

## ASZ(Asuzac) Soil Dryness Sensor (ASZ-D0908) Specification



Please check [http://www.asuzac.co.jp/div\\_pd/2003-0020/siyouindex.htm](http://www.asuzac.co.jp/div_pd/2003-0020/siyouindex.htm) for the newest data. The present version is Ver.3.07.05 .

### 【 1 】 Application

Measurement of Soil Dryness / Measurement of powder moisture  
/ Observation of landslide danger zone

### 【 2 】 Standard function of various models

	Analogue output (0-3.5V)	RS232C	Contact output (40V 500mA)	Remarks Nickname
Model		×	×	「Mimizukun」
Model			×	「Mogurakun」
Model				「Settenkun」

Following options are applicable to all the types.

- 1 . Oscillation interval      5sec.-1hour (Default 10sec)
- 2 . Cable length                6-100m            (Default 5m)

### 【 3 】 Cables

	Model	Model	Model
No. of wires in the cable	3	5	7

			No.	Colour	Description
Model I	Model II	Model III	1	Red	Power source(DC8-24V)
			2	White	Analogue output(0-3.5V)
			3	Black	GND
			4	Green	Serial transmission
			5	Blue	Serial reception
			6	Brown	Relay contact point
			7	Yellow	Relay contact point

#### 【 4 】 Characteristics

- 1 . Employs blocking oscillation (Default: Oscillates for 0.5sec. at an interval of 10sec) in order to reduce the electrolytic corrosion so that the effects on the underground environment are minimized as a result.
- 2 . Employs an original method with which the oscillation frequency can be varied from 1kHz up to 2MHz in 0.5 seconds, resulting in stable measurement.
- 3 . H8 (Hitachi) is employed as CPU to realize a temperature compensation of high precision and linear analogue output.
- 4 . It has an analogue output of 0-3.5V and can be connected directly to the meter and logger.
- 5 . Power voltage of 8-24V DC makes the connection to the sequencer easy.
- 6 . Drive circuit can be buried in the ground as it is completely molded. (All the adjustments are set on EEPROM.)
  - \*1. However, Model III "Settenkun" is equipped with a variable resistor for sensitivity setting.

#### 【 5 】 Probe Environmental characteristics

- 1 . Electrode surface treatment...Nickel-plating on copper (3 microns) plus gold plating (1 micron) are given.
- 2 . Sunshine weather test (based on JIS)...After completion of 10 cycles of the test, the probe functioned satisfactorily.
- 3 . Saline spray test (based on JIS)...After completion of 10 cycles of the test, the probe functioned satisfactorily.

#### 【 6 】 Maximum characteristics (Ta=25 )

Items	Rating	Remarks
Supply voltage	DC 35 (V)	
Operating temperature range	-20 ~ + 80	
Storage temperature range	-55 ~ +100	

【 7 】 Recommended operational conditions

Items	Rating	Conditions
Supply voltage	DC 8 ~ 30 (V)	Under 10% ripple
Operating temperature range	0 ~ + 60	

【 8 】 Electrical characteristics ( T a = 2 5 )

Items	Rating	Unit mA
Current	Supply power 12V	28

【 9 】 Measurements

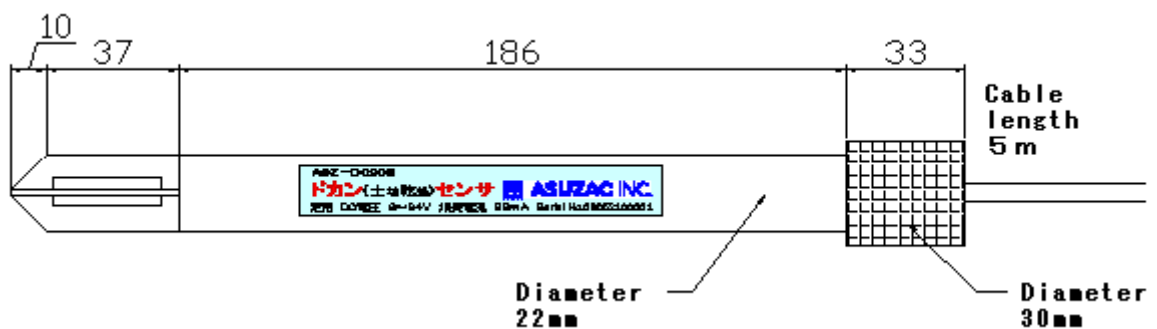


Figure 1

【 1 0 】 Example

In the case of Model III "Settenkun" (No. of wires in the cable: 7)

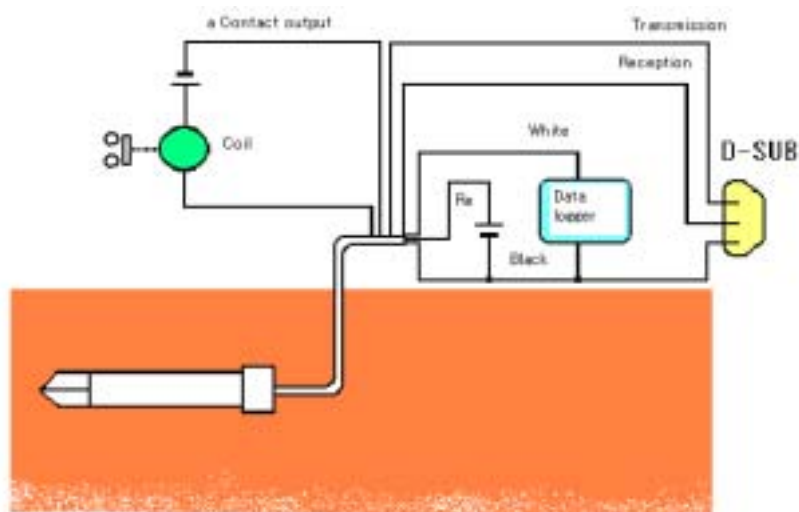


Figure 2

【 1 1 】 Data

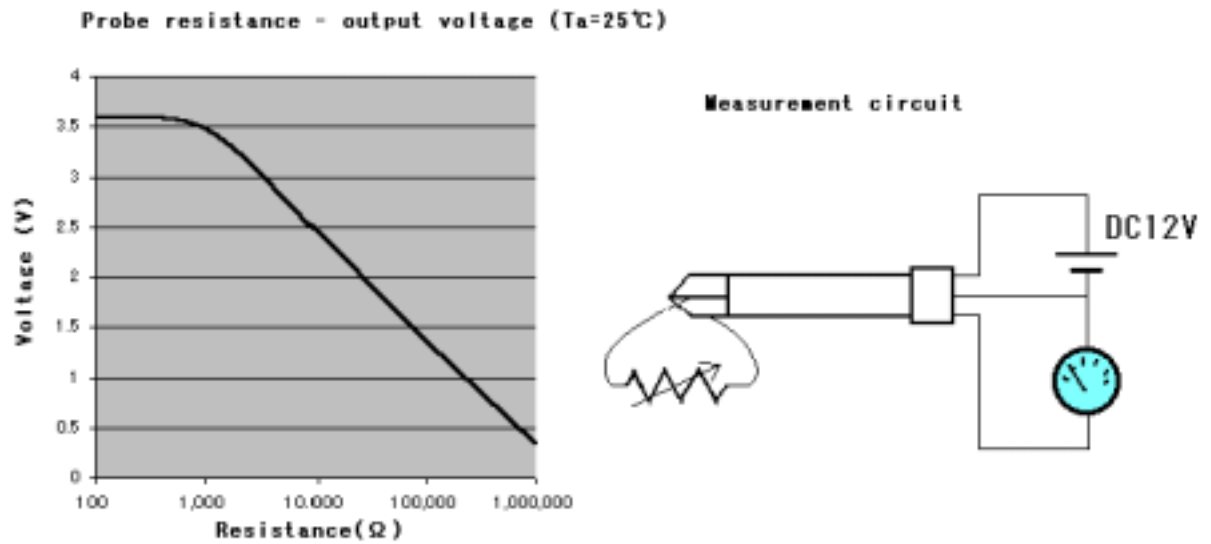


Figure 3

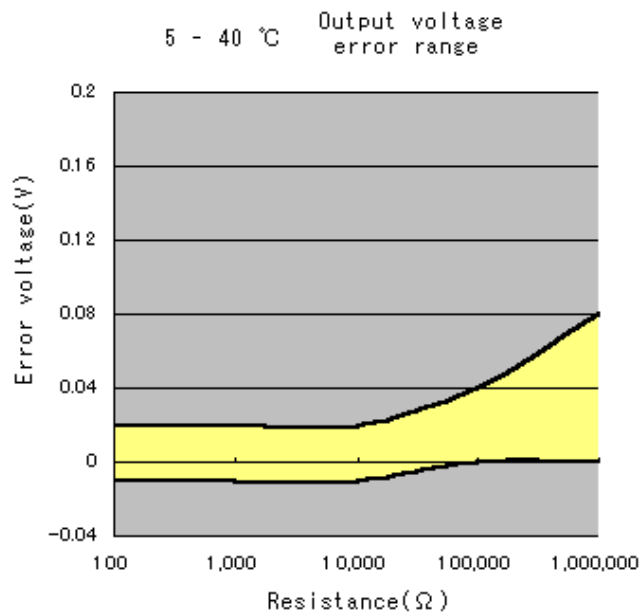


Figure 4

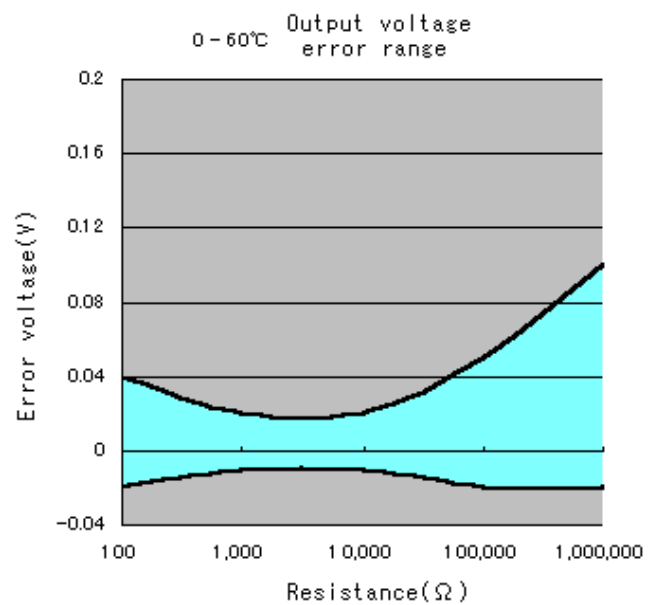
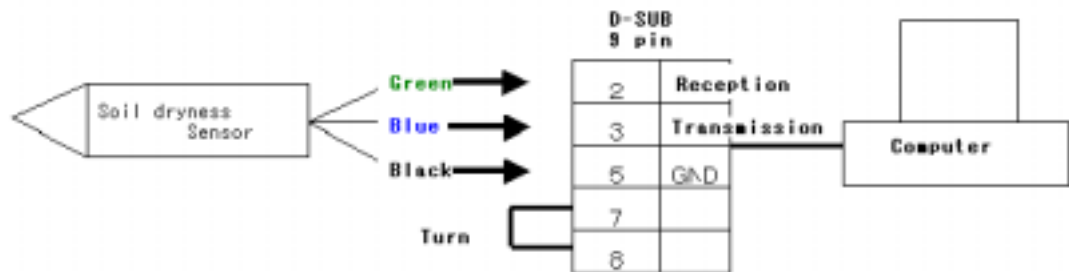


Figure 5

【 1 2 】 RS232C Output (Model II "Mogurakun" and Model III "Settenkun" only.

1 . 9600, 8, 1, No parity, No flow control



2 . Preparation Connect to the computer.

3 . Copy from the accessory CD-ROM to HD, then double-click dokan.exe.



4 . The system starts up and the screen below appears.



5 . To save the data in the file, check the file name (or change it) and uncheck "Do not save file".

6 . By pressing "Start communication" button, the preparation on computer side is completed.

7 . Turn ON the power of Soil Dryness sensor.

8 . Initial data shown below will be displayed.

```

HardWare check End!
EEPROM check End!

=== Soil Dry Sensor ===
ASZ-D0908 Rev.1.01.01 (03/06/16 8:32:40)
Hot News: http://www.asuzac.co.jp/div_pd/index.htm
ASUZAC INC.

現在設定値:移動平均数= 6 計測インターバル= 3

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9 . Data from Soil Dryness Sensor is received.

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現在設定値:移動平均数= 6 計測インターバル= 2
DAout(8Bit)= 182 Ch1(SMT)= 00028.24 °C Heikin= 6 kako[0..10]= 182 0 0 0 0 0 0 0 0 0 0
Interval= 2 * 5 (Sec)間隔
DAout(8Bit)= 189 Ch1(SMT)= 00028.48 °C Heikin= 6 kako[0..10]= 182 197 0 0 0 0 0 0 0 0 0
Interval= 2 * 5 (Sec)間隔
DAout(8Bit)= 176 Ch1(SMT)= 00028.42 °C Heikin= 6 kako[0..10]= 182 197 149 0 0 0 0 0 0 0 0
Interval= 2 * 5 (Sec)間隔
DAout(8Bit)= 146 Ch1(SMT)= 00028.48 °C Heikin= 6 kako[0..10]= 182 197 149 58 0 0 0 0 0 0 0
Interval= 2 * 5 (Sec)間隔
DAout(8Bit)= 117 Ch1(SMT)= 00028.42 °C Heikin= 6 kako[0..10]= 182 197 149 58 1 0 0 0 0 0 0
Interval= 2 * 5 (Sec)間隔
DAout(8Bit)= 130 Ch1(SMT)= 00028.42 °C Heikin= 6 kako[0..10]= 182 197 149 58 1 197 0 0 0 0 0
Interval= 2 * 5 (Sec)間隔

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	Meaning	Remarks
Daout(8Bit)	Shows the amount of moisture in the soil in the range of 0-255.	0: Dry 255: Wet
Ch1(SMT)	Temperature in the sensor	Soil temperature is a value obtained by subtracting 1.30 from the sensor temperature.
Heikin	Average number of times	1 ~ 10
Kako[0..10]	Array of the past and the present values	Max. 10pcs
Interval	Measurement interval	1 * 5 (Sec) ~ 720 * 5 (Sec)

10 . Setting method of measurement intervals

(1) Input Interval+[CR] from the input column.

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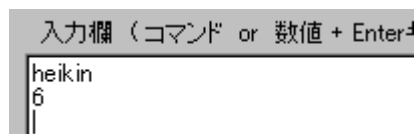



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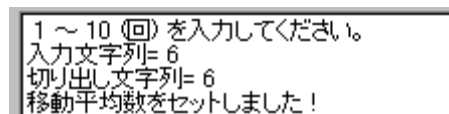
- ( 2 ) 「When "Input 1-720 (Unit 5 sec.)" is displayed, input 6 + [CR].
- ( 3 ) The above completes the setting of measurement intervals. The data is written into nonvolatile memory so that it will be maintained even when the power is turned off.

1 1 . Average number setting method

- ( 1 ) Input heikin+[CR] from Input column.

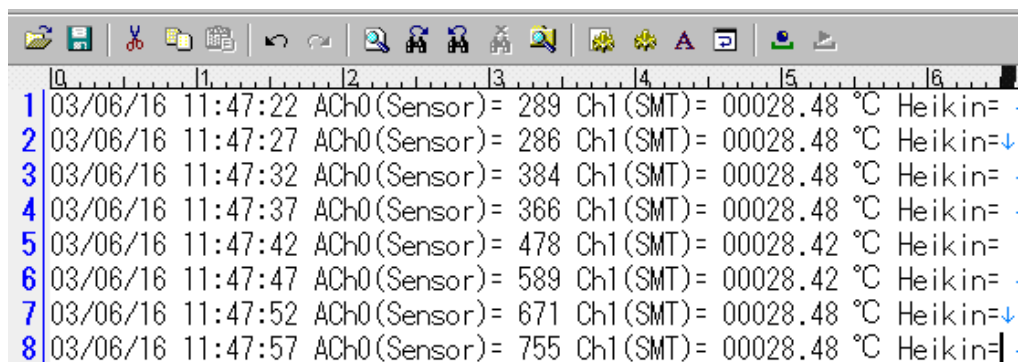


- ( 2 ) When "Input 1-10(times)." is displayed, input 6+[CR].



- ( 3 ) The above completes the average number. The data is written into nonvolatile memory so that it will be maintained even when the power is turned off.

1 2 . Saving the data in the file



Date/time and sensor data will be recorded.

【 1 3 】 Variable resistor for sensitivity adjustment (Only Model III "Settenkun")

- 1 . The middle point of the variable resistor for sensitivity setting is 2.5V (in the vicinity of 9K ). Angle of the variable resistor (effective angle 230 ) is proportionate to the setting voltage.

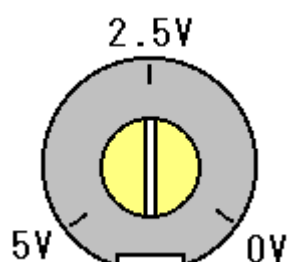


Figure 6

- 2 . If the actually measured value is "drier" than the value set by the variable resistor for the sensitivity setting, (a) contact output will be given.

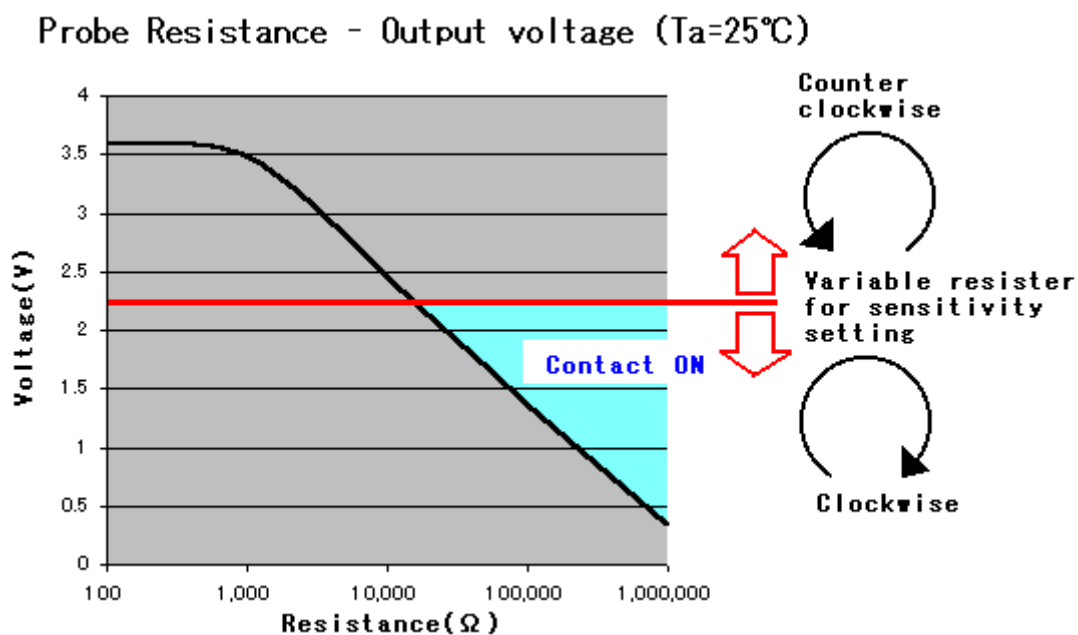


Figure 7

【 1 4 】 Measurement principle

- 1 . Total three of the present and past measurements are used to obtain an average value (default average= 3) and this value will be recognized as the new data. If we say the average value=1, the data will be output as it is. Setting range is 1-10. [User can change the setting only in the case of Model II (Mogurakun) and Model III (Settenkun). With Model I (Mimizukun), it can be dealt with as a default option.]



Graph showing the effect of taking average Using T & D product VR71

- 2 . The measurement is taken by oscillating for 0.5 seconds at intervals of 9.5 seconds. The total number of seconds (default 10 sec.) can be varied on a scale of 5 seconds. Setting range is 1-720(5 seconds - 1 hour). [User can change the setting only in the case of Model II (Mogurakun) and Model III (Settenkun). With Model I (Mimizukun), it can be dealt with as a default option.]

Interval command set	Length of interval
1 (Min)	5 sec.
2 (Default)	10 sec.
12	1 min.
120	10 min.
720 (Max)	1 hour

