



# Operating Instructions

## GSM-2 Ei

The GSM-2 Ei GPRS modem enables pressure measurements in areas exposed to gas explosion hazards when used in conjunction with an intrinsically safe pressure transmitter.

### System description

The system description document pursuant to EN 60079-25 comprises:

- Block diagram 81902.11 „GSM-2 Ei system description”
- Standard GSM-2 operating instructions ([www.keller-druck.com](http://www.keller-druck.com))
- Product information on INTRINSPAK safety barriers
- Pressure transmitter manual
- These GSM-2 Ei operating instructions

### Components

The GSM-2 Ei has a stable metal housing (GSM-2 Ei Box) and comprises a battery-powered GSM-2 with additional integrated safety barriers. It can be connected to one of the following KELLER pressure transmitters with a voltage output and an RS 485 interface:

- Series 33 X Ei, 35 X Ei, 36 XW Ei, PD-33 X Ei or PD-39 X Ei pressure transmitter with a three-wire voltage output compliant with EC type examination certificate KEMA 04 ATEX 1081 X for use in zones 0, 1 or 2, or
- Series 41 X Ei or 46 X Ei pressure transmitter with a 3-wire voltage output compliant with EC type examination certificate PTB 06 ATEX 2011 for use as a partition wall device between zones 0 and 1, or for zone 1 or 2



In contrast to a standard GSM-2, only one transmitter can be connected.

The GSM-2 Ei has 2 integrated INTRINSPAK safety barriers manufactured by R. Stahl:

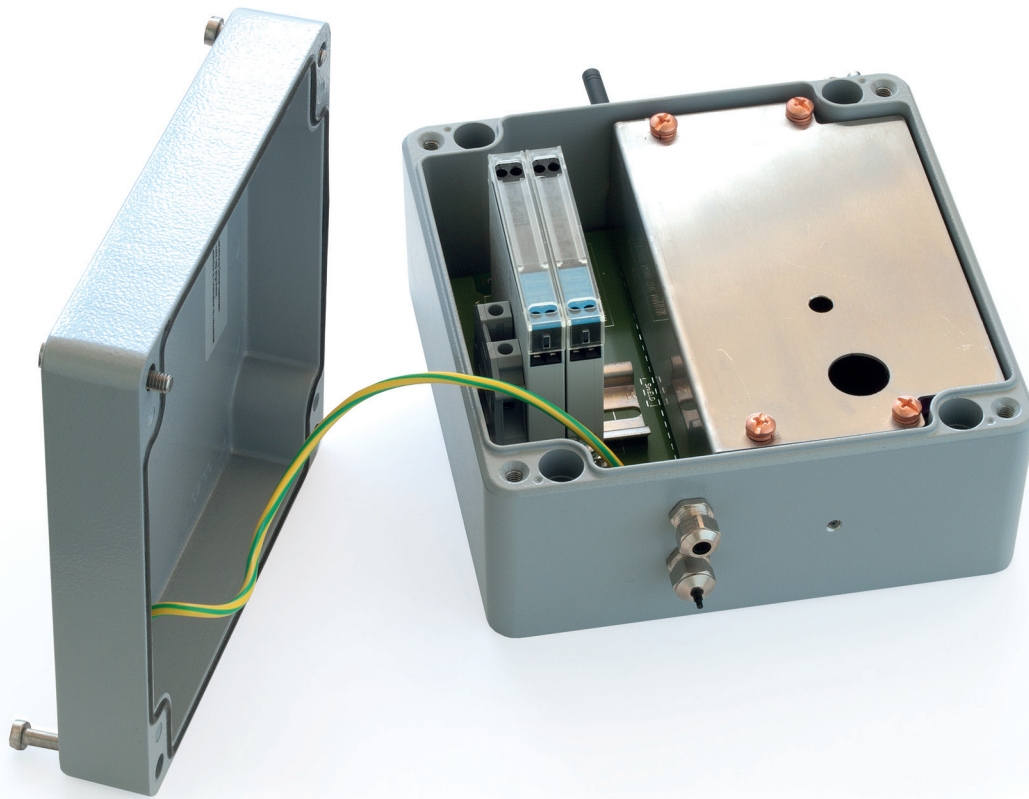
- 9001/01-168-075-101 for supplying the transmitter and
- 9001/01-120-024-001 for the RS-485 interface

### Installation location

Pressure transmitters can be installed in the explosive atmosphere in accordance with their marking. The GSM-2 Ei Box must be installed outside of the explosive area.

### Block diagram

See diagram 81902.11 „GSM-2 Ei system description”.



## Assembly

### GSM-2 Ei Box and transmitter connection

When mounting, please pay attention to the operating manual of the pressure transmitter to be connected.

Screw the GSM-2 Ei Box to a flat surface using the holes provided so that an unobstructed reception of GSM signals is possible. Insert the SIM card and replace the cover over the battery and internal GSM module. Then connect the pressure transmitter to the safety barriers as shown in the block diagram. The analogue transmitter output +OUT is not used and must be connected to the unoccupied parking terminal adjacent to the two safety barriers.

## Earthing

If the pressure transmitter is earthed through the transmitter housing, do not connect the cable shielding on the box side to earth; otherwise the cable shielding must be connected to earth inside the GSM-2 Ei Box.

The GSM-2 Ei Box must be earthed. This is achieved either via the metal housing (housing screws) or via a

separate equipotential lead of at least 4 mm<sup>2</sup>. The lead must be connected from the earth connection on one of the two safety barriers to earth. To do so, remove the blind plug from the cable screw connection, feed the cable through the opening and screw tight.

## Power supply

An integrated Tadiran TL-6937 battery with an operating voltage of 3.9 V supplies power to the GSM-2 Ei. An internal step-up switch boosts the battery voltage to 12 V. This is then supplied to the pressure transmitter. The battery's lifetime depends on the measurement rate and the scope of data transfer. The battery will last up to 10 years at a measurement rate of 1 measurement per hour and 1 data transmission per day. We recommend replacing the battery every 5 years.

The intrinsically safe pressure transmitters have a voltage output of 0-10 V and are suitable for supply feeds as of 8 V



as the voltage output +OUT is not used. This output in the GSM-2 Ei Box is connected to a parking terminal. Pressure values are transmitted to the GSM-2 module exclusively via the RS485 interface.

## Wiring

The transmitter cable is an intrinsically safe circuit and must be wired separately from other circuits that are not intrinsically safe.

## Cables

The cable length of the transmitter cable used

$L = 0,64 \text{ uH/m}$

$C \text{ (wire-wire)} = 125 \text{ pF/m}$

$C \text{ (wire-shielding)} = 215 \text{ pF/m}$

is limited to 98 m for gas group IIC. This is derived from the maximum inductivity ( $L_0 = 63 \text{ mH}$ ) limited by the safety barriers 9002/11-120-024-001 as per data sheet for R. Stahl Dual-channel Safety Barriers Series 9002.

## Overvoltage and lightning protection

The GSM-2 Ei does not have integrated lightning protection. The user must protect the GSM-2 Ei and pressure

transmitter cable in accordance with national overvoltage directives (e.g. lightning strike). If the pressure transmitter is installed in zone 0, an overvoltage protection must be installed at a maximum distance of 1 m from the starting point of zone 0.

## Replacing the battery

Remove the cover from the metal box, loosen the 4 screws and remove the cover plate. The Tadiran TL-6937 battery is connected to the GSM module's PCB via a wire and a Molex plug. Pull the plug out of the PCB and plug in the new battery. Pay attention to correct plug polarity! Replace the cover plate over the battery and GSM module. Replace the cover on the metal box. Pay attention to the correct orientation of the cover. The seal in the housing cover must match up with its counterpart.

14.02.2012

M. Schlimper – Quality Manager

### KELLER AG

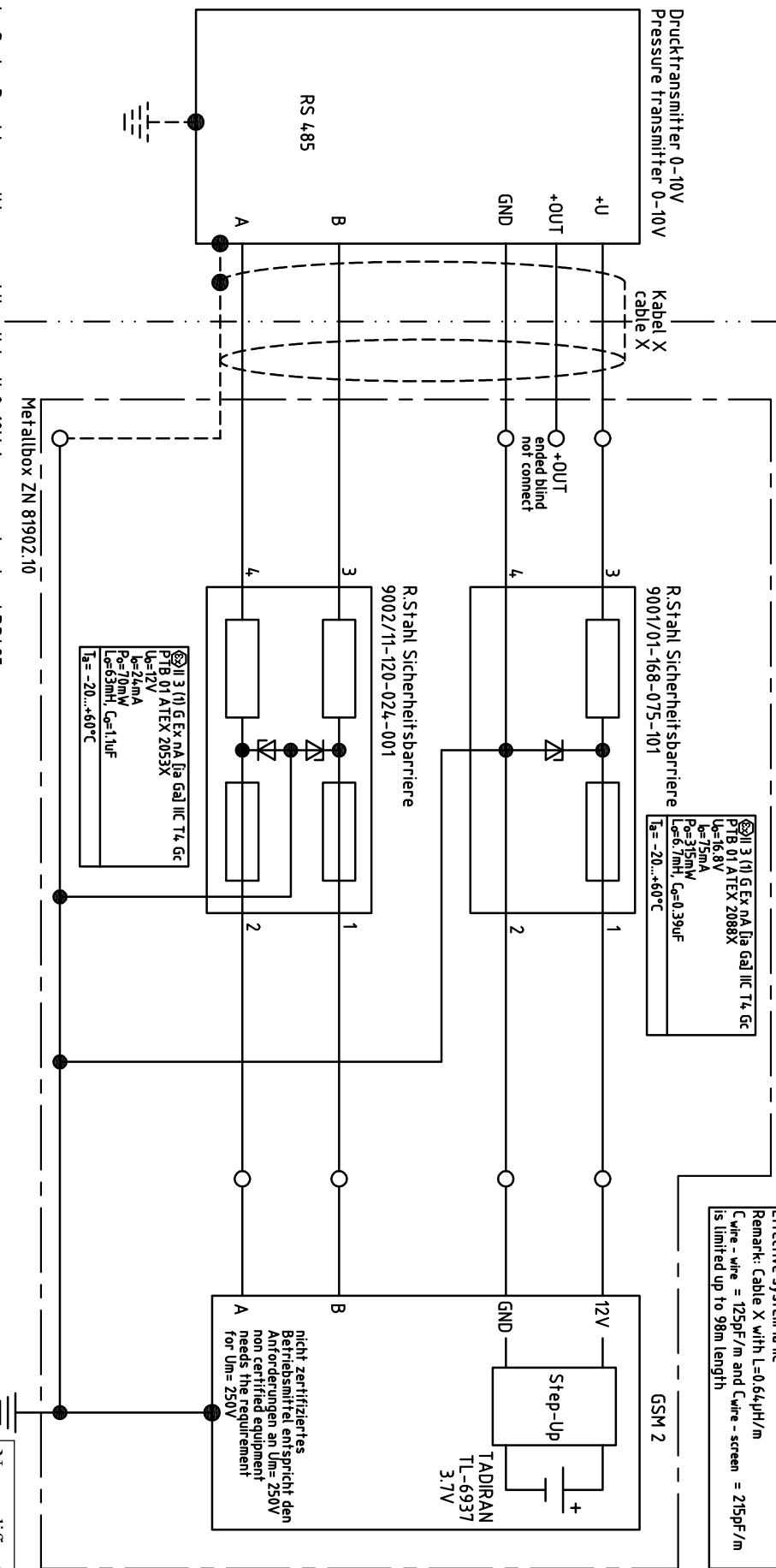
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Tel. 07745 9214 0 · Fax 07745 9214 50

explosionsgefährdeter Bereich  
hazardous area

nicht explosionsgefährdeter Bereich  
non hazardous area



Wirksames System ia IIC  
Anmerkung: Kabel X mit  $L=0.64\mu H/m$   
 $C_{ader} - Ader = 125pf/m$  und  $C_{ader} - Schirm = 215pf/m$   
ist limitiert auf max. 98m Länge  
Effective system ia IIC  
Remark: Cable X with  $L=0.64\mu H/m$   
 $C_{wire} - wire = 125pf/m$  and  $C_{wire} - screen = 215pf/m$   
is limited up to 98m length

R.Stahl Sicherheitsbarriere  
9001/01-168-075-101

3 (1) G Ex na Iia GaI IIC T4 Gc  
PTB 01 ATEX 2088X  
 $U_b=16.8V$   
 $I_b=75mA$   
 $P_o=35mW$   
 $L_b=6.7mH$ ,  $C_b=0.39uF$   
 $T_b = -20...+60^{\circ}C$

R.Stahl Sicherheitsbarriere  
9002/11-120-024-001

3 (1) G Ex na Iia GaI IIC T4 Gc  
PTB 01 ATEX 2053X  
 $U_b=12V$   
 $I_b=24mA$   
 $P_o=70mW$   
 $L_b=63mH$ ,  $C_b=1.1uF$   
 $T_b = -20...+60^{\circ}C$

GSM 2  
Step-Up  
TADIRAN  
TL-6937  
3.7V  
nicht zertifiziertes  
Betriebsmittel entspricht den  
Anforderungen an  $U_{im}=250V$   
non certified equipment  
needs the requirement  
for  $U_{im}=250V$

mögliche Serien Drucktransmitter, ausschliesslich mit 0-10V Ausgangssignal und RS485  
possible series pressure transmitter, exclusive with 0-10V output signal and RS485

33X Ei	KEMA 04, ATEX 1081 X
35X Ei	II 1 G Ex ia IIC T4...T6
36X WEi	T4: -40...+100°C
PD-33X Ei	T5: -40...+85°C
PD-39X Ei	T6: -40...+70°C
	$U_i=30V$ , $I_i=200mA$ , $P_i=0.64W$ , $L_i=0mH$ , $C_i=1nF$ (Supply), $C_i=1nF$ (RS 485 interface and voltage output)
4,1X Ei	PTB 06 ATEX 2011
4,6X Ei	II 1/2 G Ex ia IIC T4
	T4: -20...+80°C
	Versorgungstromkreis/Supply circuit $U_b=30V$ , $I_b=100mA$ , $P_b=0.64W$ , $L_b=0mH$ , $C_b=1.1uF$
	Signal- und Schnittstellenstromkreis/Signal and interface circuits together $U_b=14.7V$ , $I_b=464mA$ , $P_b=1.7W$ , $L_b=1.1uF$
	vernachlässigbar klein/negligibly small

Technische Änderungen vorbehalten.

Ersetzt durch :	Untolerierte Masse :	Kanten gebrochen
Ersatz für :	$\pm 0.1$	Kanten scharf
		nur gültig für Auftrag :

Änd-Index :	Datum :	Vis. :	Änderung :
Gegenstand : GSM2-Ei-Systembeschreibung			
Serie : GSM2-Ei 81902.10			
druckresistentechnik KELLER			
Tel. : 092 / 236 25 25 Fax : 092 / 236 25 00 http : //www.keller-druck.ch			
Stückliste 81902.11			

No modification without  
inquire of person Ex  
Date 09.02.2012 Signature MSc  
FORM 031