

INSTALLATION MANUAL

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DAVESOFT

**Diagnostic and setup software for
Digital Microwave**

DAVE



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INTRODUCTION

This software permits an accurate and simple selection of the MESDAVE microwave programming parameters and a diagnostic of the events on-field, by the detection of the delay of the alarm and the microwave signal change, related to the object that causes the microwave settings.

DAVESOFT could be installed on the operative systems Windows XP, Windows 2000 and Windows ME. The CD contains all the necessary files for the installation and the configuration of the software on the PC.

The product also contains a cable for the connection between the PC (via USB 2.0) and the device.

This connector is used to show to the microwave that the setup is executed by the software and that the data that must be stored are the ones set on the PC. If the connector will be extracted, the microwave will not consider the software data but will decode the analogue parameters (delay, sensitivity, battery ecc.) set by the trimmers and the functions set on the dipswitch (for more details see the MESDAVE200 manual)

For the PC settings, on the microwave must be set the dip1 in ON (for TX and RX) and must be inserted the DIGITAL SETTING connector as showed in the pictures at the end of the manual.

For the correct use of the software the PC must have the USB 2.0 exit.

FILE

The product have a CD that contains 2 folders. In the DAVESOFT folder there's a setup file that if executed launch the software installation. The other files in the folder are the software manual, the cable drivers setup manual, the USB driver and the freeware application Winrar for the extraction of the USB driver folders.

Open the CD, Enter in the folder, launch the setup and follow the indications for the setup.

PREDISPOSITION

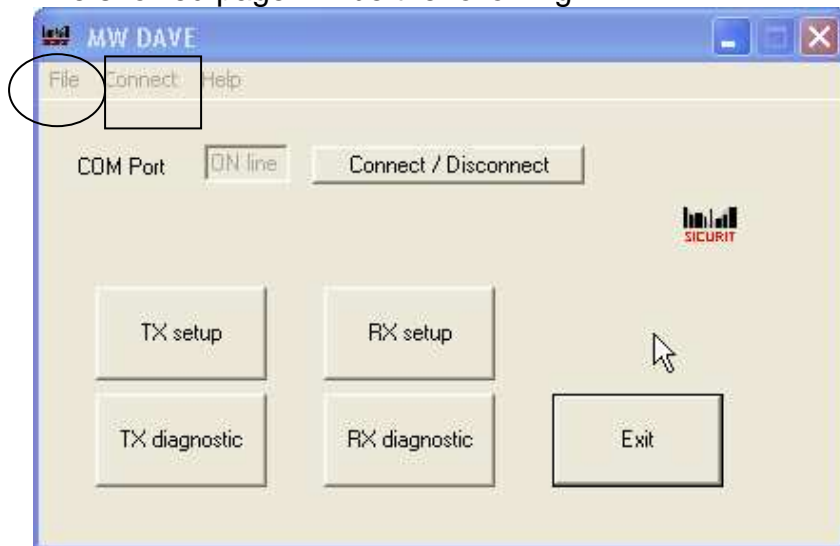
In the CD there are the drivers of the serial USB cable. Proceed at the drivers setup (the file name is CP210x_VCP_Win2K_XP_S2K3, witch is located in the subfolder named Cable Drivers) if the USB cable will not be recognized automatically by the PC.

START

Insert the cable in a USB port. Verify the recognizing of the new device by the system or proceed at the drivers setup.

Then launch the DAVE software (from the PC) located in the previously created folder/subfolder. The parameters choice is made by the left button of the mouse pushing and/or with the keyboard insert of the parameter that must be programmed.

The showed page will be the following :



In the top row there is a scrolling menu when there are the following commands :

File:

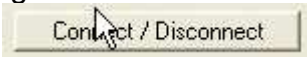
Save : Used for save a configuration of a device on the PC
Exit : Exit from the application

Connect:

Connect : Used for the connection with the microwave
Disconnect : Used for the disconnection with the microwave
ComPort : Used for the input of the correct COM port

Help:

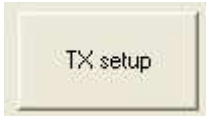
Version : The actual software version

With this software the user can locally control only a unit each time. Select the user Com Port. Connect the cable to the device to program or to see. Push the command Connect from the scrolling menu or push the button 

If there is communication between the microwave and the PC the yellow led on the microwave board will blink with small intervals frequency.

TRANSMITTER PARAMETERS SETUP

From the main application window push the button



On the screen will appear the mask on the right, that contains all the **stored parameters of the transmitter microwave board** connected to the PC.

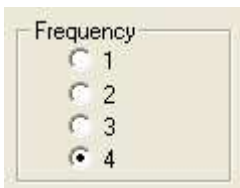
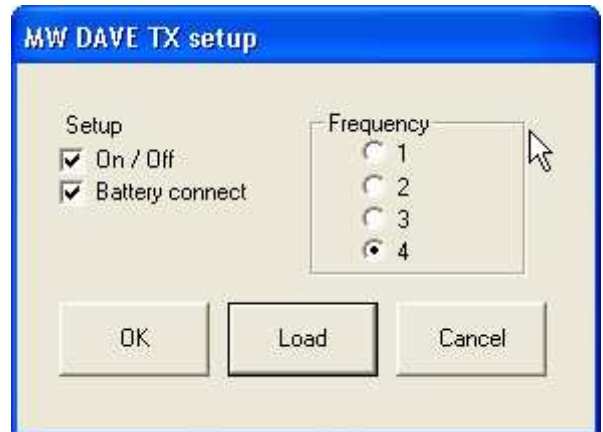
Select the function parameters of the TX microwave, in base of the installation the customer must have, and remember that if there are 2 different and near microwave stretches, the channels frequencies must be always different.

The options with \checkmark symbol present are activated.

If \checkmark is present on the **On/Off** option it means that the transmitter is active and it could send the microwave signal to the receiver one.

If the symbol is present on the **Battery connect** option means that the battery must be connected to the relative plugs on the transmitter board.

The selected frequency channel is showed with the black dot \bullet . To change the frequency



click with the left button of the mouse on the wanted option.

When the setup is complete, the parameters will be send to the TX microwave, after the pushing of the OK button.



If the user wants to save the actual configuration he must go on the main window and use the command **SAVE** from the File scrolling menu. If he wants to load a previous saved configuration he must push



And select the txt file where there is the wanted configuration.



The pushing of will exit from the setup window without any parameter sending.

RECEIVER PARAMETERS SETUP

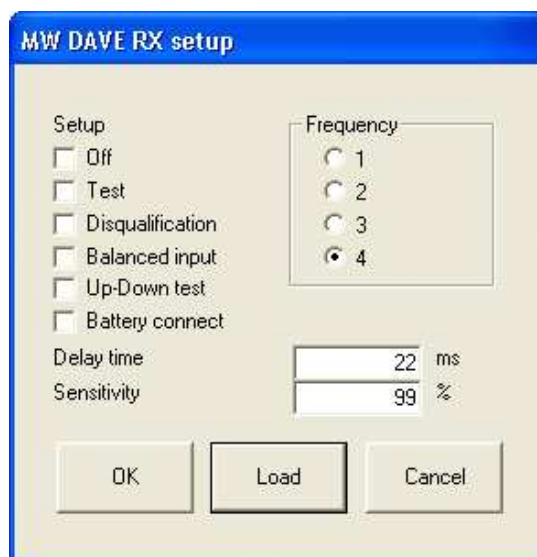
From the main window click on the button



On the screen will appear the mask on the right, that contains all the **stored parameters of the receiver microwave board** connected to the PC

Select the function parameters of the TX microwave based on the installation the customer must have, and remember that the RX frequency must be the same of its TX frequency.

The options with \checkmark symbol present are activated.



If the \checkmark symbol is not present in the **Off** option the receiver is not active and always in alarm. Theoretically is used to simulate an alarm condition.

If the symbol \checkmark is present on the **Test** option the receiver is in test mode. This mode blocks the AGC functions and permit the microwave alignment. It is used to align the TX with the RX, as described in the Dave Manual.

If the symbol \checkmark is active in the **Disqualification** option the system is in disqualify mode. This option must be used only to simulate a critical ambiental condition (as snow, fog or storms) because the disqualify activation reduce automatically the microwave sensitivity, and consequently the detection quality.

Before the activation of the option in service mode (with SENSE input activation) it is correct to verify if the parameters set with the software are sufficient to guarantee the proper intrusion revelations.

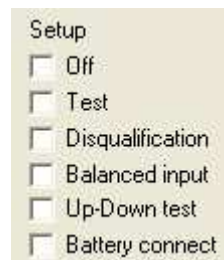
If \checkmark is present on the **Balance input** option, the disqualification condition via SENSE input on the hardware happens only if there is a 3.3KOhm resistor balance, with a tolerance of 5%.

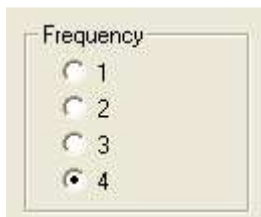
If \checkmark is present on the **Up-Down test** option the system create an alarm condition only if there is a dual mode signal variation. This function could be activated in installations where the disposition or the type of the location is not perfect for the correct microwave work.

If this function is active the alarm will be generated only when the signal variation happens for both the alarm/sensitivity limits. In this way the mw could detect for example an intrusion slow only at the exit of the detection zone.

If \checkmark is present on the **Battery connect** option means that the control on the battery is active and the battery must be connected to the relative plugs on the receiver MW.

The selected frequency channel is identified with the black dot \bullet . To change the setting click with the mouse on the wanted transmission channel.





For the selection of the sensitivity and of the delay time, insert the numbers in the relative textboxes

Delay time	22	ms
Sensitivity	99	%

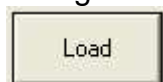
In the **Delay Time** Box select a number from 20 to 500, that represent the time (in ms) of the intrusion detection. A slow time permit the detection of a man who runs trough the microwaves.

In the **Sensitivity** channel is decided the % value of the mass that must be detected. More high is the number (the maximum value is 99), more the system becomes sensible. With the correct use of this parameter (and if the system is installed on a good field) is possible to know if there are little animal (like must be a cat) or big objects intrusions (like must be a car).

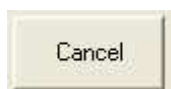
When the setup is complete, the parameters will be sent on the TX microwave after the pushing of the OK button.



If the user wants to save the actual configuration he must go on the main window and use the command **SAVE** from the File scrolling menu. If he wants to load a previous saved configuration he must push



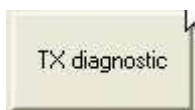
And select the txt where there is the wanted configuration



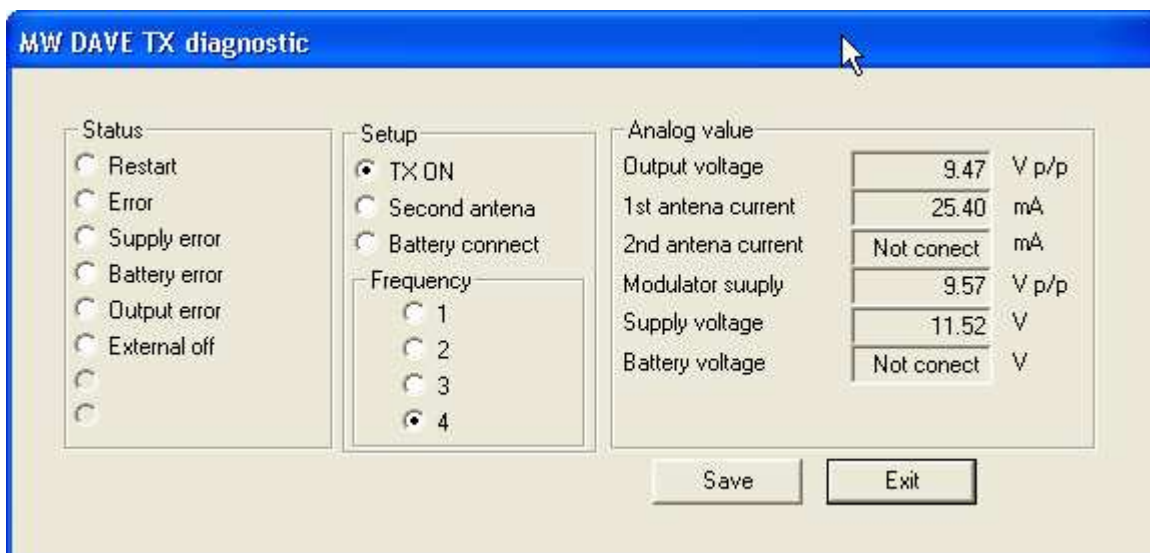
The pushing of will exit from the setup window without any parameter sending.

TRANSMITTER DIAGNOSTIC

Push from the main software window the button :



On the monitor will appear the following mask, that contains how all the transmitter parameters are set.



On the left side (**Status table**) the black dot ● shows any problem on the TX microwave

In the status table there are showed the following conditions :

The black dot ● near the **Restart** option indicates that the micro processor, for external causes, is in firmware re-initialization mode.

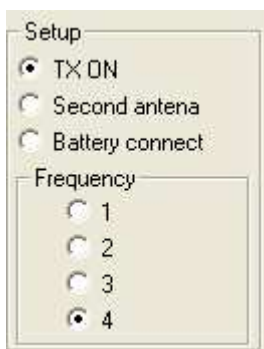
The black dot ● near the **Error** option indicates a generic non good working on the microwave. In this case verify the parameters showed in real time in the Analog value table, and compare them with the correct values of a working microwave or if they are not in the tolerated range (more details on DAVE manual)

The black dot ● near the **Supply error** option indicates an incorrect supply value, out of the limit tolerances. Verify in this case the supply value in input (Vd.c.)

The black dot ● near the **Output error** option indicates a wrong value of the modulator supply. Verify the values from the Analogue table (The correct value is around 9.5V d.c.).

The black dot ● near the **External off** option indicates that the reset input (Ext-off) is active. It means that the transmitter MW is switched off and consequently there's no signal transmitted to the RX microwave, that switches in alarm mode.

In the central table the black dot ● indicates the type of the transmitter parameters . This parameters could be changed by the user with the previously explained setup procedure :



Verify that the stored parameters are the good ones for the installation type. If the user wants to change something go, as previously described, in the “Transmitter settings setup” manual section.

In the right section of the diagnostic window there are the following parameters (showed in real time) :

Output voltage	9.47	V p/p
1st antenna current	24.60	mA
2nd antenna current	Not conect	mA
Modulator supply	9.57	V p/p
Supply voltage	11.51	V
Battery voltage	Not conect	V

If the read values are correct in the status table the **Error** Option will not result highlighted

The analogic value showed in the **Output Voltage** label must be 9,5V +/-5%

The analogic value showed in the **1st antenna current** label must be 25mA +/-30%

The analogic value showed in the **2nd antenna current** label must be 50mA +/-30% only if the second antenna is connected to the TX board.

The analogic value showed in the **Modulator supply** label must be 9,5V +/-5%

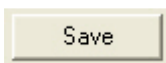
The analogic value showed in the **Supply voltage** label must be 11<V>13,6

The analogic value showed in the **Battery voltage** label must be in the tolerated value limits for the correct battery re-loading.

In the lower part of the diagnostic window there are 2 commands :



By the command



The user activate a new window, where it's possible to save the analogic parameters of the analyzed TX. The storing is made on a .txt file. The stored data could be referred to a transmitter error. To have an automatic storing at any detected TX error select the Error option from the mask, then press the File button. This operation permit to create a text file where save the data. To stop a current storing press the button Stop.



Another kind of data storing is a periodical storing, that saves the TX situation in every time periode the user wants (the minimum time between two saves is one second : if the user digit 1 in the Periode textbox the store will save the TX situation every second). Also in this kind of store is possible, with the “STOP” button, to interrupt the current data storing procedure.



WARNINGS : the storing files must be controlled, to not full the hard disk capacity. In the error storing type, the last error will not be saved if the storing function will be interrupted before the complete data archiving.

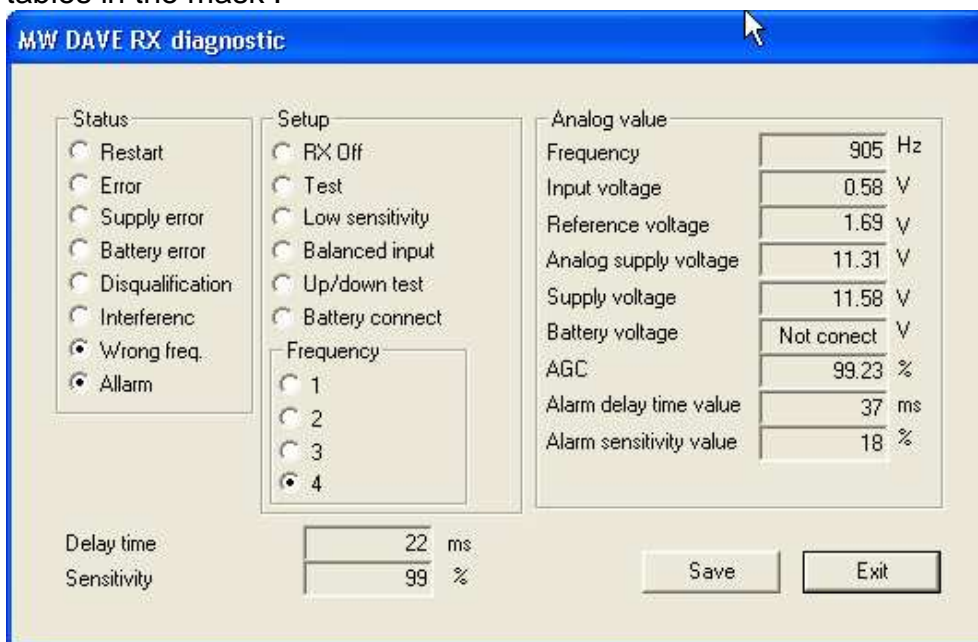
If the settings are corrected and the TX is in ON mode, with the USB cable disconnected only the green led on the board must be switched on.

RECEIVER DIAGNOSTIC

From the main window select the button :



It will appear a mask similar at the following one, that shows the actual parameters of the receiver microwave. As in the Transmitter diagnostic window there are three different tables in the mask :



The window displays the following data:

Status		Setup		Analog value	
<input type="radio"/> Restart	<input type="radio"/> Error	<input type="radio"/> RX Off	<input type="radio"/> Test	Frequency	905 Hz
<input type="radio"/> Supply error	<input type="radio"/> Battery error	<input type="radio"/> Low sensitivity	<input type="radio"/> Balanced input	Input voltage	0.58 V
<input type="radio"/> Disqualification	<input type="radio"/> Interferenc	<input type="radio"/> Up/down test	<input type="radio"/> Battery connect	Reference voltage	1.69 V
<input checked="" type="radio"/> Wrong freq.	<input checked="" type="radio"/> Alarm	Frequency		Analog supply voltage	11.31 V
		<input type="radio"/> 1		Supply voltage	11.58 V
		<input type="radio"/> 2		Battery voltage	Not conect V
		<input type="radio"/> 3		AGC	99.23 %
		<input checked="" type="radio"/> 4		Alarm delay time value	37 ms
				Alarm sensitivity value	18 %
Delay time	22 ms				
Sensitivity	99 %				

Buttons: Save, Exit

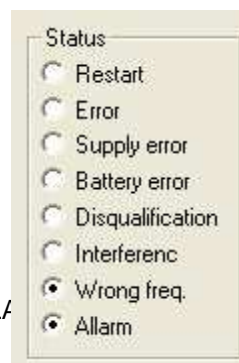
In the left table (named **Status Table**) the black dot • identify a system trouble. In the status table there are the following conditions :

The black dot • near the **Restart** label identify that the micro processor, for external causes, is making a firmware re-initialisation.

The black dot • near the **Error** label identifies a generic error on the board. Verify this conditions in the right table, that shows in real time the analogue values read from the microwave, and compare them with the correct theoretically values.

The black dot • near the **Supply Error** label identify an input supply value out of the tolerated limits. Verify the supply voltage in input (V d.c).

The black dot • near the **Battery Error** label identifies a supply value of the connected battery out of the correct parameters. In this case verify the battery parameters, and check if they are correct.



The status table shows the following conditions:

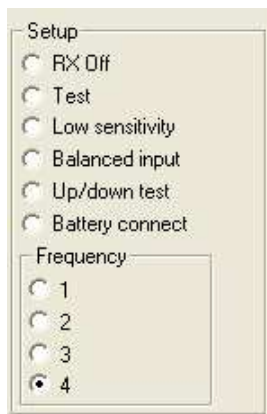
- ☐ Restart
- ☐ Error
- ☐ Supply error
- ☐ Battery error
- ☐ Disqualification
- ☐ Interferenc
- ☒ Wrong freq.
- ☒ Alarm

The black dot ● near the **Disqualification** label identifies that the SENSE activation input is in active mode, and consequently that the receiver microwave works with a reduced sensitivity (control the conformity with the wanted installation standards).

The black dot ● near the **Wrong Frequency** label identifies that the received signal has not the correct receiving frequency (wrong frequency channel), of that there is an interference with the communication.

The black dot ● near the **Alarm** label identifies an alarm condition of the receiver microwave. A possible cause of this error could be a bad (or absent) alignment of the receiver microwave with the transmitter one. Make the alignment as written in “Digital Alignment” chapter, then verify the standby status of the alarm relè.

In the central table of the window the black dot ● identifies the parameters setup, as set in the setup mask :



The black dot ● near the **Rx Off** label identifies that the receiver is not active. To activate the microwave see the “Receiver setup” chapter.

The black dot ● near the **Test** label identifies that the receiver is in test mode (with locked AGC) and that it could be aligned properly.

The black dot ● near the **Low Sensitivity** label identifies that the SENSE input is in active mode, or that the **Disqualification** function is activated in setup mode.

The black dot ● near the **Balanced input** label identifies that the SENSE input is programmed as a balanced input of 3.3Kohm.

WARNING : If the black dot is not showed near the **Balanced Input** option it means that the input is activated by a not balance negative command.

The black dot ● near the **Up Down test** label identifies that this function is in active mode.

The black dot ● near the **Battery Connect** label identifies that the receiver microwave is installed with a connected battery.

The black dot ● near the **Frequency** label identifies the frequency channel currently selected on the receiver microwave.

Verify that the values are set properly to the wanted installation. Otherwise if the user wants to change the parameters see the chapter “Receiver microwave Setup”.

In the right table of the application mask there are showed the read analog values :

If the values are correct, the **Error** label in the status table will not be highlighted.

The value showed in the **Frequency** label must be proper to the selected channel, the read received frequency is the one received from the proper transmitter. If there are problems with the channel try to modify the frequency channel (in TX or RX microwave) with the setup.

The value showed in the **Input voltage** label depends from the received signal quantity. If the system is correctly

Analog value	
Frequency	904 Hz
Input voltage	0.79 V
Reference voltage	1.69 V
Analog supply voltage	11.29 V
Supply voltage	11.58 V
Battery voltage	Not conect V
AGC	98.09 %
Alarm delay time value	37 ms
Alarm sensitivity value	18 %

aligned, this value must be around 0,7Volt, but this value could change because it's influenced by the AGC. If in alignment mode the value is lower 0.7V there's no signal.

The value showed in the **Reference voltage** label is a production parameter, and it must be around 1.7V

The value showed in the **Supply voltage** label must be in a $11 < V_{d.c.} < 13,6$ range.

The value showed in the **Battery voltage** level must be in the correct range of the connected battery.

The value showed in the **AGC** label is the most important value for the alignment procedure, because it identifies, for the receiver, the received signal quality. Higher is the AGC, lower is the received signal. At the end of the service tests mode, the AGC must be set (on the AGC trimmer) at the 25%. The trimmer increases the AGC if rotated to the left.

The value showed in the **Alarm delay time value** label it's important to quantify and set the parameters connected to the intrusion speed. At any intrusion this label shows the related time of intrusion. It's a good thing to do intrusions with objects of the same mass and speed as the ones that the user wants to detect. This thing permits to set the parameters in correct mode (it must be lower than the set parameter during the tests). The parameter value could change at the sensitivity value change. **It's a good thing repeat all the simulations when there is set the definitive time value.**

The analog value showed in the **Alarm sensitivity value** label it's important to quantify and set the detection parameters of the mass / object in the sensible area. For any alarm or intrusion this label shows the % value that the object cause on the AGC value. It's a good thing to simulate intrusions with objects of the same mass as the ones that the user wants to detect. This parameter consent to select the correct value of the mass that the user wants to detect. That value is calculated as the difference from the maximum value that could be set (99%) and the detected value. For example, if the showed % is 30%, the value that must be set is $99 - 30 = 69\%$.

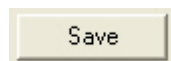
It's a good thing to have a tolerance margin (65% if referred to the previous example)

It's a good thing repeat all the simulations when there is set the definitive sensitivity value. The values of Alarm Delay and Alarm sensitivity are showed at the end of the alarm condition.

In the lower part of the mask there are also two commands :



With the button



Is possible to activate a new window, where the user could save a text file that contains the analog parameters read by the receiver microwave.



The stored values could be referred to the receiver alarm detections. To have an automatic store at any alarm detection select the **Alarm** option then press the **File** button. It will appear a mask where the user can select where save the LOG of the alarms. The directory selection is the one the user wants. The alarm event will be stored with hour, date and a number of rows that indicates the pre and the post alarm values (1 minute before and 1 minute after the alarm)

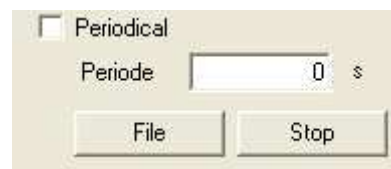


The alarm moment will be highlighted by the A at the beginning of the row (otherwise there is N). The data in this mode are stored every second.

To interrupt the data storing click on the **Stop** button.

There's another kind of storing, that happens every number of seconds as the user wants.

The clicking on the periodical save option, and after the selection of the text file where store the data (as in the alarm storing) the user could have a save of the log every number of seconds as he decide and set in the **Periode** textbox. (from 1 to 60 seconds). Also in this mode the user can stop the data storing with a click on the **Stop** button.



WARNINGS : the storing files must be controlled, to not full the hard disk capacity. In the alarm error storing mode, the last alarm will not be saved if the storing function will be interrupted before the complete data archiving, that happens 1 minute after the stop of the last alarm.

If the settings are corrected and the TX is in ON mode, with the USB cable disconnected only the green led on the board must be switched on.

ALIGNEMENT DESCRIPTION

DIGITAL ALIGNEMENT

It would be good that all the alignment operation here described will be executed on a proper installation field, without depressions, plashes, rain or other things that could change the alignment quality.

After the analog values verifying and the standard values settings verifying (as supplies, battery, load consumption, frequencies) the second step is the digital alignment (AGC setting) and then there will be set delay and sensitivity values (after the detecting tests).

For the digital alignment proceed with the following steps :

The PC that hosts the software must be connected to the receiver unity with the equipped USB cable, then go behind the pillar (or the case) to not influence the microwave signal, and proceed with slow horizontal and vertical movements of the parable, to search the best signal as possible.

The values showed in the **AGC** and in the **Input voltage** labels shows the signal received quantity, or rather the alignment quality. A rising of the **Input voltage** value means a better alignment, the same thing there is with a decrease of the **AGC** value. To execute a good alignment go behind the receiver and do not be in the detecting area (the area must be free) for a 2 minutes minimal time. Put the system in test mode (from the receiver setup) and verify the values. If there are critical values (for example 1-2% or 99% of the AGC) regulate the AGC trimmer (it is near the parable input) and set it at around the 50%, then regulate again the parable to obtain the minimum possible of the AGC value.

This operation should be repeated more than one time.

The maximum alignment research with the cavity movements must be execute on the TX and on the RX microwave and repeated, at the end of the alignment, on the RX head.

When the alignment will be finished switch off (from the receiver setup) the **test** mode and wait for 2 minutes without any access in the detecting area (do not generate alarms), then regulate the AGC trimmer to a value of 25%.

DETECTING TESTS

Make some intrusions (always with the PC connected to the receiver) in many detection zones, and with objects that can simulate the wanted mass and speed. For example if the user wants that the system detect the dimensions of a car if possible make the tests with a car, to have the better possible conditions for the microwave regulation. This is useful for not set the system with a high and not useful (for the installation) sensitivity, that means a low number of false alarms compared to a system on the same field with a higher sensitivity. Try many detections, to verify in many ambient conditions the possible alarms.

The intrusion revelation is showed with the black dot near the **Alarm** label. For any intrusion in the microwave sensible zone will be generated an alarm, and at the end of the alarm will be showed, in the Delay and Sensitivity labels, the values in ms and % of the intrusion.

The values could be showed with lower limits below the set ones (and consequently there must not be showed any alarm), theoretically when the sensitivity value is low (lower then 50-60%) and at the same time more conditions surpass the trigger limits set in a time alarm.

After the test the user must analyze the obtained data and then set the proper values of sensitivity and delay, also on base of the information described in the "Receiver diagnostic" chapter.

The detection/alarm tests must be repeated with a minimal microwave standby time of 2 minutes.

Verify the system stability in standby conditions, without any object in the sensible microwave zone, to see if there aren't false alarms or some breaks in the system (this could be seen from the diagnostic masks of the software)

It's a good thing, for all the data and the settings of any unity in the system, to have a save of the situation on the PC, to use it in an eventual maintenance of substitution of a device.

ALARM LOG FORMAT

As previously written, is it possible to store the unit data to verify the stability and the alarms of the system. A log example is posted in the next page, and in the row before the log there are indicated the hour and the date of the alarm detection.

First column:	condition of the RX microwave (A=in alarm – N= in stanby)
Second column:	Microwave frequency (in Hertz)
Third column:	Detected input voltage
Fourth column:	Detected reference voltage
Fifth column:	Detected analog supply voltage
Sixth column:	Not Used
Seventh column:	Detected supply voltage
Eight column:	Battery voltage, if present
Ninth column:	Set sensitivity
Tenth column:	Set delay time
Eleventh column:	Not Used
Twelvth column:	Detected delay time
Thirteenth column:	Detected %AGC

ALARM LOG EXAMPLE

There are stored 120 events for any alarm, that starts a minute before the detection and stops a minute after. In this example the intrusion caused a sensitivity difference of 37%, with an intrusion speed of 40mS.

The alarm was generate because the sensitivity parameters were setted to 95% (alarm detected with a situation change bigger then the 4% (detected 99-37=62%) and the delay time was bigger then the 40mS set (42 in this case). The first alarm second is the one with the row that begins with "A" (relè and board in alarm conditions), and the alarm duration is 5 seconds. It's possible that the alarm was caused by a quick object (40ms) with a medium mass (as a man)

12.03.2007 09:35:06

12.03.2007 11:19:55

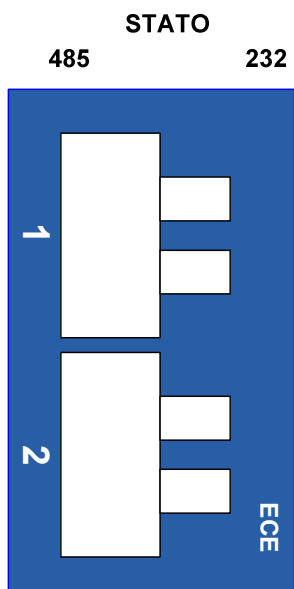
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DaveSoft Switch 232/485 scheme

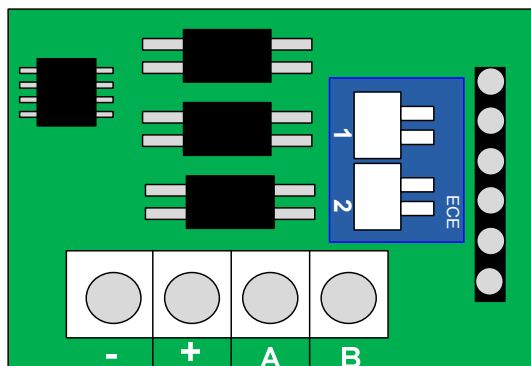


The switch, draw in white and located on the 485 board of the MesDaveSoft, allow to select the type of communication between the microwave and the remote terminal.

- With the two switches shifted on the left, the microwave will communicate with the RS485 port

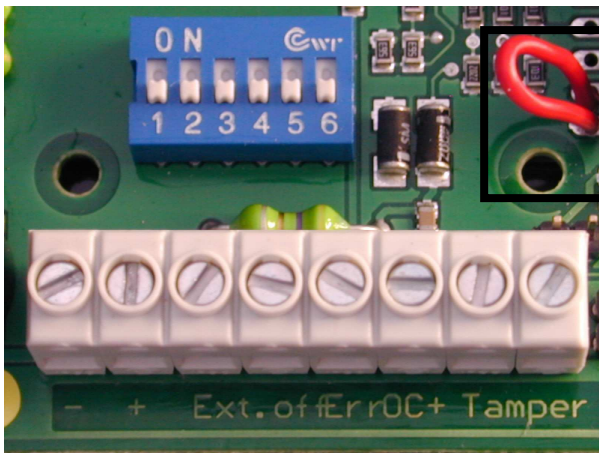
- With the two switches shifted on the right, the microwave will communicate with the remote terminal with the RS232 port, through the USB connection cable included in the DaveSoft Package

- Remember that the DipSwitch on the microwave board under this switch must have ONLY the switch 1 in ON, and all the others in OFF (in exception of the case where there are 2 cavities on the TX MW, where must also be in ON the MW TX switch 6)

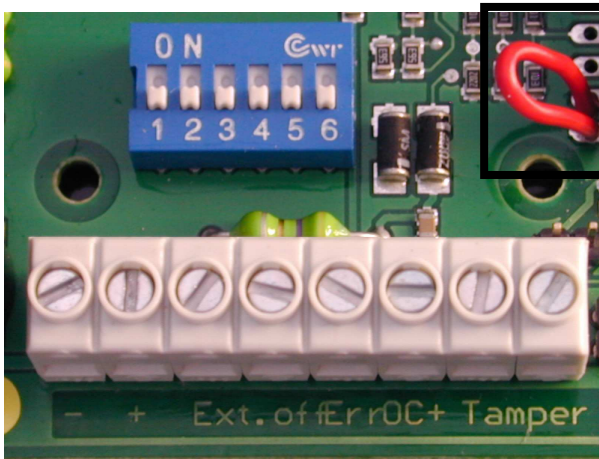


Layout of the serial board on the microwave, with the switch

Davesoft could be also used on microwaves that haven't the 485 board on them. In this case insert the Davesoft cable in the connector immediately on the right of the red cable on the TX and RX microwaves (verify that the DIP 1 is in ON and the others in OFF). If the user wants an analogic alignment and setup of the microwave cut the red cable.



PC use cable. If this cable is cut, the microwave could be aligned in analogic mode and not from the PC. For the PC diagnostic and setup insert the DAVESOFT cable in the connectors immediately on the right o the red cable.



NOTE

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