

# 3DLevelScanner-II



## Safety Instructions

### BVS 09 ATEX E 123 X

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II 2G Ex ia/ib IIB T4

II 1/2D Ex iaD/ibD 20/21 T110°C

II 2G Ex ia IIB T4



II 1D Ex iaD 20 T110°C

II (2)G [Ex ia] IIB

II (1)D [Ex iaD]

II 2G/- Ex ia IIB T4

II 1D/- Ex iaD 20 T110°C

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Declaration of conformity



Acoustic Precise  
Measurement

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our sole responsibility that our products

3DLevelScanner S, M, MV  
4...20mA/HART/RS485

to which this declaration relates is in conformity  
with the following standards

EMC: EN61326:1997 + A1: 1998 + A2: 2001 + A3: 2003  
Safety: IEC / EN 61010 – 1:2001

following the provision  
of Directives

73/23/EEC  
89/336/EEC

Tel- Aviv 30/10/08

Ofir Perl



(1) **EG-Baumusterprüfbescheinigung**

(2) **- Richtlinie 94/9/EG -**  
**Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung**  
**in explosionsgefährdeten Bereichen**

(3) **BVS 09 ATEX E 123 X**

(4) **Gerät:** 3D Füllstands-Scanner Typ II S \* B \* V \* A B, Typ II M \* B \* V \* A B und  
Typ II MV \* B \* V \* A B

(5) **Hersteller:** A.P.M. Automation Solutions Ltd.

(6) **Anschrift:** 62997 Tel Aviv, Israel

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.

(8) Die Zertifizierungsstelle der DEKRA EXAM GmbH, benannte Stelle Nr. 0158 gemäß Artikel 9 der Richtlinie 94/9/EG des Europäischen Parlaments und des Rates vom 23. März 1994, bescheinigt, dass das Gerät die grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie erfüllt.  
Die Ergebnisse der Prüfung sind in dem Prüfprotokoll BVS PP 09.2146 EG niedergelegt.


(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

EN 60079-0:2006 Allgemeine Anforderungen    EN 61241-0:2006 Allgemeine Anforderungen  
EN 60079-11:2007 Eigensicherheit I            EN 61241-11:2006 Schutz durch Eigensicherheit

(10) Falls das Zeichen „X“ hinter der Bescheinigungsnummer steht, wird in der Anlage zu dieser Bescheinigung auf besondere Bedingungen für die sichere Anwendung des Gerätes hingewiesen.

(11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf die Konzeption und die Baumusterprüfung des beschriebenen Gerätes in Übereinstimmung mit der Richtlinie 94/9/EG. Für Herstellung und Inverkehrbringen des Gerätes sind weitere Anforderungen der Richtlinie zu erfüllen, die nicht durch diese Bescheinigung abgedeckt sind.

(12) Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

 **II 2G Ex ib/ia IIB T4**  
**II 1/2D Ex IbD/iaD 20/21 T110°C**

**DEKRA EXAM GmbH**  
Bochum, den 21. September 2009

  
\_\_\_\_\_  
Zertifizierungsstelle

  
\_\_\_\_\_  
Fachbereich

## 1. Area of applicability

These safety instructions apply to the 3DLevelScanner of type S/M/MV/MVL according to the EC type approval BVS 09 ATEX E 123 X (certification number on the type label).

If the 3DLevelScanner-II S/M/MV/MVL is installed and operated in hazardous areas, the general Ex mounting instructions and these safety instructions must be observed.

These safety instructions are part of the Operating Instructions:

- MAN0001100
- MAN0001250
- MAN0001350
- MAN0001450

## 2. General information

The volume measuring instrument 3DLevelScanner is based on acoustic technology and is used to measure the volume of product using low frequency, acoustic waves in the 3-10KHz range. The electronics uses the running time of the signals reflected by the product surface to calculate the volume of the product.

The 3DLevelScanner S/M/MV/MVL is suitable for use in hazardous atmospheres for applications requiring instruments of category 2G or 1/2D. If the 3DLevelScanner S/M/MV/MVL are installed and operated in hazardous areas, the general Ex mounting instructions and these safety instructions must be observed.

If the 3DLevelScanner are installed and operated in hazardous areas, the general Ex installation regulations EN 60079-14 as well as these safety instructions must be observed.

The operating instructions as well as the valid Ex mounting regulations and standards for electrical equipment must be observed.

The installation of explosion-endangered systems and explosion-protected systems must always be carried out by qualified personnel.

## 3. Technical data

### Intrinsically safe supplied models

In ignition protection type intrinsic safety Ex ia IIB Only for connection to a certified intrinsically safe circuit. Maximum values:

a. Power Supply:

$U_i = DC\ 24\ V$  ;  $I_i = 125\ mA$  ;  $P_i = 3\ W$  ;  
Terminals J12.1 (+), J12.2 (GND)

**Do not use J13.1, J13.2 (24 VDC output voltage)**

b. 4-20mA/HART Communication circuit (ports 3,4 – 2 right ports in the left green connector on the back side of the electronic card)

$U_i = DC\ 10.5\ V$  ;  $I_i = 106\ mA$  ;  $P_i = 1.1\ W$  ;

- c. RS485 / Modbus RTU Communication circuit (ports 3,4 – 2 right ports in the right green connector on the back side of the electronic card)

$$U_i = \text{DC } 5 \text{ V} ; I_i = 0.5 \text{ A} ; P_i = 625 \text{ mW} ;$$

- d. Sonic radiation

$$\text{Radiated power (average power density)} \leq 0.1 \text{ W/cm}^2$$

$$\text{Pulse radiation} \leq 2 \text{ mJ/cm}^2$$

$$\text{Frequency range} \quad 3.5 \text{ kHz} \leq f \leq 10 \text{ kHz}$$

#### **NON-IS supplied models**

- a. Power Supply:

$$U_m = \text{DC } 24 \text{ V} ; P_n = 3 \text{ W} ;$$

Terminals J12.1 (+), J12.2 (GND)

**Do not use J13.1, J13.2 (24 VDC output voltage)**

- b. 4-20mA/HART Communication circuit (ports 3,4 – 2 right ports in the left green connector on the back side of the electronic card)

$$U_m = \text{DC } 9.5 \text{ V}$$

- c. RS485 / Modbus RTU Communication circuit (ports 3,4 – 2 right ports in the right green connector on the back side of the electronic card)

$$U_m = \text{DC } 7.5 \text{ V}$$

- d. Sonic radiation

$$\text{Radiated power (average power density)} \leq 0.1 \text{ W/cm}^2$$

$$\text{Pulse radiation} \leq 2 \text{ mJ/cm}^2$$

$$\text{Frequency range} \quad 3.5 \text{ kHz} \leq f \leq 10 \text{ kHz}$$

#### **4. Application conditions**

- a. Ambient temperature range:  $-40 \text{ }^\circ\text{C} \leq T_a \leq +85 \text{ }^\circ\text{C}$

- b. The pressure range must be  $-0.2 \text{ bar} \leq P_i \leq 1 \text{ bar}$   
( $-20 \text{ kPa} \leq P_i \leq 100 \text{ kPa}$  or  $-2.9 \text{ Psi} \leq P_i \leq 14.5 \text{ Psi}$ )

#### **5. Opening the housing**

The electronics compartment may be opened for configuration via the key pads. If the instrument is operated with opened cover, or its keys pressed, please make sure that no hazardous atmosphere exists.

The cover has to be screwed tightly after connection and adjustment.

## **6. Impact and friction sparks**

The 3DLevelScanner S/M/MV/MVL must be mounted in such a way that sparks from impact and friction between the aluminum body and other material will not occur.

## **7. Grounding**

The 3DLevelScanner S/M/MV/MVL have to be grounded electrostatically e.g. via the ground terminal both internally using the power cable ground and externally using the plants earth potential equalization.

## **8. Cable entries**

A tight and tension-free cable entry must be provided. The outer diameter of the connection cable must be adapted to the cable gland. The gland pressure screw has to be tightened carefully.

Unused openings for cable entries have to be sealed tightly.

The cable wires must be at least 20-24 AWG and cable O.D. 8-13mm.

## **9. Selection of the cables and wires**

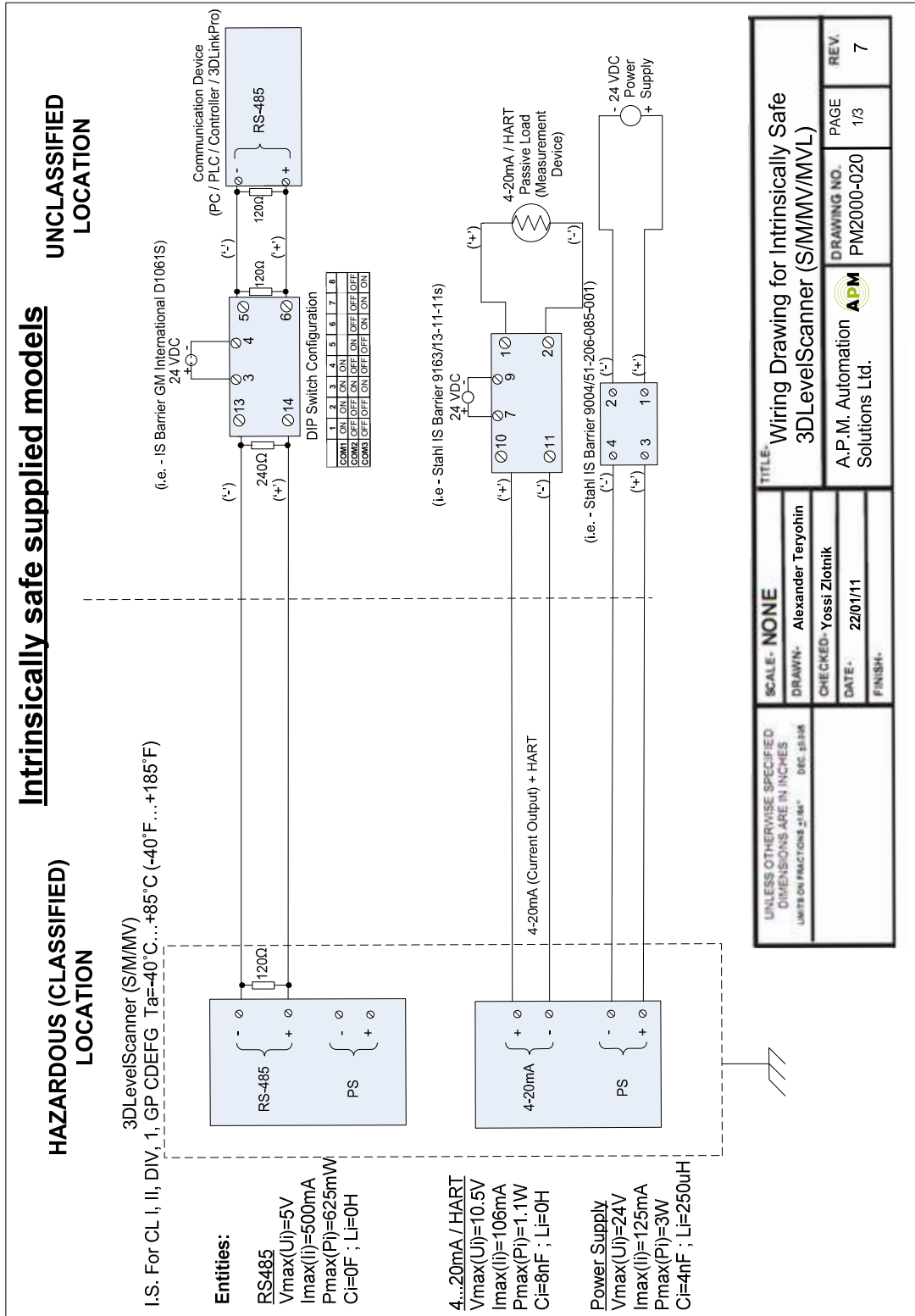
Make sure that the cables and wires used meet the operating temperature requirements and are suitable for these temperatures.



## **10. Special features**

- The instrument must be installed and operated in a way that ensures there is no danger of ignition from electrostatic charge.
- The seal between lower part of the housing and cover must be correctly in place and in faultless condition. The cover must be tightened carefully.
- Unused openings for cable entries have to be sealed tightly.
- Mount 3DLevelScanner S/M/MV/MVL in a way that adequately ensures that the scanner will not touch the vessel wall due to the movements of other vessel installations and flow conditions in the vessel.

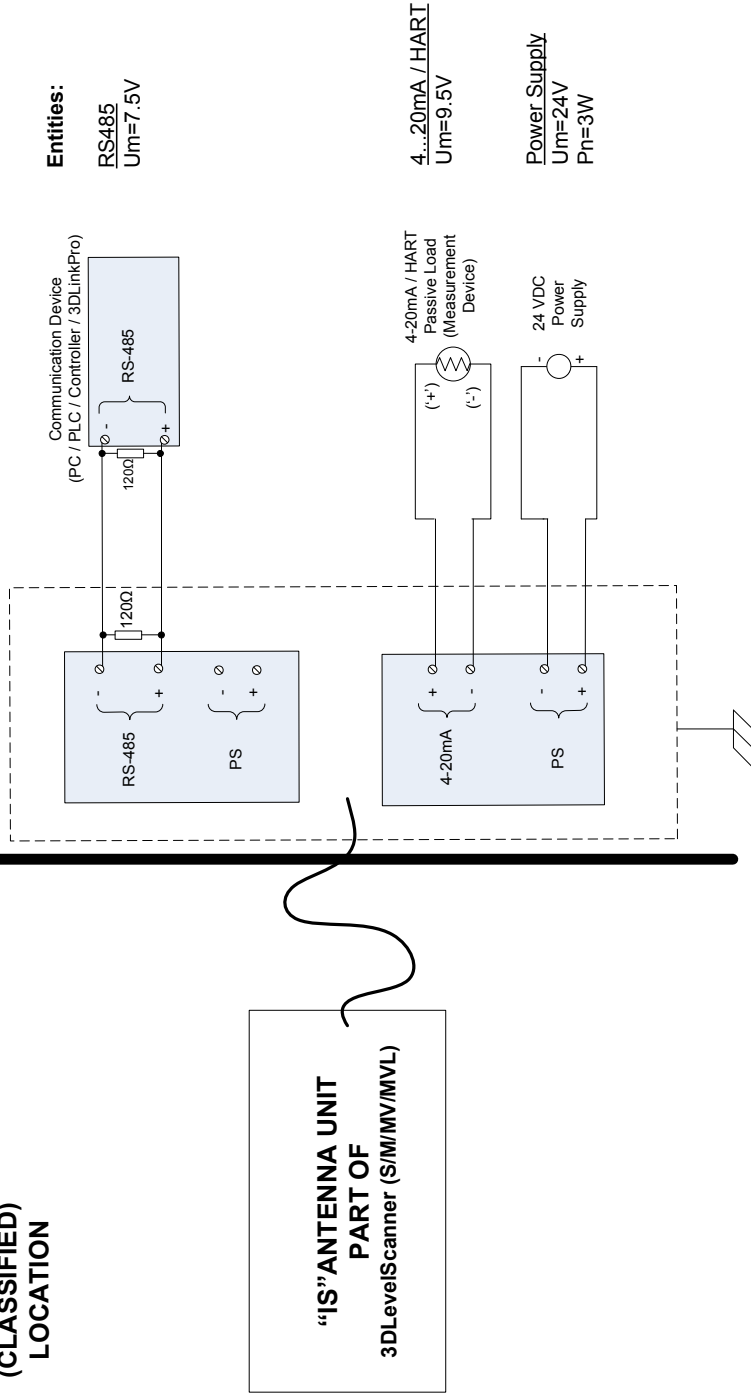
# 11.Connection Scheme



**NON-IS supplied models**

**HAZARDOUS  
(CLASSIFIED)  
LOCATION**

**UNCLASSIFIED  
LOCATION**



**Entities:**  
RS485  
Um=7.5V

4...20mA / HART  
Um=9.5V

Power Supply  
Um=24V  
Pn=3W

**"IS" ANTENNA UNIT  
PART OF  
3DLevelScanner (S/M/MV/MVL)**

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES LIMIT ON FRACTIONS: 1/16" DEC. 25.5MM	SCALE- NONE	TITLE- Wiring Drawing for Intrinsically Safe 3DLevelScanner (S/M/MV/MVL)	DRAWING NO. PM2000-020	PAGE 2/3	REV. 7
	DRAWN- Alexander Teryohin	A.P.M. Automation  Solutions Ltd.			
	CHECKED- Yossi Zlotnik				
	DATE- 22/01/11				
	FINISH-				

**Notes:**

1. **IMPORTANT:**

- a. Only a single Power Supply Barrier should be connected to a single 3DLevelScanner (e.g. – a single barrier can NOT be connected to more than one 3DLevelScanner).
  - b. For this use, only firmware version 2.9.824 and above must be used.
  - c. Only a single analog 4-20mA barrier should be connected to a single 3DLevelScanner
  - d. A single RS485 barrier could be used for multiple scanners in the same daisy chained bus.
  - e. The RS485 cable type must have resistance of 120ohm and after the connection, verify that both sides of the RS485 barrier have 60-70 ohm resistance.
2. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
  3. The Entity Concept allows interconnection of intrinsically safe apparatus with associated apparatus when the following is true:

$$V_{max} \text{ or } U_i \geq V_{oc}, V_t \text{ or } U_o;$$

$$I_{max} \text{ or } I_i \geq I_{sc}, I_t \text{ or } I_o;$$

$$P_{max} \text{ or } P_i \geq P_o;$$


$$C_a \geq C_i + C_{cable};$$

$$L_a \geq L_i + L_{cable}.$$

3. Resistance between Intrinsically Safe Ground and earth ground must be less than 1.0 Ohm.
4. Dust-Tight conduit seal must be used when installed in Class II and Class III environments.
5. Installation should be in accordance with ANSI/ISA RP12.06.01 “Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations” and the National Electrical Code (ANSI/NFPA 70).
6. The associated apparatus must be a resistively limited single or multiple channel FM Approved barrier having parameters less than those quoted, and for which the output and the combinations of outputs is non-ignition capable for the Class, Division and Group of use.
7. The output of the associated apparatus is non-linear.
8. Connect the barriers individually using different cables.

**WARNINGS:**

1. Substitution of components may impair Intrinsic Safety.
2. To prevent ignition of flammable or combustible atmospheres, read, understand and adhere to the manufacturer’s live maintenance procedures.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES UNITS ON FRACTIONS 25/32" SEC 33.288	SCALE- <b>NONE</b>	TITLE- <b>Wiring Drawing for Intrinsically Safe 3DLevelScanner (S/M/MV/MVL)</b>			
	DRAWN- <b>Alexander Teryohin</b>	A.P.M. Automation Solutions Ltd. 			
	CHECKED- <b>Yossi Zlotnik</b>				
	DATE- <b>22/01/11</b>				
FINISH-	DRAWING NO. <b>PM2000-020</b>	PAGE <b>3/3</b>	REV. <b>7</b>		

