D20006-2

Frauscher Diagnostic System FDS001 for FAdC® and FAdC®i

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Checked:	S. Raschhofer	sign. Raschhofer	2014-01-30		D20006-2
Released:	M. Rosenberger	sign. Rosenberger	2014-01-30		Page 1 of 33

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Review list

Version	Date	Prepared by	Amended sections	Amendments
1	2013-03-25	A. Ecker	all	initial version
2	2014-01-29	A. Ecker	Bibliography	new section
			chapter 1	addition: compatibility of the FDS
			chapter 1 and 3.7	additions: Software version client, Software version server and configuration version
			chapter 1.4	addition: ARP, DHCP, FAdCi 1.x.x.x-r, FAdC 2.x.x.x-r, FCT, FSE, MDI and XML
			chapter 2.1.4	addition: MDI(X) function
			chapter 3 – 3.7	revision, new screenshots
			chapter 3.2	addition: IXL element
			chapter 3.5	additions: new functions (time filter and download log files), FAdC_LogInterpreter
			chapter 3.7	addition: download configuration
			chapter 4	new chapter
			chapter 5	additions: USB and FDS storage capacity, reboot
			chapter 6	new chapter

Translation list

Version	Date	Prepared by	Amended sections	Amendments
1	2013-01-17	J. Böttger	all	new English version
1	2013-03-25	A. Ecker	chapter 1	wording, formatting, update software version
			chapter 2.1	addition
			chapters 2.1.2, 2.1.3	wording and formatting
			chapter 2.1.4	update figure and designation of interfaces
			chapter 3	new screenshots, wording and formatting
			chapter 5	new screenshots, addition file systems
2	2014-01-29	A. Ecker	bibliography, chapter 1, 1.4, 2.1.4, 3 – 3.7, 4, 5, 6	update to version 2 (see review list)
			chapter 2.1.4, 5	wording

Bibliography

[ ]	Designation		Version/issue
[1]	D3823	XML telegrams of Frauscher XML diagnostic interface for ACS2000 and FAdC® / FAdC®i	3
[2]	D3523	Specification Frauscher XML diagnostic interface – interface version 2	5

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documentation@frauscher.com

Thank you for your feedback.

Masthead

This document is the translation of the German original.

1 Important information

This documentation describes the installation and operation of

- the log computer with equipment version GS01 or higher[1] and
- the user software for the Frauscher Diagnostic System FDS001[1] (software version server 1.1.x or higher and software version client 1.1.x or higher[2])

for Frauscher Advanced Counter FAdC 2.x.x.x-r and Frauscher Advanced Counter industrial FAdCi 1.x.x.x-r.

The FDS consists of

- a software version client,
- a software version server and
- a configuration version.

The FDS is backwards compatible if the first two digits of the software version client are ≤ the first two digits of the software version server. I.e. existing project data from older versions can still be used with limited functions. To use the FDS with all functions currently available, an update of the software version client (by means of the FCT) and of the software version server must be carried out. The configuration version is self administrated by the originator of the configuration in the FCT.

In order to make use of the FDS, the following boards are needed:

- AEB or AEBi
- COM-AdC, COM-xxx or COM-AdCi, COM-xxxi

1.1 Safety instructions

This documentation contains important warnings and safety instructions, which have to be observed by the user. A failsafe and error-free operation can only be guaranteed by compliance of these preconditions and safety measures.

Following symbols and text formats are used:

Symbol and text indicate important instructions and/or user information. Failure to comply with these instructions may impair the availability of the system and, as a direct result and/or when combined with non-compliance with other instructions or errors, have a negative impact on safety.

[1] The type and equipment version of the FDS can be found on the type label of the log computer.

[2] The software version server and the software version client of the FDS can be found on the tab “settings” (see chapter 3.7 “Settings”).

1.1.1 Safety-related application conditions SAB

The information displayed regarding the Frauscher Diagnostic System FDS is intended for information only and is not safe in terms of signalling safety. Consequently, the information displayed must not be used as the basis for safety-relevant actions by operation, maintenance and repair personnel.

1.2 Intended use

This product is intended for a purpose described in detail in the document. If applied outside the intended use described, or in the case of non-compliance with compulsory requirements and safety measures, no warranty and/or liability shall apply.

1.3 Target group

The documentation is intended for technicians/mounting personnel with specific specialist knowledge regarding track clear detection systems, their operation and maintenance.

1.4 Abbreviations

AEB	Advanced Evaluation Board
AEBi	Advanced Evaluation Board industrial
ARP	Address Resolution Protocol
CF	CompactFlash
COM-AdC	Communication Board for Advanced Counter
COM-AdCi	Communication Board for Advanced Counter industrial
COM-xxx	Communication Board (generic term for a customer-specific communication board)
COM-xxxi	Communication Board industrial (generic term for a customer-specific communication board)
COM-FSE	Communication Board with implemented FSE protocol (specific implementation of COM-xxx communication board)
COM-FSEi	Communication Board industrial with implemented FSE protocol (specific implementation of COM-xxxi communication board)
DHCP	Dynamic Host Configuration Protocol

FAdC 2.x.x.x-r	Frauscher Advanced Counter with the system number 2.x.x.x-r ("x" is a free variable parameter for the specific name of the various FAdC systems, "-r" is a free variable parameter for the wheel sensor)
FAdCi 1.x.x.x-r	Frauscher Advanced Counter industrial with the system number 1.x.x.x-r ("x" is a free variable parameter for the specific name of the various FAdCi systems, "-r" is a free variable parameter for the wheel sensor)
FAT	File Allocation Table (file system)
FCT	Frauscher Configuration Tool
FDS	Frauscher Diagnostic System
FMA	track section
FSE	Frauscher Safe Ethernet
FWD	COM forwarding
GS	equipment version
HE	height unit (one height unit = 44.45 mm)
ID	identifier (number for explicit identification of each CAN bus participant)
IO-EXB	Input/Output Extension Board
IO-EXB Data	IO-EXB data transmission
IO-EXBi	Input/Output Extension Board industrial
log computer	logging and diagnostic computer
MDI	Medium Dependent Interface
XML	Extensible Markup Language
ZP	counting head

2 General

The Frauscher Diagnostic System FDS is used for comprehensive diagnostics and monitoring of the axle counting systems FAdC and FAdCi.

It offers central provision of all available diagnostic data in one or more locations within one station and across a whole line (connected via Ethernet) in real time.

The main objectives are:

- Reducing maintenance efforts
- Preventative maintenance
- Rapid and efficient troubleshooting

The FDS is designed so as to not require any servicing.

The components on which diagnostics are to be carried out (AEB/AEBi, COM-AdC/COM-AdCi and/or COM-xxx/COM-xxxi) are connected with each other via CAN bus. The COM boards communicate via Ethernet with the log computer. Furthermore, the COM board is able to safely prevent feedback to this Ethernet connection if the input filter is set in the configuration (see respective “Design & planning manual”). This means that only diagnostic data packets are accepted at this input, however no safety-relevant data.

The log computer makes the data available via a web site.

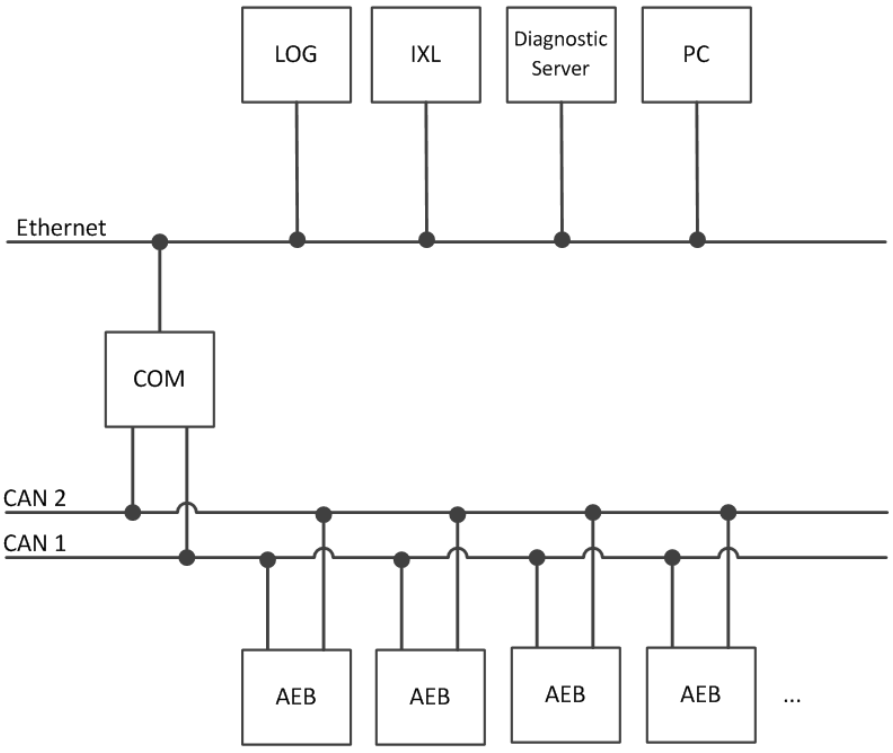


Figure 2.1: FDS architecture

2.1 Log computer

The FDS uses software which is licensed under GNU General Public License Version 2 (GPLv2):

- Linux
- Busybox

Regarding versions which are currently in use or source code Frauscher can be consulted.

2.1.1 Safety information

See chapter 1.1.1 “Safety-related application conditions SAB”.

2.1.2 Technical data

Designation	Value
dimensions (W x H x D)	170.1 mm x 32 mm x 128 mm
temperature range	-40 ºC to +70 ºC
weight	~ 550 g
power supply	19 V DC to 72 V DC
power consumption	~ 10 W

Table 2.1: Technical data of log computer

The demands placed on the installation environment (temperature ranges, EMC impact) with regard to voltage supply and compatibility requirements correspond to the information for the Frauscher Advanced Counter FAdC or FAdCi.

2.1.3 Function

The log computer is equipped with a non-volatile memory card, on which a Linux operating system with all the necessary applications for the log/diagnostic function runs.

The log computer does save and display all relevant diagnostic messages, consisting of status, component specific and configuration information, sent by the FAdC. Such diagnostic messages are sent, depending on type of message, at power up, periodically or immediately on change of status.

Furthermore, the logged data are saved on the memory card in a specific format using date, time and board identification. The time format consists of YYYY-MM-DD hh:mm:ss.fff.

For each day a new log file is stored which can be clearly identified by its file name.

The log computer may be located on a DIN top-hat rail.

2.1.4 Interfaces

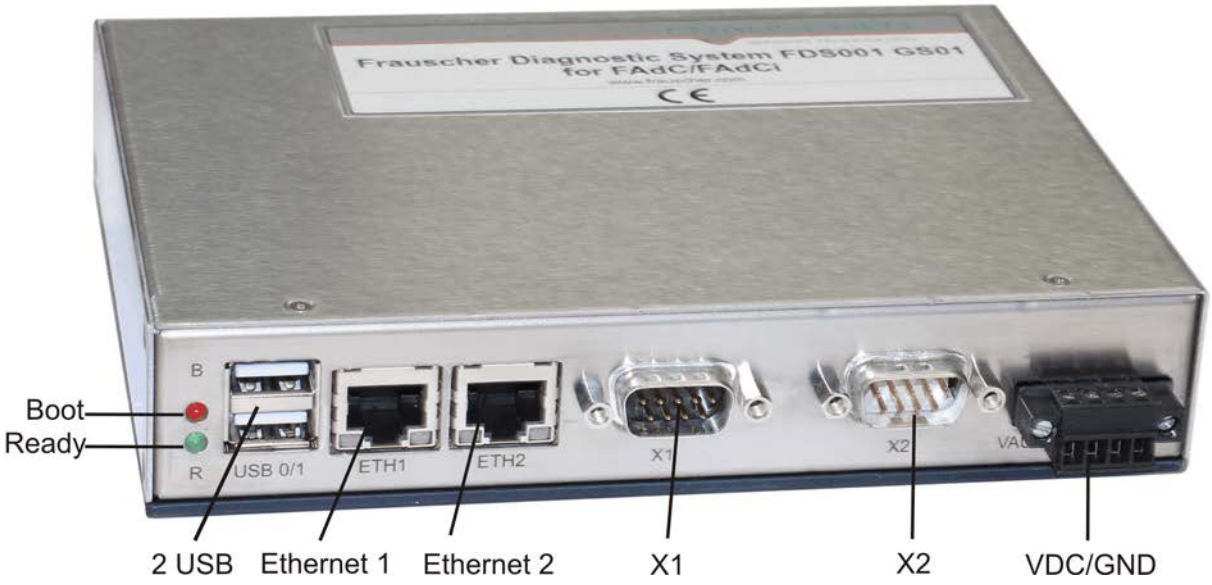


Figure 2.2: Interfaces of log computer

2 “USB” interfaces: Upload of configuration data, download of log data.

2 “Ethernet” interfaces: For communication between log computer, COM boards, diagnostic server and/or global networks (WLAN, internet, etc.).

Ethernet 1: only web interface access (default IP address: 192.168.0.11)

Ethernet 2: FAdC data forwarding and web interface access (default IP address: 192.168.1.11)

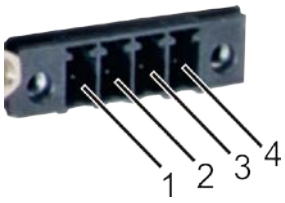
See chapter 5 “Uploads and downloads of FDS” to configure a new IP address.

The “Ethernet” interfaces support the Auto-MDI(X) function.

“X1” interface: not used

“X2” interface: not used

“VDC/GND” interface: Power supply for the log computer: 19 V DC to 72 V DC



Pins			
1	**2**	**3**	**4**
not assigned	not assigned	VDC	GND

Table 2.2: Pin assignment of sockets

3 Operation

In this chapter, the contents are described using the following scheme and elements:

1. instruction
2. ...
3. …

Catchword

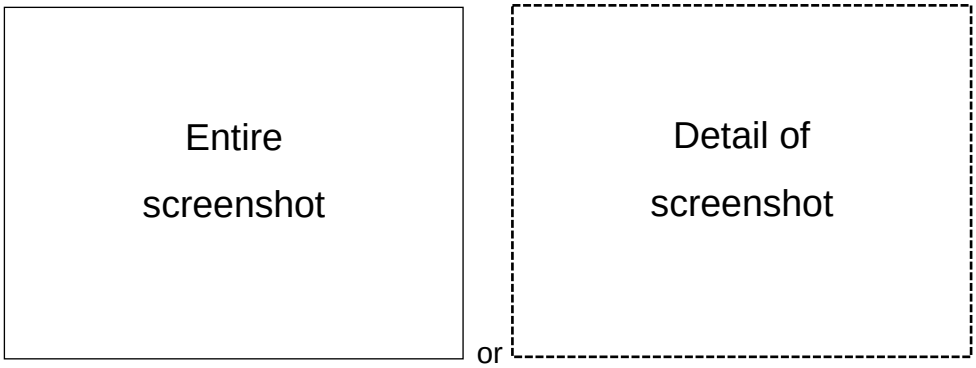


Figure x.y: Example

Icon of screenshot	Explanation

…	…

… Text with additional information…

3.1 Start and overview

1. Open an internet browser
   - Internet Explorer (version 8 or higher),
   - Safari (version 5 or higher) or
   - Firefox (version 15 or higher).

2. Enter the IP address for FAdC data forwarding and/or web interface access in the address bar of the browser:
   192.168.0.11 - only web interface access
   192.168.1.11 - FAdC data forwarding and web interface access

See chapter 5 “Uploads and downloads of FDS” to configure a new IP address.

3. Press enter.

First page

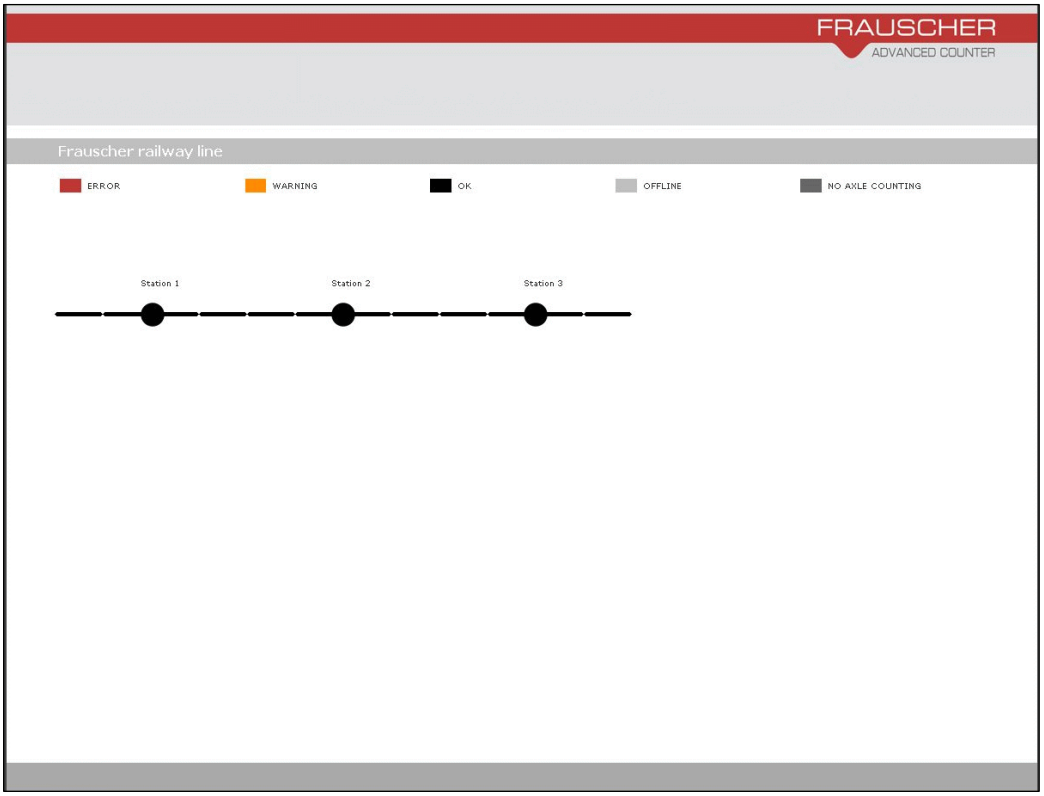


Figure 3.1: First page with all configured FDS

OFFLINE	This FDS is not available or at least 1 element of this FDS is not available.
OK	All elements of this FDS are in operation.
NO AXLE COUNTING	Marks a part of the track which is not monitored by the FDS.

WARNING	At least 1 element of this FDS is in WARNING status.
ERROR	At least 1 element of this FDS is in ERROR status.

If warnings and errors occur together, the status ERROR is displayed.

4. Select a FDS.

Overview of track layout

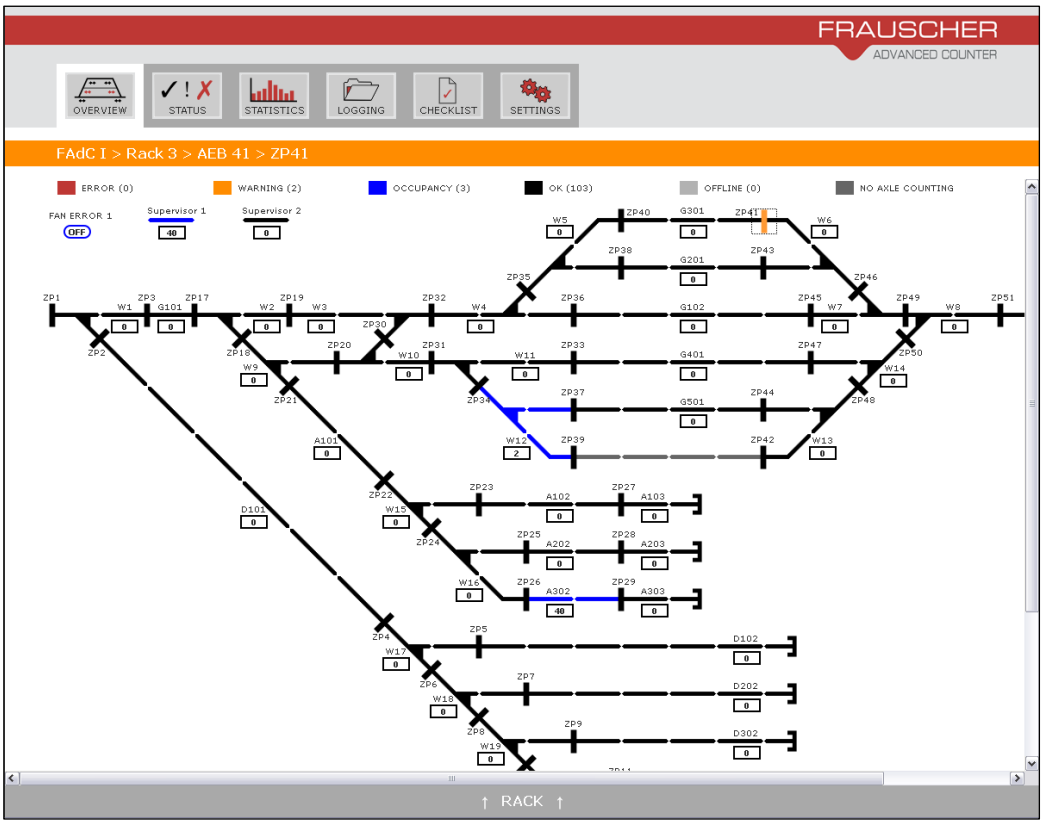


Figure 3.2: Overview of track layout

NO AXLE COUNTING	section without axle counting
OFFLINE (0)	element not available
OK (105)	element in operation
OCCUPANCY (3)	occupied track section
WARNING (0)	element in warning
ERROR (0)	element in error

FAN ERROR 1 OFF	status of IO-EXB/IO-EXBi (input or output)[3]
Supervisor 1 40	status of supervisor section

ZP 1	counting head
40	number of axles within the track section
ZP 4 GI 102 ZP 7 24	track section

[3] FAN ERROR 1: configured name, see chapter 5 “Uploads and downloads of FDS”

Focus When the selected FDS is newly opened or is refreshed using F5 or , the overview automatically focuses on the first element showing error/warning.

full width of screen A double click in the white area of OVERVIEW maximises the window with the track layout over the full width of the screen (also possible with multiple monitors). Another double click enables the return to the previous section of the screen.

5. Select 

at the bottom to view the board rack.

Overview of board rack

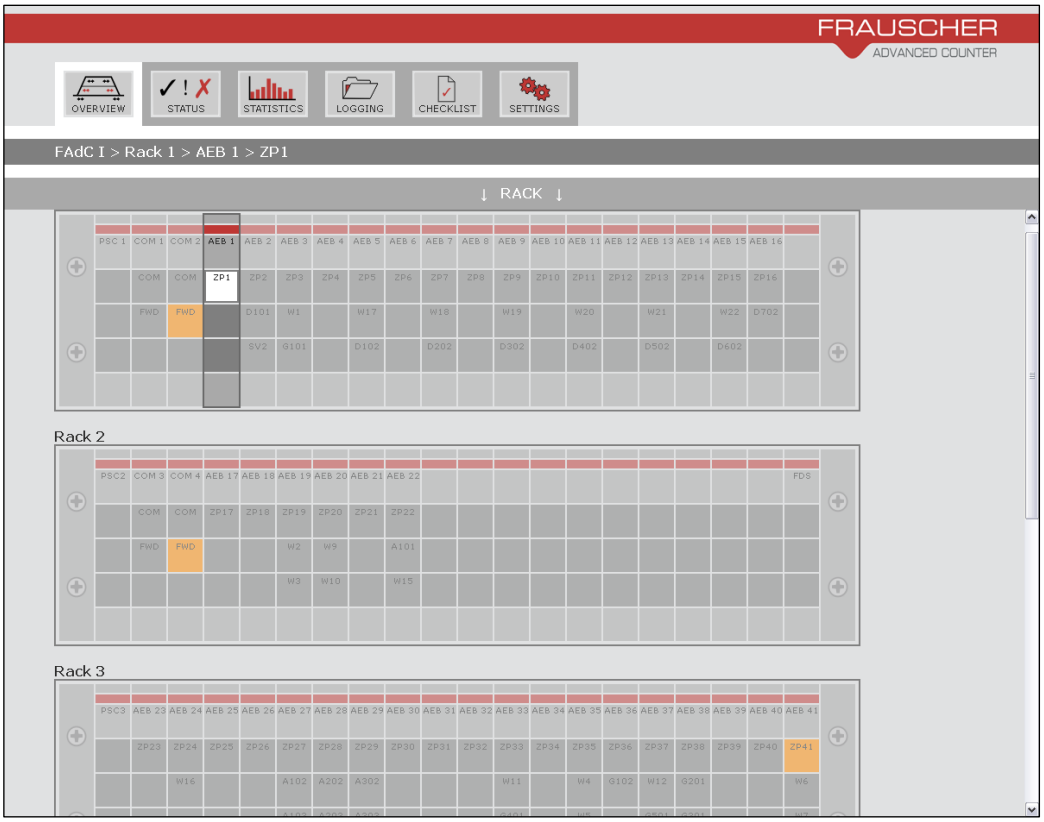


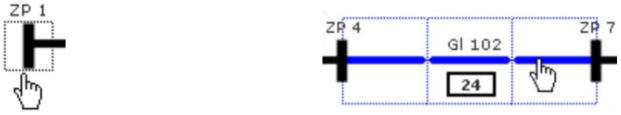
Figure 3.3: Board rack overview

3.2 Selection

Option 1: track layout

1. Click on an element in the overview of track layout (see Figure 3.2).

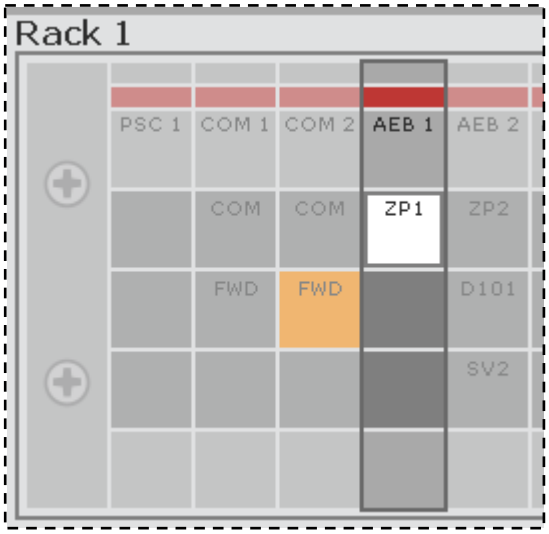
Counting head **Track section**



With a further click on the selected element, the overview of the board rack fades in, where the element is highlighted in white.

Option 2: board rack

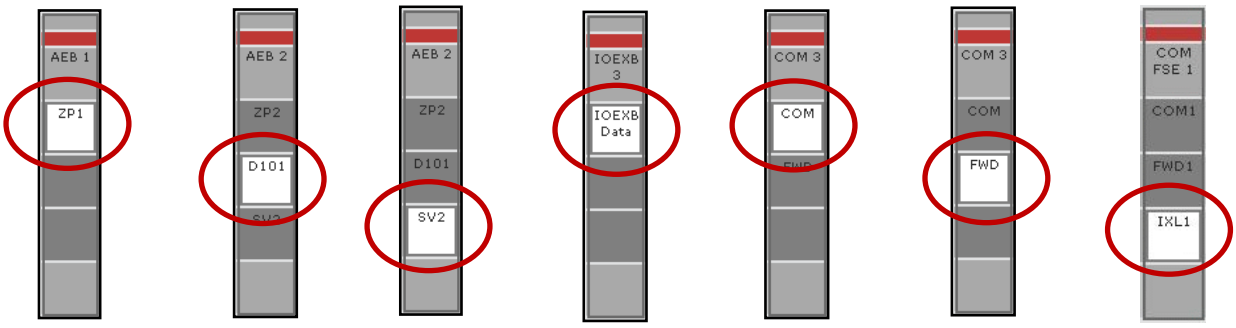
1. Click on an element within the overview of board rack which is available in each tab (see Figure 3.3).



With a further click on the selected element, the overview of the track layout fades in, where the selected element is highlighted with a dotted border.

2. Choice in the overview of the board rack:

Counting head **Track section 1** **Track section 2** **IO-EXB Data** **COM** **FWD** **IXL**



3.3 Status

1. Select element (see chapter 3.2 “Selection”).

Available elements: counting head
track section (1 or 2)
IO-EXB Data
COM
FWD
IXL

2. Select the tab **STATUS**.

Tab status

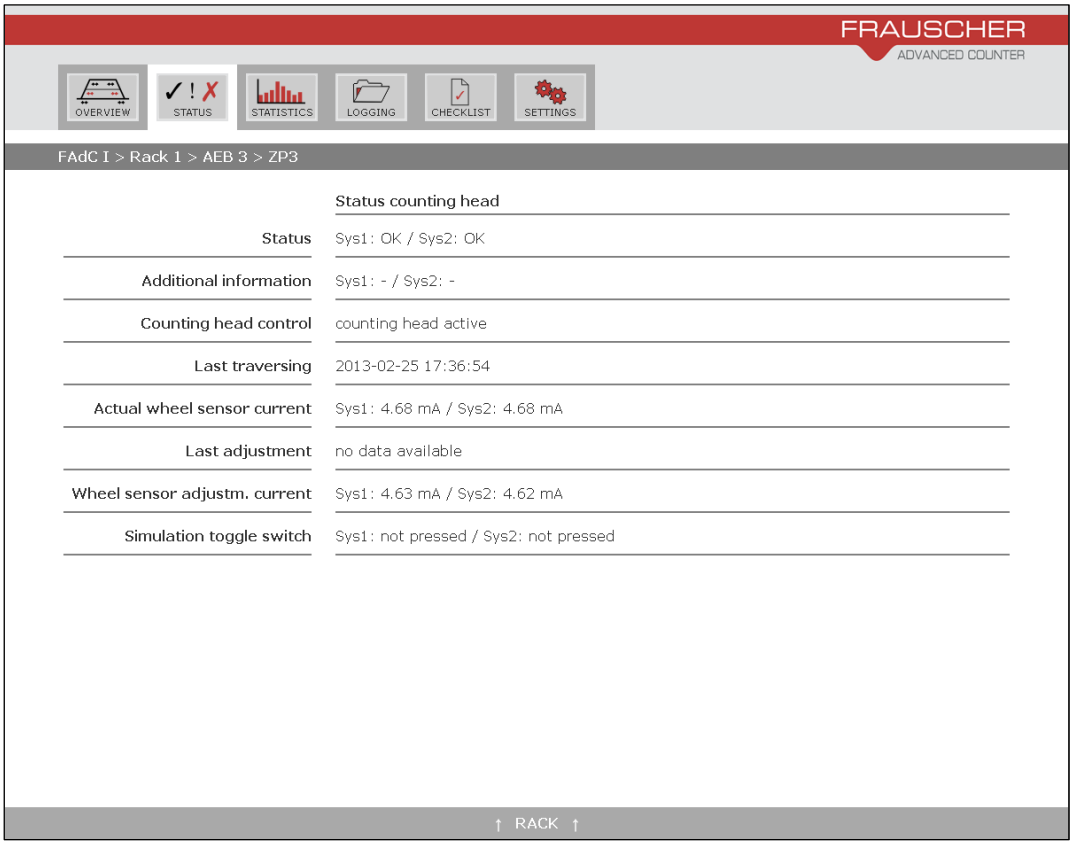
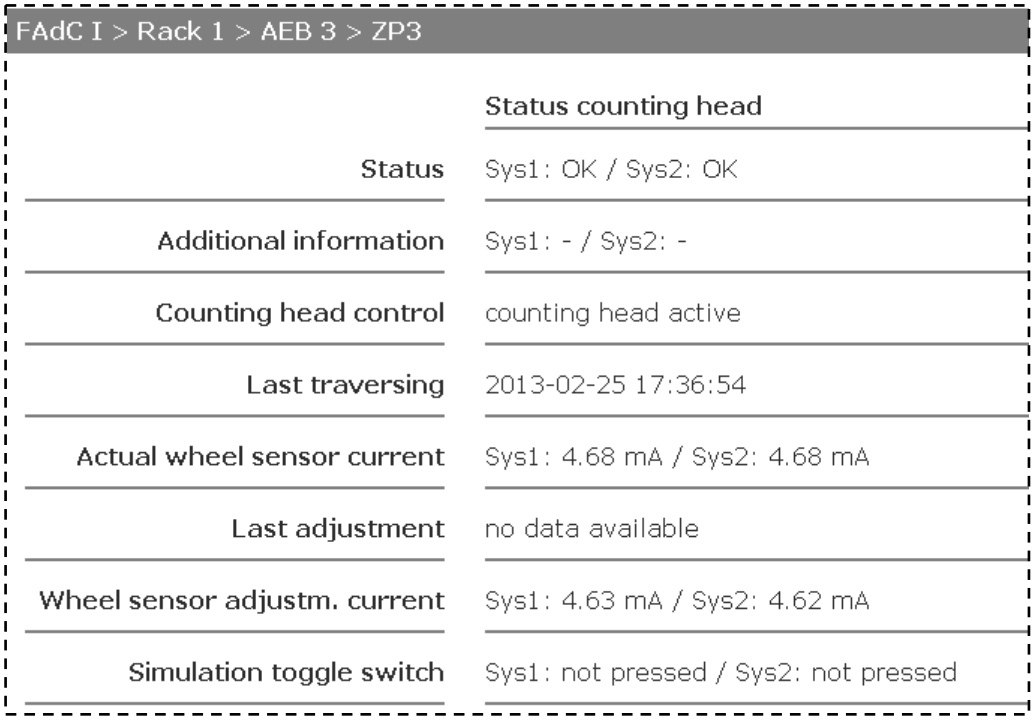


Figure 3.4: Tab status

Counting head

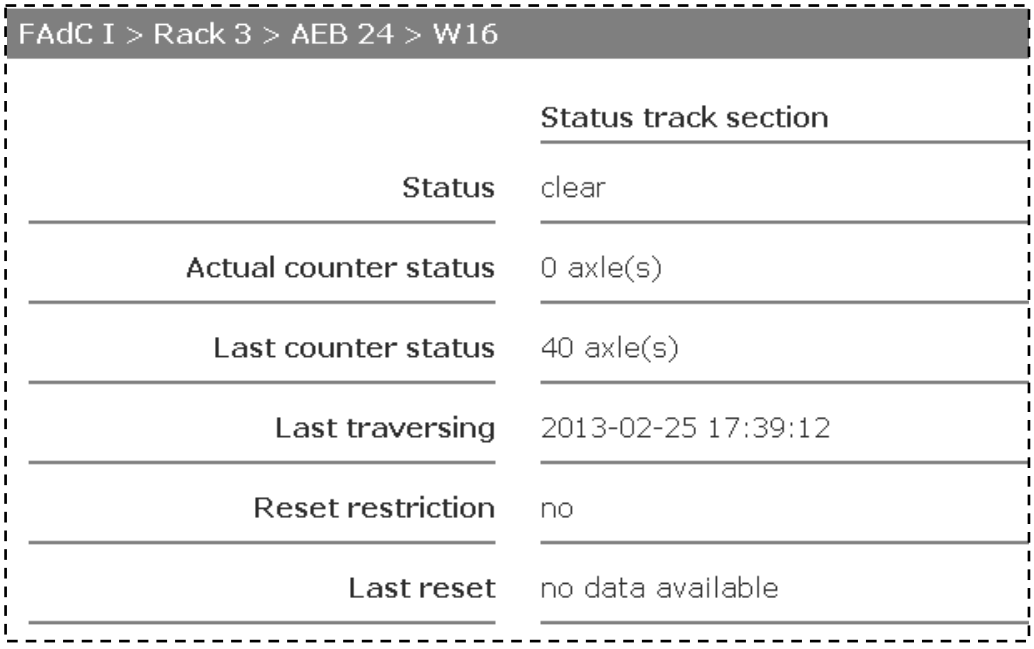


FAdC I > Rack 1 > AEB 3 > ZP3

	Status counting head
Status	Sys1: OK / Sys2: OK
Additional information	Sys1: - / Sys2: -
Counting head control	counting head active
Last traversing	2013-02-25 17:36:54
Actual wheel sensor current	Sys1: 4.68 mA / Sys2: 4.68 mA
Last adjustment	no data available
Wheel sensor adjustm. current	Sys1: 4.63 mA / Sys2: 4.62 mA
Simulation toggle switch	Sys1: not pressed / Sys2: not pressed

Figure 3.5: Status of selected counting head

Track section



FAdC I > Rack 3 > AEB 24 > W16

	Status track section
Status	clear
Actual counter status	0 axle(s)
Last counter status	40 axle(s)
Last traversing	2013-02-25 17:39:12
Reset restriction	no
Last reset	no data available

Figure 3.6: Status of selected track section

IO-EXB Data

FAdC I > Rack 5 > IOEXB 3 > IOEXB Data

	Status data transmission
Status	OK
Additional information	-
Inputs	0b 0000 0000 0000
Outputs	-

Figure 3.7: Status of selected IO-EXB Data

COM board

FAdC I > Rack 2 > COM 4 > COM

	Status board
Board error	channel 1: no board error / channel 2: no board error
Status CAN bus	channel 1: CAN bus ok / channel 2: CAN bus ok
Configuration server	no configuration server
Not answerable configuration requests	0
Status CF card	no CF card available
Error code CF card	no error

Figure 3.8: Status of selected COM board

COM-FSE board

Station 1 > Rack 1 > COM FSE 1 > IXL 1

	Status Interlocking
Interlocking channel	channel 1: Interlocking channel available / channel 2: Interlocking channel available
Sum error time-out	channel 1: no time-out / channel 2: no time-out
Sum error quality	channel 1: transmission quality OK / channel 2: transmission quality OK
Interlocking socket 1	channel 1: online / channel 2: not configured
Interlocking socket 2	channel 1: not configured / channel 2: not configured

Figure 3.9: Status of selected COM-FSE board

FWD

FAdC I > Rack 2 > COM 3 > FWD

	Status forwarding
Ethernet	channel 1: linked / channel 2: linked
IP address	channel 1: 192.168.1.53 / channel 2: 192.168.2.53
Socket 1	channel 1: online / channel 2: online
Socket 2	channel 1: online / channel 2: online
Socket 3	channel 1: not configured / channel 2: not configured
Socket 4	channel 1: not configured / channel 2: not configured
Socket 5	channel 1: not configured / channel 2: not configured
Socket 6	channel 1: not configured / channel 2: not configured

Figure 3.10: Status of selected FWD

3.4 Statistics

1. Select element (see chapter 3.2 “Selection”).

Available elements: counting head
track section (1 or 2)
IO-EXB Data

2. Select the tab **STATISTICS**.

Tab statistic

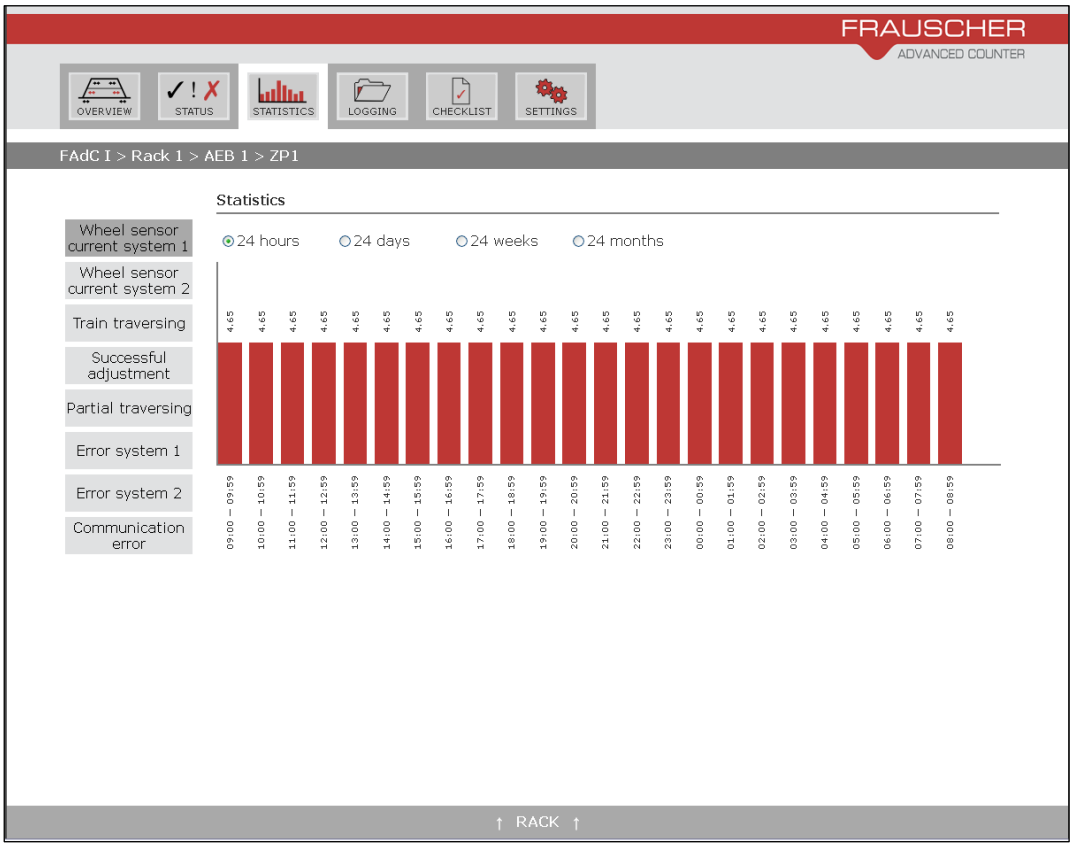


Figure 3.11: Tab statistic

3. Select the period of time.

Counting head

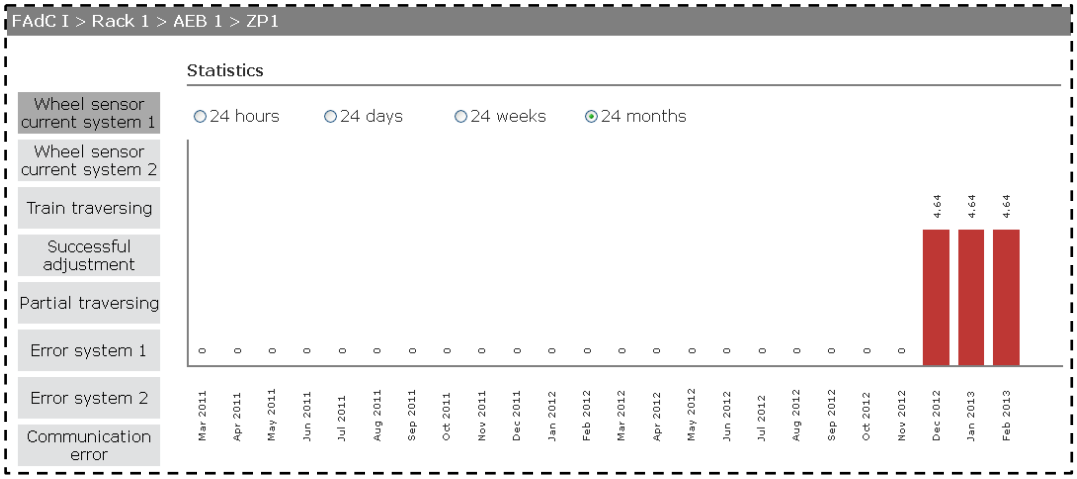


Figure 3.12: Statistic of selected counting head

Track section

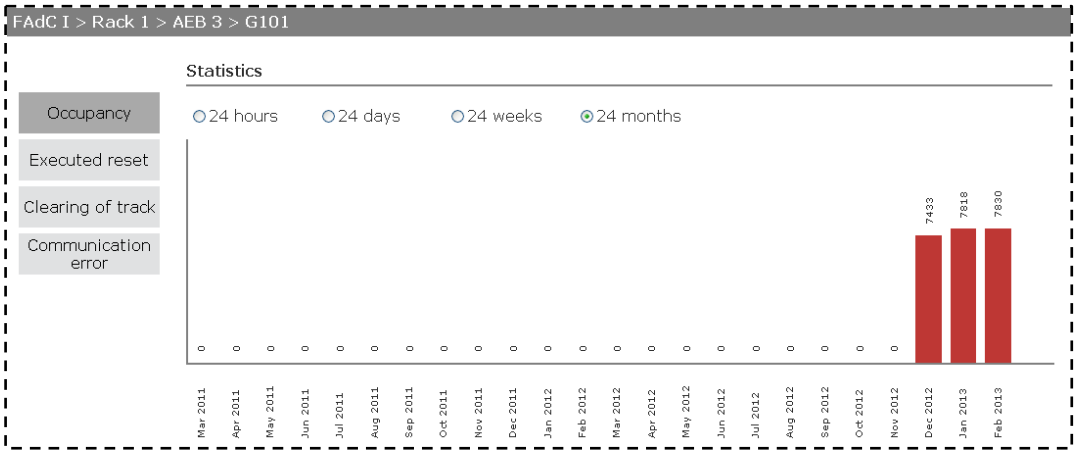


Figure 3.13: Statistic of selected track section

IO-EXB Data

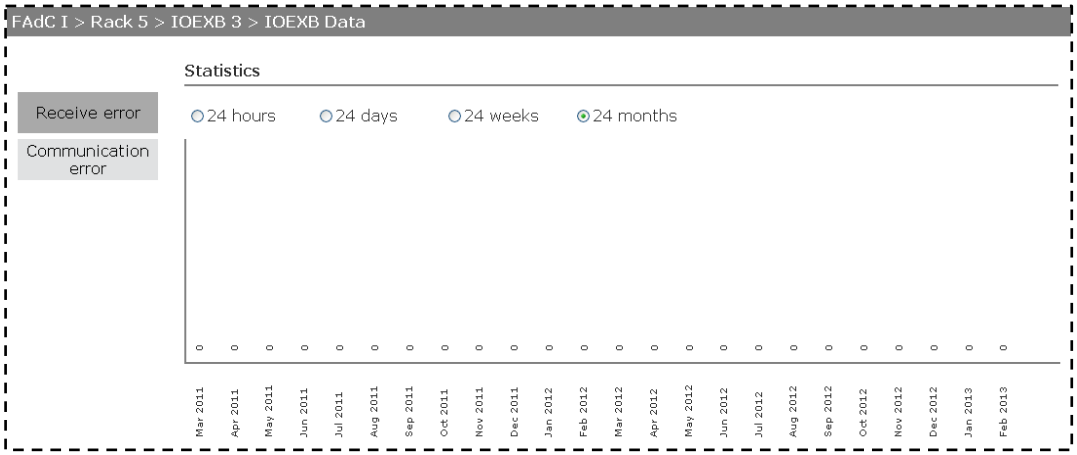
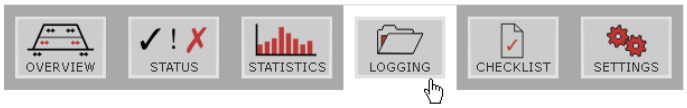


Figure 3.14: Statistic of selected IO-EXB Data

3.5 Logging

1. Select element (see chapter 3.2 “Selection”).

Available elements: counting head
track section (1 or 2)
IO-EXB Data
COM
FWD
IXL



2. Select the tab **LOGGING**.

Tab logging

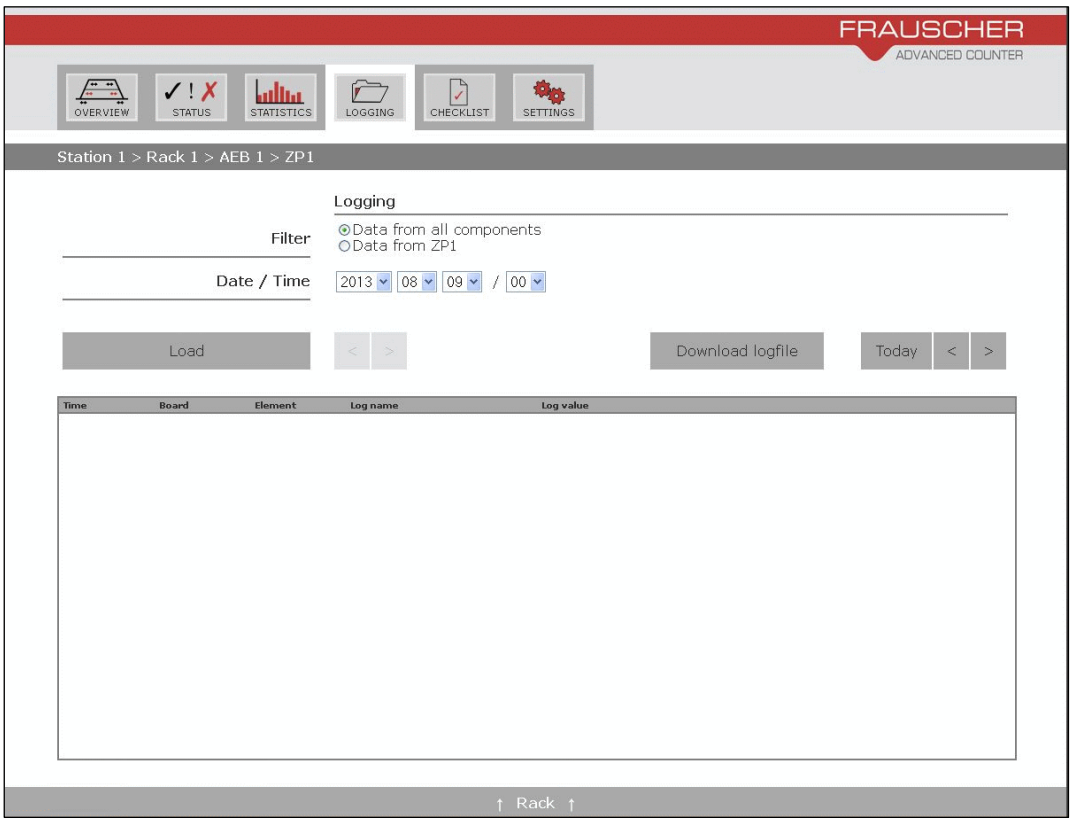


Figure 3.15: Tab logging

3. Select date/time and click 

.

Logging list

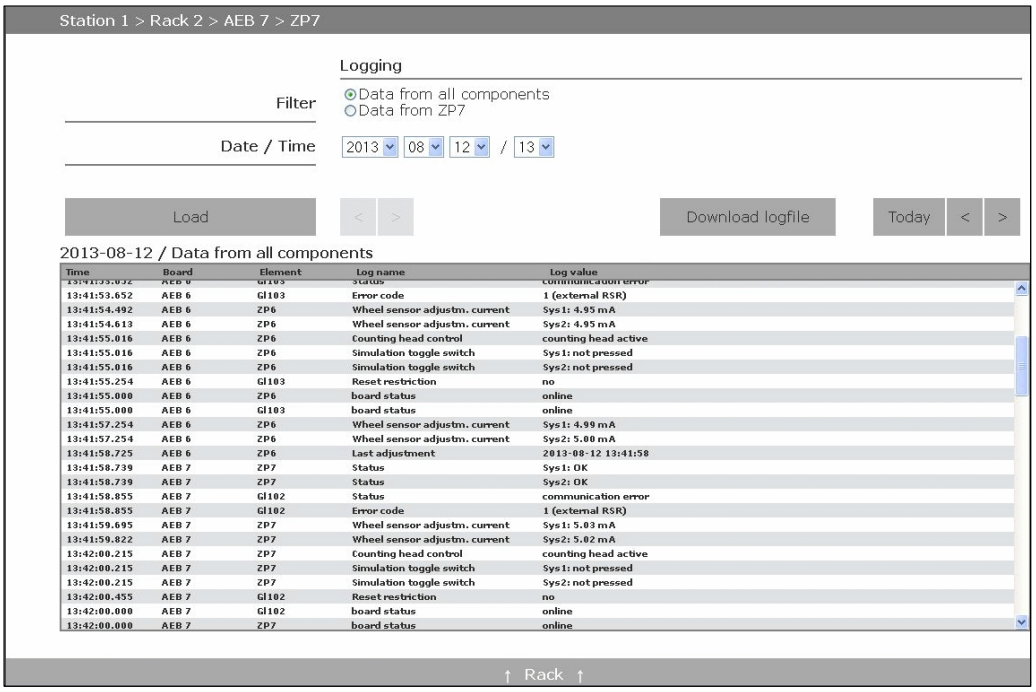
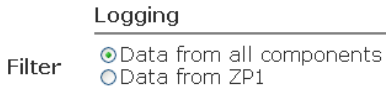


Figure 3.16: Logging list when all elements are selected



4. Set filter for all components or one selected component only.

Scroll page by page forwards and backwards within the log data.

View log data of today and/or scroll on a daily basis forwards and backwards with the arrow keys.

Download log file to view in browser. The file can be saved locally with the browser function “Save as”.

Files can also be downloaded using an USB flash drive, see chapter 5 “Uploads and downloads of FDS”.

The log files can be interpreted with the Excel file „FAdC_LogInterpreter“. This file is included in the configuration data, download see chapter 3.7. When using a USB flash drive, the required files are saved in the directory of the log files. To interprete a log file open the Excel file “FAdC_LogInterpreter” and enable macros in the options of excel. Then follow the steps given in the “FAdC_LogInterpreter”.

3.6 Checklist

1. Select element (see chapter 3.2 “Selection”).

Available elements: AEB (counting head, track section, IO-EXB Data)
COM (COM, FWD, IXL)

2. Select the tab **CHECKLIST**.

Tab checklist

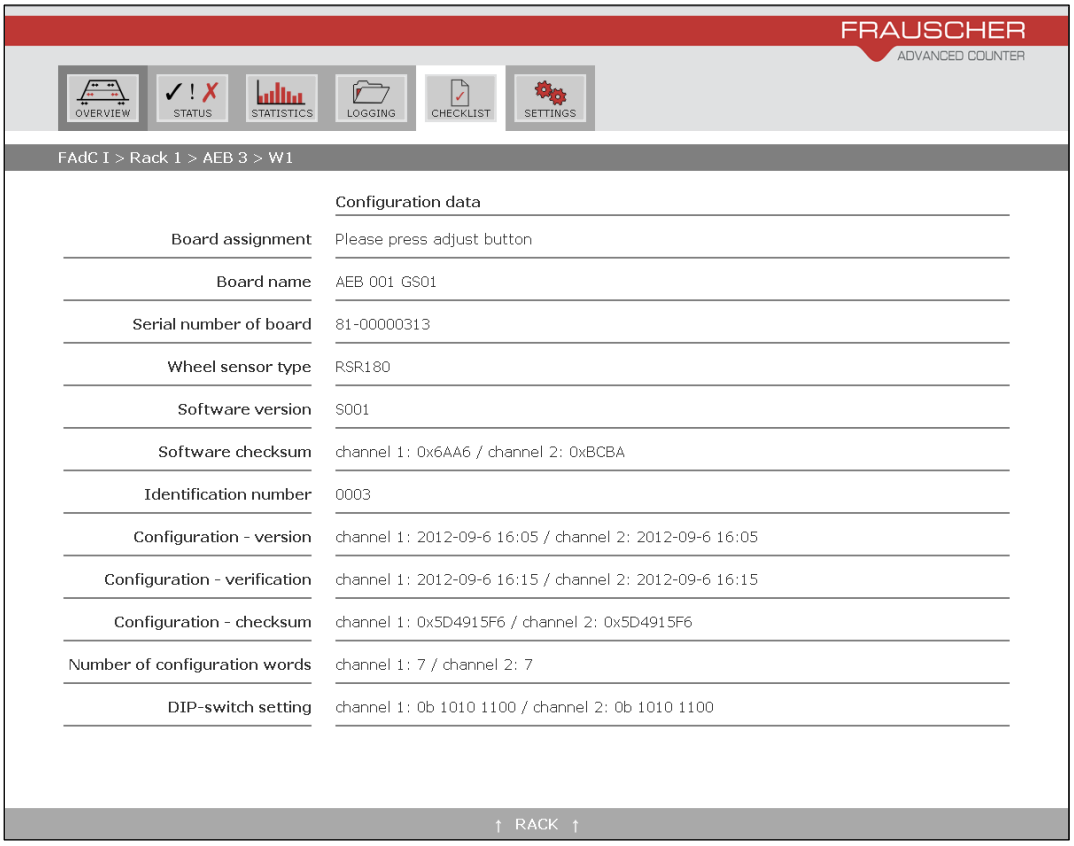


Figure 3.17: Tab checklist

AEB

FAdC I > Rack 1 > AEB 1 > ZP1

	Configuration data
Board assignment	Please press adjust button
Board name	AEB 001 GS01
Serial number of board	81-00001048
Wheel sensor type	RSR180
Software version	S001
Software checksum	channel 1: 0x6AA6 / channel 2: 0xBCBA
Identification number	0001
Configuration - version	channel 1: 2012-08-24 08:34 / channel 2: 2012-08-24 08:34
Configuration - verification	channel 1: 2012-08-27 13:30 / channel 2: 2012-08-27 13:30
Configuration - checksum	channel 1: 0x23F99C8C / channel 2: 0x23F99C8C
Number of configuration words	channel 1: 0 / channel 2: 0
DIP-switch setting	channel 1: 0b 1010 1100 / channel 2: 0b 1010 1100

Figure 3.18: Checklist of selected AEB

COM board

FAdC I > Rack 2 > COM 4 > COM

	Configuration data
Board name	COM-AdC 001 GS01
Serial number of board	78-00000349
Software version	S001
Software checksum	channel 1: 0x4D3F / channel 2: 0xF516
Identification number	0104
Configuration - version	channel 1: 2012-12-3 08:58 / channel 2: 2012-12-3 08:58
Configuration - verification	channel 1: 2012-12-3 08:59 / channel 2: 2012-12-3 08:59
Configuration - checksum	channel 1: 0x5311ED9C / channel 2: 0x345CC99C
Number of configuration words	channel 1: 5 / channel 2: 0
DIP-switch setting	channel 1: 0b 0010 / channel 2: 0b 0010

Figure 3.19: Checklist of selected COM board

3.7 Settings

1. Select element (see chapter 3.2 “Selection”).

2. Select the tab **SETTINGS**.

Tab settings

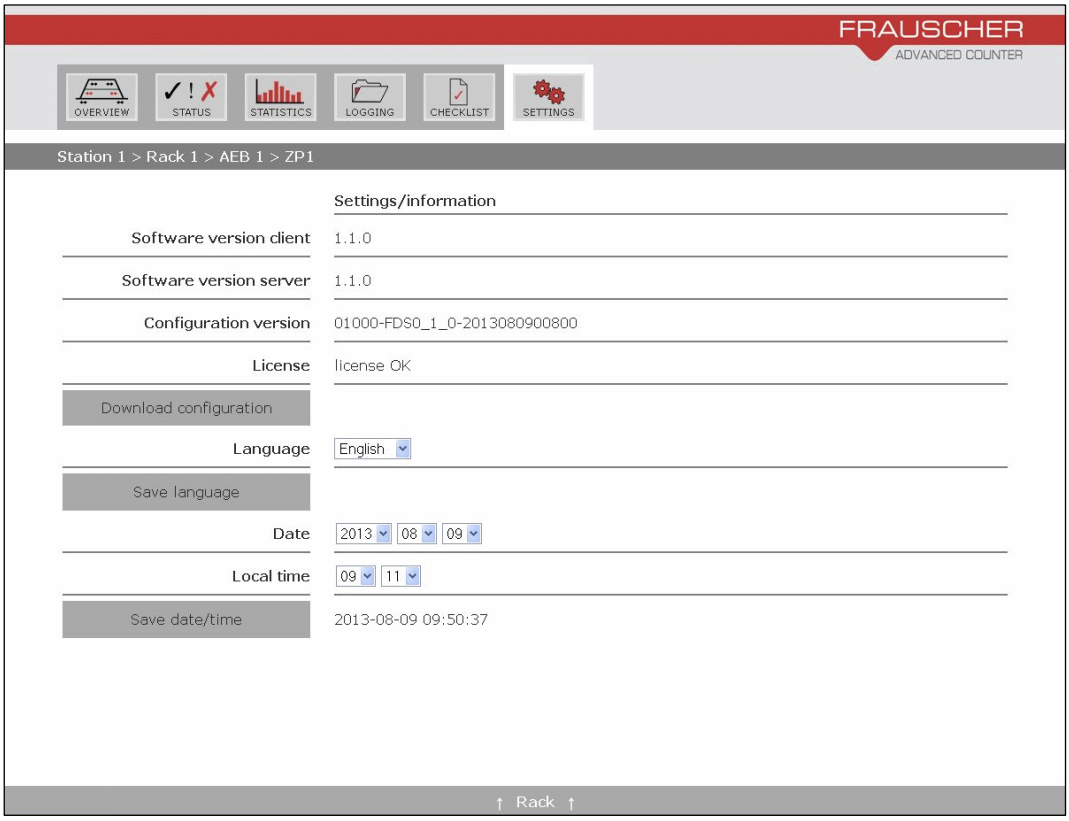


Figure 3.20: Tab settings

The software version client includes the configuration data of the FDS which are created with the FCT. The software version server includes the firmware of the FDS. The configuration version is self administrated by the originator of the configuration in the FCT. The configuration files can be downloaded for viewing with a klick on Download configuration.

3. Select language and click 

.

4. Set date/time and click 

.

5. Enter user name and password (default: admin/password).
   See chapter 5 “Uploads and downloads of FDS” to configure new user name and password.

If a time server is configured it is not necessary to set the system time manually. In this case, the system date and time is automatically synchronized periodically.

4 XML diagnostic interface

The Frauscher XML diagnostic interface is able to send events of a track section and/or a counting head to a higher-ranking diagnostic system, in the form of diagnostic messages of the axle counting system. This takes place with XML telegrams (see [1]). Therefore, the status changes of all available components are provided to this higher-ranking diagnostic system.

Detailed information on the specification of the Frauscher XML diagnostic interface can be found in [2].

5 Uploads and downloads of FDS

USB flash drive

The FDS supports only the file systems FAT16 and FAT32.

It is recommended to use a USB flash drive with LED status and a storage capacity of at least 1 GB. The standard FDS is fitted with a storage capacity of 4 GB.

LED status of the USB flash drive:
illuminated: ready
flashing: in process (read/write)

Download FDS configuration [4]

1. Connect the USB flash drive to one of the “USB” interfaces of Log computer.
2. The FDS configuration (FDS backup) with the file name “FdsBackup.zip“ is downloaded to the USB flash drive automatically.
3. Disconnect the USB flash drive when its LED has stopped flashing.

Download FDS log files[4]

1. Connect the USB flash drive to one of the “USB” interfaces of Log computer.

2 a. The FDS log files from the last 90 days are downloaded to the USB flash drive automatically.

2 b. If a file called “copyall” exists on the USB flash drive all FDS log files are downloaded automatically.

3. Disconnect the USB flash drive when its LED has stopped flashing.

Upload FDS configuration

1. Make sure that a configuration file called “FdsRecovery.zip” exists on the USB flash drive.
2. Connect the USB flash drive to one of the “USB” interfaces of Log computer.
3. The FDS configuration is uploaded to the USB flash drive automatically.
4. Disconnect the USB flash drive when its LED has stopped flashing.
5. Carry out a reboot of the FDS.

[4] The FDS backup and the log files are downloaded together on the USB flash drive, when the USB flash drive is connected to the log computer.

Update FDS

1. Make sure that a file called “FdsUpdate.zip” exists on the USB flash drive.
2. Connect the USB flash drive to one of the “USB” interfaces of Log computer.
3. The FDS update is uploaded to the USB flash drive automatically.
4. Disconnect the USB flash drive when its LED has stopped flashing.
5. Carry out a reboot of the FDS.

6 Trouble shooting

No connection to the FDS can be established.

Possible cause(s)	Measures
In case of direct access (static IP): • The laptop which is connected to the FDS has no static IP address. • The static IP address of the laptop is not in the same network as Ethernet 1 and/or Ethernet 2.	• Assign a static IP address to the laptop, which is in the network of the FDS.
In case of indirect access (dynamic IP/DHCP): • The dynamic IP address of the laptop is not in the same network as Ethernet 1 and/or Ethernet 2.	• Contact network administrator.
• The firewall is activated.	• Adapt the settings of the firewall or deactivate the firewall.

The FDS doesn't receive diagnostic data from the FAdC.

Possible cause(s)	Measures
• The diagnostic data from the FAdC are not forwarded correctly.	• The diagnostic data from the FAdC must be sent to Ethernet 2 of the FDS.

An ARP error has occurred.

Possible cause(s)	Measures
• At GS01 of the COM board, a socket which receives no axle counting data was not marked as such.	• Adapt configuration of FDS or use a COM board GS02 or higher.

The assignment of counting heads or track sections in the FDS does not correspond to the FAdC.

Possible cause(s)	Measures
• The ID of the AEB does not correspond to the configuration. • The AEB is in the wrong plug socket.	• Carry out an assignment check: Press the toggle switch "Adjust" on the front panel of the AEB to the left; this is displayed on the tab "Checklist".

A communication error has occurred.

Possible cause(s)	Measures
• The same IP address has been assigned to multiple boards.	• Check the IP addresses: each IP address must be unique within a network.

Table 6.1: Trouble shooting