

## 1. Description.

The **WSD12T-DD** is a **datalogger** with 3 input channels to acquire linear deformation and outdoor temperature, with storage functionality of samples acquired.



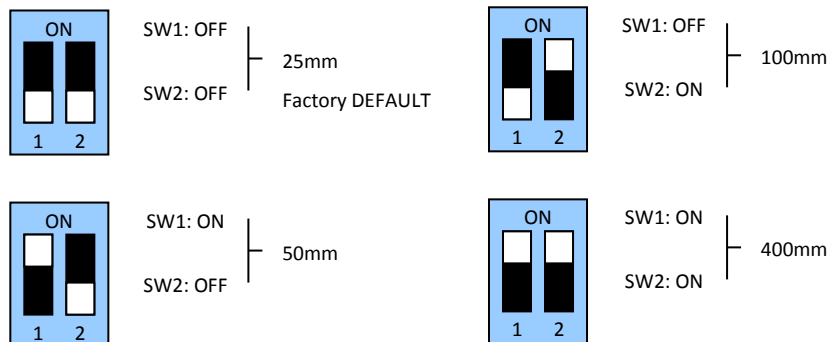
Picture 1 - Product Image

## 2. Configuration.

The linear potentiometric sensor full-scale setup must be verified working on DIP switches located on internal PCB. Refer to the following table to setup the correct range.

**WARNING:** after DIP switches setup, the enrolling operation must be repeated, so the **datalogger** must be reset (*Factory Reset*) and enrolled again (*Enroll*).

### 1.1. Potentiometer full-scale setup.



Picture 2 - DIP switches setup

### 3. Device preset and use mode.

#### a. Wireless Mode:

No setup operation is needed. Typically the system is configured from factory so the device is already associated to the system **basestation**. The device is in *STANDBY* mode (refer to [Picture 6 - Status table - Radio signal quality](#)) for which is necessary to start it with the *TEST* command (refer to [Installation procedure](#)).

Otherwise, in case the device is in *FACTORY RESET* mode (refer to [Picture 6 - Status table - Radio signal quality](#)), that means it's ready for connecting to an existing system, in order to associate it, make reference to the "[WineCap System - User Manual R29](#)" software manual. Is necessary to use the "[WineCapManager](#)" software on the PC connected to the **basestation** that will be coupled with the device.

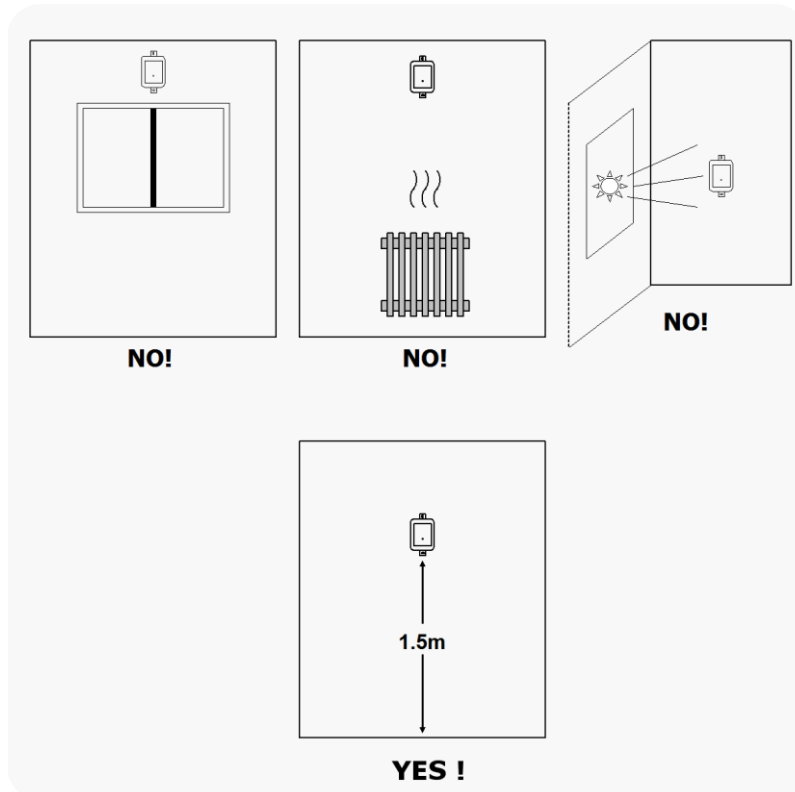
#### b. USB Logger Mode:

For this operation mode, stand-alone with data downloads through USB, the connection with the PC and the "[WineCapManager](#)" running on it is necessary in order to modify the device 's operation mode. The sampling interval must be set with the device in "*STAND-ALONE*" (refer to [Stand-alone USB datalogger installation](#).) mode and automatically, the device 's clock is aligned with the PC's clock, in order to assure the temporal reference of the sample.

Sampling operations start may be selected disconnecting the USB cable or giving the proper command with the magnetic key. (refer to [Stand-alone USB datalogger installation](#).) More details on device 's connection/disconnection through the USB cable are available on the [WineCap System - User Manual R29](#) manual.

#### c. On field transition from USB to Wireless datalogger:

This transition is practicable in field, during the sampling period, using the wireless network association command. When the association is done, the **datalogger** becomes a wireless **datalogger** and, besides sending new measures to the **basestation**, starts a download process towards the same **basestation** of the measures acquired during the stand alone period (refer to [Picture 7 - Stand-alone datalogger status](#)).

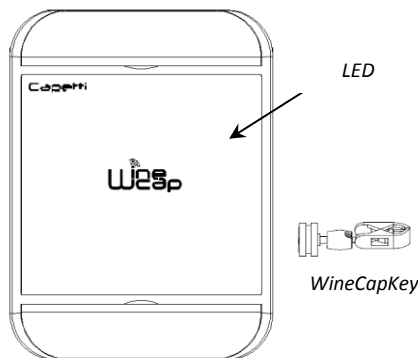


Picture 3 - Device positioning

#### 4. Wireless device user interface.


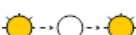

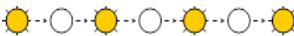
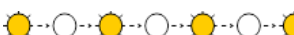




The user interface consists of a “virtual” button that can be activated using the [WineCapKey](#) and of a two-coloured led.

To give a command, user must approach the [WineCapKey](#) to the device’s sensible area and keep it in that position.; the following picture ([Picture 4 - WineCapKey positioning](#)) shows device’s sensible points.



Picture 4 - WineCapKey positioning

The following **COMMAND** table describes the available commands:

Flash count	Command	Description
1 flash 	<b>STATUS</b>	Shows the device STATUS. As answer the led perform a flash sequence as reported in the “STATUS” table. If the device is performing the TEST ( <i>refer to TEST command</i> ) this command stops it.
2 flashes 	<b>TEST</b>	Enter in TEST mode and transmits status and measurements every 5 seconds. If the device is in STANDBY mode or it is out of radio range, this command forces the connection procedure to the WSN and the return to the operative mode. The TEST stops after 120 seconds. During TEST the led continuously shows the STATUS to monitor the received radio signal quality. <b>CAUTION: Measures acquired during TEST phase are NOT saved.</b>
3 flashes 	<b>ENROLL</b>	Association to the network: must be used when the device has not yet been included in a network, starts the entry and association procedure to the <b>basestation</b> ( <i>refer to “WineCap System - User Manual R29”</i> ).
4 flashes  + 4 flashes 	<b>STANDBY</b>	Temporary device deactivation: the device is stopped. The sampling process and the radio are/is turned off losing the connection to the network. To reactivate, a TEST command is necessary. The STANDBY command must be given twice to confirm it: at the first sequence the led flashes alternating RED and GREEN lights, waiting for the second confirm sequence within 15 seconds. At the command execution the led flashes as the STANDBY status ( <i>refer to “WIRELESS MODE STATUS Table”</i> ). ( <i>refer to “STAND-ALONE MODE STATUS Table”</i> ).
5 flashes  + 5 flashes 	<b>FACTORY RESET</b>	The device performs the memory deleting procedure and goes in STOP status. All samples, configuration and wireless network data associated are LOST. To reactivate the device a new association and configuration procedure is necessary ( <i>ENROLL command</i> ). Also in this case, the FACTORY RESET command must be given twice to confirm it. At the command execution the led flashes as the “PROBE/DATALOGGER NOT ASSOCIATED” status <i>refer to “WIRELESS MODE STATUS Table”</i> ). ( <i>refer to “STAND-ALONE MODE STATUS Table”</i> ).
5 flashes  + 3 flashes 	<b>LOGGER NO WSN</b>	As the previous command but performs only the WSN deleting procedure and disassociate from the <b>basestation</b> . The device enter in LOGGER STAND ALONE mode: data are kept and the sampling activity CONTINUES with previous setup. Command must be given with 2 sequences: 5 flashes and then 3 flashes. At the command execution wait for the device reboot. At the STATUS command, “LOGGER” will be the answer ( <i>refer to “STAND-ALONE MODE STATUS Table”</i> ). A new association ( <i>ENROLL command</i> ) is possible to a new <b>basestation</b> .

Picture 5 - Commands table

## 5. Enrolling the device.

Not necessary if performed in factory before delivery.

Enroll the device to the network referring to the "[WineCap System - User Manual R29](#)". In case the device is already enrolled but in *STANDBY* status, a *TEST* command must be issued (refer to [Picture 5 - Commands table](#)).

## 6. Installation procedure.

After installing the **basestation** in appropriate place in charge, (refer to "[WineCap System - User Manual R29](#)"), be sure that the device is enrolled to the **basestation** and activated.

Head for the environment to be monitored. On the way, to check the quality of the radio coverage, use the "*Field Measurer*" function.

This function is activated issuing the *TEST* (refer to [Picture 5 - Commands table](#)) command: position the [WineCapKey](#) in the spot indicated in [Picture 4 - WineCapKey positioning](#) and wait for two *AMBER* flashes, then remove the [WineCapKey](#) from device. The "*Field Measurer*" function lasts enabled for two minutes.


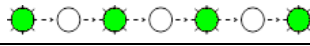






To issue commands to the device, place the [WineCapKey](#) where indicated.

Once the [WineCapKey](#) is detected, the led periodically emits *AMBER* flashes with a 2 seconds cadence.

For each flash, a different command is associated; to confirm the command the [WineCapKey](#) must be removed from the sensible area immediately after the number of flashes corresponding at the desired command. The *TEST* corresponds to the second pulse and activate the "*Field Measurer*" function.

The device will give back the radio signal quality through led flashes:

WIRELESS MODE STATUS Table

Flash count - Wireless mode	Status/Radio signal quality
 5 green flashes	Excellent
 4 green flashes	Good
 3 green flashes	Fair
 2 amber flashes	Sufficient
 1 red flash	Insufficient
 1 red flash 2" long	OUT OF RANGE Network searching
 2 red flashes 2" long	STANDBY
 Short-long-short red flashes series	FACTORY RESET Device not enrolled

Picture 6 - Status table - Radio signal quality

Optimize reception selecting the best position: small movements can help.

If the signal is absent or insufficient at the install point, a [WR12 router](#) should be put between (refer to "[WineCap System - User Manual R29](#)"). The [WR12 router](#) itself must be located in a position where the signal level is at least sufficient.

The network will reconfigure itself automatically; the signal will be good again when the device synchronizes with the [WR12 router](#).

The link will not be reconfigured until completely lost by the device. Because of this, in some cases it could be necessary to force the operation. In such cases, put the device in *STANDBY* mode, then run the *TEST* again (refer to "[WineCap System - User Manual R29](#)").

**NOTE:** The display equipped **datalogger** ([WD04T](#)) is recommended, to verify the signal quality during devices installation.

## 7. Stand-alone USB datalogger installation.


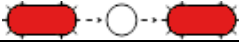

Install the **datalogger** in appropriate place.

If the sampling process has not yet been activated you can start it through the [WineCapKey](#).

Bring it closer to the sensitive point, wait for 2 flashes (**TEST**) (refer to [Picture 5 - Commands table](#)) and remove. The **datalogger** begins sampling according to your settings through your PC.

Through the [WineCapKey](#) is possible to ask for the current status, bring it close to the **datalogger** for 1 flash (**STATE**) and remove it.

**STAND-ALONE MODE STATUS** Table:

Flash count - Stand-alone mode		STATUS
	1 green flash 2 seconds long	ACTIVE
	2 red flashes 2 seconds long	STANDBY
	Sequence of red flashes: short, 2 seconds long, short	FACTORY RESET <b>INVALID datalogger</b> clock! PC connection required

Picture 7 - Stand-alone datalogger status

## 8. Shutting off/Reactivating the device.

If the device is shut off and left unused for a long time, you can issue the **STANDBY** command (refer to [Picture 5 - Commands table](#)). Its corresponds to the command number 4 and must be issued twice to confirm the operation.

Position the [WineCapKey](#) in the spot indicated in [Picture 4 - WineCapKey positioning](#) and wait for four **AMBER** flashes, then remove the [WineCapKey](#) from device.

Verify that the device asks for confirmation of **STANDBY** command with alternate **GREEN/RED** flashing, then position again the [WineCapKey](#) and wait for four flashes again. The device will confirm the **STANDBY** status lighting the **RED** led for 2 seconds twice.

To reactivate the device the **TEST** command must be issued.

## 9. Read RESETING function.

Install and fix the linear sensor in the sampling point avoid maximum extension or compression.

To activate the measurement resetting procedure, the channel reset command must be issued twice using the **WineCapKey**. Resetting commands are:

- 6 flashes for CH2
- 7 flashes for CH3

During the first command execution, the green led starts flashing, this is a confirmation waiting phase. During the second command execution the **datalogger** acquire the transducer's sample on the related channel and save it as zero value (*transducer must be already fixed*).

The following measurements will be related to this value and possible alarm threshold will be calculated on differential value. In case of missing confirmation or wrong confirmation, the probe automatically return to the normal status without performing the reset operation.

If, during the confirmation waiting phase, the red led starts flashing, means that the transducer is in a position too close to the mechanical stroke edge.

This condition must be considered wrong so, if the confirmation command is issued, the result is to cancel the previous saved zero value and return the sample to absolute condition.

Reading the stored zero values through radio of each probe is possible, using the **WinecapManager** software.

Moreover the invalid measurement alert occurs if the mechanical stroke edge is reached. Potentially is also possibly modify or reset this value in case of some intervention during the measurement session (*transducer re-positioning or substitution*).

## 10. WSD12T-DD-PC - Load tests version.

The **datalogger** version suitable for load tests executes the *Test* for 12 hours in a row.

This feature allows the reception on the **basestation** a measurement flow with a period of 5 seconds necessary for rapid changing evaluations during load/unload phases.

Data received by **basestation** can be read in real time using a USB connection and through the Modbus protocol. A data processing software can, therefore, read information coming from sensors and performs a data processing and graphic visualization.

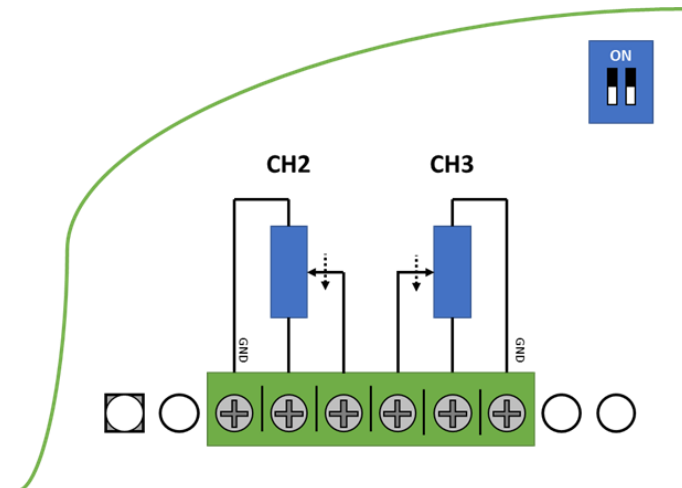
The **WineCapManager** management software usually don't save values coming from **dataloggers** in TEST mode.

To enable the saving feature and be able to perform a data post processing, the program must be run in **SAVETEST** mode.

Add or modify the command argument, located in the program link and add the -SAVETEST option:

"C:\Programmi (x86)\Capetti Elettronica s.r.l.\WineCapManager\WineCapManager.exe" -SAVETEST


## 11. Transducer's connection layout.



Arrow indicates the potentiometer pointer moving **versus** which matches to **measure growing** reported by **datalogger**

Picture 8 - Connections layout

## 12. Technical Information.

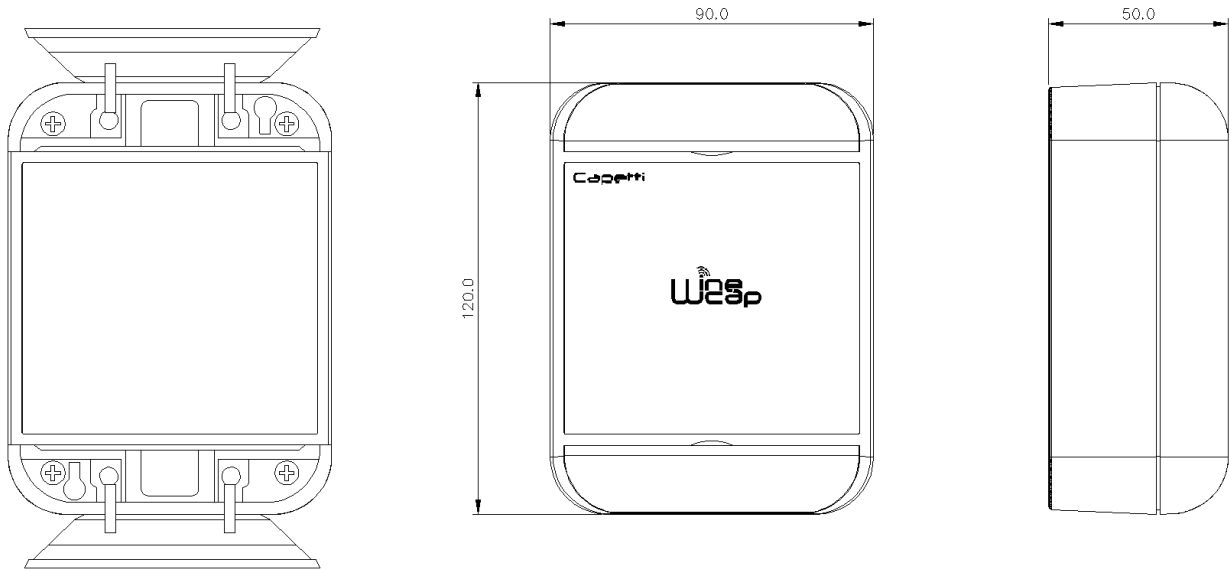
Power supply	8.5A/h - 3.6V type "C" lithium internal battery
Battery life (*)	Up to 10 years (samples every 10 minutes and radio signal quality at least sufficient)
Measures acquired (3 channels)	<ul style="list-style-type: none"> <li>Linear deformation</li> <li>Outdoor temperature</li> </ul>
Sampling interval (*)	Selectable from one minute to 24 hours (10 minutes default)
Datalogger capacity	64,000 samples
Working temperature	<ul style="list-style-type: none"> <li>Operative: -30°C ÷ +60°C</li> <li>Warehousing: -40°C ÷ +70°C</li> </ul>
Radio frequency	ISM 868MHz
Radio coverage 	Up to 6Km in line of sight (can be extended using <a href="#">WR12</a> battery powered routers)
Sealing	IP65
Dimensions	90x120x50mm
Weight	330g
Case material	ABS
Mounting	Fix on 4 points
Connections	Wireless/USB
Cable external diameter	4.7mm maximum
Copper wire section	0.05 ÷ 2.5mm <sup>2</sup> / ÷ 14 AWG
Linear deformation - Measure range (**)	25/50/100/400mm
Indoor temperature - Transducer type	NTC10KΩ
Indoor temperature - Measure range	-30°C ÷ +60°C
Indoor temperature - Measure accuracy	<ul style="list-style-type: none"> <li>± 0.5°C Range -30°C ÷ 0°C</li> <li>± 0.2°C Range 0°C ÷ +60°C</li> </ul>
Indoor temperature - Measure resolution	0.01°C

\* battery life may be influenced by fieldwork conditions, sampling interval and system configuration.

\*\* radio coverage reachable using up to 32 [WR12 routers](#) (maximum 16 for each path) between the device and the basestation.

\*\*\* refer to selected transducer's documentation. Setup DIP switches in proper way.

### 13. Mechanical dimensions.



Picture 9 - Mechanical dimensions



#### 14. Reference standards.

EN 61010 -1

For electromagnetic compatibility

EN 61000 - 3 - 2

EN 61000 - 3 - 3

EN 300 220 -2

EN 301 489 - 03

EN 61000 - 6 -1

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