Communication Interface **EMIS2**



FMC Technologies

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1 General

1.1 Orientation aids for the manual

We have provided some orientation aids so that you can easily find the necessary information in this manual.

The information in this manual ranges from imperative safety procedures and standardized guidelines through to concrete handling procedures and advice. To differentiate these more easily, the information is marked with corresponding pictograms in front of the relevant text.

These are intended not just to draw particular attention to these passages, but also to make it easier to find the information you want. Therefore the pictograms are symbolic of the underlying textual content.

The following pictograms are used in this manual:



Danger sign

Danger of explosions caused by easily ignited gases and liquids here.

- Risk of operating fault Actions that may damage the equipment.
 Legal notice Actions that may have legal consequences.
- Working step Concrete action statements, e.g.: "Press the <Enter> key".
 - Input necessary
 e.g. via numeric or function keys.
- Positive response message e.g. "The main menu now appears"
- Negative response message e.g. "If a fault message appears now..."
- Gerror Background information Short-Tip, e.g. "See more detailed information in chapter XX".
- Special case.
- **Function** Functional description.

indicates a special situation.



ATTENTION: particular attention is to be paid.

the pictograms are symbolic of the underlying textual content.

1.2 Safety instructions



Caution:

This information must be carefully read and observed before operating the unit.

1.2.1 Special requirements

The measuring systems contain high-precision, high-quality components. Consequently, mechanical actions not directly relating to the operation of the unit (e.g. dropping the unit) must be avoided.

CAUTION:

Do not open the housing cover when the unit is connected to the voltage supply!

Work must only be carried out on the Ex-e terminals when the unit is voltage free. National regulations must be satisfied when operating this unit. When performing operational checks, observe the guidelines laid out in EN 60 079-17.

1.2.2 Disposal

- It is the operator's responsibility to obtain the necessary information about all relevant regulations and requirements from your local authorities. Ensure that the relevant materials are disposed of in an environmentally safe fashion.
- S The operator is responsible for ensuring compliance with all general and local regulations which are in force at the time of disposal.



Disposal of batteries

The batteries in the controller should be replaced by a skilled person. Used batteries must not be disposed of as standard domestic waste. Ensure that all used batteries are disposed of via suitable disposal facilities.

1.2.2.1 Disposal of a functional component or system

• When a functional component or system is taken out of service, we recommend that it should be sorted into its different types of waste and then disposed of or recycled as appropriate. Sort and separate iron, nonferrous metals, plastics, electronic waste, etc.

• Fuels, grease, oil and objects or lines contaminated with them must be disposed of separately.

1.2.3 Proper intended use

- The system is used exclusively for quality control in collaboration with measuring systems on tank trucks. The corresponding applicable safety regulations (e.g. Ex protection) must be complied with.
- Any form of use which exceeds the scope described above is deemed to be improper use; the F. A. Sening GmbH is not liable for damages resulting from such improper use.
- Proper use also includes compliance with the conditions set out by the F. A. Sening GmbH with regard to operation, installation and maintenance.
- The system must only be operated, serviced and repaired by personnel who are familiar with the equipment and who have been trained regarding the dangers involved.
- If you discover any signs of damage or breakage on any parts of the system or if the system's safe operation cannot be guaranteed for any other reason, do not start the system or, if already in operation, shut down the system immediately. Notify your maintenance department.
- The F. A. Sening GmbH cannot be held liable for any damages arising as a result of unauthorized changes to the system.

2 General Description of the EMIS2 Interface

The European Multiple Interface System 2 (EMIS2) enables interfacing of the Sening vehicle systems (NoMix, MultiSeal, MultiLevel and MultiFlow) with any on-board computer (OBC).



Fig. 1 : data communication module

2.1 Data transmission

EMIS2 offers a number of variables that reflect the status of the connected devices. The OBC connected to the EMIS2 Interface can access this information and process it as required:



Figure 1: Sening tank truck components with EMIS2

2.1.1 EMIS2 with NoMix / MultiSeal



Figure 2: EMIS2 with NoMix / MultiSeal



2.1.2 Data flow



- Call up of the status information for the individual devices
- Transfer of delivery information (presets) to measuring systems (MultiFlow)
- Call up of delivery data (quantity, product, date, time etc.) from metering systems
- Call up of loading and unloading details
- Management and control of a common printer

2.2 Typical Applications for EMIS2

The EMIS2 Interface can be used in different combinations. The type and number of connected components determine the functionality of EMIS2.

2.2.1 Communication with Electronic Counters at Measuring Systems

Up to three electronic counters (MultiFlow type) can be connected to the EMIS2 interface.

Counters with software version 2.20[3.00]EN or higher are detected automatically. For older devices, the EMIS2 Interface has to be configured accordingly or the MultiFlow software updated by our customer service.



Fig. 2: Communication with measuring systems

- Via the counter(s), general information is made available to the on-board computer (OBC), e.g. serial number, number of measuring systems, status information, measurement results etc. The OBC can supply discharge data to the measuring system.
- Counter and OBC have to request access permission for a common printer from the EMIS2 Interface. For the transfer of calibration-relevant data, the counter(s) is/are connected with the printer via a separate cable. The OBC usually only has indirect access to the printer via the EMIS2 Interface.

2.2.2 Communication with NoMix / MultiSeal / MultiLevel

C When combining the EMIS2 Interface with the MultiSeal / NoMix system, the on-board computer can retrieve data from the MultiSeal / NoMix event logfile.



Fig. 3: Communication with MultiSeal / NoMix / MultiLevel

Data such as

- Start / end of filling
- Start / end of discharge
- Changes in residue sensor status
- Changes in the sensors for the
 - Foot valves
 - API couplings
 - In-line valves
 - Manlid sensor
 - Cabinet door sensor
- Loading plan
- etc.

can be retrieved.

The MultiSeal concept refers to the delivery of low-viscosity mineral oil quantities that have been measured with calibrated instruments in a secure and monitored way via tank trucks to the customer as "sealed parcels" (<u>Sealed Parcel Delivery</u>). MultiSeal offers the following main functions:

- The tank compartments are electronically sealed after loading. Die geladenen Mengen sind in den Ladepapieren aufgeführt.
- The status of the tank compartment dome covers and valves is continuously monitored, and each change is recorded in a log file.
- After delivery, MultiSeal indicates whether the compartments have been emptied completely, i.e. whether or not the compartments contain residual product.
- Any manipulation of a sealed compartment is logged. The compartment is then deemed to be "unsealed".

3 EMIS2 Interface Module

Part no.: **EMIS** Drawing: 51.351615 / S. 47 Wiring plan: 51.351658 / 49



Fig. 4: EMIS interface

- The EMIS interface is used to connect the MultiSeal, MultiFlow, MultiLevel and NoMix systems to external electronics, such as an onboard computer (OBC). It is connected to the external CAN bus of the system. All relevant data is transferred from the main unit to the EMIS interface. The connection of an on-board computer (OBC) to the EMIS interface is established through a RS232 port.
- The EMIS interface has the following connections:
 - 24V DC power supply
 - Serial RS232 interface for connecting the OBC
 - Optionally, a serial RS485 or RS232 interface for connecting a printer.
 - External Sening CAN bus for connecting other Sening[®] components
 - GPS antenna

4 Installation

4.1 General

- The EMIS2 Interface is explosion-proof and may be installed in zone 1.
- § Only qualified staff may install the EMIS2 interface on tank trucks.
 - [Qualified installers are defined as companies according to TRbF 180 Chapter no. 1.7.]
 - The qualified installer will install and check the complete system according to the criteria listed in the operating and installation instructions. Proper installation of the EMIS2 interface must be certified.

4.1.1 Preventive Measures

4.1.1.1 For Preventing Accidents (caused by ignition of explosive mixtures):



Regulations for explosion-proof installation (e.g. EN 60079-14; VDE 0165) must be adhered to!

All components are explosion-proof electrical devices that have been safety-checked and certified.

No intervention, either mechanical or electrical, is permitted.

RISK OF EXPLOSION

- The information provided on Ex-labels must be observed.
- In case of a fault, the complete module must be replaced.
- No additional components must be added to the housings or junction boxes (e.g. additional terminals), since this would void the device approval.
- Failure to observe these instructions will obviously lead to a loss of any right to claim under warranty.
- If in housings PG screw loints or metric cables have to be replaced, only ATEX-approved explosion-proof screw joints may be used.
- Cable inlets that are not used must be closed by means of blind plugs.
- The printer is only suitable for operation outside Ex-areas. To protect it from the effects of the weather, it should preferably be installed in the driver's cabin.

4.1.1.2 To Meet the Requirements Stipulated by Standards:

- The wiring must be carried out according to the wiring diagrams supplied. The colours of the wires correspond to DIN 47100. The specified wire colours **must be** followed! For wiring the battery supply and the signal cables, only cables according to the specifications in chapter 4.2 "Vehicle wiring" / page 18 must be used.
- The manufacturer's EMC declaration of conformity is only valid if the system has been installed exactly according to the information provided by the manufacturer (operating and installation instructions).
- Only one connection per terminal point is permitted for the EMIS2 tension spring terminals according to VDE0611. Dual connections can be realised by using dual wire end sleeves. In this case, two wires have to be connected in one wire end sleeve.

4.1.1.3 To Ensure Trouble-free Operation:

- During welding work at the vehicle, the power supply (plus 24 Volts **and** 0 Volts) to all electronic components must be interrupted.
- All electronic devices and junction boxes must be mounted firmly and protected from vibration. If a module is intended for installation outside the cabinet, it is explicitly stated.
- During the installation, a reliable electrical connection that complies with the relevant standards must be established between each metal housing and the vehicle chassis. Corrosion-resistant screws (V2A) with additional toothed disks must be used.
- If possible, the cable entries should always be installed facing sideways or downwards.
- Unused cable glands should be sealed watertight using blind or sealing plugs.
- If wires have to be shortened, no cable residues must be allowed to fall into the open unit. This could lead to short circuits on the electronic board.
- When connecting the cables to the electronic device, the fitter must ensure that he or she is not electrostatically charged, since electrostatic discharge could destroy the electronic components. The relevant guidelines for handling electronic products must therefore be observed (e.g. earthing strap, touching of the tank truck chassis prior to connecting the cables).

4.1.1.4 To Make the Job of the Service Personnel Easier:

- Install electronics housings such that they are easily accessible.
- Cables without plug connectors may be shortened.

• Slightly lubricate the fixing bolts of the covers prior to installation (copper paste, graphite grease). This is intended to prevent the bolts from corroding and becoming stuck after prolonged operation.

4.2 Vehicle wiring

The EMIS2 Interface was designed for installation on a vehicle.

- In order to ensure trouble-free operation, the guidelines described in the preceding chapters must be followed. Failure to follow the guidelines may lead to malfunction during operation.
- **§** In case of demonstrable failure to observe the guidelines or improper installation (violation of current regulations) F.A. Sening can't accept responsibility for any malfunctions that may occur and for any subsequent claims.
 - All cables used must be fuel-resistant. Ex-cable must be used for wiring in non-intrinsically safe areas.
 - All cables must be installed (protected) in such a way that they are not damaged during operation (operator method of working).
 - Lay a separate cable with a cross-section of ≥1.5mm² for the power supply. Screening is not required.
 - Shielding is not necessary.
 - Connect to the +24V voltage via a secured cable directly from the plus terminal of the battery.
 - Use an 8 A fuse to protect the system.
 - Connect to the 0V voltage as closely to the ground terminal of the battery as possible.

5 Commissioning

It is essential that the equipment is first commissioned in the sequence described below. If this is not done, improper handling can cause irreparable damage to the EMIS2 Interface.

5.1 Setting the DIP switches (for FTL)

The EMIS2 interface is equipped with a series of DIP switches for configuration purposes. The illustration shows the factory setting:

Factory Setting		DIP swit	ch	
OFF ON	DIP	OFF	ON	Description
	1	21	22	CAN-Bus Node No.
	2	DOK-411	FTL	Main Operation Mode
	3	0	1	ADMIN, CLOCK, AutoDST
	4	NONE	COM(1)	PRN, SETUP, Port
	4	COM(1)	NONE	GPS, SETUP, Port
d 01	5	RS232	RS485	COM(1), SETUP, Mode
	6	STD	FDW	PRN, SETUP, Protocol
	0	9600:8:E:1	9600:8:E:1	COM(1), SETUP, Protocol
	7	Start	RESET	Reset to default values
	8	Nothing	TEST	Interface test

Table 1: DIP Switch for FTL

With DIP switch 1: can be set to the node number to 21 or 22.

- With DIP switch 2: allows the operating mode between "**DOK-411**" and "**FTL**" switch.
- With DIP switch **3**: is the automatic change between summer time switched to winter time.
- With DIP switch **4**: switching between the GPS receiver and printer. In **FTL** mode no **GPS** reception is supported.
- With DIP switch **5**: the mode of the serial port **COM(1)** is set.
- With DIP switch **6**: the port settings made.

- With DIP switch **7**: Setup mode is turned on.
- With DIP switch 8: is used for interface test.



To apply the modified switch positions in the system, the DIP switch **7** is set to "**ON**" and then EMIS2 be turned on. After about 10 seconds flashing LED3. Finally EMIS2 turn **off**, DIP switch **7** set to "**OFF**" and start EMIS2 new.



The factory setting (node number **21**) must be used for MultiFlow / MultiSeal / MultiLevel / NoMix.

Gerror The "interface test" function (switch no. 8) is described in more detail in chapter 5.6 "Checking the Interfaces" / page 23.

5.2 Setting the DIP switches (for DOK-411E)

5.2.1 DIP switch settings are up to version 3.22.

The EMIS2 interface is equipped with a series of DIP switches for configuration purposes. The illustration shows the factory setting:

Factory Setting		DIP switch		h	
OFF O	N	DIP	OFF	ON	
		1	0	1	CAN-Bus Node No., Value 1
	N	2	0	2	CAN-Bus Node No., Value 2
		3	0	4	CAN-Bus Node No., Value 4
		4	0	8	CAN-Bus Node No., Value 8
G O		5	0	16	CAN-Bus Node No., Value 16
		6			for future use
		7	Start	RESET	Reset to default values
	ON	8	No	Test	Interface test

Table 2: DIP switch up to version 3.22

Dip switches 1-5 can be used to set any node number between 0 and 31. To this end, the values of the switches in **ON** position have to be added up.

- In the factory setting shown here, the "Ext. CAN bus" node number is 21 (1 + 4 + 16 = 21).
- The factory setting (node number **21**) must be used for MultiFlow / MultiSeal / NoMix.
- Gerror The "interface test" function (switch no. 8) is described in more detail in chapter 5.6 "Checking the Interfaces" / page 23.

5.2.2 DIP switch settings for DOK-411E from version 3.23

Factory Setting		DIP swit	ch	
OFF ON	DIP	OFF	ON	Description
	1	21	22	CAN-Bus Node No.
	2	DOK-411	FTL	Main Operation Mode
	3	0	1	ADMIN, CLOCK, AutoDST
	4	NONE	COM(1)	PRN, SETUP, Port
	4	COM(1)	NONE	GPS, SETUP, Port
d 01	5	RS232	RS485	COM(1), SETUP, Mode
	6	STD	FDW	PRN, SETUP, Protocol
	0	9600:8:E:1	9600:8:E:1	COM(1), SETUP, Protocol
	7	Start	RESET	Reset to default values
	8	Nothing	TEST	Interface test

 \Box The illustration shows the factory settings from V3.23:

Table 3: DIP switch for DOK-411 from V3.23.

5.3 Parameter settings

To ensure faultless cooperation, the other components have to be set accordingly.

5.3.1 MultiFlow

Parameter No.	Name	Value
3141	Mode of Operation	2 (OBC-Mode)
3161	Global Node Number	1 for 1. Meter Position, 2 for 2. Meter Position etc.
3162	CAN-Termination	see DOK-383E
3163	OBC Node Number	21 (see chapter 5.6.2 " RS232 Interface (OBC) " / page 24)

5.3.2 MultiSeal / NoMix

In the setup network, the <EMIS communication possible> option should be set to **YES**.

Parameter	Value
EMIS Node Number	21
Save Events	YES
Events send to	21
Own Node Number	11
CAN-Bus Connection Needed	NO

See table below for further settings:

5.4 Switching On

- Before switching the system on for the first time, re-check the wiring for correct connection and firm fit one more time.
- If the green LED (LED +5V) on the PCB of the EMIS2 Interface does not come on,
- Immediately switch off the system again and check the complete wiring.
- If all connections are correct, the green LED +5V should be on continuously, and the green LED 2 should flash regularly with approx. 2 pulses per second.

Note:



The EMIS2 Interface scans after power up for approx. 25 s for further units on the CAN Bus. During this time no communication takes place via the serial interfaces.

The test procedure of the interfaces is not affected.

5.5 Status LEDs

The CPU board contains 1 red and 3 green LEDs for simple functional checks. They are identified as "LED: 1 2 3" and "+5V".





LED 1 (red)

is on if the interface test is activated (see chapter 5.6 "Checking the Interfaces" / page 23).

LED 2 (green)

indicates device operating state information via a flash sequence:

	DOK-411 to V3.22	DOK-411 from V3.23	FTL
Flash frequency	1 Hz	2 Hz + pause	3 Hz + pause

(see also see chapter 5.6.4 "Displaying the test results" / page 25)

LED 3 (green)

no Fuktion

LED +5V (green)

Power supply present.

5.6 Checking the Interfaces

The EMIS2 Interface has a built-in diagnostic function that enables the wiring and the function of all interfaces to be checked.

- This diagnostic function (referred to as the loopback test) is activated by switching DIP-switch 8 to ON.
- The red LED 1 is on. The device must be switched OFF and ON again!
- In diagnostic mode, the EMIS2 Interface sends test data at all interfaces and waits for associated responses.
 - All interfaces can be prepared for the test as described below.
 - The EMIS2 Interface indicates the test results via flash signals of LED 2 according to the description in chapter 5.6.4 "Displaying the test results" / page 25.

5.6.1 External CAN-Bus

- With the "Ext. CAN bus", data are sent and received via a common pair of wires.
- For checking purposes, at least one further active device (e.g. MultiFlow, MultiSeal, NoMix) has to be connected to the "Ext. CAN bus". The EMIS2 Interface sends a test telegram. If at least one answer is received, the Ext. CAN bus is properly wired.

5.6.2 RS232 Interface (OBC)

- This interface consists of three cables: TX (EMIS2 transmit), RX (EMIS2 receive) and GND (ground). For checking purposes, the RX and TX cables should be connected as close to the OBC connection as possible, either via a test plug or by short-circuiting the wires in the terminal box.
- The OBC is usually connected using the Sening cable (part no. MS-OBC-KA) with 9-pole Sub-D socket according to following diagram (view of plug side shown):

5 1	Connection	Function (PC)
A	2	RX
	3	ТХ
9 6	5	GND

Table 4: OBC interface

In this case, connections 2 and 3 have to be bridged.

5.6.3 RS485 Interface (FDW Converter or Printer)

- This interface features two cables each for sending (TX+, TX-) and receiving (RX+, RX-). For checking purposes, TX+ has to be connected with RX+ and TX- with RX- as closely as possible to the connection of the FDW converter or the printer.
- The position of the terminals for these signals is specified in the associated drawings or the manual for the respective printer.

5.6.4 Displaying the test results

The green LED (LED 2) indicates correct interface function through associated flash patterns:

Interface	Flash Pattern
Ext. CAN-Bus	
RS232 / OBC	
RS485 / Printer	

The following example shows the continuously repeated flash pattern for an intact external CAN bus and RS485 interface; there is no echo on the RS232 interface.



Once the interface check has been completed, DIP switch no. 8 must be switched off again (OFF position), since otherwise the OBC cannot communicate with the EMIS2 Interface. The red LED 1 is no longer on. The device does not have to be switched OFF and ON again.

6 EMIS2 Interface Errors



Fault finding and corrective action must be carried out by a service workshop. The warnings on the housings, and generally EN 60079-14 and VDE 0165 must be followed. An appropriate measuring instrument must be used. If necessary, this should be Ex-protected (e.g. digital multi-meter from EX-ELEC, type DIGEX-A). Prior to disconnecting or connecting of plug connectors or cables, the electronic system must be switched off.

Fault	Possible cause	Check / Corrective action
Green LED +5V is not on	No 24 V supply voltage (terminal 1 & 2)	 Ensure supply voltage is present, check supply line from the on-board supply system to the interface
"Ext. CAN bus" check (5.6.1 / p. 24) failed	External CAN bus wired incorrectly	 Check complete wiring, particularly for reversal of CAN+ / CAN-, short circuits and interruptions
	External CAN bus interface faulty	 If the external CAN bus is not connected, the voltage at the terminals between CAN+ and GND should be approx. 3.0V and between CAN- and GND approx. 2.0V
RS232 interface check (5.6.2 / p. 24) failed	Interface wired incorrectlyInterface faulty	 Check complete wiring, particularly for short circuits and interruptions
RS485 interface check (5.6.3 / p. 24) failed	Interface wired incorrectlyInterface faulty	 Check complete wiring, particularly for short circuits and interruptions
Printer not printing	Printer is not connected correctly	Check the printer cable according to 5.6.3 / p. 24
	Printer not configured correctly	 Check configuration including interface parameters (9600 baud)
	Printer faulty	Replace printer
No connection to the OBC	OBC is not connected properly	Check the data cable according to 5.6.2 / p. 24
	OBC interface is not configured properly	Check configuration including interface parameters
	 OBC faulty 	 Replace OBC

7 Miscellaneous Information

7.1 Maintenance

The devices must not be modified mechanically or electronically in any way.

- Survive During cleaning with a steam cleaner or with pressurised water, the devices should be protected from the water jet. Never aim the steam jet directly onto the devices!
- **§** We cannot accept responsibility for any damage caused by moisture in the equipment as a result of improper cleaning procedures.



For all devices, a regular safety check in accordance with industrial safety regulations must be carried out. Equipment and protective systems which fall under the scope of Directive 94/9/EC and are operated in hazardous areas are also classified installations. It is the international standard EN60079-17 observed and there are other, country-specific policies, such as in Germany (Ordinance on Industrial Safety and Health) apply.

7.1.1 Maintenance plan

	daily	weekly	monthly	annually
Clean the outside of the device			Х	
Visual testing	X			
Checking the LED `s				Х
Examination of the case mounting for tight fit		х		
Check the cable		Х		

7.2 Software Updates

A program update can be carried out by replacing the EPROM.

7.2.1 Replacing the EPROM

For replacing the EPROM, the device must be de-energized, i.e. the EMIS2 and **all other** connected devices must be switched off.

Open the device by releasing the four screws in the lid.

The EPROM is a 32-PIN "PLCC" housing (rectangular housing with one bevelled corner) and a sticker showing the software version number (e.g. V3.00). One of the corners of the base on the board is also bevelled. A special, commercially available "PLCC removal tool" is required for removing the EPROM from the base, in order to avoid damaging the EPROM during removal. The two claws of the removal tool must be inserted into the two recesses of the EPROM base. The two arms of the removal tool are then pushed together. This causes the EPROM to be lifted from the base.



- Prior to inserting the new EPROM, its connection contacts should be checked for damage ("bent connection fingers"?).
- The new EPROM is inserted into the base and pressed in with your fingers without canting, until it noticeably engages.

The beveled corner of the EPROM must be aligned with the beveled corner of the base.

- After an EPROM replacement, the system has to be re-commissioned according to chapter 5 "**Commissioning**" / page 19.
- The system is ready for operation again. In the event of any malfunction, the EMIS2 Interface should be checked according to section xqx6.

8 Printer Configuration with EMIS Organizer

8.1 Background

A number of different settings are required in setup for different printer types and the optional GPS functionality. You need special software in order to be able to make these settings with the EMIS2 interface.

8.2 Required software

Software Version	EMIS2	3.18 bis 3.22	or higher
Software Version	MultiFlow	3.56 / MID 5.01	or higher

8.3 Preparation

- Connect the EMIS2 interface to a laptop in line with (drawing no. **51.352216** / page 50 (terminals 2, 4, 8)).
- Use cable with Sening part number EMIS2-OBC-KA (drawing no. 51.352241 / page 54) for this.
- If the laptop does not have a serial interface, use a standard USB adapter at RS 232.



DIP switch LED 2

8.3.1 Dip switch settings

Dip switches 1 - 3 - 5 to ON
 Dip switches 2 - 4 - 6 - 7 - 8 to OFF
 Dip switches 2 - 4 - 6 - 7 - 8 to OFF



Power up, wait 30 seconds.

③ The device is now ready for parameterization with the EMIS Organizer.

8.4 Installing the EMIS Organizer

8.4.1 Step 1: Open folder



8.4.2 Step 2: Save batches

(P

Save batches to a location where you will be able to find them again.

E.g. "My Documents" or the EMIS Organizer root directory "c:\Programs\FMC Technologies\EMIS-Organizer\ JOBs\GetPRNParameter.job"

8.4.3 Step 3: Run setup

Run setup and follow the instructions.

Once installation is complete, the following icon will appear on your desktop:



8.5 Starting the program

8.5.1 Step 1: Double-click to run program



EMIS-Organizer 1.1.0.5 [de-DE] (Debug)		
FMC Technol	ogies	
	Protocol (FAS)	
	Detum Zeit Aktion Choose the correct COM port, and click "Activate connection" ("Verbindung aktivieren")	COM12 COM12 verbinden Gerätetyp EMIS2-Dok411
-	·	senden

8.5.2 Step 2: Info window

☺ he following telegrams now appear in the info window

EMIS-Organizer 1.1.0.5 [de-DE] (Debug)					
FMC Technolog	oaies				
411	Protocol (FAS)				
	Datum 0 02.12.2013 02.12.2013 02.12.2013 02.12.2013 02.12.2013 02.12.2013 02.12.2013	Zet 10.39.23-646 10.39.23-646 10.39.23-709 10.39.23-740 10.39.23-740	Aktion COM12 Schnittstelle geöffnet (9600 Baud) SET.ADMIN.PROTOCOL.Ping=COM-Init <ck> REPORT.ADMIN.PROTOCOL.PING="COM-Init" <<ack></ack></ck>		[COM12] COM12 ▼ COM12 trennen Gerätetyp EMIS2-Dok411 ▼
-	SET, ADMIN, PF	ROTOCOL, F	Ping=COM-Init	•	senden

8.5.3 Step 3: Check cable connections

If the following error message appears, check COM port and make sure all cables are properly connected

EMIS-Organizer 1.1.0.5 [de-DE] (Debug)		
FMC Technologie	es	
411 Protocol	I (FAS)	
□ 111 □ □ <t< th=""><th>Datum Zeit Aktion D2 12.2013 10-40:59-374 COM12 Schnittstelle geöffnet (9600 Baud) D2 12.2013 10-40:59-374 SET.ADMIN.PROTOCOL.Ping=COM-Init D2 12.2013 10-41:02:530 Timeout_FAS</th><th>[COM12] COM12 COM12 trennen Gerätetyp EMIS2-Dok411</th></t<>	Datum Zeit Aktion D2 12.2013 10-40:59-374 COM12 Schnittstelle geöffnet (9600 Baud) D2 12.2013 10-40:59-374 SET.ADMIN.PROTOCOL.Ping=COM-Init D2 12.2013 10-41:02:530 Timeout_FAS	[COM12] COM12 COM12 trennen Gerätetyp EMIS2-Dok411
SET,A	DMIN,PROTOCOL,Ping=COM-Init	senden

8.5.4 Step 4: Automatic parameterization using "Batches"

Manual parameterization can be carried out in the left-hand window, but should not be attempted until you have received instruction from a service technician.

Sector into window and click right mouse button. The following window appears. Sector into window appears. With the left mouse button, click "Load batch" ("Lade Batch") Sector into window intowindow intowindow into windowindow into windowindow int	EMIS-Organizer 1.1.0.5 [de-DE] (Debug)				
411 Protocol (FAS) Image: Delta in the second s	FMC Technol	ogies			
Image: Speichern window appears. Image: Speichern with:	411	Protocol (FAS)			
Image: ADMIN Image: Optimized contracting contracting contracting contracting contracting contended contrac	🖃 🗖 411	Datum	Zeit	Aktion	[COM12]
Image: Construction of the second	ADMIN	O 02.12.2013	10:48:14-611	COM12 Schnittstelle geöffnet (9600 Baud)	COM12 V
B We term 0.2122013 10.4814574 cACK> Cold 102412003 10.4814576 cACK> Move cursor into window and click right mouse button. The following window appears. Speichern Speichern unter FMIS2-Dok411 EMIS2-Dok411 With the left mouse button, click "Load batch" ("Lade Batch") Speichern unter Drucken Speichern unter Speichern Sett,ADMIN,PROTOCOL,Ping=COM-Init Settden Settden Settden Settden	QAS		10:48:14-611	SET,ADMIN,PROTOCOL,Ping=COM-Init	
Geridetyp Wove cursor into window and click right mouse button. The following window appears. With the left mouse button, click "Load batch" ("Lade Batch") Set,ADMIN,PROTOCOL,Ping=COM-Init		➡ 02.12.2013	10:48:14-674	<ack>></ack>	COM12 trennen
Move cursor into window and click right mouse button. The following window appears. With the left mouse button, click "Load batch" ("Lade Batch") Speichern Spei		> 02.12.2013	10:48:14-705	REPORT, ADMIN, PROTOCOL, PING="COM-Init"	
Move cursor into window and click right mouse button. The following window appears. With the left mouse button, click "Load batch" ("Lade Batch") SET,ADMIN,PROTOCOL,Ping=COM-Init	1		10:46:14-705	(CAUN)	Gerätetyp
button. The following window appears. With the left mouse button, click "Load batch" ("Lade Batch") SET,ADMIN,PROTOCOL,Ping=COM-Init	Move cursor into wi	ndow se			EMIS2-Dok411
button. The following window appears. With the left mouse button, click "Load batch" ("Lade Batch") button, click "Load batch" ("Lade Batch") Image: Setter of the	button The followin	a		Carldan	
window appears. With the left mouse button, click "Load batch" ("Lade Batch") SET,ADMIN,PROTOCOL,Ping=COM-Init Senden unter Drucken Lische Ansicht Lade Batch Datei View_Filter		y i		Spechem	
With the left mouse button, click "Load batch" ("Lade Batch") SET,ADMIN,PROTOCOL,Ping=COM-Init	window appears.			Speichern unter	
With the left modse Lösche Ansicht button, click "Load Lade Batch Datel batch" ("Lade Batch") View_Filter View_Filter SET,ADMIN,PROTOCOL,Ping=COM-Init	With the left mouse			🛃 Drucken	
button, click "Load batch" ("Lade Batch") * SET,ADMIN,PROTOCOL,Ping=COM-Init * senden				Lösche Ansicht	
batch" ("Lade Batch")	button, click "Load	1	-	Lade Batch Datei	
View_Fiter View_Fiter SET,ADMIN,PROTOCOL,Ping=COM-Init senden	botob" ("Lodo Poto	b ")			
SET,ADMIN,PROTOCOL,Ping=COM-Init		<i>(</i> 1)		View_Filter	
SET,ADMIN,PROTOCOL,Ping=COM-Init senden	· · · · · · · · · · · · · · · · · · ·	r'			
SET,ADMIN,PROTOCOL,Ping=COM-Init senden					
SET,ADMIN,PROTOCOL,Ping=COM-Init senden					
	SET ADMIN PROTOCOL Ping=COM-Init				
		,,			

Browse to the folder containing the batches, select the appropriate one and click open.

The necessary adjustments will now be made automatically.

EMIS-Organizer 1.1.0.5 [de-DE] (Debug)			
411 Batch_Date_A	iswahl	?×	
□ 111 □ • ADMIN □ • COM(0) □ • PRN □ • GSN □ • GSN □ • TDL □ • FMC ■ • FMC ■ • FMC ■ • FMC	B Produkt - Heizzel - job B PrintHelloWorld Jube Feed - job B Irrodukt - Heizzel - job B PrintHelloWorld Jube Feed - job B Irrodukt - PCode 12. job B SetAutoDST_AUS. job B Irrodukt + 15%, job B SetAutoDST_EIN. job B Irrodukt Heizzel + Staffepreise. job B SetCOM1.RS485. job B Irrodukt Heizzel + Staffepreise. job B SetCOM1.RS485. job B 2Produkt 10.07 + 15% 89. job B SetCPS_Standard. job B 2Produkt - Heizzel Diesel. job B SetPRN.FDW.RS485. job B 3Produkt - Heizzel Diesel. job B SetPRN.FDW.RS485. job B 3Produkt - Heizzel Diesel. job B SetPRN.FDW.RS485. job B 3Produkt - Heizzel Biesel. job B SetPRN.FDW.RS485. job B 3Produkt - Heizzel Biesel. job B SetPRN.FDW.RS485. job B GetReterData. job B SetPRN.STDRS485. job B GetResults. job B SetPRN.METUR. Job B GetResults. job B SetPRN.METUR. Job Dateiname: V Dateiname: V Dateiname: V Dateiname: V) Minen prechen	COM12 COM12 COM12 COM12 trennen Gerätetyp EMIS2-Dok411
SET	ADMIN,PROTOCOL,Ping=COM-Init		senden

For the new settings to take effect, you now have to switch EMIS2.



OFF and then back ON again.

8.5.5 Step 5: Check printer function

To check the printer function, please insert paper in the printer and load **Batch no. 6 "Hello World"**

G More telegrams appear in the info window and the printout is started.

I	EMIS-Organizer 1.1.0.5 [de-DE] (Debug)					
l	FMC Technol	ogies				
L	411	Protocol (FAS)				
		Detum O 0 02.12.201 0 02.12.201 0 02.12.201 0 02.12.201 0 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201 20 02.12.201	Zeit 3 10.42:28-726 3 10.42:28-736 10.42:28-739 10.42:28-739 3 10.42:28-739 3 10.42:28-739 3 10.42:28-739 3 10.42:28-739 3 10.42:28-739 3 10.43:23-531 3 10.43:23-331 3 10.43:23-334 3 10.43:23-334 3 10.43:23-342 3 10.43:23-342	Aktion COM12 Schnittstelle geöffnet (\$600 Baud) SET.ADMIN.PROTOCOL_Pin_COM-Int <ack>> EEPQRT_ADMIN_EPQTOCOL_PIN_S="COM-Int" <<ack> Batch-Date: D:\FIMC_Programme\EMIS-Tester\Testfiles\Jobs\PrintHelloWorld job set.pm.status.MODE="obc" <nak>> set.pm.text="Hello World!\v'n" <nak>></nak></nak></ack></ack>		COM12
	-	set,prn,status	,MODE="rea	dy"	-	senden

The printer should now print out the text "Hello World".

- Exit the program.
- Gerry You can now connect the On-Board Computer using cable EMIS2-OBC-KA.

8.6 Batch overview

8.6.1 MultiFlow

Printer	Interface	Protocol	Parity	Data Bits	Batch no.
GPS	RS232	-	None	8	1
DR-295-FDW	RS232	FDW	None	8	2
DR-298-FDW	RS232	FDW	None	8	2
FDW Converter	RS485	FDW	None	8	3
DR-295	RS232	STD	Even	8	4
DR-U295	RS232	STD	Even	8	4
DR-298	RS232	STD	Even	8	4
DR-590	RS232	STD	Even	8	4

Printer	Interface	Protocol	Parity	Data Bits	Batch no.
DR-570	RS485	STD	Even	8	5
Test Drucker	-	-	-	-	6
Test GPS	-	-	-	-	7

8.7 Batch contents

8.7.1 Batch 1: GPS

SET,PRN,SETUP,PORT="NONE" SET,GPS,SETUP,PORT="COM(1)" SET,GPS,SETUP,TIMESYNC="1" SET,GPS,SETUP,UTCOFFSET="+01:00" SET,COM(1),SETUP,PROTOCOL="9600:8:N:1" SET,COM(1),SETUP,MODE="RS232" SET,ADMIN,STATUS,RESET="1"

8.7.2 Batch 2: DR-295-FDW / DR-298-FDW

SET,GPS,SETUP,PORT="NONE" SET,PRN,SETUP,PORT="COM(1)" SET,PRN,SETUP,PROTOCOL="FDW" SET,COM(1),SETUP,PROTOCOL="9600:8:N:1" COM(1),SETUP,MODE="RS232" SET,ADMIN,STATUS,RESET="1"

8.7.3 Batch 3: FDW-Converter (RS 485)

SET,GPS,SETUP,PORT="NONE" SET,PRN,SETUP,PORT="COM(1)" SET,PRN,SETUP,PROTOCOL="FDW" SET,COM(1),SETUP,PROTOCOL="9600:8:N:1" COM(1),SETUP,MODE="RS485" SET,ADMIN,STATUS,RESET="1"

8.7.4 Batch 4: DR-295 / DR-U295 / DR-298 / DR-590

SET,GPS,SETUP,PORT="NONE" SET,PRN,SETUP,PORT="COM(1)" SET,PRN,SETUP,PROTOCOL="STD" SET,COM(1),SETUP,PROTOCOL="9600:8:E:1" COM(1),SETUP,MODE="RS232" SET,ADMIN,STATUS,RESET="1"

8.7.5 Batch 5: DR-570

SET,GPS,SETUP,PORT="NONE" SET,PRN,SETUP,PORT="COM(1)" SET,PRN,SETUP,PROTOCOL="STD" SET,COM(1),SETUP,PROTOCOL="9600:8:E:1" COM(1),SETUP,MODE="RS485" SET,ADMIN,STATUS,RESET="1"

8.7.6 Batch 7: Test-GPS

REQUEST,GPS,DATA,Lat REQUEST,GPS,DATA,Lon

9 How to upgrade the EMIS2 software

9.1 How to upgrade the EMIS2 software from version 3.23 with Dok411.

Switch EMIS2 off and then insert a new EPROM into the socket.

1. Setting the DIP switches

Switches 3, 4, 6, 7 and 8 to **ON**, all others **OFF**.

2. EMIS2 ON

LED 1 and LED 4 glow, after about 15 seconds LED 3 blinks.

3. EMIS2 OFF

4. Änderung der DIP switch

Switch 6 and 8 : OFF

5. EMIS2 ON

LED 3 and LED 4 glow, after about 15 seconds LED 3 blinks

6. EMIS2 OFF

- 7. Change the DIP switches
 - Switch 7 : OFF

8. EMIS2 ON

LED 4 glows and LED 2 flashes rapidly, after a few seconds LED 2 flashes slower

9. Setting the date of EMIS2

- SET,ADMIN,CLOCK,Date=DD.MM.YYYY
- Uhrzeit von EMIS2 einstellen -> SET,ADMIN,CLOCK,Time=HH:mm
- Paperfeed ggf. einschalten -> SET,PRN,SETUP,PAPERFEED=1

10.EMIS2 OFF and ON again

Check the time and date

Factory Setting		DIP switch		Description	
OFF ON	DIP	OFF	ON	Description	
	1	21	22	CAN-Bus Node No.	
	2	DOK-411	FTL	Main Operation Mode	
	3	0	1	ADMIN, CLOCK, AutoDST	
	4	NONE	COM(1)	PRN, SETUP, Port	
	4	COM(1)	NONE	GPS, SETUP, Port	
d on	5	RS232	RS485	COM(1), SETUP, Mode	
	e	STD	FDW	PRN, SETUP, Protocol	
	0	9600:8:E:1	9600:8:E:1	COM(1), SETUP, Protocol	
	7	Start	RESET	Reset to default values	
	8	Nothing	TEST	Interface test	

The DIP switches have the following functions: (from Version 3.23.0.1)

Table 5: DIP switch for DOK-411 from V3.23.

9.2 Instructions for commissioning the EMIS2 software with FTL.

- 1. Control the configuration for EMIS2 in Multilevel and NoMix.
 - MultiLevel :

Menu – Parameter list – Device settings – Globaler CAN bus – EMIS Node ---> 21

NoMix :

Menu – Setup – Network :

- EMIS2 Interface communication possible ---> Yes
- EMIS2 Node Number ---> 21
- Save events ---> Ja
- Send events to ---> 21
- CAN bus connection required ---> Nein
- 2. Switch EMIS2 off and then insert a new EPROM into the socket.
- 3. Setting the DIP switches
 - Switches 2, 3 and 7 to ON, all others OFF.
- 4. EMIS2 ON
 - LED 3 and LED 4 glow, after about 15 seconds LED 3 blinks
- 5. EMIS2 OFF
- 6. Change the DIP switches
 - Switch 7 : OFF
- 7. EMIS2 ON

- LED 2 and LED 4 glow, after about few seconds LED 2 blinks
- Change device type to FTL
- Setting the time of EMIS2 : SET,FTL,SYSTEM,DateTime= YYYYMMDDHHmmSS
- 8. Set parameters for the last log entry of MultiLevel and NoMix
 - Determine the last log entry of NoMix
 - Select Menu event and note the numerical value behind LOG
 - Enter the password : SET,FAS,FMC,SETUP,KEY=FMCMEASUREMENT
 - Enter parameters : SET,FAS,QAS,STATUS,LASTEVENT= YYYYYY (YYYYY) = Value for the last event entry of NoMix)
 - Determine the last log entry of MultiLevel.
 - Menu Service (4) Logbooks(7) Events(1)
 - Select and enter the ID and password.
 - Confirm date and time settings by pressing Enter.

- Now press F1 (BACKWARD) and write down the value of number.

Enter parameters :

SET, FAS, LEVEL, STATUS, LASTEVENT=

ZZZZZZ (ZZZZZZ =Value for the last log entry of MultiLevel)

- 9. EMIS2 turn OFF and ON again.
 - Check the time and date on NoMix and MultiLevel.
 - Value log timestamp set to the current time : SET,FTL,LOG,TIMESTAMP= YYYYMMDDHHMMSS
 - Control NoMix event log to see if the events are stored. If necessary, change the settings to save the events.

10 Abstract from ElexV (§12)

Inspections

- (1) The operator must arrange for the electrical devices to be inspected for the proper condition of their assembly, installation and operation by a qualified electrician or directed and supervised by a qualified electrician.
 - 1. before first use
 - 2. in specific time intervals.

The periods must be calculated so that resulting deficiencies, which must be assumed, are determined in a timely manner. The inspections according to sentence 1 no. 2 must be carried out every three years. They may be omitted if the electrical devices are constantly monitored by a responsible engineer.

- (2) During the inspection, related standard engineering practices must be followed.
- (3) If requested by the relevant authority, a test book with specific entries must be kept.
- (4) In case of damage or in special cases, the regulating authority may arrange a special inspection by an expert. The operator must arrange that an assigned inspection, executed according to sentence 1, is carried out.

Abstract from Bundesarbeitsblatt 3/1997 page 101 (German Labor Bureau Sheet 3/1997)

11 Technical Data

Installation in zone 2

Power supply	$U_N = 24 V (12 - 30V) / I_{max} = 500mA$ (Outputs NOT active)
Network communication (bus)	Ext. CAN-Bus 100 kBaud
On-board computer connection	Serial Interface RS232 9600 Baud, Word Length 8 bit, 1 Stop Bit, np Parity XON/XOFF Protocol
Printer connection	Serial Interface RS485 9600 Baud, Word Length 8 bit, 1 Stop Bit, np Parity XON/XOFF Protocol
Lifetime Backup Battery	typ. 6 months
Lifetime Memory	min. 20 years
Working temperature	-20 bis 50 °C
L la vala a	
Housing	IP65, Aluminum Die-Cast
Resistance to Jamming	IP65, Aluminum Die-Cast The following regulations are being fulfilled DIN EN 50081-1 Emitted Interference Private Areas DIN EN 50082-2 Emitted Interference Industrial Areas
Resistance to Jamming Ex-approval for zone 2	IP65, Aluminum Die-Cast The following regulations are being fulfilled DIN EN 50081-1 Emitted Interference Private Areas DIN EN 50082-2 Emitted Interference Industrial Areas II 2G EEx e ia m IIB T4

C E Conformity with EC Regulation 89/336/EWG

12 Address and contact details

Our service department will be happy to assist and can be contacted as follows:



Measurement Solutions

F. A. Sening GmbH

Regentstrasse 1 D-25474 Ellerbek

Tel.:	+49 (0)4101 304 - 0	(Switchboard)
Fax:	+49 (0)4101 304 - 152	(Service)
Fax:	+49 (0)4101 304 - 133	(Sales)
Fax:	+49 (0)4101 304 - 255	(Order processing)
E-Mail:	info.ellerbek@fmcti.com	
Web:	www.fmctechnologies.co	<u>m/seningttp</u>

Appendix A. Connection of the cables at terminal blocks with tension spring connection

- The EMIS terminal blocks are equipped with tension spring connections. The cables are not screwed, but inserted from above.
- A screwdriver with a blade width of 2.5 mm is required for opening the tension spring.

The following steps are required for the safe connection of the wires (see figure opposite):

- Strip the insulation off the wire.
- The use of wire sleeves is recommended.
- Use the screwdriver to push open the terminal clamp.
 - Insert the wire into the opened terminal.
 - Remove the screwdriver.
 - Check proper fit by pulling the wire.



Fig. 6: Tension spring connection

Appendix B. Connection of the data cables at EMC cable glands

Step 1:

- Remove the insulation from 70 mm of cable
- Expose the braid screen, and shorten to 15 mm





Step 2:

- Pass the cable through the union nut
- Insert the cable into the clamping insert
- Push the cable screen over the clamping insert
- The braid screen must cover approx. 2 mm of the O-ring



Step 3

- Push the clamping insert into the intermediate muff
- Mount the fitting and tighten it
- Done!



Appendix C. Drawings and Approvals

Description	Drawing No.
EMIS2 interface, dimension outlines - EMIS2	51.351615
Basic wiring diagram EMIS2 and FlowComputer	P8000008569
EMIS2 Connection Diagram (Variant 4)	51.352216
EMIS2 and Flow Computer, Basic Wiring Diagram (Variant 4)	61.352217
GPS Receiver for EMIS2 Interface	51.352335
Wiring diagram for EMIS2 Interface & GPS2	61.352341
Interface cabel EMIS-OBC-KA	51.352241

Documentation and drawings as PDF files on the Internet:

www.fmctechnologies.com/seningttp

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P8000008569 - Basic wiring diagram EMIS2







E61.352217 - Basic Wiring Diagram EMIS and FlowComputer (Variant 4)







52 MN F19 010 EN || DOK-447E || Issue/Rev. 2.02 (02/14)



	FMC Tec	hnologie	S	F.A. Sening GmbH Ellerbek, Germany			
1	EG - Konformitätserklärung EC - Declaration of Conformity						
2	im Sinne der EG-Richtlinie über explosionsgeschützte Geräte nach 94/9/EG (ATEX) as defined by electrical explosion protected Equipment Directive 94/9/EC						
3		Der Herstel	ler / The Manufacturer				
4	F. A. S	ening GmbH, Reg	entstraße 1, D-2	5474 Ellerbek			
5	erklärt hiermit, dass / herewith we declare						
	(A) die explosionsgeschützte(n) Gerät(e) des Systems that the explosion protected Equipment of the system						
6	EMIS2						
/	Produktbezeichnung Product:	g: Zünd	schutzart: of protection:	EG-Baumusterprüf- bescheinigung*			
	EMIS2	🕞 II 2 G E	Ex m ia e IIB T4	TÜV 03 ATEX 1990			
	einschließlich aller Ergänzungen / including all supplements						
8	In der gelieferten Ausführung den folgenden Sicherheitsanforderungen entspricht (entsprechen): Corresponds to following safety requirements in the delivered design:						
9	Grundlegende Normen / CENELEC:						
10	Angewandte harmonisierte Normen, insbesondere:						
11	Andere angewandte Bestimmungen / EG-Richtlinien:EN 50014; EN 50019; EN50020; Other applied regulations / EC-Directives: EN50028						
12	Benannte Stelle / Produktionsüberwachung:Physikalisch-Technische Bundesanstalt Notified Body / Production control PTB 99 ATEX Q001; CE 0102						
13	Prüfungen/Überwachung/Kontrollen während der Fertigung: . Hersteller Examination / inspection / tests during manufacturing: Manufacturer						
14	Die zugehörige Betriebsanleitung enthält wichtige sicherheitstechnische Hinweise und Vorschriften für die Aufstellung, Inbetriebnahme Wartung und Instandhaltung der (s) Gerät(es). The appropriate operator's manual contains important safety technical notes and regulations for the installation, placing into operation, maintenance and maintenance of the equipment.						
	(B) die aufgeführte that the liste	en Geräte in der ge d devices in the delivered	lieferten Ausführu design are in accordand	ang den Anforderungen der be with the requirements of the			
	EG-Richt	linie 2004/108/EG electromagnetic co	über elektromagr ompatibility directive 20	netische Verträglichkeit 04/108/EC			
15	Zur Beurteilung des Erzeugnisses hinsichtlich der elektromagnetischen Verträglichkeit wurden die folgenden Vorschriften angewendet: For verification of conformity with the protection requirements the following standards were applied:						
	Grundlegende Norm:		EN6100	0-6-3			
16	Ort und Datum: Ellerbek, 12.0 Location and date	09.2012	Geschäftsführer _ General Manager	(F. Jönsson)			
	No. of document: KEel 170			page 1 of 1			

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