MSystem

Software	CAN-Monitor

User Manual

CAN-Monitor

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Contents

1   GENERAL

1.1   AIM AND PURPOSE OF THIS DOCUMENT

This document describes the use of the «CAN-Monitor» software for the diagnostics of the "Onboard CAN-Bus" of MICRO PANELS with Windows CE.

1.2   LIST OF DOCUMENTS

	Document	Doc. No.
[1]	Installation instructions - General wiring instructions	M000778
[2]	System description, Windows CE Image Version x.xx	M000174
[3]	System description, Networks in Brief	M000138

(this list of documents is not final)

2   INSTALLATION

The «CAN-Monitor» is an independent software package and is **not** part of the standard package. The product must be purchased once and can be installed for permanent use on any MICRO PANEL with Windows CE.

Refer to your "MICRO PANEL device description" for further information on connecting, commissioning and operating the MPI and Ethernet interface.

Permanent use:

The product can be used simultaneously with the **G**alileo **R**untime **S**ystem (GRS) without any limitation on the runtime.

It is assumed that the following software is already installed and that you are familiar with its operation:

- GALILEO HMI programming software

Refer to the Galileo documentation or the Online Help for more information on Galileo and GRS.
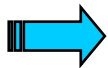
From the GALILEO version 7.1.0, GALILEO is recognized the software «CAN-Monitor» as a CE component and it will be added automatically to the CE configuration file <projectname>.INI.

If you use a GALILEO version < 7.1.0, the files in the directory «CAN-Monitor» must be copied manually into the GALILEO component directory.

- C:\Programs\Micro Innovation\Galileo\Component\ARM\<…>
- C:\Programs\Micro Innovation\Galileo\Component\X86\<…>

Then the software component «CAN-Monitor» can be activated in GALILEO via <Configuration>, <CE Configuration >. With a subsequent project download the software components for the target system will be installed.

2.1   SCOPE OF DELIVERY

Designation	
«CAN-Monitor» software incl. electronic documentation	

2.2   SYSTEM REQUIREMENTS

2.2.1   PROGRAMMING PC

Programming PC	Operating system
- GALILEO HMI programming software from version 5.2.4	Windows 2000, Windows NT, Windows XP

2.2.2   TARGET SYSTEM

Target system	Operating system (OS)
- MICRO PANEL with "Onboard CAN-Interface"	Windows CE Image Release $\geq$ 2.12.0 (x)

2.3 INSTALLATION ON THE PROGRAMMING PC

The «CAN-Monitor» Setup Wizard will be launched automatically once the installation CD is inserted in the CD drive. If the Setup Wizard does not launch automatically, run the file "CanMonitorSetup.exe" on the installation CD.

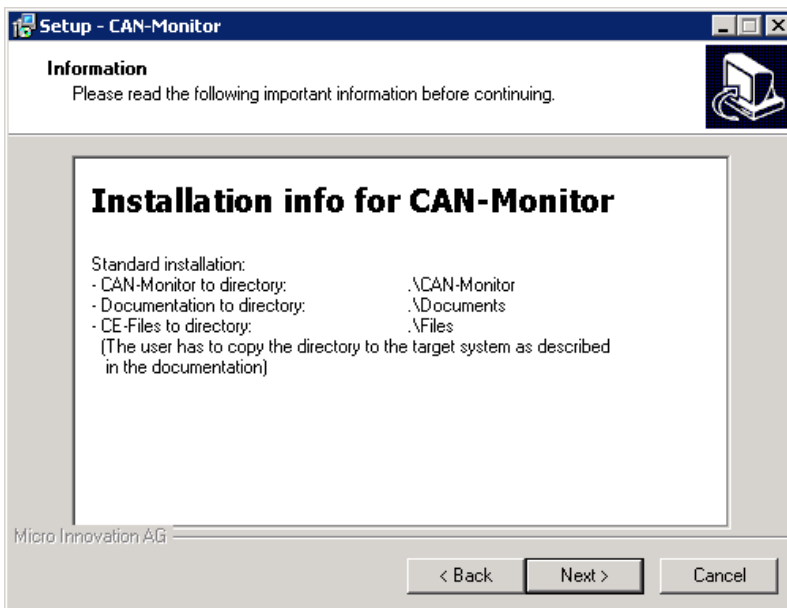Select the desired language from the drop-down menu.
Click [OK].
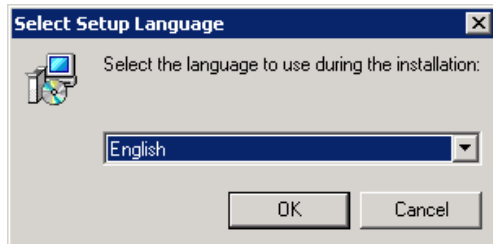
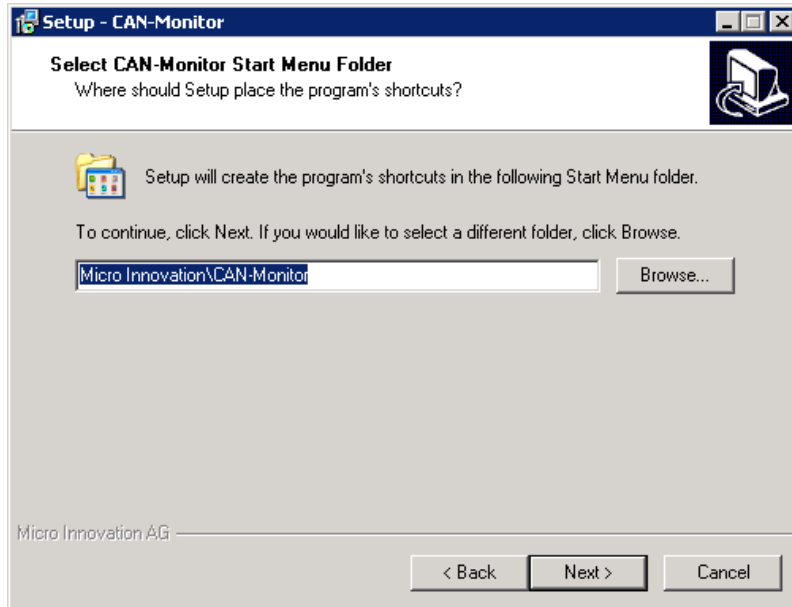Confirm the subsequent dialog by clicking [Next >].

Important installation information appears.

Confirm the subsequent dialog by clicking [Next >].

The following dialog will ask you to select an installation directory. The selected directory must contain a Galileo installation.

Confirm the dialog by clicking [Next >].
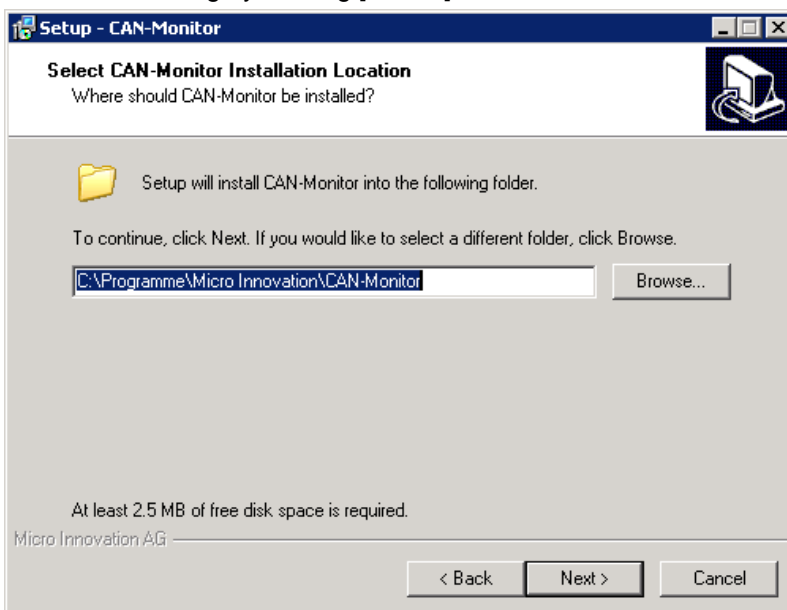
Select the directory in which the program shortcut will be created.
Confirm the dialog by clicking [Next >].

Confirm the subsequent dialog by clicking [Install].

User Manual CAN-Monitor   Software
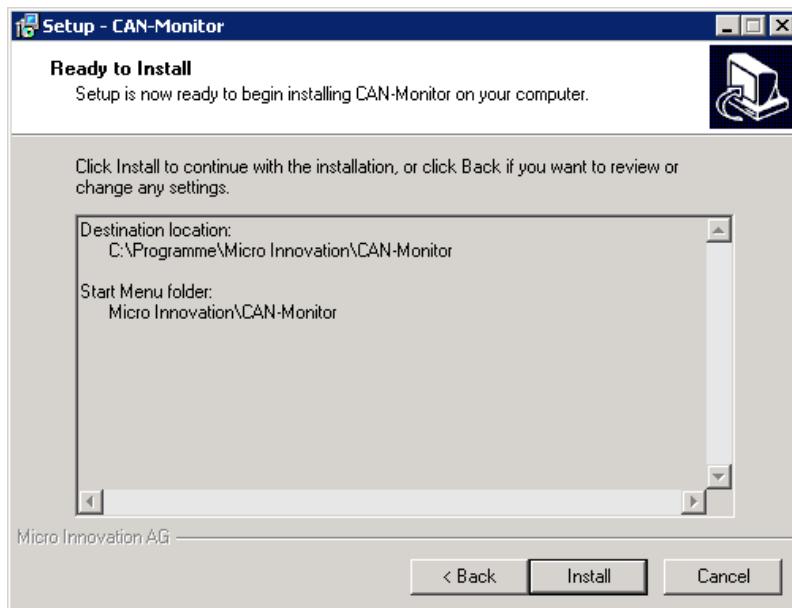
Installation

The next dialog indicates that the installation was successfully completed.
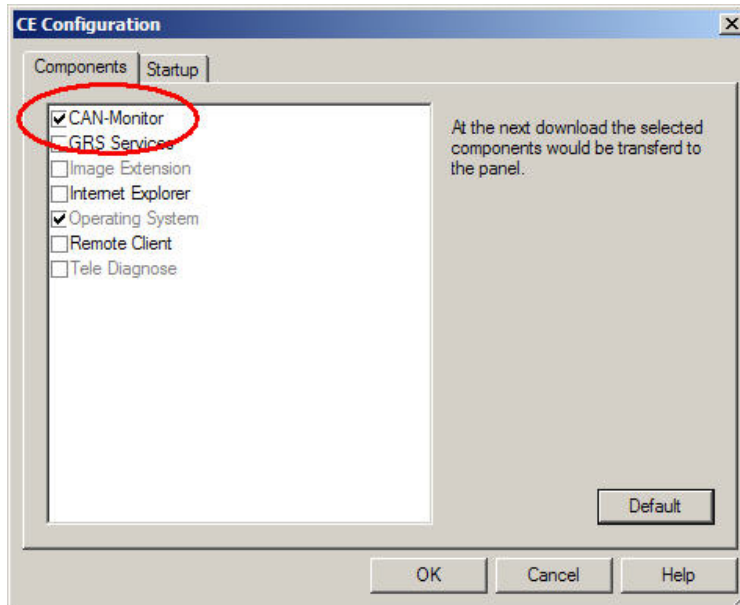Confirm by clicking [Finish].
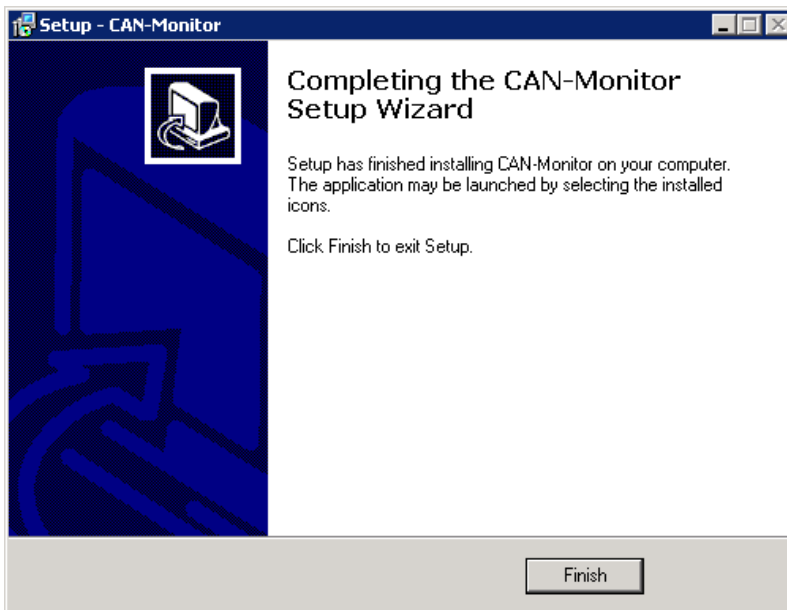
The file CanMonitor.exe was added to the GALILEO-Installationdirectory under
…\Component\ARM\CE.

3   COMMISSIONING

3.1   DOWNLOAD

Activate the «CAN-Monitor» in the CE configuration dialog. The «CAN-Monitor» will be transferred to the target system the next time the project is downloaded.

3.2   LAUNCHING THE «CAN-MONITOR» ON THE TARGET SYSTEM

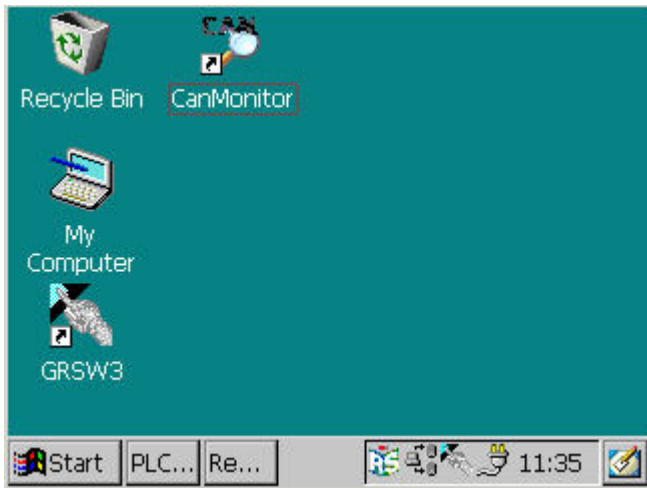#### 3.2.1   LAUNCHING THE «CAN-MONITOR» ON DEVICE START

In the CE configuration enter the appropriate command for starting the «CAN-Monitor» automatically when the device is started. The command "START CanMonitor.exe" will cause the device to start the «CAN-Monitor» during power up.

Further information on creating links is provided in the "System description, Windows CE Image Version x.xx" [2].
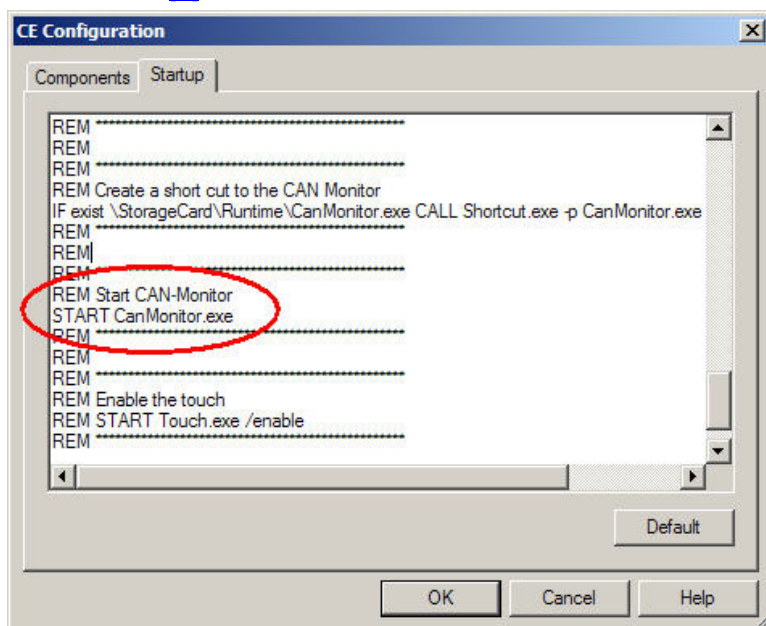
3.2.2 LAUNCHING THE «CAN-MONITOR» FROM WINDOWS CE

If the «CAN-Monitor» is installed on the target system, a shortcut is created on the desktop. Double-clicking the icon will launch the «CAN-Monitor». The file "CanMonitor.exe" is located on the target system in the directory <StorageCard\Runtime>.

3.2.3 LAUNCHING THE «CAN-MONITOR» FROM GALILEO

Use a function key to start the «CAN-Monitor» from the GALILEO application. Select the "Execute" function from the group "Internals". Then enter the command "CanMonitor.exe" under Parameter 1. You can then use this function key to start the «CAN-Monitor» from your GALILEO application.
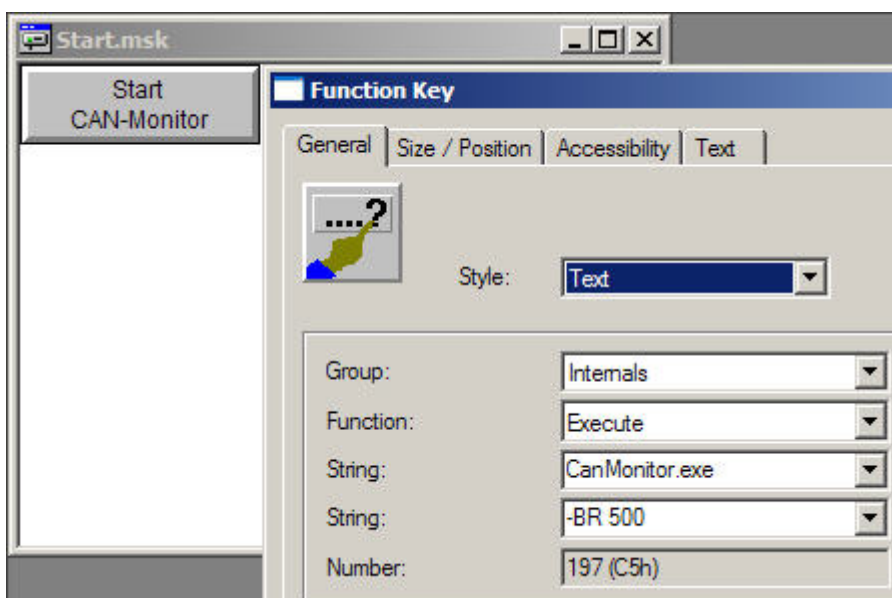
3.2.4 OTHER COMMAND LINE PARAMETERS

Additional parameters can be added to the "CanMonitor.exe" call. The Baud Rate dialog only appears of no other application is meant to defi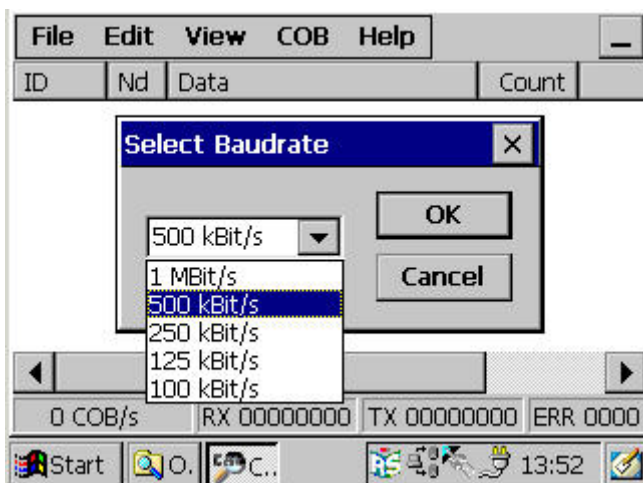ne the initialization of the baud rate. The – BR parameter likewise only has an effect if no other application is responsible for the initialization of the baud rate.

Call	Function
CanMonitor.exe	Start «CAN-Monitor» with Baud Rates dialog
CanMonitor.exe –BR 500	Start «CAN-Monitor» with selected baud rate (e.g. 500 = 500KBaud)
CanMonitor.exe –close	Shut down «CAN-Monitor»

3.2.5 SELECTING THE BAUD RATE

If the "CAN interface" has already been initialized by another application (e.g. MXpro), this baud rate is accepted by the «CAN-Monitor». No dialog is shown. A baud rate setting dialog will appear if the "CAN interface" was not initialized by another application and no baud rate was defined as the parameter when "CanMonitor.exe" is called. One of the supported baud rates can then be selected.

If, however, the initialization from another application program (e.g. MXpro) is started after the «CAN-Monitor» is launched and before the setting in the dialog is confirmed, the baud rate from the other application is accepted and this will be indicated by an appropriate message.
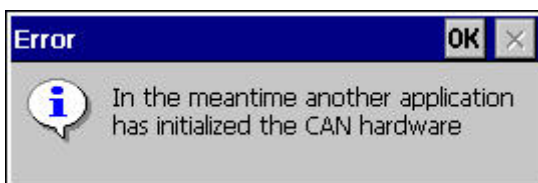
4 GENERAL OPERATION

4.1 MAIN SCREEN

This main screen is shown after the «CAN-Monitor» is launched. The main screen is divided into a menu bar, a monitor table and a status bar.

4.2 MENU BAR

4.2.1 FILE

Menu entry	Function
Save...	Save the currently displayed table in an ASCII file.
Exit	Shut down the «CAN-Monitor».

4.2.2 EDIT

Menu entry	Function
Select All	Select all entries of the currently displayed table.
Invert Selection	Invert the current selection.
Clear Selection	Cancels the current selection.

4.2.3 VIEW

Menu entry	Function
Status Bar	Show/hide the status bar.
Pause	Activate/deactivate the updating of the display in the Monitor table
Clear Messages	Deletes all entries from the monitor table.
Monitor All	Shows all 2048 COB-IDs (**C**ommunication **Ob**ject **Id**entifier).
Monitor	Shows the COB-IDs currently active on the bus.
Trace	Moves to the display of the last trace in the Monitor table. (deactivated if no trace present)
Columns	Show/hide the visible columns in the Monitor table
View ID, Nd and Data in ...	Changes the hexadecimal/decimal representation of the COB-ID, Node ID and data in the Monitor table.
Update Rate	Sets the update rate of the display.

4.2.4 COB

Menu entry	Function
Hide	Selected COB-IDs are hidden in the monitor table. These are shown in italics in "Monitor All" at the end of the table.
Make Traceable	Selected COB-IDs are made traceable. These COB-IDs are then shown in bold type.
Show When Available	The COB-IDs that are hidden or made traceable with "Hide" or "Make Traceable" respectively are shown in the Monitor Table in the normal way. The appropriate COB-IDs must be selected for this.
Trace...	Calls up the Trace dialog. (➔ Chap. 5.2)
Reset Counter(s)	Resets the counters of the individual COB-IDs.
Reset Global Counters	Resets the counters in the Status bar.

4.2.5 HELP

Menu entry	Function
About CanMonitor	Shows the information dialog of the «CAN-Monitor»

4.3 MONITOR TABLE

4.3.1 CAN TELEGRAM DISPLAY

The information of the relevant CAN telegram is shown in the columns of the Monitor table.

Column	Description
ID	CANopen symbol and COB-ID of the CAN telegram.
Nd	CANopen Node-ID (node number) in accordance with the CIA.
Data	Data content of the CAN telegram (max. 8 bytes).
Count	Counter of the individual telegrams received with the same COB-ID.
Time	Relative time stamp (ms) of the received telegram.
Period	Time (ms) since receipt of the last telegram with the same COB-ID

The columns can be shown/hidden using the "View Columns" menu item. The width of the line can be changed by clicking between the columns and dragging in the header line. The table can be sorted by column by clicking the header line of the column selected.

The line can be displayed in normal, **bold** or *italic* type. **Bold** means that the COB-ID is "traceable". *Italic* means that the COB-ID is "hidden" in the View Mode Monitor. The meaning of the CANopen symbols is explained in the following table.

CANopen Symbol	COB-ID	Description
NMT	0	NMT Network management telegram
	80h	SYNC telegram
	100h	TIME STAMP telegram
	80h+Node-ID	EMERGENCY telegram
	180h+Node-ID	PDO1(tx) Process Data Object 1 (to the master)
	200h+Node-ID	PDO1(rx) Process Data Object 1 (to the slave)
	280h+Node-ID	PDO2(tx) Process Data Object 2 (to the master)
	300h+Node-ID	PDO2(rx) Process Data Object 2 (to the slave)
	380h+Node-ID	PDO3(tx) Process Data Object 3 (to the master)
	400h+Node-ID	PDO3(rx) Process Data Object 3 (to the slave)
	480h+Node-ID	PDO4(tx) Process Data Object 4 (to the master)
	500h+Node-ID	PDO4(rx) Process Data Object 4 (to the slave)
	580h+Node-ID	SDO(tx) Service Data Object (to the master)
	600h+Node-ID	SDO(rx) Service Data Object (to the slave)
	700h+Node-ID	NMT Error Control (Node Guarding)
		According to CANopen undefined COB-ID

4.3.2 VIEW MODE MONITOR

In this mode, all COB-IDs are displayed that were registered on the bus since the «CAN-Monitor» was started. Older telegrams are overwritten by new telegrams with the same COB-ID.

File	Edit	View	COB	Help					_
ID	Nd	Data			Count	Time	Period		
NMT 000		01 02			3	12039	2310		
⚡ 080					81363	8137139	100		
⚠ 082	02	00 00 00 00 00 00 00 00			5	1944711	12795		
PDO 182	02	00 00			1	12040			
PDO 282	02	0A 00			81335	8137140	100		
PDO 382	02				1	12040			
PDO 482	02				1	12040			
SDO 582	02	60 0F 1A 00 00 00 00 00			77	12020	10		
SDO 602	02	2F 0F 1A 00 00 00 00 00			78	12019	10		
702	02	05			73945	8137059	110		

39 COB/s   RX 0004bde2   TX 00000000   ERR 0000

4.3.3 VIEW MODE MONITOR ALL

This mode displays all COB-IDs. Older telegrams are overwritten by new telegrams with the same COB-ID.

File	Edit	View	COB	Help					▲
ID	Nd	Data			Count	Time	Period		
NMT 000		01 02			3	12039	2310		
⚡ 080					84089	8409706	100		
⚠ 082	02	00 00 00 00 00 00 00 00			5	1944711	12795		
PDO 182	02	00 00			1	12040		Hidden	
PDO 282	02	09 00			84061	84097...	100		
PDO 382	02				1	12040		Traceable	
PDO 482	02				1	12040			
SDO 582	02	60 0F 1A 00 00 00 00 00			77	12020	10		
SDO 602	02	2F 0F 1A 00 00 00 00 00			78	12019	10		
702	02	85			76424	8409716	110		
001									
002									
003									
004									
005									
006									
007									
008									
009									
00A									
00B									▼

35 COB/s   RX 0004e6a0   TX 00000000   ERR 0000

4.3.4 VIEW MODE TRACE

This mode displays those COB-IDs that were previously recorded with the trace. Each line corresponds to a telegram. The time (ms) in the "Time" column starts with the trace recording at 0. The internal numbering of the trace telegrams is displayed in the "Seq#" column. They are always sorted according to the time the telegrams were received.

File	View	COB	Help					
Time	Nd	ID	Data		Seq#	Period		
0	02	282	07 00		1			
39	02	702	05		2			
100	02	282	0A 00		3	100		
149	02	702	85		4	110		
200	02	282	07 00		5	100		
259	02	702	05		6	110		
300	02	282	0A 00		7	100		
369	02	702	85		8	110		
400	02	282	00 00		9	100		
479	02	702	05		10	110		
500	02	282	05 00		11	100		
589	02	702	85		12	110		
600	02	282	0A 00		13	100		
700	02	702	05		14	111		
700	02	282	08 00		15	100		
800	02	282	06 00		16	100		
809	02	702	85		17	109		
900	02	282	06 00		18	100		
919	02	702	05		19	110		
1000	02	282	0C 00		20	100		
1029	02	702	85		21	110		
1100	02	282	07 00		22	100		
1129	02	702	05		23	110		

4.3.5 ERROR MESSAGES

In place of the COB ID, error messages of the "CAN Controller" can be indicated.

| Message	Description
Bus OFF	No more communication possible. The „CAN-Controller" stopped bus activity because of too much errors.
Bus ERROR	The bus is disturbed, data is still sent and can be received.
Bus OK	Return from status Bus OFF or Bus ERROR
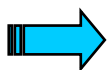
In the mentioned error messages, it concerns usually electric problems, caused through deficient cabling, incorrect bus conclusion or the defect of a bus participant. Further information on Bus state see „CAN-Specification 2.0 Part A".

4.4 STATUS BAR

The status bar shows the global information. The status bar can be shown or hidden via "View – Status Bar". The counters in the status bar can be reset via "COB – Reset Global Counters".
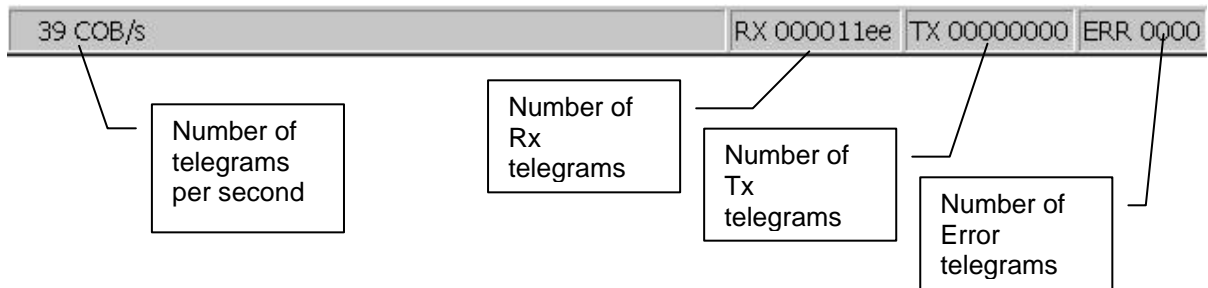
5   CREATING A TRACE

5.1   MAKE COB-ID TRACEABLE

Move to "View Mode Monitor" or "Monitor All". Select the required COB-ID by clicking the appropriate line in the Monitor table. The line will be highlighted in blue. Choose "COB – Make Traceable" to make the COB-ID traceable. The line is then shown in bold type, indicating that the COB-ID is traceable. Choose "COB – Show When Available" to undo the COB-ID setting. Several COB-IDs can be made traceable at the same time.


5.2   START TRACE

Choose "COB – Trace..." to start the trace. The dialog with the trace settings will appear.
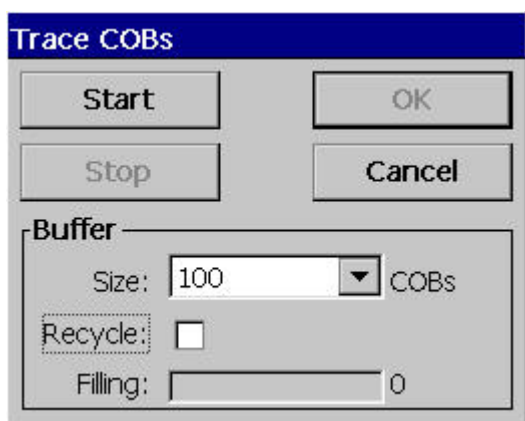
Element	Description
Start	Start trace recording
Stop	Stop trace recording
OK	Display trace recording
Cancel	Cancel
Size	Selection of the buffer size (100,500,1000,5000 telegrams)
Recycle	Trace recording always overwrites the last telegrams until the trace is stopped by clicking Stop.
Filling	Progress display of trace

5.3 DISPLAY TRACE

The trace is displayed after trace recording by clicking [OK].
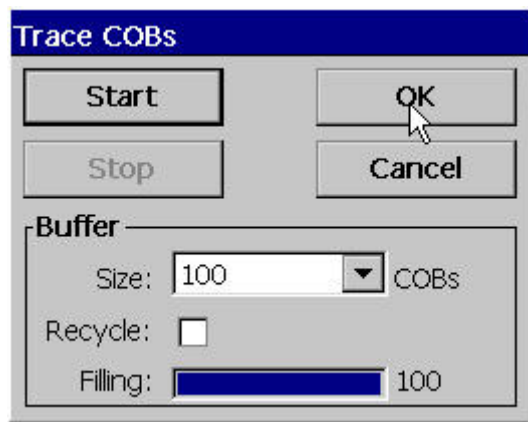
The display then activates "View Mode Trace". Choosing "File – Save" enables the trace to be saved as a comma separated or tab separated ASCII file.

6   CHANGE LIST

Revision	Date / Signed	Modification
01	5.12.2005 /As	Initial Version
02	22.10.2009 /MH	Additional installation in connection with GALILEO 7.1.0

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