

# **telos ABIC 2 Analyser**

telos Systementwicklung GmbH  
Schlueterstrasse 16  
20146 Hamburg  
Germany  
<http://www.telos.de>

## Introduction

The telos ABIC 2 Analyser can be used to log and analyze the messages exchanged between a LIN master and a NXP ABIC 2 LIN slave. Compared to a standard LIN monitor this tool allows to log not only the messages conforming to the LIN standard but also the extensions of the ABIC 2.

## System Requirements

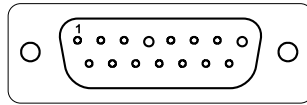
The following operating systems are supported:

- Windows XP
- Windows Vista (x32 and x64)
- Windows 7 (x32 and x64)
- Windows 8 (x32 and x64)

Due to the fact that the USB CDC kernel driver of Windows XP has got some known limitations, the use of Windows XP is not recommended.

## Hardware

The telos ABIC 2 Analyser box gets connected to the PC using USB.



The following pin assignment is used on the DSUB-15 connector:

Pin	Function
1	Not connected
2	GPIO 5
3	GPIO 6
4	Not connected
5	Not connected
6	Not connected
7	GND
8	Vcc In (LIN) / ADC 3
9	LIN
10	Vcc Out 3.3 V (max. 100 mA)
11	GPIO 4
12	GPIO 3
13	GPIO 2
14	GPIO 1
15	Vcc In (GPIO)

The following assignment has been used for boxes sold until August 2011 (serial numbers: 1BE5, 70B1, AAAC, 32CD, 2C64, 1B29, 0705, 7CC2, 352C, 5C71, 0FD9, 6107):

Pin	Function
1	Not connected
2	Not connected
3	GPIO 6
4	Not connected
5	Vcc In (LIN)
6	LIN
7	GND

8	GPIO 5
9	ADC 3
10	Vcc Out 3.3 V (max. 100 mA)
11	GPIO 4
12	GPIO 3
13	GPIO 2
14	GPIO 1
15	Vcc In (GPIO)

To use the ABIC 2 functionality of the hardware three lines must be connected to the LIN bus: "Vcc In (LIN)", "GND" and "LIN".

If the GPIO pins are to be used, the reference voltage of the GPIO must be connected to "Vcc In (GPIO)" pin. This voltage is used to configure the internal level shifter of the GPIO pins. If e.g. 3.3 V is connected to this pin, a level of 3.3 V on a GPIO pin gets interpreted as 100%.

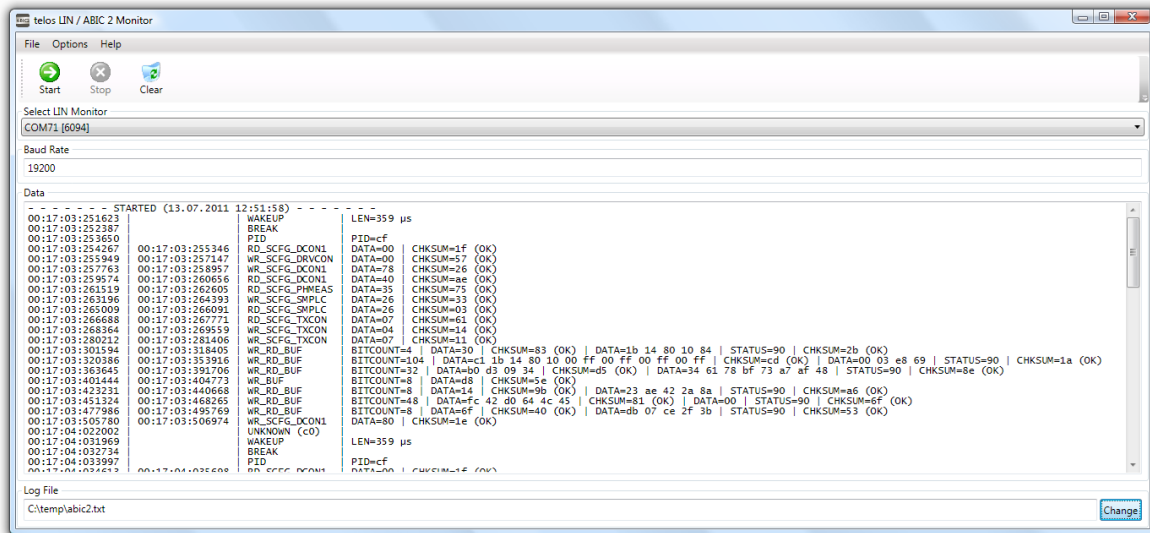
The GPIO pins can be used as inputs, outputs (push-pull) or outputs (open-drain). They operate in the range from 1.2 V to 5.5 V.

The operation range of the the ADC pin is from 0V to 5.5 V.

# Software

## Overview

The software of the telos ABIC 2 Analyser consists of a .NET compatible API and a graphical user interface.



The GUI of the telos ABIC 2 Analyser is more or less self-explanatory. There are only four options, which can be used to configure the monitor.

Several telos ABIC 2 Analyser boxes can be connected simultaneously to one PC. The box to be used is selected by the "Select LIN Monitor" box.

The LIN baud rate used by the LIN bus to be monitored must be set in the "Baud Rate" box. Valid values for the baud rate are in the range from 1000 to 21000.

Normally the telos ABIC 2 Analyser GUI interprets the messages on the LIN bus. The interpreter supports only messages conforming to the ABIC 2 LIN protocol. In some situations it can be useful to get the LIN messages without any interpretation. For this purpose the "Options/Raw Mode" check box in the menu can be used.

The last 5,000 messages, which have been seen on the LIN bus, are made visible in the "Data" box. Additionally all messages are written to a log file. The path of this log file can be set in the "Log File" box.

After the tool has been configured the telos ABIC 2 Analyser can be started by pressing the "Start" button. To stop the monitor later on simply press on the "Stop" button.

The "Clear" button clears all messages in the "Data" box. Furthermore this button can also be used to clear the current log file.

## ABIC 2 Mode

The first column of the traced data contains the start time stamp. For data bytes this time stamp is measured when the STOP condition of the first byte is seen on the LIN bus.

The second column contains the stop time stamp. For data bytes this time stamp is measured when the STOP condition of the last byte is seen on the LIN bus.

The traced LIN symbols or ABIC 2 commands are shown in the third column. The following symbols or commands are supported:

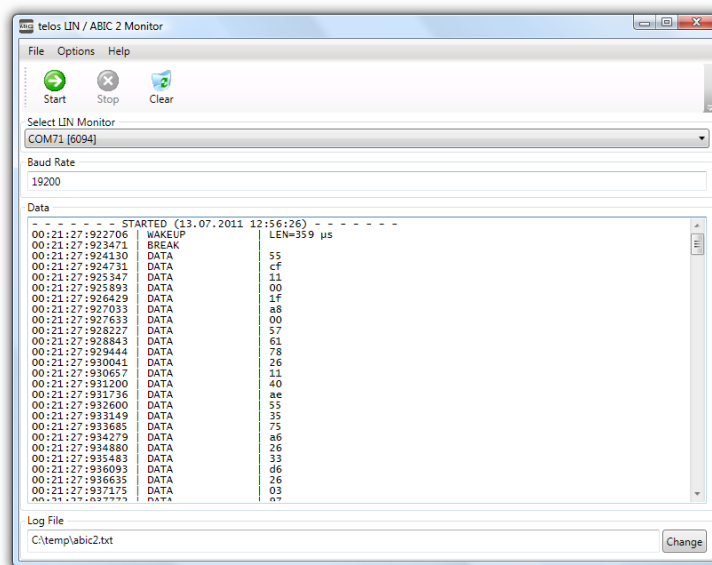
<b>Symbol</b>	<b>LIN / ABIC 2</b>	<b>Description</b>
OVERRUN		A UART overrun has occurred in the monitor.
BREAK	LIN	BREAK field
PID	LIN	PID (0xcf is used by ABIC 2)
OTHER_PID	LIN	LIN message sent to a different slave.
WAKEUP	ABIC 2	Wakeup field
UNKNOWN	ABIC 2	A command has been sent to the ABIC 2, which is not supported.
WR_CFG	ABIC 2	Write configuration command
RD_CFG	ABIC 2	Read configuration command
WR_SCFG_DCON0	ABIC 2	Write DCON0 command
WR_SCFG_DCON1	ABIC 2	Write DCON1 command
WR_SCFG_LINCFG	ABIC 2	Write LINCFG command
WR_SCFG_RCON0	ABIC 2	Write RCON0 command
WR_SCFG_RCON1	ABIC 2	Write RCON1 command
WR_SCFG_PHMEAS	ABIC 2	Write PHMEAS command
WR_SCFG_SMPLC	ABIC 2	Write SMPLC command
WR_SCFG_TXCON	ABIC 2	Write TXCON command
WR_SCFG_DRVCON	ABIC 2	Write DRVCON command
WR_SCFG_COMCON	ABIC 2	Write COMCON command
WR_SCFG_STATUS	ABIC 2	Write STATUS command
WR_SCFG_BCDAT	ABIC 2	Write BCDAT command
WR_SCFG_CHKSUM	ABIC 2	Write CHKSUM command
RD_SCFG_DCON0	ABIC 2	Read DCON0 command
RD_SCFG_DCON1	ABIC 2	Read DCON1 command
RD_SCFG_LINCFG	ABIC 2	Read LINCFG command
RD_SCFG_RCON0	ABIC 2	Read RCON0 command
RD_SCFG_RCON1	ABIC 2	Read DCON1 command
RD_SCFG_PHMEAS	ABIC 2	Read PHMEAS command
RD_SCFG_SMPLC	ABIC 2	Read SMPLC command
RD_SCFG_TXCON	ABIC 2	Read TXCON command
RD_SCFG_DRVCON	ABIC 2	Read DRVCON command
RD_SCFG_COMCON	ABIC 2	Read COMCON command
RD_SCFG_STATUS	ABIC 2	Read STATUS command
RD_SCFG_BCDAT	ABIC 2	Read BCDAT command

RD_SCFG_CHKSUM	ABIC 2	Read CHKSUM command
WR_BUF	ABIC 2	Write buffered
WR_RD_BUF	ABIC 2	Write read buffered

The forth column contains the data corresponding with the LIN symbol / ABIC 2 command. For the buffered transfers the traced checksum gets compared with the calculated checksum. If the checksums match, an "OK" is shown after the checksum. If the checksum is not correct, a "ERR" is shown.

### Raw Mode

If the GUI has been switched into the raw mode, the trace log looks like this:



The first column contains the time stamp. The second column contains one of the following symbols:

Symbol	Description
OVERRUN	A UART overrun has occurred in the monitor.
BREAK	LIN BREAK field
WAKEUP	ABIC 2 WAKEUP field
BUFFERED_TRIGGER	Pulse on the LIN line, which has been sent by the master to stop a buffered read transfer.
DATA	Data byte

The third column contains the data corresponding to the symbol.

### ABIC 2 Wakeup

The wakeup field of the ABIC 2 cannot be clearly distinguished from a normal data byte.

Due to this reason the monitor typically detects first a data byte (shown as "UNKNOWN" command) and then a wakeup field.