

[CONTENTS]

General
Features
Name and function of each part
Horizontal reference
Roles of 0-Call and 1/2-Call
Variation of measuring range due to movement of reference point
Operation
Preparation and procedure
Measurement
Zero-point setting
Leveling
Leveling in one direction
Leveling in two directions
Output signal 44
Wireless Wired
Wired
Transportation method 49
Tranaportation by personnel
Transporting by truck
Precautions
Specifications 51

WIRELESS DIGITAL LEVEL LEVELNIC DL-S4W

Niigata Seiki Co., Ltd.

Thank you for purchasing Wireless Digital Level LEVELNIC DL-S4W. Please read this manual thoroughly before use to ensure proper operation and long service life.

This precision electronic level uses the displacement of a highly sensitive pendulum to measure angle. Displacement is measured as an electronic signal and displayed as degrees (°), or gradient (mm/m) for direct reading on an LCD display. Remote output is also supported using serial port, or through wireless transmission.

- O Differential transformer technology for high sensitivity and stable output.
- \odot Measures a wide range of angles compared to a bubble (spirit) level. (±5 mm/m, 0.286 $^\circ$)
- Fast response compared to bubble levels.
 (Full range response time approx. 10 sec.)
- © Easy to read digital display reduces errors.
- Setting a reference point or halving the displayed values can easily be operated using 0-Call or 1/2 Call Button.
- O Units to be selected from either Degrees (DEG) or Gradient (mm/m) with front panel switch.
- O Mode Switch allows selecting number of significant digit to display.
- O Mounting holes (M5) on base for mounting custom jigs.
- Measured value can be output via serial port connection, or wireless transmission. (RS-232C compatible. Wireless range of 30~50m, defers depending on conditions.)
- Data Record software for displaying and recording measurements on PC. (Optional software support by specifying the DL-S3 to the model name.)
- Multiple units can be used at same location without interference. (Receiver and Transmitter are individually paired.)
- PC receiver plugs into USB port and software driver is automatically recognized. (Windows XP or later. For some installations, administrator privileges may be required.)





TOSHIBA

- 1 0-Call Button
- ② 1/2-Call · Output Signal Button
- ③ Display
- (4) Auxiliary Bubble Tube
- (5) Units Selector Switch
- 6 Mode Switch
- O Function Select Switch
- 8 AC Adapter Jack
- ④ Output Jack
- 1 Wireless Selector Switch
- 1 Power Switch
- 12 Level Base
- 13 Battery Compartment
- 1 Wireless Receiver for PC
- (15) Rechargeable Battery
- (16) Charger

(1) 0-Call Button

0-Call Button sets the displayed measurement to zero. Display value will change when button is pressed. The button requires deliberate press of about 1 second. (The button can not be used during error display.)

(2) 1/2-Call · Output Signal Button

The button function is set by the Function Select Switch to work as either 1/2-Call Button, or Output Signal Button.

1/2-Call Button

Press the 1/2-Call button to divide the displayed reading by 2. Value is changed when the 1/2-Call button is released. The button requires deliberate press of about 1 second.

(The button can not be used during error display.)

Output Signal Button

This switch is intended to control the output of signals on the side of this device.

When the Signal Output Button is pressed, the instrument transmits the measured data on the RS232C port, or on the wireless port.

Signal is output when the switch is released.

The button requires deliberate press of about 1 second.

If there is a problem with communication such as the cable not connected, an error message (E1, E2) will be displayed for about 3 seconds.

Please refer to 「 Output Signal 」 section for details.

(3) Display

Display shows angle measurements, battery status, and communication status.

Angle

Display to be set to show angle in units of DEG ($^\circ\,$) , or mm/m using the Units Select Switch.

To distinguish which units are selected, DEG (°) or mm/m, display does not show the "0" to the left of decimal point when "DEG (°) " mode is selected.

If the angle exceeds the measurement range an error message (Error, -Error) is displayed.

When viewed from the front (facing instrument with display characters upright,) for a positive out-of-range error, "EEEE" will be displayed and for a negative out-of-range error "-EEEE" will be shown.

The "E" on the elevated side will blink.

When the angle is reduced to within the measurement range, normal operation will continue.

Battery Status

When battery level is getting low the display will blink.

When the display starts to blink, please replace the battery with a new one.

Communication Status

If an error occurs during data transmission, or if cable is not properly connected, an error message (E1, E2) will be displayed for about 3 seconds.

Please refer to 「 Output Signal 」 section for details.

(4) Auxiliary Bubble Tube

Used for checking tilt in the direction perpendicular to the measurement axis (roll.)

(5) Unit Selector Switch

Specify units for displayed measurement as DEG (°), or mm/m. "mm/m" setting will display the measured angle as height of slope in mm over a distance of one meter. Measurement range is ± 5 mm/m. "DEG (°)" setting will display the measured angle in DEG (°). Measurement range is $\pm 0.286^{\circ}$.



(6) Mode Switch

For measured values less than ± 1.999 mm/m (or $\pm 0.1145^{\circ}$), the switch specifies the number of significant digits to display.

"0.001" setting will set the least significant display to 0.001 mm/m (or 0.0001°).

"0.01" setting will set the least significant display to 0.01 mm/m (or 0.001°). When set to "0.01", the displayed value is rounded off.

When the application does not require higher resolution than 0.01 mm/m (or 0.001°), setting the switch to "0.01" reduces flicker for easier reading. For measured values which exceed the above range, the least significant display is automatically set to 0.01 mm/m, (or 0.001°).

(7) Function Select Switch

Used to set function of 1/2-Call / Output Signal Button.

[1/2] functions as 1/2-Call button.

「OUT」 functions as Output Signal button.

(8) AC Adapter Jack

Power input jack for use with external supply. Please only use supplied AC adapter.

% The AC adapter jack and battery are connected with a back-current prevention diode.

When using the AC adapter, the higher voltage prevents battery drain but if adapter is not plugged in, instrument power will be supplied from the battery.

To use external power supply during measurement, no mechanical switch is required; simply plug adapter in to the jack and continue with measurements.

When the AC adapter is plugged in, the battery could be removed for charging without interrupting operations.

(9) Output Jack

RS-232C port for sending the displayed value and units to a remote device for recording or display.

Please refer to 「 Output Signal 」 section for details.

(10) Wireless Selector Switch

For selecting type of remote connection, cable or wireless, to transmit measured value.

"CABLE" - For use with PC connection cable (sold separately) connected to Output Jack.

For this setting the built in radio unit will be off, saving power.

For maximum battery life, use this setting whenever wireless is not used, even if external signal is not needed.

"RADIO" - The built in radio unit is on, for use when transmiting with the supplied PC-side radio unit (Receiver).

Use this setting only when needed; set switch to "CABLE" while preparing to take measurements in order to minimize power consumptions, and set to "RADIO" only when PC communication is needed.

% Current flow to the radio unit is three times higher when attempting to establish communication with the PC.

To save power, always set up the PC side first to reduce the time spent by the instrument trying to establish communication.

Once the PC side is ready to communicate, switch the unit over to "RADIO".

Leaving it on "RADIO" without the PC set up does not cause error, it will only reduce battery life.

(11) Power Switch

Instrument is ready for use about 5 seconds after it is switched ON. 0-Call and 1/2-Call settings are not stored when power is turned off; when power is turned back on the reference point will need to be reset.

(12) Level Base

Bottom surface has two M5 threaded holes for mounting a customer supplied custom base or jig, if required.

The holes are 8 mm deep and have a 130 mm spacing.

(13) Battery Compartment

Holder for 9V type battery.

To remove battery, push the groove toward the rear of the instrument and pull out the holder. In addition to the supplied rechargeable battery, a standard non-rechargeable 9V battery could also be used.

(14) Wireless Receiver for PC

Bluetooth Class 1 Wireless unit.

Receiver comes already one-to-one paired to the built-in transmitter.

Multiple instruments can be used in proximity without interference.

The instrument and paired receiver will be labeled with same serial number.

(A 6 digit number in the form "77****")

PC will automatically recognize the device when plugged in and will use the required driver.

※ Supported by Windows XP or later versions.

Windows may require administrator privileges to install. If required, please contact your PC administrator or PC owner to install.

(15) Rechargeable Battery

Nickle Metal Hydride (Ni-MH) battery.

Two are supplied to allow charging one while using the second one. Charge with provided charger.

(16) Charger

9V type Ni-MH battery charger.
Align polarity and insert to charge.
Will charge 1, or 2 batteries simultaneously.
While charging, LED is lit; it turns off when charging is complete.
Charge time is about 6-7 hours.

※ Standard single use 9V batteries (alkaline or zinc-carbon,) cannot be recharged.

Please do not use with charger, as there is risk of rupture and leakage of the batteries.

Horizontal reference

[Roles of 0-Call and 1/2-Call]

Level is an instrument which is sensitive to its position relative to earth's gravity. We can show how we determine true horizontal using the following method.

On a slope, put a board with a weight suspended by a string. The weight will hang at an angle of θ from a line perpendicular to the slope. If the board is rotated 180°, the weight will hang at the same angle θ from a line perpendicular to the slope.

Without having an absolute reference, we can determine the angle 2θ by rotating our instrument 180° and measuring the total change in angle relative our perpendicular reference. We can thereby determine θ if we divide by two. Also notice that the angle of the slope relative to true horizontal is also θ .

If we set zero with the level on a slope, when we rotate the level 180° the reading will be twice the actual angle of the slope. If we then adjust the slope of the surface being measured (the device under test) until the angle reading is reduced to 1/2 of that value, the surface will be horizontal.

Conversely, some desire having an absolute standard only because of confusion or misunderstanding regarding the above process.



36

[Variation of measuring range due to movement of reference point]

The instrument can be set to display a reference point of "0" at any angle using the 0-Call and 1/2-Call operations.

However, the measuring range of the instrument is limited by the range of the internal variable measured by the device. (This value is apparent when power is first turned ON, before changing the reference point.)

Instrument does not have an internal reference to true horizontal, therefore the zero reference when power is first turned on does not necessarily show true horizontal.

When an absolute reference to horizontal is needed the zero-point must be set each time power is turned on.

In this way the zero-point is accurate with each use and any error due to drift in the zero-point is eliminated.

In order to insure the Measurement Range of ± 5 mm/m ($\pm 0.286^{\circ}$), (For this discussion all the following numbers will be in mm/m) the internal measurement range has been designed to be ± 5.25 mm/m in order to anticipate a shift in the displayed zero-point relative to the internal one. The range of the display is ± 5 mm/m.

The measurement range of the instrument is limited by those two factors.

In the diagrams below, the upper numbers show the internal measurement range, and the lower numbers show the values which are shown on the display or sent on the Output Jack. ◎ When 0-Call and 1/2-Call operations have not been performed.

(Display Zero is situated at Internal Zero)



When Display Zero is moved +0.1 mm/m by 0-Call or 1/2-Call operation. (For example, 0-Call was made on +0.1 mm/m, 1/2-Call was made on +0.2 mm/m, etc.)



When Display Zero is moved +2 mm/m by 0-Call or 1/2-Call operation. (For example, 0-Call was made on +2.0 mm/m, 1/2-Call was made on +4 mm/m, etc.)



[Preparation and procedure]

This is a precision instrument; please handle with care and avoid any shock or mishandling.

Before use, wipe the instrument base and the measuring surface using a soft cloth or lens cloth moistened with alcohol or mineral spirits to remove any grease and contamination.

Place the instrument on the measuring surface.

Turn on the instrument using the Power Switch.

For best results, wait about 20 min. after power on for internal circuitry to stabilize.

The zero-point will shift up to 0.01 mm/m when first turned on as the system warms up.

If it does not affect your measurement, you can begin the measuring procedure as soon as it is turned on.

Make sure there is no difference in temperature between the instrument and the surface to be measured.

When the instrument is moved from a warm location to cold, (or opposite) the reading will not be stable.

Please allow time for display to stabilize before taking measurements, or place the instrument in location where it will be used an hour in advance. For the highest precision performance, measure at a climate controlled room following general practice for all precision measurements.

After use, protect the base of the instrument by coating with rust-preventive oil before storage.

39

[Measurement]

When viewed from the front (facing instrument with display characters upright,) if the right side is elevated the angle reading will be an increasing positive number.

If the angle is out of range an error message will be displayed (EEEE). For negative angles, a "-" sign is also shown (-EEEE).

In addition to the "-" sign, the "E" on the elevated side of the error message will also blink to help indicate the direction of tilt.



The instrument will display the angle of inclination as mm/m, which is the elevation for the surface over a distance of 1 meter, or as DEG ($^{\circ}$). When measured in mm/m, the actual height difference over a specified distance or pitch can be calculated as follows:

Height Difference / Pitch = Reading × Pitch / 1000 (mm) For an example where Measurement Pitch = 100mm, Height Difference / Pitch = Reading × 100 / 1000 (mm) = Reading × 0.1 (mm) [Zero-point setting]

The instrument does not have a preset absolute zero-point.

If a zero-point is required it must be set each time the instrument is switched on.

- A) For comparing relative slope of different surfaces.
 - (1) Place the instrument on the surface to be used as the reference.
 - (2) When the display has settled, perform the 0-Call operation to set the display to zero by pressing the 0-Call Button.

A relative zero-point has now been set for use in comparative angle measurements.

- B) If there is a true horizontal reference surface available.
 - (1) Place the instrument on the surface to be used as the reference.
 - (2) When the display has settled, press the 0-Call Button to set the display to zero.

Zero-point has now been set for absolute measurements.

- C) If surface is not known to be level.
 - (1) Place the instrument on the surface to be used as the reference.
 - (2) When the display has settled, press the 0-Call Button to set the display to zero.
 - (3) Rotate the instrument 180° in the same spot on the surface.
 - (4) When the display has settled, press the 1/2-Call Button to divide the display reading by 1/2.

Zero-point is now set at true horizontal.

The display will show the absolute tilt of the surface the instrument is on.

※ Once this operation is done the zero-point is set. However in case (C), if the reference surface is not level in the roll direction (perpendicular to the measurement axis) there is a possibility of introducing some error to the measurement. To set the zero-point more precisely, please follows the procedures described in "Leveling In Two Directions" in the section [Leveling].

[Leveling]

"Leveling in one direction"

- (1) Place the instrument on the surface or object to be measured and check the level in the roll direction using the axillary bubble tube level. Perform a 0-Call operation to set the display to zero.
- (2) Rotate the instrument 180°, and check the axillary bubble tube to make sure the it reads the same.
 Perform the 1/2-Call operation to halve the display value.
 If the axillary bubble tube reading has changed, then the tilt in the roll direction may have shifted introducing an error to the operation.
 Adjust the surface being measured to prevent shift before repeating.
- (3) Adjust the tilt of the surface to make the instrument's display read zero.
- (4) Rotate the instrument 180° again to confirm that the reading is zero and the surface is level.

If it does not read zero after rotating, then repeat steps (1) \sim (4) above.





① [0-Call: Display = 0.000 mm/m] → ② [Rotate 180°: Display = 1.400 mm/m] [1/2-Call: Display = 0.700 mm/m]



③ [Adjust Surface : Display = 0.000 mm/m]

"Leveling in two directions"

- (1) For one direction (for example the X-direction,) follow the above procedure for " Leveling in one direction ".
- (2) Repeat the procedure for the other direction (the Y-direction.)
- (3) When adjusting in one direction, it is possible that the perpendicular direction will be affected and no longer level. It may be necessary to repeat steps (1) and (2) several times to bring the two axis into level. When the reading is zero for the instrument placed in any position, the surface is level.



① 【Level in X direction】

2 [Level in Y direction]

Output signal

Instrument can output a signal using cable or wireless link.

For wireless communication the supplied Wireless Receiver is used to send data to a PC.

For remote monitoring using a wired connection, an output cable (sold separately) can be connected to the instrument's Output Jack.

The Wireless Selector Switch specifies which output method is used.

X Wireless Selector Switch

When switch is set to "RADIO", power to the built in radio unit will be ON. Please keep the switch in "CABLE" setting when wireless transmission is not in use in order to reduce power consumption.

Even when using the wireless feature, keeping the switch set to "CABLE" during preparation and when signal is not needed will conserve the battery.

Set switch to "RADIO" as needed.

When trying to establish communication with the PC receiver, power consumption of built-in wireless transmitter is 3x higher.

To minimize power consumption, the power on sequence should be as follows:

- ① PC with Wireless Receiver
- ② Instrument's built-in wireless unit (set switch to "RADIO".)

Leaving the switch set to "RADIO" when not needed will not cause error or fault, but will result in quicker drain on the battery.

The instrument will output the displayed measured value with an RS-232C compatible signal.

When battery is low and display starts to blink, data signal is not output.

[Wireless]

The PC will recognize the receiver when it is plugged in and it will appear as a new COM port from the computer.

% The COM port number can be identified using the Windows Device Manager.

Automatic driver recognition Supported by Windows XP or later versions. Windows may require administrator privileges to install.

If required, please contact your PC administrator or PC owner to install.

Comm Method	: Asynchronous
Comm Control	: None
Baud Rate	: 1200 bps
Data Length	: 8 bit
Stop Bits	: 1
Parity Bit	: No

For continuous output, data is transmitted approx. every 0.6 sec. Data signal takes about 0.14 sec. to complete.

Transmitted data (TD) will be 16 characters in each string.

(Japanese char. set.)

The data contents are as follows:

Character 1~14	Measurement data and units, padded with spaces
Character 15	Carriage Return (CR)
Character 16	Line Feed (LF)

(1)2)3)4)5)6)7)8)9)10)11)12)13)14)15)(16)char Ex.) $(\triangle \text{ symbol} = \text{space})$ $\Delta\Delta\Delta\Delta1$, 234 Δ mm/MCRLF Output units of mm/m $\Delta\Delta\Delta\Delta1$. 23 $\Delta\Delta$ mm/MCRLF Output units of mm/m $\Delta \Delta \Delta - 1$. 234 Δ mm/MCRLF Output units of mm/m $\triangle \triangle \triangle 0$. 0707 \triangle° $\triangle \triangle \triangle CR$ LF Output units of DEG $\triangle \triangle \triangle 0$. 071 $\triangle \triangle^{\circ}$ $\triangle \triangle \triangle CR$ LF Output units of DEG $\Delta \Delta - 0$. 0707 Δ° $\Delta \Delta \Delta CR$ LF Output units of DEG $\Delta \Delta + E r r \circ r \Delta \Delta \Delta \Delta \Delta CR LF$ Error Output $\Delta \Delta - E r r \circ r \Delta \Delta \Delta \Delta \Delta CR LF$ Error Output

[Wired]

Use an audio type mini-plug for connecting cable to Output Jack. (connecting cable sold separately.)



The data transmitted is the same as for wireless transmission.

Signal output is controlled by the CTS signal.

CTS tells the system when to transmit or not to transmit data.

If the Function Select Switch is set to $\lceil 1/2 \rfloor$

For CTS level "high", measurement data is sent on TD with each data update.

For CTS level "low", or not connected, measurement data is not sent.

If CTS is continuously "high", measurement data will be sent continuously.

If the Function Select Switch is set to 「OUT」

For CTS level "high", measurement data is sent on the TD line each time the Output Signal Button is pressed. (Button is shared between Output Signal, and 1/2-Call functions.)

In order to prevent multiple data from being sent, the Output Signal Button will only send out data upon release.

Data will not be output if Output Signal Button is continuously held down.

% If CTS goes "low" and stays low for about 3 sec. during the transmission of the 16 character data string, the transmission will be interrupted and the display will show "E1" for about 3 sec. and then return to normal operation.

If CTS is "low" when the Output Signal Button is pressed the display will show "E2" for about 3 sec. and then return to normal.

Transportation method

This is a precision measuring instrument.

Please be careful not to inflict impact, excessive pressure or vibration to the product when carrying or transporting it.

[Transportation by personnel]

Please use the provided storage case when transporting. Please do not carry the product with tipped over or turned upside down. When transporting the product in a car, please avoid vibration as much as possible and place it on the seat of the passenger seat.

[Transporting by truck]

When transporting the product by truck or air, please prepare a sturdy carton with the inside dimensions of about 20 cm larger than the dimensions of the storage case for both height, width and length.

Store the product in the storage case then place it to the center of the carton with cushioning packing material wrapped around, under and above the case so that it is placed in the true center inside the carton.

Please make sure that the top and bottom of the packed carton is clearly stated on the carton in order to avoid being transported with tipped over or upside down.



*Leave room for 10cm of packing material on all six sides.

Precautions

This is a precision measuring instrument.

Please handle the instrument with care not to drop it, hit it against anything, or subject it to excessive pressure or vibration while working or carrying it.

The bottom measuring surface is a critical component for accurate measurements; use care to protect from corrosion.

After use, clean any rust or dirt from instrument and apply rust preventive oil to the bottom measuring surface before storing in the case.

If not used for a long period, please remove the battery.

Store in cool, dry location out of direct sunlight, and protect from high humidity or severe temperature changes.

Make sure surface to be measured is free of any dirt or burrs which may cause damage to the measuring surface.

Keep away from magnets and strong magnetic fields.

When used in a support capacity for other equipment, it can easily be damaged; please use care to avoid scratches or corrosion.

Do not modify or use for purpose other than the original intended use.

Specifications

Model	DL-S4W	
Meas. Range	±5.00 mm/m, ±0.286°	
Resolution	0.001mm/m, 0.0001° (0~±1.999mm/m, 0~±1.1145°)	
	0.01mm/m, 0.001°	
Meas. Time	Approx. 0.5~0.6 sec.	
Temperature	Operating Range: 0~40°C	
Accuracy	[For operating temperature: 17~23°C]	
(※1)	Larger of ±0.85% rdg, or Repeatability Spec	
	(For 0~±1.999 mm/m, 0~±0.1145°)	
	±1.0%rdg(For ±2~±5 mm/m, ±0.115~±0.286°)	
	[For operating temperature: 0~40°C]	
	Larger of ±2.6% rdg, or Repeatability Spec	
	(For 0~±1.999 mm/m, 0~±0.1145°)	
	±2.7%rdg(For ±2~±5 mm/m, ±0.115~±0.286°)	
Repeatability	Within ±0.005 mm/m, ±0.0003°	
Output Signal	RS-232C compatible	
	Wired / Wireless	
	(Bluetooth Class1, Range Approx. 30 \sim 50 m)	
Power	9V Battery (JIS 6F22Y (zinc-carbon),	
	or 6LR61(alkaline)), 1x	
	8.4V (9V type) rechargeable battery, 1x	
	AC adapter (DC9V output)	
Continuous On Time	Zinc carbon batt. 12 hrs. (With wireless use: 3 hrs.)	
(※2)	Alkaline battery 30 hrs. (With wireless use: 10 hrs.)	
	Rechargeable 10 hrs. (With wireless use: 4 hrs.)	
Outside Dim.	158 (L) × 61 (W) × 107 (H) mm	
Base Dim.	150 (L) × 55 (W) mm	
Weight	2.0 kg	
Accessories AC adapter (DC9V output)		
	8.4V (9V type) Rechargeable battery 2x	
	Battery Charger (6-7 hr. charge time)	
	Wireless Receiver for PC	
	Data recording software	
	Storage Case, Operation Manual	

- (※ 1) %rdg (percentage reading) is a percentage of the reading. Ex: ±0.85%rdg may include an error of ±0.0085 mm/m when the reading is 1.000 mm/m.
- (※ 2) It varies slightly depending on operating conditions such as temperature.
 Please note: Due to characteristic of voltage discharge curve for rechargeable batteries, once display starts blinking there is only short period until battery voltage is below operable level.
 Rechargeable capacity will decrease with each recharge cycle, and

expected life of rechargeable batteries is about 200 to 300 cycles.

When using the USB Wireless Receiver, Windows may display an error message or there may be arbitrary motion of the mouse cursor. The following procedure will prevent the error from occurring.

- - (1) Windows displays an error message when first connected and the driver is recognized.
 - (2) The cursor moves arbitrarily when the wireless unit is connected to the PC.
 - (3) The cursor moves arbitrarily when laptop display is opened after closing.
- When USB Wireless Receiver is inserted, or when the Laptop is first opened, the USB Receiver is in the process of being recognized.

If data is sent at this time, when received by the unit it will be erroneously interpreted as cursor movement.

Do not send data before connecting the USB Wireless Receiver to the PC, and before closing the Laptop display.

- : Set the Wireless Selector Switch to "CABLE" * DL-S4W
- or set the DL-S4W Power Switch to "OFF" * DL-S2W(USB) : Set the Wireless Selector Switch to "OFF"
- or set the DL-S2W Power Switch to "OFF"
- * DL-BW (USB) : Set the DL-BW Power Switch to "OFF"
- : Set the Wireless Selector Switch to "OFF" * DI -m5W
- or set the DL-m5W Power Switch to "OFF"
- : Set the Wireless Selector Switch to "OFF" * DI -SXYW-S
- or set the DL-SXYW-S Power Switch to "OFF"
- * DL-BW2(USB) : Set the DL-BW2 Power Switch to "OFF"

Start sending data once the USB unit is connected, and the Laptop display is open.

: Remove the wireless unit from the PC USB port For case (1)

Restart the PC and allow the device to be recognized and the driver reloaded.

For case (2)(3) : Stop sending data from Levelnic After 2~3 seconds, resume sending data.

USB 无线装置的使用方法 相关内容的补充説明

新泻精机株式会社

在使用ユ USB 式 信号接收装置的时候、电脑会出现有错误报警、或是鼠标的光标任意移动等现象。 为了不再发生类似于上述的不良状况,对此设备的使用方法做补充说明。

- ①向电脑连接的最先接续的软件自动识别驱动程序时、会从 Windows 发出错误报警信息表示。 ②如果无线单元器接续电脑的话、会有鼠标的光标随意移动现象出现。 ③关闭使用接续无线装置的笔记本电脑显示屏、如果在启动的话会有鼠标的光标随意移动现象出现。
- 在处于驱动程序的自动识别,和电脑接续的前后间,还有就是打开笔记本电脑显示屏的前后间 USB 无线装置在被电脑识别的过程的状态。 这个时候,如果有水平仪的数据信号接收的话 这个数据就会向电脑发送不需要的信息 那么此时就会有错误报警或是有光标任意移动的 现象出现。

USB 无线装置和电脑接续的时候,或是关闭笔记本电脑的显示屏时停止数据送信。 :无线切换开关 切换为「CABLE」。 • DI --S4W 时 或者、DL-S4W的电源开关切换为「OFF」。 DL-S2W(USB)的时候:无线切换开关 切换为「OFF」。 或者、DL-S2W的电源开关切换为「OFF」。 •DL-BW(USB)的时候 :DL-BW 的电源切换为「OFF」。 的时候 :无线切换开关 切换为「OFF」。 • DL-m5W 或者、DL-m5W的电源开关切换为「OFF」。 ・DL-SXYW-Sの場合 : 无线切换开关 切换为「OFF」。 或者、DL-SXYW-S的电源开关切换为「OFF」。 ・DL-BW2 (USB) の場合: DL-BW 的电源开关切换为「OFF」。

USB 无线装置和电脑接续后 或者是笔记本电脑的显示屏打开后 请再开始数据送信。

- ①的状态时 : 从电脑上拔下 USB 无线装置。
 - 然后重启电脑后,重新识别驱动程序。
 - ②③的状态时: 先暂停水平仪的数据送信传输。 2~3 秒后再开始数据传输。



DL-S4W Data Logger Program Ver.2.0

Niigata Seiki co., Itd

DL-S4W Data Logger Program ("the Program") is dedicated software for LEVELNIC DL-S4W ("DL-S4W").

The Program captures the output by DL-S4W and saves this data as text files on a computer.

You can also enlarge the DL-S4W display to fill up the entire computer screen.

The Program is able to capture up to 14,400 items of data.

You can use the buttons in the Program's windows or the operation button on the DL-S4W to specify the timing for data capture.

You can also select to have data automatically captured at specified intervals.

There is no need to set up the program on your computer.

Simply double-click DL-S4W-E.EXE on the CD-ROM to start running the program.

You can also store the program in a folder on your hard drive or a USB flash drive. The only file you need to copy is DL-S4W-E.EXE.

If you want to copy the operation manual, copy the FIG folder and README.htm and save them in a folder.

If you want to connect to a computer using the PC-side radio unit (receiver), COM port is assigned to the radio unit.

COM port number assigned, you can check by using the Windows Device Manager.

If you want to connect a cable, you need a computer with a RS-232C port (serial port or COM port).

If there is no RS-232C port on your computer, use a USB-RS232C converter cable. Follow the instructions in the cable manual to set up the device driver for the converter cable.

Windows Description

[Capture Window]

DL-S4W Data Logger ver2.0	- 🗆 🗵
File Edit Copy Data	
EVELND Settings EVELND Settings OUH : 1 Data Acquisition Tining : Computer Specify number of data points (14400 max, 0-not specified) - Memo Stocker max0 Memo Stocker max0 Second Stocker max0 Second Stocker max0 Second Stocker Math Context[22]	Gasture/FEI
	eap an official
O DATA Auto Capture : OFF	Quit

■DL-S4W Deta Logger ver20 File Edit Copy Data	1, -0.220 mm/H, -0.220, 2016/01/20 12:00:46 2, -0.220 mm/H, -0.220, 2016/01/20 12:00:46	
-0. 254	8, -0.247 mn/H, -0.247, 2016/01/2012:01:00 4, -0.258 mn/H, -0.258, 2016/01/2012:01:01 5, -0.254 mn/H, -0.254, 2016/01/2012:01:03	
	LEVELNID Settings	
	Data Acquisition Timing : Computer	
	Specify number of data points (14400 max, 0-not specified) -	
nn/M	Memo (50char max)	
Full Screen	Save Clear Start Auto Capture[F2]	Capture[F5]
O DATA Auto Capture : OFF		Quit

The Program communicates with DL-S4W, capturing data and displaying the measurement values.

[Display]

A wide open field on the left of the screen.

The measurement value is displayed in the field after communication with DL-S4W starts.

The unit of measurement is shown in the lower right.

[Full Screen]

Selecting "Full Screen" enlarges the Display region to fill the entire window.

DL-SHW Deta Lowner ver.20 File Edit Copy Data	-DX
-0.	254
Dill Screen	nw/M
O DATA Rule Capture : OFF	Cuit

[DATA Indicator]

Indicates the communication status with DL-S4W.

Flashing : Communicating with DL-S4W.

Receiving data at regular intervals.

Off : Cannot communicate with DL-S4W. Check to see if there are any problems with the switch settings for DL-S4W and output, the connection status, or the LEVELNIC settings in the Program.

Green : Normal.

Red : The indicator turns red if it receives error data beyond the measurement range.

[Auto Capture]

Indicates whether data acquisition in a regular interval is on or off. If data acquisition is on, the interval is also displayed. To modify the settings, use the File / Settings tab in the menu bar.

[Records Field]

Displays the captured data.

The captured data, the data item number, and the data values are displayed in chronological order (date and time).

To save the content of the field as a text file, click the "Save..." button after ending communication.

[LEVELNIC Settings]

Displays the Program settings for communicating with DL-S4W. Check this field to see whether there any problems with the conditions. To modify the settings, use the File / Settings tab in the menu bar.

[Specify number of data points]

If you specify the number of data items to be captured, communication ends when the specified number is captured.

After communication ends the "Save..." button is enabled.

If you specify 0, communication continues until the maximum number of data items is reached (14,400).

When you have captured the desired number of data items, click "Disconnect" to enable the "Save..." button.

[Memo]

You can add strings of text to describe items of saved data.

These memos are for reference sake only.

You can also conduct measurements and input data without adding memos.

E	Buttons]	
	Connect	: Starts communication with DL-S4W.
		Pressing the "Connect" button causes it to change to
		the "Disconnect" button.
	Disconnect	: Ends communication with DL-S4W.
		If any records exist, the "Save " button and "Clear"
		button are enabled.
	Save	: Saves the records as a text file.
	Clear	: Clears the records.
	Start Auto Capture	: Enables the auto capture function.
		If auto capture is on, this button is enabled when
		communication with DL-S4W starts.
	Capture	: Captures the data in the Records Field.
		This button is enabled when communication with
		DL-S4W starts.
		If auto capture is on, the button is enabled when you
		start auto capture.
		If you click this button while auto capture is in
		progress, the item of data for that time is captured
		and displayed in the Records Field.
	Quit	: Quits the Program.

[

Menu bar]	
File :	
About Settings	: Displays the name and version of the Program.
een ge	This window allows you to specify the conditions for communicating with DL-S4W. You can also specify the color and size of the font used in the Program.
Quit	: Quits the Program.
Edit :	
Cut	: Allows you to cut portions of data that can be input.
Сору	: Allows you to copy portions of data that can be input.
Paste	: Allows you to paste portions of data that can be input.
Copy Data :	
Separated by Commas	 S: Copies all the records displayed.by Commas The records are separated by commas, just as they are displayed in the Records Field. This function is useful when pasting data into other items of software.
Separated by TAB	: Copies all the records displayed.
	All the commas between the records are replaced by a tab.
	This function is useful when pasting data into
	other items of software (particularly spreadsheet applications).

[

[Settings Window]

Settings	
Port Settings COM Port Data Acquisition Timing Computer Set LEVELNIC Set	Color Settings Window CINavy Fonts CIYel Iow
Auto Capture Interval (0.1 to 60 min) 0.5	Font Size for the Screen
Cancel	ОК

This window allows you to specify measurement conditions.

It also allows you to specify the window color, font size, and sounds issued.

[Port Settings]

COM Port : Specifies the COM port number of the RS-232C port used for communication with DL-S4W.

If you do not know the COM number, use the Windows Device Manager to check the communication port number.

A COM port number (such as COM1) is attached to the name of each available RS-232C port.

- [Data Acquisition Timing]
 - Computer Set : Specify to capture data by using the "Capture" button in the Program. In this case, the function switch of DL-S4W is changed to "1/2".
 - LEVELNIC Set : Specify to capture data by using the switch on DL-S4W. In this case, the function switch of DL-S4W is changed to "OUT".

[Auto Capture]

Specify whether to capture data at regular intervals (ON) or manually (OFF).

When using auto capture, specify an interval of between 0.1 to 60.0 minutes.

[Color Settings]

Allows you to specify the background color of the window and the color of characters.

[Font Size for the Screen]

Allows you to change the font size of the characters displayed in the window.

[Beep on Error]

If the sound on the computer has been enabled, you can specify whether to issue a beep when the DATA indicator turns red or when the Program issues an operational warning.

[Beep on Capture]

If the sound on the computer has been enabled, you can specify whether to issue a beep when data is captured.

Using the program

[Restoring the default settings]

This program stores the status of configurable items in the DL-S4W.ini configuration file.

To restore the default settings, remove the DL-S4W.ini file. After you restore the default settings, a new DL-S4W.ini file is created the next time you start the program.

[Getting Started]

Make sure that communication is ready for using the Program.

- Does your computer have an RS-232C port? Do you know the COM port number?

 If your computer does not have an RS-232C port, use a USB-RS232C converter cable in place of the RS-232C port.
 Follow the instructions in the cable manual to set up the device driver of the USB-RS232C converter cable.

 If you do not know the COM port number, use the Windows Device Manager to check the communication port number.
 A COM port number (such as COM1) is attached to the name of each available RS-232C port.

Getting the program ready.

There is no need to set up the program on your computer. Simply double-click DL-S4W-E.EXE on the CD-ROM to start running the program.

You cannot save measurement files or configurations on this CD-ROM. You can store the program in a folder on your hard drive or a USB flash drive.

We recommend using a copy saved on your hard drive or a USB flash drive.

Doing so allows you to save measurement data. The only file you need to copy is DL-S4W-E.EXE. If you want to copy the operation manual, copy the FIG folder and README.htm and save them in a folder. [Steps]

- < Recording data >
 - 1) Connect DL-S4W to your computer.
 - 2) Start the Program.
 - Check the LEVELNIC settings and whether Auto Capture has been enabled.
 - If needed, enter a comment or specify the maximum number of data items to be captured.
 - 3) Check the power and connection with DL-S4W.
 - 4) Start communication.
 - Capture data.
 - 5) End communication.
 - 6) Save the data as needed
- < Displaying measurement values >
 - 1) Connect DL-S4W to your computer.
 - 2) Start the Program.
 - Check the LEVELNIC settings. Modify the settings as needed.
 - 3) Check the power and connection with DL-S4W.
 - 4) Start communication.
 - You can enlarge the display area by selecting "Full Screen".
 - You can also change the window size by dragging it.
 - 5) Stop communication.
- If the computer is unable to communicate with DL-S4W, check whether there are any problems with the DL-S4W power, output switches, connection status, or LEVELNIC settings of the Program.
 If DL-S4W has not been turned on when you press "Connect" button, the attempt to communicate with the computer will fail, even if you turn on DL-S4W after pressing the "Connect" button.
 In this case, exit and restart the Program.