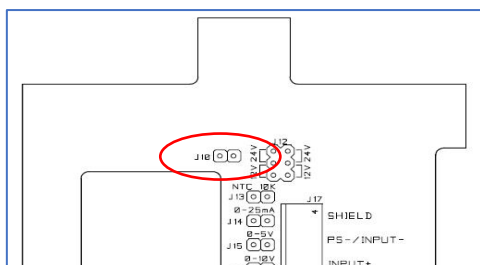WSD12PS-4AI

User Manual

Capetti ELETTRONICA

wine cap plus

General warnings.

- The following information must be read and understood before proceeding with the installation, commissioning and maintenance of the devices described in this document.

- <u>ATTENTION!</u> Any omission or failure to follow these instructions scrupulously can cause danger.

- <u>ATTENTION!</u> Explosion hazard. In case of batteries substitution, make sure that the type is compatible and complies with the specifications indicated by the manufacturer.

- In case of batteries substitution, <u>DO NOT</u> disconnect the flat cable which connect the electronic boards without removing batteries before

- ALWAYS substitute all the batteries, also in case of one single battery exhausted.

- During the installation/configuration procedure, disconnect the jumper 10 to avoid transducers or devices connected to the PS output (*Capetti's electronics is provided with short-circuit and over-absorption protections, but transducers can be damaged in case of wrong connections or inverted polarities*).


- If the device is powered by a fixed network, make sure you have disconnected the power supply before carrying out any type of intervention. Failure to comply with this indication can cause damage to people and/or property.

- Follow the manufacturer's suggested warm-up time (*time required to obtain a reliable measurement*) of the transducer.

- Follow the manufacturer's suggested electric wiring of the transducer to measure (*ground shields at a single point, cable length and section*); voltage measures on distances exceed 15/20 meters are subjected to electromagnetic disturbances. 0÷25mA inputs have a superior electromagnetic compatibility (*EMC*).

- Avoid passage in cavities with power or high voltage cables.

- The protection and safety measures and the warranty provided by the Manufacturer with the equipment may be compromised if it's used in a manner that does not comply with this user manual.

- This equipment complies with CE regulations.

- Modifications or tampering not expressly approved by the Manufacturer could void the user's authorization to operate the equipment.

- This equipment must be installed by qualified personnel and in accordance with national regulations and/or related local requirements.

- Make sure that the object is properly fixed to supports/infrastructures capable of withstanding this load. Make sure proper methods and materials are used when fixing the equipment to a wall.

- Only personnel expressly authorized by the manufacturer can open the container. There are no user serviceable parts inside.

1. Description.

The WSD12PS-4AI is a four analog inputs datalogger designed for voltage measurement (*0÷5Vdc, 0÷10Vdc, 0÷25Vdc*) or current (*0÷25mA*) selectable using jumpers, capable of powering external transducers with a 12Vdc or 24Vdc power supply (*up to 100mA distributed on 4 analog channels*). Measurements acquired are expressed in percentage of full scale.

Picture 1 - Product image

2. Channel description.
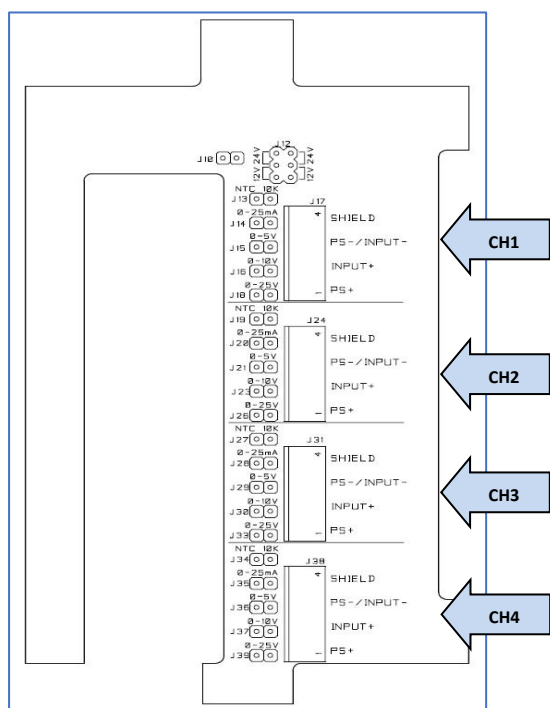
Picture 2 - Channel description

SHIELD: shield cable connection

PS-/INPUT-: datalogger generated voltage negative pole. Input signal negative reference.

INPUT +: Signal input. 0÷25mA, 0÷5Vdc, 0÷10Vdc, 0÷25Vdc. Full-scale selectable using scale jumpers.

PS+: datalogger generated voltage positive pole to power-up transducers with 12Vdc or 24Vdc @ 100mA selectable using *J12 jumper*.

3. Selecting the generated power supply

The device supplies for a specified time (*programmable warm-up time using WineCapManager – from 1 [default] to 32 seconds*) a DC voltage on PS+ pin of the terminal block. The value of the DC voltage can be selected using J12 (*Picture 3 – Jumper positions*):

	DC voltage generated for a specified time: 24Vdc @ 100mA
	DC voltage generated for a specified time: 12Vdc @ 100mA (*default*)

Picture 3 – Jumper positions

Removing jumper J10 (*Picture 2 - Channel description*), voltage generation on pin PS+ of the terminal block is disabled. This situation may be useful in case the DC voltage is not necessary. Consequently, the battery life is increased.

4. Full-scale setting

The measurement's full-scale selection, is done positioning a jumper on the proper strip:

	0÷25mA input (*default*)
	0÷5Vdc input
	0÷10Vdc input
	0÷25Vdc input

Picture 4 - Full-scale setup

The measurement acquired is displayed as percentage of the selected full-scale.

5. Measurement's scale impedance

Input	Input's impedance
0÷25mA	100Ω
0÷5V	24KΩ
0÷10V	16KΩ
0÷25V	13.333KΩ

*Picture 5 - Input impedance*

6. Warm-Up time

The device can be interfaced with different types of transducers and furnish proper power supply and guarantee the measure sample.

The transducer needs a warm-up time before physically performing a measure. The WSD12PS-4AI can be programmed using WineCapManager, to supply a warm-up time variable from 1 (*default*) to 32 seconds.

- Be sure that the device is linked to its gateway (*refer to 10 - Installation procedure.*)
- Run *WineCapManager* and open the plant related database. If the database doesn't exist and the gateway is not properly licensed on connected PC, refer to "*WineCap System - User Manual R31*".
- From the *WineCapManager* main window select the WSD12PS-4AI row
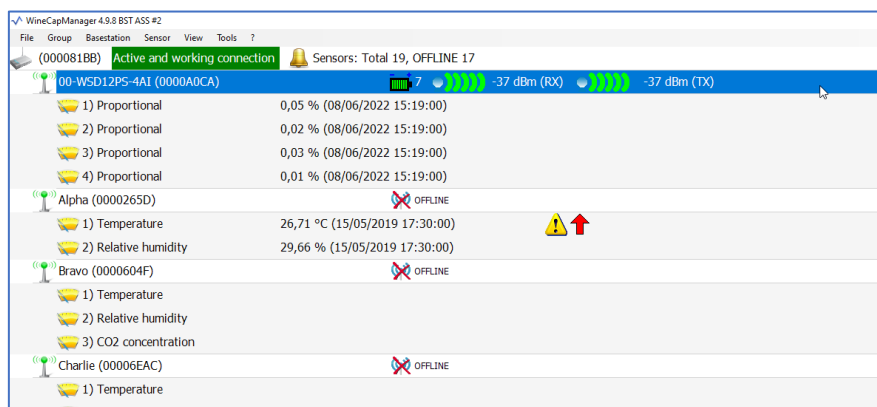
- From the drop-down menu "*Sensor*" select the item "*Properties*"
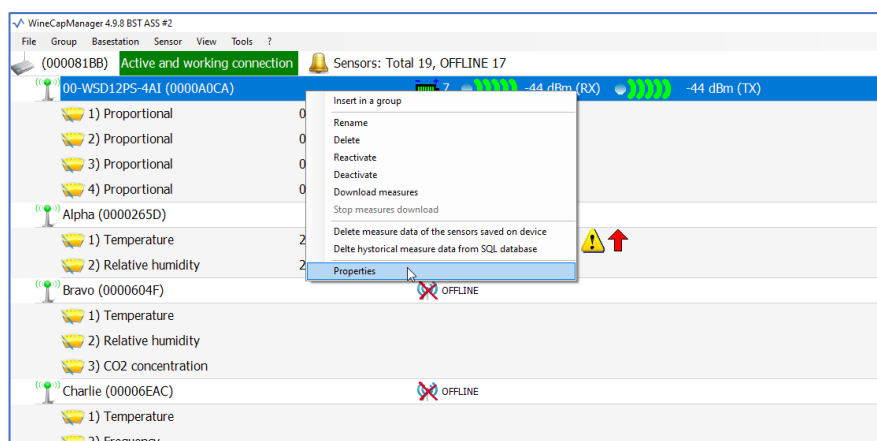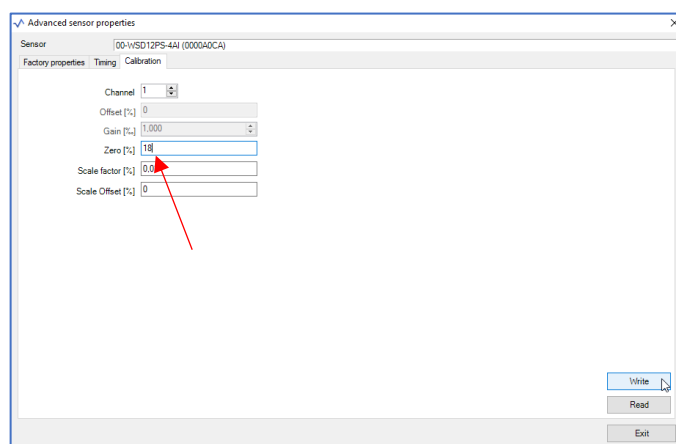

- Select the card "*Tools*"
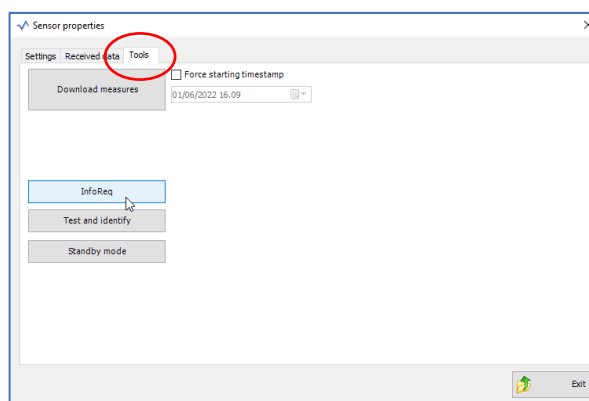
- Click on "*InfoReq*" button
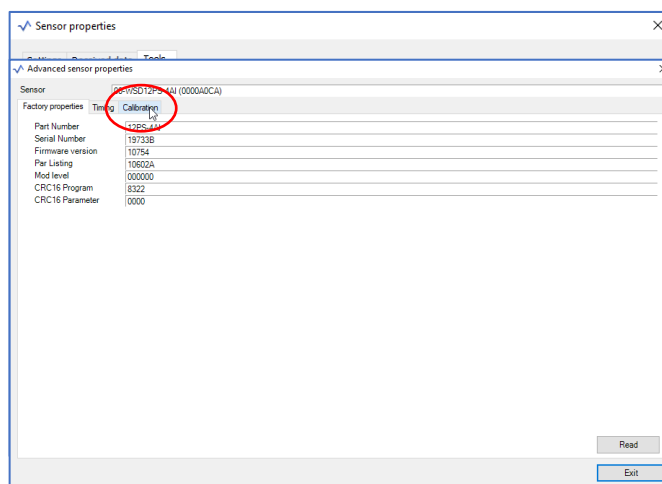

Select the card "*Calibration*"

- Modify the "*Zero [%]*" field with the desired warm-up value (*default=1 – maximum=32*). The inserted value is expressed in seconds and represents the duration of output power supplied to transducer (*net off +0,4s of tolerance*).

The following table shows different behaviours with different warm-up values:

Warm-Up value	Effetto
0	The device doesn't generate any voltage but, in any case, carries out the measurements.
>=1 <=32	The device generates a voltage for a period in seconds equal to the value inserted +450ms (*approximately*).
>32	The device sets-up the warm-up time to 32s and generates a voltage for a period of approximately 32.45s.
Decimal value	The device round down the inserted value.
<0	The device sets-up the warm-up time to 32s and generates a voltage for a period of approximately 32.45s.

- Save the new configuration clicking on "*Write*" button.
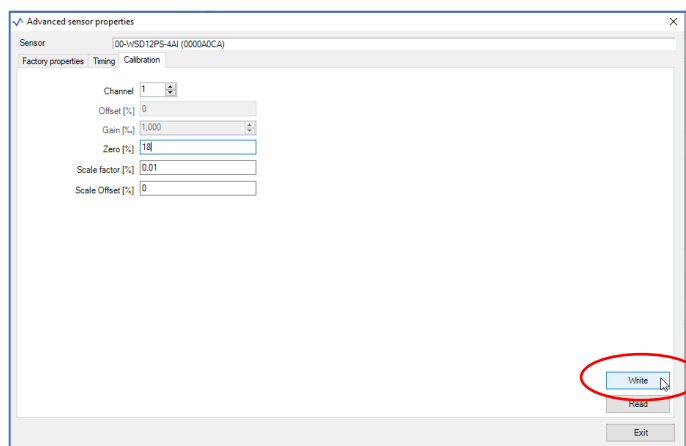
7. Device pre-set and use mode.

a. Wireless Mode:

No setup operation is needed. Typically, the system is configured in factory, so the device is already associated to the system gateway. The device is in **STANDBY** mode (*refer to Picture 7 - Command table*) for which is necessary to start it with the **TEST** command (*refer to 10 - Installation procedure.*).

Otherwise, in case the device is in **FACTORY RESET** mode (*refer to Picture 7 - Command table*), that means it's ready for connecting to an existing system, in order to associate it, make reference to the *"WineCap System - User Manual R31"* software manual. It is necessary to use the *WineCapManager* software on the PC connected to the gateway that will be linked 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 to modify the device 's operation mode. The sampling interval must be set with the device in **STAND-ALONE** (*refer to 11 - 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 11 - Stand-alone USB datalogger installation.*). More details on device 's connection/disconnection through the USB cable are available on the *WineCap System - User Manual R31* 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 gateway, starts a download process towards the same gateway of the measures acquired during the stand-alone period (*refer to Picture 9 - Stand-alone device - Status table*).

8. Wireless device user interface.

The user interface consists of a "virtual" button that can be activated using the *WineCapKey* and of a two-colours 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 6 - WineCapKey positioning*) shows device's sensible points.

LED
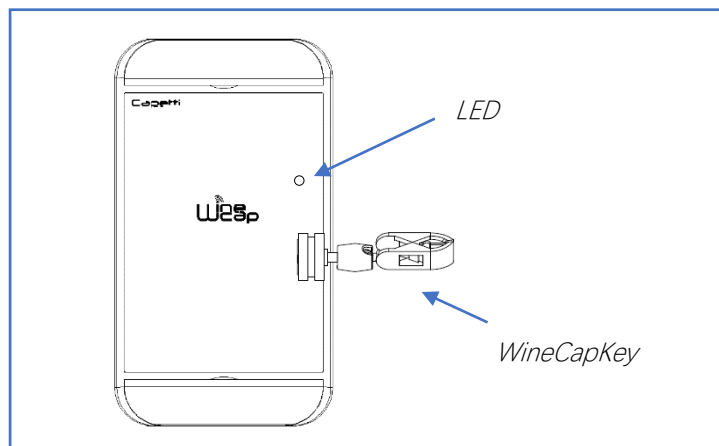
WineCapKey

Picture 6 - WineCapKey positioning

The following COMMAND table describes the available commands:

WIRELESS MODE COMMAND table

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 gateway (*refer to "WineCap System - User Manual R31"*).
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 "Picture 8 - Status table - Radio signal quality"*).
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 "Picture 8 - Status table - Radio signal quality"*).
5 flashes + 3 flashes	**LOGGER NO WSN**	As the previous command but performs only the WSN deleting procedure and disassociate from the gateway. The device enters 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 (*refer to "Picture 9 - Stand-alone device - Status table"*). A new association (*ENROLL command*) is possible to a new gateway.

Picture 7 - Command table

9. Device enrolment.

Not necessary if performed in factory before delivery.

Enrol the device to the network referring to the *"WineCap System - User Manual R31"*. In case the device is already enrolled but in **STANDBY** status, a **TEST** command must be issued (refer to *Picture 7 - Command table*).

10. Installation procedure.

After installing the gateway in appropriate place in charge, (*refer to "WineCap System - User Manual R31"*), be sure that the device is enrolled to the gateway 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 7 - Command table*) command: position the *WineCapKey* in the spot indicated in *Picture 6 - 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	ACTIVE - Radio signal: Excellent
	4 green flashes	ACTIVE - Radio signal: Good
	3 green flashes	ACTIVE - Radio signal: Fair
	2 amber flashes	ACTIVE - Radio signal: Sufficient
	1 red flash	ACTIVE - Radio signal: Insufficient
	1 red flash 2" long	OUT OF RANGE Network searching
	2 red flashes 2" long	STANDBY Radio off - No Logging
	Short-long-short red flashes series	FACTORY RESET Device not enrolled – No logging

Picture 8 - 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 *repeater WR12* should be put between (*refer to "WineCap System - User Manual R31"*). The *repeater WR12* 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 *repeater WR12*.

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 R31"*).

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

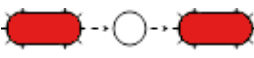# 11. Stand-alone USB datalogger installation.

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 7 - Command table*) and remove. The datalogger begins sampling according to your settings through your PC.

Through the *WineCapKey* is possible to ask for the status, bring it close to the datalogger for 1 flash (*STATUS*) and remove it.

STAND-ALONE DEVICE - STATUS TABLE 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 INVALID datalogger clock! PC connection required.

Picture 9 - Stand-alone device - Status table

12. 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 7 - Command 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 6 - 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.

13. Transducer's connection layout.
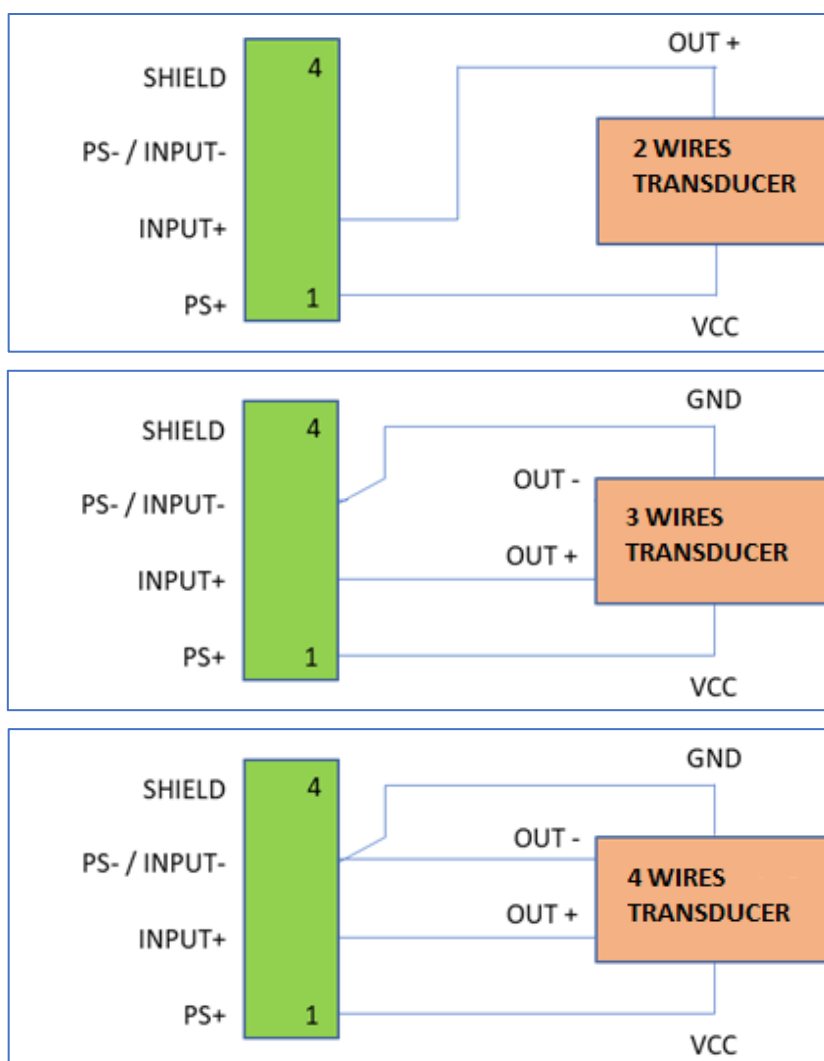
Picture 10 - Connections layout

14. Product versions

The device can be supplied in various versions, by the application.

The following table shows different features and identify the related ordering code.

	Warm-Up		Cable gland	Valve	CH1	CH2	CH3	CH4
	Default	Range	PG	Goretex				
WSD12PS-4AI	1 second	From 1 to 32 seconds	7	❌	Proportional	Proportional	Proportional	Proportional
WSD12PS-4AIM4	1 second	From 1 to 32 seconds	9	✅	Proportional	Proportional	Proportional	Proportional
WSD12PS-4AIM8	1 second	From 1 to 32 seconds	7	❌	Temperature (-30 ÷ +80°C) NTC3K	Proportional	Proportional	Proportional
WSD12PS-4AIM9	12 seconds	From 1 to 32 seconds	7	❌	0÷25mA	-	-	-
WSD12PS-4AIM10	5 seconds	From 1 to 32 seconds	9	✅	0÷25mA	0÷25mA	0÷25mA	0÷25mA

Picture 11 - Product code nomenclature

15. Technical Information

Power supply	Double 5,8Ah - 3,6 V type "C" lithium internal battery
Battery life (*)	Up to 3 years (with 100mA charge distributed on 4 analog channels, 1 second warm-up time, 12V or 24V power supply, samples every 60 minutes and radio signal quality at least sufficient)
Power supply generated for transducers	+12Vdc or +24Vdc (up to 100mA) - (Selectable onboard using jumpers)
Warm-up time	From 1 (default) to 32 seconds (Selectable using WineCapManager)
Sampling interval (*)	Selectable from one minute to 24 hours (60 minutes default)
Datalogger capacity	64,000 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	IP65
Dimensions	90x160x50mm
Weight	450g
Case material	ABS
Mounting	Fix on 4 points
Connections	Wireless, USB
Cable external diameter	4.7mm maximum
Copper wire section	0.05 ÷ 2.5mm² / ÷ 14 AWG
Measures acquired (4 channels) Possible Input Signals (up to 4)	0÷5Vdc, 0÷10Vdc, 0÷25Vdc, 0÷25mA
Measures acquired (4 channels) - Resolution	12 bits converter
Measures acquired (4 channels) - Measurement Expression	Expressed as full scale % setting
Measures acquired (4 channels) - Transducers Connection	Through 5mm pitch screw terminal blocks
Measures acquired (4 channels) Settings (measure/system of measure)	Using jumpers (***)

* battery life may be influenced by fieldwork conditions, sampling/measuring interval and system configuration.
** radio coverage can be extended using up to 32 WR12 repeaters (maximum 16 for each path) between the device and the basestation.
*** refer to selected transducer's documentation. Setup DIP switches in proper way.

16. Mechanical dimensions.
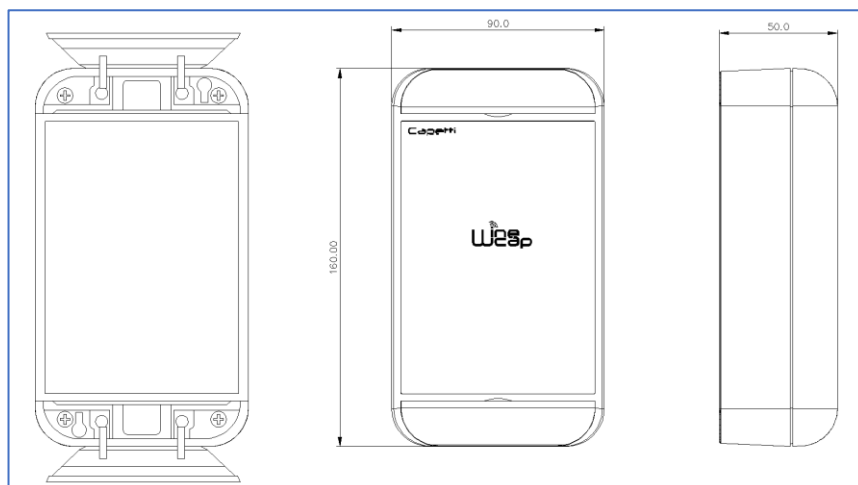
Picture 12 - Mechanical dimensions

17. Disclaimer.

- Specifications are subject to change without notice and should not be interpreted as a commitment on the part of Capetti Elettronica S.r.l.

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- The product is not intended for use in applications where safety is critical, such as life-security systems or medical-related applications.

- If a channel is saturated or disrupted "Frequency hopping" transmitting method allows data integrity and security, but correct functioning of the product in environments with high radio activity is not guaranteed.

18. 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.

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