



## Safety instructions

- ! Please read these instructions carefully before assembling, installing or commissioning the EM260 to avoid any damage, dangers or problems.  
Assembly and installation should be carried out by qualified personnel !
  
- ! The 'AC' version of the EM260 has a power supply of 90...260 V. Do not touch any live parts as this is extremely dangerous !  
Shut off the power supply before carrying out any installation work and before opening the housing !  
Switch the power back on only after all of the work has been completed and the housing has been firmly closed!

## Other notes:

- ☞ **When using a GSM modem, switch off the power on the EM260 before inserting or removing the SIM card!!!**
- ☞ **The PE connections in both the EM260 and the EK230 should be as short as possible and have as wide a cross-section as possible.**
- ☞ When assembling the front cover, ensure that the flat-strip cable for connecting the LEDs integrated into the front transparent film is plugged into the 4x1 pin strip ST8!
- ☞ In the GSM modem, the SIM eject button is next to the SIM insert carriage on the right!

## 1 Features

- Modem for use with ELSTER LIS-100 and LIS-200 end devices
- Internal TTL interface for one of the following communication modules:
  - Standard analogue modem
  - GSM module
  - GPRS-TSC module
  - ISDN adapter
  - Ethernet LAN adapter.
  - ELSTER-CL0 interface card
- RS232 / V.24 interface to end device (RxD, TxD, Gnd, DCD, DTR, RI), galvanically separated
- Power supply for EK2x0 and EK-88
- 5 VDC outputs for interface component of LIS100 devices, only switched on during modem connection (online status)
- EMC in accordance with standards EN55011 Class B, EN55024, EN61326 and EN12405 (standard for volume correctors)
- Operating status display: Power on (green LED), Ring and Online (yellow LED)
- Apart from mains cable, all cables are already assembled exworks (Plug & Play):
  - Data cable
  - Power supply for end device
  - Communication cable (TAE, ISDN, Ethernet, GSM antenna).

## 2 Wiring EM260 ↔ EK230

EK230 terminal	Direction of data	EM260 terminal
TxD	→	TxD
RxD	←	RxD
RI/DSR		n.c.
- (GND)	↔	GND
Vext +	←	+9V
Vext -	↔	GND

For the wiring, a shielded 8-wire cable (Elster-Instromet ID no. 04250469) is recommended. In the EM260 the cable is assembled by Elster-Instromet exworks. When connecting the EM260 to the EK230, please ensure the cable is properly inserted into the EMV cable fitting on the EK230.

## 3 Wiring of EM260's communication interface

If an analogue modem, an ISDN adapter or an Ethernet adapter is mounted inside the EM260, the corresponding cable is also mounted by Elster-Instromet exworks. The cable is connected to the terminals a(Rx-), b(Rx+), a2(Tx-) and b2(Tx+). In the case of a GSM modem, a suitable GSM antenna is connected directly to the GSM module.

When using a CL0 interface, a shielded cable with two leads (e.g. ID no. 04250467, 2 x 1,0 mm<sup>2</sup>) must be connected on site by the customer in the following way:

EM260 terminal	Terminal in the CL1 modem
a (Rx-)	CL- / Rx-
b (Rx+)	CL+ / Rx+

## 4 Parameters of the internal serial interface in the EK230

If the EK230 is delivered together with the EM260 the EK230's internal serial interface as well as the communication module integrated in the EM260 are properly set by Elster-Instromet exworks. If the EM260 is delivered separately for additional installation beside an EK230, the internal serial interface of the EK230 must be set in accordance with the software version of the EK230 and with the type of communication module integrated in the EM260.



**The serial interface of the EK230 must be parameterised before the EM260 is connected to the EK230 and switched on.**

For this purpose the parameter software "WinPADS200-EK" can be used: Menu "Data transfer", item "Send parameter file...". Then you can select the parameter file (\*.WPP) which fits to your application (communication module, version of EK230).

### Example:

EM260/GSM with EK230 V1.71

→ "EK230\_1v7.. - EM260 & int. GSM-Modem Wavecom\_b.WPP "

If there is no laptop with WinPADS available on site, you can set the most important values via the keypad of the EK230 (menu "Ser.IO"). The following values cannot be set via the keypad: SMS and GSM specific values, ISDN MSN, IP address, modem parameters.

The following table contains the most important parameters which can be set via menu "Ser.IO":

Communication module	EK230 SW vers.	Md.S2 (2:705)	DF.S2 (2:707)	Bd.S2 (2:708)	----- (2:709) <sup>1)</sup>	Num.T (2:720)
<b>Analogue</b> <sup>4)</sup>	all	<b>3</b>	<b>0</b>	<b>19200</b>	<b>19200</b>	1, 2...9
GSM	all	3	0	19200	19200	1, 2...9
GPRS-TSC	from 1.2..	3	2	19200	19200	1...3
ISDN	up to 1.1...	5	0	19200	19200	- <sup>3)</sup>
	from 1.2...	3	0	19200	19200	1
Ethernet	up to 1.1...	5	2	19200	19200	- <sup>3)</sup>
	from 1.2...	3	2	19200	19200	1
CL	all	5	0 od. 2 <sup>2)</sup>	300... 19200 <sup>2)</sup>	300... 19200 <sup>2)</sup>	- <sup>3)</sup>

<sup>1)</sup> Not available in menu Ser.IO! Can only be modified with parameter software "WinPADS200-EK"!

<sup>2)</sup> According to the settings in the CL1 modem and the other devices installed in the current loop (CL).

<sup>3)</sup> This setting (number of rings) is not used in mode 5. In mode 5 the communication module in the EM260 does always pick up an incoming call after the first RING message.

<sup>4)</sup> **Numbers in bold:** Ex-works settings performed by Elster-Instromet if the EK230 was delivered without any modem.

## 5 Setting the parameters for the communication module

The parameters for the communication module (modem) in the EM260 are set exworks for use with an EK230.

If the parameters have to be modified on site, this can be carried out with the help of the parameter software "WinPADS200-EK": Menu „File transfer...“, item "Send parameter file...". Then you can select the parameter file (\*.WPP) which fits to your application (communication module, version of EK230).

**Example:** EM260/Analogue modem with EK230 V1.22

→ "EK230\_1v7.. - EM260 & int. Analog-Modem Insys\_b.WPP"

Before disconnecting, the button "Init modem" should be pressed ("Interface – Modem initialisation"). → after it is disconnected, the EK230 sends the parameters to the communication module. The parameters are also sent after switching on the power supply and after "M.INI=1" in EK230's menu "Ser.IO".

The parameterisation of the communication module does not work with all EK230 versions and also not with all types of communication modules. The following table shows the dependences ("x" means: Communication module can be parameterised by the EK230):

Software version of EK230	Communication module in EM260					Remarks
	Analogue	GSM	ISDN	Ethernet	CL0	
up to V1.1..	<sup>1)</sup>	1)	<sup>1)</sup>	<sup>1)</sup>	2)	
from V1.2..	x		x <sup>3)</sup>	x		

<sup>1)</sup> Parameterisation can be carried out only by Elster-Instromet exworks or by Elster-Instromet customer service on site with the help of the software tool "ModemIni" (ID no. 73017249) and modem programming adapter (ID no. 73018295).

<sup>2)</sup> CL0 interface need not be parameterised

<sup>3)</sup> The modem parameters, of course, can be set by "WinPADS200-EK" („Interface – String for connected modem"), but after carrying out the parameterisation (Button „Init modem", „M.INI=1" or switching on power supply) they must be deleted again!!! Otherwise the communication module will not pick up any further incoming call!!!

## 6 Replacement of communication modules

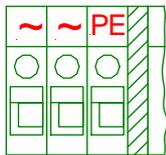
A faulty communication module can be substituted by another communication module of the same type by the customer on site. It depends on the software version of the EK230 and on the type of the communication module if the new module can be parameterised on site or if it must be parameterised by Elster-Instromet exworks (refer to the table in chapter 5).

The replacement of a communication module by another communication module of a different type (e.g. analogue modem replaced by ISDN adapter) can only be carried out by Elster-Instromet exworks or by Elster-Instromet's customer service.

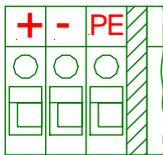
## 7 Power supply

The voltage required for power supply is marked on the nameplate (90...260 VAC / 18...30 VDC). The three left screwing terminals are connected as follows:

90...260 VAC version:



18...30 VDC version:



## 8 Operating status display

Green LED: Power on

Yellow LED: Ring / Online / GSM status: depending on which communication module (Modem) is integrated, yellow Online-LED has the following meanings:

Analogue Modem / ISDN / Ethernet	
LED status	Meaning
off	no connection
flashing briefly	ringing signal
on	online / data transfer

NB: when a CL interface is in use, the Online-LED is always off!!!

EM260/GSM and EM260/GPRS-TSC				
LED	no GSM net	Registered in GSM net, no connection („offline“)	Incoming call	Data connection active („online“)
Netz/Online <sup>1)</sup>	off	flashing slowly, inv <sup>5)</sup>	flashing quickly, inv. <sup>6)</sup>	on
Flash <sup>2)</sup>	on	flashing slowly <sup>3)</sup>	flashing quickly <sup>4)</sup>	blinkt schnell <sup>4)</sup>
TxD <sup>2)</sup>	off	off	off	flickering (send data)
RxD <sup>2)</sup>	off	off	off	flickering (receive data)
DCD <sup>2)</sup>	off	off	off	on
RI <sup>2)</sup>	off	off	flashing	off

<sup>1)</sup> on the lid of the EM260

<sup>2)</sup> on modem adapter board V1.2

<sup>3)</sup> flashing slowly: 0,45 Hz, 2 sec off, 0.2 sec on

<sup>4)</sup> flashing quickly: 1,25 Hz, 0.6 sec of, 0.2 sec on

<sup>5)</sup> flashing slowly, inverted: 0,45 Hz, 2 sec on, 0.2 sec off

<sup>6)</sup> flashing quickly, inverted: 1,25 Hz, 0.6 sec on, 0.2 sec off

## 9 Jumper

	J1	J2	J3	
up	□	□	□	Analogue Modem / ISDN / Ethernet / <a href="#">CL</a>
down	□	□	□	GSM Modem
up	□	□	□	Setting parameters for analogue modem / ISDN / Ethernet
down	□	□	□	Setting parameters for GSM Modem
	any	down		Reserved

## 10 Modem Reset

### 10.1 Modem-Watchdog

In EM260/GSM with **Wavecom-Adapterboard** starting from **V1.2**, a **Watchdog** function is implemented ex-works. The watchdog controls the modem function and resets the modem in the case of a failure.

The watchdog is active if the jumper "JP7" ("Watchdog") is in the position "enabled".



Jumper „JP7“ (Watchdog)

### 10.2 Cyclical modem reset via output 4 of the EK230

After activating the modem reset function the modem is restarted once a day via output 4 of the volume corrector. Time and duration of the modem reset are defined by the time window 2 of the EK260. If time window 2 is used to control the modem reset, it can no longer be used as a call acceptance window. In this case, call acceptance is exclusively defined by time window 1.

- ☞ In EM260 with **Wavecom adapter board** starting from **V1.2**, a **watchdog function** (refer to chapter 10.1) is implemented ex-works. The watchdog controls the modem function and resets it in the case of a failure. The presence of the watchdog makes the cyclical modem reset via output 4 of the EK230 unnecessary. Output 4 of the EK230 can still be used for call acceptance.
- ☞ The modem reset function should be activated only if necessary (if manually operated modem resets have repeatedly been necessary to ensure the accessibility of the modem)!  
Ex-works the modem reset function is not activated!

To activate the modem reset function, it is necessary to send a special parameter file to the EK230 and to modify the wiring between the EM260 and the EK230 (see below).

Before activating the modem reset function, the following conditions must be fulfilled:

- The version number of the Wavecom-Integra-Adapter board (ID no. 73018344) inside the EM260 must be 1.1 or higher.
- On a Wavecom-Integra-Adapterboard V1.1 the soldering pad LF7 must be short-circuited, e.g. by a 0 Ohm resistor.
- If, in the case of an EK230 V1.2x, the modem reset function should be used together with an active PIN, the time windows in the EK230 must be set in the following way:
  - a) Time window 1 (call acceptance) must be open at 00:00 o'clock
  - b) Time window 2 (modem reset) must be open shortly before 00:00 o'clock

**Reason:** The EK230 V1.2x sends the PIN query command (AT+CPIN?) only at 00:00 o'clock and only if time window 1 is already open at 00:00 o'clock !!!

**Example of setting for the time windows:**

Time window 1 (call acceptance): 23:58 to 23:55 o'clock

Time window 2 (modem reset): 23:56 to 23:57 o'clock

**Parameter file for cyclical modem reset**

If a cyclical modem reset is to be carried out and if all conditions for its use are fulfilled (see above), a special parameter file has to be loaded into the EK230. The name of the parameter file to be used depends on the software version of the EK230:

“EK230\_yvy.. - Funktion=Modem-Reset täglich EM260\_x.WPP“

(where yvy = software version of the EK230, e.g. 1v7 and x = latest file index)



For a cyclical modem reset, output 4 of the EK230 must be connected to the modem reset input! (→ Wiring instructions see below)

**Wiring instruction for cyclical modem reset**

If a cyclical modem reset is to be carried out and if all conditions for its use are fulfilled (see above), the wiring between the EM260 and the EK230 must be modified as follows:

EK230 clamp	Signal direction	EM260 clamp
Uext +	←	+9V
Uext -	not connected	GND
Short circuit wire		<b>Wavecom-Adapter-Board V1.1 or higher</b>
		+9V
DA4+	→	Switch
DA4 -	not connected	



If output 4 of the EK230 is connected to the modem reset input, it is absolutely necessary to load the corresponding parameter file into the EK230 !!! (→ see above)

**11 Operating an EM260 with GPRS-TSC modem inside**

To operate an EM260 with an integrated GPRS-TSC modem, please refer to "Operating Instructions EM260 / GPRS-TSC (Document „WAVECOM-GPRS-TSC-Install-EM260\_en\_x.doc“, x=latest file index).

## 12 Technical Data

- Internal communication module (only one of the following possibilities is integrated into the EM260):
  - Standard analogue modem: V.32bis (14.4 kbps)
  - GSM module: Dual-Band 900/1800 MHz
  - GPRS-TSC module: Dual-Band 900/1800 MHz
  - ISDN adapter: V.110, V.120, X.75, PPP, HDLC
  - Ethernet-LAN adapter: 10base-T, 10Mbit/s.
  - ELSTER-CL0 interface card
- RS232 / V.24 interface to the end device (RxD, TxD, Gnd, DCD, DTR, RI), galvanically separated, screw terminals for leads with cross section 0.5...1.5 mm<sup>2</sup>
- Power supply for EK2x0 and EK-88: output 8.5 VDC +/-5% / 50 mA, galvanically separated, screw terminals for leads with cross section 0.5...1.5 mm<sup>2</sup>
- 5 VDC outputs for interface component of LIS100 devices, only switched on during modem connection (online status), screw terminal for lead with cross section 0.5...1.5 mm<sup>2</sup>
- Power supply:
  - 90...260 VAC, L, N, PE
  - 18...30 VDC, +, -, PE
  - screw terminal for lead with cross section 0.5...1.5 mm<sup>2</sup>
- Synthetic housing (standard ABS) with metallised surface inside, IP65 in accordance with EN60529, EMV cable fitting for shielded cable, otherwise synthetic cable fittings
- Ambient temperature:
  - with analogue modem 'INSYS i-module-Modem': 0 ... + 50 °C
  - with ISDN adapter 'TA+HUX': 0 ... + 50 °C
  - with GSM modem 'Wavecom-Integra': -10 ...+ 60 °C
  - with GPRS-TSC modem 'Wavecom-Integra': -10 ...+ 60 °C
  - with RS-232 plate: -10 ...+ 60 °C
  - with CL interface (CL0, passive): -10 ...+ 60 °C
  - with Ethernet card: 0 ...+ 50 °C
- Ambient humidity: max. 93%, non condensating
- **Declaration of EU conformity** in accordance with the current version of the EMC-Directive 89/336/EEC:  
The product 'EM260' conforms to the current versions of the following standards:

Emission	EN 55011 Class B (for domestic and commercial applications)
Immunity	EN 61326 (Electrical equipment for measurement, control and laboratory use)
	EN 12405 (Volume correctors)
	EN 55024 (IT equipment, data transmission devices)