



**10<sup>-n</sup>**  
**mbar**

VACOM

# *ATMION*<sup>TM</sup>

**Operating Instructions Profibus-DP for  
ATMION Wide Range Vacuum Measuring System**

Manual  
01/2001

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## 1. General Information

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The *ATMION*<sup>TM</sup> Controller is optionally equipped with a field bus interface Profibus-DP. The technical and functional characteristics of this field bus system are described in the standards DIN 19245 and EN 50170.

The *ATMION*<sup>TM</sup> Controller represents a slave unit which receives different messages from the Profibus master and outputs corresponding replies in response to the information (commands) from the master.

The properties and the capabilities of a Profibus-DP unit are documented in the GSD-File. The GSD file for the *ATMION*<sup>TM</sup> Controller is available on a 1.44 MB disc or can be downloaded from <http://www.vacom.de>.

## 2. Instruction

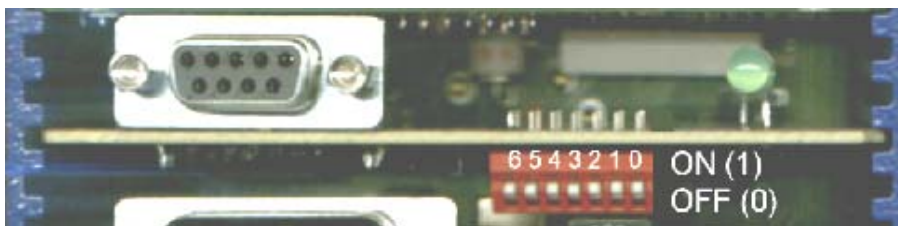
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**The designations used in the following for the input and output data must always be seen from the master side of the Profibus system. E. g. measurement data sent by the *ATMION*<sup>TM</sup> Controller (slave) are designed as input data (as seen by the master).**


### 2.1 Slave Address of the *ATMION*<sup>TM</sup> Controller

The address of the *ATMION*<sup>TM</sup> Controller (slave) can be selected from 0 to 125. After removing the rear cover of the *ATMION*<sup>TM</sup> Controller, the address switches (☞ **Figure 1**) can be set. Setting of switch 0 to upper position corresponds to  $2^0 = 1$ , setting of switch 6 to upper position corresponds to  $2^6 = 64$ .



*Figure 1 – Address switches of *ATMION*<sup>TM</sup> Controller, rear view, rear cover removed*

## 2.2 Parameter Modification of *ATMION*<sup>TM</sup> Wide Range Manometer

For special application, it can be useful to modify the some factory installed parameters of the *ATMION*<sup>TM</sup> Wide Range Manometer. The Profibus-DP interface supports the modification of gauge parameters given in  **Table 1**.

The gauge parameters are sent as parameter setting data within the parameter setting telegram.

Parameter	Standard value, recommended	Minimum value	Maximum value
16 bit value at which the <i>ATMION</i> <sup>TM</sup> switches automatically from Pirani gauge to ion gauge (Pressure value in mbar)	40960 ( $1 \cdot 10^{-2}$ mbar)	39727 ( $5 \cdot 10^{-3}$ mbar)	47919 ( $5 \cdot 10^{-1}$ mbar)
16 bit value at which the <i>ATMION</i> <sup>TM</sup> switches automatically from ion gauge to Pirani gauge (Pressure value in mbar)	45052 ( $1 \cdot 10^{-1}$ mbar)	40960 ( $1 \cdot 10^{-2}$ mbar)	47010 ( $3 \cdot 10^{-1}$ mbar)
16 bit value of analysed gas for ion gauge (Correction factor)	12288 (1.0)	9850 (0.254)	16383 (10.0)

*Table 1 – Parameter setting data (16 bits) for *ATMION*<sup>TM</sup> Wide Range Manometer*

### Conversion of:

Pressure value in mbar to 16 bit value:      **Value = 49152 + 4096 · log (Pressure)**

Correction factor of gas to 16 bit value:      **Value = 4096 · log (Factor · 1000)**

## 2.3 Output Data (Seen from the Master)

Word	Description
Word 1	Set point ON notated as 16 bit unsigned integer (2 bytes high to low)
Word 2	Set point OFF notated as 16 bit unsigned integer (2 bytes high to low)
<b>Word 3</b>	<b>16 control bits of the ATMION™ Controller (☞ Table 3) (2 bytes high to low)</b>
Word 4	Reserved

Table 2 – Output data (4 words)

Bit	Active	Name	Description
0	1	<b>AUTORANGE</b>	Change between Pirani and ion gauge automatically
1	1	<b>PIRANI</b>	Only valid for AUTORANGE = 0: Pirani gauge only, ion gauge is deactivated
2	1	<b>IG</b>	Only valid for AUTORANGE = 0: ion gauge only, Pirani gauge is activated only in case of safety turn-off of the ion gauge
3	1	<b>AUTOFIL</b>	Change between filament 1 and filament 2 automatically (condition factory-installed)
4	1	<b>FIL1</b>	Only valid for AUTOFIL = 0: filament 1 is selected, filament 2 is deactivated Setting is only possible if Pirani gauge is activated
5	1	<b>FIL2</b>	Only valid for AUTOFIL = 0: filament 2 is selected, filament 1 is deactivated Setting is only possible if Pirani gauge is activated
6	1	<b>DEGAS</b>	Start of degassing, automatically stopped after 2 min
7	1	<b>E_STROM</b>	Selection of low emission current
8	1	<b>SP_MAN</b>	Only valid for closed jumper J1: output level of PIN 9 can be set manually
9	1	<b>SP_OUT</b>	Only valid for closed jumper J1 and SP_MAN = 1: setting of output level of PIN 9
10	1	<b>SP_AUTO</b>	Only valid for closed jumper J1 and SP_MAN = 0: output level of PIN 9 is pressure dependent, pressure condition is defined by the set point function
11	1		Not available
12	1	<b>R_ERROR</b>	Setting is only possible if PIRANI = 1 and AUTORANGE = 0: reset of error bit of ion gauge
13	1	<b>VAK</b>	Zero-adjustment of Pirani gauge at vacuum pressure
14	1	<b>ATM</b>	Adjustment of Pirani gauge to atmospheric pressure
15	1		Not available

Table 3 – Data format of output word 3: Control bits of the ATMION™ Controller

## 2.4 Input Data (Seen from the Master)

Word	Description
Word 1	Measured pressure notated as 16 bit unsigned integer (2 bytes high to low)
Word 2	Set point ON notated as 16 bit unsigned integer (2 bytes high to low)
Word 3	Set point OFF notated as 16 bit unsigned integer (2 bytes high to low)
<b>Word 4</b>	<b>16 status bits of the ATMION™ Controller (☞ Table 5) (2 bytes high to low)</b>
<b>Word 5</b>	<b>16 status bits of the ATMION™ Gauge (☞ Table 6) (2 bytes high to low)</b>
Word 6	Reserved

Table 4 – Input data (6 words)

Bit	Active	Name	Description
0	1	<b>AUTORANGE</b>	Mode of auto range activated
1	1	<b>PIRANI</b>	Only Pirani gauge is activated, read out of pressure
2	1	<b>IG</b>	Only ion gauge is activated, read out of pressure
3	1	<b>AUTOFIL</b>	Mode of AUTOFIL is activated
4	1	<b>FIL1</b>	Filament 1 is selected
5	1	<b>FIL2</b>	Filament 2 is selected
6	1	<b>DEGAS</b>	Degas activated
7	1	<b>E_STROM</b>	Low emission current is selected
8	1	<b>SP_MAN</b>	Output level of PIN 9 can be set manually
9	1	<b>SP_OUT</b>	Output level of PIN 9 (1 indicates 24 V)
10	1	<b>SP_AUTO</b>	Set point function or output of degas status activated
11	1	<b>EXT_ENABLE</b>	External control enabled
12	1	<b>R_ERROR</b>	Error bit of ion gauge
13	1	<b>VAK</b>	Zero-adjustment of Pirani gauge at vacuum pressure activated
14	1	<b>ATM</b>	Adjustment of Pirani gauge to atmospheric pressure activated
15	1	<b>LEBENSBIT</b>	Test bit of <i>ATMION</i> <sup>TM</sup> sent every 500 msec

*Table 5 – Data format of input word 4: Status bits of *ATMION*<sup>TM</sup> Controller*

Bit	Active	Name	Description
0	1	<b>IG_ERROR</b>	Ion gauge locked – error of ion gauge
1	1	<b>IG_Time_Off</b>	Ion gauge locked temporarily – protection of ion gauge
2	1	<b>FIL1_ERROR</b>	Filament 1 defective
3	1	<b>FIL2_ERROR</b>	Filament 2 defective
4	1	<b>TIME_DEGAS</b>	Degassing finished by end of time
5	1	<b>DEGAS_RS232</b>	Degassing requested by RS 232 interface
6	1	<b>E_STROM2</b>	High emission current selected
7	1	<b>DEGAS_OFF</b>	Degas locked
8	1	<b>UA_ERROR</b>	Error of anode potential
9	1	<b>E_STROM_ERROR</b>	Error of emission current – too high current
10	1	<b>IG_DRUCK</b>	Last turn-off of ion gauge due to pressure measurement of ion gauge
11	1	<b>P_DRUCK</b>	Last turn-off of ion gauge due to pressure measurement of Pirani gauge
12	1	<b>P_ERROR</b>	Pirani wire defective
13	1		Reserved
14	1		Reserved
15	1		Reserved

*Table 6 – Data format of input word 5: Status bits of *ATMION*<sup>TM</sup> Gauge*

**Conversion of:**

16 bit value to pressure value in mbar: **Pressure = 10** <sup>(Integer / 4096 - 12)</sup>



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