# Pressure & DP transmitter (RS485) Instructions for use



Silver Automation Instruments Ltd.

## **Button operation**

#### 1. Backlight time setting

Press and hold the "M" key to enter the password input state, press the "Z" key to move the cursor, and the "S" key to change the value at the cursor. Enter the password "00001" to enter the setting state.

Parameter settings are divided into viewing state and modification state. In the viewing state, press the "S" and "Z" keys to turn the menu, and press the "M" key to enter the modification state. In the modification state, the cursor flashes. If only one cursor flashes, the "Z" key moves the cursor and the "S" key changes the value at the cursor. If the whole cursor flashes, both the "S" and "Z" keys are used to modify the parameter value. In the modification state, press the "M" key to return to the viewing state.

BKLIT: Backlight time setting, (OFF: turn off the backlight, 15:15 seconds, 30:30 seconds, 60:60 seconds, ON: always on)

SAVE: Exit, YES to save the settings, "No" not to save

Note: If no button is pressed for 60 seconds, the instrument will automatically exit the primary user setting.

#### 2. Beginner User Settings

Press and hold the "M" key to enter the password input state, press the "Z" key to move the cursor, and use the "S" key to change the value at the cursor. Enter the password "00016" to enter the primary user setting state.

The setting method is the same as above.

Contains backlight time setting items

ADDR: Address setting, range (1~247)

BAUD: baud rate setting, range (1200, 2400, 4800, 9600, 19200, 38400)

PAR: Check bit setting, range (0: no check, 1: odd check, 2: even check)

SAVE: Exit, YES to save the settings, No not to save

Note: If no button is pressed for 60 seconds, the instrument will automatically exit the primary user setting.

# 3. Advanced User Settings

Press and hold the "M" key to enter the password input state, press the "Z" key to move the cursor, and use the "S" key to change the value at the cursor. Enter the password "00026" to enter the advanced user setting state.

The setting method is the same as above.

Contains entry-level user settings

COL-P: Collection cycle setting, in seconds (0 means continuous collection, collection frequency is 10Hz or 40Hz, related to ADC-S). If it is greater than or equal to 43200, it is triggered collection. Writing a value greater than 0 in the trigger collection register triggers collection. Waiting for the trigger collection register to be cleared to indicate that the collection is completed, and then the latest collection data can be read.

ADC-S: ADC rate, unit Hz, 10 means 10Hz, the conversion rate is slow, the characteristic is that the data is stable, but the power consumption will increase, 40 means 40Hz , the conversion rate is fast, the characteristic is that it saves power, but the data is not as stable as 10Hz

PUNIT: Pressure unit setting, range (0:Pa, 1:KPa, 2:MPa, 3:mmH2O, 4:mH2O, 5:bar, 6:psi, 7:atm, 8:kgf/cm2, 9:mm, 10:m), only temperature and pressure integration and single pressure have this menu

P-DOT: Pressure decimal places setting, range (0~4), only temperature and pressure integration and single pressure have this menu

PK: Pressure gain value setting, only temperature and pressure integration and single pressure have this menu, (V0.10 and above versions have this function)

PBASE: Pressure base value setting, the unit is PUNIT, only temperature and pressure integration and single pressure have this menu, (V0.06 and above versions have this function)

PK: Pressure gain value setting, only temperature and pressure integration and single pressure have this menu, (V0.10 and above versions have this function)

DENSI: Density setting, unit is g/cm3, (V0.10 and above versions have this function)

G: Gravity acceleration setting (this function is available in V0.10 and above)

TUNIT: Temperature unit setting, range (11: ${}^{\circ}$ C, 12: ${}^{\circ}$ F), only temperature and pressure integration and separate temperature have this menu

T-DOT: Temperature decimal place setting, range (0~4), only temperature and pressure integration and separate temperature have this menu

PTTIM: Temperature and pressure display switching time, unit: second, range (1~60), only the temperature and pressure integration has this menu

SAVE: Exit, YES to save the settings, No not to save

Note: If no button is pressed for 60 seconds, the meter will automatically exit the high user setting.

#### 4. Clear Operation

Press and hold the "M" key to enter the password input state, press the "Z" key to move the cursor, and the "S" key to change the value at the cursor. Enter the password "00036" to enter the zeroing state (only pressure can be cleared).

Press the "S" and "Z" keys to select "YES (confirm zeroing)", "No (do not clear zeroing)", "RST (reverse zeroing)", and press the "M" key to exit.

Note: If no button is pressed for 60 seconds, the meter will automatically exit the zeroing mode.

## 5. Restore to factory settings (this function is available in V0.07 and above)

Press and hold the "M" key to enter the password input state, press the "Z" key to move the cursor, and use the "S" key to change the value at the cursor. Enter the password "00056" to enter the factory restore state.

Press the "S" and "Z" keys to select "YES (confirm factory restore)" or "No (do not restore factory restore)", and press the "M" key to exit.

Note: If no button is pressed for 60 seconds, the meter will automatically exit zeroing mode.

#### **Modbus Communication Protocol**

1. Hardware Interface

Using RS485 serial interface

Serial port parameters: Baud rate: (1200, 2400, 4800, 9600, 19200, 38400) bps

Data bit: 8bit Stop bit: 1 bit

Parity bit: None, Odd, Even

#### 2. Protocol

All message formats comply with "GBZ 19582.1-2004 Industrial Automation Network Specification Based on Modbus Protocol Part 1: Modbus Application Protocol" .

According to the device function, the MODBUS-RTU protocol function codes currently supported by the device are: 03H, 04H, 06H, and 10H.

3. Register address allocation and detailed description

Because some MODBUS registers of this instrument can be configured by users, which is also one of the features of this product, this description only provides the factory default register addresses .

Register Name	type of data	Number	Register	Supported	
		of	offset	MODBUS-RTU	illustrate
		registers	address	function codes	
Pressure floating			0000Н	03H, 04H	Floating point output value,
point lower 16 bits	Floating	2			
Pressure floating	point	2	000111	0211 0411	format: CDAB
point high 16 bits			0001H	03H, 04H	
Temperature floating			0002H	03H, 04H	Floating point output value, format: CDAB
point lower 16 bits	Floating	2			
Temperature floating	point		000011	03H, 04H	
point high 16 bits			0003H		
Pressure Integer	Signed integer	1	0004Н	03H, 04H	Range: -32768~32767, indicating that the value is related to the decimal place of pressure. For example, if the register value is 1000 and the decimal place is 2,
					the pressure value is 10.00.
Temperature Integer	Signed integer	1	0005Н	03H, 04H	Range: -32768~32767, indicating that the value is related to the decimal place of the temperature. For example, if the register value is 1000 and the decimal place is 2, the temperature value is 10.00.
battery voltage	Unsigned integer	1	0006Н	03H, 04H	Two decimal places, for example, the register value is 360, which means the battery voltage is 3.6V
battery power	Unsigned	1	0007H	03H, 04H	Range: 0~100

	integer				
	Unsigned				
address	integer	1	H8000	03H, 04H, 06H, 10H	Range: 1~247
Baud rate	Unsigned integer	1	0009Н	03H, 04H, 06H, 10H	0:1200, 1:2400, 2:4800, 3:9600,
Dadd Tate		1		0311, 0411, 0011, 1011	4:19200, 5:38400
Check Digit	Unsigned	1	000AH	03H, 04H, 06H, 10H	0 : No check 1: Odd check 2: Even
-	integer				check
Pressure decimal	Unsigned	1	000BH	03H, 04H, 06H, 10H	Range: 0~4
places	integer				D. D. 4. KD. 2. MD. 2
Dung sayana 11. ''	Unsigned integer	1	000CH	03Н, 04Н, 06Н, 10Н	0: Pa, 1: KPa, 2: MPa, 3: mmH2O, 4:
Pressure Unit					/cm2, 9: mm, 10: m, 13: KN
Temperature decimal	Unsigned				/CIII2, 9. IIIII, 10. III, 13. KN
places	integer	1	000DH	03H, 04H, 06H, 10H	Range: 0~4
	Unsigned				
Temperature Units	integer	1	000EH	03H, 04H, 06H, 10H	<b>11</b> :℃, <b>12</b> :℉
Pressure gain					
coefficient lower 16			000FH		
bits	Floating	2		03H 04H 06H 10H	Format: CDAB
Pressure gain	point	2	0010H	103H, 04H, 06H, 10H	
coefficient high 16					
bits					
Pressure offset value			0011H	O3H, 04H, 06H, 10H	Format: CDAB
lower 16 bits	Floating	2			
Pressure offset value	point	-	0012H		
high 16 bits					
Density low 16 bits	Floating	2	0013H	03H, 04H, 06H, 10H	Format: CDAB
Density high 16 bits	point		0014H	, , , , , , ,	
Gravity acceleration			0015H 2 0016H	-03Н, 04Н, 06Н, 10Н	Format: CDAB
lower 16 bits	Floating	2			
Gravity acceleration	point				
high 16 bits					
The lower 16 bits of			004711		
the original pressure	Ela-#!		0017H		
value	Floating 2 point	2	2	03H, 04H	Format: CDAB
High 16 bits of the			001811		
original pressure value		0018H			
Pressure range zero position low 16 bits	Floating		0019H	03H, 04H	
Pressure range zero	point	2			Format: CDAB
position high 16 bits	ροιπι	001AH			
Pressure range full	Floating	2	001BH	03H, 04H	Format: CDAB
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scale lower 16 bits	point				
Pressure range full	1				
scale high 16 bits			001CH		
Temperature range					
zero position low 16			001DH		
bits	Floating	2		03H, 04H	Format: CDAB
Temperature range	point	2		0311, 0411	Torriat. CDAD
zero position high 16			001EH		
bits					
Temperature range					
full scale lower 16	Floating		001FH		
bits	point	2		03H, 04H	Format: CDAB
Temperature range	polite		0020H		
full scale high 16 bits			002011		
					Range: -32768~32767, indicating
		1	0021H		that the value is related to the
Pressure offset value	Signed				decimal place of pressure. For
integer	integer		002111	0311, 0411, 0011, 1011	example, if the register value is
					1000 and the decimal place is 2, it
					means 10.00
	Signed integer	1	0022H	03H, 04H	Range: -32768~32767, indicating
					that the value is related to the
Pressure range zero					decimal place of pressure. For
position integral					example, if the register value is
					1000 and the decimal place is 2, it
					means 10.00
	Signed integer	1	0022H	03H, 04H	Range: -32768~32767, indicating
					that the value is related to the
Pressure range full					decimal place of pressure. For
scale integer					example, if the register value is
					1000 and the decimal place is 2, it
					means 10.00
Temperature range zero position integer	Signed integer	1	0022Н	03H, 04H	Range: -32768~32767, indicating
					that the value is related to the
					decimal place of the temperature.
					For example, if the register value is
					1000 and the decimal place is 2, it
					means 10.00
Temperature range full scale integer	e Signed integer	1	0022H	03H, 04H	Range: -32768~32767, indicating
					that the value is related to the
					decimal place of the temperature.
					For example, if the register value is
					1000 and the decimal place is 2, it

					means 10.00
Trigger acquisition	Unsigned integer	1	0023H	03H, 04H, 06H, 10H	Writing a value greater than 0 triggers the acquisition. After the trigger acquisition register is cleared, it indicates that the acquisition is complete. Then you can read the latest acquisition data.
Clear	Unsigned integer	1	0023H	103H. 04H. 06H. 10H	Write 1000 to clear, write 1001 to cancel clearing

Note: All writable registers will have their written data saved immediately and will take effect immediately after being saved.

# **Wiring Instructions**

