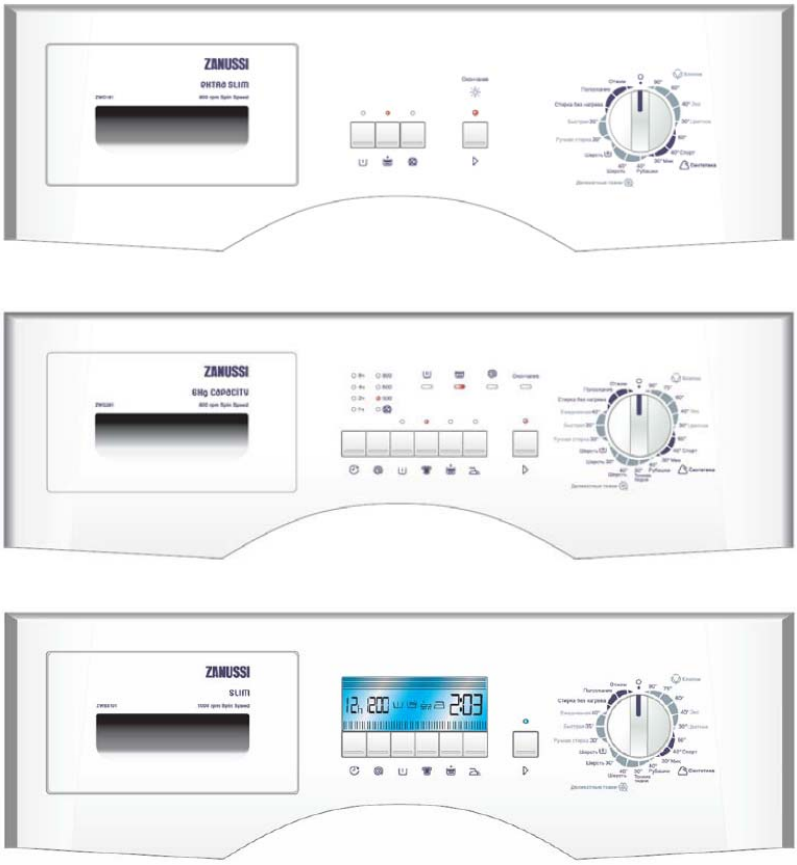
Electrolux Distriparts

SERVICE MANUAL
WASHING



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WASHING MACHINES

Janus system on hand-held terminal for configurable electronic modules

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Warnings

Safety instructions:

Read the simple safety instructions reported below. Non-compliance with these instructions can be dangerous.
USE THE APPARATUS IN AN APPROPRIATE MANNER
The terminal must only be used in the normal position, as described in the product documentation. Do not attempt to touch any inaccessible parts unless explicitly instructed to do so.

QUALIFIED PERSONNEL
Installation and technical assistance activities on this product can only be carried out by qualified personnel.

ACCESSORIES AND BATTERIES
Only approved accessories and batteries may be used with this product.
Do not connect to incompatible products.
Do not use non-rechargeable alkaline batteries together with the batteries supplied.

CONNECTING TO THE MAINS SUPPLY
The connection to the mains supply should only be made through a power supply line compatible with the characteristics specified on the power supply unit / battery charger supplied.

EC conformity:

European Community
Conforms to European directives

Disposal:

The mark reported on the product or in the documentation indicates that, at the end of its useful life, the product itself must not be disposed of together with other domestic refuse.
In order to prevent damage to the environment and/or health by the inappropriate disposal of waste material, the user is invited to separate this product from other types of waste and to recycle it in a responsible manner, thus favouring the sustainable re-use of material resources.
Domestic users are invited to contact the retailer from whom the product was purchased or the local offices providing information on the differentiated collection and recycling of this type of product.
Business users are invited to contact their suppliers and verify the terms and conditions of the purchase agreement. This product must not be disposed of together with other commercial waste.

1. Purpose of this manual

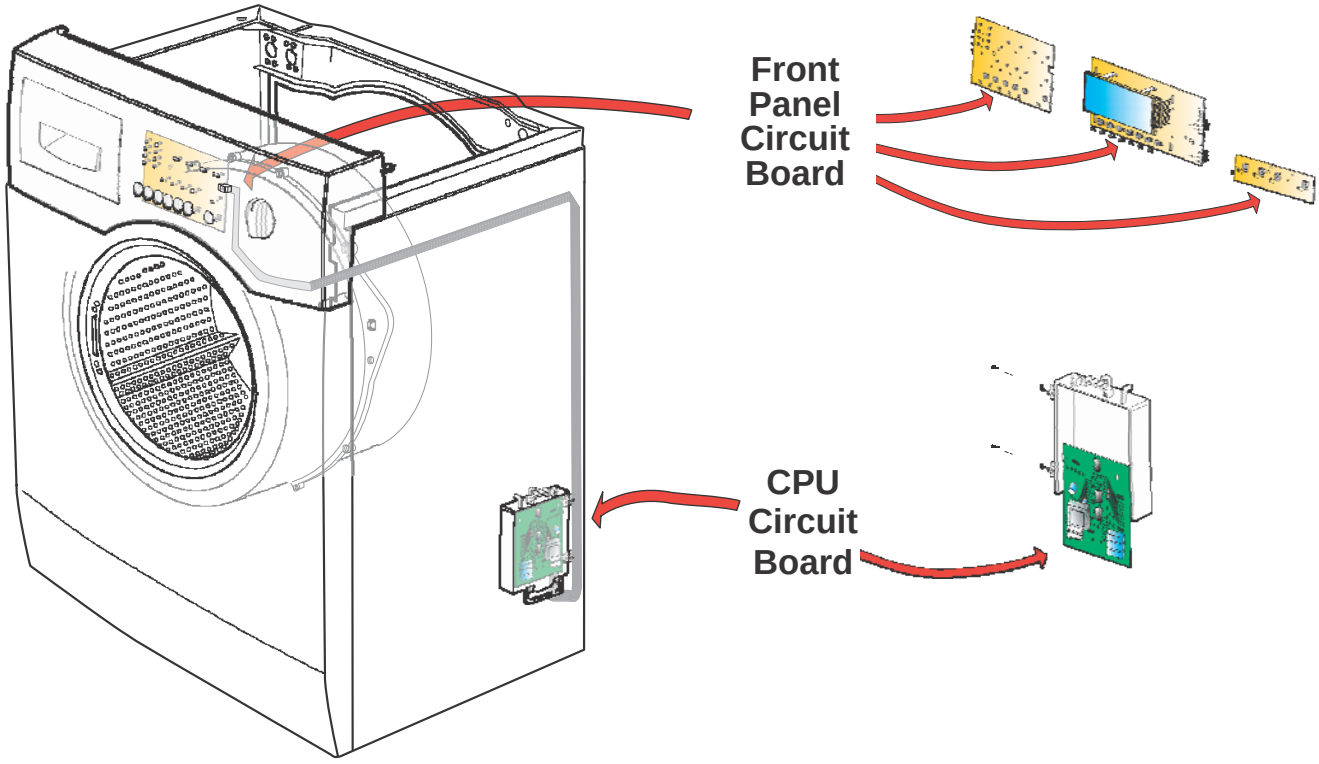
The design and specifications of the product are subject to modification without prior notification. These include the main product specifications, any software, accessories and user manual. This Service Manual is provided as a general guide to the product for use as reference material. The product and accessories supplied with the terminal may differ slightly to that described in this manual. This is due to the fact that retailers often specify slightly different options and accessories for the product in order to satisfy the diversification in the demand, in line with requirements, availability and zone preferences. The products subject to the widest variations are accessories, such as batteries, chargers, AC adapters, memory cards, cables, cases/holders for transport purposes and linguistic support. In exceptional cases, the colour, aspect and capacity of the onboard memory of the product can be specified. Refer to the manufacturer for detailed information on the product and the available accessories. The illustrations present in the manual are provided for reasons of clarity and may differ slightly from the actual appearance of the terminal in your possession. The manufacturer will not be held liable for any errors or discrepancies in this user manual.

2. INTRODUCTION

The **"Janus"** interface has been created in order give the Service Centre technician full control over the washing machine when carrying out the following operations:

- Configuration of replacement circuit boards
- Diagnostics (troubleshooting)
- Autotest

The washing machine is controlled by the **CPU Circuit Board** (Central Processing Unit) and the **Front Panel Board.**



The management of the wash programmes and the characteristics of each washing machine model, such as the wash load capacity of the appliance itself, the type of motor and its power supply (AC = alternating current – DC = direct current), the type of temperature sensor and the pressure switch levels are all managed by the program (software) integrated in the CPU Circuit Board. The control panel components (Display, Pushbuttons, Leds and Potentiometers) are instead controlled by the Front Panel Board.

When the washing machine is switched on, the correspondence between the two circuit boards (Front Panel and CPU) is checked. If there is no correspondence, the appliance switches to "Service Mode". This condition is recognised by the continuous flashing of the Start led and/or the symbol 00 appearing on the LCD display, where fitted.

Both the **CPU Board** and the **Front Panel Board** are personalised and only accept codes compatible with the configuration of the washing machine.

3. CONFIGURATION CODE FOR REPLACEMENT BOARDS

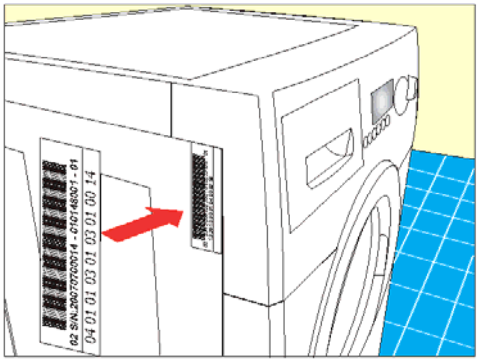
The specific characteristics of each individual washing machine model are enabled by entering an 18 digit code (divided into 9 pairs of digits) in the **Front Panel Circuit Board** and in the **CPU Circuit Board.**

Key to washing machine barcode

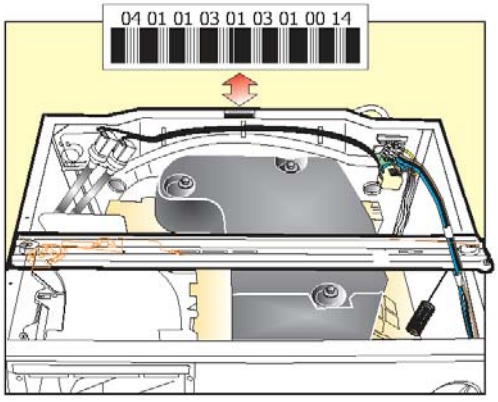
02	= Years under guarantee
S/N: 20070700014	= Serial number
2007	= Year of manufacture (2007)
07	= Week of manufacture (seventh)
00014	= Progressive number of the week of manufacture
010148001	= Finished product code number
01	= Factory 01= S.Maria Fabriano

4. CONFIGURATION CODE TRACEABILITY

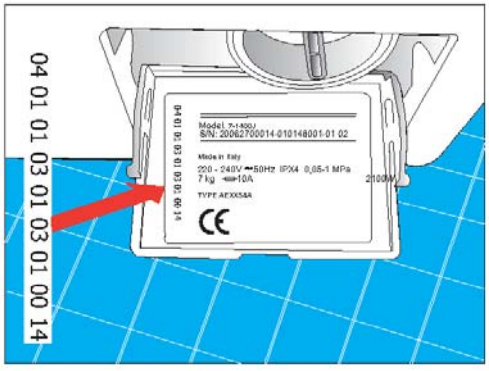
The product configuration code is coupled to the barcode. The barcode is affixed to all washing machines by means of labels applied at the following three positions:



1°) On the left hand side of the washing machine near to the control panel.

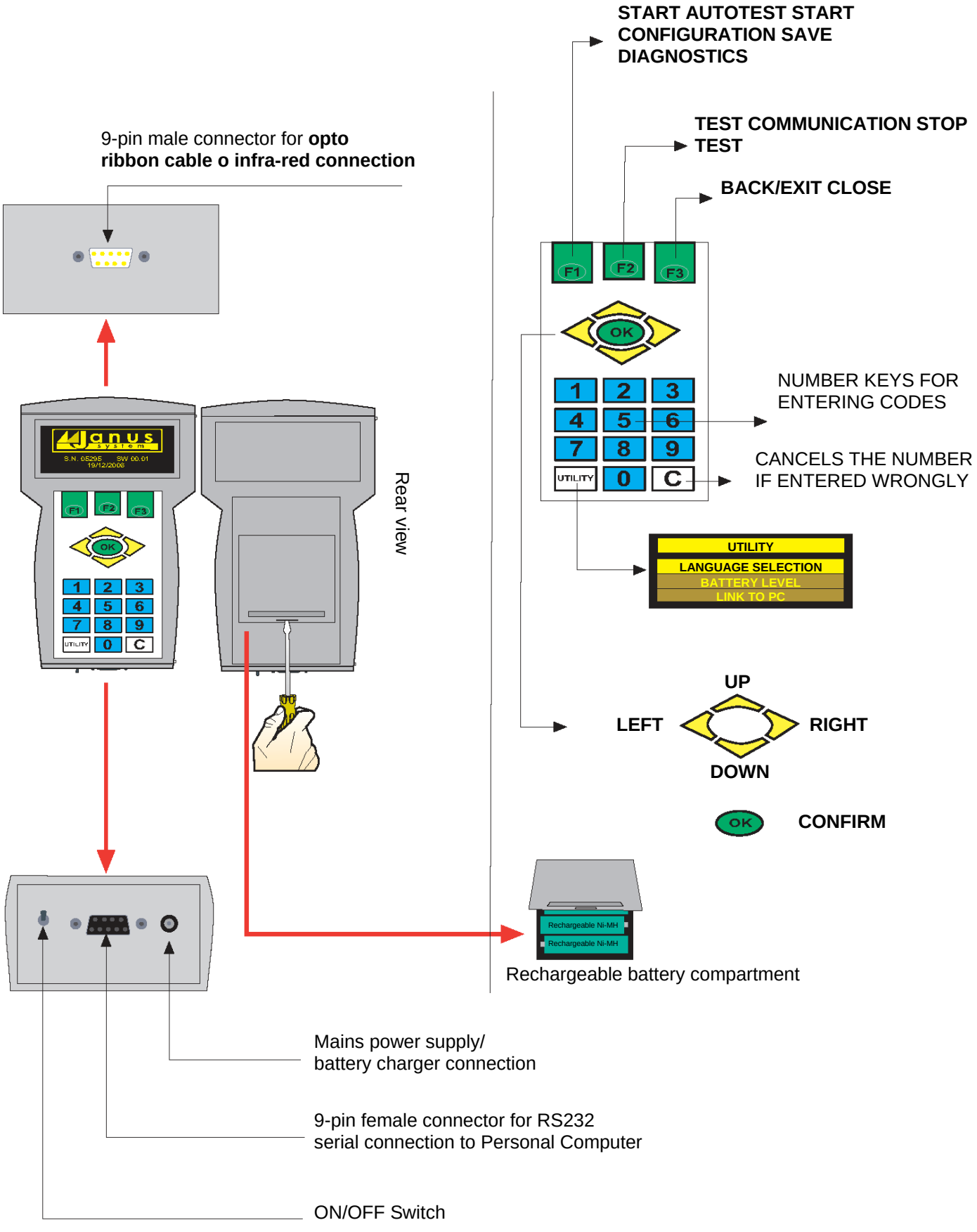


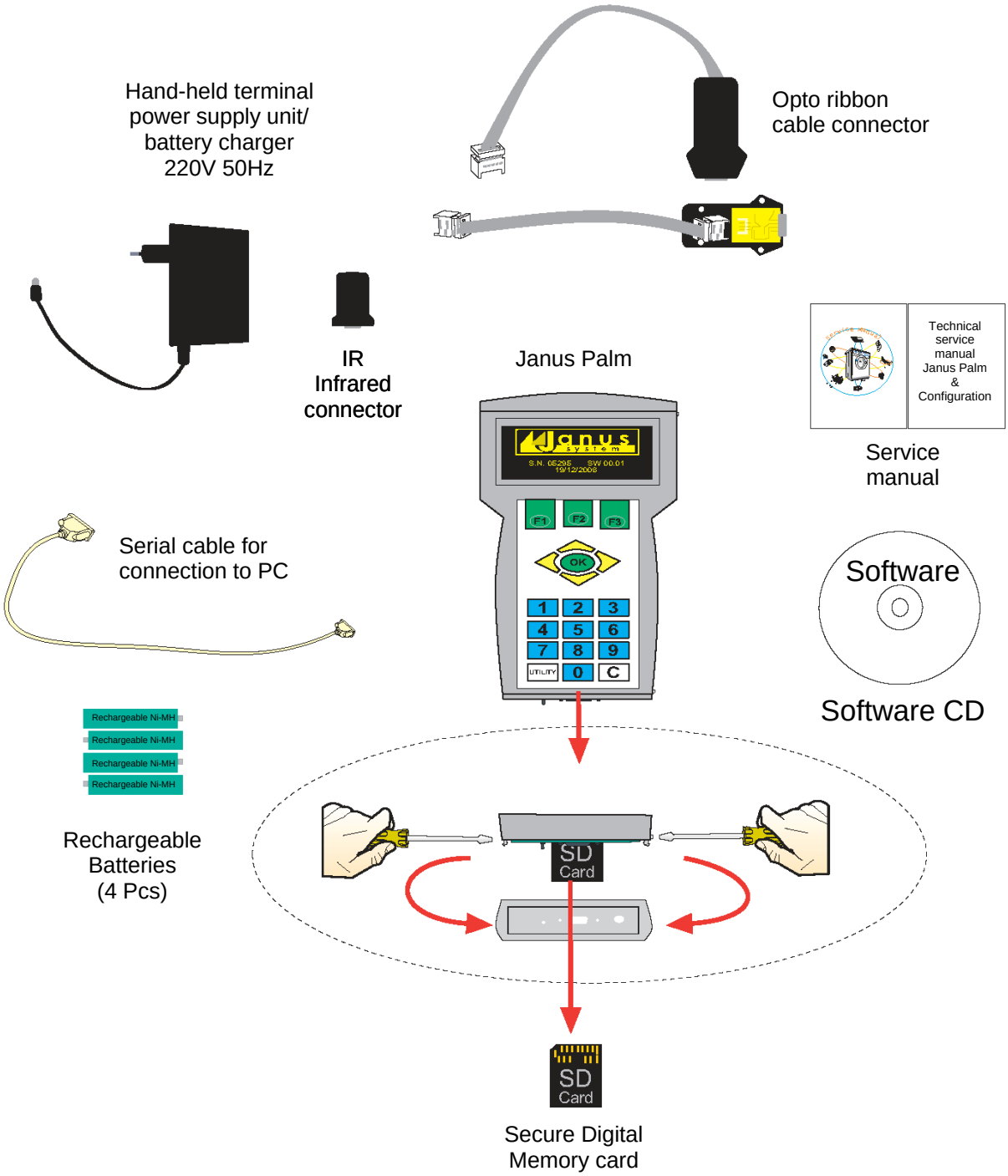
2°) Under the top cover on the rear cross-member.



3°) On the identification plate fixed to the inside of the filter door.

5. JANUS PALM, ACCESSORIES AND KEY FUNCTIONS





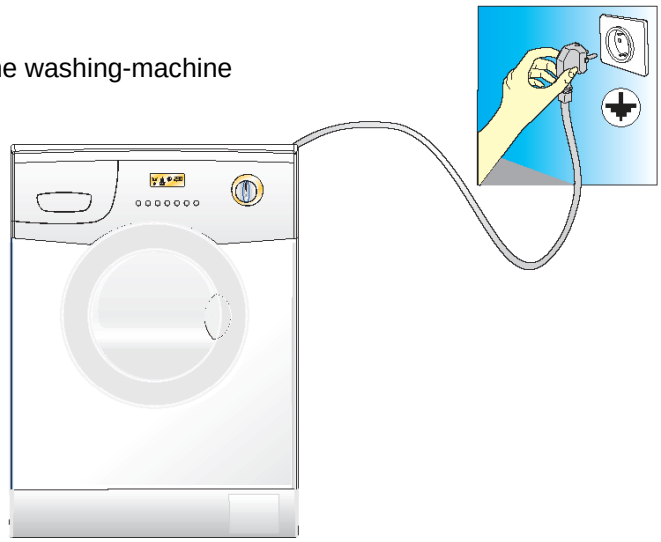
The **Janus Palm** (hand-held terminal) is normally used for the following purposes:

- entering and reading a configuration code associated to a barcode
- reading wash programmes effected (diagnostics)
- checking the operation of the components (autotest).

In order for the Janus Palm (hand-held terminal) to communicate with the washing machine, the "Activate Service Mode" procedure must be performed first.

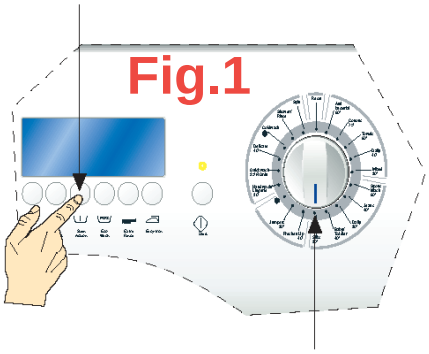
6. SERVICE MODE

1 – Switch on the washing-machine



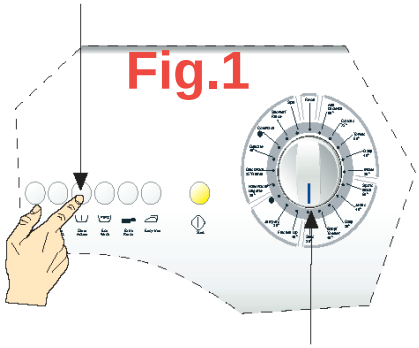
2 – Position the **Programme knob** at 6-o-clock and keep the **Prewash button** pressed for 5 seconds (Fig. 1). The washing machine is in “Service Mode” and is ready to accept any command entered on the Janus Palm terminal (the washing machine Start led flashes continuously and 00 appears on the lcd display, where present).

Prewash for 5 seconds



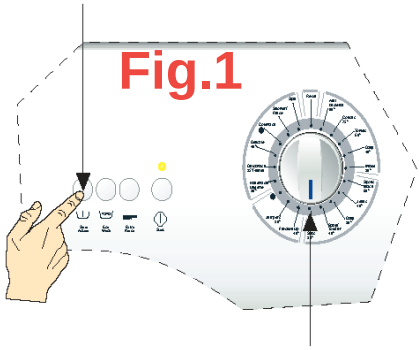
Programme knob
6-o-clock

Prewash for 5 seconds



Programme knob
6-o-clock

Prewash for 5 seconds



Programme knob
6-o-clock

<u>Important</u>:
Do not change the **Programme knob** setting when entering codes via the **Janus Palm** terminal.

NOTE:
Entry into Service Mode can be forced by disconnecting the selector cable from the front panel circuit board. The washing machine will remain in Service Mode until the selector cable is reconnected.

3 – Connect the **Janus Palm** terminal to the washing machine **front panel** as necessary, using one of the two methods described below.

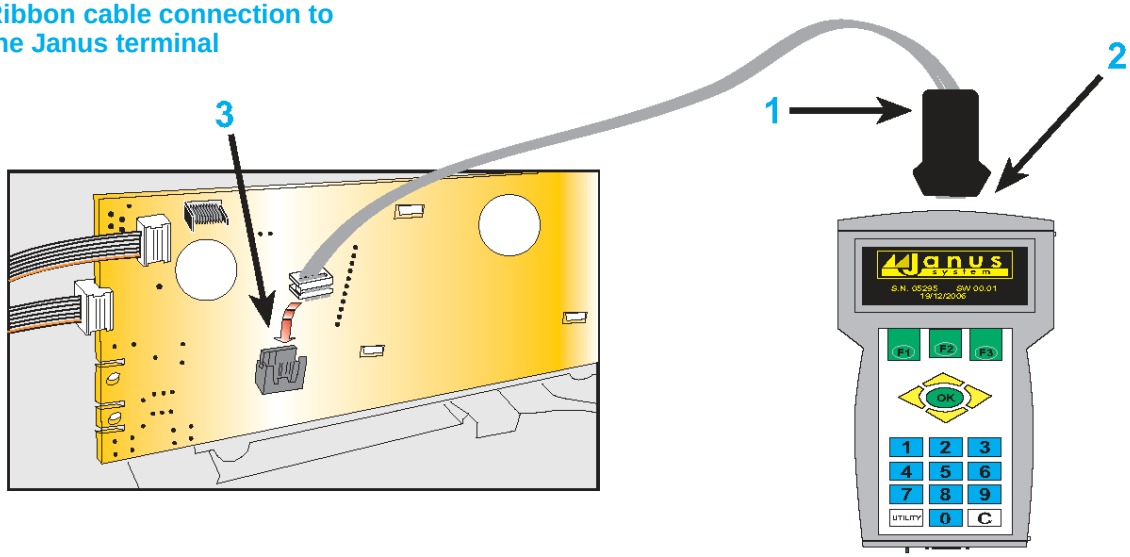
Note 2: After 4 minutes of inactivity time in Service Mode, the washing machine returns to a standard function mode.

7. TERMINAL - WASHING MACHINE COMMUNICATIONS

The communication between the terminal and washing machine takes place:

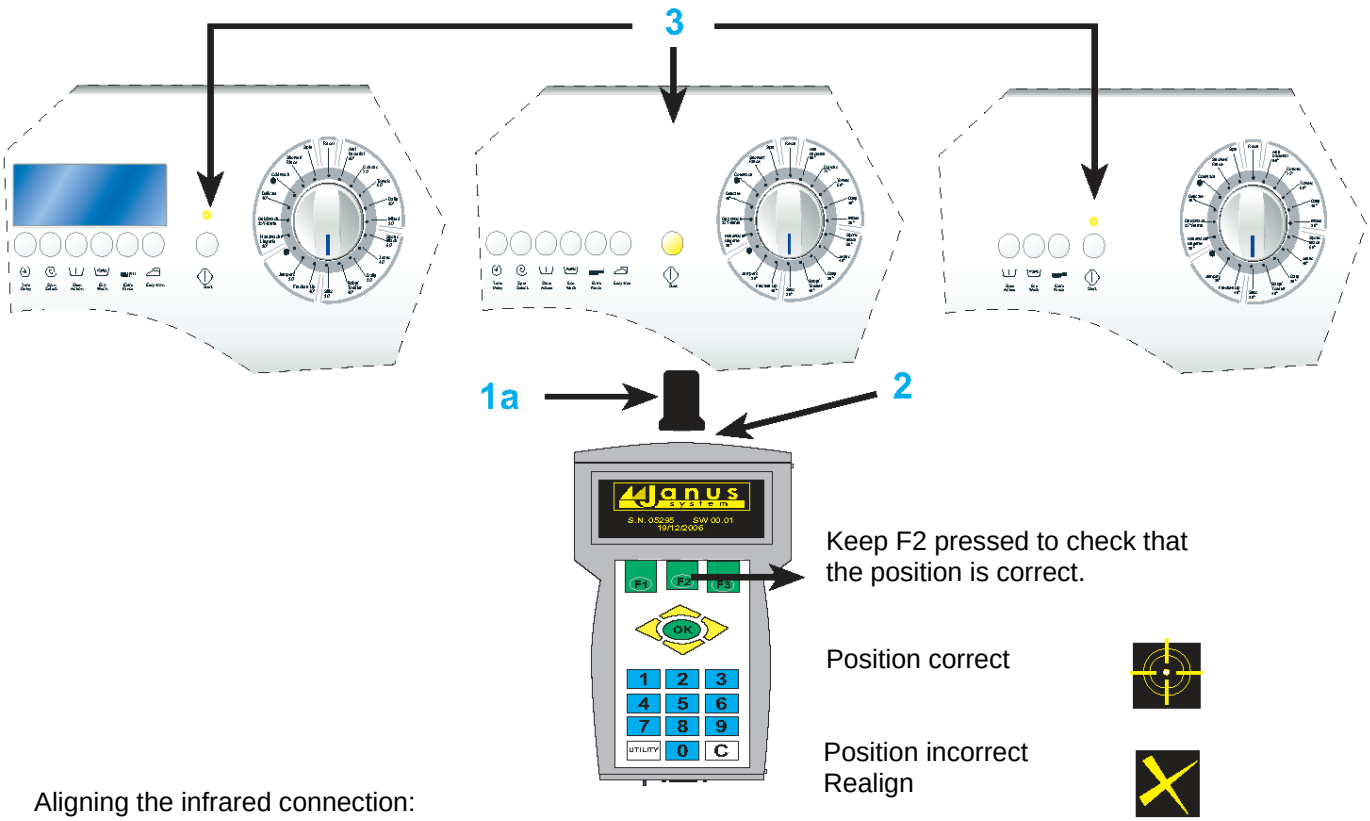
– Through a ribbon cable opto connector (1), connected to port (2) of the **Janus Palm terminal and to** connector (3) on the front panel board on the opposite side to the controls.

Ribbon cable connection to the Janus terminal



– Through an infrared connector (1a) connected to port (2) of the **Janus terminal** and placed in contact with the start led (3) on the front panel, aligning the hole in the infrared connector with the start led as much as possible.

Infrared connection to the Janus terminal



Aligning the infrared connection:

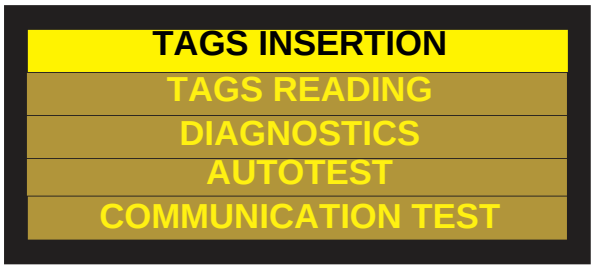
Position the infrared connector in contact with the start led on the front panel of the washing machine and keep key **F2** pressed. The position of the infrared connector is correct when a ‘target” appears at the centre of the display. If an **X** appears, move the connector slightly to find the correct position.

8. TERMINAL START-UP AND MAIN MENU

When the hand-held terminal is switched on at the ON/OFF switch, the following display, or similar, will appear for approximately 5 seconds.

The information shown on the display includes the master, slave and the serial number of the terminal

Immediately after this display, the main menu will appear:



Use the direction arrows (UP and DOWN) to scroll up and down the menu. Confirm the selection by pressing the **OK** key.
It is possible to return to the main menu from a sub menu by pressing key **F3**.

MENU STRUCTURE AND MENU ITEMS:

MAIN MENU
- TAGS INSERTION
- TAGS READING
- DIAGNOSTICS
- AUTOTEST
- COMMUNICATION TEST

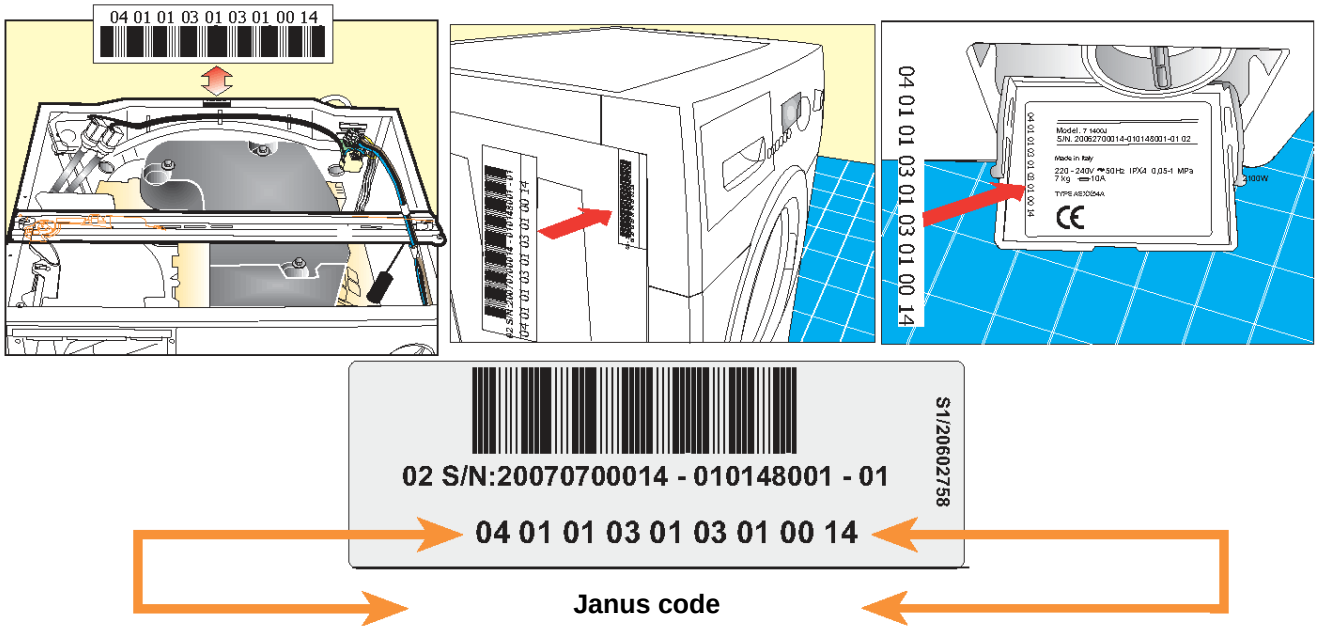
JANUS KEY — UTILITY
- LINK TO PC
- LANGUAGE SELECTION
- BATTERY LEVEL

8.1 TAGS INSERTION (TAGS INSERTION)

WARNING: THIS FUNCTION CAN ONLY BE USED WHEN THE **JANUS PALM TERMINAL** IS CONNECTED TO THE WASHING MACHINE **VIA AN OPTO RIBBON CABLE CONNECTOR.**

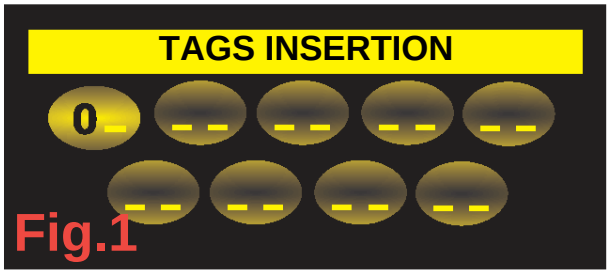
The tags insertion function is used to configure the standard replacement board with the characteristics of the washing machine. This configuration procedure must be carried out each time the front panel board is replaced. In the case where the CPU board is replaced with one of the same version, the enter code function is not necessary in that configuration takes place automatically from the front panel board. This takes place the first time the washing machine is switched on, with the configuration procedure completing within a few seconds. During this phase, the start led flashes rapidly and switches off once the procedure has terminated correctly, otherwise the led will flash slowly if the configuration was unsuccessful. If the CPU circuit board is replaced with one of a different version, then the configuration code still needs to be entered.

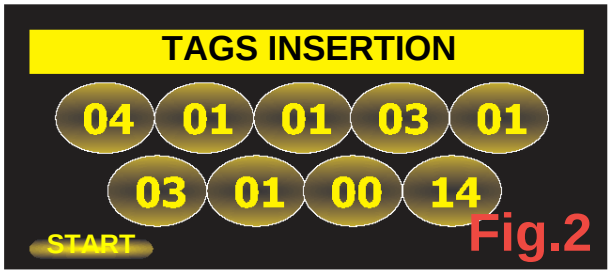
The Janus code can be found at the following locations:



When the code is entered using the numerical keys, the cursor will move progressively switching from one field to the next (**Fig.1**).

Once the code has been entered, press **OK** and the word START (**Fig. 2**) will appear. Then press F1 and the Janus terminal will send the code to the washing machine. On completion, the washing machine will be correctly programmed.



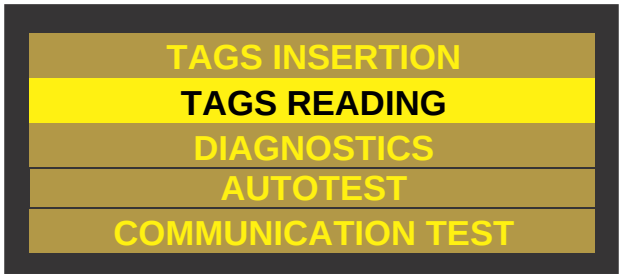


Depending on the situation, one of the following warning messages may be displayed.

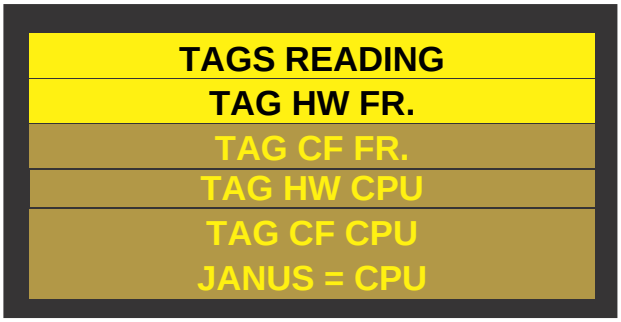
JAN CODS CHKSUM ERR.	An invalid code has been entered, repeat the operation and check.
FILE NOT FOUND	The code entered is not present in the terminal memory card.
SD CARD NOT READY	The memory card has not been inserted or incorrectly initialised.

8.2 TAGS READING (READ CODES)

The second item in the menu is "Tags Reading". When selected, this item provides information on the software and hardware versions of the boards present in the washing machine and actually connected to the terminal.



Pressing the OK key will download the data present on the washing machine boards:



Select **TAG HW FR.** and press the **OK** key to check the serial n°, date, ID and code of the front panel hardware.

Select **TAG CF FR.** and press the **OK** key to display the front panel software configuration, i.e. the barcode, Janus code, date and ID.

Select **TAG HW CPU.** and press the **OK** key to check the serial n°, date, ID and code of the CPU hardware.

Select **TAG CF CPU.** and press the **OK** key to display the CPU software configuration, i.e. the barcode, Janus code, date and ID.

Select **JANUS = CPU.** and press the **OK** key to display the **JANUS CODE** present inside the machine. This is useful to verify the effective code inserted by the producer.

8.3 DIAGNOSTICS

The third item in the main menu is "Diagnostics" (Fig. 1). This is used to analyse the operation of the washing machine, displaying information on the cycles effected.

Select the function by pressing the OK key. The system will then download the data from the washing machine (Fig. 2) and subsequently display the diagnostics screen (Fig. 3).
This diagnostics display provides the following information:

- Total number of cycles effected
- Data relating to the last 6 cycles effected (1/6 is the last cycle run by the washing machine)

The following information is displayed for each wash cycle:

- Cycle under examination
- Set temperature
- Spin speed
- Option buttons selected
- Safety codes triggered during the wash cycle.

Fig.1

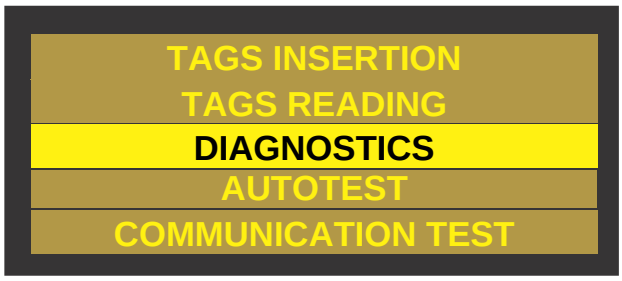
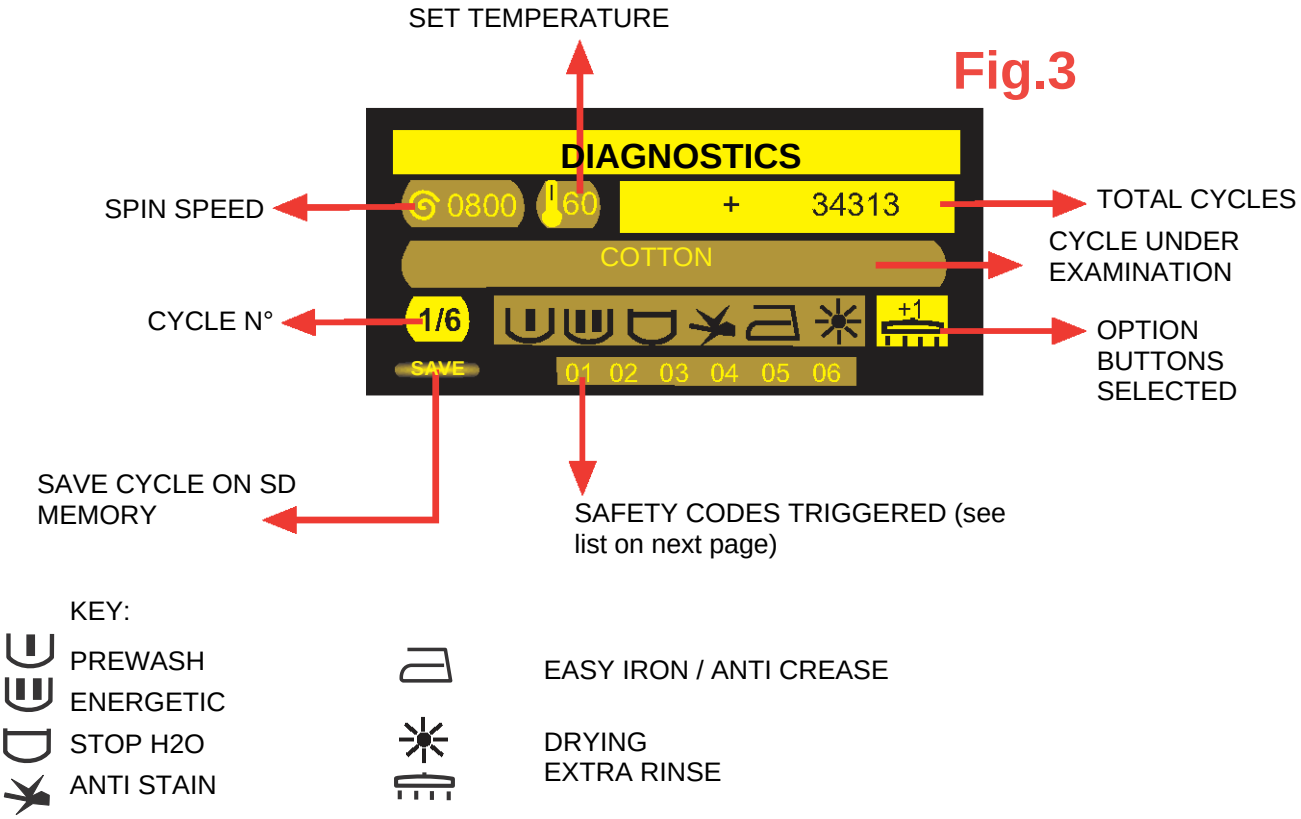


Fig.2

Fig.3



KEY:

PREWASH
ENERGETIC
STOP H2O
ANTI STAIN
EASY IRON / ANTI CREASE
DRYING
EXTRA RINSE

8.3.1 DIAGNOSTICS: LIST OF SAFETY CODES

Any safety trips occurring during a wash cycle are signalled by a safety code. The following table lists the safety codes and their associated events.

Code	Safety	Description
01	Dynamic protection, triac motor short-circuit	Both represent the failure of a CPU board component linked to the motor control
02	Static protection, triac motor short-circuit	
03	Tachometric protection	Indicates the absence of the tachometric signal
04	Temperature sensor protection	Indicates a defective temperature sensor
05	Maximum temperature protection	Indicates that the safety temperature (90°C) has been exceeded
06	Heating timeout	Indicates that the maximum heating temperature of a wash program has been exceeded
07	Drain timeout	Indicates that the maximum drain time (20') has been exceeded
08	Water feed timeout	Indicates that the maximum water feed time (5') has been exceeded by the solenoid valves
09	Mains voltage read protection	Indicates a low power supply level from the mains of less than160 volts
10	Microcontroller reset	Indicates a reset (operational block) of the CPU board microcontroller
11	Manual reset (knob)	Indicates the interruption of a wash cycle due to the programmer knob being moved to the Stop position
12	External reset (power supply)	Indicates the interruption of a wash cycle due to an interruption(or momentary suspension) of the power supply
13	Motor heat sensor tripped	Indicates the intervention of the motor cut-out due to overheating
14	Maximum number of balancing attempts protection	Indicates the maximum number of balancing attempts effected during the final spin phase due to an unbalanced load
15	Maximum number of resets safety	Indicates the maximum number of resets effected (20) in the Cotton program
16	Door catch safety	Indicates incorrect operation of the door catch
17	Sponge check safety	Indicates the intervention of the spongy load control in Cotton and Synthetic programs
18	Rinse antifoam protection	Both represent the intervention of the foam control during the rinse and spin phases
19	Spin antifoam protection	
20	Emergency spin safety	Indicates the execution of an emergency spin (550 rpm) at the end of the wash cycle.

8.4 AUTOTEST

This function is used to check the operation of the various electrical components (motor, pump, heater element, etc.....)

NOTE: It is recommended that an opto ribbon cable terminal to washing machine connection is used for this function.

WARNING:
Each test is carried out taking into account the following considerations:

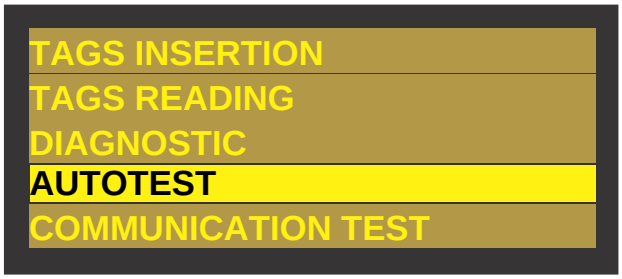
- Washing machine empty

- Correct mains power supply
- Correct mains water pressure
- Sudden start-ups of the motor do not indicate a malfunction, in that the balance checks are excluded from the autotest

When the Autotest mode is selected:

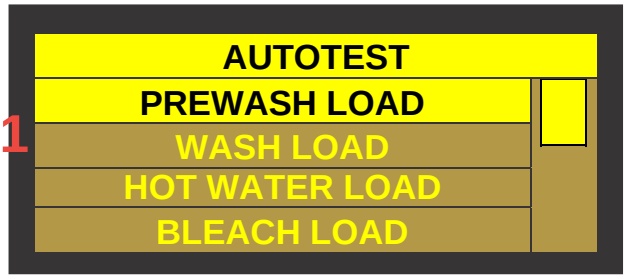
- The front panel of the washing machine lights up to allow the buttons and leds to be tested.
- The door catch is activated.
- All the previously active functions are stopped.

All the tests are carried out on the basis of the Janus code of the appliance.



Pressing the **OK** key will load the data from the terminal, and then the main autotest menu will be displayed (**Fig.1**).

Fig.1



Menu structure:

AUTOTEST
- PREWASH LOAD
- WASH LOAD
- HOT WATER LOAD
- BLEACH LOAD
- SOFTENER LOAD
- DRAINING
- MOTOR 45 RPM CLOCKW.
- MOTOR 45 RPM ANTICKW.
- SPINNING
- HEATER
- DRYING

Scrolling through the menu using the **UP** and **DOWN** keys will display all the menu items indicated on the previous page. Each function can be selected by pressing the **OK** key (**Fig.2**):

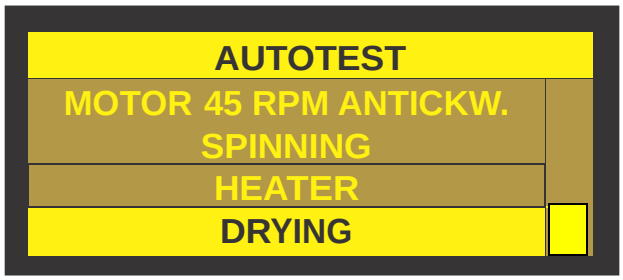
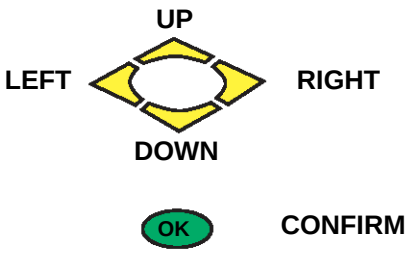
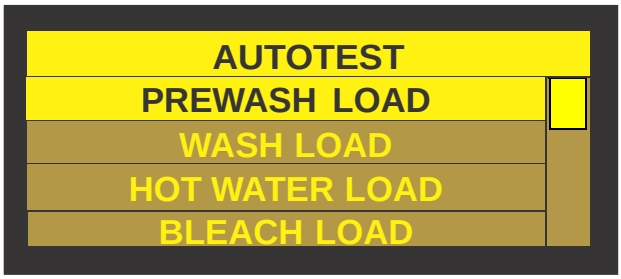


Fig.2

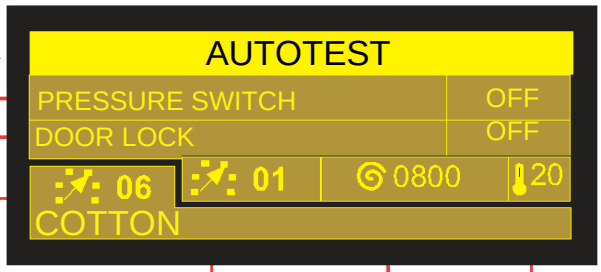


Pressing the **RIGHT** key **while still in the main autotest menu** will display information on the actual conditions present in the washing machine (**Fig. 3**).



RIGHT

Fig.3



From here, it is possible to check:

- the status of the pressure switch

- the status of the door lock (catch)

- the position of the programmer knob and the relative programme

- the position of the secondary knob (where fitted)

- the set spin speed

- the temperature detected by the internal sensor.

When menu item **PREWASH** is selected and the **OK** key pressed, the display will appear as in (**Fig.4**).

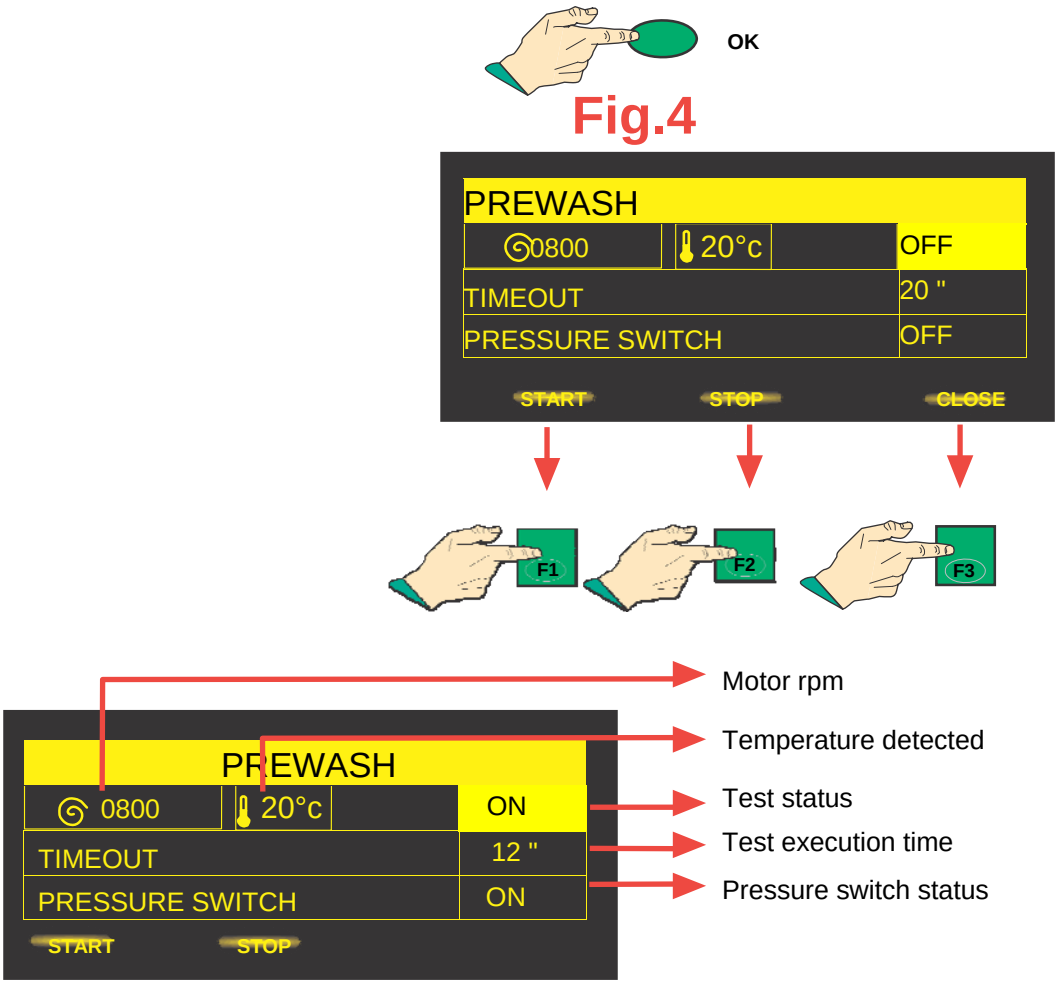
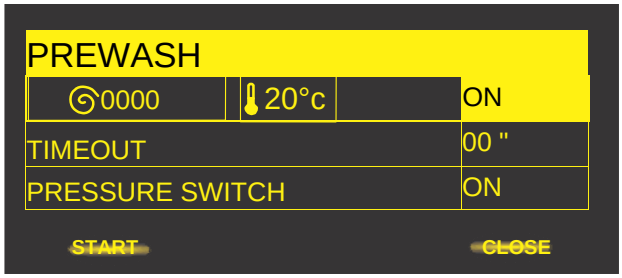


Fig.4

Each submenu present in the "Autotest" section indicates:
- the rpm of the motor in real time
- the temperature detected by the sensor inside the tub
- the status of the pressure switch
- the status of the test
- the timeout time

When the start key of the relative test to carry out is pressed (key F1 on the terminal) the "Timeout" time will reduce and the status of the pressure switch can change from on to off and vice versa.
The change in the status of the pressure switch will stop the test being executed.

Furthermore, once the timeout has finished, the test can be restarted by pressing key **F1** (start).

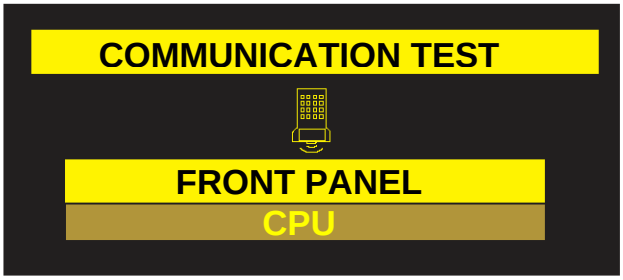


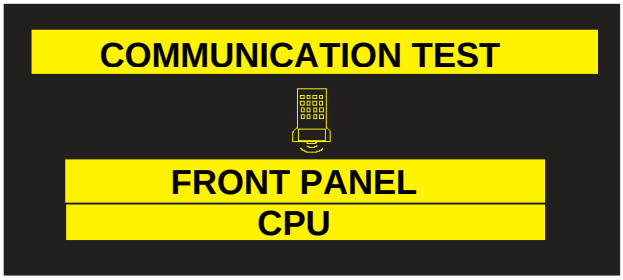
8.5 COMMUNICATION TEST

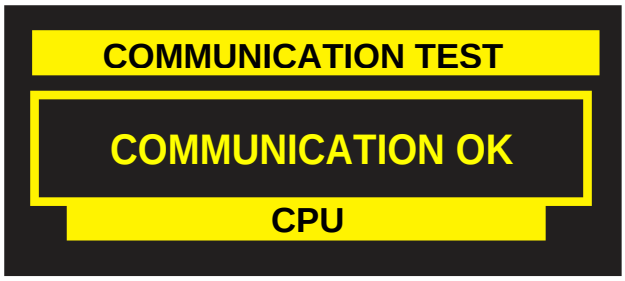
This function checks that all the connections are operational (CPU – Front Panel board, Front Panel board – Janus hand-held terminal.

NOTE: The Communication test can be carried out with either the opto flat ribbon cable connection or with the infrared connection.

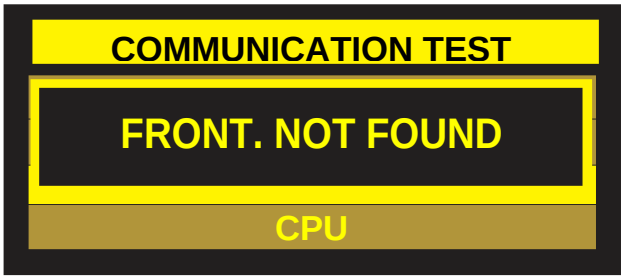
When the OK key is pressed the following sequence is displayed:







If there are any problems in the communications with the washing machine, the following message is displayed:

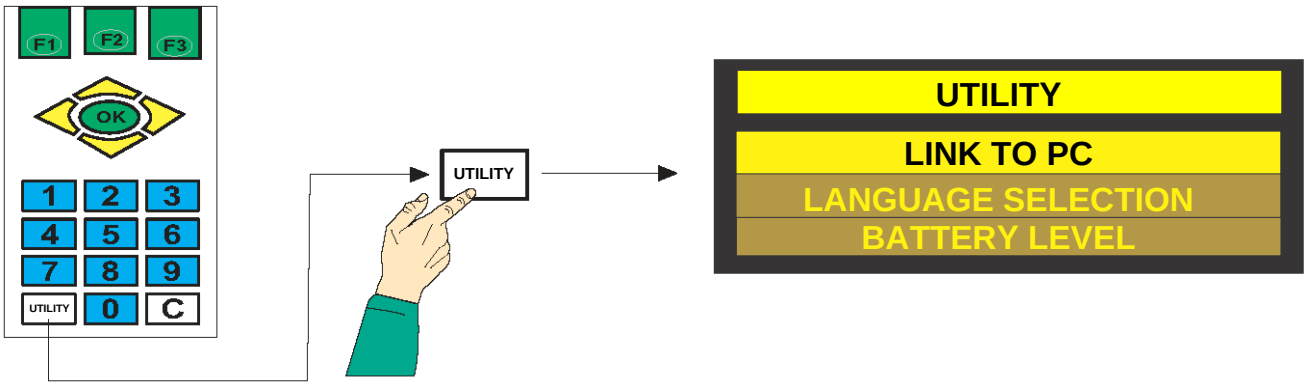


Note: The communication test can also be carried out by pressing key **F2** on the hand-held terminal. In this case, however, only the communication between the terminal and the front panel of the washing machine is tested. This test can be carried out with the infrared connection.

Position correct - Communication Ok

Position incorrect - Realign

9. UTILITY KEY ON THE TERMINAL AND ITS FUNCTIONS



The communication with the computer is activated by selecting **LINK TO PC** and pressing the **OK** key (**Fig. 1**):
In this case, the Janus Palm terminal is set-up for communicating with the personal computer through the RS232 serial cable.

Fig.1

Selecting the **"LANGUAGE SELECTION"** option and then pressing the **OK** key will display a list of languages available on the terminal (**Fig. 2**).
The language required is selected by pressing the **OK** key.

Selecting the **"BATTERY LEVEL"** option and then pressing the **OK** key will display the remaining percentage battery charge (**Fig. 3**).
If the battery charger is connected, the display will indicate that the battery is charging.

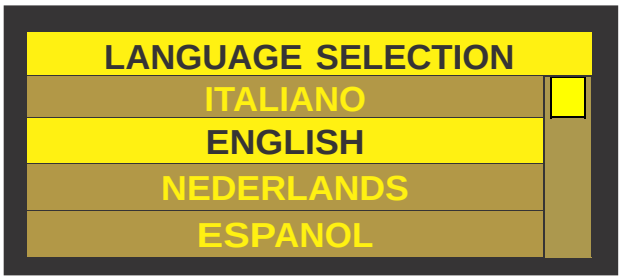


Fig.2

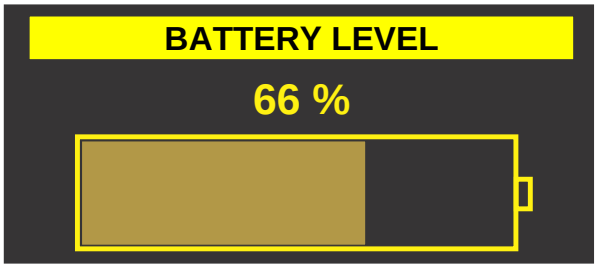


Fig.3

When the hand-held terminal is not used for a few minutes, it automatically switches to standby mode.

8.6 TROUBLESHOOTING

- The hand-held terminal will not switched on or the display is unclear:
Check that the batteries are inserted correctly.
Check that the batteries are charged or the external power supply is connected properly.
Use NiMH rechargeable AA L6 batteries only, or alternatively use alkaline batteries.
Do not use alkaline batteries together with the power supply unit supplied.

- During the enter code phase, "Tags Insertion", the terminal keeps displaying the "SD card not found" message.
Check that the memory card is inserted correctly in the terminal. If necessary re-format it using the "Janus Palm" software supplied.

- The terminal does not respond when a key is pressed.
Remove the batteries from their compartment, check their charge level and check that the connection to the external power supply unit is correct.
Switch the terminal off and on again using the ON/OFF switch.

- The infrared connection is unstable or there are errors occurring.
Check that the infrared connector is inserted properly and in the correct position.
If the problem persists, make the connection using the opto ribbon cable

- The washing machine does not enter "service mode" when using the standard procedure.
Try entering “service mode” by disconnecting the selector cable from the front panel circuit board.

- The communication between the terminal and personal computer does not function as it should:
Check that the computer used to install the "Janus Palm" software meets the minimum requirements and that it has at least one free RS232 serial COM port.

10. INSTALLING AND RUNNING THE JANUS PALM SOFTWARE

From “Janus Palm Software v1.0 Instruction Manual”

10.1 Introduction

The software allows communication with the Janus palm terminal and read/write functions on the SD card housed in the terminal.
It is possible to upload configuration files from the PC to the terminal and check their correspondence, and download any diagnostics present to the PC or delete the entire content of the SD card.
It is also possible to update the firmware of the terminal with any available updates and upload or add languages.

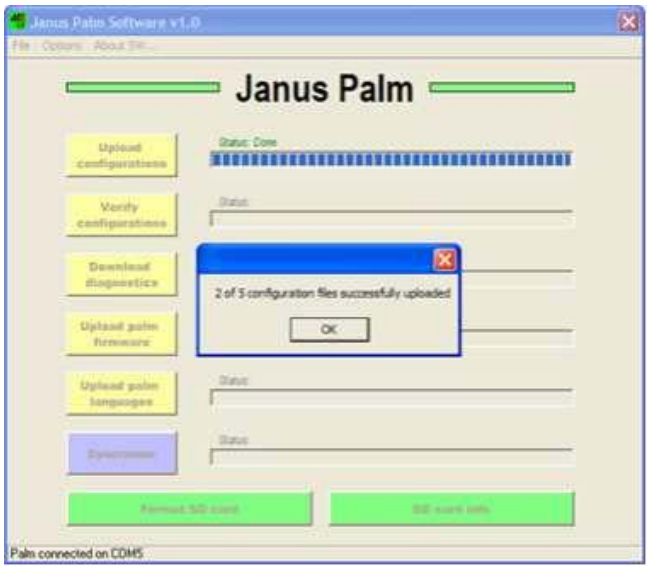
11. Installing and launching the software on the PC

Start the installation program and select the destination folder. Links will be created in the Start menu of Windows for running and uninstalling the software. Working subdirectories will be created inside the selected directory which will be used by the software for the files it exchanges with the hand-held terminal. These directories are: "\JCfg", "\JDia", "\JS19", "\JLang" and "\JLog").
After installing the software, connect the hand-held terminal to a free serial port on the PC.
Then launch the program.
The main page will appear as shown below:

From the drop-down menu at the top right, select the software language required (all the text strings will be converted immediately).
The centre drop-down menu lists all the detected free COM ports on the PC. Select the port to which the palm terminal is connected and press “Link”. If the terminal is not recognised on the selected port, try another.
The software will now attempt to communicate with the terminal. If the link is established, the window will close and the software and all its function can be used.
The language and COM port selected are saved to disc and loaded each time the software is launched.

12. Function “Upload configurations”

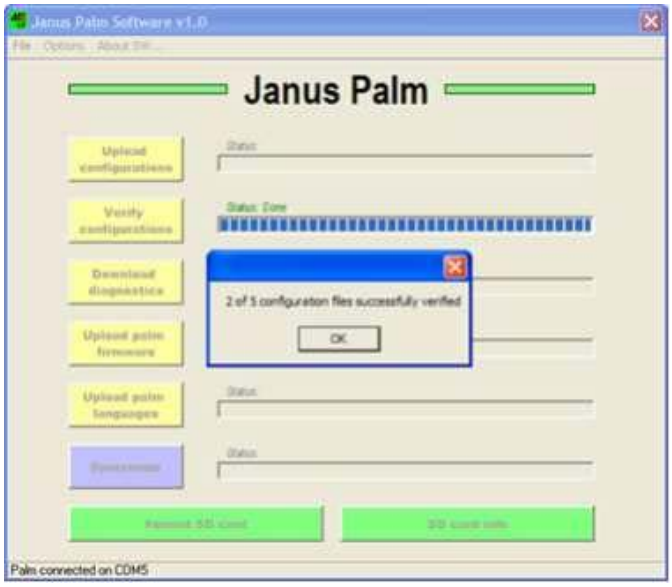
The software searches for the index file of the "Janus_Cfg_ListaCodici.cfg" configurations in subdirectory "\JCfg", analyses it and uploads to the hand-held terminal all the configuration files listed that do not have the same Janus, PDV_FR and PDV_CPU codes.



A message window communicates the completion of the operation and the number of configuration files uploaded into the SD card of the hand-held terminal.

13. Function “Verify configurations”

The software searches for the index file of the "Janus_Cfg_ListaCodici.cfg" configurations in the "\JCfg" subdirectory, analyses it and checks that all the required configuration files are present on the SD card of the terminal. The files are read from the SD card and compared byte by byte with those on the PC.



A message window communicates the completion of the operation and the number of configuration files verified.

14. Function “Download diagnostics”

The software analyses the SD card of the terminal and downloads any diagnostic files to the PC. The files are saved in subdirectory "\JDia" and renamed "JDia_xxxxxxxxxxx-xxxxxxxxx-xx_yy.dia", where the x’s indicate the 22 decimal numbers of the barcode of the washing machine and the y’s indicate the number of the file assigned by the terminal.

15. Function “Upload palm firmware”

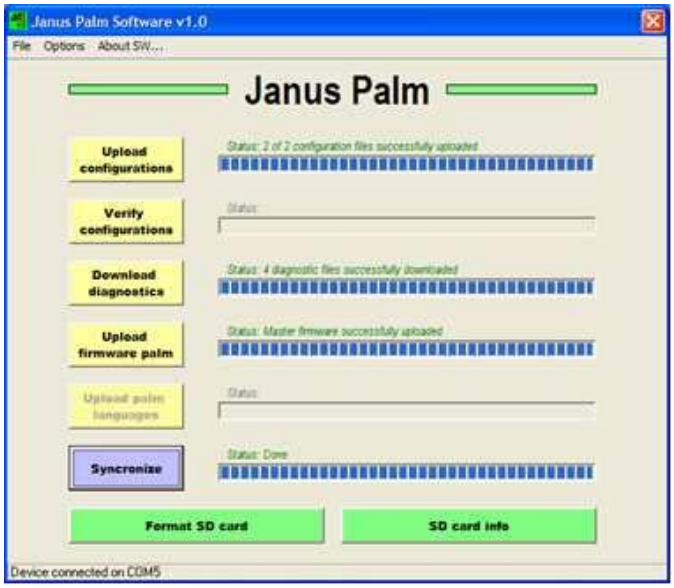
The software checks whether there are any terminal update files in subdirectory "\JS19". These files contain the firmware of the terminal microcontrollers. These files, maximum two, are in S19 format (with the S19 extension): "SWMaster.S19" and "SWSlave.S19". The first of these is analysed and split into two temporary files which will be uploaded separately and subsequently deleted. Consequently, a maximum of three files will be downloaded in this operation.
The update is completed once the hand-held terminal has been switched off and then back on again.

16. Function “Upload palm languages”

The software searches for the terminal language index file "Lang_index.lif" in the "\JLang" subdirectory, analyses it and uploads all the configuration files listed.

17. Function “Synchronise”

All the operations selected in the "'Options" -> "Synchronise tasks" menu are carried out without interruption (see paragraph). The default setting is to execute all the functions, excluding "Verify configurations" which is considered as not strictly necessary.
On completion of the operation, a window similar to the following will be displayed.

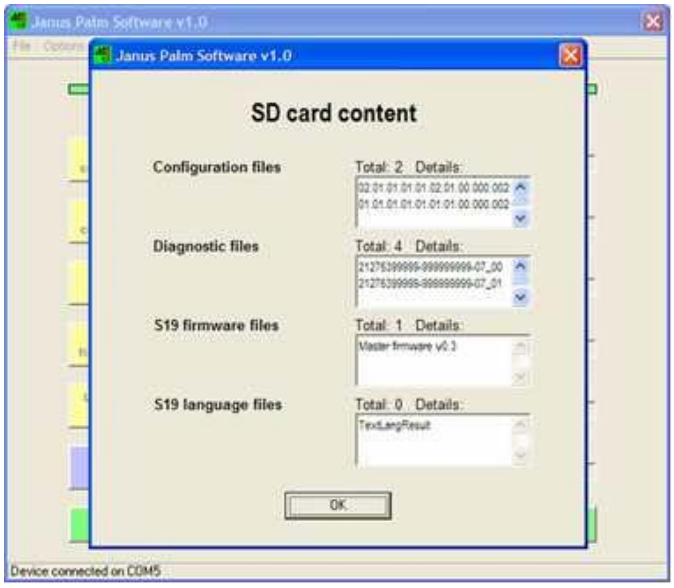


18. Function “Format SD card”

Performs a fast format of the SD card. All the information contained in the memory will be lost.

19. Function “SD card info”

Analyses the SD card and displays a window with the details of the content.



20. “File” Menu

The file menu allows operations to be carried out on the files in the working subdirectory of the software.

Clicking on one of the "Import" lines opens a dialogue window in which it is possible to select the file to copy to its respective destination directory. The S19 firmware update files must be imported one at a time, while for the configurations and languages it is sufficient to select the index file and all the files listed will be imported.

Clicking on the "Export diagnostic files" line opens a dialogue window in which it is possible to select the destination directory where the entire working directory "\JDia" will be copied.

21. “Options” Menu

Clicking on line "Synchronise tasks" will enable the operations included in the "Synchronise" macro operation to be display and modified.