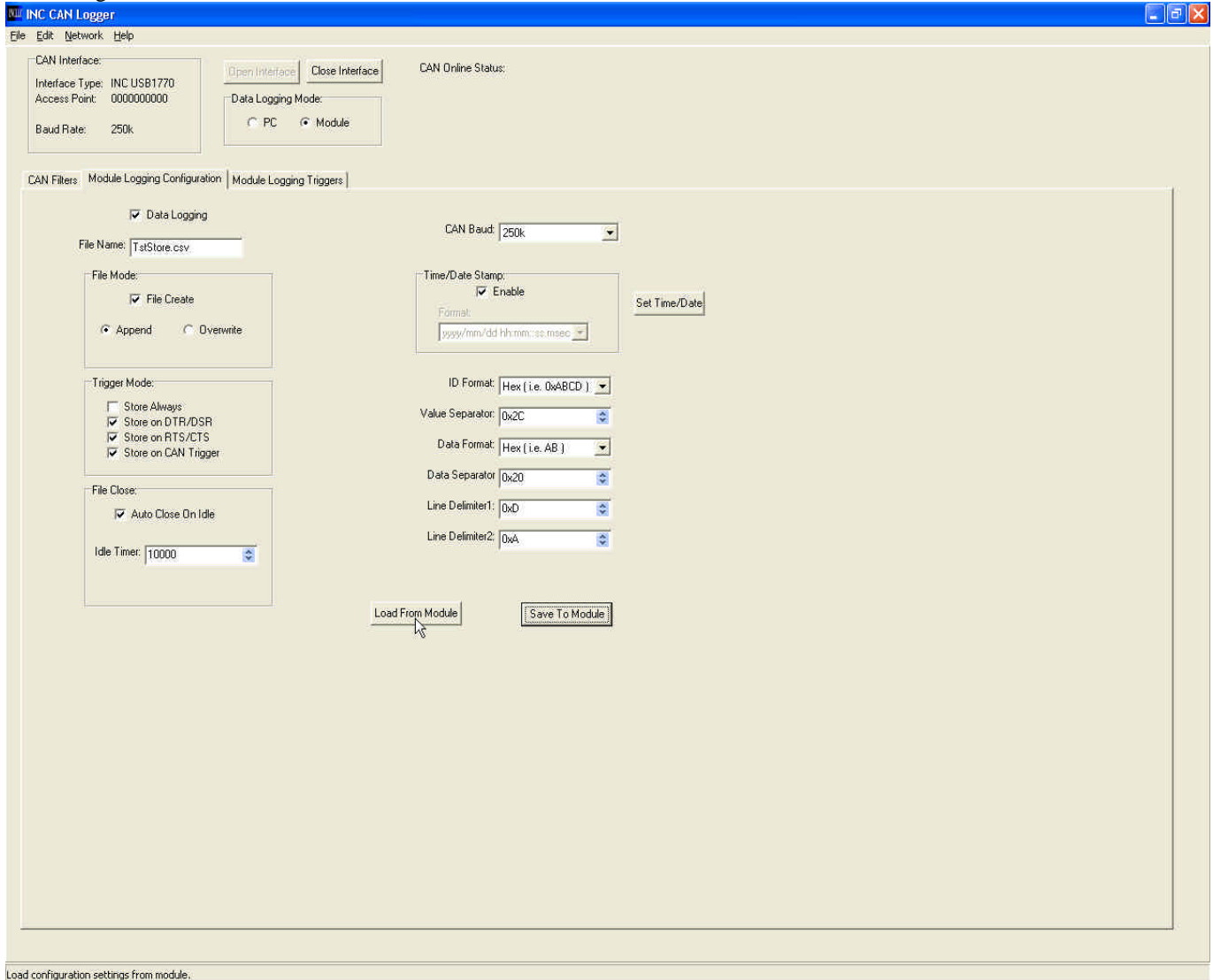
Mode:
 USB RS232

COM Port: COM1
COM Baud Rate: 57600

Test Ok Cancel

Module Logging Configuration:

If the user is using CAN logging on the module and not on the PC, the user must set how to start and stop logging as well as configuring the file information for storing the data. This can be done by clicking on the “Module Logging Configuration” tab.



Module Logging Configuration Options:

Data Logging: When checked the module will store the Data on the SD card. When unchecked the data is stored on the PC.

File Name: The file name that the module will store the data to on the SD card.

File Mode:

File Create: This determines if a file is created if it does not exist.

Append Overwrite: Defines whether the file is appended to or overwritten.

Trigger Mode:

Store Always: When checked, any received message is stored.

Store on DTR/DSR: When checked, messages are stored when DTR is connected to DSR.

Store on RTS/CTS: When checked, messages are stored when RTS is connected to CTS.

Store on CAN Trigger: When checked, the messages are stored when a configured CAN trigger has occurred.

File Close:

Auto Close On Idle: The module will close the file if no messages are received for the amount of time specified in the Idle Timer value.

Idle Timer: This value specifies how long to wait for a CAN message before closing the file.

CAN Baud: Specifies the the CAN Baudrate for capturing.

Time/Date Stamp:

Enable: When checked, the Time and Date format that is specified is timestamped at the start of each CAN frame that is logged.

Format: This specifies what format to use for the time/date stamp.

Set Time/Data: Pressing this button allows the user to set the time and date on the module. This is maintained on the module using a battery backed RTC.

ID Format: Specifies what format to use to log the CAN ID of each frame (decimal or hex)

Value Separator: Specifies what character to insert between the the different parts of the CAN frame. This defaults to a 0x2C which is an ASCII code for a comma. This will lead to a comma separated value file that is easily read by programs such as Excel.

Data Format: Specifies what format to use to store the CAN Data. This will specify hex or decimal.

Data Separator: Specifies the character to insert between elements of the CAN data. This defaults to a 0x20 which is the ASCII code for a space character.

Line Delimiter 1: Specifies the first character to insert at the end of the stored frame. This defaults to a 0x0D which is the ASCII code for a carriage return.

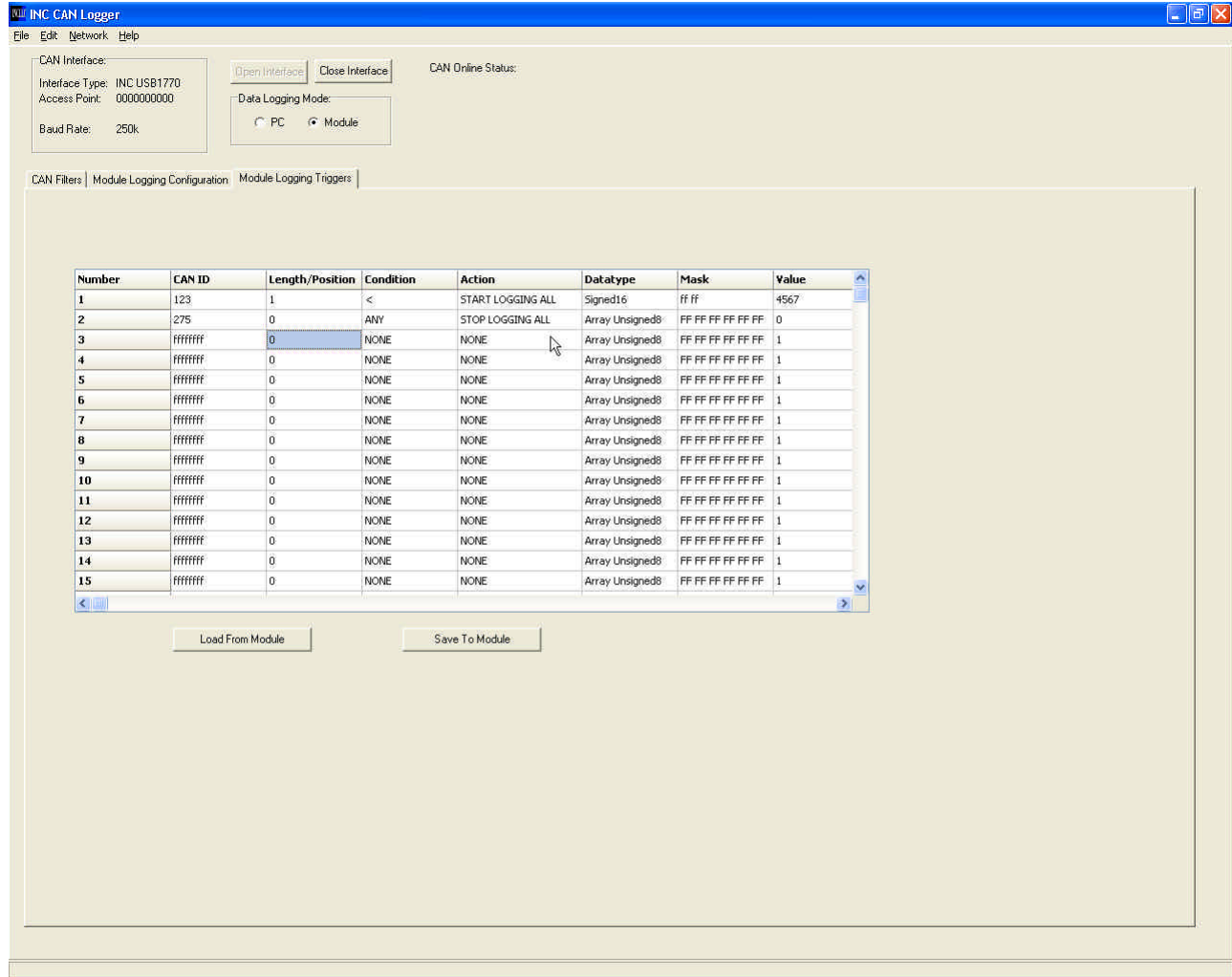
Line Delimiter 2: Specifies the second character to insert at the end of the stored frame. This defaults to a 0x0A which is the ASCII code for a line feed.

Load From Module: This button will read the settings from the module and display them on the screen.

Store To Module: This button will take the configuration that the user has set and save them to the module.

Module Logging Triggers:

The user can configure the CAN triggers to start and stop CAN logging by clicking on the “Module Logging Triggers” tab, and filling in the grid.



The user should first click the “Load From Module” button. This will populate the grid with the current stored configuration.

Module Trigger Configuration Options:

CAN ID: Specifies the CAN ID of the trigger, this value is in hex.

Length/Position: Specifies the length of the array or the position in the CAN frame for integer values.

Conditions: Specifies the condition in the CAN frame for the module to look for

None: Does nothing

Any: Performs the Action specified when any message is received with a matching CAN ID.

And: Performs the Action specified when the CAN Frame Anded with the VALUE field is true.

Or: Performs the Action specified when the CAN Frame Ored with the VALUE field is true.

==: Performs the Action specified when the CAN Frame is equal to the VALUE field.

!:=: Performs the Action specified when the CAN Frame is not equal to the VALUE field.

<: Performs the Action specified when the CAN Frame is less than the VALUE field.

<=: Performs the Action specified when the CAN Frame is less than or equal to the VALUE field.

>: Performs the Action specified when the CAN Frame is greater than the VALUE field.

>=: Performs the Action specified when the CAN Frame is greater than or equal to the VALUE field.

Action:

None: Does nothing

Start Logging: Starts logging specified messages.

Log Frame: Logs the matching frame.

Stop Logging: Stops logging CAN messages.

Start Logging All: Starts logging all received (filtered) CAN messages.

Stop Logging All: Stops logging all received (filtered) CAN messages.

Data Type: Specifies the data type of the trigger

Mask: This field is a space separated field that is anded with the received frame before the comparison is made with the value field.

Value: This field specifies the value to compare the received CAN frame with.

Example CAN logging File:

Below is an example from the CAN_Log.csv file created with the default values.

What is shown is as follows:

Date Stamp TimeStamp, Id in hex, Length, Data Data Data Data Data Data Data Data

```
2009/09/28 20:13:44.441,0x0789,5,05 04 03 02 01
2009/09/28 20:13:44.814,0x0789,5,05 04 03 02 01
2009/09/28 20:13:45.187,0x0789,5,05 04 03 02 01
2009/09/28 20:13:45.545,0x0789,5,05 04 03 02 01
2009/09/28 20:13:46.065,0x0789,5,05 04 03 02 01
2009/09/28 20:13:54.456,0x0123,8,01 02 03 04 05 06 07 08
2009/09/28 20:13:54.729,0x0123,8,01 02 03 04 05 06 07 08
2009/09/28 20:13:55.030,0x0123,8,01 02 03 04 05 06 07 08
2009/09/28 20:13:55.245,0x0123,8,01 02 03 04 05 06 07 08
2009/09/28 20:13:55.417,0x0123,8,01 02 03 04 05 06 07 08
2009/09/28 20:13:55.561,0x0123,8,01 02 03 04 05 06 07 08
2009/09/28 20:13:55.728,0x0123,8,01 02 03 04 05 06 07 08
2009/09/28 20:13:55.862,0x0123,8,01 02 03 04 05 06 07 08
2009/09/28 20:13:56.005,0x0123,8,01 02 03 04 05 06 07 08
2009/09/28 20:13:56.143,0x0123,8,01 02 03 04 05 06 07 08
2009/09/28 20:14:00.841,0x0456,2,01 02
2009/09/28 20:14:01.071,0x0456,2,01 02
2009/09/28 20:14:01.242,0x0456,2,01 02
2009/09/28 20:14:01.400,0x0456,2,01 02
2009/09/28 20:14:01.558,0x0456,2,01 02
2009/09/28 20:14:01.713,0x0456,2,01 02
2009/09/28 20:14:01.845,0x0456,2,01 02
2009/09/28 20:14:02.017,0x0456,2,01 02
```