1. Description.

The **WD04T** is a device to monitor radio signal level of wireless network thanks to the "Test Link Radio" function.

Is used to verify quality and range of radio signal in different measure points and to identify best positions for **WR12** repeaters if needed.

Picture 1 - Product Image

2. Wireless device user interface.

The user interface consists of a "virtual" button that can be activated using the *WineCapKey* and of a two-colors 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 3 - WineCapKey positioning*) shows device's sensible points.
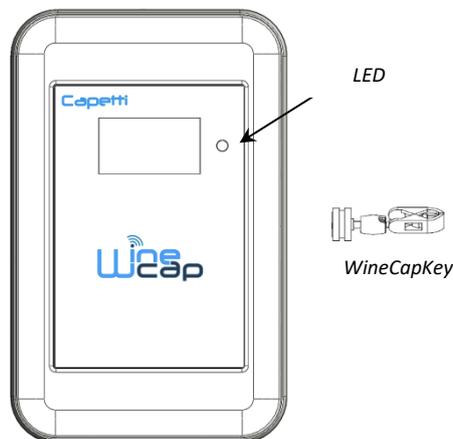
Picture 2 - WineCapKey positioning

The following __COMMAND__ table describes the available commands:

Flash count	Command	Description
1 flash	**STATUS**	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 (*refer to TEST command*) this command stops it.
2 flashes	**TEST**	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. __CAUTION__: Measures acquired during *TEST* phase are __NOT__ saved.
3 flashes	**ENROLL**	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 **basestation** (*refer to "WineCap System - User Manual R30"*).
4 flashes + 4 flashes	**STANDBY**	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 (*refer to "**WIRELESS MODE STATUS Table**"*).
5 flashes + 5 flashes	**FACTORY RESET**	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 (*ENROLL command*). 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 *refer to "**WIRELESS MODE STATUS Table**"*.
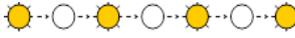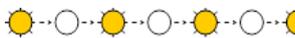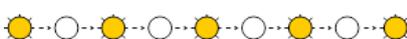
Picture 3 - Commands table

3. Enrolling the device.

Not necessary if performed in factory before delivery.

Enroll the device to the network referring to the "*WineCap System - User Manual R30*". In case the device is already enrolled but in *STANDBY* status, a *TEST* command must be issued (*refer to Picture 4 - Commands table*).

4. Installation procedure.

After installing the **basestation** in appropriate place in charge, (*refer to "WineCap System - User Manual R30"*), 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 4 - Commands table*)command: position the *WineCapKey* in the spot indicated in *Picture 3 - 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 second 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
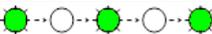
Picture 4 - Status table - Radio signal quality

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

If the signal is absent or insufficient at the install point, a *WR12 repeater* should be put between (*refer to "WineCap System - User Manual R30"*). The *WR12 repeater* itself must be 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 repeater*.

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 R30"*).

5. Displaying the WSN reference point.

When moving around the area covered by the radio signal, the **WD04T** probe will automatically connect to the *WR12 repeater* or to the **basestation** when the signal emitted by the previous reference is no longer adequate to ensure a stable communication link.

The display will show the wireless network address of the signal reference used at any time. The value "0" is reserved for the **basestation**, higher values correspond to *WR12 repeaters*.

During the enrolling process, the **WineCapManager** software assigns an address between 1 and 31 to the *WR12 repeater*. Taking note of this number and for the *WR12 repeater* position in the field is stronger recommended.

When the **WD04T** loses the connection, temporarily switches to "NO RF" status, then it connects to a new reference and refreshes the displayed details. The address is displayed on the screen:

RF signal (*notches*)

RF signal (*% or dBm*)

Battery charge

Radio reference address

Picture 6 - WD04T Display

6. Display selection button.

The display is typically off, to preserve battery life.

The button located below the display, corresponding to the **WineCap™** logo, can be used to switch the display on and show the tester status. By pressing it, three pages alternates on the display: indoor temperature, radio signal reading (*which persists during the radio test*) and the manufacturer logo.

During the test, when the signal level is displayed, the button allows to switch between showing the signal intensity as dBm or as signal percentage.

Press HERE
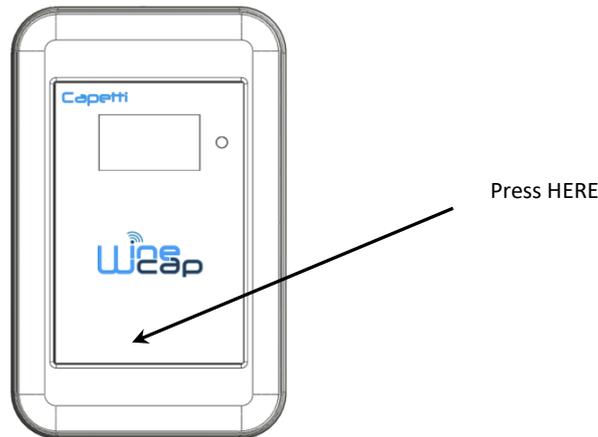
Picture 7 - Display selection button

7. Tester unenroll – enrol.

If many WSN plants are installed and the radio coverage of each of those systems must be tested, the **WD04T** device should be moved to the system to be tested. So, the **WD04T** must be "unenrolled" from the previous system and "enrolled" to the new one. The **WD04T** radio can communicate with only one WSN network at a time, so be sure that the enrolling process with the intended network has been completed successfully.

To unenroll the device, the "*Factory Reset*" process must be completed using the **WineCapKey** (*refer to "WineCap System - User Manual R30"*). Put the **WineCapKey** close to the sensible point and wait for five *AMBER* flashes, remove the **WineCapKey** away and put it close again and wait for further five flashes. The **datalogger** erases its internal memory and "*Factory Reset*" status is displayed.

To enrol the **WD04T** to another **basestation** a PC connection is necessary, and a new enrolling procedure must be allowed. Put the **WinecapKey** close to the sensible area and wait for three *AMBER* flashes. At the end of the procedure the display will show the "*Linked*" status.

By the **basestation** side, the **WD04T** is manages as a temperature **datalogger**; **WineCapManager** reports information regarding radio signal quality and battery charge. Delete the element from the list if not desired.

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 4 - Commands table*). It corresponds to the command number 4 and must be issued twice to confirm the operation.

Position the *WineCapKey* in the spot indicated in *Picture 3 - 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. Technical Information.

Power supply	2.4Ah - 3.6V type "AA" lithium internal battery
Battery life (*)	Up to 5years *(samples every 10 minutes and radio signal quality at least sufficient)*
Measures acquired *(2 input channels)*	• Diagnostic information and radio signal quality • Indoor temperature
Sampling interval *(*)*	Selectable from one minute to 24 hours *(10 minutes default)*
Datalogger capacity	8,000 samples *(for each channel)*
Working temperature	• Operative: -30°C ÷ +60°C • Warehousing: -40°C ÷ +70°C
Radio frequency	ISM 868MHz
Radio coverage	Up to 6Km in line of sight *(can be extended using WR12 battery powered repeaters)*
Sealing	IP30
Dimensions	105 x 65 x 18 mm
Weight	130g
Case material	ABS
Temperature - Transducer type	NTC10K
Temperature - Measure range	-10°C ÷ +60°C
Temperature - Measure accuracy	±0.2°C in whole range
Temperature - Measure resolution	0.01°C
Radio tester - Radio signal level	• In % or dBm - selectable
Radio tester - Radio reference indicator	• Net Id Basestation/Router
Radio tester - Display	• 128x64 pixels graphic OLED
Radio tester - Operative keys	• 1 - placed in the middle of Winecap™ logo

* battery life may be influenced by fieldwork conditions, measuring interval and system configuration.
** radio coverage reachable using up to 32 WR12 repeaters (maximum 16 for each path) between the device and the basestation.

10. Mechanical dimensions.
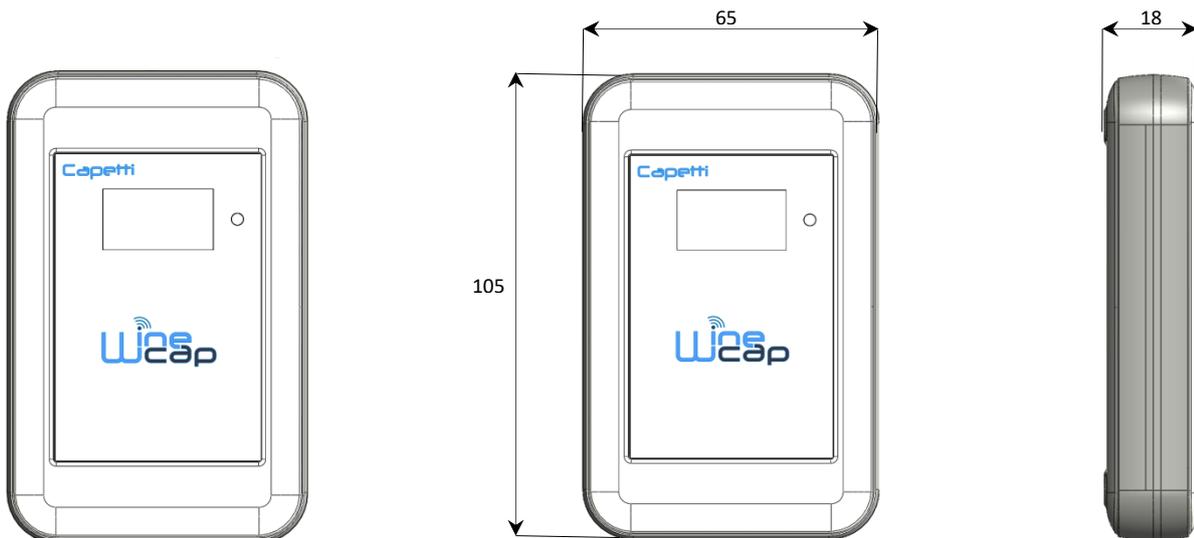
Picture 8 - Mechanical dimensions

11. 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

This symbol indicates that this product is compliant with the European Directive 2011/65/CE that restricts the use of substances in the manufacturing of electronic devices.

RoHs 2011/65/CE

The "WEEE" logo on the label indicates that this product is compliant with the "WEEE" EC Directive. This symbol (valid only in the European Union countries) indicates that the product it is applied to, MUST NOT be discarded with ordinary household or industrial waste, but must be sent to an authorized reception point. The end user should contact the device provider, either the manufacturer or the reseller, to agree a collection and disposal process, after having checked the terms and conditions of sale.

IT190200000111

The features shown may be subject to change without notice.

$C\epsilon$