



# 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:

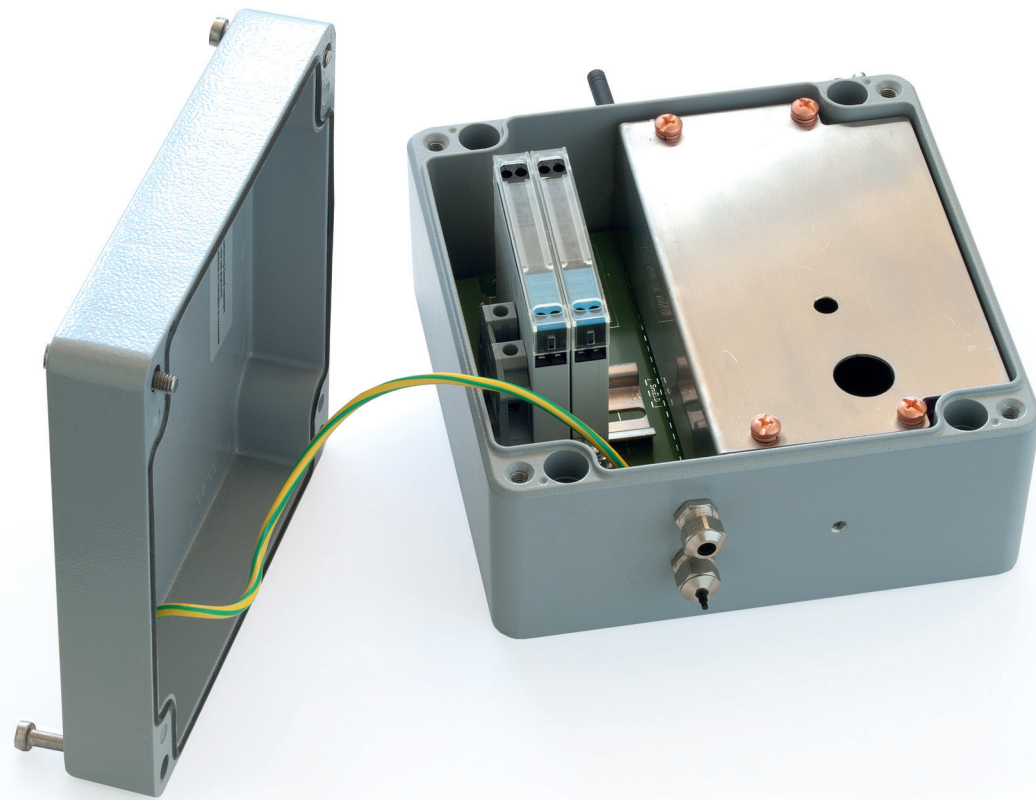
- 9001/01-168-075-101 for supplying the transmitter and
- 9001/01-120-024-001 for the RS-485 interface

### 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 3,7 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.

### 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.

09.04.2013

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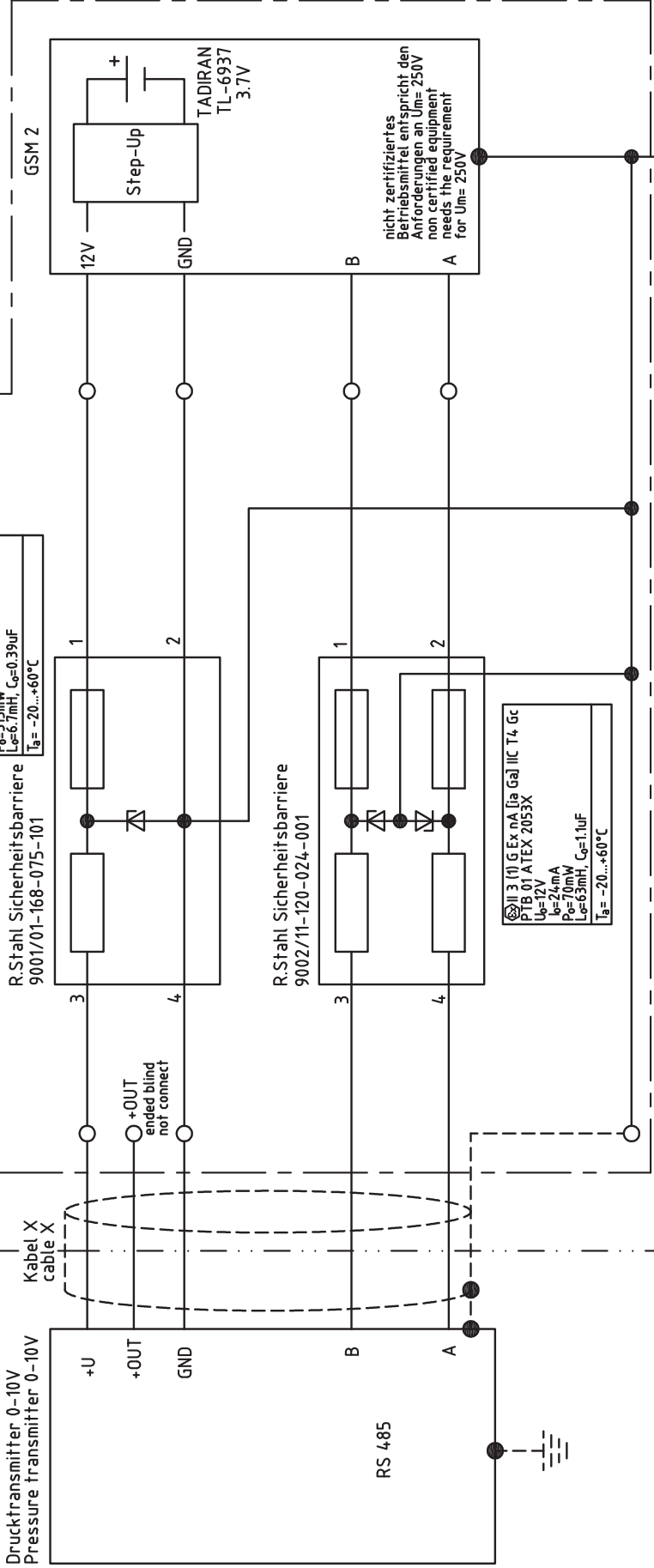
Schwarzwaldstrasse 17 · D-79798 Jestetten  
Tel. 07745 9214 0 · Fax 07745 9214 50

explosionsgefährdeter Bereich  
hazardous area

nicht explosionsgefährdeter Bereich  
non hazardous area

Wirksames System ia IIC  
Anmerkung: Kabel X mit  $L \leq 12 \mu\text{H}/\text{m}$   
 $C_{\text{Ader}} - \text{Ader} \leq 150 \text{pF}/\text{m}$  und  $C_{\text{Ader}} - \text{Schirm} \leq 250 \text{pF}/\text{m}$   
Effective system ia IIC  
Remark: Cable X with  $L \leq 12 \mu\text{H}/\text{m}$   
 $C_{\text{wire}} - \text{wire} \leq 150 \text{pF}/\text{m}$  and  $C_{\text{wire}} - \text{screen} \leq 250 \text{pF}/\text{m}$

II 3 (1) G Ex nA [ia Ga] IIC T4 Gc  
PTB 01 A TEX 2088X  
 $U_p = 16.8 \text{V}$   
 $I_p = 75 \text{mA}$   
 $P_p = 315 \text{mW}$   
 $L_p = 6.7 \text{mH}$ ,  $C_p = 0.39 \mu\text{F}$   
 $T_a = -20 \dots +60^\circ\text{C}$



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

33X Ei 35X Ei 36X WEI PD-33X Ei PD-39X Ei	KEMA 04 A TEX 1081 X II 1 G Ex ia IIC T4...T6 $T_4: -40 \dots +100^\circ\text{C}$ $T_5: -40 \dots +85^\circ\text{C}$ $T_6: -40 \dots +70^\circ\text{C}$ $U_i = 30 \text{V}$ , $I_i = 200 \text{mA}$ , $P_i = 0.64 \text{W}$ , $L_i = 0 \text{mH}$ , $C_i = \text{Inf}$ (Supply), $C_i = \text{Inf}$ (RS 485 interface and voltage output)
41X Ei 46X Ei	PTB 06 A TEX 2011 II 1/2 G Ex ia IIC T4 $T_4: -20 \dots +80^\circ\text{C}$ Versorgungstromkreis/Supply circuit $U_i = 30 \text{V}$ , $I_i = 100 \text{mA}$ , $P_i = 0.64 \text{W}$ , Li/Gi vernachlässigbar klein/negligibly small Signal- und Schnittstellenstromkreis/Signal and interface circuits together $U_p = 14.7 \text{V}$ , $I_p = 464 \text{mA}$ , $P_p = 1.71 \text{W}$ , $L_i/G_i$ vernachlässigbar klein/negligibly small

No modification without  
inquire of person Ex.....  
Date 08.04.13 Signature MSc  
FORM 031

Änd-Index: <b>a</b>	Datum: 08.04.13	Vis.: RaG	Neu/(alt): L=1.2 (=0.64 $\mu\text{H}/\text{m}$ , CADER-ADER=150 (=125 $\mu\text{pF}/\text{m}$ , CADER-SCHIRM=250 (=215 $\mu\text{pF}/\text{m}$
Gegenstand: <b>GSM2-Ei-Systembeschreibung</b>	Änderung:	Werkstoff:	grz. 18.01.11 RaG
Serie: <b>GSM2-Ei 81902.10</b>	Massstab: A3	Freigabe: 10.02.12	MSc
KELLER druckmesstechnik		<b>81902.11</b>	

Technische Änderungen vorbehalten.  
Ersetzt durch: Untolerierte Masse: ±0,1  
Ersatz für: nur gültig für Auftrag: ☉ Kanten gebrochen ☉ Kanten scharf