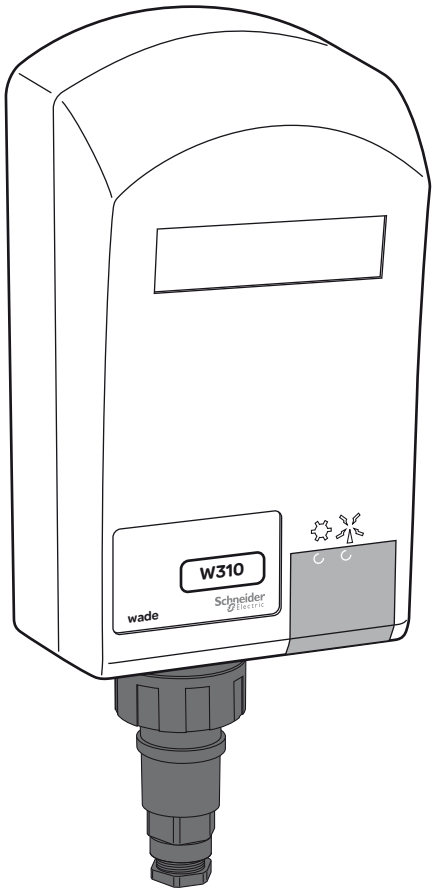
Remote Terminal Unit

W@de range

W310 (Brio)

Telemetry remote autonomous system

User's manual



Schneider Electric

Contents

Safety informations

Safety

NOTICE: **Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate or maintain it.**

The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not complied with.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

or DANGER

DANGER indicates an imminently hazardous situation, which, if not prevented, will result in death or serious injury.

or WARNING

WARNING indicates a potentially hazardous situation, which, if not prevented, **can result** in death, serious injury or equipment damage.

CAUTION

CAUTION indicates a potentially hazardous situation, which, if not prevented, **can result** in injury or equipment damage.

Disclaimer

NOTICE: **Electrical equipment should be installed, operated, serviced and maintained only by qualified personnel.**

Schneider Electric may not be held liable for any consequences arising out of the use of this equipment.

W310 security alert

WARNING

MOUNTING OF W310 (UL COMPLIANCE)

The W310 must be mounted vertically in order to offer the best protection against the spread of fire.
The W310 shall be installed and used on distance greater than 20 cm from human body.

WARNING

ONLY QUALIFIED PERSON TO OPEN THE EQUIPMENT

It's forbidden to open the equipment by an operator:
Battery or SIM card installation must be obligatorily carried out by the office, factory or a qualified person.

Failure to follow these instructions can result in serious injury or equipment damage.

Safety informations

⚠ CAUTION

PIN CODES INFORMATION

Before the insertion of the SIM card, you must check the correspondence between PIN codes or inhibit the PIN code of the card to be used.

Failure to follow these instructions can result in invalidate the SIM card. Then you will need to request the PUK code from the operator!

⚠ CAUTION

INSERTION OF SIM CARD

Never insert or extract a SIM card when W310 is in communication (indicator lit on or blinking).

Failure to follow these instructions can result in equipment destruction.

⚠⚠ WARNING

BATTERY REPLACEMENT AND RESPECT THE POLARITY

The W310 operates exclusively on a Lithium Thionyl Chloride battery (VITZROCELL SW-D02 or SAFT LSH20).
Replace only with the same model or an equivalent model proposed by the manufacturer.
The battery must be positioned correctly while respecting polarity inside the socket.

Failure to follow these instructions can result in serious injury or equipment damage and the W310 will have to be repaired in the manufacturer.

⚠⚠ WARNING

ELECTRICAL SHOCK RISK

All wiring must be carried out in accordance with industry standards.
NEVER ALLOW BARE WIRES TO COME INTO CONTACT WITH EACH OTHER.

The sensors or the power used with the W310 must answer specifications SELV (Safety Extra Low Voltage). They must be obligatorily installed by qualified personnel.

Failure to follow these instructions can result in death, serious injury or equipment damage.

⚠ CAUTION

RECOMMENDATION ON SENSORS CONNECTION

The total length wiring must not exceed 3 meters. The wiring must be twisted pair armed type to connect the sensor.

Failure to follow these instructions can result in equipment measurement failure.

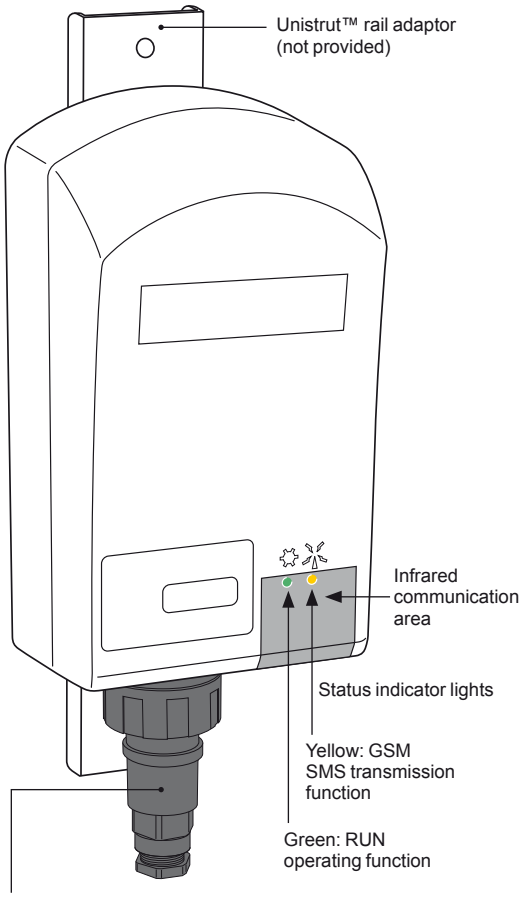
⚠⚠ DANGER

SENSORS INSTALLATION

This manual covers only W310. The installation of the sensors and the external elements is not the subject of this document. Imperatively contact the manufacturer as of these supplies to know the limitations of uses of their products.
Please refer to the applicable safety requirements on their use.

Failure to follow these instructions can result in death, serious injury or equipment damage.

Overview



Purpose

This document is the user manual for the W310 wireless local telemetry unit. W310 refers to the same product. In the following, only W310 will be used.

Presentation

W310 belongs to a generation of ultra-low power consumption data acquisition and transmission products that use the GSM network.

W310 is battery-powered, making it completely self-sufficient and extremely quick and simple to install.

W310 comes in a robust polycarbonate box which is highly resistant to adverse weather conditions and is connected to the signals it is monitoring by means of a waterproof connector. It has two indicator lights which indicate the device's operating status.

Main features

Operating temperature	Between –25°C and +60°C, between 0 and 90% humidity
Protection class	IP56 (IP40 for UL)
Dimensions	194.4 x 107.7 x 65.7 mm
Power supply	Lithium-thionyl-Chloride 3.6 V (size D) cell
Battery life	Up to 10 years depending on type of use
Connection	IP68 waterproof connector
Local link	IrDA infrared (9600 bauds no-parity 8 bits)
GSM	Quadri-band (850, 900, 1800, 1900 MHz)
GSM antenna	Internal
Digital inputs	■ 4 digital inputs usable as pulse counting (32 bits, 50 Hz, minimum pulse width: 10 ms) ■ Flow calculation, close contact time calculation ■ Measuring voltage: ~ 3.3 V ■ Reading current: ~ 3 µA
Analogue inputs	4 universal analogue inputs: ■ 0-100 mV, 0-1 V, ±10 V, ±10 Vpp ■ 0-20 mA, 4-20 mA (W310 is able to power sensors (supply voltage = 15 V)) ■ Resistor (0-2000 Ω), PT1000, PT100 (2 and 3 wire)
Other link	Modbus Master RS485 (1200 – 38400 bauds) W310 is able to power Modbus sensors (supply voltage = 15 V)
Measurement resolution	16 bits
Accuracy	< 0.1% (see features in detail)
Security	■ SIM card PIN number management ■ Configuration backed up in non volatile EEPROM memory and non-volatile RAM ■ “Watchdog timer” ■ Overvoltage protection and polarity reversal protection on input
Conformity	■ CE ■ UL61010-1
RoHS	Compliant

Overview

Self-sufficiency

W310 has been developed using ultra-low power consumption technology which enables it to be selfpowered for up to 10 years.
W310's self-powered lifespan is closely connected to the conditions in which it is used, especially transmission frequency. Schneider Electric Telecontrol can assess the probable lifespan of the battery according to the type of use to which it will be put. The table below indicates probable lifespans for several typical hypothetical scenarios:

SMS transmission frequency	Count frequency	Lifespan (average)
1 / month*	3 Hz	10 years
1 / week	3 Hz	8 years
1 / day	3 Hz	5 years

3.6 V Supply voltage	Consumption	Activities carried out by W310
Sleep mode	<30 µA	At 25°C, Clock running, 1 Hz counting on on-off inputs.
Read mode	<30 mA	Reading analogue channels (Except 4/20 mA and Modbus sensors)
GSM transmission mode	400 mA	Sending the SMS(s) (*)

(*) Real-life measurements have shown that the system can transmit more than 12000 SMS messages without a change of battery (the consumption in this test is essentially due to the communication).

Please note that by nature 4-20mA sensors cause a high level of consumption when supplied by the W310. The longer it takes for the sensor to stabilise, the higher the consumption will be.

Operating principles

W310 is based on simple operating principles:

■ **Programmable frequency acquisition and logging** of various physical measurements (metering, voltages, 4-20 mA sensing probes, temperatures, etc.). Note that W310 is able to supply power to 4-20mA sensing probes. After taking readings, the W310 then implements its alarm detection function.

■ **Programmable frequency transmission** (in SMS form) of the data logged. Data reception is provided by a master station such as Kerwin supervisor of Schneider Electric Telecontrol.
Note that in the event of an alarm, a transmission will be sent as soon as the alarm status is detected during a logging. To facilitate diagnostic of whichever element is in alarm status, the W310 transmits all data in the memory at the same time as it transmits the alarm.

■ **In sleep mode**
□ Real time “**Detection**” of changes in status of the digital inputs, with transfer to “Read” mode
□ **Pulse counting** (50 Hz max.) on all digital inputs.

■ **Programmable frequency diagnostic** of operating settings (Battery voltage, GSM signal strength, etc.): these settings are intended for monitoring and preventive maintenance of the equipment.

Note: to be able to receive SMS messages sent by W310, the master station must be equipped with a GSM modem in reception mode (cf. “Configuration of the Kerwin master station”).

Overview

Operating modes

W310 essentially operates in two modes, **“Sleep”** mode and **“Awake”** mode.
It is important to note that as W310 is an ultra-low power consumption product, it is in “sleep” mode most of the time.

Its functions are activated under the following conditions:
■ When it is the time programmed for acquisition or transmission
■ When the activating magnet is used (A sufficiently powerful magnet or the magnet located in the infrared interface)
■ When a change occurs on the status of one digital input (depending on the settings of the digital inputs).

In particular, the system cannot be activated by a GSM call, as this would involve a “standby” level of power consumption that would not be compatible with the lifespan of the battery. These energy saving principles have been adopted in order to obtain a maximal battery lifetime.

When the W310 is not in operation, for example when in transit, it can be set to **“transport”**mode. While this mode is activated, W310 doesn't perform any acquisition nor data transmission.

Function indicator lights

Two indicator lights are used to indicate the device's operating modes:

Light	Colour	Function	Notes
RUN	Green	Indicates the processor's activity: ■ In “sleep” mode, a very short flash every second. ■ In “transport” mode, one flash every two seconds. ■ Quick blink when the magnet is detected (local mode activation W310). ■ ON during acquisition and transmission periods. ■ During dialogue with Kervisu, flashes at each query during IrDA connection.	In sleep mode, the flash each second is only noticeable in semi-darkness; it is more visible on each minute.
GSM	Yellow	Indicates activity of the GSM function: ■ Short flash (1/10 s) each second during GSM communication. ■ "Long" signal (1s x 1) to indicate SMS successfully sent ending communication. ■ Variable length signal to indicate GSM reception strength (only when reading GSM signal strength).	During data transmission, the number of flashes corresponds to the time taken to transmit the SMS(s).

Installation

Prerequisites

Please refer to the W310 Installation Guide for the details of the installation steps.

In order to operate the W310, you will need:

■ **Kervisu software version 1.9.4.1** or higher with the configuration file for W310 used by Kervisu (Ref.: **KvBRIO_6_Fr.CFG** on the CD-ROM delivered with the product).

■ A **Kervin** master station, **version 4.1.X** or higher (applying a 3.6.2 patch to Kerwin version 3.6 will also allow SMS messages from W310 version 5 or higher to be received).

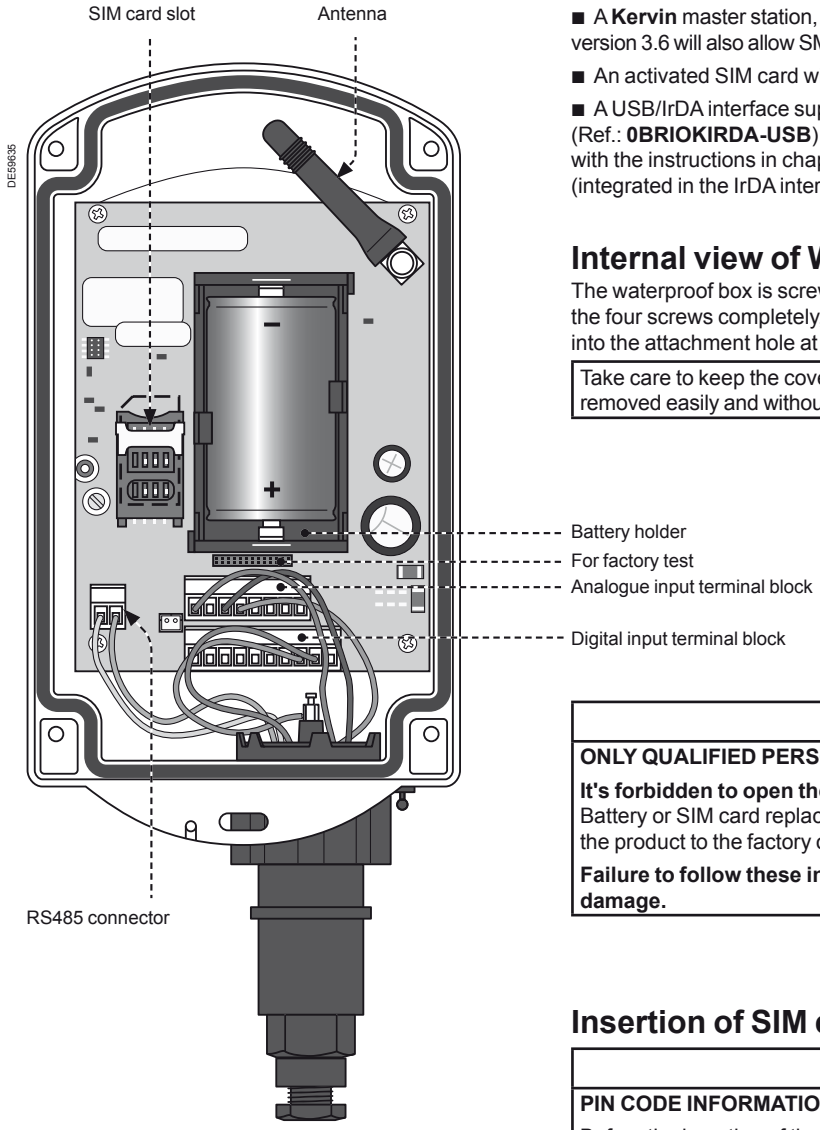
■ An activated SIM card with SMS capability.

■ A USB/IrDA interface supplied by Schneider Electric Telecontrol (Ref.: **0BRIOKIRDA-USB**) for which the drivers are loaded onto the PC in accordance with the instructions in chapter “Setting up the infrared / USB interface” and a magnet (integrated in the IrDA interface).

Internal view of W310

The waterproof box is screwed down using four head screws: after loosening the four screws completely, the cover can be removed by inserting a screwdriver into the attachment hole at the top.

Take care to keep the cover parallel with the box when removing, so that it can be removed easily and without damaging it.



⚠ ⚠ WARNING

ONLY QUALIFIED PERSON TO OPEN THE EQUIPMENT

It's forbidden to open the equipment by an operator:
Battery or SIM card replacement must be necessarily carried out by returning the product to the factory or by a qualified person.

Failure to follow these instructions can result in serious injury or equipment damage.

Insertion of SIM card

⚠ CAUTION

PIN CODE INFORMATION

Before the insertion of the SIM card, you must check the correspondence between PIN codes or inhibit the PIN code of the card to be used.

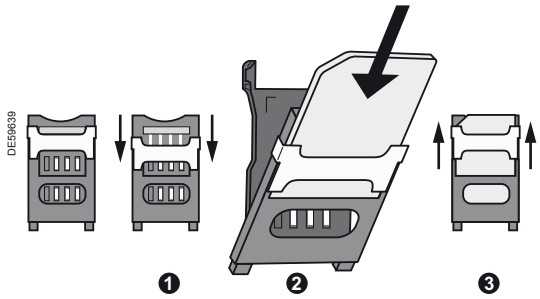
Failure to follow these instructions can result in invalidate the SIM card. Then you will need to request the PUK code from the operator!

⚠ CAUTION

INSERTION OF SIM CARD

Never insert or extract a SIM card when W310 is in communication (indicator lit on or blinking).

Failure to follow these instructions can result in equipment destruction.



❶ Unlock the SIM card slot by moving down the metal part to the bottom.

❷ Insert the SIM card inside the shutter.

❸ Pull down the SIM card shutter toward the support and lock it by moving up the metal part.

Installation
Connectors

⚠ ⚠ WARNING

ELECTRICAL SHOCK RISK

All wiring must be carried out in accordance with industry standards. NEVER ALLOW BARE WIRES TO COME INTO CONTACT WITH EACH OTHER.

The sensors or the power used with the W310 must answer specifications SELV (Safety Extra Low Voltage). They must be obligatorily installed by qualified personnel.

Failure to follow these instructions can result in death, in serious injury or equipment damage.

⚠ CAUTION

RECOMMENDATION ON SENSORS CONNECTION

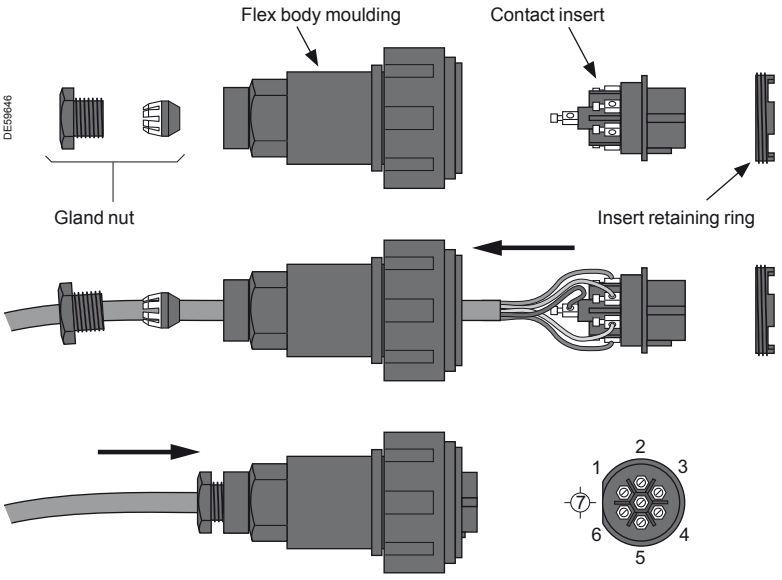
The total length wiring must not exceed 3 meters. The wiring must be twisted pair armed type to connect the sensor.

Failure to follow these instructions can result in equipment measurement failure.

(*) BUCCANER connector ref.: PX0745/S, Manufacturer: BULGIN (UK).
This connector is supplied as standard with the W310 but can also be ordered directly from Schneider Electric Telecontrol or via the electronic distribution system.

Connectors

The W310 is equipped with a 7-point IP68 fixed female connector (*) which can be screwed directly onto the ends of the cables, with no welding or crimping.
The connector can be detached using a screw-off (anti-clockwise) threaded bolt.



The 7 pins, which have their numbers printed in relief on the connecting piece, are for connecting to the signals that are to be read.

The 7 pins are connected to wires inside the box which are coloured according to the international code and can be wired to the terminal blocks when required. Schneider Electric Telecontrol delivers the W310 pre-wired according to various different standard schemes (The different schemes are described in the Appendices).

Analogue input internal terminal block

The detachable terminal block has 8 terminals. Each of the analogue channels corresponds to two terminals (signal and reference). The 4 analogue channels all have the same reference.
Reference screen-printed on the electronic card: ANALOG INPUT

Terminal no.	1	2	3	4	5	6	7	8
Printed ref.	A1(*)		A2		A3		A4	
Corresponding reading	Ana 1 signal	AGND	Ana 2 signal	AGND	Ana 3 signal	AGND	Ana 4 signal	AGND

(*) A1: Analogue Input 1

NB: please take note of the polarity of the signals, especially for sensors supplied by the W310 (two-wire sensors should be connected between the supply signal and the relative input, the sensor's + to the power, the sensor's – to the signal terminal of the channel in question).

NB: please take note of the correspondence between the physical signals and the software channels configuration. (See the channels configuration screens on Local configuration of W310 (Kervisu) chapter).

Digital input internal terminal block

The detachable terminal block has 10 terminals. Each of the inputs corresponds to two terminals (signal and reference). The 4 digital channels all have the same reference. It also has 2 terminals that can supply power to a 4-20mA sensing probe.
Reference screen-printed on the electronic card: DIGITAL INPUT

Terminal no.	1	2	3	4	5	6	7	8	9	10
Printed ref.	DI1		DI2		DI3		DI4		15V(*)	15V(*)
Corresponding reading	EL/Cpt 1	GND	EL/Cpt 2	GND	EL/Cpt 3	GND	EL/Cpt 4	GND	Sensor power	Sensor power

(*) For 4-20 mA and Modbus sensors.

Installation
Connectors

Connections for the various types of sensor

Digital Input or Counting

NB: the digital inputs are filtered by an RC/Hysteresis device, but they are high impedance in order to limit the power consumption; the reading voltage is approximately 3.3 V and the reading current is 3 µA.
The connected contact must therefore be potential-free and leakage-free.

Wire between DI (1 to 4) and GND internal block DIGITAL INPUT

4-20 mA Analogue Input

2-wire passive: sensor block	Internal W310 block
+	+15V (terminal 9 or 10, Digital Input block)
–	Ai (i = 1 to 4) (terminal 1, 3, 5, 7 on Analog Input block)

Active sensor block	Internal W310 block
+	Ai (i = 1 to 4) (terminal 1, 3, 5, 7 on Analog Input block)
–	AGND (terminal 2, 4, 6, 8 on Analog Input block)

Voltage, Resistance, Platinium sensor analogue inputs

Voltage sensor block	Internal W310 block
+	Ai (i = 1 to 4) (terminal 1, 3, 5, 7 on Analog Input block)
–	AGND (terminal 2, 4, 6, 8 on Analog Input block)

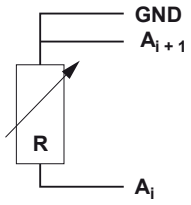
Resistance, Platinium sensor block	Internal W310 block
Terminal 1 (*)	Ai (i = 1 to 4) (terminal 1, 3, 5, 7 on Analog Input block)
Terminal 2 (*)	AGND (terminal 2, 4, 6, 8 on Analog Input block)

(*): any polarity

Modbus sensor

Modbus sensor block	Internal W310 block
Power +	+15V (terminal 9 or 10 on Digital Input block)
Power –	GND (terminal 2, 4, 6, 8 on Digital Input block)
RS485 +	RS+ (RS485 block 2 terminal)
RS485 –	RS- (RS485 block 2 terminal)

PT100 sensor – 3 wires:



Checks before starting

For your activation to run smoothly, you are strongly advised to check that the following conditions have been met:
Please note that the checks below are not required if the product has been factory pre-configured (the final quality control sheet will certify that the settings have been checked).

■ The battery installed should be brand new and not used at all (this can be quickly verified using a multimeter, which should give a reading between 3.6 V and 3.7 V). You are strongly advised to attach a label with the date on which the battery is first used.

■ The analogue signals that are to be connected are compatible with the inputs used (you should pay particular attention to the connection direction when connecting 4-20 mA sensors when these are being supplied by the W310).

■ The digital signals connected are completely potential free: zero voltage should be recorded at the start for each pair (before connection)..

■ The SIM card should be correctly inserted in its holder, which should be locked in place.

In order for the configuration and test to be carried out smoothly, ensure that:

■ The device is fitted with a SIM card for which the **account has been activated** (this can easily be checked by sending an SMS with the SIM card inserted in a mobile phone).

■ On the supervisor, a site has been created with a phone number corresponding to the one of the SIM card inserted in the tested W310 (this is the condition which determines that the data sent by W310 is registered). The number is usually provided by the network operator when the card is delivered. If you are unsure of the number, it will be displayed when an SMS sent from the SIM card is received.

NB: Kerwin versions 4.1 and higher allow autoconfiguration of a W310 site (in that case, the site is automatically created in Kerwin Supervisor with W310 phone number as soon as a SMS coming from that W310 is received).

Types of configuration

W310 has been designed to be set up very simply. There are two different configuration possibilities:

Factory pre-configuration

In this instance, commissioning on-site consists of connecting the signals, fixing the item in place and running a diagnostic transmission. The same method will be used for repeat installations where all the operating settings are pre-configured in advance (see details of the procedure in paragraph “Activating a diagnostic SMS send” of this chapter).

User configuration

This solution is more flexible and allows all the operating settings to be configured on-site. It requires use of a PC equipped with Kervisu software (Version 1.9.4.1 or higher). Details of the procedure and the different possibilities for configuration are given below.

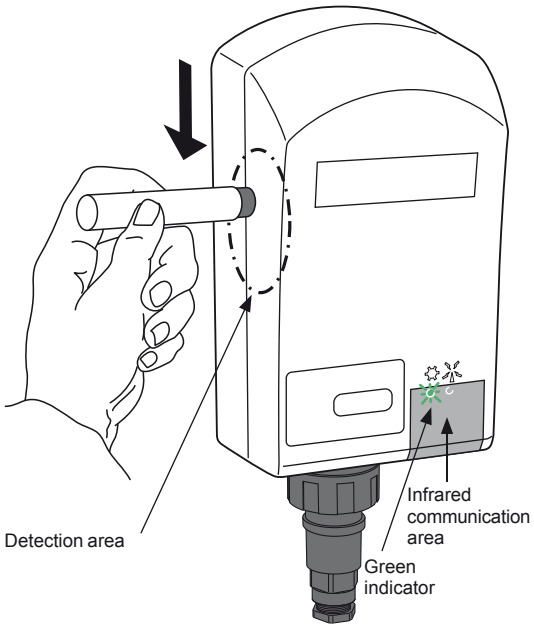
⚠ **In both case, W310 must be activated.**

W310 is delivered in the “transport” mode to prevent any energy consumption before commissioning. In this mode (one weak flash every 2 seconds), neither data capture nor SMS transmission is activated.

The operation described hereafter switches the W310 from the transport mode to the active mode and allows local communication.

Commissioning

Wake up W310 and local activation of the dialogue



Wake up W310 and local activation of the dialogue

The W310 is always in sleep mode except during acquisition and transmission phases, therefore it is necessary to activate it before being able to initiate a dialogue.

The port is activated by holding a magnet (located in the infrared interface supplied by Schneider Electric Telecontrol) against the left side of the device for a few seconds (5 s), as shown in the photo above. When the W310 is activated, **the green indicator light will go on.**

When the green light is on, the W310 is ready to dialogue with Kervisu, and you can then proceed with configuration according to the instructions in Chapter “Local configuration of W310 (Kervisu)”.

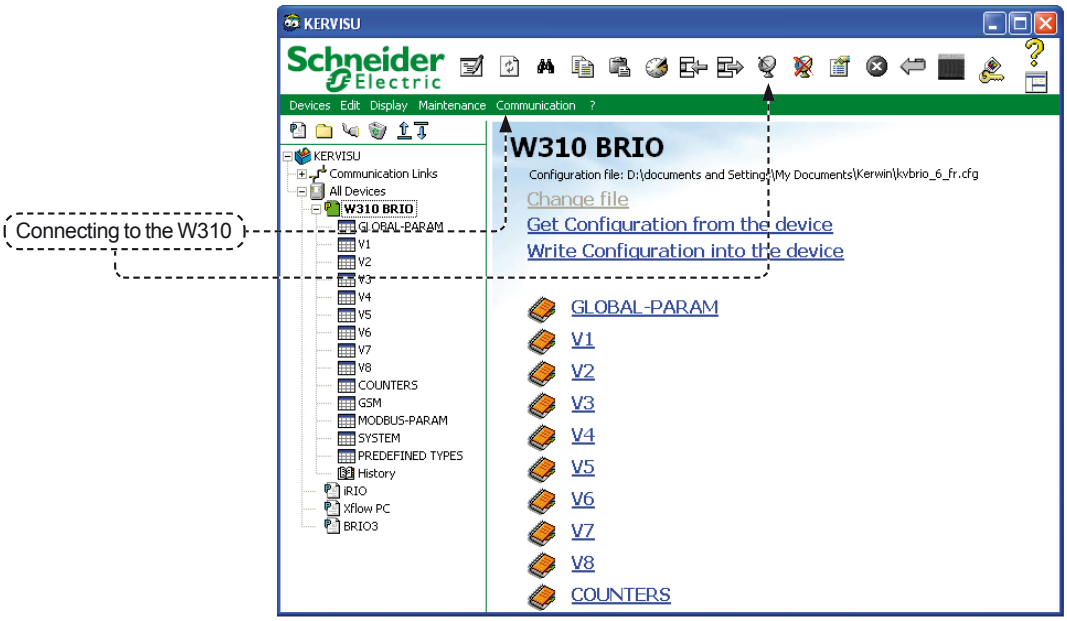
Please note that once it has been activated, the W310 will be in communication standby mode for 2 minutes. If there is no dialogue during that time, it will automatically revert to sleep mode. It will then need to be activated again in order to start the dialogue. When the green indicator light (on the left) is flashing, this shows that communication is in progress. The light changes status at each data exchange.

The infrared port is located near the two indicator lights to the right of the “W310” mark. It uses the IrDA protocol.

Schneider Electric Telecontrol provides a USB/IrDA cable as standard, which can be used on any PC that has a USB port. As with all USB devices, it requires drivers, which need to be installed as per the procedure described in appendix.

The Kervisu connection is carried out either by clicking on the , or by selecting “connect” from the “communication” menu, as shown in the screen shot below. The icon should then change colour and you will be able to choose one of the pages suggested: “configuration”, “channel 1” , etc. If the connection icon (dish aerial) does not change colour, it means the infrared cable is not connected or Kervisu has not been correctly configured (see chapter Appendices).

NB: from version 1.10.0.0 of Kervisu, the IrDA link must be positioned in order to communicate with the W310 awake to allow the connection.



The following indicates that communication between Kervisu and the W310 has been successful:

- The values on the various screens are refreshed and appear in bold.
- The green light on the W310 flashes simultaneously with the data exchange.

Note: the link will only be established if the pre-requisites mentioned in page 9 have been met, especially setting up the infrared interface on the PC, and registering the W310 in the Kervisu configurator (cf. Appendices).

Activating a diagnostic SMS send

NB: since it is coded, a diagnostic SMS can only be sent to a suitable supervisor (Kerwin type); it is no sense to send a diagnostic SMS to a cellular phone (except for tests).

Definition of a diagnostic SMS

A diagnostic SMS can be sent automatically at a programmable frequency or on demand.
Diagnostic data are intended for monitoring and preventive maintenance of the W310 equipment.

A diagnostic SMS includes:
- The current values of the configured variables
- The diagnostic values (system data available on every W310).

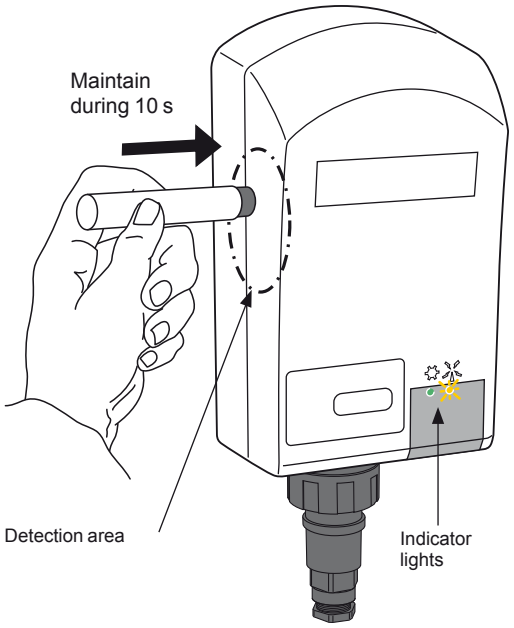
In the SMS, diagnostic values are identified with a 2 letters mnemonic.
Kerwin supervisor matches these mnemonics with comprehensive labels (those labels identify the W310 system variables on Kerwin supervisor side).

Each label has a default value but can be changed as the user wants.
The relation between the mnemonic and the label is specified in the KERWIN32.CFG file (which stands in the Kerwin32 installation directory) in the [Brio diagnostic] section.

Mnemo	Corresponding label in Kerwin supervisor	Description
RL	**R**adio **L**evel	GSM received signal strength (in dBm)
BL	**B**attery **L**evel	Minimum voltage reading of the battery during the previous data transmission phase (in Volts)
SV	**S**oftware **V**ersion	Numeric value for the software version (e.g.: 510 => 5.1.0)
SA	**S**end **A**ttempts	Number of attempts at sending SMS
SS	**S**MS **S**ent	Number of SMS actually sent to the GSM network
MC	Gaz Consumption	Calculation of the total amount of energy consumed from the delivery of the W310 (x 100 µA)
SE	**S**ystem **E**rror	Numeric value of the last system error (See system error table)
ST	**S**ession **T**ime	Total number of seconds the W310 modem has been taking to send SMS
LC	**L**ast **C**onfiguration	Date of last change in the W310 configuration
NV	**N**umber of **V**ariables	Maximum number of variables (usually 8)
SN	**S**erial **N**umber	Serial number
AV	**A**pplication **V**ersion	Numeric value corresponding to the configuration loaded in the W310 before the delivery
SR	**S**MS **R**eceived	W310 received SMS counter
OP	**OP**erator ID	Operator ID number ■ MCC: first 3 digits (Mobile Country Code) ■ MNC: 2 last digits (Mobile Network Code) The information sent within a diagnostic SMS concerns the operator to which the W310 is registered when the SMS is sent. This operator code is memorized on the W310 and is displayed on Kervisu GSM page
RT	**R**egistration **T**ime	This field represents time in seconds encountered between the modem start (beginning of the SMS session) and the registration on a network
CB	**C**urrent **B**ands	This field represents the frequencies band or the group of two frequencies bands chosen by the modem to register on the network. This field is transmitted on a numerical format and matches a field of bits defining the different frequencies which are compatible with the modem. 1 : 0000 0001 GSM 900 MHz 2 : 0000 0010 GSM 1800 MHz 4 : 0000 0100 GSM 1900 MHz
CI	**C**ell **I**dentification	Cell ID number. This information is transmitted in a decimal format (unsigned 4 bytes (2 words)): ■ 1st word : LAC: Location Area Code. In each network, cells are grouped by geographical regions which are attached to a LAC. These regions can be more or less big depending on the density of the covered surface, on average some dozens of kilometers. ■ 2nd word: CI: Cell ID Inside a LAC, each cell owns a unique ID (CI). Information transmitted on a diagnostic SMS matches the cell where the W310 is registered at the moment when the SMS is sent.

Note: diagnostic values OP, RT, CB and CI are valid from W310 firmware version 6.20 and higher.

Commissioning
Activating a diagnostic SMS send



When the W310 has been factory pre-configured

A factory pre-configuration means that Schneider Electric Telecontrol will have all the configuration data relating to the site for which the W310 is to be used:
- What signals are to be connected to the W310 (which determines which channels will be registered, along with their type)
- The frequency with which the data acquisitions are to be carried out
- The frequency with which the readings will be transmitted by SMS
- The SIM card's PIN number
- The receiving telephone number(s) for the SMS messages.

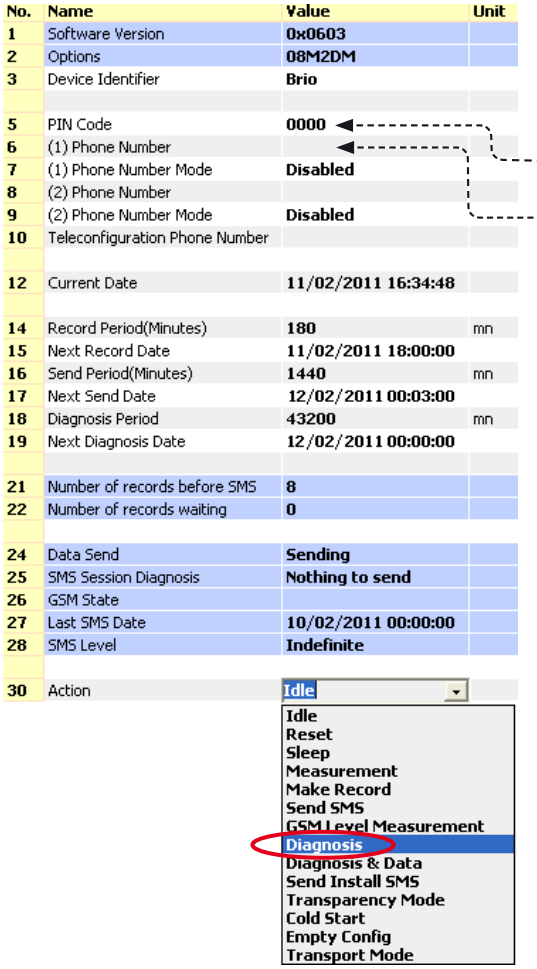
The customer will also have provided Schneider Electric Telecontrol with the SIM card and requested its activation in order for Schneider Electric Telecontrol to insert it at the factory before delivery.

If all the above conditions have been met, you simply need **to hold the activating magnet in position for at least 10 seconds** in order to activate the following actions:
- Acquisition via the registered channels
- Sending a diagnostic SMS
- Sending a diagnostic SMS including:
  - values of the configured channels
  - values of the diagnostic parameters.

When the green LED flashes (5 Hz), this shows that W310 has detected the presence of the magnet.
One flash per second of the yellow LED indicates that the request for a diagnostic SMS has been registered and is being transmitted.

If the SMS transmission is successful, the final flash lasts for a whole second.

If however the transmission is not successful, the W310 will retry for a further 2 minutes, after which it will abandon the attempt. It will only retry again if:
- The current date is a logging date.
- The diagnostic procedure is reactivated (you must wait until W310 has returned to sleep mode – one flash per second on the green LED).



When the W310 has not been factory pre-configured

In this case, before being able to carry out a test SMS transmission, you will need to make the local connection (with Kervisu) (see chapter "Wake up W310 and/or local activation of the dialogue"), so as to configure the settings which until will enable an SMS to be transmitted:
- Be sure that at least one measurement channel is configured (see Channels 1 to 8 screen)
- The SIM card's PIN code
- The phone number to call for the Kerwin supervisor (if there is no mobile phone number)
- Enter the PIN code
- Enter the Kerwin receiving number for the SMS, along with its mode (Data or Data + Alarms)
- In the "Action" field, select the command "Diagnostic"
- An SMS will be prepared and sent; you can track the send status in the "GSM action" and "Session diagnostic" fields.

Local configuration of W310 (Kervisu)

Configuring using Kervisu

The W310 is configured using Kervisu, on a PC equipped with the infrared interface cable.

This guide gives details of:
- The installation procedure for the infrared interface, chapter Appendices.
- The procedure for registering W310, chapter Appendices.
- The procedure for activating W310's to communicate with Kervisu, chapter "Commissioning".

All the actions needed for configuration are carried out under 4 section headings, which correspond to the four screens described below:

Configuration screen
This is where all the general operating settings are defined (names, logging and transmission frequency, telephone number, etc.).

Channels (1 to 8) screen
This is where the variables to be logged are defined: their names, types, slope, shift, modes and alarm thresholds.

System screen
For the system control (traceability) and system settings.

Counters screen
Where the indexes for the digital input counters (DI1 to DI4) can be pre-loaded, whether they are used for pulse counting or time counting.

Various commands can also be run from these screens, such as SMS send, reading GSM reception signal strength.

Just to remind you…

Kervisu is the configuration tool for W310 products.

All the device's operating settings can be displayed in Kervisu. This paragraph is intended for users who have not used it before:

Communication can only take place if Kervisu is in connected mode

(click on the corresponding icon  , see chapter Commissioning ➡ Wake up W310 and local activation of the dialogue).

Local configuration of W310 (Kervisu)

Configuration screen

NB: all the modifiable fields need to have values entered which are consistent with one other, even if they are not going to be used. You are advised to use short titles, as these are the titles which will be transmitted in the SMS messages.

No.	Name	Value	Unit
1	Software Version	0x0603	
2	Options	08M2DM	
3	Device Identifier	Brio	
5	PIN Code	0000	
6	(1) Phone Number		
7	(1) Phone Number Mode	Disabled	
8	(2) Phone Number		
9	(2) Phone Number Mode	Disabled	
10	Teleconfiguration Phone Number		
12	Current Date	17/02/2011 16:10:48	
14	Record Period(Minutes)	180	mn
15	Next Record Date	17/02/2011 12:00:00	
16	Send Period(Minutes)	1440	mn
17	Next Send Date	18/02/2011 00:03:00	
18	Diagnosis Period	43200	mn
19	Next Diagnosis Date	31/02/2011 00:00:00	
21	Number of records before SMS	8	
22	Number of records waiting	0	
24	Data Send	Ended Session	
25	SMS Session Diagnosis	Nothing to send	
26	GSM State	Repos	
27	Last SMS Date	17/02/2011 00:00:00	
28	SMS Level	Indefinite	
30	Action	Idle	

Name	Modifiable	Description
Software version	No	Version number of the W310 application software. This number should match the version of the configuration file used (KvBRIO_6_En.CFG)
Options	No	Character string defining the various software options.
Device identifier	Yes	7-character serial number for identifying the W310.
PIN code	Yes	The W310 is capable of managing the PIN code, which is a **4-character** code. It is **ESSENTIAL** that the code corresponds to the code belonging to the card that is being used
(1) Phone number	Yes	Telephone number (maximum of 12 digits, without spaces)
(1) Phone number mode	Yes	Transmission mode for 1st number, between: ■ **None:** no transmission ■ **Data:** transmission of data to the (Kerwin) master station ■ **Data + Alarms:** transmission of data and alarms to the (Kerwin) master station ■ **Text alarms:** transmission of alarms in SMS form to a mobile phone. Note that Kerwin **does not read SMS text messages**.
(2) Phone number	Yes	Telephone number for a second recipient of data transmission if required.
(2) Phone number mode	Yes	Transmission mode for 2nd number
Teleconfiguration phone number	Yes	This is the master station from which the remote configuration operations are carried out. W310 answers to Teleconfiguration SMS: ■ Either to the phone number mentionned in this field ■ Or to the sender of the teleconfiguration SMS. The Teleconfiguration tool, can specify in the SMS it sends to the W310 which telephone number should receive the answer of the W310 (the one specified in this field (default) or another one specified in the Teleconfiguration SMS).
Current date	Yes	Enter in the format dd/mm/yy hh:mm:ss (*)
Record period	Yes	Number of **minutes** between each logging of the variables being measured (Programme between 1 and 10080, equivalent to 7 days max.). NB: when the logging interval is changed, the logging memory is cleared; when this happens, you are therefore advised to run a send if you do not wish to lose any data.
Next record date	Yes	Enter in the format dd/mm/yy hh:mm:ss (*) This enables the date for the first logging to be set. After a logging, or when the logging interval is changed, W310 automatically updates the date.

Local configuration of W310 (Kervisu)

Configuration screen

Name	Modifiable	Description
Send period	Yes	Number of **minutes** between 2 regular transmissions. This number should be a **multiple** of the logging interval. W310 automatically limits the number if the value entered is too high for W310's storage capacity.
Next send date	Yes	This variable tells the user the date of the next SMS message(s) transmission. This date is especially useful for synchronising the transmission date to a precise schedule. It will be repeated for each transmission, except if there is an alarm or the file is full. The date should coincide with a logging date. E.g.: if a logging interval of 60 mins is specified, with a transmission interval of 1440 mins (1 day) and a transmission time of 05h00, the transmission will take place every day at 5am.
Diagnostic interval	Yes	Number of **minutes** between 2 diagnostic transmissions (see chapter Overview ➡ Operating principles)
Date of next diagnostic	Yes	Date and time of next diagnostic; the date entered must correspond to a scheduled transmission date.
Number of logs before sending the SMS	No	This refers to the relationship between the transmission interval and the logging interval. In other words, the number of logs sent with each transmission (when there is no alarm situation).
Number of logs ready to send	No	Number of logs present in the system memory which have not yet been sent.
GSM action	No	Indicates the status of the GMS function, which will be either: ■ **Data not sent** ■ **Send in progress** ■ **GSM standby mode:** wait during a configurable temporization (precede the reading of received SMS) ■ **SMS search:** look for the SMS stored in the SIM card or in the modem. ■ **SMS processing:** SMS processing and deletion ■ **Complete session:** the device has terminated the last command to be sent to the GSM network. The result is shown under the section "GSM Diagnostic". ■ **GSM signal strength:** the device is reading the GSM reception signal strength.
GSM diagnostic	No	Gives the result of a transmission request (automatic or manual): ■ **-------- :** Diagnostic not yet determined ■ **Nothing to send:** no recipient configured or no variable declared ■ **SIM card problem:** SIM card not present or not detected ■ **Wrong PIN code:** failure when writing the PIN code ■ **PIN code problem:** there is less than 3 tries left for entering the PIN code, as a result **SMS sending is locked** (to unlock the W310 PIN code protection and allow again SMS sending see chapter Local configuration of W310 ➡ GSM screen) ■ **Wrong tel. number:** no telephone number or bad format ■ **Send failure:** the SMS sending is interrupted by the W310 after 3 minutes ■ **SMS sent:** the last SMS requested was transmitted to the network ■ **Too many failures:** after 4 successive sessions of SMS sending having failed, the sending of SMS is blocked (the number of failure is set to zero every day at 12am and 12pm). However it is possible to force the sending of SMS at any moment by using the commands (Send SMS, Diagnostic,...).
SMS state	No	Shows the status of the SMS transmission dialer.
Date of last SMS transmission	No	Shows the date when the last SMS was sent.
GSM level	No	Shows the reception strength at the transmission of the last SMS or in real time during the test GSM strength command. The reception quality is shown as one of the following: **Very good; Good; Medium; Weak; Very weak; Too weak** The objective measurement in decibels (dBm) is also given for the memory., This varies between – 51 dBm (very strong signal) and – 110 dBm (very weak signal). The dBm is the usual unit of measurement of electromagnetic field strength. It is equivalent to 10*LOG(P) where P is the power received expressed in milliwatts.
Command	Yes	This refers to a menu which allows you to send various commands to the device. To do this, click on the field, select the command you require and wait for it to run before using another command. The most frequently used commands are: **Read channels; Test GSM strength; Send SMS; Sleep; Etc.** Details of these commands are given in the command table below

(*) : Depending on the date format selected (Kervisu: Devices – Options – Time and Date format, Format type).

⚠ **IMPORTANT**
Some special characters must not be used for the titles, otherwise the SMS messages may not be sent.
The following characters can be used: **@ _ - : ' / =**
Do not use the following characters: **# 2 & \ ? % + ( ) ''**

Local configuration of W310 (Kervisu)

Configuration screen

Table of commands

Name	Description
Idle	No command running The field assumes this value as soon as a command has been processed.
Sleep	Tells the device to return to sleep mode (if there is no transmission or measurement in progress); it will return to awake mode: ■ When activated (See chapter Commissioning ➡ Wake up W310 and local activation of the dialogue) ■ If the current date is a logging date ■ When activated by a magnet.
Measurement	The W310 gets the data from the channels; each time this command is run, the values for the different channels will be displayed in the value field on each channel screen. This command can be used to check the wiring and that the sensors are functioning properly.
Send SMS	The device sends the waiting data to the master station. This command should be run when you wish to transmit data that is ready to the master station. ⚠ If a “send SMS” command is run when there are no logs waiting to be sent, W310 will not send any data, but will send a Diagnostic SMS. **This command can be used to unblock a blocked GSM transmission (diagnostic: too many failures)**
GSM level measurement	The device reads the GSM signal strength for approximately 2 minutes. The value appears in the “GSM strength” field. It can also be seen from the GSM indicator light, which lights up in proportion to the signal strength (the longer the light is on, the better the signal quality).
Empty configuration	All the settings return to their “Factory” configuration. **NB:** it is essential that this command is run after inserting a battery if the device has been without a battery for several minutes, especially when first activating, if the battery is delivered separately.
Transport mode	Places the W310 in sleep mode. It can only be activated using the magnet, as outlined (see chapter Commissioning ➡ Wake up W310). This mode is used to reduce power consumption and to prevent any transmission attempt.
Diagnostic	Initiates send of a diagnostic SMS (diagnostic data + variable current value)
Diagnostic & Data	Initiates send of a diagnostic SMS and data to send
Send install SMS	Send diagnostic data + install data (software version, options,…) + variable current value
Transparent mode	Used during maintenance for direct dialogue with the GSM module
Reset	Used during maintenance, in particular when loading a new software version

Local configuration of W310 (Kervisu)

Channels (1 to 8) screen

NB: the titles entered on this screen are restricted to 7 characters, so as to avoid lengthy SMS transmissions; a longer, more explanatory title can be entered in the Kerwin master station.

No.	Name	Value	Unit
1	Current Date	17/02/2011 ...	
2	Action	Idle	
4	Var.Name	V1	
5	Unit		
6	Var.Type	None	
8	Value	0,000000	
9	Status	OK	
11	Slope	1,000000	
12	Shift	0,000000	
13	Data Format	0.	
14	Stabilization Time	20	100ms
16	Alarm Type	None	
17	Hysteresis	0,000000	
18	Upper Threshold	0,000000	
19	Lower Threshold	0,000000	
20	Upper critical level	0	
21	Lower critical level	0	
22	Send critical level	No	
23	Upper Class	Upper	
24	Lower Class	Lower	
25	Send Class	No	
27	Alarm Date	01/01/2011 ...	
28	Value in Alarm	0,000000	
29	Alarm State	OK	
30	SMS Status	OK	
32	Predifined Type	-------	
33	Type Name		
34	Predifined Type Status	Original	

Name	Modifiable	Description
Current Date	No	Date and time on W310's real time clock
Action (Command)	Yes	See the table of commands previous page
Var. Name	Yes	Channel title, maximum 7 characters long. This title is transmitted in full to the master station; therefore you are advised to choose very short titles.
Unit	Yes	Unit used for display (5 characters maximum) and during transmission of an alarm in SMS text format.
Var. Type	Yes	This refers to the type of channel, selected from the list of available types which is described in chapter following page. NB: if this field is set to "None", it means that this channel is not in use by W310 (no readings or transmissions associated with the channel).
Value	Yes	Value of the variable at the last reading. The value as displayed takes into account the type, slope and lag.
Status	No	Indicates any anomalies encountered during acquisition of the variable (e.g. Modbus timeout for digital sensors).
Slope	Yes	Coefficient to be applied to the value to bring it in line with the required units. The default slope value is 1. The slope is used particularly for 4-20 mA sensors, as it enables the sensor's scale to be defined. For 4-20 mA types, the value is given between 0 (4 mA) and 1 (20 mA). For example, if you are using a 600 bar pressure sensor, a slope of 600 will provide the value directly in bars.
Shift (Lag. Offset)	Yes	Lag to be applied to the value. The lag is usually nil and allows sensor errors to be corrected.
Data format	Yes	Indicates the format in which the values for this channel will be sent (during transmission of the readings history (to the supervisor) or of alarms (to the supervisor or to a mobile phone as an SMS text message). The choices available are: 0.: whole number 0.0: floating point number with one decimal place 0.00: floating point number with two decimal places 0.000: floating point number with three decimal places.

Local configuration of W310 (Kervisu)

Channels (1 to 8) screen

Name	Modifiable	Description
Stabilization time	Yes	Supply time of the sensor in 1/10 s (+15V) before acquisition
Type of alarm	Yes	Choose from the 4 possibilities: ■ **None:** no alarm has been transmitted ■ **Min:** W310 recognises two bottom thresholds: the upper and the lower (lowest) ■ **Max:** W310 recognises two top thresholds: the upper (highest) and the lower ■ **Min-Max:** W310 only recognises one top (the upper) and one bottom threshold (the lower).
Hysteresis	Yes	Hysteresis value registered when returning to normal. The hysteresis is defined in the same units as the variable itself.
Upper threshold	Yes	Value recognised for the top threshold, whose significance determines the type of alarm. This threshold should be higher than or equal to the bottom threshold and should be defined in the same units as the variable itself.
Lower threshold	Yes	Value recognised for the bottom threshold, whose significance determines the type of alarm. This threshold should be lower than or equal to the top threshold and should be defined in the same units as the variable itself.
Upper critical level	Yes	This value is optional and is relayed to the master station to allow the alarms to be routed according to certain conditions.
Lower critical level	Yes	This value is optional and has the same role as the upper critical level
Send critical level	Yes	YES/NO field to authorise sending of the critical level (*)
Upper limit class	Yes	Optional string of characters for identifying the alarms at the reception end
Lower limit class	Yes	Same as Upper limit class
Send class	Yes	YES/NO field to authorise sending of the “class” (*)
Alarm date	No	Date on which the last alarm was recorded
Value in alarm	No	Value of the variable when the last alarm occurred (whose date of detection will be indicated as above)
Predefined Type	Yes	Selection of a predefined type in the listbox to configure the whole parameters of the variable. (as a result, all parameters are erased) To use this fonctionality, predefined types must have been uploaded earlier in factory
Type Name	No	Label of the last predefined type applied to the variable
Predefined Time Status	No	Status of the last predefined type applied: ■ **Original:** no parameters have been changed after the selection of the predefined type ■ **Modified:** at least one parameters have been changed.

(*) As these optional data items take up space in the SMS messages sent, you are advised to disable their sending when they are not relevant.

Table of channel types

Channel type	Full scale value	Default format	Comments
None			Used to avoid sending unnecessary data when a channel is not in use
Counter		0.	Sum of pulses at a digital input
Flow		0.	Difference in the pulse count between two acquisitions. By choosing a suitable slope setting, it is possible to obtain the flow in minutes or in seconds.
Digital input	0: Open 1: Closed	0.	
Digital input with wake-up	0: Open 1: Closed	0.	The W310 is automatically woken up (to transmit an alarm or to revert to normal) if the status changes. When reverting to awake mode at a change in the on-off status, W310 carries out a reading of all the channels (but without logging them) in order to detect any events, then sends alarm SMS messages / returns to normal as applicable. **=> There must be an alarm associated with all channels of this type.**
Contact closed duration		0.	Period in seconds during which the contact is closed
1 V	1.0 V	0.000	
+/- 10 V	10 V	0.00	
10 Vpp	10 V	0.00	Peak to peak voltage calculation of an alternative signal (by detecting minimum and maximum voltage over a 1 second period)
0-20 mA	1	0.000	Used for 0-20 mA analogue sensors. When this type is used, the terminal supplies a voltage of 15 V and W310 waits for a certain time (configurable) before taking a reading.
4-20 mA	1	0.000	Used for 4-20 mA analogue sensors. When this type is used, there is a voltage of 15 V at the terminal and W310 waits for a certain time (configurable) before taking a reading.
2000 Ω	2000 Ω	0.	For a resistive sensor; value read with a current of 0.4 mA
PT100		0.0	In °C, with **2-wire** wiring
3-wire PT100		0.0	In °C, with **3-wire** wiring
PT1000		0.0	In °C, with **2-wire** wiring
Modbus sensor		0.000	Value of a Modbus register read on a peripheral device
3V supply			*For maintenance only*
4V supply			*For maintenance only*
Sensor supply			*For maintenance only*

Local configuration of W310 (Kervisu)

Channels (1 to 8) screen

Correspondence between physical and software Channels

W310 usually enables to set up to 8 channels.
Up to 4 physical digital inputs and up to 4 physical analogue inputs can be connected.

Physical signals cannot be set on any software channels.

The relationship between physical and software channels is the following:

Physical signal (Terminal block reference)	**Possible channels in Kervisu**	**With type**
DI1 (Digital Input)	1, 5	Digital Input Counter Flow Contact close duration
DI2 (Digital Input)	2, 6	
DI3 (Digital Input)	3, 7	
DI4 (Digital Input)	4, 7	
A1 (Analogue Input)	1, 5	100 mV, 1 V, ± 10 V, ± 10 Vpp 0-20 mA, 4-20 mA R 2000 Ω, PT100, PT1000
A2 (Analogue Input)	2, 6	
A3 (Analogue Input)	3, 7	
A4 (Analogue Input)	4, 8	
RS+, RS- (RS485, JP7)	Any channel	Modbus sensor

Examples:

■ Application with one digital input (for counting) and two 4-20 mA sensors

First possibility

Physical signal (Terminal block reference)	**Channel in Kervisu 1-8**	**With type**
DI1 (Digital Input)	1	Counter
A2 (Analogue Input)	2	4-20 mA
A3 (Analogue Input)	3	4-20 mA

Second possibility

Physical signal (Terminal block reference)	**Channel in Kervisu 1-8**	**With type**
A1 (Analogue Input)	1	4-20 mA
A2 (Analogue Input)	2	4-20 mA
DI1 (Digital Input)	5	Counter

■ Application with one digital input (for counting and flow calculation) and one 4-20 mA sensor

Physical signal (Terminal block reference)	**Channel in Kervisu 1-8**	**With type**
DI1 (Digital Input)	1	Counter
A2 (Analogue Input)	2	4-20 mA
DI1 (Digital Input)	5	Flow

In this specific case, it is not possible to use physical Analogue signal 1 (channels 1 and 5 are already configured in Kervisu because of digital signals wiring).
You have to wire the 4-20 sensor on A2, A3 or A4.

Local configuration of W310 (Kervisu)

Channels (1 to 8) screen

Operation of alarms

W310 handles:

- 3 types of alarm: **Min, Max and Min-Max**
- 2 thresholds: **Top and Bottom**

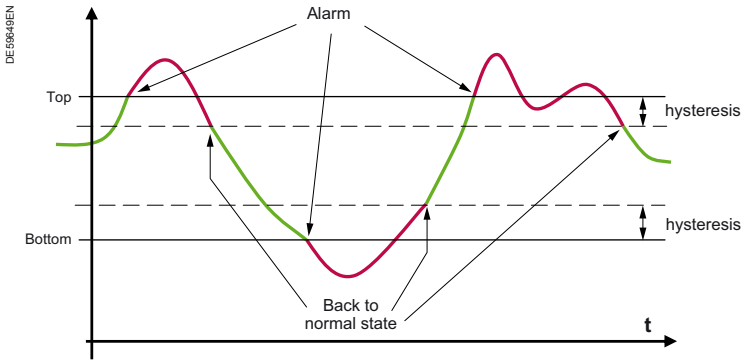
Both thresholds can be used for each type. **The top threshold must always be higher than the bottom threshold**.

For the **Min-Max** type, the **top** threshold corresponds to the upper top threshold and the bottom threshold to the lower bottom threshold.

For the **Min** and **Max** types the **top** and **bottom** thresholds have 2 Min thresholds or 2 Max thresholds respectively. The advantage of 2 thresholds is that different procedures can be triggered for each at the master station.

E.g.: for a level reading, the upper bottom threshold triggers a simple notification at the master station, whereas the lower bottom threshold (therefore very low) triggers a more critical alert procedure.

How the hysteresis operates



The graph above illustrates how the alarm operates in the case of a Min-Max alarm. The variable is shown in green when it is within the normal range and in red when it is in the alarm range. In this case a non-zero hysteresis is used, which avoids “interference” when the value is oscillating between the two thresholds.

The hysteresis is only recognised on **return to normal**, i.e.the alarm is triggered as soon as the value goes over the threshold; return to normal is when the + (lower) hysteresis threshold or – (upper) hysteresis threshold is crossed.

NB: in order for the detection of alarms to be effective, at least one of the telephone numbers needs to be using one of the alarm transmission modes (Data + Alarms or Text Alarms).
The occurrence of the fault and the return to normal are routinely transmitted whatever of the type of recipient (Supervisor or Mobile phone).

Alarms on On-Off status inputs

The channel on which you wish to register the alarm should be programmed as a **STATUS** type or STATUS with wake up.

The value read is **1 for a closed (Off) contact** and **0 for an open (On) contact**. This means that the alarms need to be programmed as follows:

- For an alarm on **contact open** (i.e. contact usually closed):
  - Type of alarm: **MIN**
  - Top threshold: **0**
  - Bottom threshold: **0**
- For an alarm on **contact closed** (i.e. contact usually open):
  - Type of alarm: **MAX**
  - Top threshold: **1**
  - Bottom threshold: **1**

Note that for digital inputs which by definition can only have two different statuses, it is essential that both thresholds be programmed to the same value, otherwise there can be no detection of the alarm or return to normal.

Local configuration of W310 (Kervisu)

Counters screen

System screen

No.	Name	Value	Unit
1	Counter V1	0	Imp
3	Counter V2	0	Imp
5	Counter V3	0	Imp
7	Counter V4	0	Imp
11	Time V1	0	s
13	Time V2	0	s
15	Time V3	0	s
17	Time V4	0	s

Counters screen

This screen is used for controlling and pre-loading counters. Please not that the values will change in real time when the pulses are sent.

Two types of counter can be pre-loaded:

- Pulses counters (pulses counted on digital channels 1 to 4)
- Time interval counters (equivalent to the time the contact is closed on digital channels 1 to 4).

Pre-loading pulse counters

The counters indicate directly the number of pulses, before the slope is taken into account. If you want to align the value indicated by a counter that sends pulses (Energy, water, etc.), the counter's "pulse weighting" needs to be taken into account to convert the pulse reading.

The same "pulse weighting" will also be used to programme the slope for the variable in question and to convert the W310 and counter readings to the same units.

For example:
For a water meter supplying pulses calibrated at 10L/pulse and displaying a value in m^3

- 1) If you wanted the W310 to transmit the value in m^3, you would need to programme a slope of 0.01 (since one pulse is equivalent to 10 litres, or 0.01 m^3).
- 2) If you wanted to align W310 with the value read on the counter, for example 31415 m^3, you would convert this value into pulses, giving 3141500 pulses (100 pulses per 1 m^3). You would then enter this value (3141500) on the counter screen to obtain the desired value of 31415 m^3.

System screen

This screen is used for analysing W310's internal data.

No.	Name	Value	Unit
1	Current Date	17/02/2011 ...	
2	Action	Idle	
4	Board(16 chars)	Brio	
5	Serial No (Lot)	10283	
6	Serial No (Index)	111	
7	Application Number	4294967295	
8	Software Version	0x0603	
9	Options	08M2DM	
10	Build Date	Jan 31 2011	
11	Build Time	10:38:28	
13	Last Modification Date	01/01/2011 ...	
14	Saved Date	17/02/2011 ...	
15	Stack Space	38	
16	System Error	OK	
17	Battery Voltage(Min)	4400	mV
18	Battery Alarm Threshold	2500	mV
19	Power Gauge	3051179803	100uAS
21	Number of Reset	0	
22	Number of SMS	0	
23	Number of SMS OK	0	
24	Number of SMS Received	0	
25	Sessions Total Duration	0	
26	Number of SMS Errors	2	
27	SMS Timeout	3	mn
29	Local Time / GMT	0	1/2h
30	Wake DI Tempo	2	s
31	Reception SMS Time	1	s
32	Keylock	0x2601	

Local configuration of W310 (Kervisu)

System screen

Name	Modifiable	Description
Current date	No	Date and time on W310's real-time clock
Action/Command	Yes	See the commands table on the pages "Configuration screen"
Board	No	Name of the card (Hardware)
Serial no. (batch)	No	Batch number for traceability
Serial no. (index)	No	Card number within the batch (traceability)
Software version	No	Software version number
Options	No	Character string indicating the software version options
Last modification date	No	Date and time of last security backup (especially when changing battery)
Saved date	No	Date on which one of the settings was last changed; this date is transmitted during diagnostics and allows a change in configuration to be detected.
Card capacity	No	Available memory space on the system memory stack; this value must not be zero (> 10 typically)
System error	No	Value of the last system error detected by W310. This field usually shows the value OK. See system error table.
Battery voltage	No	Minimum voltage reading of the battery (in millivolts) during a data transmission phase (i.e. time of maximum consumption). This value will not be calculated until a SMS is sent (default value after a Reset and before the first SMS is sent = 4400 mV). It is recalculated at each attempted SMS send.
Battery alarm threshold	Yes	Threshold (in mV) below which a low battery alarm will be transmitted during a SMS transmission. NB: the alarm will be sent at once a day maximum
Number of RESET's	No	No. of times the processor has been reset. The number of RESETs should remain low and constant; a high number is a sign that there is a malfunction
Number of SMS attempts	No	Number of attempts at sending an SMS; this number is increased when an attempt is being made. Note that there will be no attempts if the SIM card is absent, the PIN code is rejected, or the network is not found.
Number of successful SMS attempts	No	Number of SMS messages actually sent to the GSM network. If reception conditions are in order, this number should be very close to the previous one.
Number of received SMS	No	Number of SMS read by the W310 (command SMS or spam)
Session total duration	Yes	Sum of SMS sessions duration
Number of SMS errors	Yes	Number of failed sessions logged since: ■ Either the last successful transmission ■ or 0h00 on today's date. When this number **is greater than 4, transmission is disabled** until 12h00 (midday) or 0h00 (midnight) (4 consecutive fails -1/2 day).
SMS time-out	No	Maximum duration of SMS sessions; the default value is set at 2 minutes.
Local Time/UTC	Yes	Offset between the local time and UTC (GMT) (in 1/2 hour). Parameter used to write the local time in text SMS.
Digital wake-up Time	Yes	Time (in seconds) for detecting a change of status in the digital inputs (taken on the terminal)
Reception SMS Time	Yes	Time (in seconds) to wait after a successful SMS session in order to receive SMS.

System error table

Value displayed	Meaning	Comments
OK	No error	
ERR RAM	Data lost in RAM	Displayed following a battery change (the status can be re-initialised using the Reset command)
ERR RTC	Clock anomaly detected	
LOW BAT	Battery voltage too low to guarantee transmission	The GSM transmission phase is the period of maximum power consumption. If the voltage drops below a pre-defined threshold during this phase, the W310 will interrupt the communication in order to avoid an overall lack of power. In this case, the low battery error message will be displayed.
ERR I2C	Anomaly in external EEPROM memory access	A problem in accessing this memory will translate as a loss of the data history
ERR EEPROM	Inconsistency detected in internal memory	This error is possible if the memory is new or following a change in the W310 programme version. (Error unlikely to occur when in operation)
ERR COMPIL	Inconsistency in the programme	Invalid software version loaded
LENGTH SMS	Error in compiling SMS	If this error message appears, the SMS sent may be incorrect (may be incomplete).

Local configuration of W310 (Kervisu)

GSM screen

This screen resumes part of the parameters bound to the sending of SMS.

No.	Name	Value	Unit
1	Current Date	21/02/2011 1...	
2	Action	Idle	
4	Number of SMS	152	
5	Number of SMS OK	149	
7	Data send	Ended Session	
8	SMS Session Diagnosis	Nothing to send	
9	GSM state	Repos	
10	Last SMS Send Date	20/02/2011 1...	
11	GSM Level	Medium (-73dB)	
13	GSM Buffer	T^SMSO	
15	PIN attempt remaining	3	
16	Push PIN Code	No	
18	SMS text language	Language N°1	
19	Language N°1	English	
20	Language N°2	Français	
22	Kerwin Token		
23	Mobile Phone Token		
24	Teleconfiguration Token		

Name	Modifiable	Description
Current date	No	Date and time on W310's real-time clock
Action/Command	Yes	See the commands table on the pages "Configuration screen"
Number of SMS attempts	No	See "System screen" pages
Number of successful SMS attempts	No	
GSM action	No	See "Configuration screen" pages
GSM diagnostic	No	
SMS state	No	
Date of last SMS transmission	No	
GSM level	No	
GSM Buffer	No	To check Hayes commands sent to the modem
Number of remaining PIN attempts	No	Number of remaining PIN attempts during the last SMS session. If the number of attempts is lower than 3, SMS are no longer sent to prevent a SIM card locking.
Force PIN code	Yes	Allows to force the writing of the PIN code in the modem during the next SMS session
SMS text language	Yes	Language used in the text SMS
Language n°1	No	Language n°1 pre-loaded in the W310 for the text SMS
Language n°2	No	Language n°2 pre-loaded in the W310 for the text SMS
Kerwin Token	Yes	Token inserted at the beginning of the SMS sent to the Kerwin
Mobile Phone Token	Yes	Token inserted at the beginning of the text SMS
Teleconfiguration Token	Yes	Token inserted at the beginning of the SMS sent in response of a teleconfiguration SMS

PIN code protection

If there was a failure when the PIN code has been entered during the previous SMS session (diagnostic of session: "Error PIN"), the next sessions will be automatically stopped not to enter again a bad PIN code and thus risk to lock the SIM card).

To unlock the W310 PIN code protection and allow again to send SMS, it is necessary having corrected the PIN code in the page GLOBAL-PARAM. Then you have to activate the field "Force the PIN code". Thus, during the next SMS attempt the W310 will try again to enter the PIN code in the modem. As soon as the PIN code is validated, the sending of the SMS is unlocked.

It is important to note that if we place a SIM card for the first time in a W310 and if a bad PIN code was already entered in the SIM card, the sending of SMS will be locked (no matter the PIN code configured in the W310 is correct or bad).
To unlock the sending of SMS you can do what is described in the previous paragraph or just put the SIM card in a phone to enter the correct PIN code.

Local configuration of W310 (Kervisu)

Modbus settings screen

No.	Name	Value	Unit
1	Current Date	17/02/2011 ...	
2	Action	Idle	
4	Response Time	5	100ms
6	Parity V1	None	
7	Baudrate V1	9600	bps
8	Mask V1	0xFFFF	
9	Slave Address V1	1	
10	Function V1	(3) Read N ...	
11	Data Adress V1	0x0200	
12	Type V1	byte	
14	Parity V2	None	
15	Baudrate V2	9600	bps
16	Mask V2	0xFFFF	
17	Slave Address V2	1	
18	Function V2	(3) Read N ...	
19	Data Adress V2	0x0200	
20	Type V2	byte	
22	Parity V3	None	
23	Baudrate V3	9600	bps
24	Mask V3	0xFFFF	
25	Slave Address V3	1	
26	Function V3	(3) Read N ...	
27	Data Adress V3	0x0200	
28	Type V3	byte	
30	Parity V4	None	
31	Baudrate V4	9600	bps
32	Mask V4	0xFFFF	
33	Slave Address V4	1	
34	Function V4	(3) Read N ...	
35	Data Adress V4	0x0200	
36	Type V4	byte	

Name	Modifiable	Description
Current date	No	Date and time on W310's real time clock
Action/Command	Yes	See the commands table on the pages "Configuration screen"
Starting time/Stabilisation time	Yes	Anticipated time (in 1/10s) between switching on the 15 V power supply and the first Modbus reading. This time will be zero if the peripheral is powered by a different source other than the W310. This time interval has a direct impact on W310's power consumption.
Response time	Yes	Maximum time anticipated by the W310 to obtain a response. After this time has elapsed, the status of the variable displayed will be "Modbus time-out".
Parity Vx	Yes	Parity used for the Modbus connection
Baud rate Vx	Yes	Speed of the Modbus connection
Mask Vx	Yes	Used to isolate the digital statuses within words (from version 5.20 and higher). The value should be kept at 0 x FFFF if it is not in use. Only valid for types Byte, Word or Word [i].
Slave address Vx	Yes	Modbus address of the (slave) peripheral in which the variable in question is read
Function	Yes	Modbus function used to read the variable in the Modbus (3 or 4) peripheral
Address	Yes	Address (hexadecimal) of the variable in question in the Modbus peripheral
Type		Type of variable read at the address specified above. The type can be: **byte ; word ; int16 ; dword ; int 32 ; ieee ; word [i] ; int 16 [i] ; dword [i] ; int 32 [i] ; ieee [i]**

Local configuration of W310 (Kervisu)

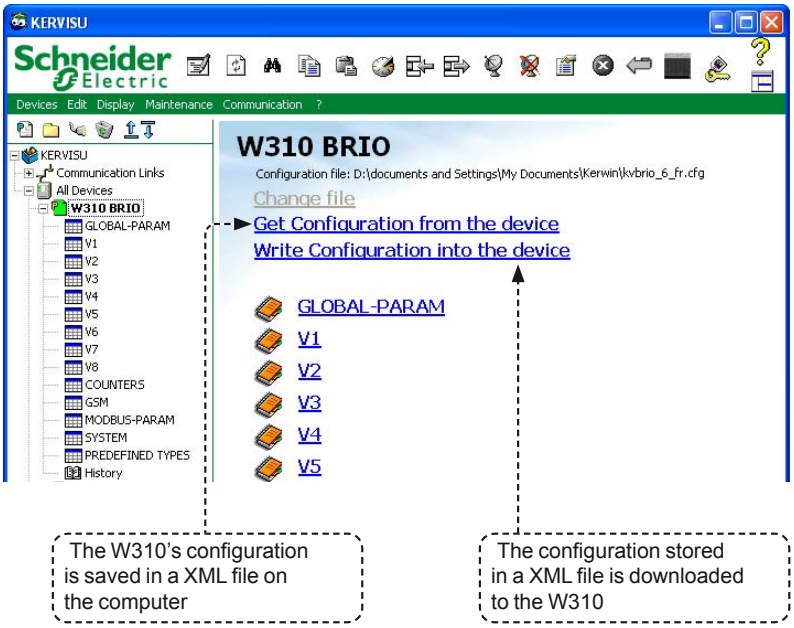
Retrieval/Downloading of the configuration

Retrieval/Downloading of the configuration

The retrieval and the downloading of a W310 configuration via Kervisu are available in the version 1.10.0.0 and higher.

⚠ Download a W310 configuration with a version of Kervisu previous to the 1.10.0.0 may involve a configuration corruption.

To activate this functionality, be sure that the peripheral is declared with the connection type W310 (Properties – Parameters - Connection – W310 (Brio))
See Appendices “Setting up the W310 peripheral with Kervisu”
When the connection to the peripheral is established, the commands of retrieval and downloading of the configuration are active.



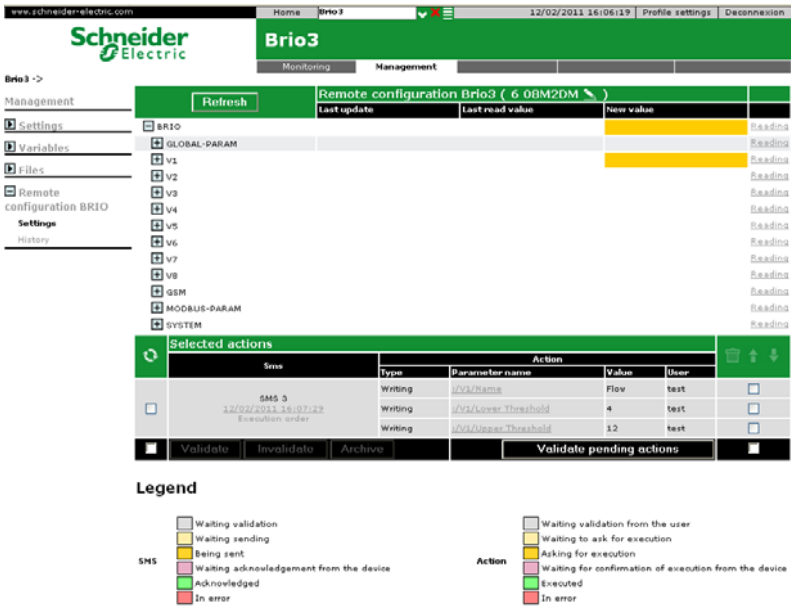
Remote configuration of W310 (Kerweb)

The Web module (Kerweb) of Kerwin Supervisor allows you to remotely read or write any of the W310 parameters described in the previous chapter.

The Remote configuration Web page of a W310 is available as soon as it has been created in Kerwin supervisor (see next chapter).

Once the W310 site is selected in the Kerwin Web interface, the Remote configuration web page is available from the " Management " menu.
All reading or writing demands are synthesized in the second part of the web page: "Selected actions".
These actions are performed as soon as the user clicks on "Validate pending actions" button. Then Kerwin generates the corresponding SMS and sends them to the W310.

⚠ Notice
W310 retrieves the SMS from Kerwin only once it is awakened to send data SMS. For example, if the W310 is configured to send its measurements once a day at midnight, the reading/writing demands from Kerwin will be taken into account at that time. In this case, it might have a delay of 24 hours between the Kerwin demands and the W310 responses.



Configuring the Supervisor (Kerwin)

Setting up a site in Kerwin consists of registering the new site with its properties, in particular its phone number, in the form in which it will be received by Kerwin.

NB: up to version 4.0.0 inclusive of the Kerwin Scada, there is no self-configuration.

In this case, the data (only history files) will be updated in Kerwin as of the first call from W310, once the W310 site has been manually configured in Kerwin.

Data coming from W310 can be received by Kerwin versions 3.6.2 and higher.

Self-configuration: case of a W310 unit site

Kerwin supervisor version 4.1.0 and higher manages self-configuration for W310 (Brio) type units (for Kerwin earlier versions until 4.0.0 included, see W310 (Brio) sites manual configuration in the next paragraph).

Kerwin creates automatically a new W310 site when it receives a SMS from a W310 unit for the very first time (based on W310 telephone number).

The self-configuration of a W310 site in Kerwin consists in:

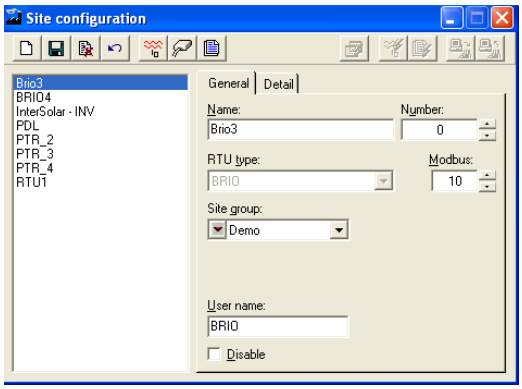
- Adding automatically a new W310 site
- Creating automatically all application and system variables attached to this W310
- Creating automatically all files attached to the W310 (one file per application variable, one file logging all system variables); System variables are transmitted within diagnostic SMS.

If a W310 site with this telephone number already exists in Kerwin sites database, no new W310 site is added.

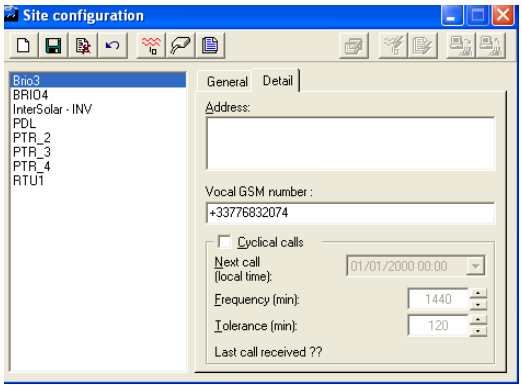
The name of a W310 site that has been automatically created has the following format:

- Always began with characters: “<>”.
- The name configured in the W310 (See Configuration screen, field Device Identifier)
- The phone number detected (international form).

This name can then be changed at your convenience.



Configuring a site manually: “General” tab



Configuring a site manually: “Detail” tab

Manual creation of a W310 unit site

From Main Menu of Kerwin Scada, go to “Configuration/Sites”.

General tab

Enter the following information below:

- **Name:** the name given to the site (for example its location, e.g. “33 Main Street”)
- **RTU Type:** you must choose W310 (Brio)
- **Site group:** optional facility for dividing the units into sectors (geographical) - cf. general documentation on Kerwin.

Detail tab

Enter the following information below:

- **Address:** precise geographic location of the site (optional)
- **Vocal GSM number:** number received by Kerwin when it receives an SMS message from the site: it usually includes the prefix (+33 for France), followed by the 9 last digits of the telephone number belonging to the sending SIM card (usually its calling number). This setting is essential as it is the default setting enabling the sender of the information to be recognised.
- **Cyclical calls:** tick the “periodic call” field to monitor whether W310’s regular calls are functioning smoothly, specifying the date of the next call and the interval between calls.

Note: these configuration operations on Kerwin supervisor are also available from its Web interface(Kerweb).

Testing the installation

The tests described below require a local connection between the W310 and a PC equipped with Kervisu, via an IrDA link.

Checking the reading values

In order to check the readings and wiring, you are strongly advised to check the values read for each sensor after the initial installation.
To do this:

- On one of the channel configuration screens, activate an acquisition of all the channels by running the “Read channels” command.
- The value will appear a few seconds later in the “value” area.

Transmission test

In the same way, you are strongly advised to carry out a test transmission: the test transmission can be done:

- Either directly to the master station, if you have access to it
- Or to a mobile phone (you will need to enter its number in the “configuration” screen).
  - ☐ 1) Check that at least one telephone number and transmission mode are configured
  - ☐ 2) Check that the card’s PIN number has been entered
  - ☐ 3) Open the list on the right of the “Command” page and select “Diagnostic”.

As soon as the command is registered (immediately), the GSM indicator light will flash on and off (see “Function indicator lights” chapter) for around 30 seconds if the transmission is running smoothly.

The GSM indicator light will then go on for a final full second. During this transmission phase, it is possible to follow the progress of the transmission in real time by consulting the sections:

- **SMS progress:** indicates in real time the status of the SMS send dialer.
- **SMS Diagnostic:** indicates the various situations detected by the SMS send dialer.
- **Data sending:** indicates the data sending status.

If the transmission is not running smoothly, the GSM indicator light will flash on and off for 2 minutes before the modem goes off.

The table below indicates the various values that these indicators can have.

Section	Possible values	Comments
Data sending	Data not sent	Before a send request has been made
	Request send	Press to request a send
	Send in progress	Displayed while sending
	Session ended	Displayed at the end of the end session
SMS session diagnostic	-----	Undetermined status
	SIM card problem	The modem cannot detect the card
	PIN code problem	PIN code error
	Send failed	This session was not completed
	SMS sent	This session was completed
	No. of fails exceeded	4 consecutive fails per half day
SMS progress	-----	Intermediate stages
	Resting	No GSM activity
	Awaiting PIN code	
	Awaiting autorisation	
	Reading GSM signal strength	
	Waiting for network	
	SMS receive in progress	

Testing the installation

Testing the GSM signal strength

On-off reading: the value of the GSM signal strength is shown on the configuration screen after an SMS send.

Continuous measurement: if you request the action “test GSM strength”, the W310 will read the signal level for 2 minutes; the information can be displayed in two different ways:

■ On the Configuration screen, in the “GSM level” page

■ By watching the yellow communication indicator light: the rate at which the indicator lights up periodically is higher when the signal is stronger. When the light is on more or less continuously, this indicates a strong signal; when it is on for very short periods at a time, it indicates a weak signal.

This command can be used to determine the optimum location for the W310 before it is installed, especially on sites where reception is weak.

Other checks

Before finishing the installation, you are strongly advised to check the following points:

■ On the **Configuration** screen:
□ the current date and time are entered correctly
□ the data acquisition date and interval are entered, as well as the number of logs before sending.

■ On the **Channel** screens that are in use:
□ all the required titles have been entered and are different for each channel
□ all the variables to be logged have been properly selected, in other words that the type associated with them is set to a value other than “none”.

Frequently asked questions

The network connection is good, but the W310 does not send anything when the "send SMS" command is run.

Check that at least one of the receiving numbers is registered in DATA mode along with its telephone number, and that the PIN code entered is correct.
If there is no log waiting to be sent, the W310 will send a diagnostic SMS.

I would like to adjust my counter indexes to the reading on the counter itself.

Simply go to the "counters" screen and enter the required value. This value is in pulses; in some cases, you will first need to convert the value read on the counter into the number of pulses.

For example:

- A water meter displays 450 320 litres
- The pulse value is 0.1 litre/pulse (indicated on the counter)
- The counter's index in pulses is 450320 L x 10 pulses/L, or 4503200 pulses

The latter value is entered into the W310
The value can be set to scale (in litres) in the appropriate channel in the W310 (slope field = 0.1)

Kerwin will therefore receive the values for this counter directly in litres (i.e. Kerwin will not need to convert the value).

After connecting a 4-20mA sensor, the value on the reading is still very low.

Proceed with caution, as 4-20 mA sensors have a different wiring procedure:

- The sensor's + terminal should be connected to the + terminal of the 15V power supply (last two terminals on the 10-way terminal block).
- The sensor's – terminal should be connected to the "signal" input of the selected channel on the analogue input terminal block (under no circumstances should it be connected to the 0V reference).
- Power for the 4-20mA loop is supplied by W310 during readings only, which are on a timeout of approximately one second. The sensor must therefore provide a stable signal no later than 1 second after connecting to the power; this setting is usually provided in the sensor manufacturer's documentation. W310's waiting time can be increased by adjusting the setting "4-20mA delay" on the "System" screen (given in 1/10 second).

What types of pulse emitter can be connected?

W310 is adapted for most pulse emitters, especially reed-switch systems, which are found in most gas or water meters. In this instance, the polarity does not matter. Some electronic counters have a polarised input which therefore needs to be connected correctly. (The + to the input and the – to the shared GND).

A tip for checking the wiring: with a modern multimeter (high impedance), you should get a reading of around 3 volts between the input and the GND, except when a pulse is passing through, at which time the voltage falls below one volt.

How do I know whether Kerwin has received an SMS sent by a W310?

When a data SMS arrives, this will be shown in Kerwin's "Event History" section:

- If the site has already been registered, the sending site is displayed
- If the site has not yet been registered, KERWIN indicates that the information is of unknown origin but shows the phone number which sent the information. This is the number that should be registered on the "link" page, as indicated in chapter "Configuring the Supervisor (Kerwin)"

NB: SMS messages received by Kerwin are all stored in the directory: KERWIN32\Mail\Inbox

My data has been safely received by Kerwin, but has been inserted on future dates, which cannot be right.

There are 3 possible causes:

- W310 is not set to the correct date and time (or these were not correct at the time they were set), in which case, you should set the correct time on the "Configuration" screen (Kervisu).
- "Extra" logs have been included, via the "Logging" command
- The battery has been removed for a period of time and the logging interval has not been re-programmed: in this case, you are advised to change the logging interval to a new value, then to enter the value required. W310 will then automatically re-calculate the time intervals for each of its channels.

My Kerwin does not seem to be able to handle SMS messages?

- If your Kerwin version is < 4.1, check that the correct telephone number for Kerwin is entered in Kerwin.
- It is possible that Kerwin's GSM modem is not reading the SMS messages in the memory where they are stored (SIM card or modem memory) ➡ You can tell the GSM modem which memory to read the SMS messages in using the command: **AT+CPMS**.

For TC35 modems, the MT value authorises reading of the SMS messages stored in both memories (modem and SIM card).
You then need to add the string **+CPMS="MT"** to the initialisation string for the GSM modem (Kercom.ini file, section [initstring], line corresponding to the COM port for the GSM modem).

For example if the modem is on COM1 and you had: **COM1=V1E0M1**
You will need to have: **COM1=V1E0M1+CPMS="MT"**

⚠ The value **"MT"** is specific to TC35 modems.
The standard values associated with this command are:

- **"ME"** for reading SMS messages from the modem's memory
- **"SM"** for reading MSM messages from the SIM card.

Frequently asked questions

My KERWIN does not seem to be processing the SMS messages received correctly (a portion of the data is missing or incorrect)?

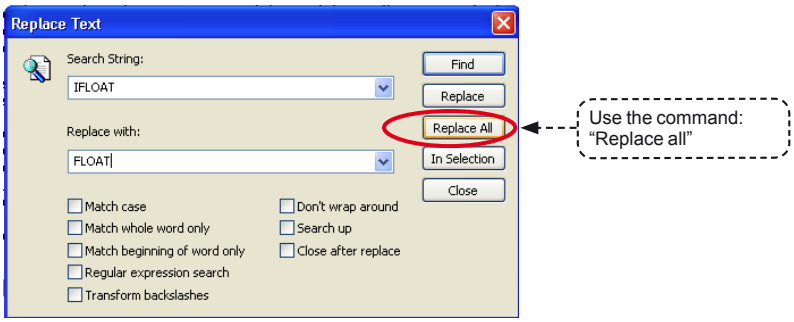
For GSM modems other than SIEMENS, reading of the SMS messages can be faulty if an initialisation string is not added, indicating the set **"GSM"** as the character set.
This string is standard and can be used for any GSM modem (including Siemens).
To do this, you need to go into the file kercom.ini, in the section [initstring] and add the string **+CSCS="GSM"** to the port on which the GSM modem is configured.
For example, if the modem is on COM1 and you had: **COM1=V1E0M1**
You will need to enter: **COM1=V1E0M1+CSCS="GSM"**

I am unable to establish a local connection between my Kervisu and the W310 (even though the USB-IrDA interface has been correctly installed and I made a correct note of the communication port which the PC allocated to the interface to define the link in Kervisu)?

In Kervisu, check that the address is set to 1 in W310 peripheral properties.
In Kervisu, the default address allocated when you set up a peripheral is 10.

I always read the value 0 in KERVISU for the various variables configured.

Check that the version of Kervisu used is 1.9.4.1 or higher.
If it is a previous version, you have to edit the configuration file of Kervisu: **kvbrio_6_en.cfg** and replace the fields **IFLOAT** by **FLOAT**:



Appendices
Detailed technical features

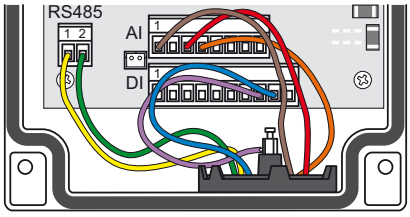
Operating conditions	
Operating temperature	–25°C to +60°C
Altitude	Less than 2000 m
Relative humidity	90% (IEC 60068-2-3)
Protection	IP56 (IP40 for UL)
Resistance to vibrations	5-150 Hz / 3.5 mm amplitude / 1 g (IEC 60068-2-6)
Resistance to shock	15 g / 11ms / 3 shocks / 3 axis (IEC 60068-2-27)
Power supply	
Lithium Thionyl Chloride battery	
Nominal voltage	3.6 V
Dimensions	Ø 33 mm, L = 60 mm (type D)
References	VITZROCELL SW-D02 (www. vitzrocell.com) SAFT LSH20 (www.saftbatteries.com)
Consumption	
Basic (sleep mode)	< 30 µA
Measurement mode (without 4-20 mA)	< 30 mA
With GSM communication (SMS)	Maximum 400 mA
Port RS485 (according to configuration)	
Voltage	- 7 to +12 V,
Limits	± 250 mA
Max. transfer rate	115200 Bauds
Input (according to configuration)	
Logic input ■ Status (On/Off wake up transition) ■ Counter (pulse counting) ■ Flow ■ Time counting	Dry contact Maximum 50 Hz pulse mini 10 ms Auto powered 3.3 V (3 µA) Input impedance > 1 MΩ
Analogue voltage input ■ 0-100 mV ■ 0-1 V ■ +/-10 V ■ 10 Vpp (peak to peak measurement of an alternating signal)	± 40 V, 2 MΩ precision ± 0.25% Measurement during 200 ms
Analogue current input ■ 0-20 mA ■ 4-20 mA	Maximum 35 mA accuracy ± 0,05 mA Waste voltage < 2.5 V
Potentiometer input ■ 0-2000 Ω ■ PT100 (2 and 3 wires) ■ PT1000 (2 and 3 wires)	2000 Ω maximum accuracy ± 0.5 Ω or ± 0.2°C Read with 0.4 mA during 200 ms
Insulation between channels (GND are not separated)	250 V
Output specification (according to configuration)	
Maximum output current (Power 15 V in SC) (limited by fold back set to 0.5 s)	0.6 A
Maximum output voltage	16 Vdc
Output specification	14 Vdc / 35 mA 12 Vdc / 40 mA
Maximum output power admissible	400 mW
Insulation (GND is not separated)	250 V

Appendices
Factory predefined cable

Factory predefined cable configurations

AIR LIQUIDE (0BRIOBULK)

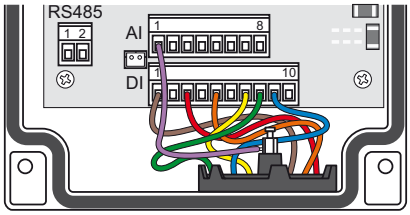
DE59651



Bulgin pin			Marks & terminals W310		Type	Description
1		Brown	A1	AI 1	Current	Channel 1 current meas. (4-20 mA)
2		Red	A2	AI 3	Current	Channel 2 current meas. (4-20 mA)
3		Orange	AGND*	AI 4	Ground	0 V analogue V1 and V2
4		Yellow	RS+	RS485 1	Modbus +	COM RS485 Tx
5		Green	RS-	RS485 2	Modbus -	COM RS485 Rx
6		Blue	15V	DI 9	Power +15 V	+15 V sensors power supply
7		Purple or grey	GND*	DI 8	Ground	0 V sensors

WATER (0BRIOEAU)

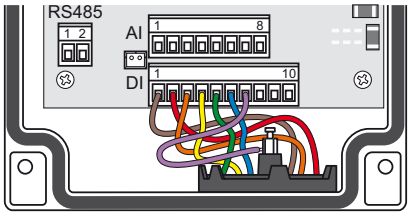
DE59652



Bulgin pin			Marks & terminals W310		Type	Description
1		Brown	DI1	DI 1	Logic	Channel 1 On/Off with wake up
2		Red	DI2	DI 3	Logic	Channel 2 On/Off with wake up
3		Orange	DI3	DI 5	Logic	Channel 3 On/Off with wake up
4		Yellow	DI4	DI 7	Logic	Channel 4 counting or DI
5		Green	GND*	DI 8	Ground	0 V logic/analogue
6		Blue	15V	DI 9	Power +15 V	+15 V sensors power supply
7		Purple or grey	A1	AI 1	Current	Channel 5 measurement (4-20 mA)

COUNTING (0BRIOCOMPTAGE)

DE59653



Bulgin pin			Marks & terminals W310		Type	Description
1		Brown	DI1	DI 1	Logic	Channel 1 (counting or DI)
2		Red	GND*	DI 2	Ground	0 V logic Ch1
3		Orange	DI2	DI 3	Logic	Channel 2 (counting or DI)
4		Yellow	GND*	DI 4	Ground	0 V Logic Ch2
5		Green	DI3	DI 5	Logic	Channel 3 (counting or DI)
6		Blue	GND*	DI 6	Ground	0 V logic Ch3 and Ch4
7		Purple or grey	DI4	DI 7	Logic	Channel 4 (counting or DI)

*Not differentiated ground (the 0 V is common)

Notes:

■ **For On/Off status with wake-up types:** the W310 will be activated in practice (to take readings and detect / transmit any alarm events) if the change in status in this On/Off input signal lasts for more than 2 seconds (default value of the “Digital wake-up time-out” setting, which can be modified on the System page in Kervisu).

■ **For 4-20 mA types:** the sensor’s measurement stabilisation time once power has been switched on is 1 second (default value for the “4-20 delay” which can be modified on the System page in Kervisu).

Configuration on delivery (portion that is same for all pre-set types)

Description	Value	Comments
PIN code	0000	PIN code!!! Make sure it is the right code for the SIM card installed before you enter the telephone no. settings
Serial no.	Brio	7 characters maximum
Telephone no.1		To be set
1st number mode	No transmission	To be set: if the SMS messages are going to be sent to a supervisor (Kerwin), set to: “Data + alarms”. If they are going to be sent to a mobile phone, choose “Text SMS” (in this mode, only alarms are sent (not the reading files).
Telephone no. 2		
2nd number mode	No transmission	
Today's date		Set to local time (GMT in the UK)
Logging interval	1440	1440 mins, or 1 day
Date of next log		Set automatically depending on the date/time of delivery and the logging interval. To be modified.
Transmission interval	10080	10080 mins, or 1 week
Date of next send		Set automatically depending on the date/time of delivery and the logging interval. To be modified.

Appendices
Setting up the infrared/USB interface

Stage 1

Installing the drivers on your PC

You will need to use the following file which has the drivers for Windows:
Driver_IrDA _USB-LINK-IR.zip

This file should be on the CD-ROM supplied along with the W310. If it is not, you can download it from the Lascar website:
http://www.lascarelectronics.com/software/USB-LINK-IR.zip

The file contains a self-extracting executable file which will install the drivers in the directory c:\lascar.
Run the executable file contained in the ZIP file, confirm all the stages by choosing “next”; the data will be installed by default in the directory c:\lascar\USB-LINK-IR.

Stage 2

Depending on which version of Windows you are using, follow one of the following procedures:

Installing the virtual port in Windows XP

1 - Connect the IR-USB interface
2 - Windows will detect the new peripheral and will open a search window for the new driver
3 - Select “search for a driver for my peripheral” (recommended), then press “NEXT”
4 - Select “search in a specific location”, then press “NEXT”
5 - Select “BROWSE” and search for the location C:\lascar\USB-LINK-IR\WIN then click OK
6 - Check that the correct pathway has been recognised then click on “NEXT”
7 - Click on “FINISH”
8 - The installation wizard will start stage 2 a second time: use the same answers again.

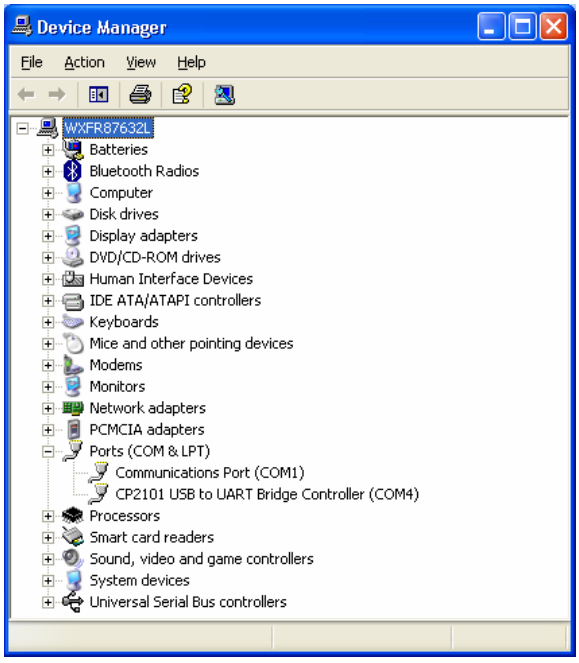
Installing the virtual port in Windows 2000

1 - Connect the IR-USB interface
2 - Windows will detect the new peripheral and will open a search window for the new driver
3 - Select “search for a driver for my peripheral” (recommended), then press “NEXT”
4 - Select “search in a specific location”, then press “NEXT”
5 - Select “BROWSE” and search for the locations C:\lascar\USB-LINK-IR\WIN, then click OK
6 - Check that the correct pathway has been recognised, then click on OK
7 - Click on “FINISH”
8 - The installation wizard will start stage 2 a second time: use the same answers again.

Checking which COM port is being used

Once the Driver has been installed, Windows will create a new COM port, which will be the first available port before the driver was installed: for example if COM1, COM2 and COM3 are already allocated on the PC, the location used by the infrared port will be COM4.

To find out which COM port is being used, you will need to look in the driver manager:
- Right click on the **workstation**
- Go to the **properties** section**, hardware tab**
- Choose the **peripheral manager** section
- Select the communication ports from the list
- The USB-IrDA interface will be on the COM port marked “CP2101 USB to UART bridge controller”; in this example, this is COM4.

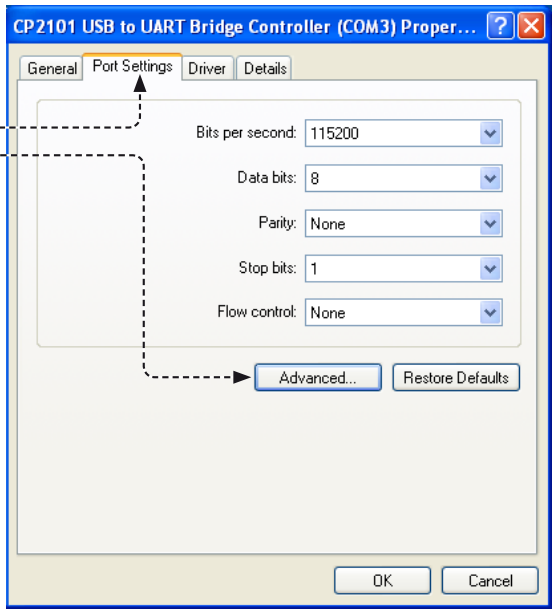


Appendices
Setting up the infrared/USB interface

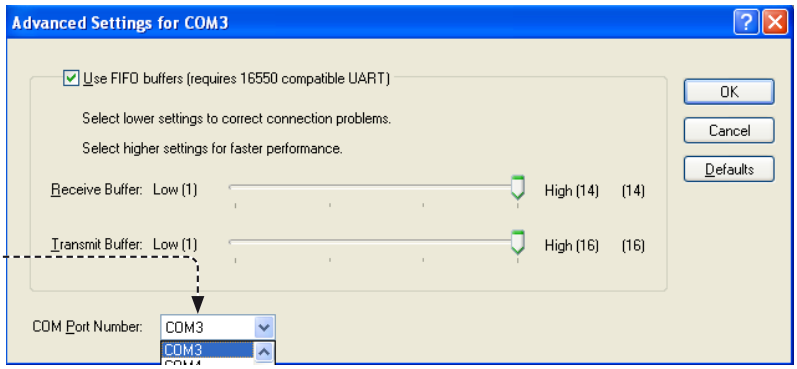
If the COM port which your computer has allocated to the USB – IrDA interface is not convenient (e.g. if it is COM3 and this is usually used by your PC's internal modem), the automatic allocation can be changed by performing the following operations:

On the "Device manager" screen:
- Point the port "CP2101 USB to UART…".
- Right click then select "Properties".

The window "CP2101 USB…properties" will be displayed:
- Choose the "Port Settings" tab
- Then click on "Advanced"



In the advanced settings window, select the port number you require

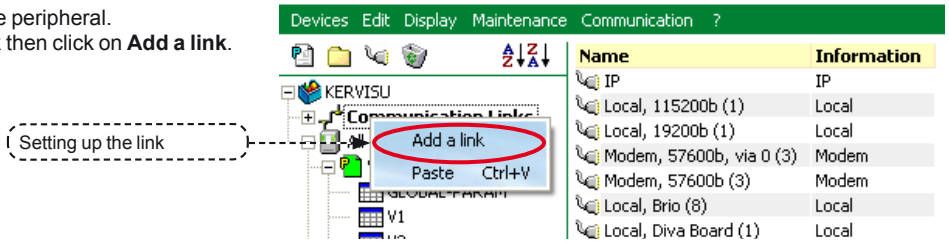


Appendices

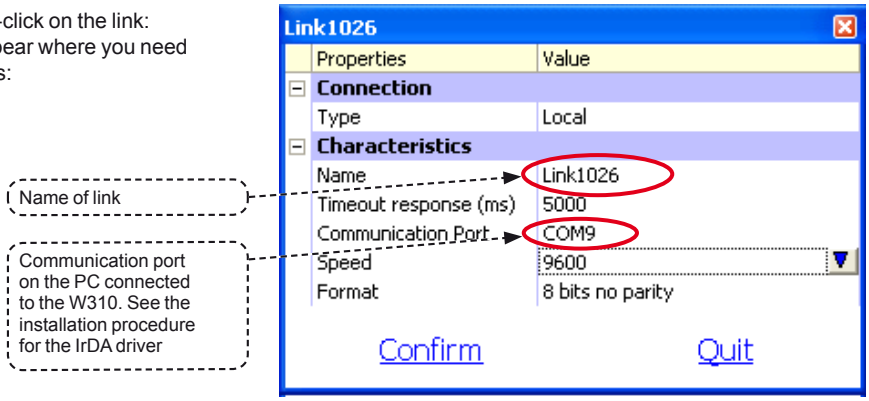
Setting up the W310 peripheral with Kervisu

Setting up the link

A link must be set up for the peripheral.
To do this, right-click on **Link** then click on **Add a link**.



To configure the link, double-click on the link:
the following window will appear where you need to enter the following settings:



Once the fields have been correctly filled, click on **Confirm**.
To rename the link, you simply need to right-click and select **Rename**.
In the rest of this document, the link is given the name “Link 1026”.

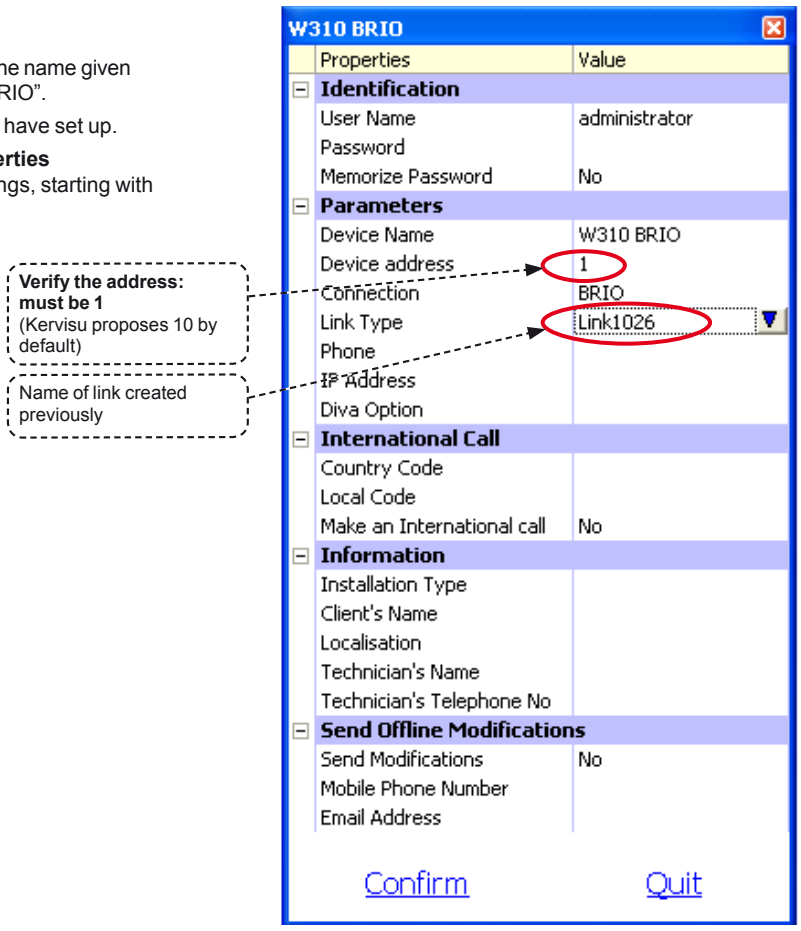
Setting up the peripheral

Right click on **All devices**
then select **Add a device**.
In the rest of this document, the name given to the device will be “W310 BRIO”.

Next, click on the device you have set up.

Right-click then select **Properties**
then enter the following settings, starting with the Connection field:

Then click on **Confirm.**

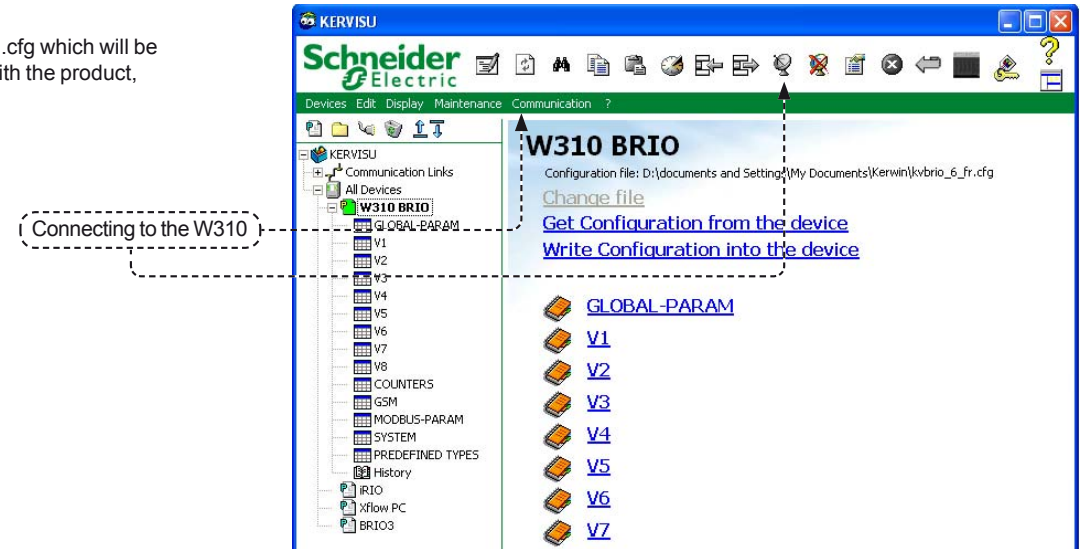


Appendices

Setting up the W310 peripheral with Kervisu

Loading the configuration and connecting

Then click on **Change file**.
Select the file Kvbrio_6_En.cfg which will be on the CD-Rom supplied with the product, then connect to the W310.

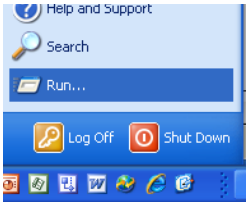


The various settings can then be viewed and you will be able to select one of the information screens.

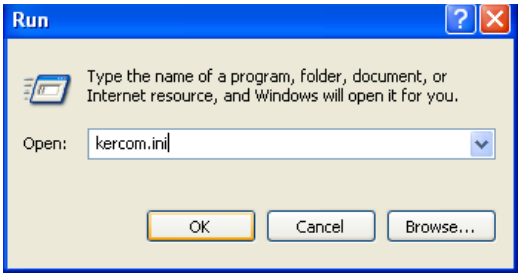
NB: if the COM port which the PC automatically allocates to the USB-IR interface is not one of **COM1 and COM4**, Kervisu will generate an error notification when you attempt to connect to the W310.

For Kervisu to be able to use a port COMx, proceed as follows:

1 - From the Windows Start menu: click on **Run**



2 - Then in the command line, enter the file name: **kercom.ini** (communications configuration file for Kervisu).



Then click on OK, the file kercom.ini will then be edited.

in the section [Type], add the new serial port associated with the USB-IR interface:
For our purposes, let us suppose that serial port COM5 has been allocated to the interface:

```
[Type]
COM1=Local
COM2=Remote
COM3=Remote
COM4=Remote
COM5=local
```

Also complete the section [Comm services]

```
[comm services]
ports=COM255,COM1..COM4,COM5
modbus answer to=10000
modbus repeat count=3
```

Appendices
Local data retrieval
Calculating the battery's lifespan

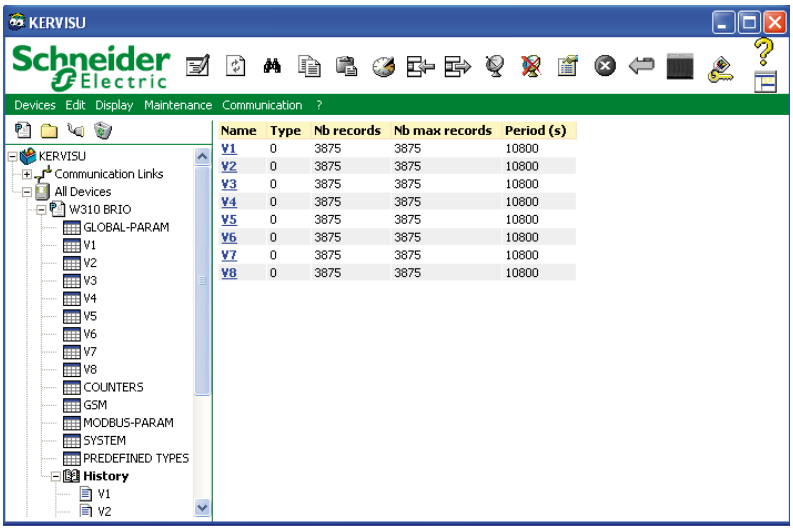
Local data retrieval

NB: the W310 (Brio) version 4.11 and higher enable the local data retrieval From version 1.10.0.0. this function is available in Kervisu.

To activate this functionality, be sure that the peripheral is declared with the connection type W310 (Properties – Parameters - Connection – W310) see previous chapter.

During the connection to the peripheral, the W310 must be woken and the IrDA positioned in order to communicate with the W310.

If the W310 is compatible (version 4.11 or higher), the page "History" appears when the W310 is connected.



To read a file of measure, it is necessary to click the name of the wished variable.

The following window appears to allow you to choose the period of measure which you wish to get:

Calculating the battery's lifespan

The lifespan of the battery can be calculated by adding together the average currents corresponding to each one of the functions, which will give the average current consumption. The number of hours'power left in the battery can then be worked out simply on the basis of the battery's capacity, taking a safety margin into account.

Each consumption item is associated with an average current given in microamps (µA) which needs to be multiplied by a frequency coefficient relating to each item.

Consumption item	**Average value in µA** (for 1 use per hour)	**Frequency of use** (in hours)	**Actual value**
Battery self-discharge	34 µA	1	34
Basic operation	25 µA	1	25 µA
Sending SMSs	800 µA	1/24 (1SMS/day)	33 µA
Reading	3 µA	1 (1 reading/hr)	3
Counting	2 µA /Hz	10 (10 Hz counting)	20 µA
Total			**111 µA**

Calculation	**Hypothetical value**	**Breakdown of calculation**	**Value obtained**
Theoretical no. of hours	Capacity LSH20: 13 000 mAh	13 000 000 µAh /111µA	117 117 h
Theoretical no. of years	1 year = 8766 hrs	117 117 h /8766	13.36 years
Estimated no. of years	Coefficient 0.6		8 years

Appendices

Tips for opening your GSM account
Codes and spare parts

Tips for opening your GSM account

Your account for W310

It is not necessary to open a voice & data account: a machine to machine account will suffice, which will not include a voice function.
If there is a likely risk of vandalism, you are advised to use a different PIN code from the default code given by the network operator (usually 0000).
If this is not likely, the energy consumed by GSM transmissions can be reduced by suppressing the PIN code request (this reduces the time required for transmission).
With some network operators, you will need to request your SIM card to be activated before it is first used in W310. This is done simply by telephoning the network operator.
The purpose of activation is to:

- Enable you to be connected to the network
- Set up regular billing on your account.

Your account for Kerwin

The same type of account is required for the master station, and can be supplied by a different network operator if required. If you are operating a large number of devices giving rise to more than 10,000 MSMS messages per year, you are strongly advised to request a terrestrial connection from your chosen network operator or from a “NETSIZE” type operator: this will improve reception security.
It is particularly important to consider the fact that the number of SMS messages that can be received with a SIM card is limited to several tens of thousands, therefore you are strongly advised to request a spare SIM card in advance from you network operator, which can be activated and substituted for the first during periods of scheduled maintenance or in case the card fails.

GSM modem for Kerwin

Schneider Electric Telecontrol recommends using modems of the type TC35 Terminal, MC35 Terminal, TC65 Terminal: other modems can be used, provided that they use the standard GSM character set. This character set is essential in order for the compressed SMS message reception function to operate properly. Some modems accept the GSM character set, but only after a specific character string has been entered.

Reminder: If you envisage intensive use (i.e. more than 1000 SMS/month received by Kerwin), you are strongly advised to request a fixed link from your chosen operator.

Codes and spare parts

Part	Schneider Electric Telecontrol code	Type	Manufacturer
USB infrared interface	0BRIOKIRDA-USB*		Lascar
Battery (size D)	0BAT3V613ALT	3.6 V 14 Ah SW-D02 3.6 V 13 Ah LSH20	Vitzrocell Saft
IP68 female connector		PX0745/S	Bulgin
10-way terminal block	See electronic distribution	MC 1.5/10-ST-3.81	Phoenix-Contact
8-way terminal block	See electronic distribution	MC 1.5/8-ST-3.81	Phoenix-Contact

(*) Schneider Electric Telecontrol inserts a magnet in the Lascar interface.
Reference for the IrDA interface + magnet = 0BRIOKIRDA-USB.

Appendices

W310 (Brio) hardware/sofware version history

Hardware	W310 (Brio) version	Evolution	Kerwin version
	2.56 2.57 December 2004	First version of Brio software: ■ Dedicated channels (3 counters, 1 4-20 mA channel, 1 voltage channel and 1 resistance channel) ■ No alarm functions ■ SMS readings not compressed.	3.0.8
	3.15 May 2005	■ Universal channels (up to 4 On/Off/Status/Counting + 4 analogue) NB: the Bulgin connectors attached to the blue and white boxes only have 7 available terminals ■ Alarm function with 2 thresholds per channel ■ Compressed SMS messages ■ 2 possible receiving numbers for SMS messages (for sending readings or readings/alarms or text alarms).	3.3.3
	3.16 January 2007	■ Addition of Rate type	3.3.3
	4.xx September 2006	■ Negative voltage readings (Cathodic protection application) ■ Linearisation of PT100 / PT1000 sensors ■ Wake-up on change of On/Off status ■ Modbus slave management ■ Diagnostic SMS ■ Automatic backup of data (configuration) ■ Extension of storage memory capacity (from 4 ko to 128 ko) ■ Transparent mode for direct modem access (Tests/technical assessment).	3.5
	5.13 January 2007	Brio software versions > 5.00 cannot be loaded on preceding Brio hardware (grey and white boxes) ■ New types of reading: Rate, contact closure time, unprocessed converter readings (Tests) ■ Ability to download a programme with the box closed (Tests/Production) ■ Measurements converted to scale in Brio (no longer necessary to configure the scales in Kerwin) ■ SMS reading function (remote configuration, measurement request) ■ Installation diagnostic SMS.	4.1.0 A Kerwin 3.6.2 patch is available for receiving SMS messages from Brio v5.xx and higher
	6.03 September 2007	■ Sending a commissioning SMS by magnet activation ■ Possibility to insert an identifier at the beginning of the SMS ■ Predefined measurement types management ■ Control the number of tries for entering the PIN code.	
	January 2009	■ New product name: W310	
	6.10 March 2009	Note: delivered only on the W310 3G version ■ Sending a sensor fault alarm and returning to normal status ■ Addition and transmission of a sensor status ■ Daily downloading (at 0h) of the configuration stocked on EEPROM to avoid RAM corruption ■ Addition of the product serial number Product serial number is transmitted on the commissioning SMS instead of the card serial number (field SN: Serial Number).	
	6.20 April 2011	■ Selection of modem frequency bands for network reasearch ■ Diagnostic additional information ■ SMS validity duration is extended to 7 days (instead of 1 day).	

Notes

Notes

Notes

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